Courage + Khazaka electronic GmbH
Mathias-Brüggen-Str. 91 * 50829 Köln, Germany
Phone: +49-221-956499-0 * Fax: +49-221-956499-1

Literature List
Cutometer®

A. Jaekel, M. Wirtz, **Surface Characterization of Skin Substitute Materials**, Skin Research and Technology, Volume 31, Issue 7, July 2025

Background: Transdermal therapeutic systems use substance transport through the skin to provide an active pharmaceutical ingredient. To ensure a reliable supply, adhesion to skin must be guaranteed. In practice in vivo studies as well as in vitro studies on steel (ISO-standard for self-adhesive tapes) are used. As in vitro—in vivo correlation is poor, extensive in vivo studies are applied during industrial product performance tests. Hence, a specialized skin substitute material for in vitro adhesion testing is needed. Materials and Methods: Synthetic leather (polyurethane), silicone (Dragon Skin), gelatines, and VitroSkin are used as skin substitute materials. For topographical analysis, reflected light microscopy and confocal light microscopy are applied. Infrared spectroscopy is performed for analysis of functional groups. Dermatological skin probe systems are used to analyze friction, surface pH, and elasticity. To bundle all data with regards to skin similarity, mid-level data fusion is applied. Results: For all substitute materials, common topographic characteristics compared to human skin can be observed. However, all materials show limitations regarding their topography. Gelatine and VitroSkin feature comparable surface functionality compared to human skin. Allmaterials show significant deficits in their mechanical properties. All characteristics can be summarized as the Skin Similarity Index to give a comprehensive overview regarding substitutes similarity to skin. Conclusions: A comprehensive evaluation of topography, chemical functionality, and mechanical properties regarding a skin substitutes similarity to human skin was performed. This data should be considered as a baseline for further research in the field of adhesion to skin. By adding further characteristics and materials, it is a versatile approach that can be implemented in a variety of areas.

*D. Poon, M. Chin, C. Chan***, Extracellular matrix and its role in skin health**, PERSONAL CARE Magazine, Volume 26, Issue 5, May 2025, p. 43-47

Intrinsic ageing, driven by genetics, involves natural changes like cellular senescence, decreased collagen and elastin production, increased breakdown of these proteins, and altered extracellular matrix (ECM) protein composition. However, extrinsic factors such as physical trauma, inflammations, UV radiation, oxidative damage, air pollutants and toxic chemicals exacerbate undesirable ECM changes and premature skin ageing.

C*. Vigo, E. Escudero, S. Benito*, **Interkingdom harmony for ever-blooming female skin**, PERSONAL CARE Magazine, Volume 26, Issue 5, May 2025, p. 49-52

In recent years, the conversation around femininity has evolved, blending empowerment, timeless beauty, and selfactualization. This transformation signifies a profound shift in the demands of adult women for beauty products. Pureblome bridges advanced scientific cosmetics with a holistic approach to wellbeing. Through an agro-psychological lens, it emphasizes the purity of nature as a reflection of healthy, balanced skin. Developed by Triplobiome technology, this new active ingredient is the result of the isolation of Bacillus velezensis bacteria from the leaves of an agroecologically grown hyssop (Hyssopus officinalis). This novel, 100%-traceable ecosystem ingredient harnesses the metabolic intelligence of the plant-bacteria symbiosis, transferring nature's balance and regenerative power directly to the skin. This innovative post-biotic ingredient balances the skin, addressing the complex needs of mature women. Its triple-efficacy approach improves acne, oily skin and inflammation while preventing ageing signs, thus promoting balanced and rejuvenated skin.

L. Guihua, J. Wencai, D. Shan, J. Yanzhu, D. Baek, Y.H. Lee, T. Yimei, **A Study on the Difference in Aging Characteristics of Sensitive and Non-Sensitive Skin**, Skin Research and Technology, Volume 31, Issue 2-5, February-May 2025

Background: According to Euromonitor and T Mall data statistics from 2017 to 2022, the Chinese market for sensitive skin (SS) skincare is growing by 20% every year, and anti-aging concept cosmetics

for sensitive skin are becoming popular. There are few studies on the difference in aging between sensitive and non-sensitive skin. Objectives: This study is to determine whether sensitive skin ages faster than non-sensitive skin. Method: Eighty subjects aged 25–50 years each from sensitive and non-sensitive skin participated in this clinical trial. trans-epidermal water loss (TEWL), CIE-L* a*b* values, gloss, hydration, sebum content, dermis density, elasticity, wrinkles, smoothness, artificial intelligence (AI)-estimated skin age, and pores were evaluated in subjects with sensitive and non-sensitive skin. Results: In the 25- to 29-year-old group, the pore score and nasolabial fold count of non-sensitive skin were significantly lower than those of sensitive skin ($p < 0.05$), but the transparency was significantly higher than that of sensitive skin ($p < 0.05$). There was a significant difference between groups in the MAE value between AI skin age and chronological age, and the AI-estimated skin age of sensitive skin is significantly older than that of non-sensitive skin ($p < 0.05$). There were no significant differences between sensitive and non-sensitive skin in other parameters ($p > 0.05$). In the 30- to 34-year-old group, the TEWL value and a* value of non-sensitive skin are significantly lower than those of sensitive skin, but the L* value and glossiness are significantly higher than those of sensitive skin ($p < 0.05$). There is no statistical difference in other parameters between sensitive and non-sensitive skin ($p > 0.05$). In the 35- to 50-year-old group, sensitive skin demonstrated better performance only in crow's feet compared to non-sensitive skin, with no significant differences observed in other parameters between the groups. ($p > 0.05$). Conclusion: The phenomenon of premature aging in sensitive skin is more obvious, but as age increases, the difference in aging is not obvious. Early anti-aging care for sensitive skin is necessary.

J. Jain, **Combatting ageing with Ayurvedic science**, PERSONAL CARE MAGAZINE, Volume 24, Issue 4, April 2025, p. 101-104

Ageing is an inevitable part of life, but that does not mean your skin has to surrender to time. Fine lines, wrinkles, and loss of elasticity are common signs of ageing, yet the quest for youthful, radiant skin has never been more innovative, or more rooted in nature. While countless skin care solutions promise to turn back the clock, few combine the ancient wisdom of Ayurveda with cutting-edge scientific research to deliver real, lasting results.

S. Leoty-Okombi, C. Kalem, N. Pelletier, C. Pierre, A. Courtois, **Cellular senescence: the age of longevity**, PERSONAL CARE MAGAZINE, Volume 24, Issue 4, April 2025, p. 83-86

The global shift towards longevity in beauty emphasizes ageing as a journey of vitality rather than decline. Cellular senescence, a key hallmark of ageing, disrupts skin integrity and regeneration via the senescence-associated secretory phenotype (SASP). Clinical studies demonstrate the efficacy of a new plant extract from Lysimochia christinae to preserve skin vitality and resilience, in line with the paradigm of pro-longevity in beauty.

S Hettwer, E Besic Gyenge, L. Schoeffel, C. Degl'Innocenti, B. Suter, E. Starace, B. Obermayer, **Upcycled mate tea for healthy ageing**, PERSONAL CARE MAGAZINE, Volume 24, Issue 4, April 2025, p. 43-46

Ilex Paraguariensis Leaf Extract (Yerbaluxe®-Pearl, in the following Ilex Extract), sourced from left-overs from the yerba mate tea production, is a potent ingredient for enhancing skin vitality and supporting healthy ageing. Rich in polyphenols, caffeine, and rutin, it improves skin microcirculation, skin oxygen supply, hydration, and firmness and elasticity, contributing to a youthful appearance. The extract strengthens the skin barrier and protects mitochondria, essential for maintaining cellular health and energy production. Its sustainable production from upcycled mate dust aligns with eco-friendly practices. By fostering resilience and vitality, Ilex Paraguariensis Leaf Extract supports the skin's natural functions, making it a valuable addition to skincare regimens focused on longevity and holistic wellbeing.

Ò. Expósito, M. Buchholz, A. Guirado, A. Gallego, S. Ruiz, M. Mas, P. Riera, D. Luna, S. Lapla-na, T. Ruiz, L. Facchini, M. Gibert, L. Cano, **Following Nature's Rules: A Step Forward in Skin and Hair Care Through Advanced Plant Peptidomics and Proteomics**, IFSCC Magazine, Volume 27 (4), March 2025

The oligopeptide industry, predominantly driven by human-derived peptides in cosmetics and pharmaceuticals, is constrained by transgenic and costly production processes. A paradigm shift towards non-transgenic, cost-effective, and scalable methods is crucial. Plant biotechnology has emerged as a promising alternative, revealing key oligopeptides that closely mimic animal cell regenerative mechanisms, thereby enhancing human cellular growth. This breakthrough expands the horizons of proteomics and peptidomics, unveiling a synergy in peptide biodiversity and composition. Our study leverages patented Phyto-Peptidic Fractions technology to identify a new generation of natural biomimicking peptides from the secretomes of Centella asiatica and Curcuma longa stem cells.

Through sustainable plant biotechnology, these plantderived peptides offer signifcant potential for tissue regeneration, anti-aging, and hair revitalization treatments. The high activity analogy to animal growth factors, coupled with inherent biodiversity, provides a robust, sustainable alternative to synthetic peptides. These fndings underscore the effcacy of genuine plant peptides, substantiated in both in vitro and clinical tests, marking a pioneering advancement in cosmetic science and therapeutic applications.

I. Montaño, **How a Bio-optimized Collagen Peptide Masters Timeless Beauty**, Cosmetics & Toiletries, March 2025

Human type I collagen plays an essential function in skin health and regeneration. It is the most abundant protein, comprising 90% of the human body's protein content, and gives structural support to tissues like skin, tendons and bones. In the skin, it constitutes a significant portion of the extracellular matrix (ECM), granting skin integrity and function and contributing to its biomechanical properties.

K. Saito Otsuka, M. Kita, K. Motonami, M. Takaishi, Z. Guo, H. Kato, M. Toriyama, T. Hara, M. Tominaga, K.J. Ishii, F. Fumitaka, **"Warm skincare" without warming: Novel function of TRPM4 in the skin**, 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

"Warm skincare," such as spa, steam skincare, and thermal massage, have traditionally been used to improve the condition of the skin; however, the detailed mechanisms are unclear. In the present study, we aimed at elucidating the role of TRPM4, a member of the thermosensitive TRP channels activated at warm temperatures, in the skin. To this end, we also conducted an in vivo efficacy study using a TRPM4 activator. TRPM4 mRNA was found to be broadly distributed in the epidermis in the human skin samples. TRPM4 activation by its agonist BTP2 and aluminum potassium sulfate, significantly promoted34rd IFSCC Congress, Brazil, 14-17 October 2024 the proliferation of HaCaT keratinocytes. In a 3D skin model, 7 days of culture with aluminium potassium sulfate significantly increased the loricrin mRNA levels, and decreased transepidermal water loss (TEWL). Additionally, treatment with aluminum potassium sulfate also stimulated tight junction (TJ) formation in a 3D skin model. Lastly, we found that, topical application of the aluminum potassium sulfate-containing lotion increased skin moisture content and Ur/Ua (immediate recovery/total recovery) value and decreased the TEWL value. These results suggest that TRPM4 regulates skin homeostasis by regulating the proliferation and differentiation of keratinocytes, providing an important clue to the mechanisms underlying the skin-ameliorating effect of warm skincare. Warm skincare performed without warming can be achieved by activating TRPM4.

K.M. Kim, Y. Ji, Y. Kim, J. Kim, J. Kim, **Exploring the potential of age reversal: A study from transcriptomic analysis to clinical trial of *Iris germanica L.* rhizome-derived exosomes**, 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Plant-derived exosomes are typically analyzed for their size, purity, and concentration, but their bio-actives are unclear. In this study, we aimed to identify specific components in plant-derived exosomes to understand their unique features and functions. Qubit analysis confirmed bioactivity in Iris rhizome-derived exosomes (IREX), while transcriptome analysis revealed modulation of aging-related genes including, reprogramming (c-MYC, SALL4, CCND1), DNA methylation (DNMT1, DNMT3A, DNMT3B), and longevity (SIRT3, SIRT6). Clinical trials demonstrated a reduction in skin age index, indicating improvements in skin texture and elasticity, with decreased crow's feet wrinkles. Overall, these results suggest that IREX exhibit a capability to reverse the aging process.

S. Sakaguchi, M. Tsutsumi, N. Arakawa, A. Machida, M. Konyo, K. Kajiya, **Skin Sense for Beautiful Life - Improving Mechanical Propagation in the Skin as the Key to Restoring Perceptual Ability**, 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Sensory input through our skin, or "skin sense," is vital for a beautiful life in harmony with others and the environment. Regrettably, skin sense declines mainly due to aging, and there is no aid to restore this vital sense, unlike glasses or hearing aids. Recent observations suggest that variations in skin condition can lead to noticeable differences in skin sense, but the internal mechanisms within the skin remain unclear. To maximize perceived sensory input, this study focused on the force propagated to mechanoreceptors within the skin rather than just the stimuli applied to the skin. We aimed to reveal new possibilities for skincare to directly stimulate skin sense by modifying skin mechanical properties. The results show that both stratum corneum softness and high elasticity of the dermis significantly enhance the efficiency of force propagation to mechanoreceptors, thereby restoring tactile perception. Furthermore, this restored perception can potentially enhance aspects of higher brain function, leading to appropriate cognitive and behavioral responses and enabling harmonious coexistance with others. The unique sensory restoration provided by skincare products that interact directly with the skin will open the door for a new objective in skincare: leading a beautiful life.

O. Doucet, L. Ma, X. Ma, Y. Tan, W. Jiang, **Impact of fatigue on the skin: pilot study on "996" work-life pattern in China and the influence of their lifestyle on the skin**, 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Highly intensive work-life patterns could lead to excessive fatigue, acting as a major cause for the deterioration of health state. However, little is known about the impact of fatigue on skin. Herein, a one-week single center clinical study on full face was conducted to evaluate the impact of fatigue on skin phenotypes. Subjects with 996 work-life patterns (working from 12 hours per day, 6 days per week) and high fatigue score were enrolled. Questionnaires, clinical grading and instrumental measurements were carried out before working week, after 1 working day, 3 working days and 5 working days to trace both the fatigue sensation and skin phenotype change. It was found that the fatigue score increased during the working week. Meanwhile, aging related signs such as fine lines of the cheeks and periocular areas, forehead wrinkles and elasticity were significantly worsened during workdays. In conclusion, the pilot study showed that fatigue was a nonnegligible factor in accelerating skin aging.

Y. Zhang, B. Zhang, X. Sun, J. Wang, Y. Wu, R. Wang, S. Zou, W. Qu, **Multi-dimensional applications of innovative cationic hyaluronan in skincare and haircare**, 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

A cationic hyaluronan derivative was developed with enhanced skin and hair benefits by modifying hyaluronan with hydroxypropyltrimonium. This modification not only boosts skin hydration and barrier function but also soothes skin and reduces signs of aging more effectively than traditional hyaluronan. It also adheres to hair better, providing increased protection and conditioning. This derivative's performance was evaluated in a two-part study. For skin, we measured its effects on moisture-related and anti-aging genes in cells, and its impact on wrinkle reduction and elasticity in human trials. For hair, we assessed how well it binds, its ability to smooth hair, and its influence on hair strength and heat protection. The results showed our cationic hyaluronan derivative increased beneficial gene expression in the skin, visibly reduced wrinkles, and improvedelasticity. In hair, it showed better binding, strength, and protection against heat. Overall, this new hyaluronan derivative offers potent, multifunctional benefits for both skin and hair care, making it an effective ingredient in cosmetics.

L. Liu, W.H. Zhao, H. Wang, X.B. Lan, F. Li, Z.J. Liu, W.F. Ding, **A novel peptidomimetic ameliorates skin photoaging through targeting TGF-β/Smad signaling**, 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Environmental aggressors impact directly on skin structure and function and play prominent roles in driving skin aging. With the emphasis on the importance of photodamage in skin aging, bioactive peptides have been extensively investigated worldwide for their efficacy and safety in the prevention of photoaging. A peptidomimetic compound, identified with the INCI name of β-alanyl hydroxyprolyldiaminobutyroyl benzylamide (abbreviated to β-AHB), has been developed with a notable anti-photoaging activity. In vitro experiments showed that β-AHB exerted a protective effect on the growth of epidermal and dermal cells exposed to UVB radiation, without causing cytotoxicity. Further investigation revealed that β-AHB exhibited significant abilities to enhance ECM components and reduce the total elastase content in UVB-induced human dermal fibroblasts. Additionally, UVB-induced dermal fibroblasts treated with β-AHB displayed a significant increase in protein levels of TGF-β1 and phospho-Smad2/3. In vivo clinical results showed that topical application of 5% β-AHB resulted in a significant and visible improvement in periorbital wrinkles and skin elasticity compared to placebo group. Our findings indicate that β-AHB may possess a significant anti-aging potential in the prevention of UV-induced skin aging.

E. Doridot, E. Pinard, M. Leonard, C. Bondil, P. Mondon, **Characterization of skin elbow aging by 3D fringe projection-based device, standardized pictures and elasticity measures**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Skin aging and its quantification is well known on face. However, other sites are also visible, and the elbow is one of them, in particular in summer and spring seasons. It is generally admitted that with aging the elbows tend to become sagging and more wrinkled and that can be impactant for people in their social relation and self-esteem. Despite this, metrological evaluation of elbow aging is not at all developed. Our aim was to set up reproducible and reliable methods for evaluating elbows changes thru aging and evaluation of anti-ageing products. We developed specific methods, first is a standardized acquisition with a photographic bench, second method consisted in performing 3D acquisition by fringe projection (AEVA). Moreover, we completed this study with use of ElastiMeter® and Cutometer® to get skin elasticity. 35 female volunteers aged 20 y/o to 73 y/o were recruited and submitted to various measures on the elbows. The photographic and the fringe projection benches were both set up to

achieve a good and reproducible contention of volunteers and has allowed us to build up one picture scale and one 3D scale with six age categories that could be useful for clinical evaluation. For both roughness and elasticity analysis, all the parameters have shown a correlation with age. We have thus demonstrated with these methods that wrinkles appearance and loss of elasticity on the elbows are age dependant. We found that fringe projection, Cutometer® and Elastimeter® parameters are valuable to precisely quantify elbow aging and could be advantageously used for the evaluation of cosmetic products.

S. Li, Y. Yu, S. Ding, **Evaluation of stability and efficacy of anti-aging preparation designed by biomimetic extracellular matrix**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

To investigate the stability and efficacy of an extracellular matrix biomimetic anti-aging preparation. The stability test, Free radical (DPPH) clear rate and elastase inhibition test were carried out respectively. A single-center open, 4-week continuous before and after control experiment was conducted with 30 subjects. The results showed that within 6 months, the formula had good stability, after 6 months, the DPPH clear rate of the test sample at 40±2℃ and 75%± 5%RH accelerated condition significantly decreased. Under both storage conditions, 0.1%—1% of the test samples showed certain inhibitory effect of elastase, promoting fibroblast proliferation and up-regulation effect of type I collagen, and there was no significant change within 6 months. Furthermore, the human test confirms that after 4 weeks, the increase rate of skin elasticity and firmness was 7.86% ($P<0.05$), 10.66 ($P<0.05$). More than 90% of the subjects were satisfied with improvement of skin firmness, indicating that the extracellular matrix biomimetic anti-aging preparation has a good application prospect in anti-aging.

Z. Huang, N. Xiang, C. Zhang, J. Huang, Z. Wang, J. Zhang, C. Wu, J. Zhang, W. Peng, **Tea Extract and Peptide Loaded Liposomes for Antiaging Synergistic Effect**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

In this study, our objective was to evaluate the physical and chemical mechanisms underlying the efficacy of this innovative technique involving a combination of LRF and L, termed LLRF, that exerts a synergistic anti-aging effect on human skin. Physical and chemical analyses indicated that a relatively stable liposome with a uniform nano-size, which was formed, possessed good transdermal permeability that was 2.74 folds higher than that of the free peptide (F). LLRF exhibited a higher transdermal permeation performance that was of 3.65 folds higher than that of the free one, which was substantiated via confocal laser scanning fluorescence microscopy. These findings indicated that photoaging skin can be effectively and comprehensively rejuvenated, and that even photodamage can be reversed, thereby restoring the original physiological characteristics of healthy skin. Clinical tests have confirmed that although liposome technology is an effective antiaging method which helps exert tightening and anti-wrinkle effects on human skin, LLRF is an even more effective anti-aging technique. This study reveals a highly effective technique involving a combination physical and chemical therapy that may be utilized for antiaging purposes as well as repairing lightly damaged skin, and can be made readily available in the future.

C.C. Riegler Lis, B. Gruber, R.S. Britto; T. Foti Réus, L. Hoffmann, **Interaction between polyglutamic acid and structuring polymers in skin care formulations**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Polyglutamic acid (PGA) is a skincare active that despite its undeniable efficacy holds great formulation challenges such as its compatibility with others skincare ingredients and theviscosity of final formulation that tends to be low. This biodegradable polymer can improve moisturization and elasticity levels, however, it was noted that PGA shows restrictions with some viscosity donors such as acrylates polymers and high amounts of oily compounds maydifficult to achieve high viscosity. Therefore, the present study aims to suggest technical solutions for high-viscosity formulations containing polyglutamic acid and present its efficacy results. In the laboratory scale, a viscous cream was developed with PGA and submitted to stability tests, remaining stable with viscosity results between 19100cp to 27100cp. Clinical tests were carried out with female volunteers aged between 30 and 59 years, for 28 days, through instrumental evaluations. A significant improvement in skin moisturization, reduction of fine expression lines, and skin elasticity was observed after 14 and 28 days and it was reported that the product has a light texture, not leaving the skin sticky, with an oily and greasy residue. Given these results, it is concluded that the product remained stable and with satisfactory efficacy results.

D. Lin, J. Shen, Y. Li, M. Zhang, H. Zhang, Y. Mao, Y. Li, **A topical antioxidant serum: its antioxidant of squalene effect on human skin sebum filter**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Skin lipids, primarily secreted by sebaceous glands, play a crucial role in skin health but can lead to oily skin and inflammation when overproduced. Environmental and hormonal factors increase reactive oxygen species (ROS) levels, causing oxidative stress and damage to skin lipids. This study examined the effect of a formulation known as EBS, which contained antioxidants such as hydroxydecyl ubiquinone and ethyl bisiminomethylguaiacol manganese chloride, and lipid oxidation inhibitors such as silymarin and sodium ascorbyl phosphate, on skin health. Methods included the exposure of ex vivo skin tissues to UV irradiation to assess changes in ROS, collagen IV, and elastin with EBS treatment, and a clinical trial with 32 volunteers measuring sebum levels, skin firmness, and inflammation after 4 weeks of treatment with EBS. Treatment of ex vivo skin with showed a 26.37% reduction in ROS levels, a significant increase in collagen IV and elastin levels, and a 36.42% decrease in the squalene monohydroperoxide/squalene (SQOOH/SQ) ratio. The clinical results included reduced sebum levels, enhanced skin firmness, and decreased facial redness. Overall, the levels of oxidants and antioxidants following EBS treatment elicited significant improvements in oily skin conditions, reducingoxidative stress and inflammation. These findings support the use of as a comprehensive skincare solution for managing oily skin, with both immediate and long-term benefits.

Y.H. Kim, B.K. Kim, Y.K. Nam, H.Y. Kim, J.S. Lee, E.Y. Jeong, K.H. Lee, S.S. Shin, **The human-like collagen alpha-1 type V peptides improve dermal environment and restore the skin**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

As collagen, the main component of the skin, decreases with age, skin changes such as wrinkles, loss of elasticity, sagging, and dryness appear. Most collagen used in cosmetics is hydrolyzed or fish collagen, and its effects are well known. However, little is known about how collagen type V peptides act on the skin. In this study, we produced our own human-like collagen alpha-1 type V peptides (hCOLVp) and studied their effects on the skin. hCOLVp increased the expressions of collagen type I, III, XVII and laminin 5. And collagen gel treated with hCOLVp showed a significantly greater contractile force than untreated gel and elevated fiber density. In addition, through a skin absorption test on RS, it was confirmed that hCOLVp absorbed into the skin over time. An increase in collagen fibers was confirmed in the reconstructed human skin (RS), and the expression of involucrin and tgase-1 related to the skin barrier was found to be increased. Furthermore, clinical trials have shown that hCOLVp improves skin barrier, density and elastic recovery. From our results, we suggest that hCOLVp can affect structural changes in the skin and improve the entire skin.

J. Zuo, M. Guo, Z. Zhou, F. Yang, **Exploring the Anti-Aging Efficacy and Mitochondrial Impact of a Formulation Containing α-Ketoglutaric Acid (α-AKG)**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Objective: Exploring the anti-aging efficacy of a formulation Containing α-Ketoglutaric Acid (α-AKG), especially the impact on mitochondrial function. Methods: The study involved 33 Chinese women with sensitive skin who tested the anti-aging formula over 56 days. Assessments were conducted at intervals (0, 7, 28, 56 days) using various tools: VISIA and Primos CR for wrinkle analysis, Visioscan® for skin surface texture analysis, Dermlab Combo for dermal density, Tewameter® for skin moisture loss, Glossymeter® for glossiness analysis, and Cutometer® for elasticity analysis. Subjective evaluations were gathered through a questionnaire. Observations of mitochondrial morphology andmitochondrial membrane potential were conducted after treatment with α-AKG (with or without UV exposure) using fluorescence microscopy. Results: The study demonstrated that continued use of the formulation significantly reduced wrinkles, improved skin moisture retention, surface texture, roughness, glossiness, tightness and boosted dermal density. Subjects reported over 90% satisfaction after 56 days. In vitro tests confirmed that α-AKGimproved mitochondrial morphology and membrane potential. Conclusion: This study indicates that the formulation containing α-AKG offers multi-dimensional anti-aging benefits especially in improving mitochondrial function, affirming its potential as a holistic anti-aging skincare solution.

Z. Zhou, Q. Meng, S. Xi, Q. Zhou, H. Meng, F. Yi, H. Ren, Y. Du, **New thinking on the Facial Skin aging stage in a Chinese female population aged 18-60,** Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Background: Facial skin is exposed to the environment, which is characterized by obvious signs of aging. Based on multi-dimensional non-invasive evaluation data, female facial skin can be characterized. However, there are few studies on the general aging rules of facial skin that changes with age. Moreover, most studies divide the aging age group according to 5/10 years old, which lacks dynamic matching with facial skin aging. Aim: Explore facial skin aging rules, discuss the main parameters of facial skin aging, propose an unequal-distance aging division method with age based on the main parameters, and study the skin characteristics of different aging stages. Methods: We

comprehensively described the skin status from five dimensions (24 non-invasive skin parameters) including skin wrinkles, texture, stain, color and barrier, and performed polynomial fitting on 21 skin parameters that were significantly related to age, and got the rules of aging in different dimensions. Based on the wrinkle dimension, the facial skin aging process was divided into four stages, and the skin characteristics of different stages were analyzed. Results: Skin wrinkles increased, texture deteriorated, acne decreased, pigment spots increased, skin tone darkened, and sebum secretion decreased with age based on polynomial fitting. The aging stage was divided into incubation period (18-30 years old), aging occurrence period (31-42 years old), rapid aging period (43-47 years old), and stable aging period (48-60 years old) according to wrinkles. And different aging stages have different skin characteristics. Conclusions: The incubation period is the critical period for the appearance of stains; the skin texture gradually deteriorates during the aging occurrence period; the rapid aging period is a critical period for the aging of skin parameters; skin status during the stable aging period is the worst.

Y. Fan, C. Wei, N. Su, F. Lei, J. Li, P. Sun, **A novel evaluation method of facial skin aging in young Chinese women: An exploratory study**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Background: With the increasing awareness of facial anti-aging, there is a growing demand for anti-aging products, particularly among young females. Various noninvasive methods have been widely used in the assessment of skin aging, and various parameters show unique characteristics on skin aging in some aspects. However, these parameters are independent and scattered, failing to provide an overall assessment of facial skin aging, especially for young Chinese women with characteristics. Based on the research, it is urgent and feasible to screen and integrate the objective quantitative parameters and develop a reliable and accurate method to evaluate the facial skin aging of young populations. Therefore, we constructed, for the first time, a comprehensive evaluation method for facial skin aging in young Chinese women based on correlation analysis. Methods: A total of 100 young Chinese consumer aged 18-33 were enrolled as study subjects, and 39 parameters, such as facial skin wrinkles (around the eyes, under the eyes, cheeks, and nasolabial folds), elasticity, color, moisture, and sebum, were collected from different anatomical positions of the face. Multivariate factor analysis (MFA) and partial least squares regression analysis (PLS) was conducted to determinethe most effective parameters for evaluating facial skin aging and to understand the relationship between these parameters and age. Results: A novel young skin aging prediction model 'CYSPM' was built by using the evaluated facial parameters, which is correlated to women's chronological age. The R square and Q square of the CYSPM is 0.886 and 0.641, respectively, suggesting that the CYSPM was effective and reliable. According to the VIP value, nasolabial fold (Ra), elasticity (R7), face tone (ITA°)/melanin, and sebum are critical factors, suggesting these characteristics are important in skin aging of young Chinese women. Conclusion: Among the 39 parameters, nasolabial fold (Ra), elasticity (R7), face tone (ITA°)/melanin, and sebum as key parameters determining facial skin aging in young Chinese women. For the assessment of facial skin aging in young women, thedetermination of key parameters is meaningful, and the establishment of the model establishes a scientific correlation between objective data and subjective cognition, which is very meaningful for the assessment of aging and overall cognition. Continually, large-scale studies with more parameters will be further performed to refine and optimize this prediction model in future.

Y. Zheng, L. Wang, W. Ding, X. Li, B. Wang, J. Li, **Precision Skincare For Adolescent Acne Skin: A Systematic Approach Combining Lipidomics, Microbiome And Bioinformatic Data Mining To Identify Insightful Targets And Bioeconomic Ingredient Solutions**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Acne vulgaris is a prevalent chronic skin condition in adolescents, with nearly 80% affected, leading to potential long-term stigmatization and psychological distress. Despite its prevalence, the interplay between acne, the skin microbiome, and lipid metabolism is not well understood. This study aimed to elucidate these relationships and develop targeted cosmetic ingredients for adolescent acne. A cohort of 70 adolescents, with and without acne, was assessed using Visia for clinical skin features, high-throughput sequencing for microbiome analysis, and LC-MS/MS for lipidomics. Correlation and network pharmacology analyses identified 59 molecular targets, guiding the design of a novel composition consisting of Euglena gracilis extract, Saccharomyces/Laminaria saccharina ferment, and Ectoin. Cytological experiments validated the composition's effectiveness, showing increased cell survival in HaCaT cells and reduced NO content in RAW264.7 cells. In vivo assays demonstrated improved acne lesions, pimples, and skin erythema with the cosmetic product containing the composition. The study found a significant correlation between skin sebum content and acne severity, with high sebum levels disrupting the skin microbiome and being linked to increased levels of diacylglycerol, fatty acids, and triglycerides, particularly unsaturated fatty acids (FA26:2, FA16:2,

FA24:2). The composition's design addresses two therapeutic targets: skin barrier repair by controlling sebum secretion and avoiding unsaturated fatty acids, and inflammation relief to address lesions and erythema. The successful application of the green-produced composition offers a promising approach for adolescent acne vulgaris treatment.

I. Montaño, G. Grigolon, K. Kappler, J. Baumann, F. Wandrey, F. Zülli, **Six-Amino-Acid Peptide Analogous to Human Skin Collagen: A Novel Agent for Skin Revival**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

The cosmetics industry is continually evolving to incorporate safer and more ethical ingredients. Collagen, a fundamental structural protein in human tissues and a crucial component in many skincare products, is traditionally sourced from animals, followed by marine species till recombinant sources, raising significant ethical and safety concerns. Collagen I is the most abundant protein in the dermis, playing a crucial role in maintaining skin structure and health. However, collagen synthesis decreases with age, leading to wrinkles and other signs of skin aging. Furthermore, collagen decline has recently been linked as a cause, not merely an effect of aging, which makes collagen boosting a promising longevity intervention. To address this and aligned with the global market needs, we have developed a non-animal derived six-amino-acid peptide (6-AA-P) with a sequence identical to a region of the human skin collagen I, designed to trigger the skin repair process and promote skin youthfulness.

K.M. Kim, Y. Kim, E. Lim, J. Kim, H. Lee, **Innovative Assessment of Facial Skin Aging: Development and Validation of the Skin Integrity Index with Anti-Aging Cream**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Accurate assessment of these age-induced alterations is essential for effective skincare. A comprehensive evaluation integrating various skin parameters, contributes to deepening our understanding and addressing these age-related skin concerns. This study introduces an innovative Skin Integrity Index (SI-Index), meticulously designed to evaluate skin aging. Developed through simulations based on extensive big data analysis, the SIIndex comprises five key factors and undergoes validation in clinical studies with anti-aging cream. This research enhances our understanding of skin aging and significantly contributes to refining the precision of anti-aging skincare strategies.

V. Bicard-Benhamou, S.B. Moura, J. zur Lage, M. Lefort, M. Schwachenwald, C. Carola, G. Witte, **A compelling narrative of a baobab extract from its ethical sourcing to in-vitro data and up to outperforming anti-aging in-vivo results**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

The baobab tree primarily grows in Africa. It is widely used for diverse medicinal and non-medicinal purposes, including its potential to alleviate skin conditions. This narrative presents the journey of developing a baobab extract (INCI: Adansonia Digitata Pulp Extract), from ethical and sustainable sourcing to detailed explorations of its mechanisms of action and comprehensive in-vivo evidence. Our studies focused on its biological activity in-vitro, and a 56-day double-blind, placebo-controlled in-vivo study was also carried out.The extract was found to significantly increase the expression of genes involved in the extracellular matrix (e.g., DPT, TIMP1) and genes regulating the oxidative stress response (e.g., HMOX1, SOD2), while also inhibiting collagenases and elastases. In-vivo results demonstrated substantial wrinkle reduction on the crow’s feet, undereye area and around the mouth. Increased collagen fiber perimeter, papillae density and collagen network, along with enhanced firmness, elasticity, and skin density achieving statistically significant effects over the placebo could be also achieved. These results exceeded primary expectations, particularly in challenging areas around the mouth and were consistent with the extract's mechanisms of action.

C. Radoski Neumann, L. de Oliveira Hoffmann, C. Motter Catarino, A.C. Campos Paschoal, B. Bosquetti, C.F. Schettino Oliveira, B. Gruber Rodrigues, A. di Pietro Micali Canavez, A.R. Inacio Firmino, I. Castro Rossato, M.S. da Silva, F. Alvim Sant’Anna Addor, R. Collina Romanhole, D. Cigaran Schuck, **Assessment of Sensitive Skin Tolerance and Efectiveness of a Cosmetic with Vitamin C, Through in Vitro and Clinical Studies**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

While vitamin C's efficacy in cosmetics is well-established, its use on sensitive skin necessitates careful consideration. This study evaluated the safety and efficacy of a 10% 3-O-Ethyl-L-Ascorbic Acid facial serum in improving sensitive skin parameters and promoting anti-aging benefits. In vitro studies using a 5% SLS-sensitized ex vivo human skin model demonstrated the serum's ability to increase filaggrin synthesis while decreasing IL-1α and TRPV1 production, indicating a positive modulation of skin sensitivity markers. Furthermore, the serum significantly increased type 1 pro-collagen synthesis, suggesting anti-aging potential. These findings were corroborated by clinical studies in individuals with

a clinical diagnosis of sensitive skin. The serum demonstrated good safety and tolerability, alongside significant improvements in wrinkle depth, skin hydration, firmness, elasticity, and transepidermal water loss, further confirming its barrier repair properties. This combined in vitro and clinical approach strengthens the robustness of the findings while minimizing participant risk, highlighting the serum's potential as a safe and effective option for sensitive skin.

G.I. Licco, C.F. Cadioli, L. Kakuda, R.A. Zito, C.R.F. Souza, P.M.B.G. Maia Campos, **Long-term effects of sunscreen formulations contain-ing Tara and red algae extract on photoaged mature skin**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

The objective of this study was to evaluate the long-term effects of a sunscreen formulation containing or not 1% Tara (Caesalpinia spinosa) and red algae extract (Kappaphycus alvarezii) in the improvement of photoaged mature skin conditions. For this, twenty participants aged 40- 63 with phototypes II and III were enrolled and divided into two groups: G1 and G2. G1 used the formulation without the active substance (F1), while G2 used the formulation containing Tara and red algae extract (F2). Skin hydration, viscoelasticity and morphological characteristics were evaluated before and after 45 and 90 days of formulations application. Results showed no change in skin characteristics due to regular use of sunscreen by the study participants. Reduction in pore size was noted, attributed to the anti-aging properties of the formulation. The group using the formulation with the extract exhibited improved skin viscoelasticity. The formulation was non-oily with no white residue, enhancing product adherence. In conclusion, the use of active substances with film-forming properties in sunscreens helps to protect the mature skin from exposoma damage, keeping its hydrolipidic balance, hydration and morphological characteristics. Thus, the extract under study can be suggested to apply in multifunctional photoprotective formulations.

H. Wang, M. Guo, Z. Zhou, F. Yang, **A new eye cream enhances anti-aging effects through extracellular matrix synthesis promotion**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

The periorbital region is susceptible to skin dehydration, wrinkles, and loss of elasticity. Therefore, targeted and effective interventions are necessary for the periorbital area. In this study, the efficacy and safety of a new anti-aging eye cream formulated with the active complex (Yeast/Rice fermentation filtrate, N-acetylneuraminic acid, Palmityl Tripeptide-1, and Palmitoyl tetrapeptide-7) were investigated. The expressions of key extracellular matrix (ECM) components of the active complex were evaluated via a fibroblast model. In the 12-week clinical trial, skin hydration, elasticity, facial photographs, and collagen density following eye cream application were assessed. Dermatologists and participants evaluated clinical efficacy and safety at baseline, and after 4, 8, and 12 weeks. PCR and immunofluorescent analyses revealed that the active complex significantly stimulated fibroblast proliferation and markedly promote the synthesis of collagen and elastin. Clinical finding demonstrated a substantial enhancement in skin hydration, elasticity, and collagen production following 12 weeks of eye cream application. Dermatological evaluations and participants' assessments reported a significant improvement in skin moisture, roughness, elasticity, as well as fine lines and wrinkles by week 8. The new anti-aging eye cream, enriched with the active complex, demonstrates comprehensive rejuvenating effects, effectively addressing aging concerns in the periorbital area.

Y. Zhu, Q.-N. Zhou, Y.H. Kim, **Study on Anti-Aging Potential of "Gold Flower" Fungi Fermented Camellia Sinensis Extract**, Presentation at 34rd IFSCC Congress, Iguazu, Brazil, 14-17 October 2024

Ultraviolet B (UVB) radiation induces the generation of free radicals, which in turn leads to inflammation and ultimately causes skin ageing. The signs of skin ageing include wrinkles, pigmentation, loss of skin moisture, and disruption of the skin barrier. The objective of this study was to develop a novel fermented *Camellia sinensis* extract (FCE) and to compare its composition with that of traditional *Camellia sinensis* extracts(TCE). The analysis revealed no significant changes in polyphenols, flavonoids, and saponins between FCE and TCE. However, there was a notable increase in amino acid content from 0.02% to 0.07% and polysaccharide content from 0.36% to 0.48% in FCE. In vitro cell assays demonstrated that the FCE effectively scavenges reactive oxygen species (ROS), inhibits fibroblast β-galactosidase activity, promotes the secretion of type I collagen and hyaluronic acid by fibroblasts, and suppresses the secretion of inflammatory factor iNOS and COX-2 by keratinocytes. Furthermore, human efficacy tests revealed improvements in skin hydration, trans-epidermal water loss (TEWL), skin elasticity, and skin brightness, along with reductions in wrinkles and erythema.

C. Pretel-Lara, R. Sanabria-de la Torre, S. Arias-Santiago, T. Montero-Vilchez, **Skin Barrier Function and Microtopography in Patients with Atopic Dermatitis**, J. Clin. Med. 2024, 13, 5861

Background: Atopic dermatitis (AD) is a chronic inflammatory skin disease whose incidence is

increasing. Skin barrier dysfunction plays an important role in this disease. It has been observed that AD patients have higher transepidermal water loss (TEWL) and lower stratum corneum hydration (SCH); however, there is little information about skin microtopography in this pathology. The objective of this study is to evaluate skin barrier dysfunction and structural changes in patients with AD. Methods: A cross-sectional study was conducted including patients with AD. Parameters of skin barrier function were measured (TEWL, temperature, erythema, pH, skin hydration, elasticity) and also other topographical parameters (scaliness, wrinkles, smoothness, surface, contrast, variance) in both healthy skin and flexural eczematous lesions. Results: A total of 32 patients with AD were included in the study. Flexural eczematous lesions had higher erythema (369.12 arbitrary unit (AU) vs. 223.89 AU, $p < 0.001$), higher TEWL (27.24 g/h/m2 vs. 13.51 g/h/m2, $p < 0.001$), lower SCH (20.3 AU vs. 31.88 AU, $p < 0.001$) and lower elasticity (0.56% vs. 0.65%, $p = 0.05$). Regarding topographic parameters, flexural eczematous lesions presented greater scaliness (5.57 SEsc vs. 0.29 SEsc, $p = 0.02$), greater smoothness (316.98 SEsm vs. 220.95 SEsm $p < 0.001$), more wrinkles (73.33 SEw vs. 62.15 SEw $p = 0.03$), greater surface area (836.14% vs. 696.31%. $p < 0.001$), greater contrast (2.02 AU vs. 1.31 AU $p = 0.01$), greater variance (6.22 AU vs. 4.96 AU $p < 0.001$) and a lower number of cells (105.5 vs. 132.5 $p < 0.001$) compared to unaffected healthy skin, reflecting a decrease in skin quality in AD patients. Conclusions: Both skin barrier function and skin topography are damaged in patients with AD, with differences between healthy skin and flexural eczema.

C. Chen, Y. Ke, **Picosecond Alexandrite Laser With Diffractive Lens Array Combined With Long-Pulse Alexandrite Laser for the Treatment of Facial Photoaging in Chinese Women: A Retrospective Study**, Skin Research & Technology, Volume 30, Issue 10, October 2024

Background and objectives: Facial photoaging is a type of facial skin aging induced mainly by exogenous factors (ultraviolet radiation) and often manifests itself in the form of hyperpigmentation, telangiectasia, roughness, increase in fine lines/wrinkles, and enlarged pores. Recently, picosecond lasers have become an emerging option for the treatment of facial photoaging, and longpulse alexandrite lasers (LPAL) have demonstrated promising potential in the treatment of photoaging-related symptoms. This study aimed to evaluate the efficacy and safety of picosecond alexandrite laser (PSAL) with diffractive lens array (DLA) combined with LPAL for facial photoaging. Methods: This is a retrospective study of 20 Chinese female patients with facial photoaging who received PSAL with DLA combined with LPAL during a 1-year period. All patients were treated every 4 weeks for a total of three treatments. Objective indicators of facial photoaging and patient satisfaction were evaluated before each treatment, and pain scores and adverse effects were recorded after each treatment. Results: Compared with baseline, patients showed significant differences in all facial photoaging indices ($p < 0.01$). After receiving three treatments, there was a 20.1% decrease in the pigmentation index, a 23.9% decrease in the erythema index, a 34.5% decrease in the texture index, a 28.4% decrease in the fine lines index, a 56% decrease in the pore index, a 9.3% elevation and a 17.1% decrease in elasticity R2 and F4, respectively, and a 55% decrease in sebum content. The mean satisfaction score for the three treatments was 4.67 (3.33, 5.00), and the mean visual analogue scale (VAS) pain score was 7.00. No serious adverse effects such as postinflammatory hyperpigmentation (PIH), hypopigmentation, or blistering were observed at the treatment site during the treatment period. Conclusion: PSAL with DLA combined with LPAL for the treatment of facial photoaging with significant efficacy, high patient satisfaction, and minimal adverse effects.

T. Dusabimana, J. Karekezi, T.A. Nugroho, E. Ntambara Ndahigwa, Y.J. Choi, H. Kim, H. J. Kim, S.W. Park, **Oyster hydrolysate ameliorates UVB-induced skin dehydration and barrier dysfunction**, Life Sciences 358 (2024) 123149

Ultraviolet (UV) exposure triggers skin aging primarily by disrupting skin barrier function, resulting in dry skin and wrinkle formation. Oyster hydrolysate (OH), as a functional food, has been reported for anti-cancer, antioxidant and anti-apoptotic effects. This study investigated the underlying mechanism of OH effect on UVBinduced skin aging in SKH1 hairless mice. Mice were exposed to UVB three times per week while they were fed with a normal diet or diet containing OH for 10 weeks. Additionally, a randomized, double-blind, and placebo-controlled clinical trial was performed to investigate the OH effect on human skin moisturizing to evaluate its effcacy and safety. UVB exposure increased parameters of skin aging; dehydration, transepidermal water loss, and macroscopic dorsal skin lesions. OH signifcantly reduced these features of skin aging. Histological analysis demonstrated that OH decreased skin epidermal and dermal thickness and collagen degradation induced by UVB. OH significantly reduced ROS production, suppressed macrophage activation and neutrophil infltration, and downregulated proinflammatory cytokine production. OH improved skin barrier function by increasing the expression of flaggrin, aquaporin-3, and hyaluronic acid synthesis enzymes and promoting recovery from skin damage. Importantly, the results from a human clinical trial demonstrated that OH improved

skin moisturization and integrity with no side effects. Taken together, OH supplementation ameliorates skin damage via anti-oxidant and anti-inflammatory properties and enhances skin hydration and barrier function. OH has a therapeutic potential for skin photoaging.

J.L. Volzke, H. van der Hoeven, **Vegan kefir: a daily companion for skin care**, PERSONAL CARE MAGAZINE, October 2024, p. 31-33

The human skin serves as the body's first line of defence, acting as a barrier between the internal environment and external threats. This seemingly thin layer where our inner world meets the often harsh environment has the major task of keeping 'bad things'out and 'good things'in our body. Particularly facial skin is continuously exposed to various exogenous factors, includingsunlight and pollution, which are exacerbated by global climate change. Additionally, such factors as psychological stress, sleep deprivation, and poor nutrition-which are fundamentally exogenous in nature-also negatively impact the skin. Collectively, these external influences are termed the 'exposome'. The members of the exposome are wellknown contributors to skin ageing and damage. In skin, they generate free radicals, which cause oxidative stress and damage cellular andextracellular components.

O. Exposito, M. Buchholz, A. Guirado, A. Gallego, M. Mas, P. Riera, D. Luna, S. Laplana, T. Ruiz, S. Ruiz, M. Gibert, **Revitalisierung der Hautfitness: Die Synergie von sportlichen Vorteilen und Pflanzenbiotechnologie**, söwf journal, 10/24

Ihr Haut-Workout: Nutzung der molekularen Vorteile von Bewegung fur die Hautgesundheit. Körperliche Aktivitat formt unseren Korper, fördert die Gesundheit und steigert unser Wohlbefinden im Alter. Aber was wäre, wenn auch Ihre Gesichtshaut von einem ähnlichen Training profitieren konnte? Stellen Sie sich vor, solche Effekte könnten allein durch kosmetische Produkte erzielt werden. Jüngste Studien haben gezeigt, dass gezielte Übungen die Gesichtsmuskulatur verjüngen und sich positiv auf die innere Struktur und die biologischen Funktionen der Haut auswirken, von der Kollagenproduktion bis hin zur Verbesserung der Festigkeit und Dichte der Haut. Diese Erkenntnisse haben das Interesse an neuen Methoden und Technologien zur Gesichtsstraffung geweckt.

C. Vigo Xanco, E. Escudero, S. Benito, D. Manzano, **Der erste Ökosystem-Inhaltsstoff fur multi-omischen Hautschutz**, söwf journal, 10/24

Genauso wie unsere Zivilisation als ein weltumspannendes Netz funktioniert, bestehen in dem dichten, komplexen Geflecht eines Ökosystems verschiedenste symbiotische Beziehungen zwischen den Reichen und Domänen von Pflanzen, Tieren und Mikroorganismen, die für das Gleichgewicht und die Lebensfähigkeit des gesamten natürlichen Systems von grundlegender Bedeutung sind. Vor dem Hintergrund der Entwicklung grüner Technologien, der Achtung der Natur und des Strebens nach Wohlbefinden stellt Provital seinen bahnbrechenden neuen Inhaltsstoff Shiloxome vor, den ersten wirklichen „Ökosystem"-Inhaltsstoff, der Alterungserscheinungen entgegenwirkt und zugleich die Haut auf nachweislich multi-omische Weise schützt. Dieser mit der neuartigen Triplobiome™-Technologie hergestellte Wirkstoff wird durch die Isolierung der endophytischen Hefe *Kwoniella mangroviensis* gewonnen, die in der schützenden Rinde der Korkeiche (*Quercus suber*) vorkommt. Dank seines symbiotischen Ursprungs wirkt Shiloxome™ als unvergleichlicher Schutzschild, der die Anpassung, den Selbstschutz und das Wohlergehen der Haut unterstützt. In diesem Artikel liefern wir multi-omische Belege fur die positive Wirkung von Shiloxome™ gegen die Folgen von Umweltschadstoffen und der Hautalterung. Die Ergebnisse zeigen, dass dieser endophytische Extrakt in vitro und in vivo eine klare verjüngende Wirkung erzielt und verschiedene Aspekte eines gesunden Erscheinungsbildes der Haut signifikant verbessert. Darüber hinaus bewahrt dieser neue Wirkstoff das natürliche Mikrobiom der Haut und birgt somit das Potenzial, Hautveranderungen infolge von Umweltverschmutzung vorzubeugen. Durch die Modulation des Lipidomprofils zugunsten von Lipiden mit längeren Ketten und die Verringerung ihrer Oxidation stärkt er zudem die Schutzfunktion der Hautbarriere in einem durch Umweltverschmutzung belasteten Umfeld.

B. Nedelec, Z. Edger-Lacoursière, N. Gauthier, E. Marois-Pagé, S. Jean, **Randomized, controlled, withinpatient, single-blinded pilot study to evaluate the efficacy of 12-weeks of endermotherapy with adult burn survivors**, Burns, 2024 Sep 22:S0305-4179(24)00293-6

Background: Vacuum massage, or endermotherapy, is applied to scar tissue with the primary therapeutic goal of promoting structural or physiological changes. These changes are intended to enhance pliability, enabling the skin to possess the strength and elasticity required for normalmobility. The advantage of vacuum massage compared to therapist-generated manual massage is that it provides a standardized dosage using rollers and suction valves to mobilize the tissue. However, research documenting and supporting its impact on post-burn hypertrophic scar islacking. Thus, this tudy was designed to objectively characterize the changes in scar elasticity, erythema, melanin,

thickness, and transepidermal water loss immediately after a vacuum massage session and after a 12-week course of treatment compared to intra-individual matched control scars. Methods: We conducted a prospective, randomized, controlled, within-patient, single-blinded clinical trial, initially designed as a fully-powered study but limited to a pilot study due to COVID-19 restrictions. Nineteen burn survivors consented to participate and 16 completed the study. Two homogeneous, intra-individual scars were randomized to usual care control or vacuum massage therapy plus usual care. Vacuum massage interventions were provided by a certified massage therapist three times per week for 12 weeks. Scar characteristics were evaluated every four weeks immediately before and after mechanical massage treatment. The evaluations included measurements of elasticity (Cutometer), erythema and melanin (Mexameter), transepidermal water loss (TEWL) (Tewameter), and thickness (high-frequency ultrasound). Linear mixed-model analyses were performed to test for immediate and long-term treatment effects. Results: The ANOVA analyses revealed a non-significant time: treatment interaction for elasticity, erythema, melanin, thickness, or TEWL. There was a significant increase in elasticity and erythema and a decrease in TEWL in both the control and treatment sites over time with consistent standard care. However, there was no statistically significant immediate or long-term treatment effect for any of the skin characteristics. Nonetheless, the mean participant satisfaction was 4/5 (SD = 1.5) and the mean participant perception of effectiveness was 8/10 (SD = 1.9). Conclusions: This pilot study did not find a treatment benefit of vacuum massage therapy for elasticity, erythema, melanin, thickness or TEWL, but it did find an improvement with time in elasticity, erythema and TEWL. Despite the lack of objective improvement of the treated scar site, participants were satisfied with the results and believed vacuum massage was very effective. Further high-quality research is required to better inform clinicians patient education and treatment decisions for this costly, burdensome treatment approach that has high participant satisfaction.

M. Roohaninasab, A. Jafarzadeh, A. Sadeghzadeh-Bazargan, S. Zare, M. Nouri, M.A. Nilforoushzadeh, E. Behrangi, **Evaluation of the efficacy, safety and satisfaction rates of platelet-rich plasma, non-cross-linked hyaluronic acid and the combination of platelet-rich plasma and noncross-linked hyaluronic acid in patients with burn scars treated with fractional CO2 laser: A randomized controlled clinical trial**, Int Wound J. 2024;21:e70065, September 2024

Skin scarring can result from burns, injuries, stretch marks and acne, leading to cosmetic and functional difficulties. Treatments for burn scars encompass a range of options, such as lasers, corticosteroid injections, surgery and regenerative techniques such as platelet-rich plasma (PRP). Hyaluronic acid-based products offer skin hydration and shield against aging effects. A study is being conducted to evaluate how effective PRP injection, hyaluronic acid and their combination improve burn scars and their effects on quality of life and potential disabilities. In our study, PRP and non-cross-linked hyaluronic acid treatments were compared in 10 individuals with burn scars between 2022 and 2023. Patients received CO2 fractional laser treatment followed by injections in scar areas. Evaluations included the Vancouver scar scale (VSS), biometric assessments, ultrasounds and satisfaction ratings. Two therapy sessions were conducted at 1-month interval, and assessments were done before treatment, 1 month after the first session, and 3 months after the first session. Biometric assessments showed significant improvements in various parameters (tewametry, corneometry, erythema index, melanin index, cutometry, thickness and density) in the intervention groups compared to the placebo group ($p < 0.05$). PRP-non-cross-linked hyaluronic acid, PRP and non-cross-linked hyaluronic acid treatments exhibited the best clinical responses with significant differences between groups ($p < 0.05$). Dermal thickness did not show significant improvement during treatment sessions, and changes among subjects were not significantly different. The colorimetry parameter improved in all groups except the placebo group, with no significant difference between intervention groups. The VSS significantly decreased in all treatment groups except the placebo group. PRP, non-cross-linked hyaluronic acid and especially the combination of these two treatment options are very effective in treating burn scars.

M. Boccardi, S. Cilla, M. Fanelli, C. Romano, P. Bonome, M. Ferro, D. Pezzulla, R. Di Marco, F. Deodato, G. Macchia, **Ultra-Hypofractionated Whole Breast Radiotherapy with Automated Hybrid-VMAT Technique: A Pilot Study on Safety, Skin Toxicity and Aesthetic Outcomes, Breast Cancer: Targets and Therapy**, September 2024:16, p. 611–619

Purpose: The most prevalent treatment-related side effect related to adjuvant radiotherapy (RT) for breast cancer is acute skin toxicity in the irradiated area. The purpose of this single-institution pilot study is to provide preliminary clinical results on the feasibility and safety of a breast ultra-hypofractionated radiation treatment delivered using an automated hybrid-VMAT technique. Skin damage was assessed both with clinical examination and objectively using a Cutometer equipment. Patients and Methods: Patients received 26 Gy to the whole breast and 30 Gy to the tumoral bed in 5 fractions using an automated hybrid-VMAT approach with the option for the breath hold technique if

necessary. Acute and late toxicities were clinically evaluated at baseline, 1- and 6-months after treatment using the CTC-AE v.5.0 scale. An instrumental evaluation of the skin elasticity was performed using a Cutometer® Dual MP580. Two parameters per patient, R0 (the total skin frmness) and Q1 (the elastic recovery), were registered at the different timelines. Results: From June 2022 to January 2024, 30 patients, stage T1-T2, N0 were enrolled in the study. Four out of 30 (13.3%) patients reported G2 acute skin toxicities. At 6 months, G2 late toxicity was registered in 3 patients (10%). A total of 2160 measures of R0 and Q1 were recorded. At 1 month after treatment, no correlation was found between measured values of R0 and Q1 and clinical evaluation. At 6 months after treatment, clinical late toxicity ≥1 was strongly associated with decreased R0 and Q1 values ≥24% (p = 0.003) and ≥18% (p = 0.022), respectively. Conclusion: Ultra-hypofractionated whole-breast radiotherapy, when supported by advanced treatment techniques, is both feasible and safe. No severe adverse effects were observed at any of the different timeframes. Acute and late skin toxicities were shown to be lower in contrast to data presented in the literature.

M.A. Nilforoushzadeh, S. Rafiee, M. Heidari-Kharaji, T. Fakhim, N. Najar Nobari, M. Shahverdi, Z. Lotfi, S. Zare, E. Torkamaniha, S. Alavi, **Investigating the efficacy of Endolift laser and Nanofat as a combination therapy for horizontal neck lines compared to Nanofat autologous alone**, Skin Research & Technology, Volume 30, Issue 9, September 2024

Background: The emergence of horizontal neck wrinkles is increasingly becoming a focal point for both cosmetic professionals and clients. Various treatment approachesmust be considered to address this issue effectively, owing to its diverse underlying causes. The study explores the potential of utilizing the Endolift laser in conjunction with nanofat injection as a viable treatment option. Methods: Twenty patients with horizontal neck wrinkles involved in the study. Ten patients underwent treatment with a combination of Endolift laser and nanofat injection and 10 patients treated with nanofat injection alone. The participants were monitored for 6 months post-treatment. Biometric measurements were utilized to assess outcomes, including changes in volume, depth, and area of the wrinkles, skin elasticity, as well as the diameter and density of the epidermis and dermis in the treated area. Skin improvement was evaluated by two independent dermatologists, who compared before and after photos in a blinded manner. Patient satisfaction levels were also documented. Results: The Visioface analysis showed a notable decrease in neck wrinkle depth and area in both groups. However, the group receiving the combination treatment of Endolift laser and nanofat exhibited a significantly greater improvement compared to the group treated with nanofat alone. Skin ultrasonography results demonstrated an increase in thickness and density of the dermis and epidermis in both groups. Particularly, the group treated with Endolift laser-nanofat displayed significant enhancements in dermis and epidermis density and thickness when contrasted with the nanofat-only group. Analysis with Cutometer revealed a marked enhancement in skin elasticity in the Endolift-nanofat treated group in comparison to the nanofat-only treated group. Furthermore, in the Endolift-nanofat treated group, a substantial majority (90%) of patients exhibited improvement. Patient evaluations highlighted significant distinc tions between the two groups, with 95% of patients in the Endolift-nanofat treated group demonstrating enhancement. Conclusion: Both methods notably enhance horizontal neck wrinkles; nevertheless, the combination of endolift laser and nanofat seems to be more efficient for treating horizontal neck wrinkles.

S. Kondo, N. Ozawa, T. Sakurai, **The effect of degeneration of elastic fibres on loss of elasticity and wrinkle formation**, Int J Cosmet Sci., September 2024

Objective: Skin elasticity, which is vital for a youthful appearance, depends on the elastic fibres in the dermis. However, these fibres deteriorate with ageing, resulting in wrinkles and sagging.Changes that occur in the elastic fibres in living human skin and the relationship between elasticfibres and the state of the skin surface remain unclear. Therefore, it is necessary to verify therelationship between elastic fibres and skin elasticity. In this study, we investigated the association of the elastic fibre structure with skin elasticity and stratum corneum protein content in living human skin. Methods: Thirty-five female volunteers aged 25-66 years were included in this study. Elastic fibres were observed using a multiphoton scanning laser biomicroscope. Skin elasticity was measured using a Cutometer, and stratum corneum proteins (Heat-shock protein 27 [HSP27] and galectin-7 [Gal-7]) in tape-stripped samples were analysed using an enzyme-linked immunosorbent assay. Results: Elastic fibres exhibited increased curvature and thickness with increased age, with fragmentation observed in women aged >60 years. Elastin scores, which reflect thinness and curvature, were negatively correlated with age, whereas they were positively correlated with R7 elasticity (recovery ability). In individuals aged 20-30 years, higher levels of inflammatory markers (HSP27 and Gal-7) correlated with lower elastin scores; however, this trend was not observed in older participants.Conclusion: Elastic fibre deterioration worsened after 40 years of age, and this effect correlated with reduced skin recovery and increased wrinkles. In younger individuals, inflammatory markers affected elastic fibres. These findings can guide

anti-ageing strategies that focus on elastic fibre preservation and inflammation control.

H. Chajra, T. Saguet, C. Granger, L. Breton, P. Contreiras Pinto, M. Machicoane, J.M. Le Doussal, **A New TGF-β Mimetic, XEP™-716 Miniprotein™, Exhibiting Regenerative Properties Objectivized by Instrumental Evaluation**, Dermatol Ther (Heidelb), September 2024

Introduction: Skin aging, which results from intrinsic and extrinsic factors, is characterized bya rough, uneven and wrinkled appearance of the skin at the macroscopic level. At the microscopic level, aging shows lowered keratinocyte turnover, fattened dermal-epidermal junction and reduced collagen fber density; however, use of skin biopsies to evaluate characteristic properties of these microscopic changes is too limiting for panellists and rarely used. The development of non-invasive techniques is an opportunity to be considered for such evaluations. Our objective was to demonstrate the rejuvenating effects of XEP™- 716 Miniprotein™ on skin, a miniprotein having TGF-β beta-like properties, in vitro on normal human fbroblasts and at the clinical level. Methods: In vitro, the skin rejuvenation properties of XEP™-716 Miniprotein™ were studied by quantifcation of well-known dermal components such as collagen type I, hyaluronic acid and elastin. At the clinical level, we used a non-invasive technique, the confocal laser scanning microscopy (CLSM) system, which enabled non-invasive morphological characterization of skin structures (stratum corneum thickness, viable epidermis, full epidermis, dermal-epidermal junction, papillae, dermal collagen density) and high-frequency ultrasonography to quantify the dermal density and thickness, which are useful parameters for quantifying rejuvenating effects on skin. Lastly, a cutometer was used to assess the skin's biomechanical properties, mainly frmness and elasticity. This monocentric double-blind, split-face, randomized, placebo-controlled clinical trial compared the active ingredient XEP™-716 Miniprotein™ in a vehicle on one hemiface versus vehicle alone on the other (placebo) and enrolled panellists aged 40 to 60 years old. All measurements were carried out on the malar area before and after 28 and 56 days of twice daily application of a cosmetic cream formulation containing either 2.5% or 5% XEP™-716 Miniprotein™. The skin rejuvenating properties were demonstrated by studying dermo-epidermal junction (DEJ) fattening reduction using the measure of two parameters by CLSM: the DEJ length and number of edged papillae. Dermis rejuvenation was assessed by measuring the collagen fber perimeters (CLSM), dermal density and dermal thickness (ultrasonography). Results: The in vitro results confrmed the ability of XEP™-716 Miniprotein™ to stimulate the key extracellular macromolecules, namely collagen type I, hyaluronic acid and elastin, at a level comparable to that induced by TGF beta growth factor. The clinical data showed that after 28 and 56 days of topical XEP™-716 Miniprotein™ application, there was a statistically signifcant increase of DEJ length, number of edged papillae and collagen fber perimeters. At the same time point, the B-scan images of facial skin showed a statistically signifcant increase of dermal density and thickness. These results reveal that the DEJ became more undulated and tightly attached to the dermis, while the papillary dermis was densifed, both traits being typical characteristic of younger skin. Rejuvenation was also confrmed by an improvement of skin frmness and elasticity. Conclusion: The in vitro and clinical results presented in this article show that XEP™-716 Miniprotein™ is a potent ingredient to rejuvenate the DEJ and dermis of mature skin.

G. Grigolon, K. Nowak, F. Wandrey, F. Zülli, **Combat inflammaging with upcycled mandarin extract**, PERSONAL CARE MAGAZINE, Volume 28, Issue 8, September 2024, p. 53-56

Inflammaging', a term coined by Professor Franceschi two decades ago, refers to a persistent, low-grade inflammatory state that develops with age due to a combination of chronological ageing, intrinsic factors, and external stressors. As we age, the body's capacity to counter inflammation diminishes, leading to this chronic inflammatory state, which contributes to visible signs of ageing skin and age-related pathologies, creating a vicious cycle. In fact, this inflammatory state reduces the energy available to produce essential skin molecules like hyaluronic acid and collagen, levels of which are observed to decrease in ageing skin.Therefore, boosting energy to enhance the production of these vital molecules can significantly benefit the skin.

A. Charpentier, **K-Beauty- New challenges around claims & substantiation**, Cosmetic Business, September 2024

Korean beauty emerged as a major actor in product cosmetics, setting new standards for efficacy, ingredients and product diversity. Fueled by social media and a growing interest in skin care, K-beauty blends centuries-old tradition, culture and ancient practices with modem scientific advancements in research and formulations. Additionally, Korean brands, as well as OEM/ODMs, are the driving force behind new marketing concepts, quickly picking up on the weak signals of the expectations of well-informed beauty consumers.

S.H. Kim, J.H. Kim, Y.M. Choi, S.M. Seo, E.Y. Jang, S.J. Lee, H.-S. Zhang, Y. Roh, Y.W. Jung, C.O.

Park, D.H. Jeong, K.H. Lee, **Development of a biomarker-based platform for comprehensive skin characterization usingminimally invasive skin sampling and quantitative real-time PCR**, Skin Research and Technology: Volume 30, Issue 8, August 2024

Background: Classifying diverse skin types is crucial for promoting skin health. However, efficiently identifying and analyzing relevant biomarkers from a vast array of available genetic data is challenging. Therefore, this study aimed to develop a precise and efficient platform for analyzing specific skin biomarkers using quantitative real-time PCR (qRT-PCR) with the minimal invasive skin sampling method (MISSM). Materials and methods: MISSM was used for RNA extraction from skin samples, followed by qRT-PCR analysis to quantify the expression of 20 biomarkers associated with skin characteristics (four biomarkers each for five skin characteristics). Noninvasive measurements from 299 Korean participants were utilized to correlate biomarker expression with skin parameters. Statistical analyses were conducted between biomarker expression levels and noninvasive skin measurements to select the relatively best-performing biomarker for each skin characteristic. Results: Collagen type 1 alpha 1 (COL1A1) and moesin (MSN) were identified as skin aging biomarkers. Krüppel-like factor 4 (KLF4) and serine peptidase inhibitor Kazal type 5 (SPINK5) were identified as skin dryness biomarkers, whereas melan- A (MLANA) was selected as a biomarker for understanding pigmentation dynamics. Myelin protein zero like 3 (MPZL3) and high mobility group box 2 (HMGB2) were identified as markers of oily skin and skin sensitivity, respectively. Statistically significant correlations were found between the biomarker expression levels and noninvasive skin characteristic measurements. Conclusion: This study successfully developed a platform for the precise evaluation of individual skin characteristics using MISSM and qRT-PCR biomarker analysis. By selecting biomarkers that correlate with noninvasive measurements of skin characteristics, we demonstrated the platform's efficacy in assessing diverse skin conditions.

H. Chun, H. Lee, J. Kim, H. Yeo, K. Hyung, D. Song, M. Kim, S.-H. Jun, N.-G. Kang, **Efficacy of Vitamin B12 and Adenosine Triphosphate in Enhancing Skin Radiance: Unveiled with a Drug–Target Interaction Deep Learning-Based Model**, Curr. Issues Mol. Biol. 2024, 46, p. 9082–9092

Skin radiance is crucial for enhancing facial attractiveness and is negatively affected by factors like hyperpigmentation and aging-related changes. Current treatments often lack comprehensive solutions for improving skin radiance. This study aimed to develop a cosmetic formula that enhances skin radiance by reducing hyperpigmentation and improving skin regeneration by targeting specific receptors—the endothelin receptor type B (EDNRB) for hyperpigmentation and the adiponectin receptor 1 (ADIPOR1) for sagging and wrinkles. To achieve this, we used artifcial intelligence technologies to screen and select ingredients with an affnity for EDNRB and ADIPOR1. Vitamin B12 (VitB12) was identifed as a molecule that targets EDNRB, which is involved in melanogenesis. Adenosine triphosphate (ATP) targets ADIPOR1, which is associated with skin regeneration. VitB12 successfully inhibited intracellular calcium elevation and melanogenesis induced by endothelin-1. In contrast, ATP increased the mRNA expression of collagen and elastin and promoted wound healing. Moreover, the VitB12 and ATP complex signifcantly increased the expression of hyaluronan synthases, which are crucial for skin hydration. Furthermore, in human participants, the application of the VitB12 and ATP complex to one-half of the face signifcantly improved skin radiance, elasticity, and texture. Our fndings provide valuable insights for the development of skincare formulations.

Y. Fujimoto, Y. Yuri, H. Tamiya, **Skin mechanical propertiesmeasured with skin elasticity measurement device in patientswith lymphedema: Scoping review**, Skin Research and Technology: Volume 30, Issue 8, August 2024

Background: Skin conditions in patients with lymphedema have been identified according to changes in skin mechanical properties. The skin elasticity meter is a noninvasive tool formeasuring themechanical properties of the skin; however, its potential use in patients with lymphedema has received little attention. This review aimed to provide an overview of studies measuring the skin mechanical properties of patients with lymphedema using a skin elasticitymeter. Materials and methods: Search terms and synonyms related to lymphedema and skin mechanical property measurement using a skin elasticity meter were identified, and electronic databases containing articles in English were searched. Results: A total of 621 articles were retrieved, and four articles were analyzed after screening. Despite this research subject receiving increasing attention, no consensus has been reached regarding the bestmethods. Conclusion: Measurement methods are expected to be standardized in the future to elucidate the skin mechanical properties of patients with lymphedema.

E. Rahman, P. Rao, W. Philipp-Dormston, W. R. Webb, P.E. Garcia, S. Ioannidis, N. Kefalas, A. Kajaia, L. Friederich, N. Yu, K. Wang, A. Parikh, A.R.T. Almeida, J.D.A. Carruthers, A. Carruthers, A. Mosahebi, W. Wu, G. Goodman, **Intradermal Botulinum Toxin A on Skin Quality and Facial Rejuvenation: A**

Systematic Review and Meta-analysis, Plast Reconstr Surg Glob Open 2024, August

Background: Botulinum toxin A (BTxA) has gained popularity as a nonsurgical aesthetic treatment for skin rejuvenation. However, previous studies on intradermal BTxA have shown inconsistent results. This systematic review and meta-analysis with trial sequential analysis aimed to assess the efficacy and safety of intradermal BTxA for facial rejuvenation. Methods: Following PRISMA guidelines, a comprehensive search was conducted in various databases from January 2008 to March 2023. Outcome measures included sebum production, pore size, skin hydration, skin texture, erythema index, facial wrinkles, and facelift. Eligible studies included human-based clinical trials and prospective cohort studies published in English, focusing on healthy populations requiring facial rejuvenation. Two authors independently screened the titles and abstracts, followed by a full-text review to determine study eligibility. Data extraction and quality assessment were performed by two authors using predefined criteria. Results: Ten studies met the inclusion criteria, including five randomized controlled trials and five prospective cohort studies with 153 participants. Studies revealed positive effects of intradermal BTxA on various outcome measures related to facial rejuvenation. These effects included improvements in sebum production, pore size, erythema index, facial wrinkles, skin texture and elasticity, and overall facelift but not skin hydration. All failed to reach the required information size in the trial sequential analysis. Conclusions: Findings suggest positive outcomes in multiple attributes of skin quality and facial rejuvenation. However, more high-quality research is needed to establish definitive conclusions. These findings contribute to the evidence base for nonsurgical aesthetic treatments, emphasizing the importance of ongoing research in this field.

V. Bicard-Benhamou, J. zur Lage, M. Lefort, C. Carola, G. Witte, **A Promising Alternative to Retinol as a Powerful Anti-Aging Cosmetic Ingredient, IFSCC magazine**, August 2024, p. 103-108

The cosmetic market offers a wide range of anti-aging products, making it challenging for consumers to select the right ingredients. While retinol has long been considered the gold standard in anti-aging, it may not be suitable for all skin types. Consequently, consumers must consider various factors such as frequency of use, concentration, and application time when choosing a skincare product containing retinol. This scientific study aimed to compare the in vivo anti-aging effects of our ingredient, RCL (INCI: Sorbitol, Dihydroxy Methylchromone), with those of retinol. RCL is a nature-identical, multifunctional active ingredient. To evaluate its performance, a 28-day in vivo study was conducted, which explored several parameters including wrinkle status, biomechanical properties of the skin, and cutaneous barrier integrity. The results of the study demonstrated that the emulsion containing RCL outperformed the formulation containing retinol. This suggests that RCL may offer superior anti-aging benefits when compared to retinol-based products.

M. Knoz, J. Holoubek, B. Lipový, M. Faldyna, R. Chaloupková, V. Pavliňáková, Johana Muchová, K. Kacvinská, J. Brtníková, J. Jarkovský, L. Vojtová, **Evaluation of viscoelastic parameters and photo-based assessment of newly developed dermal substitutes modified with thermostabilized fibroblast growth factor**, Burns Volume 50, Issue 6, August 2024, p. 1586 - 1596

Background: The purpose of dermal substitutes is to mimic the basic properties of the extracellular matrix of human skin. The application of dermal substitutes to the defect reduces the formation of hypertrophic scars and improves the scar quality. This study aims to develop an original dermal substitute enriched with stable fibroblast growth factor 2 (FGF2-STAB®) and test it in an animal model. Methods: Dermal substitutes based on collagen/chitosan scaffolds or collagen/chitosan scaffolds with nanofibrous layer were prepared and enriched with FGF2-STAB® at concentrations of 0, 0.1, 1.0, and 10.0µg · cm^{-2}. The performance of these dermal substitutes was tested in vivo on artificially formed skin defects in female swine. The outcomes were evaluated using cutometry at 3 and 6 months. In addition, visual appearance was assessed based on photos of the scars at 1-month, 3-month and 6-month follow-ups using Yeong scale and Visual Analog Scale. Results: The dermal substitute was fully integrated into all defects and all wounds healed successfully. FGF2-STAB®-enriched matrices yielded better results in cutometry compared to scaffolds without FGF2. Visual evaluation at 1, 3, and 6 months follow-ups detected no significant differences among groups. The FGF2-STAB® effectiveness in improving the elasticity of scar tissues was confirmed in the swine model. This effect was independently observed in the scaffolds with nanofibres as well as in the scaffolds without nanofibres. Conclusion: The formation of scars with the best elasticity was exhibited by addition 1.0µg cm^{-2} of FGF2-STAB® into the scaffolds, although it had no significant effect on visual appearance at longer follow-ups. This study creates the basis for further translational studies of the developed product and its progression into the clinical phase of the research.

K. Handeland, M. Wakeman, L. Burri, **Krill oil supplementation improves transepidermal water loss, hydration and elasticity of the skin in healthy adults: Results from two randomized, double-blind, placebo-controlled, dose-finding pilot studies**, J Cosmet Dermatol. July 2024

Background: Dietary marine omega-3 fatty acids and phospholipids have individually shown favorable effects on skin barrier function. Krill oil offers a combination of omega-3 in phospholipid form which might enhance the efficacy in supporting skin health. Aims: The aim was to investigate the impact of two different doses of krill oil on skin transepidermal water loss (TEWL) in healthy adults. Secondary outcomes were skin hydration, elasticity and the omega-3 index. Methods: Two randomized, double-blind, placebo-controlled, pilot studies were conducted in healthy adults with a baseline TEWL of >10 and ≤24.9 g/m2/h. In study 1, 51 participants consumed 1 g of krill oil or placebo daily. In study 2, 50 participants consumed 2 g of krill oil or placebo daily. The outcomes were assessed at baseline, 6 and 12 weeks. Results: The krill oil supplemented groups significantly increased their omega-3 index versus placebo in both studies. Furthermore, the krill oil groups in both studies showed statistically significant beneficial reductions in TEWL (from 14.47 ± 3.65 to13.83 ± 3.78 in study 1 and from 14.25 ± 3.21 to 13.02 ± 2.76 in study 2) and increases in hydration and elasticity when compared to placebo. There were significant linear relationships between changes in the omega-3 index and changes in TEWL, hydration and elasticity in both studies. Conclusions: Daily oral supplementation with 1 and 2 g of krill oil showed significant and dose-dependent improvements in skin TEWL, hydration, and elasticity compared to placebo that correlated with changes in the omega-3 index.

D.M. Reilly, L. Kynaston, S. Naseem, E. Proudman, D. Laceby, **A Clinical Trial Shows Improvement in Skin Collagen, Hydration, Elasticity, Wrinkles, Scalp, and Hair Condition following 12-Week Oral Intake of a Supplement Containing Hydrolysed Collagen**, Dermatol Res Pract. 2024 Jul

Background: Hydrolysed collagen supplements are reported to fight the signs of aging and improve skin appearance, but more authoritative clinical evidence is needed to support efficacy. Aim: This randomised, double-blind, placebo-controlled study evaluated the efficacy of a supplement containing hydrolysed collagen and vitamin C (Absolute Collagen, AC) on biophysical parameters and visible signs of aging for skin, scalp, and hair, when taken daily or every 48 hours. Methods: We measured dermal collagen using confocal microscopy and high-resolution ultrasound. Hydration, elasticity, wrinkles, and clinical trichoscopy were measured in parallel to expert visual grading. Efficacy measures were recorded at baseline, week 6, and week 12. Results: Following 12 weeks daily use of the AC supplement, using confocal microscopy, we observed a significant 44.6% decrease in fragmentation vs. placebo ($p < 0.01$). We also measured a change in the ultrasound LEP (low echogenic pixel) ratio comparing upper and lower dermis (-9.24 vs. -7.83, respectively, $p=0.05$), suggesting collagen improvements occurred more in the upper dermal compartment. After 12 weeks vs. placebo, skin hydration was increased by 13.8% ($p < 0.01$), R2 elasticity index was increased by 22.7% ($p<0.01$), and Rz profilometry index was decreased by 19.6% ($p < 0.01$). Trichoscopy showed an average 11.0% improvement in scalp scaling and a 27.6% increase in the total number of hairs counted vs. placebo (p=n.s.). This was associated with a 31.9% increase in clinical grading score for hair healthy appearance ($p < 0.01$). Conclusion: The AC supplement has shown clinical benefits for skin, scalp, and hair, when used either daily or every 48 hours, over a 12-week period.

S. Zang, J. Chen, C. Chevalier, Ji Zhang, S. Li, H. Wang, J. Li, Y. Chen, H. Xu, L. Sheng, Z. Zhang, J. Qiu, **Holistic investigation of the anti-wrinkle and repair efficacy of a facial cream enriched with C-xyloside**, J Cosmet Dermatol. July 2024

Objective: To investigate the repairing and anti-wrinkle efficacy of the facial cream enriched with C-xyloside, aiming at comprehensively evaluating its skin anti- aging effect and clarify its potential mechanism of action. Methods: The repairing efficacy was studied on 3D epidermis skin model and the antiaging efficacy was studied on ex-vivo human skin. Two clinical studies were conducted with Chinese females. In the first study, 49 subjects aged between 30 and 50 with wrinkle concerns were recruited and instructed to apply the investigational cream containing C-xyloside for 8 weeks. Wrinkles attributes were assessed by dermatologist. Instrumental measurements on skin hydration, trans-epidermal water loss (TEWL), and skin elasticity were also conducted. In the second study, 30 subjects aged between 25 and 60 with self-declared sensitive skin and facial redness were recruited and instructed to apply the cream for 4 weeks. Biomarker analysis of the stratum corneum was conducted through facial tape strips. Results: The cream improved the histomorphology of the 3D epidermis skin model after SLS stimulation, and significantly increase the expression of LOR and FLG. On human skin, the cream improved the histopathology induced by UV, and significantly increased the protein content of COL I and COL III, collagen density and the number of Ki-67 positive cell of skin compared with model group ($n = 3$, $p < 0.01$). The results from the first clinical study demonstrate a significant increased the skin hydration and elasticity by 21.90%, 13.08% (R2) and 12.30% (R5), respectively ($n = 49$, $p < 0.05$), and the TEWL

values decreased by 33.94% ($n = 49$, $p < 0.05$), after 8 weeks application of the cream. In addition, the scores for nasolabial folds, glabellar wrinkle, underneath eye wrinkles, crow's feet wrinkle and forehead wrinkle in the volunteers exhibited a significant reduction of 34.02%, 43.34%, 50.03%, 33.64% and 55.81% respectively ($n = 49$, $p < 0.05$). The (rCE)/(fCE) ratio of volunteers based on tape stripping significant increased after using the sample cream ($n = 30$, $p < 0.05$). Conclusion: The cream containing C-xyloside showed improvement of skin wrinkles and enhancement of skin barrier function. These efficacies may be attributed to the fact that the sample cream can increase the expression of skin barrier related proteins LOR and FLG, promote the maturation of cornified envelope, enhance collagen I and III protein expression and stimulate skin cell proliferation, to provide sufficient evidence supporting its antiaging efficacy of skin.

R. di Lorenzo, V. di Lorenzo, T. di Serio, A. Marzocchi, L. Ricci, E. Vardaro, G. Greco, M. Maisto, L. Grumetto, V. Piccolo, E. Morelli, S. Laneri, **Phenylalanine Butyramide: A Butyrate Derivative as a Novel Inhibitor of Tyrosinase**, Int. J. Mol. Sci. 2024, 25, 7310

Metabolites resulting from the bacterial fermentation of dietary fibers, such as short-chain fatty acids, especially butyrate, play important roles in maintaining gut health and regulating various biological effects in the skin. However, butyrate is underutilized due to its unpleasant odor. To circumvent this organoleptic unfavorable property, phenylalanine butyramide (PBA), a butyrate precursor, has been synthesized and is currently available on the market. We evaluated the inhibition of mushroom tyrosinase by butyrate and PBA through in vitro assays, finding IC50 values of 34.7 mM and 120.3 mM, respectively. Docking calculations using a homology model of human tyrosinase identified a putative binding mode of PBA into the catalytic site. The anti-aging and anti-spot efficacy of topical PBA was evaluated in a randomized, double-blind, parallel-arm, placebo-controlled clinical trial involving 43 women affected by photo-damage. The results of this study showed that PBA significantly improved skin conditions compared to the placebo and was well tolerated. Specifically, PBA demonstrated strong skin depigmenting activity on both UV and brown spots (UV: −12.7% and −9.9%, Bs: −20.8% and −17.7% after 15 and 30 days, respectively, $p < 0.001$). Moreover, PBA brightened and lightened the skin (ITA°: +12% and 13% after 15 and 30 days, respectively, $p < 0.001$). Finally, PBA significantly improved skin elasticity (Ua/Uf: +12.4% and +32.3% after 15 and 30 days, respectively, $p < 0.001$) and firmness (Uf: −3.2% and −14.9% after 15 and 30 days, respectively, $p < 0.01$).

G. Siquier-Dameto, P. Boadas-Vaello, E. Verdú, **Intradermal Treatment with a Hyaluronic Acid Complex Supplemented with Amino Acids and Antioxidant Vitamins Improves Cutaneous Hydration and Viscoelasticity in Healthy Subjects**, Antioxidants 2024, 13, 770.

Intradermal injection of bioactive compounds is used to reduce the effects of aging skin. The aim of this work is to study the response of facial injection of a hyaluronic acid complex supplemented with amino acids and antioxidant vitamins on skin rejuvenation. A total of 40 healthy adult subjects were recruited to whom this complex was injected into the facial skin, three consecutive times every two weeks. Together with assessing the degree of skin hydration, the level of skin microcirculation, wrinkles, skin color, and skin biomechanical parameters were evaluated. Using the GAIS scale, the degree of satisfaction of the participants was assessed. At 42 days (D42), there was an 11–12% increase in skin hydration and viscoelasticity, a 23% increase in skin density, a 27% increase in skin microcirculation, and a signifcant lightening and whitening of skin color, but without causing changes in skin wrinkles. A value between 1 and 3 on the GAIS scale was observed between 70 and 92% of the participants, and 87% of subjects found their skin more beautiful, 85% would recommend this treatment, and more than 50% found their face rejuvenated. In summary, the intradermal treatment tested suggests skin rejuvenation, with a good degree of safety.

J.S. Lee, Y.C. Yoon, J.M. Kim, Y.-H. Kim, Y.-H. Kang, Y.C. Shin, **Liquid collagen from freshwater fish skin ameliorates hydration, roughness and elasticity in photo-aged skin: a randomized, controlled, clinical study**, Nutr Res Pract. 2024 Jun;18(3):357-371

Backgroud/Objects: Collagen is commonly used in diverse forms as a functional component in skincare products. On the other hand, the effects of collagen on human skin are controversial. Dietary collagen hydrolysates from freshwater *Pangasius hypophthalmus* fish skin ameliorated photo-aged skin of hairless mice. This study conducted a randomized, double-blind, placebo-controlled clinical trial to determine if liquid fish collagen (CollagenTripep20™, Tripep20) as a drink strengthens skin health and quality. Subjects/Methos: In this clinical trial, 85 subjects aged 35–60 yrs were diagnosed with photo-aged skin. Eighty-fve subjects were randomized to receive either Tripep20 ($n = 44$) or placebo ($n = 41$). Seventy-eight subjects fully participating for a 12-week period consumed 1,000 mg of Tripep20 ($n = 41$) or placebo ($n = 37$) in a 50-mL bottle as a daily drink. The intend-to-treat and per-protocol populations were 85 and 78, respectively. Skin hydration, wrinkles, and elasticity were assessed at 0 (baseline), 6,

and 12 weeks during the study period. Results: Skin hydration in the Tripep20 group was signifcantly higher from 6 weeks ($P < 0.001$) than the baseline. Afer 12 weeks, the Crow's-feet visual score and skin roughness (Ra, Rq, and Rmax) were signifcantly improved in the Tripep20 group than in the placebo group ($P < 0.05$). Consuming liquid collagen Tripep20 greatly enhanced skin elasticity (Gross R2, Net R5, and Biological elasticity R7) in 6 weeks compared to the placebo group. The Tripep20 group showed a signifcant increase in skin elasticity from the baseline afer 6 and 12 weeks ($P < 0.001$). Neither abnormal symptoms nor adverse events were encountered during the study period in subjects ingesting Tripep20 or placebo. The changes in parameters related to hematology and clinical chemistry were within the normal ranges. Conclusion: Oral consumption of liquid collagen Tripep20 was safe and well-tolerated. The results of this study show that freshwater fsh-derived liquid collagen Tripep20 can be used as a healthy functional food ingredient to improve skin moisturizing, anti-wrinkling, and elasticity in an aging population.

G.E. de Lima Faria, N.l Fakih-Gomez, A. Tartare, L. Zattar, A.C. Henriques Ribeiro Machado , F. Felice, J. Kadouch, C. Muñoz-Gonzalez, R. Frota Boggio, **Hand Rejuvenation with Customizable Hybrid Fillers: Premixed Calcium Hydroxyapatite and Hyaluronic Acid**, Aesthetic Plast Surg. 2024, June

Introduction: Hand aging is a prevalent concern characterized by the atrophy of local soft tissues and increased visibility of vessels and tendons. Hyaluronic acid (HA) and calcium hydroxyapatite (CaHA) are well-established treatments for addressing this issue. While hybrid filler containing HA and CaHA has been proposed for facial rejuvenation, studies investigating its efficacy for hand rejuvenation are lacking. Objective: This study aims to assess the safety and efficacy of a premixed hybrid filler containing calcium hydroxyapatite (CaHA) and hyaluronic acid (HA) for hand rejuvenation. Methods: A prospective, double-blind, controlled trial was conducted. The control arm (CA) received conventional subdermal treatment with CaHA at a 1:1 dilution. The intervention arm (IA) underwent hybrid treatment, consisting of CaHA at a 1:1 dilution combined with 1 ml of lowdensity HA. Evaluation was performed subjectively using the Global Aesthetic Improvement Scale (GAIS) and the Manch ster Hand Grading System (MHGS), and objectively using cutometry, corneometry, and ultrasound. 30.07.24, 17:09 Hand Rejuvenation with Customizable Hybrid Fillers: Premixed Calcium Hydroxyapatite and Hyaluronic Acid and International Society of Aesthetic Plastic Surgery. Results: Both the CA and the IA exhibited high rates of patient satisfaction and satisfaction as assessed by blinded evaluators. Although numerical superiority was observed in the IA, no statistical difference was found between the two groups. Significant improvements in hydration, elasticity, and skin thickness were observed in both arms, with no discernible difference between them. Greater ultrasound echogenicity was noted in the IA, which, as indicated by existing literature, may suggest enhanced biostimulation. No adverse effects were reported in either arm. Conclusion: Premixed filler containing HA and CaHA for hand rejuvenation appears to be a safe and effective approach.

C. Pagano, M.R. Ceccarini, A. Marinelli, A. Imbriano, T. Beccari, S. Primavilla, A. Valiani, M. Ricci, L. Perioli, **Development and characterization of an emulgel based on a snail slime useful for dermatological applications**, International Journal of Pharmaceutics 660 (2024) 124337

Snail slime is an interesting material for effective dermatological use (e.g. wounds). Its properties are strictly connected to the origin. In this paper a snail slime, deriving from the species Helix aspersa Muller and obtained from a company, was deeply characterized and then properly formulated. The slime, obtained by Donatella Veroni method, was frstly submitted to NMR analysis in order to evaluate the chemical composition. The main molecules found are glycolate and allantoin, well known for their activities in wound healing promotion. In vitro experiments performed on keratinocytes, revealed the snail slime ability to promote cellular well-being. Moreover, the microbiological analysis showed high activity against many strains involved in wounds infections such as gram+ (e.g. S. aureus, S. pyogenes), gram- (e.g. P. aeruginosa, E. coli) and the yeast C. albicans. The effect on skin elasticity was evaluated as well by the instrument Cutometer® Dual MPA 580. The snail slime was then formulated as hydrophilic gel, using a combination of corn starch and sodium hyaluronate as polymers, then used as external water phase of an O/W emulgel. The formulation is physically stable and easily spreadable and demonstrated antimicrobial activity as observed for slime alone, suggesting its suitability to be used for wound treatment.

C.S. Barros-Oliveira, M.J. Melo de Jesus, V.C Campos, R. Salvatori, A. Antunes de Souza Araújo, R. Fernandes Soares Neto, A. Bartke, V.O. Batista , A. Schneider, K.R. Villar-Gouy, M.M. Masternak, Â.C. Leal, L.B. Santos, C.R.P. Oliveira, E.G. Santos, D.A. Oliveira Simões, B. de Santana Silva, M.H. Aguiar-Oliveira, **Skin assessment in congenital untreated isolated GH deficiency**, Endocrine, 2024 Jun;84(3): p. 1116-1124

Purpose: The separation between the inside and outside through the skin was fundamental for

the evolution of prevertebrates, which grow through extrapituitary circuits, to vertebrates, which grow through the somatotrophic axis, namely pituitary growth hormone (GH). and circulating IGF1.Individuals with untreated isolated growth hormone (GH) deficiency (IGHD) due to a mutation in the GH-releasing hormone receptor (GHRH) gene, residing in Itabaianinha, Brazil, are vulnerable to skin cancer and have reduced sweating. However other aspects of their skin physiology are still unknown. Our objectives were to evaluate the number of skin cancers, skin aging, and functional aspects of the skin in this IGHD cohort. Methods: Twenty-six IGHD individuals and 26 controls matched by age, sex, ethnicity, and occupation were submitted to a biochemical, dermatological and a functional skin assessment by the Multi Probe Adapter Cutometer® MPA 580. Results: There was no difference in the number of skin cancers and in the degrees of photodamage between the groups. The melanin content in the forearm was similar between the groups but was lower in the buttocks ($p = 0.005$), as well as skin resistance ($p < 0.0001$) and elasticity ($p = 0.003$), lower in the IGHD. There was no difference in hydration and sebum content between the two groups. Conclusion: IGHD is apparently associated with a neutral profile in terms of skin cancer and photodamage, with similar melanin on the forearm and lower buttocks, lower skin resistance and elasticity, with hydration and sebum similar to controls.

R. Sfriso, B. Brockway, M. Logozzi, S. Fais, R. di Raimo, M. Gempeler, **Unlocking the Power of Plant Exosomes (PDEVs) - The New Natural Way of Delivering Cosmetic Efficacy**, Cosmetics & Toiletries, June 2024

Plant exosomes are one of the latest innovations in cosmetics and toiletries and the one emerging technology that market analysis companies, such as Mintel, tell us to watch. Exosomes are a special type of tiny extracellular vesicles (EVs) that offer a natural way to substantially improve product performance. While it is very likely that you have heard of synthetic liposomes and natural subcellular organelles such as melanosomes, lvsosomes and plant phytosomes, it is less likely that that you are familial* with plant derived exosomes. Plant exosomes (PDEVs) have significant advantages over exosomes derived from other sources. For example, plant exosomes are accepted for use in personal care, pharma and food, which is not the case for human derived exosomes, which are not allowed in beauty products. Plant exosomes are beginning to be produced on a commercial scale and are currently used to optimise and enhance cosmetic efficacy. Exosomes have been shown to penetrate the skin barrier and help reduce fine lines, improve skin texture and hydration, and enhance skin elasticity. They have been shown to reduce inflammation and the damage caused by sunlight. Potentially they could be valuable tools for combating photodamage and premature skin ageing.

R. Gibson, L. Krug, D.L. Ramsey, A. Safaei, S. Aspley, **Beneficial Effects of Multi-Micronutrient Supplementation with Collagen Peptides on Global Wrinkles**, Skin Elasticity and Appearance in Healthy Female Subjects, Dermatol Ther (Heidelb) (2024) 14: p. 1599–1614

Introduction: With ageing, collagen production slows down, leading to wrinkle appearance and loss of elasticity. Replenishing key structural molecules through oral supplementation is a promising strategy that complements the topical delivery of cosmetic products and creates a holistic skincare regimen. The present study assessed the effectiveness of a food supplement with collagen peptides, vitamins and minerals in improving the quality of the skin and general wellbeing of healthy women. Methods: This was an open-label study of 135 women aged between 45 and 65 years. A 3-month treatment phase followed a 4-week washout phase, with visits scheduled at baseline and after each month of treatment. Subjects received three tablets of Richelet Skin Renewal daily. The primary outcome was change from baseline to month 3 in global wrinkles score by expert grader analysis. Secondary outcomes included changes in skin elasticity and other skin attributes, product assessment via self-perception questionnaires and total antioxidant status. Results: A total of 116 subjects completed the study. The mean global wrinkles score indicated a statistically significant decrease from 5.9 at baseline to 5.0 at month 3 ($p < 0.0001$), with 83.6% of subjects showing an improvement; significant changes were reported at all intermediate visits. The increase in skin elasticity was also statistically significant (R2 score 0.74 at month 3; $p < 0.0001$). All subjects (100%) demonstrated significant improvements in skin texture, skin tone evenness, skin radiance and overall skin quality at the month 3 visit. Conclusions: The study product achieved statistically significant, noticeable effects on global wrinkles, skin elasticity and a range of skin attributes after 3 months of use in healthy women. These results strengthen the evidence for supplementation of collagen peptides and other micronutrients as an effective component of anti-ageing skincare.

X.R. Zhang, Y.X. Jin, P.N. Chien, T.T. Thuy Tien, S.Y. Zhou, N.N. Giang, L.T. Thuy Le, S.Y. Nam, C.Y. He, **Evaluation test and analysis of a microneedle and iontophoresis based medical device "CELLADEEP Patch" in skin improvement on ex vivo human-derived skin tissue models**, Skin Research & Technology May 2024

Background: Microneedles are tiny needles, typically ranging from tens to hundreds of micrometers in length, used in various medical procedures and treatments. The tested medical device named “CELLADEEP Patch” a dissolvable microneedle therapy system (MTS), made of hyaluronic acid and collagen. And the iontophoresis technique is also applied in the system. The study aimed to evaluate the effectiveness of the “CELLADEEP Patch” in skin improvement. Methods: Ex vivo human-derived skin tissue models were used in this study and they were divided into three different groups, namely, the Untreated Group, the Negative Control Group, and the Test Group respectively. The Untreated Group received no treatment measures, the Negative Control Group was exposed to ultraviolet B radiation (UVB) irradiation, and the Test Group was exposed to UVB irradiation and treated with “CELLADEEP Patch”. Skin moisture content, transdermal water loss, and skin elasticity were evaluated by three clinical devices. Additionally, histological staining and related mRNA expression levels were also analyzed. Results: The results of skin moisture content, transdermal water loss, and skin elasticity evaluation consistently illustrated that the application of “CELLADEEP Patch” led to remarkable skin improvement. And the analysis of histological staining images also confirmed the effectiveness of the “CELLADEEP Patch”, especially for increasing collagen density. Moreover, the upregulation of Collagen type 1 a (COL1A1) and hyaluronan synthase 3 mRNA expression and the decrease of Matrix metalloproteinase 1 (MMP- 1) and Interleukin-1 beta (IL-1β) mRNA expression reflected its wrinkle improvement, moisturizing and anti-inflammation function.

K. Frank, N. Moellhoff, N. Engerer, K.O. Kaye, M. Alfertshofer, R.H. Gotkin, S. Kassirer, C. Weinmann, G. Casabona, S. Cotofana, **Understanding the Interplay Between Skin, Fascia, and Muscles of the Midface in Facial Aging**, Aesthetic Plast Surg, May 2024

Background: Surgical, minimally-invasive, and non-invasive aesthetic procedures try to ameliorate the signs of facial aging, but also focus on enhancing various individual features of beauty in each patient. Herein, the midface plays a central role due to its location but also its importance for the aesthetic perception and facial expression. Objective: To date, no study has investigated the interplay between facial muscles and its connecting subdermal architecture during facial aging to provide a more comprehensive understanding of the middle face. Materials and methods: A total of 76 subjects, consisting of 30 males (39.5%) and 46 females (60.5%) with a mean age of 42.2 (18.7) years [range 19-80] and a mean BMI of 24.6 (3.7) kg/m [range 18-35], were enrolled in this investigation. Cutometry (skin aging), 3D skin displacement analyses (subdermal connective tissue aging), and sEMG (muscle aging) analyses were utilized. Results: The results revealed that overall skin firmness increased, and skin elasticity decreased ($p < 0.001$), sEMG signal of the investigated muscles decreased ($p < 0.001$), whereas midfacial mobility remained unaltered ($p = 0.722$). Conclusion: The results of this study indicate that midfacial aging is a measurable effect when utilizing individual measurement modalities for assessing skin, subdermal fascia, and midfacial muscles. The function of midfacial muscles revealed a potential threshold effect, which is not reached during midfacial aging due to the unchanged soft tissue mobility at older age. However, to understand its clinical presentation all midfacial soft tissues need to be factored in and a holistic picture needs to be created. No level assigned: This journal requires that authors assign a level of evidence to each submission to which Evidence-Based Medicine rankings are applicable. This excludes review articles, book reviews, and manuscripts that concern Basic Science, Animal Studies, Cadaver Studies, and Experimental Studies. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to authors www.springer.com/00266 .

F. Yang, X. Zhang, H. Wang, M. Guo, J. Zhang, X. Feng, J. Yu J. Yang, J. Zhu, Y. Wang, **Comprehensive evaluation of the efficacy and safety of a new multi-component anti-aging topical eye cream**, Skin Research & Technology, May 2024

Background: The delicate periorbital region is susceptible to skin dehydration, wrinkles, and loss of elasticity. Thus, targeted and effective anti-aging interventions are necessary for the periorbital area. Aim: To evaluate the efficacy and safety of a new anti-aging eye cream formulated with the active complex (Yeast/rice fermentation filtrate, *N*-acetylneuraminic acid, palmityl tripeptide-1, and palmitoyl tetrapeptide-7). Methods: The cell viability and expressions of key extracellular matrix (ECM) components of the active complex were evaluated using a human skin fibroblast model. In the 12-week clinical trial, skin hydration, elasticity, facial photographs, and collagen density following eye cream application were assessed using Corneometer, Cutometer, VISIA, and ultrasound device, respectively. Dermatologists and participants evaluated clinical efficacy and safety at baseline, and after 4, 8, and 12 weeks. Results: PCR and immunofluorescent analyses revealed that the active complex significantly stimulated fibroblast proliferation ($p < 0.05$) and markedly promote the synthesis of collagen and elastin. Clinical findings exhibited a substantial enhancement in skin hydration (28.12%), elasticity (18.81%), and collagen production (54.99%) following 12 weeks of eye cream application. Dermatological

evaluations and participants' assessments reported a significant improvement in skin moisture, roughness, elasticity, as well as fine lines and wrinkles by week 8. Conclusion: The new anti-aging eye cream, enriched with the active complex, demonstrates comprehensive rejuvenating effects, effectively addressing aging concerns in the periorbital area, coupled with a high safety profile.

S. Fallone de Andrade, C. Ferreira-Pêgo, T. Fontes Sofia Lopes, L.M. Rodrigues, **Omnivore and vegetarians show similar body composition and skin physiology across body regions—A comparative analysis**, Skin Res Technol. May 2024

Background: Skin physiology seems to be influenced by dietary choices and body composition, although links between these factors remain poorly characterised. In the present manuscript, we elaborate on the potential relationships among food groups,body composition and skin physiology in omnivores and vegetarians. Material and Methods: This cross-sectional observational study involved 181 participants, 129 omnivores and 52 vegetarians. The main functions of the skin measured in our laboratory were transepidermal water loss, deep and superficial epidermal hydration, skin elasticity, and carotenoid content. Skin variables obtained from different body regions were made comparable by a new Proportional Skin Index calculated to respect their relative representativity. Results: No statistical differences were found when comparing both groups' body composition and skin variables from different body regions, with the exception of the skin carotenoid content significantly higher in the vegetarian group ($p < 0.001$). Conclusion: Although dietary patterns significantly differed between groups, with vegetarians consuming fewer animal-derived products and more plant-based foods, multiple linear regression analysis revealed no differences or association between the dietary pattern and the skin physiology. These findings highlight the need for further research to elucidate the specific impact of diet and food groups and body composition on skin physiology.

E. Behrangi, M. Feizollah, S. Zare, A. Goodarzi, M.R. Ghasemi, A. Sadeghzadeh-Bazargan, A. Dehghani, M. Nouri, R. Zeinali, M. Roohaninasab, M.A. Nilforoushzadeh, **Evaluation of the efcacy of mesenchymal stem cells derived conditioned medium in the treatment of striae distensae: a double blind randomized clinical trial**, Stem Cell Research & Therapy (2024) 15:62

Background Striae distensae is a disfguring atrophic skin condition that impairs the body's aesthetic image. Despite the variety of conducted studies, there is controversy regarding the best modalities. Human mesenchymal stem cells are considered a rich source for scar treatment. Skin needling is among the most efcient and safe aesthetic and ther- apeutic devices. This study aimed to evaluate the efcacy of the combination of needling and intradermal injection of mesenchymal stem cells compared to skin needling alone for treating striae distensae. Method This study was a randomized, double-blind clinical trial involving 10 women aged 18–60. Each striae lesion was divided into two parts, with one side receiving needling and intradermal injection of conditioned medium, while the other side received needling and intradermal injection of normal saline. This treatment was administered in three sessions with three-week intervals. Patients were evaluated before the frst intervention and three months after the fnal session. Three months after the completion of the intervention, patients' lesions were evaluated using biometric criteria, physician evaluation, and patient self-assessment. Results The results demonstrated a signifcant improvement in dermal and complete thickness and skin density in patients treated with microneedling. All skin ultrasound parameters improved signifcantly in patients receiving the combination of needling and conditioned medium. When comparing the two groups, signifcantly higher physician and patient satisfaction was observed in the combination group. However, the comparison of biometric indices improvement wasn't signifcant between these groups. Conclusion The combination of human mesenchymal stem cells with microneedling could be considered a novel efective option for stretch marks.

M. Coirier, M. Humeau, H. Muchico, E. Aymard, B. Closs, **An alfalfa quintessence to the benefit of a plural beauty**, HPC Today, Vol. 19(2), 2024

In the cosmetics industry, "plural beauty" is a concept that has been rising with the diversity equity and inclusion (DEI) movement. In line with this idea of considering all skin specificities, SILAB identified the main cutaneous characteristics of consumers in terms of ethnicity age, and gender. This approach highlighted that the three major beauty axes responding to universal expectations are all regulated by biological mechanisms taking effect in both the dermis and epidermis. The aim of the study was therefore to demonstrate how a Water & *Medicago sativa* (Alfalfa) Extract can respond to the needs of all skin types through a transversal action on both the dermis and the epidermis.

B. Brockway, **Ancient ayurvedic adaptogen ashwagandha - Now trending in modern beauty**, HPC Today, Vol. 19(2), 2024

Ashwagandha (*Withania somnifera*) is an adaptogenic herb that has been used in India's

traditional Ayurvedic medicine for over 3000 years. The roots of the ashwagandha plant contain a diverse array of bioactive compounds including withanolides, alkaloids, and antioxidants that areresponsible for its rejuvenating and health-promoting properties. Therefore, full spectrum extracts containing these actives at their natural levels provide the greatest benefits. Recent clinical studies have validated ashwagandha's traditional uses for combating stress and for healthy-aging. These studies show ashwagandha is effective for body building along with benefits for skin and hair. Ashwagandha root extract applied topically can improve skin wrinkles, texture, elasticity, and hydration in healthy adults with photo damaged skin. When applied regularly, Ashwagandha root extract can also reduce hair loss, increase thickness and density. *Withania somnifera* root extract has GRAS status and numerous studies confirm its safety for topical use. The emerging clinical data is adding to ashwagandha's value as a holistic cosmetic ingredient.

M. Giakoumaki, G.I. Lambrou, D. Vlachodimitropoulos, A. Tagka, A. Vitsos, M. Kyriazi, A. Dimakopoulou, V. Anagnostou, M. Karasmani, H. Deli, A. Grigoropoulos, E. Karalis, M. Christou Rallis, H.S. Black, **Type I Diabetes Mellitus Suppresses Experimental Skin Carcinogenesis**, Cancers 2024, 16, 1507

This study explores the previously uncharted territory of the effects of ultraviolet (UV) radiation on diabetic skin, compared to its well-documented impact on normal skin, particularly focusing on carcinogenesis and aging. Employing hairless SKH-hr2, Type 1 and 2 diabetic, and nondiabetic male mice, the research subjected these to UV radiation thrice weekly for eight months. The investigation included comprehensive assessments of photoaging and photocarcinogenesis in diabetic versus normal skin, measuring factors such as hydration, trans-epidermal water loss, elasticity, skin thickness, melanin, sebum content, stratum corneum exfoliation and body weight, alongside photo documentation. Additionally, oxidative stress and the presence of hydrophilic antioxidants (uric acid and glutathione) in the stratum corneum were evaluated. Histopathological examination post-sacrifce provided insights into the morphological changes. Findings reveal that under UV exposure, Type 1 diabetic skin showed heightened dehydration, thinning, and signs of accelerated aging. Remarkably, Type 1 diabetic mice did not develop squamous cell carcinoma or pigmented nevi, contrary to normal and Type 2 diabetic skin. This unexpected resistance to UVinduced skin cancers in Type 1 diabetic skin prompts a crucial need for further research to uncover the underlying mechanisms providing this resistance.

L. Budel, F. Paul, **Senolytic science: plant extract for well-ageing**, PERSONAL CARE MAGAZINE, Volume 25, Issue 4, April 2024, p. 117-123

Senescence cells are seen as fundamentaldrivers of tissue ageing. Senescent ‘zombiecells’accumulate with age and causedamage through damaging secretions. Eliminating these cells is a revolutionary approach to restoring youthful skin. Research by experts in ageing has revealed that *Epilobium fleischeri* extract is a natural botanical senolytic (a substance that can selectively induce the death and removal of senescent cells). The experiments discussed in this paper show that *Epilobium fleischeri* extract can selectively clear senescent cells from the skin. *In vitro* evidencedemonstrates the targeted elimination of senescent fibroblasts by *Epilobium fleischeri* extract, which is mediated by bioactive flavonoids. *In vivo* studies have shown the reduced expression ofsenescence biomarkers, improved collagen production, and dramatic improvements in multiple signs of skin ageing. In clinicaltrials, elasticity and tonicity were improved by 18% after two months of using a creamwith 3% *Epilobium fleischeri* extract as compared with a control group using a placebo cream.

E.A. Márquez-Gutiérrez, L. Tamez-Pedroza, E.D. Morales-Naya, M. Vélez-Palafox, G. Cuartero-Castro, N. Zacaula-Juárez, R. Sánchez-Sánchez, M. González-Torres, **A randomized intraindividual comparative study evaluating the effects of two ultrasound-assisted liposuction devices on the abdomen**, Journal of Plastic, Reconstructive & Aesthetic Surgery 94 (2024) p. 20–26

Background: Ultrasound-assisted liposuction (UAL) has become popular because of its favorable outcomes in fat emulsification, blood loss reduction, and skin tightening. This study aimed to compare the effects of two UAL devices on the abdomen by assessing postsurgery skin biomechanical properties. Methods: This single-blind, prospective study (2020–2022) involved 13 liposuction procedures performed on patients without chronic diseases. Each patient’s abdomen was divided vertically from the xiphoid to the perineum. Vibration amplification of sound energy at resonance (VASER)-assisted liposuction (Solta Medical, Inc., Hayward, CA) was performed on one half, while the other half underwent liposuction with high-frequency ultrasound energy (HEUS)-assisted technology. Skin biomechanical measurements, including distensibility, net elasticity,

S. Conway, M. Jefferson, D.T. Warren, T. Wileman, C.J. Morris, **The WD Domain of Atg16l1 Crucial for LC3-Associated Phagocytosis Is Not Required for Preserving Skin Barrier Function in Mice**,

JID Innovations (2024);4:100283

The skin is a multifunctional organ, forming a barrier between the external and internal environment, thereby functioning as a safeguard against extrinsic factors. Autophagy has been implicated in epidermal differentiation and in preserving skin homeostasis. LC3-associated phagocytosis (LAP) uses some but not all components of autophagy. The Atg16l1 (Δ WD) mouse model lacks the WD40 domain required for LAP and has been widely used to study the effects of LAP deficiency and autophagy on tissue homeostasis and response to infection. In this study, the Δ WD model was used to study the relationship between LAP and skin homeostasis by determining whether LAP-deficient mice display a cutaneous phenotype. Skin histology of wild-type and Δ WD mice aged 1 year revealed minor morphological differences in the tail skin dermal layer. RT-qPCR and western blot analysis showed no differences in key keratin expression between genotypes. Skin barrier formation, assessed by dye permeation assays, demonstrated full and proper formation of the skin barrier at embryonic day 18.5 in both genotypes. Biomechanical analysis of the skin showed decreased skin elasticity in aged Δ WD but not wild-type mice. In summary, the LAP-deficient Δ WD mice displayed subtle alterations in dermal histology and age-related biomechanical changes.

A. Ayatollahi, A. Samadi, B. Barikbin, M. Saeedi, L. Saeedi, S. Zamani, M. Fattahi, A. Firooz, **Efficacy and Tolerability of a Hyaluronic Acid-Based Extracellular Matrix for Labia Majora Rejuvenation and Augmentation: A Pilot Study**, Cureus, 2024 Apr 25;16(4)

A new injectable solution containing low-molecular-weight hyaluronic acid (HA) and a specific amino acid mixture was formulated with proper aesthetic performance for the main signs of facial skin photoaging. The present study aimed to investigate its new application for rejuvenating and augmenting labia majora using clinical and biometric assessments. Three sessions of intradermal injections were performed using 3 ml of test extracellular matrix (ECM) for 10 eligible post-menopause female subjects (age 53.6 ± 7.93 years). The effectiveness of the intervention was assessed by an independent physician using before-and-after pictures based on the physician's global assessment score. Objective biophysical skin assessments, including skin hydration, skin erythema, and melanin index, as well as elasticity parameters including firmness (R0), gross elasticity (R2), and net elasticity (R5), were also performed before the first injection and then on the 2nd and 12th weeks after the last session. Patients' satisfaction and allreported or observed adverse events were documented. At week 12, all the subjects reported an aesthetic improvement of 25% or more in rejuvenation and sagging of the labia major area. A statistically significantimprovement was also detected in R0 and R5 at week 12 (p-values 0.005 and 0.022, respectively). Patient satisfaction surveys revealed a median score of 8 at both follow-up visits. The results showed a new indication ofthe tested HA ECM for providing a beneficial, durable, rejuvenating effect on the labia majora with a good safety profile.

L.K.W. Phoebe, K.W.A. Lee, L.K.W. Chan, L.C. Hung, R. Wu, S. Wong, J. Wan, K.-H. Yi, **Use of platelet rich plasma for skin rejuvenation**, Skin Research & Technology, April 2024

Objective: Platelet-rich plasma (PRP) is recognized as a safe and effective therapy for regenerative skin healing and rejuvenation, utilizing autologous blood enriched with various growth factors. This review aims to assess the efficacy of PRP treatments forskin rejuvenation. Methods: Keywords such as “platelet-rich plasma,” “rejuvenation,” “skin aging,” and“wrinkles” were queried on Ovid, PubMed, and MEDLINE to identify pertinent studies on PRP treatment for skin rejuvenation.Results: Analysis revealed that PRP treatment led to significant enhancements in multiple facial parameters after one to three sessions. Improvements were noted in skin pore size, texture, wrinkle reduction, pigmented spots, collagen density, hyaluronic acid levels, and protection against ultraviolet damage. Combining PRP with hyaluronicacid demonstrated a synergistic effect, particularly enhancing skin elasticity in patients with lower body mass index and firmness in individuals aged 50s and 60s. Incorporating both physical and biometric data for assessment proved superior to relying solely on physical observations for evaluating subtle skin quality and structural changes. Conclusion: This study underscores the efficacy of PRP monotherapy for skin rejuvenation and emphasizes the necessity of standardizing PRP preparation protocols in future investigations. Heightened awareness and advancements in technology have contributed to the emergence of higher-quality, less biased studies supporting PRP as a reliable and safe therapeutic option for skin rejuvenation.

R. Amin, F. Rancan, K. Hillmann, U. Blume-Peytavi, A. Vogt, J. Kottner, **Effects of a leave-on product on the strength of thedermoepidermal junction: An exploratory, intraindividual, randomized controlled trial in older adults with dry skin**, Health Sci. Rep. 2024;7:e1985

Background and Aims: Skin aging is associated with dry skin and a decrease of the strength of the dermoepidermal adhesion, which increases the risk for lacerations
(skin tears). Application of leave-on products improves dry skin and seems to reduce skin tear incidence.

The aim of this study was to measure the effects of a humectant containing leave-on product on the strength of the dermoepidermal junction in older adult participants with dry skin.Methods: A randomized controlled trial using a split body design was conducted. One forearm was randomly selected and treated with a lipophilic leave-on product containing 5% urea for 8 weeks. The other forearm was the control. The parameters stratum corneum hydration (SCH), transepidermal water loss, pH, roughness, epidermal thickness and skin stiffness were measured at the baseline, Weeks 4 and 8. At Week 8, suction blisters were created and time to blistering was measured. Blister roofs and interstitial fluid were analyzed for Interleukin-1α, 6 and 8. Results: Twelve participants were included. After 8 weeks treatment, SCH was higher (median difference 11.6 AU), and the overall dry skin score (median difference −1) and median roughness (Rz difference −12.2 µm) were lower compared to the control arms. The median group difference for Interleukin-1α was −452 fg/µg total protein (TP) in the blister roofs and −2.2 fg/µg TP in the blister fluids. The median time to blister formation was 7.7 min higher compared to the control arms. Conclusion: The regular application of humectant containing leave-on products improves dry skin and seems to lower inflammation and contribute to thestrengthening of the dermoepidermal adhesion. This partly explains how the use of topical leave-on products helps to prevent skin tears.

B. Jadach, Z. Mielcarek, T. Osmałek, **Use of Collagen in Cosmetic Products**, Curr. Issues Mol. Biol., 2024, 46, p. 2043–2070

Collagen (CLG) belongs to the family of fbrillar proteins and is composed of left-handed α polypeptide chains, which, twisting around themselves and their axis, form a right-handed superhelix. In the chemical structure, it contains mainly proline, hydroxyproline, glycine, and hydroxylysine. It occurs naturally in the dermis in the form of fbers that provide the skin with proper density and elasticity. The review aimed to present the types of collagen protein, factors affecting its structure and its unusual role in the functioning of the human body. Also, an overview of cosmetic products containing collagen or its derivatives, the characteristics of the formulas of these products, and the effects of their use were presented. Throughout the market, there are many cosmetic and cosmeceutical products containing CLG. They are in the form of fllers administered as injections, belonging to the group of the oldest tissue fllers; products administered orally and for topical use, such as creams, gels, serums, or cosmetic masks. Analyzed studies have shown that the use of products with collagen or its peptides improves the general condition of the skin and delays the aging process by reducing the depth of wrinkles, improving hydration (in the case of oral preparations), reducing transepithelial water loss (TEWL), as well as improving skin density and elasticity. In addition, oral application of bioactive CLG peptides has shown a positive effect on the nails, reducing the frequency of their breakage.

J. Robic, W. Lata, A. Nkengne, A. Bigouret, K. Vie, **The impact of air pollution on the facial skin of Caucasian women using real-life pollutant exposure measurements**, Skin Research & Technology, March 2024

Background: To date, studies examining the effect of air pollution on skin characteristics have relied on regional pollution estimates obtained from fixed monitoring sites. Hence, there remains a need to characterize the impact of air pollution in vivo in realtime conditions. We conducted an initial investigation under real-life conditions, with the purpose of characterizing the in vivo impact of various pollutants on the facial skin condition of women living in Paris over a 6-month period. Materials and methods: A smartphone application linked to the Breezometer platform was used to collect participants' individual exposures to pollutants through the recovery of global positioning system (GPS) data over a 6-month period. Daily exposure to fine particulate matter (PM 2.5 µm and PM 10 µm), pollen, and air quality was measured. Facial skin color, roughness, pore, hydration, elasticity, and wrinkle measurements were taken at the end of the 6-month period. Participants' cumulated pollutant exposure over 6 months was calculated. Data were stratified into two groups (lower vs. higher pollutant exposure) for each pollutant.Results: 156 women (20–60 years-old) were recruited, with 124 women completingthe study. Higher PM 2.5 µm exposure was associated with altered skin color andincreased roughness under the eye. Higher PM 10 µm exposure with increased wrinkles and roughness under the eye, increased pore appearance, and decreased skin hydration. Exposure to poorer air quality was linked with increased forehead wrinkles and decreased skin elasticity, while higher pollen exposure increased skin roughness and crow's feet. Conclusion: This study suggests a potential correlation between air pollution and facial skin in real-life conditions. Prolonged exposure to PM, gases, and pollen may be linked to clinical signs of skin ageing. This study highlights the importance of longermonitoring over time in real conditions to characterize the effect of pollution on the skin.

L. Ma, H. Zhang, Q. Jia, T. Bai, S. Yang, M. Wang, Y. Li, L. Shao, **Facial Physiological Characteristics and Skin Microbiomes Changes are Associated with Body Mass Index (BMI)**, Clinical, Cosmetic

and Investigational Dermatology 2024:17, p. 513–528

Background: Overweight and obesity have become public health problems worldwide. An increasing number of research works are focusing on skin physiology and the manifestations of obesity-associated skin diseases, but little is known about the correlations between body mass index (BMI), facial skin physiological parameters, and the facial skin microbiome in healthy women. Objective: To investigate the correlations between BMI, facial skin phyiological parameters and facial bacteria and fungi in 198 women aged 18 to 35 years in Shanghai. Methods: According to the international BMI standard and Chinese reference standard, subjects were divided into three groups, “lean” B1, “normal” B2 and “overweight” B3, and the physiological parameters of facial skin were measured by non-invasive instrumental methods, and the skin microbiota was analyzed by 16S rRNA and ITS high-throughput sequencing. Results: Compared with the skin physiological parameters of the normal group, those of the overweight group exhibited a significant increase in trans-epidermal water loss (TEWL), which indicated that the skin barrier was impaired. The skin haemoglobin content was signifcantly increased, and skin surface pH was signifcant decreased in those with a high BMI. Furthermore, α-diversity, analysed using the Shannon, Chao, Sobs, and Ace indexes, was increased in the overweight group, suggesting that the diversity and species abundance of facial bacterial and fungal microbiota were also increased. Moreover, the overweight group had higher abundances of *Streptococcus*, *Corynebacterium*, *Malassezia*, and *Candida*. Notably, skin surface pH was signifcantly and negatively correlated with the relative abundances of *Malassezia*, *Candida*, and *Cladosporium*. Besides, the abundance of Malassezia was positively associated with the abundances of *Staphylococcus* and *Corynebacterium*. Conclusion: These results indicate that BMI is associated with differences in the biophysical properties and microbiome of the facial skin. A high BMI affects the integrity of skin barrier and changes the skin flora diversity and species composition.

S.G. Lee, S. Ham, J. Lee, Y. Jang, J. Suk, Y.I. Lee, J.H. Lee, **Evaluation of the anti-aging effects of Zinc-α2-glycoprotein peptide in clinical and in vitro study**, Skin Research & Technology, Volume 30, Issue 3, March 2024

Background: Skin aging, characterized by the deterioration of skin density and elasticity, is a common concern among individuals seeking to maintain a youthful appearance. Zinc-α2-glycoprotein (ZAG) is secreted by various body fluids, and is associated with lipolysis and identified as an atopic dermatitis biomarker. This study evaluated the potential of ZAG peptides, which exert multiple benefits such as anti-aging. Materials and Methods: We conducted a 4-week clinical trial on patients with noticeable periorbital wrinkles (n = 22) using a ZAG peptide-containing product. The effects of the products on skin density, elasticity, and the depth of periorbital wrinkles were evaluated using Cutometer Dual MPA580, Ultrascan, and Antera 3D CS, respectively. The effect of ZAG peptides on UVB-treated keratinocyte cells was evaluated in vitro to understand the mechanisms underlying its effects against impaired skin barrier function, collagen degradation, and senescence. In addition, the effects of ZAG peptides on cell viability and expression of aging and skin barrier-related genes were assessed using cell counting kit assay and quantitative reverse transcription-polymerase chain reaction, respectively. Results: The patients demonstrated improved skin density, elasticity, and reduced periorbital wrinkles. Further, more than 85% patients scored the product as satisfactory regarding anti-aging effects. Furthermore, ZAG peptides reduced SA-β-gal staining, downregulated the senescence-related genes, and upregulated the skin barrier function-related genes in UVB-irradiated keratinocyte cells. Conclusions: Our clinical and in vitro findings showed that ZAG peptides exert antiaging effects and improve skin barrier functions, suggesting their promising potential as therapeutic agents to combat skin aging and improve skin health.

Y. Choi, Y. Hur, S. Kwak, D. Shin, **Body contouring effects of at-home beauty device equipped with suction, radiofrequency, and electrical muscle stimulation functions**, J Cosmet Dermatol. March 2024

Background: With the rise in interest and demand for body contouring, beauty devices have continuously developed. Suction can aid in increasing the rate of fat breakdown by inducing a massage-like effect, thereby increasing blood flow. Moreover, radiofrequency (RF) can boost fibroblast activity and help reduce cellulite. In addition, electrical muscle stimulation (EMS) can use electrical stimulation to induce muscle contraction, leading to an athletic, and skin elasticity-increasing effect. Aims: This study aimed to assess the effects of body contouring, such as cellulite and swelling, in healthy Korean women to objectively prove the efficacy of an at-home beauty device equipped with suction, RF, and EMS functions. Methods: For 8 weeks, 21 participants used the at-home beauty device 3 days a week on their abdomen, thighs, and left calf. Validity assessments and subjective surveys were conducted at 4 and 8 weeks, including the first visit. Results: The results of the validity assessments revealed that cellulite, swelling, elasticity, femoral skin texture, and dermal density were significantly ($p < 0.05$)

improved in the experimental group compared with those at the baseline. Conclusions: The results of this study demonstrate that the combination of suction, RF, and EMS function is effective for body skin, fat, and body shape management. For better body-contouring effects, combining the beauty device with regular exercise and healthy eating habits is recommended.

M.P. Pagac, M. Stalder, R. Campiche, **Menopause and facial skin microbiomes: a pilot study revealing novel insights into their relationship**, Frontiers in Aging, March 2024

Introduction: The human skin microbial composition is affected by age. Previous studies reported skin microbiome diversity shifts between elderly and significantly younger subjects. Some studies implied that menopausal status, which is inherently linked to age, could be associated with changes in skin microbial compositions. Nevertheless, the influence of menopausal status on skin microbiome profiles while minimizing the impact of aging-associated changes in skin parameters still needs further clarification. Methods: We performed an observational study on healthy Caucasian female volunteers, which were grouped according to their pre- or postmenopausal status. Bacterial community structures on facial skin were analyzed using 16S rRNA gene sequencing. Cutometer® measurements were performed to evaluate aging-associated changes in facial skin biophysical properties. Results: The relative abundance of the lipophilic Cutibacterium genus was decreased, and bacterial diversity was increased in skin samples of postmenopausal volunteers. The mean age difference between examined groups in this study was 12.4 years only. Accordingly, Cutometer® measurements revealed no differences in aging-associated skin biophysical parameters between pre- and postmenopausal groups. Consequently, no correlation was detected between Shannon diversity and measured age dependent biomechanical properties of facial skin. Discussion: These findings are in line with previous studies, which investigated the wide-ranging impact of chronological aging on skin microbial communities. However, this work reports for the first time a direct association between menopausal status and facial microbiomes on skin of similarly aged study participants, and hence uncouples aging-associated skin biophysical parameters, such as viscoelastic properties, from the equation. These findings open avenues for the development of microbiome-targeting strategies for treatment of menopause-associated skin disorders.

S.S. Woo, H. Gwak, K.H. Kim, J.W. Lee, J. K. Choi, I. Suh, S.H. Kim, **Evaluation of Esthetic Results after Mass Removal with Elliptical Skin Excision Using Ultrasonography to Measure Skin Thickness**, J. Clin. Med. 2024, 13, 1467

Background: The growth of benign cutaneous masses causes the overlaying skin to expand and become thinner, especially at the central, most projected point. In this retrospective study, a surgical technique comprising an elliptical skin excision was employed to account for these skin changes. Methods: This retrospective study enrolled 980 patients with benign masses. Preoperatively, all patients underwent ultrasonography to evaluate the mass depth and thickness of the attached skin, and mass excision was performed using the elliptical skin-excision method. The operative time was recorded, and complications and esthetic outcomes were assessed using the Cutometer® and the modified Vancouver Scar Scale (mVSS) during 1- and 3-month follow-up visits. Results: The mean operative time (17.48 ± 3.46 min) was significantly shorter than that of conventional methods ($p < 0.05$). Cutometer parameters showed no significant differences from those of intact skin. The average mVSS scores were 5.21 ± 1.42 and 3.50 ± 1.79 at 1- and 3-month follow-ups, respectively. Conclusions: Mass excision with an elliptical skin attachment resulted in improved esthetic results and easy removal. The attached skin enabled convenient handling without damaging the capsule or other adjacent structures, leaving a thick dermis on both wound edges. Thus, this technique resulted in minimal scarring.

N.S. Vicient, **Biomimetic lipid with skin repair effects**, PERSONAL CARE MAGAZINE, March 2024, p. 45-47

Consumers are becoming increasingly interested in beauty secrets and regimens from around the world due to curiosity about how people from other cultures attain and maintain their beauty. The demand for global beauty brands has grown as a result of globalization and increased interest in foreign travel and culture, with the 'Made In'stamp now carrying more meaning than ever before.

L. Girão, P. Pinto, **Efficacy and Safety of an Autologous Micrografting Procedure for Management of Striae Distensae in Women**, Dermatol Ther (Heidelb) (2024) 14: p. 469–488

Introduction: Striae distensae (SD), or stretch marks, are a common skin problem having a psychological impact and cosmetic concern, especially for women, in whom the prevalenceis higher than in men. This study assessed the efficacy and safety of a single autologousmicrografting treatment (AMT) using Rigenera technology for the management of SD.Methods: This single-centre study included 10 healthy women between 24 and 65 years of age, with Fitzpatrick–Goldman skin types I–IV, who had

visible SD in glutes/thighs. Each subject acted as their own control. The treatment procedure (microneedling + AMT) and the control procedure (no treatment) were performed on contralateral sides of the glutes/ thighs, targeting matched and paired SD. Microneedling was carried out using Dermapen, equipped with 32 needle heads set at 1.5 mm needle length. The AMT procedure involved extracting biopsies from the mastoid hair zone with a 2.5-mm dermal punch, followed by disaggregation of the biopsies in a physiological saline solution using the Rigeneracons. The disaggregated micrografts were then intradermally injected using 30G 4-mm needles, maintaining a distance of 1 cm between injection points, covering the entire marked treatment region. Results: In the treated area, at 3 months postprocedure compared to pre-procedure, the following changes were observed, all with statistical significance (P ≤ 0.05): (a) significant reductions in skin roughness (Ra, - 15.9%; Rz, - 22.6%), skin luminance (- 2.0%), and bluegreen color distribution (- 10.6%); (b) significant increases in skin microcirculation maximum value (+ 240.1%), skin hydration (+ 71.2%), skin elasticity (+ 216.5%), skin density (+ 34.3%), skin thickness (+ 26.0%), and hypodermis thickness (+ 29.9%).Furthermore, for each of the aforementioned parameters, there was a significantly greater improvement observed with the AMT procedure compared with microneedling at 3 months (all P ≤ 0.05). Conclusion: The AMT procedure using Rigenera technology resulted in an noticeable improvement in the SD appearance after 3 months in healthy women.

Y. Hao, W. Song, L. Qu, **Effects of a combination of *Poria Cocos*, *Ziziphus spinose*, and gamma-aminobutyric acid (GABA) on sleep quality and skin health: A randomized double-blind placebo-controlled clinical trial**, Food Sci Nutr. 2024;12: p. 3883–3892

Sleep is crucial for preserving both physical and mental health, including skin health. Presently, there is a burgeoning interest in the use of herbal and natural ingredients to mitigate the adverse effects of sleep disorders. In this 4-week, randomized, doubleblind, controlled trial, 70 subjects with sleep disorders were randomly assigned to receive either a placebo or a *Poria cocos*, *Ziziphus spinose*, and GABA (PZG) supplement (10 mL per day). Total sleep duration was detected by wrist actigraphy, and sleep quality was assessed by the Pittsburgh Sleep Quality Index (PSQI). Skin conditions wereevaluated based on assessments of skin hydration, glossiness elasticity, color, severity of wrinkles, and skin roughness. After 4 weeks, the total sleep duration significantly increased by 12.96% ($p = .006$) and the PSQI score notably decreased by 59.94% ($p = .000$) compared to the baseline. Notably, compared to the baseline conditions, skin hydration, radiance, elasticity, firmness, wrinkle severity, and roughness were significantly improved in the PZG group. In addition, the PZG group demonstrated significantly greater improvements than the placebo group in terms of changes from baseline in total sleep duration, PSQI score, skin hydration, wrinkle severity, and skin roughness. The present results demonstrated that the combined intake of herbs and GABA can improve sleep quality and enhance skin health without adverse effects.

S. Apsara, T. Opatha, R. Chutoprapat, P. Khankaew, V. Titapiwatanakun, W. Ruksiriwanich, K. Boonpisuttinant, **Asiatic acid-entrapped transfersomes for the treatment ofhypertrophic scars: In vitro appraisal, bioactivity evaluation, and clinical study**, International Journal of Pharmaceutics, Feb 2024

Non-invasive treatment options for hypertrophic scars (HTS) are limited, and treating HTS remains challenging due totheir unappealing appearance and associated social stigma. In this work, a novel transfersomal system named Asiaticacid-entrapped transfersomes (AATs) was prepared. AATs were evaluated for their skin permeability, anti-inflammatory activity, and other characteristic parameters to determine the most promising formulation. Asiatic acid-entrapped transfersomal gel (AATG), which was obtained by incorporating the lead AATs in a gel base, underwenttesting in an 8-week, double-blind, placebo-controlled, split-skin clinical study. The net skin elasticity (R5), melaninindex (MI), and skin surface hydration were analyzed employing Cutometer®, Mexameter®, and Corneometer®, respectively, in order to evaluate the effectiveness of the developed AATG. AATs exhibited vesicular sizes and zetapotential values within the range of (27.15 ± 0.95 to 63.54 ± 2.51 nm) and (-0.010 to −0.129 mV), respectively. TW80AATgave the highest %EE (90.84 ± 2.99%), deformability index (101.70 ± 11.59 mgs), permeation flux at 8 h(0.146 ± 0.005 mg/cm/h), and anti-inflammatory activity (71.65 ± 1.83%). The clinical study results of AATG indicated noadverse skin reactions. Furthermore, product efficacy tests demonstrated a significant reduction in MI and an increasein net skin elasticity at 2, 4, and 8 weeks. These pilot study outcomes support the effectiveness of the AATG.

A.L.V. Pequeno, E. Bagatin, **Dermatological ultrasound in assessing skin aging,** Frontiers in Medicine 11:135360, 2024

Ultrasonography (US) has emerged as a pivotal tool in Dermatology since its inaugural use in 1979. Its evolution encompasses technological advancements, higher frequencies, and diverse

applications in clinical, surgical, and research aspects. The discussion centers on its crucial role in assessing skin aging through various parameters such as skin thickness, subepidermal low echogenicity band (SLEB) characterization, and echogenicity assessment. This analysis can help guide interventions in a more personalized manner for each patient and assess the effectiveness of cosmetics and procedures. Despite its widespread utility, challenges persist, including discrepancies in research outcomes, operator dependence, inability to detect minute lesions, and measurement variations throughout the day. Combining US with complementary methodologies is advocated for a better understanding of skin aging in vivo. The costeffectiveness and non-invasiveness of the US emphasize its promising future in dermatology, but ongoing research remains imperative to enhance its accuracy and expand its applications.

M.A. Nilforoushzadeh, M. Heidari-Kharaji, N. Najar Nobari, E. Torkamaniha, S. Rafiee, M. Shahverdi, S. Tehrani, T. Fakhim, **Treatment of horizontal neck wrinkles by Endolift laser: Biometric measurement**, Skin Research & Technology, February 2024

Background: One of the common esthetic complaints of patients is horizontal neck wrinkles that have limited treatment modality. Aim: In the present study, we evaluated the efficacy of the Endolift laser on the horizontal neck wrinkles. Methods: Totally, 10 healthy female and male patients suffering horizontal neck wrinkles were joined in this study. All patients are treated with Endolift laser. The effectof the Endolift methods on the horizontal neck wrinkles was evaluated by biometric parameter changed resultswith Cutometer, Visioface, and the Skin Ultrasound Imaging system. Also, three blinded dermatologists and patients' satisfaction were evaluated. Results: The Visoface results showed that the Endolift laser treatment significantly decline the depth and area of horizontal neck wrinkle. The skin ultrasonography results reported the epidermis and dermis density and thickness were significantly increased. Also, the cutometer outcomes displayed that the Endolift laser treatment can increase skin elasticity. Also, significantly a greater number of patients were well satisfied with the technique. Conclusion: In conclusion, Endolift laser is a safe and effective method for decreasing the horizontal neck wrinkles and improving the appearance of the neck. This proceduredoes not require general anesthesia and recovery time.

*P. Charipoor, M.A. Nilforoushzadeh, M. Khani, M. Nour, E. Ghasemi, M.A. Amirkhani, M. Eftekhari, B. Shokr*i, **The FEDBD plasma's quantitative investigation of skin parameters: Skin elasticity, thickness, density, tissue oxygenation, perfusion, and edema**, Heliyon 10 (2024)

This study used the FEDBD plasma device for skin rejuvenation in animal samples. There were two groups of six male Wistar rats. Before starting the treatment, immediately after the treatment, the fourth week, and the tenth week of follow-up, biometric tests were performed, including moisture level, evaporation from the skin surface, erythema and melanin, skin elasticity and firmness with an MPA9 device and cutometer. The thickness and density of the epidermis and dermis, an essential indicator in rejuvenation, were evaluated with a skin ultrasound device. Also, the level of oxygen, perfusion, and interstitial water (edema) was checked using a Tivita tissue hyperspectral camera at a depth of 6 mm of the skin.

S.H. Seong, Y.I. Lee, J. Lee, S. Choi, I.A. Kim, J. Suk, I. Jung, C. Baeg, J. Kim, D. Oh, J.H. Lee, **Low-molecular-weight collagen peptides supplement promotes a healthy skin: A randomized, double-blinded, placebo-controlled study**, J Cosmet Dermatol. 2024;23: p. 554–562

Background: Oral collagen peptides supplementation was reported to improve skin integrity and counteract skin aging. Aims: A randomized, double-blinded, placebo-controlled study was conducted to clinically evaluate the impact of low-molecular-weight collagen peptides on the human skin. Patients/Methods: Healthy adult participants (n = 100) were randomly assigned to receive a test product containing low-molecular-weight collagen peptides or a placebo. Parameters of skin wrinkles, elasticity, hydration, and whitening (melanin and erythema indexes) were measured at baseline and after 4, 8, and 12 weeks. Results: Compared with the placebo group, the average skin roughness, maximum of all peak-to-valley values, maximum peak height of the wrinkle, and average maximum height of the wrinkle were significantly improved in the test group. Parameters of skin elasticity, including overall elasticity, net elasticity, and biological elasticity, were also significantly improved in the test group at Week 12 as compared with the placebo group. Moreover, skin hydration and whitening parameters changed more significantly in the test group than in the placebo group. None of the participants experienced adverse events related to the test product. Conclusions: Taken together, these findings suggest that low-molecular-weight collagen peptides supplementation can safely ehance human skin wrinkling, hydration, elasticity, and whitening properties.

J.M. Jurek, V. Neymann, **The role of the ImmunatuRNA® complex in promoting skin immunity and**

its regenerative abilities: Implications for antiaging skincare, J Cosmet Dermatol. 2024;23: p. 1429–1445

Introduction: Recent advancements in cosmetic science have ushered in a new era of skincare strategies, with a focus on utilizing natural bioactive ingredients to enhance skin health and combat premature aging. The skin, as the largest organ of human body, provides as a vital protective barrier against external hazards such as environmental pollutions, toxins, and radiation. However, intrinsic and extrinsic factors, including various types of radiation, reduced air quality, and increased exposure to pollutants, lead to an imbalance in the skin's immune system, significantly reducing the skin's ability to regenerate and accelerating skin aging. Therefore, there is an emerging need to develop innovative skincare strategies that could support the skin's immune capacity by strengthening antioxidant protection, skin regeneration, and repair. Plant-derived compounds, along with naturally sourced ingredients, show promise in accelerating wound healing, especially when incorporated into cosmetic formulation. ImmunatuRNA® stands as a prime example of a biologically active complex, uniquelycomprising yeast-derived RNA, marine exopolysaccharides, and natural hyaluronic acid, that exhibits high antioxidant activity and exerts beneficial modulatory effects on skin microbiota, thereby positively influencing skin immunity. Methodology: The main aim of this study was to investigate the potential of the ImmunatuRNA® complex in promoting skin regeneration and reducing signs of skin aging, both through the use of in vitro human skin cultures and the evaluation of clinical trials in healthy volunteers. Results: The results of conducted experimental studies have shown that the ImmunatuRNA® complex demonstrated significant positive effects on the immunity and repair capabilities of the skin, characterized by increased fibroblast proliferation, enhanced glycosaminoglycan synthesis, and reduced oxidative stress. Furthermore, use of the complex also significantly accelerated wound healing following mechanically-induced damage in the keratinocytes, demonstrated as reduction in wound margins measurement, new cell production, and an increase in regeneration speed. In addition, conduced clinical study on healthy human volunteers with various skin types confirmed that use of cosmetic products that incorporate theImmunatuRNA® complex within the formulation can visibly improve skin condition, appearance, and general health, achieved by increased skin hydration and elasticity, reduced wrinkles, and enhanced skin firmness. Conclusions: This study confirms the usefulness of the ImmunatuRNA® complex inthe innovative antiaging cosmetic products that can be suitable for all skin types, including sensitive skin. The inclusion of naturally sourced bioactives, as those found in ImmunatuRNA® complex, represents a promising advancement in holistic natural skincare that consumers appreciate. The active ingredients of the complex support the skin's immunity, fostering its repair and protecting against oxidative damage, thus maintaining skin homeostasis and promoting its regenerative capacity. Further research is necessary to explore the long-term effects of ImmunatuRNA® complex on skin health and its potential applications in innovative skincare formulations.

J.M. Carbajo, A. Michan-Doña, M. I. Carretero, M.L. Vela, J.A. de Gracia, F. Maraver, **Biophysical effects of a natural peloid on normal skin**, Int J Biometeorol., 2024 Jan;68(1): p. 143-152

A protocol study was designed to examine cutaneous behavior after continuous application of a peloid in the dry mineral residue of Lanjarón-Capuchina natural mineral water. This study aims toanalyze the biomechanical behavior of normal skin using various non-invasive bioengineering techniques after the application of this peloid. We determine the effects of its application for 3months on 38 healthy volunteers (41.4 ± 5.9 years, range 32-58) without a previous history of skin diseases by courtmetry, sebumetry, pH-metry, reviscometry, and tewametry. It was shown that the production of cutaneous sebum is significantly reduced by 6%, trans epidermal skin loss (TEWL) by21%, skin fatigue by 30%, elasticity increased by 19%, firmness by 5%, and a skin redensification by 6% was obtained under these experimental conditions. Disparate and non-significant results wereobtained concerning pH and viscoelasticity. Continuous skin care with the Lanjarón-Capuchina natural peloid modifies skin behavior, normalizing sebaceous secretion, favoring the biomechanical properties of the skin and the skin barrier function without modifying skin homeostasis.

A. Jaros-Sajda, E. Budzisz, A. Erkiert-Polguj, **Ascorbic Acid Treatments as Effective and Safe Anti-Aging Therapies for Sensitive Skin**, Antioxidants 2024, 13, 174

The most common signs of aging skin include a decrease in firmness and density, uneven skin tone, and a tendency to erythema. There is an ever-increasing interest in aesthetic treatments that maintain the skin’s favorable appearance. However, such therapies are difficult in the case of sensitive skin, defined as a set of stimuli-triggered symptoms (stinging, erythema, burning, and itching) that would not appear in healthy skin. Sensitive skin is common and affects, to varying degrees, about half of the European population. This study was aimed at evaluating the effects of ascorbic acid—a known antioxidant—applied with sonophoresis and microneedling on the signs of photoaging in reactive and erythematous skin. A significant improvement in skin elasticity was observed after a series of tests. A

significant reduction in erythema was observed after both therapies. The greatest reduction was observed on the cheeks after applying vitamin C combined with microneedling. At the same time, the results showed an excellent tolerance of both treatments, which proved them to be safe and effective.

H.K. Sung, T.J. Kim, H.M. Kim, S.J. Youn, Y. Choi, N.Y. Lee, H.J. Oh, H.S. Kwon, S.M. Shin, **Anti-Wrinkle and Skin Moisture Effcacy of 7-MEGA™: A Randomized, Double-Blind, Placebo Comparative Clinical Trial**, Nutrients 2024, 16, 212

7-MEGA™ is a food product made from purifed Alaska pollack fsh oil containing palmitoleic acid (16:1), commonly referred to as omega-7. We sought to quantitatively evaluate whether this substance inhibits skin aging. A total of 101 middle-aged females were randomly allocated to the intervention (N = 50) or placebo group (N = 51). Each participant was advised to takeeither 500 mg of 7-MEGA™ or a placebo twice daily for 12 weeks. The primary outcomes were the degree of improvement in wrinkles and the degree of moisture flling after consumption for 12 weeks compared to baseline. The secondary outcomes were improvement in skin wrinkles; moisture changes at 4 and 8 weeks from baseline; changes in transdermal water loss, skin elasticity, the melanin index, the erythema index, and the Global Photo Damage Score. We found a signifcant improvement in skin wrinkles and elasticity at 12 weeks in the 7-MEGA™-consuming group compared to that in the placebo group; skin moisture, elasticity, and the melanin index were also improved. No supplementrelated adverse reactions were observed and 7-MEGA™ was identifed as safe. 7-MEGA™ was effective for human skin function in terms of wrinkles, moisture, elasticity, and melanin production and may be useful as a skin nutritional supplement.

L. Canel, **Ashwagandha: adaptogenic plant for skin revival**, PERSONAL CARE MAGAZINE, Volume 25, Issue 1, January 2024, p. 45-48

Gattefosse has introduced an all-natural active ingredient designed to rejuvenate the skin. This innovative solution is derived from the roots of ashwagandha, a renowned adaptogenic herb. It harnesses the herb's inherent vitality-boosting properties while acting as a shield for skin cells against various aggressors, with a specific focus on combatting digital stress. Skin is invigorated, brimming with new life, and features enhanced biomechanical attributes, such as tonicity and elasticity. As a result, the skin experiences a significant revival, with visible signs of fatigue dissipating, leaving behind a radiant, healthy complexion.

H. Falholt Elvebakken, I. Blomquist Christensen, C. Vedel, S. Kjærulff, **A proof of concept: Clinical anti-aging efficacy and safety of *Lactiplantibacillus plantarum* LB244R® applied topically in a double-blinded placebo-controlled study**, J Cosmet Dermatol. 2024;23: p. 1233–1242

Background: With the increasing age of the westernized population, there is also increasing economic and aesthetic interest in reducing the signs of skin aging. Additionally, the physical aspect of aging can be displeasing and have detrimental effects psychologically in individuals. Probiotics have shown potential as anti-agingagents, albeit proper studies are needed to confirm their potential. Aims: Proving that *Lactiplantibacillus plantarum* LB244R® could alleviate aging signs relative to its placebo vehicle. Patients/Methods: In total, 46 subjects were randomly assigned either the ointment with live bacteria, *L. plantarum* LB244R® or its vehicle ointment, and had to use the assigned ointment twice daily for 56 days. On Day 0, Day 28, and Day 56 subepidermal low echogenic band (SLEB) thickness, dermal density, skin firmness and elasticity, skin hydration, transepidermal water loss (TEWL), skin pH, collagen fiber visualization using confocal microscopy, Crow's feet, spot score, skin smoothness, and complexion radiance were assessed by dermatologists. Results: All parameters except TEWL improved relative to their baseline (D0) for the active group. *L. plantarum* LB244R® improved SLEB thickness, dermal density, skin elasticity, skin hydration, and Crow's feet wrinkle score relative to the placebo vehicle ointment. Conclusion: The study demonstrates an anti-aging effect of *L. plantarum* LB244R® for topical skin use in the first double-blinded, vehicle-ointment placebo-controlled clinical study.

N. Ashok Chand, S. Duarah, B.A. Yuk-Winters, D. Fomra, **Clinical Investigation of Collagen-Based Electrospun Nanofbers for Enhanced Delivery of Skincare Ingredients**, Cosmetics 2024, 11, 18

Nanofber-based materials, due to their unique properties, are of remarkable interest across multiple felds of applications, including cosmetics. Collagen, a primary structural protein in human skin, is well-regarded for its critical role in maintaining skin health, elasticity, and enhancing skin regeneration. This study reports the characterization, safety, and effcacy evaluation of DermaLayr™, a novel collagen-based nanofber platform, for skincare application. The collagen nanofbers were developed using a sonic electrospinning technique, and scanning electron microscopy (SEM) analyses indicated that the nanofbers were uniform with average fber diameters ranging from 250 to 300 nm. The skin permeation studies on EpiDerm™ indicated that applying the test products resulted in around 5–25% higher collagen permeation into the epidermis, and 16–20% higher collagen permeation into the dermis when

compared to the non-treated sample. Additionally, the safety of the developed nanofibers was assessed in vitro and in vivo and both the studies indicated their non-toxic and nonirritant properties. Moreover, clinical trials on human subjects further substantiated the clinical efficacy of DermaLayr™ by demonstrating significant improvement in several skin parameters such as hydration, elasticity, and overall skin health. In summary, the findings of this study emphasize the huge potential of DermaLayr™ nanofiber products for their safe application in cosmetics and skin therapeutics.

S. Sakaguchi, K. Saito, N. Arakawa, M. Konyo, **Stratum corneum compliance enhances tactile sensitivity through increasing skin deformation: A study protocol for a randomized controlled trial**, J Cosmet Dermatol. 2024;23: p. 296–307

Background: Tactile sensation plays a crucial role in object manipulation, communication, and even emotional well-being. It has been reported that the deformability of skin (also described as skin compliance) that shows a large mechanical response to stimuli is associated with high tactile sensitivity. However, although the complianceof the stratum corneum, the outermost layer of skin, can change daily due to skin care and environmental factors, few studies have quantified the effect of the stratum corneum on tactile sensation. Aims: We investigated the changes in tactile sensitivity resulting from skin hydration and identified corresponding alterations in the compliance of the stratum corneum.Methods: A randomized controlled trial was conducted. Participants were randomly assigned to an intervention group ($n = 20$) that had a moisturizing cream applied totheir cheeks or a control group ($n = 19$) that had Milli-Q water applied to their cheeks.Tactile discrimination performance was assessed using psychophysical techniques before and after application. The water content, mechanical response characteristics, and penetration of PEG/PPG-17/4 dimethyl ether from the cream in the stratumcorneum were evaluated to identify hydration effects. Skin deformations occurring during tactile sensation were measured concurrently using a suction device employed for tactile stimulation.Results: Tactile sensitivity was increased in participants who had cream applied to theskin surface, while no significant change was observed in participants who received Milli-Q water. The improved discrimination of tactile stimulus intensity was directly related to the magnitude of skin displacement. The higher water content of the stratum corneum due to cream application decreased the dynamic modulus of elasticity of the stratum corneum and increased the skin's extensibility in response to tactile stimuli. Conclusions: Hydrating the stratum corneum significantly enhances tactile sensitivity and is accompanied by an increase in skin extensibility, a factor in tactile intensity perception. The compliance of the thin stratum corneum layer plays a crucial role in tactile experiences that involve skin stretching.

C. Kern, S. Dudonné, C. Garcia, **Dietary supplementation with a wheat polar lipid complex improves skin conditions in women with dry skin and mild-to-moderate skin aging**, J Cosmet Dermatol. 2024;23:1, p. 320–1330

Background: Aging, menopause, and seasonal changes alter the lipid composition of the outermost skin layer, the stratum corneum, resulting in dry and itchy skin. Aims: This clinical trial aimed at evaluating the effects of a wheat polar lipid complex (WPLC) on skin characteristics in women showing dry and wrinkled skin, investigating its effects in a subgroup of postmenopausal women, and assessing if benefits were maintained after supplementation. Methods: Seventy-two women with dry and wrinkled skin were recruited in thisdouble-blind, randomized, parallel-group study, and allocated to three groups of 24 subjects, each including at least 10 postmenopausal women. For 56 days, subjects consumed the WPLC supplement (oil or powder), or the placebo. Skin hydration, transepidermal water loss (TEWL), elasticity, and profilometry were evaluated at baseline, after 14, 28, and 56 days of supplementation, and 56 days after the end of supplementation. Additionally, a lipidomic analysis was performed to examine changes in superficial skin layers over 56 days. Results: Dietary supplementation with WPLC rapidly improved all parameters. It increased skin hydration, smoothness, and elasticity while decreasing TEWL, roughness, and wrinkle depth after only 14 days of supplementation. These effects werealso observed in the subpopulation of postmenopausal women and led to an improved self-perception of skin. For all the parameters, outcomes were not maintained after the supplementation was stopped. The lipidomic analysis revealed 10 compounds evolving over the 56 days of WPLC supplementation. Conclusion: WPLC supplementation improved skin hydration, smoothness, elasticity, and wrinkledness within 14 days and, as expected, did not last after supplementation was stopped.

G.H. Na, S.J. Kim, H.M. Jung, S.H. Han, J. Han, Y.K. Koo, **Skin Anti-Aging Effcacy of Enzyme-Treated Supercritical Caviar Extract: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial**, Nutrients 2024, 16, 137

Oxidative stress in the skin, induced by an unhealthy lifestyle and exposure to UVB radiation, leads to skin aging, including reduced elasticity, formation of wrinkles, moisture loss, and inflammation. In a previous study, we revealed the photoaging effects of enzyme-treated caviar extract (CV) by

regulating collagen and hyaluronic acid synthase, melanogenesis, anti-oxidant mechanisms, and inflammation in a UVB irradiation-induced mice model. HPLC and MALDI-TOF were performed to determine the effect of enzyme treatment on the free amino acid contents andpeptide molecular weight in supercritical caviar extract. As results of the analysis, CV is mainlycomposed of low-molecular-weight peptides consisting of leucine, tyrosine, and phenylalanine. Based on our in vitro and in vivo study, we conducted a clinical trial to assess the skin anti-aging effcacy of CV. In this randomized, double-blind, placebo-controlled trial, we measured indicators related to elasticity, wrinkles, and skin hydration at 4 and 8 weeks after consumption of CV. The subjects were categorized into caviar, combination, and placebo groups. After 4 weeks, skin hydration, dermal hydration, and transepidermal water loss all showed signifcant improvement. Furthermore, after 8 weeks, skin elasticity indexes—R2 (total elasticity), R5 (net elasticity), and R7 (ratio of elastic recovery to total deformation)—exhibited signifcant increases. Improvement in wrinkle indicators (Rmax, Ra, and Rz) and the whitening indicator melanin pigment was also observed. This is the first report showing that CV has signifcant skin anti-aging effcacy on human skin. In conclusion, our study suggests that CV can be used as skin anti-aging nutraceuticals through positive effects on skin condition in clinical trials.

J.H. Lee, J. Kim, Y.N. Lee, S. Choi, Y.I. Lee, J. Suk, J.H. Lee, **The efficacy of intradermal hyaluronic acid filler as a skin quality booster: A prospective, single-center, single-arm pilot study**, J Cosmet Dermatol. 2024;23: p. 409–416

Background: The use of “skin boosters” comprised of hyaluronic acid (HA)-based fillers to improve skin quality has gained popularity recently, especially in individuals interested in skin rejuvenation. Aim: This study aimed to evaluate the efficacy and safety of intradermal micropuncture injections of HA-based gel filler combined with lidocaine (BYRYZN® SKINBOOSTER HA, ACROSS Co., Ltd., Gangwon-do, Korea). Patients/Methods: A prospective, single-arm, open-label pilot study was conducted with study subjects who were aged between 30 and 60 years old and exhibited evidence of skin aging, such as wrinkles and loss of elasticity. They received three injections at 2-week intervals and were followed up for a total of 12 weeks. Results: Twenty subjects with a mean age of 54.1 years were included. The mean Lemperle wrinkle scale demonstrated a 40% decrease from 2.60 ± 0.60 at baseline to 1.55 ± 0.51 at week 8. The improvement rate was maintained at about 33% until week 12. The average maximum height of the wrinkle (Rz, μm), average skin roughness (Ra, μm), skin elasticity (R2, AU), facial curved length (mm), skin pore size (mm2), skin hydration (AU), TEWL (g/hm2), and skin glossiness (gloss value, AU) exhibited statistically significant improvements over time compared with the baseline measurements. No serious adverse effects or persistent adverse effects were reported, except for a transient subcutaneous nodule in one subject. Conclusions: This study demonstrates that multiple microinjections of HA-based gel filler for facial skin aging are safe and effective in improving facial skin quality.

L. Lu, W. Bai, M. Wang, C. Han, H. Du, N. Wang, M. Gao, D. Li, F. Dong, X. Ge, **Novel roles of bovine milk-derived exosomes in skin antiaging**, J Cosmet Dermatol. 2024;23: p. 1374–1385

Background: Exosomes are small vesicles released from cells and are found in various mammalian biological fluids, such as bovine milk, which has been employed in skincare for many years, apart from its dairy applications. In addition, exosomes have been recognized as vehicles for intercellular communication. Aims: In this study, we aimed to investigate the novel effects of bovine milk-derived exosomes (MK-Exo) on antiaging in human skin. Methods: Initially, MK-Exo were co-cultured with keratinocytes and fibroblasts; subsequent analysis involved qPCR and western blotting to assess induced gene expression. Subsequently, MK-Exo were topically applied to the facial skin of 31 female volunteers twice daily for 28 days. The functions were evaluated after conducting safety assessments in vivo. Results: Purified MK-Exo demonstrated the ability to be taken up directly by keratinocytes and fibroblasts in vitro, resulting in the upregulation of natural factors associated with skin moisturization, including filaggrin (FLG), aquaporin 3 (AQP3), and CD44 in keratinocytes, as well as hyaluronidase (HAS2) in fibroblasts. Concurrently, MK-Exo promoted fibroblast cell migration and restored the expression of type I and III collagen (Col I and Col III) following exposure to ultraviolet radiation. Furthermore, phototoxicity, photoallergy, repeated skin irritation, skin allergy, and patch tests confirmed the safety of MK-Exo for skin application. Finally, we elucidated the roles of MK-Exo in preserving moisture and reducing wrinkles in humans. Conclusion: Our findings unveil the novel contributions of MK-Exo to human skin aging, presenting a new avenue in the field of skincare.

R. di Lorenzo, M. Maisto, L. Ricci, V. Piccolo, A. Marzocchi, G. Greco, G.C. Tenore, S. Laneri, **Annurca Apple Oleolite as Functional Ingredient for the Formulation of Cosmetics with Skin-Antiaging Activity**, Int. J. Mol. Sci. 2024, 25, 1677

The identification of natural remedies for the management of the skin aging process is an

increasingly growing issue. In this context, ursolic acid (UA), a ubiquitous molecule, mainly contained in Annurca apple (AA) fruit, has demonstrated valuable cosmetic potential. To this end, in the current study, the AA oleolite (AAO, extract in sunflower oil containing 784.40 ± 7.579 μg/mL of UA) was evaluated to inhibit porcine elastase enzymatic reactions through a validated spectrophotometric method. AAO has shown a valuable capacity to contrast the elastase enzyme with a calculated IC50 of 212.76 mg/mL, in comparison to UA (IC50 of 135.24 μg/mL) pure molecules and quercetin (IC50 of 72.47 μg/mL) which are used as positive controls. In this context and in view of the valuable antioxidant potential of AAO, its topical formulation with 2.5% (w/w) AAO was tested in a placebocontrolled, double-blind, two-arm clinical study on 40 volunteers. Our results indicated that after 28 days of treatment, a significant reduction of the nasolabial fold (−7.2 vs. baseline T0, $p < 0.001$) and forehead wrinkles (−5.3 vs. baseline T0, $p < 0.001$) were registered in combination with a valuable improvement of the viscoelastic skin parameters, where skin pliability/firmness (R0) and gross elasticity (R2) were significantly ameliorated (−13% vs. baseline T0, $p < 0.001$ for R0 and +12% vs. baseline T0, $p < 0.001$ for R2). Finally, considering the positive correlation between skin elasticity and hydration, the skin moisture was evaluated through the estimation of Trans epidermal water loss (TEWL) and skin conductance.

G. Siquier-Dameto, G. Salti, S. Rharbaoui, D.M. Hernandez Malgapo, S. Innocenti, M. Manni, **A 12-Month Analysis of the Dermatologic Effects and Durability of Midface Volume Correction With DEFCL Volumizing Filler in a Prospective, Single-Center Study**, Dermatol Surg 2024;00: p. 1–6

Background: Certain manufacturing processes confer distinctive rheologic features to hyaluronic acid (HA), ensuring long-lasting effects. Skin quality improvement and the volumizing effects of the DEFCL volumizer filler, a sterile, biodegradable, viscoelastic, transparent, isotonic, and homogenized injectable cross-linked high G9 filler for the treatment of moderate-to-severe age-related midface changes, were initially documented at 6 months after the first injection. Obejective: The authors aimed to objectively evaluate the effects of the DEFCL volumizer filler in improving skin density, thickness, and biomechanical properties and on tissue volume augmentation in women with midface volume loss after 12 months. Materials and Methods: Fifty women with midface volume loss were recruited in this prospective, noncomparative, single-center, postmarket study. The authors report changes in skin density, thickness, and quality and subjective and objective evaluation of facial and/or cheek volume augmentation using the Global Aesthetic Improvement Scale, as well as injection site reactions and adverse events. Results: Improvements in skin quality and thickness and volumization were maintained 12 months after the first injection. Injector and patient satisfaction were highly rated with only mild adverse reactions observed. Conclusion: Skin improvement and volumizing effects persisted in patients treated with the DEFCL volumizer after 12 months.

F. Huang, X. Wang, M. Zhang, L. Wang, Y. Wang, Y. Hu, T. Dong, P. Wie, **Correlating facial skin parameters with age and gender in population of Shaanxi Province**, **China**, J Cosmet Dermatol. 2024;23: p. 1386–1395

Objective: This study was designed to comprehensively evaluate the changes in facial skin biophysical parameters with age, as well the influence of gender differences in populations of Shaanxi Province, China. Methods: Fourteen skin parameters, including stratum corneum hydration (SCH), transdermal water loss (TEWL), erythema, melanin, R0, R2, R5, R7, F4, gloss, skin surface pH, skin erythema index (a*), wrinkle length, and sebum, were measured by noninvasive instruments in 481 volunteers from Shaanxi Province. Spearman correlation analysis was performed to analyze the relationship between skin parameters and age. Additionally, skin parameters were analyzed for different age groups and different genders. Results: The results of the study showed a linear decrease in skin surface pH and sebum content with age, and the skin elasticity parameters R0, R2, R5, and R7 decreased significantly at the age of 54–65 years. Wrinkle length showed a linear andincrease with age. R5 showed a weak negative correlation with age, R2, R7, and sebumcontent showed a moderate negative correlation, while wrinkle length showed a strong positive correlation. Considering the effect of gender on skin parameters, the results showed that SCH and gloss were lower in men than in women, while TEWL, erythema, melanin, wrinkle length, and sebum were higher than in women. However, there was no difference in skin elasticity between them. Conclusion: The facial skin parameters, especially for the wrinkle length, exhibited the strong correlation relationship with ages in Shaanxi Province. Meanwhile, most skin parameters show significant differences with gender, which can provide a reference for future research and development in the field of cosmetics.

D. Deflorio, M. Di Luca, A.M. Wing, **Skin properties and afferent density in the deterioration of tactile spatial acuity with age,** J Physiol 601.3 (2023) p. 517–533

Tactile sensitivity is affected by age, as shown by the deterioration of spatial acuity assessed with the two-point discrimination task. This is assumed to be partly a result of age-related changes of

the peripheral somatosensory system. In particular, in the elderly, the density of mechanoreceptive afferents decreases with age and the skin tends to become drier, less elastic and less stiff. To assess to what degree mechanoreceptor density, skin hydration, elasticity and stiffness can account for the deterioration of tactile spatial sensitivity observed in the elderly, several approaches were combined, including psychophysics, measurements of fnger properties, modelling and simulation of the response of frst-order tactile neurons. Psychophysics confrmed that the Elderly group has lower tactile acuity than the Young group. Correlation and commonality analysis showed that age was the most important factor in explaining decreases in behavioural performance. Biological elasticity, hydration and fnger pad area were also involved. These results were consistent with the outcome of simulations showing that lower afferent density and lower Young's modulus (i.e. lower stiffness) negatively affected the tactile encoding of stimulus information. Simulations revealed that these changes resulted in a lower build-up of task-relevant stimulus information. Importantly, the reduction in discrimination performance with age in the simulation was less than that observed in the psychophysical testing, indicating that there are additional peripheral as well as central factors responsible for age-related changes in tactile discrimination.

G. Nam, H.W. Lee, J.S. Jang, C.H. Kim, K.-H. Kim, **Novel conformation of hyaluronic acid with improved cosmetic efficacy**, J Cosmet Dermatol. 2023;22: p. 1312–1320

Background: Hyaluronic acid presents a valuable cosmetic ingredient that occurs naturally. Its direct links to skin aging has led to its broad application. The aim of this study was to improve the cosmetic efficacy of high molecular weight hyaluronic acid (HMWHA) without chemical modifications and evaluate such improvements through clinical and in vitro studies. Methods: A novel formulation of HMWHA (SCAI-HA) was prepared and investigated to comparatively assess 6 clinical and 2 in vitro parameters concerning its dermatological cosmetic efficacy and biological properties. The dermatological and cellular parameters examined in this study include skin hydration, transepidermal water loss (TEWL), skin elasticity, wrinkles, facial sagging, dermal density, cytotoxicity, and collagen synthesis. Results: SCAI-HA exhibited the ability to improve the tested dermatological parameters (hydration, elasticity, wrinkles, and density) to magnitudes comparable to those of HMWHA. In addition, SCAI-HA showed notably improved capacities for attenuating facial sagging and TEWL and promoting cellular collagen synthesis in normal human dermal fibroblasts. Conclusion: SCAI-HA presents a novel conformation of HMWHA with improved cosmetic efficacy in mitigating (i) facial sagging, (ii) TEWL, and promoting, and (iii) collagen synthesis. These findings denote the enhancement of SCAI-HA as a cosmetic ingredient with potential anti-aging properties.

E. Ghasemi, M.A. Nilforoushzadeh, M. Khani, M.A. Amirkhani, M. Nouri, P. Charipoor, M. Eftekhari, S. Izadpanah, B. Shokri, **The quantitative investigation of spark plasma on skin parameters with skin elasticity, thickness, density, and biometric characteristics**, Scientifc Reports, (2023) 13:7738

Cold atmospheric plasma has been developed and utilized as a novel technique for skin rejuvenation because of its various efects on cells and living things. This study investigated the accuracy of this claim and any possible side efects of using spark plasma to rejuvenate skin. The present work is the frst quantitative investigation using animal models. 12 Wistar rats were divided into two groups for this investigation. To compare the skin's natural process with the treated skin, the frst group underwent a single session of plasma therapy, while the second group served as the control group. The back of the necks of the samples was shaved for 20 cm. Before beginning treatment, the MPA9 multifunctional skin tester was used to determine the melanin index, erythema index, and transepidermal water loss (TEWL). The skin's thickness and density were assessed using sonography, and its elasticity index was calculated using a Cutometer. The samples were exposed to plasma radiation in the designated area (in a triangular pattern). The abovementioned signs were examined immediately after the following therapy and at the weekly appointment 2–4 weeks later. Optical spectroscopy was also used to demonstrate the presence of active species. In this study, we found that a plasma spark therapy session signifcantly boosts skin elasticity, and the ultrasound results revealed a signifcantly increased skin thickness and density. The plasma increased the amount of skin surface evaporation, erythema, and melanin immediately following the treatment. However, 4 weeks later, it recovered to its former state and did not difer signifcantly from before the therapy.

F. Li, H. Chen, D. Chen, B. Zhang, Q. Shi, X. He, H. Zhao, F. Wang, **Clinical evidence of the efficacy and safety of a new multi-peptide anti-aging topical eye serum,** Journal of Cosmetic Dermatology, Volume 22, Issue 12, December 2023

Background: Skin aging is a complex multifactorial progressive process. With age, intrinsic and extrinsic factors cause the loss of skin elasticity, with the formation of wrinkles, resulting in skin sagging through various pathways. A combination of multiple bioactive peptides could be used as a treatment for skin wrinkles and sagging. Objectives: This study aimed to evaluate the cosmetic efficacy of a multi-

peptide eye serum as a daily skin-care product for improving the periocular skin of women within the ages of 20–45 years. Methods: The stratum corneum skin hydration and skin elasticity were assessed using a Corneometer CM825 and Skin Elastometer MPA580, respectively. The PRIMOS CR technique based on digital strip projection technology was used for skin image and wrinkle analysis around the “crow's feet” area. Self-assessment questionnaires were filled on Day 14 and 28 of product use. Results: This study included 32 subjects with an average age of 28.5 years. On Day 28, there was a significant decrease in the number, depth, and volume of wrinkles. Skin hydration, elasticity, and firmness increased continuously during the study period, consistent with typical anti-aging claims. A majority of the participants (75.00%) expressed overall satisfaction with their skin appearance after using the product. Most participants noted a visible skin improvement, with an increase in skin elasticity and smoothness, and confirmed the extensibility, applicability, and temperance of the product. No adverse reactions related to product use were observed. Conclusions The multi-peptide eye serum uses a multi-targeted mechanism against skin aging to improve the skin appearance, making it an ideal choice for daily skincare.

K.O. Kaye, F. Paprottka, N. Moellhoff, S. Fertsch, K. Frank, G. Casabona, **Radiofrequency and pulsed electromagnetic field application following liposuction-Clinical evaluation of performance and safety**, Journal of Cosmetic Dermatology, Volume 22, Issue 12, December 2023, p. 3298-3304

Objective: With more than 1.5 million performed procedures, liposuction was the second most performed esthetic surgical procedure all over the world in males and in females in the year 2020. The objective of this open-label, evaluator-blinded study was to assess the efficacy and safety of an energy-based device that combines multipolar radiofrequency with pulsed electromagnetic field (PEMF) in patients that underwent liposuction. Materials and methods: A total of 30 subjects, of whom 24 were females (80%), with a mean age of 48.4 ± 11.0 years (range: 27-69 years) and a mean weight of 69.5 ± 11.7 kg underwent unilateral treatment with radiofrequency and application of PEMF after bilateral liposuction. One month after the last of a total of six weekly treatments, skin elasticity, visco-elasticity and net elasticity, as well as subject reported satisfaction on a 5-point scale ranging from -1 (worse) to 3 (very much improved) and esthetic improvement ranging from 0 (very unsatisfied) to 4 (very satisfied) rated by three independent reviewers were assessed. Results: Three independent and blinded reviewers rated the improvement of the treated side on average as 1.17 + 0.07 compared with baseline. Subjects were very satisfied with their treatment, with a mean score of 3.24 (0.03) out of 4 at the 1-month follow-up visit. Cutometer measurements showed no significant changes. Conclusion: This study revealed that the subjective satisfaction with the results of the application of RF and PEMF after liposuction is high, while at the same time the esthetic appearance as rated by independent raters improved on the treated side.

W. Poomanee, N. Yaowiwat, T. Pattarachaidaecharuch, P. Leelapornpisid, **Optimized multiherbal combination and in vivo anti-skin aging potential: a randomized double blind placebo controlled study**, Scientifc Reports, (2023) 13

The present study aimed to optimize a multi-herbal combination exerting the greatest antioxidant property using statistical method for anti-skin aging application as well as to elucidate its in vivo safety and anti-skin aging potential. The multi-herbal combination was optimized using a two-level, full factorial approach by exploring the correlation between the concentrations (0–3%w/v) of three extracts from *Centella asiatica* (CA)*, Momordica cochinchinensis* (MA), *Phyllanthus emblica* (EM). Ananti-skin aging emulsion containing the optimized combination was then developed and evaluated for its physicochemical characteristics with its stability under storage conditions. The in vivo anti-skinaging potential of the emulsion was subsequently investigated among 60 women in a randomized, double-blind, placebo-controlled study. Skin hydration, elasticity and wrinkles at eye and cheek areas were measured at baseline, after 30 and 60 days of application. Before performance testing, in vivo skin irritation was evaluated using the patch test and homogeneity between groups was also statistically analyzed. According to the model describing the signifcant main efects of each extractand interaction efects between extracts on percent inhibition against DPPH radicals, the best multi-herbal combination consisted of 3%w/v EM and 3%w/v CA. The developed emulsion containing the combination presented smooth soft texture with good stability in terms of physical characteristics and biological property. Regarding the clinical study, no skin erythema and edema was reported amongin all volunteers. After 60 days of application, signifcantly improved skin hydration, elasticity and wrinkles were observed in the test group. In addition, signifcantly reduced wrinkles were observed after 60 days in both skin areas of the test group. The anti-skin aging emulsion containing this optimized combination exhibited good safety and performance. Ultimately, this product comprises an efective anti-skin aging formulation for applications.

M. Roohaninasab, F. Khodadad, A. Sadeghzadeh-Bazargan, N. Atef, S. Zare, A. Jafarzadeh, S.T. Rahimi, M. Nouri, M. Ali Nilforoushzadeh, E. Behrangi, A. Goodarzi, **Efficacy of fractional CO2 laser in combination with stromal vascular fraction (SVF) compared with fractional CO2 laser alone in the treatment of burn scars: a randomized controlled clinical trial**, Stem Cell Research & Therapy (2023) 14

Background: The appearance of skin scars is known as one of the main side effects of skin burns. Stromal vascular fraction (SVF), as a rich source of cell populations with tissue regeneration properties, plays an important role in the healing of skin lesions. Fractional CO2 lasers have occupied a special place in treating skin lesions, particularly skin scars, since their introduction. Our study aimed to compare the combination of SVF and fractional CO2 laser with fractional CO2 laser alone in the treatment of burn scars. Method: This double-blind clinical trial study was conducted on ten patients with burn scars that were treated three times with a fractional CO2 laser at site of burn lesions, and one of the two areas studied was randomly injected with SVF. Two months after completion of the procedure, patients' scars were assessed using the Vancouver scar scale (VSS), biometric criteria, and physician and patient satisfaction ratings. Results: The results confirmed a significant improvement in VSS, cutometry, R7 criteria, complete density sonography, and skin density sonography in the fractional CO2 laser-treated group. The VSS criteria, epidermal thickness sonography, complete density sonography, and skin density sonography in the group treated with the combination of fractional CO2 laser and SVF also showed significant improvement. The VSS criteria and melanin index of Mexameter in the group treated with SVF in combination with fractional CO2 laser were significantly better than the group treated with fractional CO2 laser alone. Also, physician and patient satisfaction in the group treated with SVF injection in combination with fractional CO2 laser was significantly higher than the other group. Conclusion: The results confirm the efficacy of SVF injection in combination with fractional CO2 laser in the treatment of burn scars and can be considered as a treatment option for better management of these lesions.

Y. Fujimotoa, Y. Yuria, Y. Katob, S. Kinoshitab, H. Tamiyab, **Intra- and inter-rater reliabilities of skin mechanical properties measured in healthy individuals using skin elasticity meter,** Annals of Medicine 2023, Vol. 55, No. 2, 2279747

Purpose: The aim of this study is to establish a standardized measurement method and to examine the intra- and inter-reliabilities and absolute reliability of measuring skin mechanical properties using a skin elasticity meter (Cutometer®). Methods: Ten healthy participated in the study. Skin mechanical properties were measured at four sites: upper arm, lower arm, upper leg and lower leg on both sides in supine position using a non-invasive skin elasticity meter by two trained different raters. The measurements include quantitative indices of the maximal distensibility (R0), elasticity (R2, R5, R7), and viscoelasticity (R6). Intra- and inter- relative reliabilities were determined using the intraclass correlation coefficient (ICC) (1,1) and ICC (2,1) methods, respectively. The absolute reliability was assessed via the Bland-Altman analysis. Moreover, we evaluated the minimal detectable change at a 95% confidence level (MDC95). Results: At each site, the ICC (1,1) values were >0.90, and the ICC (2,1) values were >0.50. The Bland–Altman analysis did not reveal any fixed errors, and several sites and parameters have proportional errors. Conclusions: In this study, intra- and inter-reliabilities were measured at "excellent" and more than "moderate" levels, respectively. However, because some proportional errors were observed, the limits of reliability agreement should be considered when using the proposed methods. We believe that the results of this study can be applied to clinical research in field of rehabilitation treatment.

L. Chen, Y. Lv, F. Xu, F. Zhong, **The effect of oral supplements containing collagen peptides rich in X-Hyp or X-Hyp-Gly compared with normal collagen hydrolysates on skin elasticity and collagen holes: a randomised double-blind clinical study**, Food Funct., 2023 Nov 27;14(23): p. 10628-10638

Collagen peptides enriched with X-Hyp or X-Hyp-Gly have demonstrated resistance to digestive and systemic enzymes, suggesting their potential for improved absorption efficiency and enhancement of skin properties. This study aimed to evaluate the effects of oral supplementation with collagen peptides rich in X-Hyp or XHyp-Gly on skin properties in a clinical setting. A double-blind, randomized study was conducted on 30 healthy adult participants aged between 22 and 30. Normal collagen hydrolysates were used as the control, and each participant received a daily powdered drink containing either 5 grams of collagen peptides or hydrolysates (n = 15 in each group) for a period of 42 days. Skin elasticity was evaluated using the Cutometer, revealing a significant increase in the intervention group's skin elasticity (R2 values: 0.86 to 0.92, $P < 0.001$; R7 values: 0.77 to 0.84, $P < 0.001$). Collagen synthesis in the dermis was assessed using the SIAscope, demonstrating a substantial increase of 30.67 in the intervention group, while the control group exhibited a marginal increase of 0.49. In vitro digestion and cellular

transport models were employed to evaluate the absorption and transport of Hyp-containing collagen peptides. LC-MS analysis demonstrated a significantly higher proportion of small peptide oligomers below 500 Da in the CP product compared to the control group (approximately 70% vs. 50%) after digestion. Additionally, the CP product exhibited a greater uptake of peptides (27%) compared to the control group (21%). These findings highlight the potential use of Hypcontaining collagen peptides with a low molecular weight in food supplements for improving skin health.

Q. Wang, Y. Zhong, N. Li, L. Du, R. Ye, Y. Xie, F. Hu, **Combination of dimethylmethoxy chromanol and turmeric root extract synergically attenuates ultraviolet-induced oxidative damage by increasing endogenous antioxidants in HaCaT cells**, Skin Research & Technology, 2023;29:e13539

Background: Repeated exposure to UV generates excessive reactive oxygen species (ROS) and damages the enzymatic antioxidant defense system including quinone oxidoreductase 1 (NQO1) and superoxide dismutase (SOD) in skin. Topical application of antioxidants may prevent the undesired damage of cellular proteins, lipids and DNA in skin. Dimethylmethoxy chromanol (DMC) is a bioinspired molecule, designed to be a structural analog to the γ–tocopherol that is naturally present in vegetables and plants. Turmeric root extract (TRE) is from a plant in South Asia extensively used as a food spice & vegetable, and its main components are turmerones. As both DMC and TRE are strong antioxidants with complementary antioxidation mechanisms, the aim of this study was to investigate the enhanced protective effects of their combination on oxidative damage in HaCaT cells following UVB exposure. Materials and methods: The effects of single and combined administrations of DMC and TRE on the SOD activity of HaCaT cells were evaluated by the SOD assay and qPCR. The NQO1 expression in the UVB-treated HaCaT cells was analyzed by the Western Blot. Furthermore, a clinical test involving 24 subjects was conducted to evaluate the in vivo antioxidation efficacies of the serum formulated with the combination of DMC and TRE at the optimal weight ratio. Results: SOD assay showed that pretreatingDMC or TRE alone could not preserve the impaired HaCaT SOD activity after UVB treatment. DMC and TRE at 1:1 weight ratio was the optimal combination to enhance the HaCaT SOD activity by approximately more than 1-fold compared with either of the single treated groups. No enhancement effect was observed at other mixing ratios. The 1:1 weight ratio was further proved to be optimal as this combination boosted the NQO1 expression by more than 50%, whereas no boosting effect was observed at other mixing ratios. The clinical test of the serum containing this optimal antioxidant combination demonstrated promising in vivo antioxidation efficacies after 4-week use, including 7.16% improvement in skin lightening,18.29% reduction in skin redness, 35.68% decrease in TEWL, 19.05% increase in skin glo ss and 32.04% enhancement in skin firmness. Conclusion: Collectively, our results indicated that the combination of DMC and TRE at 1:1weight ratio attenuated the UV-induced oxidative damage by synergistically boosting endogenous antioxidant enzyme activity in HaCaT cells. Therefore, this optimal antioxidant combination is a promising treatment to boost skin antioxidation defense system.

H. Yuceler Kacmaz, H. Kahraman, S. Levent Cinar, F. Ozkan, **Skin properties associated with skin tears in older adults: A case-control study**, Journal of Tissue Viability, Volume 32, Issue 4, November 2023, p. 585-589

Background: The world population is growing rapidly and skin problems such as skin tears (STs) are more common in aging skin dueto changes in the epidermis and dermis. Identification of ageing related skin properties, which are risk factors for STs, isessential for the development of ST prevention protocols. Objective: The aim of this study was to reveal the skin properties related to epidermal function and dermal associated with STs. Material and methods: A prospective case-control study was conducted with a sample of 36 older adults, 18 participants with ST and 18participants without ST, in two elderly care centers. Tewameter TM 210 was used to measure transepidermal waterloss, the Sebumeter SM810 was used to measure sebum, and Cutometer Dual MPA 580 was used to measure skinviscoelasticity (R0-R9). The differences of skin properties between groups were analyzed using the independent t-testand Mann-Whitney U test. Results: The case group had a mean age of 77,17 ± 9,7 and the control group had a mean age of 75,33 ± 6,8. It was determined thatthere were more ecchymosis ($p < 0.000$), hematoma ($p = 0.008$), and ST history ($p = 0.001$) in the case group. Older adultsin the case group were more frail than the control group ($p = 0.044$). Regarding the score of the skin properties, the casegroup showed that the TEWL levels of the older adults in the case group were lower ($p = 0.031$) compared to the controlgroups. There was a significant difference between the groups and R0, R2, R5, and R7. While R0 was higher in the casegroup, R2, R5, and R7 were lower than the control group. Conclusion: Older adults with ST showed differences in skin properties compared to those without ST, especially transepidermalwater loss, and viscoelasticity (R0, R2, R5, R7). The results of this study suggest that some changes in skin propertiesmay be a risk factor for STs.

E. Tarshish, K. Hermoni, N. Muizzuddin, **Effect of Lumenato a Tomato derived oral supplement on**

improving skin barrier strength, Skin Research & Technology, Volume 29, Issue 11, November 2023

Introduction: Improvement of skin barrier strength could lead to healthy and youthful appearance. “Beauty inside-out” approach using nutraceuticals such as tomato derived carotenoids to support skin barrier strength could be of benefit to the ageing population. Method: A panel of 60 female subjects were provided with the Lumenato capsules (containing carotenoids) or placebo capsules as nutritional supplements for 3 months. Skin health and barrier function were observed using evaporimeter which measures transepidermal water loss (TEWL). Barrier strength was determined by study of the number of strippings required to disrupt skin barrier and barrier repair was observed in terms of TEWL a few hours after barrier disruption. Cutometer was used to observe skin firmness and elasticity. Measurements were obtained before treatment and after 4 and 12 weeks of use. Results: Results indicated a statistically significant improvement ($p < 0.05$) in skin barrier strength; a higher number of strippings were required to disrupt skin barrier after 12 weeks of supplement use. There was also a significant improvement in skin firmness and elasticity as observed with a cutometer. Conclusion: Based on the confines and conditions of this study, oral supplementation with Lumenato resulted in significant improvement in skin barrier as well as skin firmness and elasticity.

M. Bagheri, M. Werres, P.C. Fuchs, H. Seyhan, R. Lefering, G. Grieb, J.L. Schiefer, **Which Moisturizer to Use in Scar Therapy after Burn Injuries? A Subjective and Objective Skin and Scar Evaluation after Topical Treatment with Dexpanthenol, Aloe Vera, and Plant Oil**, Medicina 2023, 59

Abstract: Background and Objectives: Good scar management in burn care is essential. Nevertheless, there are no consistent recommendations regarding moisturizers for scar management. Our aim was to investigate and compare the effects of commonly used products on normal skin and burn scars. Materials and Methods: A total of 30 skin-healthy (control group) and 12 patients with burn scars were included in this study. For an intraindividual comparison, each participant received creams consisting of dexpanthenol (P), aloe vera (A), and a natural plant oil (O) with instructions to apply them daily to a previously defined area for at least 28 days. Objective scar evaluation was performed with Visioscan®; Tewameter®; Cutometer®, and the Oxygen To See® device. Subjective evaluation was performed with an “application” questionnaire, the Patient and Observer Scar Assessment Scale (POSAS), and with the “best of three” questionnaire. Results: After (A) a high trend of amelioration of +30%, TEWL was detected on the scar area. Blood flow increased slightly on healthy skin areas after (A) application to +104%. The application of (A) on healthy skin demonstrated a positive effect on the parameters of scaliness (+22%, $p < 0.001$), softness (+14%, $p = 0.046$), roughness R1 (+16%, $p < 0.001$) and R2 (+17%, $p = 0.000$), volume (+22%, $p < 0.001$), and surface area (+7%, $p < 0.001$) within the control group. After (P), a significant improvement of the baseline firmness parameter of +14.7% was detected ($p = 0.007$). (P) also showed a beneficial effect on the parameters of R1 (+7%, $p = 0.003$), R2 (+6%, $p = 0.001$), and volume (+17%, $p = 0.001$). (O) lead to a statistically significant improvement of volume (+15%, $p = 0.009$). Overall, most study participants stated (A) to be the “best of three”. Conclusions: (A) performed statistically best, and is a well-tolerated moisturizing product. However, further quantitative studies are needed to provide statistically significant clarification for uniform recommendations for scar therapy.

D. Banov, M. Carvalho, S. Schwartz, R. Frumento, **A randomized, double-blind, controlled study evaluating the effects of two facial serums on skin aging**, Skin Research & Technology, October 2023

Background: Skin aging is a natural process that occurs because of oxidative stress. Facial skin aging is often concerning for individuals due to the exposure of the face. Objectives: To assess and compare the effects of two anti-aging facial serums on the following characteristics associated with facial skin aging: fine lines/wrinkles, age spots, firmness, elasticity, texture, radiance, tone, lifting, clarity, and complexion. Methods: A 24-week, double-blind controlled study was conducted on 130 participants who were randomized into two groups: facial serum with Liposomal Blend and facial serum without Liposomal Blend. Clinical evaluations (Visual Analog Scale) and instrumental evaluations (Cutometer, SIAscope, and Clarity Pro image analysis) were performed at weeks 0 (baseline), 2, 4, 8, 12, and 24 to assess for changes in skin aging characteristics. Results: A total of 123 participants completed the study; participants that used the facial serum with Liposomal Blend had significantly greater improvements in skin aging characteristics compared to those that used the facial serum without Liposomal Blend. This study shows that Liposomal Blend is a vehicle with the ability to enhance the antiaging properties of the ingredients within the facial serum by facilitating its delivery into the underlying layers of the skin. Higher concentration of ingredients at the site of action could potentially lead to greater damage repair and improvements in signs of facial skin aging. Conclusion: By using Liposomal Blend, practitioners and pharmacists could potentially improve the delivery of the ingredients within their formulations into the skin, which may lead to increased treatment efficacy

L. Tamez Pedroza, E. Marquez, G. Cuartero, **Skin Biomechanical Characteristics Differences in Ultrasonic Liposuction Devices Used in Liposuction**, Plast Reconstr Surg Glob Open. 2023 Oct; 11(10 Suppl): 151

Introduction: New plastic surgery devices have been development to improve results in liposuction procedures like Vibration Amplification of Sound Energy at Resonance (VASER) is one of those devices that revolutionized liposuction surgery. Liposuction developed in 1977, with many changes over the years on cannulas, aspirating devices, assist with external devices on fat emulsification, tumescent infiltration, in late 1980s Zocchi described the use of ultrasonic lipoplasty in which fat was liquefied with ultrasonic energy and then evacuated from subcutaneous space reducing trauma and blood loss in patients. Vibration amplification of sound energy at resonance (VASER) is a third-generation ultrasound-assisted modality of liposuction. Which was introduced to the United States in the early 90s and now stands as the most popular of its kind. This system uses ultrasound energy at a 36 kHz frequency to separate the adipose cells from its tissue matrix through stable cavitation and acoustic streaming. By this mechanism it facilitates fat emulsification and extraction, preserving vascularization and improving the long-term aesthetic results4. In 2009 Nagy and Vanek published a multicenter, prospective, randomized, single-blind, clinical trial comparing VASER-assisted lipoplasty and Suction-Assisted lipoplasty finding improved skin retraction and reduction in blood loss compared to suction-assisted lipoplasty. Methods: This prospective study compared two different devices (VASER, Solta Medical Inc. Hayward Calif.) and the new HEUS (Inomedica, México) for liposuction procedures. Thirteen patients (2 males and 11 females) between the ages of 21 and 46 years received Ultrasound-Assisted liposuction with both devices, one side with HEUS-assisted liposuction and the contralateral side treated with VASER-assisted liposuction; the side of the patients treated with HEUS and VASER were randomized. We used the devices in the same conditions, same anatomical areas, time applied in each area, device power parameters (%), fat aspirated volume and surgeon, the assigned side was randomly assigned to VASER and HEUS. We measured bio-mechanical skin parameters: distensibility, Net-elasticity, Biological-Elasticity, Skin Hydration, Erythema and Melanin with cutometer MPA 580. 2 sides were compared. In the statistical analysis, no statistically significant differences were observed in any of the functional or biomechanical parameters. Conclusion: According to cutometer there was no difference between HEUS ultrasonic liposuction device and VASER, HEUS is a safe option to archive good results in liposuction surgery, this device is currently use over Mexico and Latin America.

C. Heidecke, **Beneficial Use of Phospholipids**, COSSMA 10/23

Phospholipids are attractive components in cosmetic products because of their natural origin and multifunctional properties. In the following study the beneficial cosmetic effects of a phospholipid-based liposomal formulation of ascorbylglucoside are demonstrated.

S.-H. Woo, J.H. Choi, Y.J. Mo, Y.-I. Lee, W.B. Jeon, Y.-S. Lee, **Engineered elastin-like polypeptide improves the efficiency of adipose-derived stem cell-mediated cutaneous wound healing in type II diabetes mellitus**, Heliyon 9 (2023) e20201

Impaired cutaneous wound healing is a major complication in patients with diabetes mellitus (DM), leading to increased amputation and mortality rates in affected patients. Adipose-derived stem cells (ASCs) are widely used seed cells for promoted tissue regeneration to improve wound closure under diabetic conditions. However, ASCs-based therapies remain limited due to difficulties in maintaining cell quality during transplantation. To overcome this problem, extracellular matrix mimetic biomaterials have been developed for use in biomedical engineering field, including tissue engineering and regenerative medicine. Herein, a biosynthesized arginine–glycine–aspartate amino acid residues (RGD motif, known as a cell adhesion motif)-containing elastin-like polypeptides (REPs) improved the efficacy of ASCs in enhancing wound closure and skin elasticity in diabetic wounds by promoting the expression of angiogenic growth factors. Therefore, REPs can be used as potential supplements to stem cell-based therapeutic approach to accelerate diabetic wound repair.

D. Andriani Ratna Dewi, A. Arimuko, L. Norawati, S.W. Yenny, N.L. Setiasih, A. Perdiyana, N. Arkania, F. Nadhira, N. Wiliantari, **Exploring the Impact of Hydrolyzed Collagen Oral Supplementation on Skin Rejuvenation: A Systematic Review and Meta-Analysis**, Cureus 15(12), September 2023

With increasing life expectancy, the quest for skin rejuvenation has gained prominence among individuals of diverse age groups. The popularity of nutricosmetics, notably dietary supplements, has garnered significant attention in recent years. Many scientific investigations have amassed compelling evidence highlighting the positive impact of hydrolyzed collagen supplementation in mitigating the visible signs of skin aging. Thisstudy aims to know the powerful effect of hydrolyzed collagen on the skin. This research method is to conduct a systematic review followed by a meta-analysis of the clinical trial

focusing on randomized, double-blind, and controlled trials that examined the oral consumption of hydrolyzed collagen and reported outcomes related to skin aging, wrinkles, moisture levels, elasticity, and firmness. The selected articles from CENTRAL, PubMed, Google Scholar, and ScienceDirect databases were published from 2017 to 2023. The subsequent meta-analysis, comprising 14 distinct studies and a collective cohort of 967 participants, revealed encouraging findings favoring hydrolyzed collagen supplementation. It consistently demonstrated substantial enhancements in skin moisture levels and elasticity compared to the placebo group, a trend robustly corroborated by subgroup analysis. These compelling findings underscore the effectiveness of a 12- week regimen of hydrolyzed collagen supplementation in revitalizing the skin by augmenting its hydration and elasticity.

M.A. Nilforoushzadeh, M. Heidari-Kharaji, T.F. Seyedeh, T. Hosseini, S. Rafiee, M. Shahverdi, N.N. Nobari, **Efficacy evaluation of endolift laser for treatment of nasolabial folds and marionette lines**, Skin Research & Technology, September 2023

Background: The nasolabial folds are the most marked sign of aging. Endolift laser was used for the treatment of nasolabial folds andmarionette lines (one of the facial danger zones). Methods: Ten female subjects were engaged in this study. Patients underwent Endolift laser for nasolabial folds and marionette lines treatment. The efficacy of the Endolift technique on the nasolabial folds and marionette lines was evaluated by biometric assessment with Cutometer, Visioface, and the Skin Ultrasound Imaging system. Also, patient's satisfaction and blinded dermatologists' assessment were assessed. Results: The Visoface results displayed that the Endolift laser treatment significantly
declined the depth and area of the nasolabial wrinkles. The skin ultrasonography results reported that the epidermis and dermis density and thickness were significantly increased. Also, the cutometer outcomes showed that the Endolift laser treatment can increase skin elasticity. The results showed that a large number of patients were very satisfied with the technique. Conclusion: In conclusion, Endolift laser has an effective technique for decreasing the nasolabial folds, marionette lines, and improve the appearance of the face without any sever side effect. This technique does not need general anesthesia and recovery time.

G. Fattorini, S. Zanzottera, **IN & OUT Routine zur Vorbeugung der Hautalterung**, sofw journal, 149 Jahrgang, 9/23

Hyaluronsaure ist dank seiner vorteilhaften Wirkungauf die Haut ein sehr bekannter Inhaltsstoff im Kosmetikmarkt. Normalerweise hangt die biologische Wirksamkeit mit dem spezifischen Molekulargewicht zusammen. Die biologische Wirksamkeit kann uber verschiedene Stimulationen durch ein breites Spektrum an Molekulargewichten erreicht werden, das in der Lage ist, die Biologie und die Anforderungen des Hautgewebes nachzuahmen und so eine gezielte und breite Wirkung zu gewahrleisten. Der vorliegenden Artikel soil die Wirksamkeit eines spezifischen Natriumhyaluronats, das auf der Full Spectrum Technologie beruht, zeigen, den Zeichen der Hautalterung in einer IN&OUT Routine entgegenzuwirken: als Wirkstoff in einem kosmetischen Produkt und als Hauptbestandteil eines Nahrungserganzungsmittels.

C. Vigo Xancó, S.Bouhrir, E. Escudero, D. Manzano, **Dermohacking von Seneszenz mit einem neuen, KI-geprüften biotechnischen Inhaltsstoff**, sofw journal, 149 Jahrgang, 9/23

Die moderne Wissenschaft hat zahlreiche neue Möglichkeiten zur Erhöhung der Lebensdauer und -qualitat eröffnet. Gleichzeitig hat der aktuelle Trend zur besseren Gesundheitsvorsorge im wachsenden Bevölkerungssegment der „reiferen Jahrgänge" zu einem immensen Erfolg neuer Gesundheitskonzepte wie dem Biohacking geführt. Die One-Health-Bewegung geht mit einem beispiellosen wissenschaftlichen Fortschritt auf dem Gebiet des Anti-Agings einher, insbesondere im Zusammenhang mit der Zellseneszenz. Diese Entwicklungen in der wissenschaftlichen Gemeinschaft ermöglichen es auch der Schönheitsbranche, die Chancen besser zu nutzen, die sich durch die hohe Lebenserwartung ergeben. Dabei übernimmt Provital eine Führungsrolle bei einer neuen Art von Kosmetika, die im Zusammenspiel von Technologie, Wissenschaft, natürlichen und ganzheitlichen Ansätzen die Grenzen der Wirksamkeit und Selektivitat neu definieren, während zugleich ein umweltfreundliches Markenimage gestärkt wird: Dermohacking-Kosmetik. Altheostem™ ist der erste Dermohacker von Provital. Dieser Wirkstoff aus den Stammzellen von *Althaea rosea* verfügt nachweislich uber die Fähigkeit, selektiv seneszente Zellen zu beseitigen. Der im Labor gezüchtete Wirkstoff hat dank Biotechnologie eine selektive biologische Wirkung auf ältere Haut. In diesem Artikel wird beschrieben, wie Provital die positiven Wirkungen seiner senolytischen Aktivitat *in vitro* und *in vivo* getestet hat. Dabei kamen sowohl instrumentelle Analysen als auch Modelle mit kunstlicher Intelligenz zum Einsatz, die das Potenzial des Wirkstoffs zur Förderung von „gutem" Altern aufgedeckt haben.

M.A. Nilforoushzadeh, M. Heidari-Kharaji, T. Fakhim, E. Torkamaniha, S. Tehrani, S. Delavar, S. Rafiee, M. Nouri, N. Najar Nobari, M. Shahverdi, **Treatment of periorbital hyperpigmentation using sublative fractional radiofrequency (SFR)**, Skin Research & Technology, Volume 29, Issue 9, September 2023

Background: Periorbital hyperpigmentation (POH) is a common cosmetic concern. Numerous techniques of treatment have been assessed with variable results. Aim: The purpose of this research is to assess the efficacy of non-ablative radiofrequency, Sublative fractional Radiofrequency (SFR) on POH treatment. Methods: In this research study, nine patients with POH and the age range of 25–57 years, were enrolled. The patients were treated by non-ablative radiofrequency SRF. The outcomes were assessed by biometric assessment. The skin lightness and melanin content of the periorbital skin were assessed by colorimeter and Mexameter. Skin elasticity was assessed by Cutometer. The skin ultrasound imaging system was used to evaluate the diameter and density of the epidermis and dermis. Visioface was used to evaluate the skin color and wrinkles. Also, patient's satisfaction and physician's assessment were assessed. Results: The results showed that the lightness and elasticity of the periorbital skin were significantly increased after treatment. Also, the melanin content of the skin was decreased. The denser skin layers were seen in both dermis and epidermis. The Visioface results displayed the reduction in the percent change of the skin color and wrinkle ($p < 0.05$). Similarly, the physician and patients' assessment confirmed the outcomes. No serious adverse effect was reported. Conclusion: In conclusion, the SFR technique is an effective and satisfactory therapeutic choice for treatment of POH.

S. Bielfeldt, H. Gilicki, M. Seise, G. Kourbaj, M. Brandt, **Photoaging related protein fiber depletion in the human dermis is accompanied by a marked loss of skin elasticity and increase of water in the tissue**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Background: Premature aging of the skin is mainly caused by sunlight and appears on the photo-exposed skin areas. Although the well reflective dead horny cells and the melanin in the epidermis protect the dermis from sunlight, an important amount of UVA and high energetic visible light reaches the deeper skin layers and causes photoaging. Ex vivo invasive methods to assess aging processes in the dermis are well established, but there is still a demand for noninvasive approaches of direct in vivo measurement. In this work we performed in vivo measurements of optical density of human dermis and compared the results with skin elasticity measurements and dermal water content. Methods: Twelve female subjects with fair skin were included in the study. Measurements were performed in vivo on the volar sun-protected and on the dorsal sun-exposed forearm. Results: On the sun-exposed dorsal forearm, a lower optical density compared to sun protected volar dermis was observed. In addition to low optical density, low skin elasticity and high water content in the dermis were observed. Conclusion: The well known loss of fiber density in photoaged dermis could successfully be quantified in vivo by dermal LC-OCT measurements, as well as water and skin elasticity assessments.

W. Lu, M. Wang, X. Qu, X. Jiang, M. Valerio-Santiago, N. Alminana, R. Delgado, J. Cheng, **The combination of chlamydomonas extract and peptides improves skin aging through activating autophagy and easing pro-inflammation**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

To explore how the combination of Chlamydomonas Extract and Acetyl Hexapeptide-8 affects the global structure of aging skin, we conducted a human genome wide test on human *ex vivo* skin model and an *in vivo* study on 33 female volunteers who applied a cream containing Chlamydomonas Extract and Acetyl Hexapeptide-8 for 28 days. Transcriptomic analysis showed that surprisingly Acetyl Hexapeptide-8 may provide a significant anti-inflammatory effect that can protect the skin from photodamage and maintain epidermal barrier, as Acetyl Hexapeptide-8 downregulated IL-33 pathway including IL-33, the IL-33 receptor (ILIR1, ST2) and IL-1 receptor associated kinase I (IRAK1) expression. Additionally, further downregulation of PTGS2, IL-6, ICAM and various MMPs may suggest that Acetyl Hexapeptide-8 can maintain the basal membrane integrity and protect the dermal compartment, which were not reported previously for Acetyl Hexapeptide-8. More interestingly, the combination of Acetyl Hexapeptide-8 and Chlamydomonas Extract upregulated the whole autophagy signaling process including autophagosome formation (ULK1, ATG13, AMBRA1), growth (ATG4D) and autolysosome (LAMP3). Besides, the combination of Chlamydomonas Extract and Acetyl Hexapeptide-8 significantly attenuated wrinkles by 31.06%, improved elasticity by 9.81%, and increased ITA° by 20% after 28 days of treatment, demonstrating an efficient anti-aging benefit.

H. Chajra, T. Saguet, E. Sevestre, A. Tableau, N. Hulo, C. Granger, L. Breton, M. Machicoane, J.-M. le Doussal, **Miniproteins: a new class of active ingredients for cosmetic and dermatological applications**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

This work presents our strategy for exploring and developing miniproteins for cosmetic and dermatological applications. For example, we searched for miniproteins present in all kingdoms and mimicking the activity of TGF-β, a known pleiotropic growth factor. Our proprietary "SILICOS®" discovery platform, which contains hundreds of thousands of miniprotein sequences, enabled the identification of a lead miniprotein. Its overall biological activity was studied in fibroblasts by RNAseq in comparison with TGF-β. The miniprotein up- and down-regulated the same genes as TGF-β with a similar level of expression. This stimulatory effect was reflected at protein or molecule level, since collagen and hyaluronic acid were also stimulated. In addition, the miniprotein upregulates genes correlated with gene expression in young donor fibroblasts, supporting its skin rejuvenation properties. Finally, two randomized, vehicle-controlled cosmetoclinical studies in elderly volunteers demonstrated that the miniprotein reveals, in line with preclinical data, impressive rejuvenating properties. Wrinkles were reduced thanks to dermal densification, with concomitant improvement in skin biomechanical properties (firmness and elasticity), skin tone and shininess. The results confirm that miniproteins could be the source of a new generation of safe and effective active ingredients for cosmetic and dermatological applications.

E. Escudero, M. Perez-Aso, B. Martínez-Teipel, J. Bosch, D. Manzano, **The senolytic *Althea rosea* stem cell extract induces rejuvenation *in vivo*, as shown by instrumental and artificial intelligence innovative tools**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The accumulation of senescent cells over time is one of the hallmarks of ageing, being correlated with visible signs of advanced skin age such as wrinkles and lack of elasticity. Therefore, the elimination of skin senescent cells is an attractive strategy to develop cosmetic actives with anti-ageing properties. In a previous study in Human Dermal Fibroblast (HDF) model, we identified that *Althaea rosea* stem cells extract (ASCE) displayed senolytic activity. Also, we demonstrated that ASCE induced apoptotic cell death in senescent HDF and that the extract treatment of aged HDF induced the expression of genes involved in extracellular matrix (ECM) biosynthesis and repressed the expression of genes involved in ECM degradation. In the present study, we investigate the anti-ageing efficacy of ASCE in an instrumental *in vivo* study with significant improvement in the radiance, elasticity, and the thickness of the skin, a decreasing in volume and depth of wrinkles and a reduction in the estimated age as revealed both by analysis of periocular wrinkle depth and by estimation of the apparent age using Artificial Intelligence tools. These results reveal a cosmetic active ingredient with skin antiaging properties based on the selective elimination of senescent cells.

F. Wang, S. Ke, L. Xiao, Q. Lu, L. Wang, H. Qi, **Novel Encapsulation Structure formed by Silk Protein Nanofibers and Sphingolipids: Added Value of Skin Repair to Various Loaded Actives**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Introduction: Silk biomaterials from silkworm have long been used in skin tissue engineering and drug delivery because of its good biocompatibility, biodegradability, low inflammation, and loading capacity for both hydrophobic and hydrophilic cargo. β-sheetrich silk nanofibers (SNF) were assembled recently and showed better biocompatibility in tissue regeneration and enhanced loading capacity as carriers. Further improvement of silk nanofiber carriers is desirable to encapsulate higher amount of active cargo with enough bioactivity and good water dispersibility in cosmetic applications. Sphingolipids as a group of functional lipids has drawn our interests to be introduced to SNF solution to tune the liposome-like assembly, bringing additional benefits in skin repair. The research designed a universal encapsulation systems composed of SNF and sphingolipids, which exhibits better loading capacity and stability than liposome systems. Methods: We loaded sphingolipids such as ceramide NP (CER) to 2% SNF hydrogel (INCI: Silk Extract) with the help of natural emulsifiers. Heating a mixture of CER and natural emulsifiers above their melting temperature, a homogeneous emulsion was obtained upon addition and mixing with 2% SNF hydrogel. The final SNF-CER mixture was a thick paste. We have characterized the size and structure of the mixture using dynamic light scattering, confocal microscopy, scanning electron microscopy, Fourier transfer infrared, and X-ray scattering. We have also examined the functionality in skin repair via *in vitro* cell models, and assess its performance as encapsulation vehicles of active molecules. Result: The structural characterization of SNF-CER mixture showed that CER was evenly loaded onto NSF, and formed stabled liposome-like particles with diameters under 500 nm .Such loading onto nanofibers restrained the crystallinity of CER as shown by X-ray scattering. This mixture has demonstrated synergistic effect between SNF and CER in skin barrier repair via several in-vitro methods and models. Compared to the liposomeencapsulated CER, our present SNF-CER vehicles induced better cell proliferation and higher active protein secretion, confirming its improved bioactivity. The creams containing CER-loaded SNF vehicles with CER concentration of 0.04% exhibited significant improvement of skin hydration and barrier function, revealing its promising applications in

cosmetic fields. Discussion and Conclusion: This research have designed a novel liposome-like encapsulation structure composed of natural bio-materials including silk protein nanofibers and sphingolipids. The manufacture process is simple and scalable. The format of SNFCER complex as a stable pre-dispersion also increased the easiness to add it to a emulsion system. The complex itself could be used as a functional material with controlled release of CER and synergistic effect in skin repair. Additionally, the SNF-sphingolipid complex retains the nature of silk protein as nanofibers and still allow it to carry other active molecules. Such properties of this system therefore opens numerous opportunities in the design of encapsulation systems with multi-functional benefits beyond skin repair.

Y. Ye, L. Sun, Y. Li, X. Wei, J. He, **The study of permeability, tolerability, and efficacy of a serum containing 12.5% L-ascorbic acid**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Ascorbic acid is a powerful antioxidant ingredient due to its biological functions in maintaining and improving skin health. Maintaining the stability and facilitating percutaneous absorption of ascorbic acid remains the biggest challenge in cosmetics. We designed a serum containing 12.5% pure L-ascorbic acid in powder-liquid separation ampoules with low pH to provide maximum stability and efficacy, and carried out the following experiments: the permeability of L-ascorbic acid in serum was determined by a Franz diffusion cell; the safety and tolerance of serum were tested by 48-hour closed patch test and a 4-week safety evaluation; a 4-week clinical research was finally conducted to verify the efficacy of serum. The ampoules which separated L-ascorbic acid powder from the solution to ensure stability before application, and the low pH of serum after mixing to help percutaneous absorption. The permeation results showed that the serum had better permeability, the serum passed the 48-hour closed patch test and safety evaluation, indicating it was safe and well tolerated. Clinical research demonstrated that 12.5% L-ascorbic acid provided a significant improvement in skin texture, wrinkles and skin color, shown by an increase in skin glossiness, whiteness, elasticity parameters, as well as a decrease in wrinkle parameters.

S. Zhao, Y. Mao, Y. Li, M. Zhang, X. Wie, **In-vitro and in-vivo evaluation on the anti-oxidation and anti-glycation efficacy of a formulation**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Oxidation and glycation are prominent factors contributing to skin aging, characterized by clinical manifestations such as diminished skin elasticity, wrinkles and skin yellowing. Consequently, there is an urgent demand for the development of products that possess dual, antioxidant and anti-glycation properties. In this investigation, we examined the efficacy of a formulation EBE consisting of astaxanthin, sulforaphane, dimethylmethoxy chromanol, decarboxylated peptides, niacinamide, and *Salvia miltiorrhiza* extract in alleviating skin manifestations associated with oxidation and glycation. To assess the effectiveness of EBE, we utilized flow cytometry to evaluate the in vitro scavenging activity of reactive oxygen species (ROS), performed immunohistochemical analysis carboxymethyl lysine (CML) in methylglyoxal (MGO) stimulated glycation models, and conducted clinical studies. The results revealed that EBE exhibited superior ROS scavenging activity in comparison to positive control (alpha-tocopherol). Furthermore, EBE impeded CML induced by MGO, showing a good antiglycation effect in vitro. Human efficacy tests involving 32 Chinese female participants corroborated significant improvements in skin yellowness, wrinkle appearance, elasticity, and proportion of pigmentation area to the application of EBE. The essence EBE developed in this study, incorporating a scientifically balanced amalgamation of antioxidant and anti-glycation ingredients, demonstrates effective mitigation of skin issues attributable to oxidation and glycation.

F. Yang, T. Chen, M. Guo Z. Zhou, H. Wang Hua, **The New Skin Barrier Insights for Skin Aging of Asian Ethnic Group from Multi-Omics Study**, Podium presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

To study the correlation between clinical skin parameters, skin metabolites, skin microbiomes in different age groups, 83 healthy Asian volunteers were recruited and their skin physiological clinical parameters (e.g., Tewameter and wrinkles) were characterized. The skin metabolites were collected by swab and analyzed by untargeted metabolomics technique, and the skin microbiomes of different age groups were detected using the high-throughput detection technique. The multi-omics study was carried out by pearson correlation analysis. PLS-DA and student t-test demonstrated that several key metabolites (e.g., isocitric acid) showed significant differences within the aged group and young group. The KEGG pathway analysis found that tricarboxylic acid (TCA) cycle ranked the most dominant metabolic pathway. Moreover, the microbiome diversity increased with age, as indicated by the differences in Propionibacterium, and Cutibacterium acnes at species level. The multi-omics data cross-domain correlations also suggested clinical skin parameters, skin metabolites, and skin microbiome are

mutually influenced. This work provides more deep insights for studying the skin aging and skin barrier mechanism and developing microecology-relevant cosmetics.

A. Porcheron, A. Makdani, A. Marshall, J. Latreille, M.-H. Bardel, F. McGlone, **The impact of skin hydration on pleasant touch: What the nerves tell the brain**, Podium presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

There is a close, two-way relationship between the biomechanical properties of skin, and cutaneous innervation and sensitivity. Previous research has considered the impact of skin hydration on tactile perception but has focused primarily on glabrous skin, and discriminatory touch mediated by A-β afferent fibres. This study expands on this work, using microneurography (an electrophysiological technique) and psychophysics, to explore the impact of both acute hydration and dehydration on cutaneous afferents in hairy skin (i.e. the majority of the human body), with a particular focus on gentle dynamic touch, and on unmyelinated C- low threshold mechanoreceptors (C-LTMRs), which have previously been linked to social and affective touch (C-Tactile fibres). The results show that, in contrast to the impact of treatment on A-β afferent fibres, C-Tactile fibres activity is significantly dampened post-dehydration, and that acute hydration (i.e. with a moisturiser) appears to have a protective or stabilising effect on their sensitivity. The microneurography data and the psychophysical responses showing that gentle dynamic touch applied to hydrated, moisturised skin was more pleasant, than touch applied to dehydrated skin, together support the hypothesis that biomechanical changes in skin affecting C-Tactile fibres and other afferent activity are key parts of the mechanism driving self-grooming behaviour.

M. Isoir-Ingrez, A. Falip, N. Yousfi, L. Arnaud-Sebillotte, B. Biatry, K. Delhommeau, C. Cornillon, P. Wang, M. Huey, J.T. Simonnet, **Ascorbic acid formulation in a neutral aqueous serum and its efficacy**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Vitamin C stabilization is very challenging specially at a high level of ascorbic acid. Internal in vitro data on fibroblasts show a superior pro-collagen I stimulation for ascorbic acid, compared to its derivatives. Herein, up to 15% of ascorbic acid was stabilized in an aqueous serum. We have shown that by adjusting pH to 6, ascorbic acid chemical loss was less than 10% for 2 months at 45°C and CO2 release was prevented. Color evolution was reduced by polyquaternium-67 addition which complex the ascorbate anion. Classically, the ascorbic acid efficiency is linked with low pH (Pinnell SR et al, 2001). We demonstrate herein that 12% ascorbic acid at pH6 significantly inhibits sebum lipoperoxidation (in vivo and ex vivo), has a strong effect on anti-pigmentation and significantly decreases transepidermal water loss. Benefits were further confirmed by a 2-months clinical study with significant clinical scores at day 56 on radiance, skin tone evenness, skin softness, skin smoothness, fine lines, wrinkles and skin firmness. Moreover, no significant differences were achieved between the pH6 serum and a 15% ascorbic acid serum at pH 2,6. So, we have shown that ascorbic acid can be also efficient when formulated at pH6.

Y. Zhong, X. Zheng, Q. Zhang, J. Liu, X. Wu, **The efficacy of the revitalizing oil cream in sensitive skin repairing**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The revitalizing oil cream is an innovative cream formula, up to 35% oil phase. The unique and critical dual-phase system is designed to efficiently delivery actives to the skin layers, which could quickly repair the skin barrier and improve the skin fatigue of aging, friendly to the sensitive skin. In this study, the in-vitro studies were assessed oil cream's protective effects against damaged skin. Notably, Oil cream effectively inhibited the inflammatory reactions via the down-regulation of the IL-1α, TNF-α, IL-6, and PGE2, caused by SLS-induced EpiKutis®3D epidermis models via ELISA, and protected the SLS-induced epidermis models by upregulating the expressions of filaggrin (FLG), Transgulataminase-1 (TGM1), and loricrin (LOR), which is known to decreased in damaged skin cells. The clinical result demonstrated that using oil cream for 4 weeks could effectively increase the hydration degree of cheek cuticle and reduce trans-epidermal water loss and skin redness. Additionally, the skin firmness and dermal thickness were significnatly improved. These evidences to confirm the oil cream can efficiently rapair the damaged skin, and concurrently improve the signs of skin aging.

V.H. Pacagnelli Infante, R. Bennewitz, M.C. Meinke, **Human glabrous skin contains crystallized urea structures in the *stratum corneum* which affect the hydration levels: a pilot study**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

We recently discovered crystallized urea dendriform (CUD) structures located exclusively in the *stratum corneum* (SC) of glabrous skin which affects skin hydration levels. Here, we performed a pilot study with sixty participants where four anatomic positions were analyzed: index finger (IF), small finger (SF), tenar palm (PL) and index finger of left hand (IFL). We acquired images using laser scan

microscopy (LSM) and measured the skin hydration by corneometry. One participant with CUD structures immersed the hand during 45 minutes in distilled water and images were acquired before and after 0, 2h and 48h from the experiment. The participants were asked about their cosmetic habits. CUDs were found in the *stratum corneum* of 45% of participants. The participants with a higher density of CUD exhibited lower skin hydration. The volume fraction of CUD increased again after 2h, recovering after 48 h. This pilot study confirms that the presence of CUD structures in the glabrous skin reduces the water binding capacity of urea and leads to dry hands. Mostly, participants with CUD did not apply creams with urea. These findings highlight a new direction in understanding the mechanisms leading to dry hands with opportunities for the development of better hand moisturizers.

C. Monastier, S. Mac-Mary, X. Wang, J.-M. Sainthillier, C. Fogelgesang, S. Remiot, M. Azzaoui, L. Li, **Clinical study evaluating the anti-ageing propertiesLof a cosmetic 'night' cream conducted on Asian skin for one year**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Time but also the numerous external aggressions that the skin must face every day are responsible for the appearance of ageing signs. These marks are constantly evolving over time and some are likely to become more pronounced during the various seasonal changes. Physiologically to address them, skin protects itself all day and switches into "recovery mode" during the night. The aim of the study was to evaluate the global anti-ageing efficacy of a cosmetic "night" cream on Asian women during a year-long study taking into account seasonal changes. The study was conducted on 46 women, aged 40-65 presenting ageing signs that applied a neutral moisturizing cream every morning and the tested product each evening for 1year. Assessments were performed at D0, D28, D84, D180, D270 and D365 and consisted of clinical scoring, self-assessment, corneometry, Visia®-CR, ultrasound imaging and cutometry. The global anti-ageing efficacy was demonstrated by following the Clinical scoring Index with a significant improvement on all the women after only 1 month. A significant improvement of each item assessed by clinical scoring and self-assessment was observed after 3 months and remained for 12 months, and this in spite of seasonal changes and pollution.

N. Kaul, B. Drewitt, S. Raju, E. Kohoot, **Evaluating efficacy and tolerability of two doses of herbal dietary supplements use on aging hair, skin and nails in a 12 week clinical trial**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Visible effects of aging include (lines and wrinkles, dullness, loss in radiance) on skin (reduced strength, rough texture, decreased lustre, brittleness, overall dull appearance) of hair and (dullness, brittleness, and less growth) of nails. For sustainable youth, countering the effects of aging, besides cosmetics, that act from outside in, dietary supplements (DS) are gaining attention rapidly, with an increased demand for "beauty from within" products. Topically applied cosmetic products often fail to reach the deeper layers of the skin in order to causally affect or impact lasting influence of skin, hair, and nail aging process. Goldstein Research estimated this (DS) market to reach $6.8 billion by 2024. Dietary supplements tested in this clinical study contained ancient Indian herbs: Amla (Phyllanthus Emblica); Haritaki (Terminalia chebula) and Bahera (Terminalia bellirica) all well known in Ayurveda, for imparting multiple benefits - antioxidant, anti-inflammatory, anti-microbial, rejuvenating, and promoting overall health.

S. Arandas Monteiro e Silva, L. Moretti Aiello, R. Ferreira Magalhães, G. Ricci Leonardi, **Cutaneous Biophysical Characterization of Senile Skin**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Aging is a set of irreversible and unavoidable physiological changes, accompanied by a change in the normal functioning of the organism. Skin aging participates in the involutive changes that occur in the individual in an icy way. Intrinsic aging is characterized by decreased functional capacity, increased susceptibility to certain diseases and environmental aggressions, and is suffered by all body tissues. The most noticeable changes in the skin are flaccidity, increased deepening of expression wrinkles and dryness. On the other hand, the so-called extrinsic aging can be conceived as a result of several factors, such as: sun exposure, and it overlaps with intrinsic aging. The appearance of the skin can vary between individuals and is dependent on the degree of melanization, individual predisposition, frequency and duration of exposure throughout. As a result of this type of aging, there is a thickening and dryness of the skin and the formation of deep wrinkles, telangiectasials and other benign, premalignant and malignant lesions. It is interesting to note that while intrinsic aging is perceived in areas little exposed to radiation, extrinsic aging occurs in highly exposed areas, such as the face, neck and hands.

R. di Lorenzo, L. Ricci, T.di Serio, F. Forgione, A. Sacchi, S. Laneri, **Innovative 2D and 3D analysis to assess lips volume boosting and lip line mouth-filling redesign, related to lip plumpers**

applications or lip augmentation techniques, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Throughout the last half-century, the chase for full, plump lips has increasingly gained importance. An increasing number of people undergo procedures to obtain an attractive appearance with a natural three-dimensional enhancement of lips' volume, and well-defined vermilion borders. Several lip augmentation techniques are known, but only few studies properly analyze how they enhance the three-dimensional lip's structure. This study aims to establish a quantitative analysis for lips augmentation and assess the efficacy of lip plumpers through stereophotogrammetry by comparing lip dimensions of subjects treated with a commercial lip plumper. Specifically, lip dimension was assessed through multi-spectral imaging with VISIA 7th, while lips' volume and shape were analyzed using VECTRA H2 markerless tracking technology and 3D interpolating surface method. Finally, lips' youth fullness was also determined through evaluation of the moisture level, softness, firmness, and tissue density. Demand for lip augmentation is rising because of its quick recovery and low danger. Thus, the efficacy in promoting lip augmentation has to be demonstrated with significant and reproducible results. The applied techniques suggest that 3D and 2D stereophotogrammetry represent reliable techniques for the routine evaluation of the lips' size before and after lips' augmentation techniques, obtained with both cosmetics and aesthetic procedures.

Y. Ying, L. Sun, Y. Li, W. Xiaolan, H. Jingru, **The study of permeability, tolerability, and efficacy of a serum containing 12.5% L-ascorbic acid**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Ascorbic acid is a powerful antioxidant ingredient due to its biological functions in maintaining and improving skin health. Maintaining the stability and facilitating percutaneous absorption of ascorbic acid remains the biggest challenge in cosmetics. We designed a serum containing 12.5% pure L-ascorbic acid in powder-liquid separation ampoules with low pH to provide maximum stability and efficacy, and carried out the following experiments: the permeability of L-ascorbic acid in serum was determined by a Franz diffusion cell; the safety and tolerance of serum were tested by 48-hour closedpatch test and a 4-week safety evaluation; a 4-week clinical research was finally conducted to verify the efficacy of serum. The ampoules which separated L-ascorbic acid powder from the solution to ensure stability before application, and the low pH of serum after mixing to help percutaneous absorption. The permeation results showed that the serum had better permeability, the serum passed the 48-hour closed patch test and safety evaluation, indicating it was safe and well tolerated. Clinical research demonstrated that 12.5% L-ascorbic acid provided a significant improvement in skin texture, wrinkles and skin color, shown by an increase in skin glossiness, whiteness, elasticity parameters, aswell as a decrease in wrinkle parameters.

P. Pinto, J. Almeida, M. Fitas, **Skin dynamic firmness: a new evaluation method using High Speed Cameras and kinematic analysis**, Podium presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Between the cosmetic users, the firmness and elasticity are one of the most frequently searched claims. To evaluate the skin dynamical firmness and elasticity during facial movements we developed new protocols that uses an air blow system filmed with a high speedcamera in order to obtain a new dynamical firmness parameter. 10 women with apparent lowfirming criteria and 10 women without any lack of firmness and elasticity were selected and submitted to two dynamical protocols using the air blow-controlled system and expressing an extreme smile. At the same time the subjects were filmed at 4300 frames per second with a High-Speed Camera. Results show that a kinematic approach can calculate the dynamical firmness of the skin area as a function of the time needed to recovery from a maximum deformation and the observation of a delay in the movement particularly in the group of the lack of firmness and elasticity subjects. The new proposed methods could be complimentary to investigate the firmness and elasticity of the skin in usual conditions (linked to the movement) rather than the traditional methods where the static of the face is a condition for the calculations.

M.L. Mourelle, C.P. Gómez, M.E. Ordoñez, J.L. Legido, **Efficacy assessment of honeybee-based natural cosmetic products**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

The aim of this work is to assess the efficacy of five natural cosmetic products composed by ingredients derived from bees, mainly honey, but also include pollen and beeswax. The study was carried out with 60 individuals separated into two groups in which different cosmetics were evaluated. It was necessary to apply some inclusion and exclusion criteria to be able to participate in the study. Two types of evaluations were done, a sensory test and a biometric evaluation. For this evaluation, the equipment used was the Cutometer MPA580 and corneometer CM825 and sebumeter SM815 probes

the Courage-Khazaka, analysing hydration, sebum content, and elasticity before and after the use of the cosmetic. Improvements were obtained both in hydration and sebaceous regulation of the studied products. Likewise, there was a great acceptance of the products in the sensory test.

T. Martínez-Valverde, E. Suñer, **Preclinical and Clinical Determination of the Synergistic Action of a Hyaluronic Acid Complex and a Plant Proteoglycan**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

Facial aging is a multifactorial process whereby intrinsic and extrinsic factors lead to a progressive loss of skin structural integrity and physiological function. We designed a product combining 2.5% of a 5-type HA complex, that acts on different skin layers, and a proteoglycan.The HA synthesis increase was tested *in vitro*. Skin hydration and firmness was evaluated objectively in a clinical trial under dermatological control on 30 volunteers for 56 days. 24-hour hydration kinetics were done after the first application. Cells treated with the combination of actives synthesized 3 times more HA than the treated without proteoglycans. *In vivo*, the first application resulted in a moisturizing effect of 88%, 39%, and 31% after 1, 8, and 24 hours, respectively. Continuous application increased skin hydration to 21% after 28 days. Images showed wrinkles reduction and rejuvenation effect. The dermatologist did not observe any skin reactions. A high percentage of volunteers reported that cosmetic qualities were very good. In conclusion, the HA complex was synergistically enhanced by proteoglycans. Its antiageing effect was demonstrated *in vivo* by an increase in skin moisturization and an improvement in overall facial skin appearance, with good skin tolerance. These results are in keeping with previously published studies.

K. Zhou, Q. Wu, B. Wang, F. Wang, **Efficacy of An Anti-ageing Treatment Serum Formulated by Targeting to Multiple Pathways Throughout Skin Layers**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

A novel treatment serum targeting multiple pathways in the anti-ageing cascade throughout epidermis, dermis and hypodermis was developed. The *in vitro* test was performed using a reconstructed human epidermis to determine the repair of skin barrier and down regulation of MMPs. A 4-week single center *in vivo* study was conducted in 30 female volunteers with a lactic acid irritating test as exclusively screening for sensitive skin subjects. The *in vivo* results showed significant improvement in visible signs of facial skin ageing, including skin hydration, skin elasticity, and skin texture. The skin conditions of subjects were assessed and rated by a dermatologist as well, which indicated overall fine line, skin hydration, smoothness, radiance and skin pore were all remarkedly improved. 100% of the subjects agreed that the designed serum could relieve skin and be efficient for anti-wrinkle. A human patch test performed in 30 Chinese volunteers showed no irritation case. This formulated serum was demonstrated as mild to skin and beneficial to reduce visible signs of skin ageing.

K. Zhou, Q. Wu, B. Wang, F. Wang, **Efficacy of An Anti-ageing Treatment Serum Formulated by Targeting to Multiple Pathways Throughout Skin Layers**, Poster presentation at the 33rd IFSCC congress, Barcelona, September 4-7, 2023

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Y. Jiang, J. Wu, **Study on the Anti-Aging Effect of HyaInno™ ACE Sodium Acetylated Hyaluronate on Asian and Caucasian Subjects**, Poster T.S. Biotech Co., 2023

Skin aging is characterized by thinning of epidermal thickness, flattening between epidermis and dermis, degradation of subcutaneous tissue. According to the market survey, it has been found that people over 40 years old have a stronger consuming power on medical cosmetology, and the anti-aging and wrinkle-removing projects have grown rapidly. As a global leading biotechnology innovator, TS-Biotech links white technology to ingredient solutions and serve the health and personal care industries.

N. Saewan, A. Jimtaisong, N. Panyachariwat, P. Chaiwut, **In Vitro and In Vivo Anti-Aging Effect of**

Coffee Berry Nanoliposomes, Molecules 2023, 28, 6830

Encapsulation of bioactive compounds in the liposome system provides several advantages, such as enhancing the stability and lowering the toxicity of active compounds. Coffee berry extract (CBE) has previously been established to have in vitro anti-aging properties and to retard the aging of human skin. The purposes of this study were to encapsulate CBE in nanoliposomes and to assess its stability and in vitro anti-aging potential in human dermal fibroblasts (HDF), as well as in healthy human skin. In the HDF model, anti-aging potential was determined by nitric oxide (NO) and collagenase inhibition assays and a superoxide dismutase (SOD) activity assay, whereas in healthy human skin (in vivo), the skin elasticity and brightness were examined. First, liposomal CBE (L-CBE) was created with a particle size of 117.33 ± 2.91 nm, a polydispersity index (PDI) of 0.36 ± 0.03, and a zeta potential of -56.13 ± 1.87 mV. The percentages of encapsulation efficacy (%EE) and loading efficacy (%LE) were 71.26 ± 3.12% and 2.18 ± 0.18%, respectively. After undergoing a 12-week stability test, the L-CBE retained more phenolic content than the free CBE when stored at 4 °C, room temperature, and 45 °C. Compared to free CBE, the L-CBE demonstrated a more consistent, elevated, and prolonged release of phenolics from the lipid system. In human dermal fibroblasts, L-CBE showed lower toxicity, and at its maximum nontoxic concentration (10 mg/mL), it exhibited slightly higher anti-aging effects than CBE, including NO inhibition, enhanced SOD activity, and anti-collagenase activities. In clinical trials (30 volunteer subjects), none of the participants' skin was irritated when the L-CBE, the CBE, or base creams were applied. After 2 weeks of application, the L-CBE and CBE creams both demonstrated an improvement in skin elasticity and a reduction in melanin levels, and after 4 weeks, L-CBE cream showed a significantly greater improvement in skin elasticity and lightening. The results demonstrate that the encapsulation of the CBE in liposomal systems could increase its stability and skin penetration, reduce its toxicity, and maintain its anti-aging effect, which is powerful enough to be exploited in anti-aging and whitening agents for application in cosmetics and cosmeceuticals.

Y. Sunada, A. Chikatomo, K. Kanazawa, K. Matsumoto, Y. Matsumoto, Y. Takai, J. Kishimoto, **Glucosyl naringin: skin-reviving solution**, PERSONAL CARE MAGAZINE, September 2023

The global market for anti-ageing reached $62.6 billion in 2021 and is projected to grow to $93.1 billion by 2027.1The market isexpected to continue growing as disposable incomes increase, people become moreaware of healthier lifestyles, life expectancy increases, and the ageing population grows. From this perspective, wellbeing can be considered to be the desire of all people to become healthy in mind and body, while aesthetically viewed, it is a concept that leads to well ageing: the idea that people become more attractive and graceful as they age. Furthermore, the concept of holistic beauty is gaining attention due to the growing need for natural and clean products with less environmental impact. For consumers who wish to stay youthful and attractive withoutharming the environment and society, holistic well ageing may be the essential concept for today.

S.-M. Choi, K.-S. Kook, J. Park, B.-L. Lew, S.-H. Kwon, **Human dermal fibroblast-derived extracellular matrix reduces postinflammatory hyperpigmentation after fractional carbon dioxide laser facial resurfacing in Asians**, J Cosmet Dermatol, 2023 Aug;22(8): p. 2239-2245

Background: Extracellular matrix (ECM) components promote the development of skin wounds by providing biological scaffolds and regenerative microenvironments. Aims: To evaluate the beneficial effects of human dermal fibroblast-derived ECM after fractional carbon dioxide laser resurfacing in Asians. Patients/methods: In this double-blind, randomized, vehicle-controlled, split-face study, 15 participants with features of facial skin aging were treated with a single session of fractional carbon dioxide laser, followed by the application of either ECM (ECM group) or placebo (control group). In vivo skin parameters were measured at baseline and after 4 and 12 weeks of treatment using the Antera 3D®, Cutometer® MPA580, Dermascan®, and Tewameter®.
Results: A total of 14 participants (mean age 45.1 ± 9.7 years) completed the study. The change in melanin level was significantly lower in the ECM group than in the control group at week 12 ($p < 0.05$). Transient increase in erythema level was observed at week 4 in the control group, and the change in the erythema level was greater in the control group than in the ECM group ($p = 0.014$). Though the ECM group showed improvements in the dermal density, texture, transepidermal water loss, marionette lines (volume, maximum depth, and average depth), and nasolabial folds (volume, maximum depth, and length), no significant differences were found between the two groups. Treatment-related adverse events were not reported. Conclusions: We suggest that human dermal fibroblast-derived ECM may be used as adjunctive therapy after fractional carbon dioxide resurfacing to prevent postinflammatory hyperpigmentation in Asians.

J.W. Byun, Y.R. Kang, S. Park, W. Hong, **Efficacy of radiofrequency combined with single-dot ultrasound efficacy for skin rejuvenation: A non-randomized split-face trial with blinded**

response evaluation, Skin Res Technol. 2023;29

Background: High-intensity focused ultrasound (HIFU) and radiofrequency (RF) are non-invasive modalities for skin rejuvenation, but their combined effects have not been evaluated. Objective: We evaluated and compared the efficacy of HIFU alone and combined HIFU and bipolar RF using a newly designed probe. Methods: Twenty-two Korean adults with facial wrinkles and aging underwent treatment on both sides of their face: HIFU-only on the left and HIFU combined with RF on the right. Skin parameters were measured at different time points to evaluate the improvement in skin rejuvenation. Results: HIFU treatment significantly improved skin parameters, including pore volume and number, skin elasticity, depth of eye wrinkles, degree of sagging in the eye area, nasolabial folds and cheeks, volume of the jawline, skin density, and permittivity. Furthermore, combining bipolar RF with HIFU treatment enhanced efficacy in reducing pore number, improving skin elasticity, diminishing eye wrinkle depth, and increasing skin moisturization. These findings indicate that bipolar RF can synergically improve skin rejuvenation by providing a thermal effect to the upper papillary dermis, which is more superficial than the target area of HIFU. Conclusion: Combining HIFU with bipolar RF synergistically improves skin rejuvenation, including pore reduction, periorbitalwrinkle improvement, skin elasticity, and skin moisturization.

S. Blome-Eberwein, A. Schwartz, C. Pinataro, P. Pagella, D. Boorse, C. Gogal, **Epidermal-cell-based therapy as an adjunctto healing second degree burns—A randomized controlled pilot study**, Burns, Volume 49, Issue 5, August 2023, p. 1134-1143

Background: Healing of partial-thickness (2a and 2b) burns is notoriously unpredictable as far ashealing time, scarring and (hypo)pigmentation is concerned. Epidermal blister grafting isan autologous grafting technique involving transfer of epidermal islands without dermalelements. Cellutome™ is an FDA-acknowledged epidermal harvesting device. This proof-of-concept study evaluates whether blister grafting of partial-thickness burns results inimproved healing compared to standard acellular treatment. Methods: This is a randomized controlled trial with 8 patients in which each patient received bothtreatments randomized to different burn sites. Healing was assessed at regular intervals. Twelve months after treatment, outcomes were measured with the Vancouver Scar Scale(VSS), Patient and Observer Scar Assessment Scale (POSAS), photography, spectrometry, Semmes-Weinstein Filaments, cutometry and high-resolution ultrasound. Results: Areas treated with epidermal blister grafting healed slightly faster than acellulartreatment. Epidermal treatment yielded healing with less erythema, closer to that ofsurrounding normal skin ($p = 0.0404$). Donor sites were not visible and not measurablydifferent than normal skin. Conclusions: Results favor cellular over acellular technique for the treatment of partial-thickness (2aand 2b) burns. Significant improvement in erythema implies a higher quality healingprocess. Further studies should look primarily at larger areas of treatment, and largersample size.

A. Brown, M. Furmanczyk, D. Ramos, A. Ribes, L. Pons, J. Bustos, A.R. Fernández de Henestrosa, C. Granger, E. Jourdan, **Natural Retinol Analogs Potentiate the Effects of Retinal on Aged and Photodamaged Skin: Results from In Vitro to Clinical Studies**, Dermatol Ther (Heidelb) (2023) 13: p. 2299–2317

Introduction: Plants are a source of natural ingredients with retinol-like properties that candeliver anti-aging benefits without the side effects typically associated with retinoid use. We hypothesized that by combining two such analogs, bakuchiol (BAK) and *Vigna aconitifolia* extract (VAE), with the potent retinoid retinal (RAL), the anti-photoaging potential of RAL could be enhanced without compromising its skin irritation profile. The purpose of this study was to demonstrate that BAK and VAE potentiate the anti-photoaging activity of RAL. Methods: Gene expression profiling of fullthickness reconstructed skin was first used to examine the impact of BAK or VAE in combination with RAL on skin biology. Next, the irritative potential of this combination, and its capacity to reverse key signs of photoaging in anex vivo model was assessed. Finally, a proof-ofconcept open label clinical study was performed to evaluate the anti-photoaging capacity and skin compatibility of a cosmetic formulation (tri-retinoid complex; 3RC) containing this complex in combination with other well characterized anti-photoaging ingredients. Results: In vitro profiling suggested that combining 0.1% RAL with BAK or VAE potentiatesthe effect of RAL on keratinocyte differentiation and skin barrier function without affecting its skin irritation profile. When formulated with other anti-photoaging ingredients, such as niacinamide and melatonin, 3RC reversed ultraviolet radiation-induced deficits in structural components of the dermal extracellular matrix, including hyaluronic acid and collagen. In vivo, it led to a reversal of clinical signs of age and photodamage, with statistically significant improvement to skin firmness (+5.6%), skin elasticity (+13.9%), wrinkle count (-43.2%), and skin tone homogeneity (+7.0%), observed within 28 days of once nightly use. Notably, the number of crow's feet wrinkles was reduced in 100% of subjects. Furthermore, 3RC was very well tolerated. Conclusion: These data suggest that 3RC is a highly effective and well-

tolerated treatment for photoaging.

G. Gentili, P. Perugini, S. Bugliaro, C. D'Antonio, **Efficacy and safety of a new peeling formulated with a pool of PHAs for the treatment of all skin types, even sensitive**, J Cosmet Dermatol. 2023; p. 22: p. 517–528

Background: Actually, the use of chemical peels in cosmetics and dermatology continues to grow due to their versatility, clinical endpoint–directed predictability, and favorable risk profile in comparison to lasers. The chemical peel is a generally safe method for treatment of some skin disorders and to refresh and rejuvenate the skin. The major challenge of chemical peels is the tolerability, that is because of sensitive skin which is one of the most common skin disorders. Aim: The aim of this study was to evaluate the effectiveness of the new Miamo Renewal Peel Serum formulated with a pool of new generation acids (ELPA25™) on sensitive skin with respect to mandelic acid serum only and with respect to placebo comparison. Materials and Methods: The “in vivo” study following the half-face experimental protocol active versus placebo involved 30 healthy Caucasian female volunteers between 25 and 64 years, with sensitive skin, who were divided into two different groups. ELPA25™ serum was applied in one group three times a week for 8 weeks. The other group, with the same protocol, applied an active serum containing mandelic acid, as control, versus placebo. In particular, skin moisturizing, skin viscoelastic properties, skin surface smoothness, wrinkle reduction, and stratum corneum renewal were evaluated. Results: Renewal Peel Serum was very well tolerated from sensitive skin. A significant decrease in skin roughness and wrinkle breadth, and an improvement in firmness and in skin elasticity, was observed after 2 months of treatment with respect both to mandelic acid serum and to placebo comparison. Conclusions: Scientific protocol using self-controlled study methodology and noninvasive skin bioengineering techniques with adequate statistical methods were able to evaluate both the safety and the efficacy of the new Miamo Renewal Peel Serum. This study highlighted that the Miamo Renewal Peel Serum formulated with a patent-pending mixture of new generation acids (ELPA25™) exerts many beneficial effects and it can be successfully employed for sensitive skin.

V. Couturaud, M. Le Fur, M. Pelletier, F. Granotier, **Reverse skin aging signs by red light photobiomodulation,** Skin Research & Technology, Volume 29, Issue 7, July 2023

Background: Photobiomodulation is a process by which the absorption of red light energy produces a series of physiological effects at the cellular level such as the enhancement of mitochondrial Adenosine Triphosphate (ATP) production, cell signaling and growth factor synthesis, and the reduction of oxidative stress. Light emitting diodes (LEDs) photobiomodulation is an increasingly popular therapy for treating skin problems, especially for reversing the signs of skin aging. Objective: The objective of this study is to demonstrate the effectiveness of a photobiomodulation treatment using red LEDs on the facial skin at a rate of two sessions per week for 3 months. The LED mask used is the Skin Light Dior x Lucibel mask diffusing a cold red light with a wavelength of 630 ± 10 nm and a power of 15.6 J/cm2 for a duration of 12 min. Method: In order to demonstrate the effectiveness of the mask in reversing the signs of skin aging, a clinical study was conducted on 20 healthy Caucasian women: the antiwrinkle effect by measuring the depth of the crow’s feet wrinkle, the relaxation of the oval of the face by clinical scoring, the firmness and elasticity of the skin by cutometric measurement, the density of the dermis by ultrasound analysis, the smoothness of the skin by measuring the roughness at the cheek, the homogeneity of the complexion by chromametric measurement, the diameter of the pores by macrophotographs and finally the sebo-regulating effect by measurement of the rate of sebum and quantification of the number of pores containing porphyrin in the subjects presenting a mixed to oily skin. The satisfaction of the volunteers was also evaluated at the end of the study via a self-questionnaire. Results: The efficacy results measured after 1, 2, and 3 months of use are progressive and confirm the interest of LED photobiomodulation to reverse the visible signs of skin aging. All the volunteers observed an overall improvement in skin quality. Conclusion: All the results observed confirm the interest of using photobiomodulation to reverse the visible signs of aging. These results last for up to 1 month after stopping the use of the mask, which is a sign of lasting structural and functional rejuvenation of the skin.

H. Zhao, B. Park, M.-J. Kim, S.-H. Hwang, T.-J. Kim, S.-U. Kim, I. Kwon, J.S. Hwang, **The Effect of γ-Aminobutyric Acid Intake on UVB- Induced Skin Damage in Hairless Mice**, Biomol Ther 31(6), p. 640-647 (2023)

The skin, the largest organ in the body, undergoes age-related changes influenced by both intrinsic and extrinsic factors. The primary external factor is photoaging which causes hyperpigmentation, uneven skin surface, deep wrinkles, and markedly enlarged capillaries. In the human dermis, it decreases fibroblast function, resulting in a lack of collagen structure and also decreases keratinocyte function, which compromises the strength of the protective barrier. In this study, we found that treatment with γ-aminobutyric acid (GABA) had no toxicity to skin fibroblasts and GABA enhanced

their migration ability, which can accelerateskin wound healing. UVB radiation was found to significantly induce the production of matrix metalloproteinase 1 (MMP-1), but treatment with GABA resulted in the inhibition of MMP-1 production. We also investigated the enhancement of filaggrin and aquaporin 3 in keratinocytes after treatment with GABA, showing that GABA can effectively improve skin moisturization. In vivo experiments showed that oral administration of GABA significantly improved skin wrinkles and epidermal thickness. After the intake of GABA, there was a significant decrease observed in the increase of skin thickness measured by calipers and erythema. Additionally, the decrease in skin moisture and elasticity in hairless mice exposed to UVB radiation was also significantly restored. Overall, this study demonstrates the potential of GABA as functional food material for improving skin aging and moisturizing.

I. Dolečková, P. Orzol, K. Vašičková, S. Karel, L. Petrovičová, G. Huerta-Angeles, M. Stěpánová, V. Velebný, **Retinol-like zinc hexapeptide complex**, Personal Care Magazine online, July 2023

Acne vulgaris is a common chronic skin disease affecting individuals of all ages. The pathogenesis of acne is characterized by four core events: hyperseborrhoea. Epithelial hyperkeratinization, *Cutibacterium acnes* colonization and inflammation. Due to the multifactorial nature of the disease a combination therapy or use of multifunctional compounds are the preferred approaches. Retinoids are among the most effective compounds targeting multiple acne associated pathways. However, they often cause negative adverse effects including skin dryness and irritation.

G.-H. Park, H.H. Kwon, J. Seok, S.H. Yang, J. Lee, B.C. Park, E. Shin, K.Y. Park, **Efficacy of combined treatment with human adipose tissue stem cell-derived exosome-containing solution and microneedling for facial skin aging: A 12-week prospective, randomized, split-face study**, J Cosmet Dermatol. 2023;22: p. 3418–3426

Background: Studies have reported promising results of mesenchymal stem cell therapies for skin aging. However, in the use of mesenchymal stem cells, some drawbacks including rarely possible tumorigenicity and low engraftment rates have limited their widespread clinical use. Adipose tissue stem cell-derived exosomes (ASCEs) are emerging as effective cell-free therapeutic agents. Aims: It was evaluated the clinical efficacy of combining the application of human ASCE-containing solution (HACS) with microneedling to treat facial skin aging. Methods: A 12-week, prospective, randomized, split-face, comparative study was conducted. Twenty-eight individuals underwent three treatment sessions separated by 3- week intervals and were followed up for 6 weeks after the last session. At each treatment session, HACS and microneedling were administered to one side of the face, and normal saline solution and microneedling were administered to the other side as a control. Results: The Global Aesthetic Improvement Scale score was significantly higher on the HACS-treated side than on the control side at the final follow-up visit (p= 0.005). Objective measurements obtained by different devices including PRIMOS Premium, Cutometer MPA 580, Corneometer CM 825, and Mark-Vu confirmed greater clinical improvements in skin wrinkles, elasticity, hydration, and pigmentation on the HACStreated side than on the control side. The results of the histopathological evaluation were consistent with the clinical findings. No serious adverse events were observed. Conclusions: These findings demonstrate that combined treatment using HACS and microneedling is effective and safe for treating facial skin aging.

M.A. Nilforoushzadeh, M. Heidari-Kharaji, M. Shahverdi, M. Nouri, R. Enamzadeh, N. Najar Nobari, T. Fakhim, S. Rafiee, **Microneedle fractional radiofrequency in the treatment of periorbital dark circles**, J Cosmet Dermatol. 2023;22: p. 2218–2224

Background: Periorbital hyperpigmentation (POH) is a common disorder in the patients. Women are more upset with POH in compare to males. Several methods have been used to the POH, with different efficacy and adverse reactions. Aim: The aim of the present study is to evaluate the efficacy of microneedle fractional radiofrequency (MRF) in treating POH. Methods: So, nine patients with POH and the age range of 25–57 years, were treated by microneedle fractional radiofrequency (MRF). The outcome was evaluated via biometric assessment. The colorimeter was used to assess the skin lightness. Mexameter was used for evaluated the amount of Melanin in the periorbital skin. Cutometer was used for skin elasticity assessment. The skin ultrasound imaging system was utilized to estimate the epidermis and dermis diameter and density. Furthermore, Visioface was applied to assessed the skin color and wrinkles. Also patient's satisfaction and physician's assessment were evaluated. Results: The results displayed that the periorbital skin lightness 32.38% ± 5.67 and elasticity of the R2: 40.29% ± 8.18, R5: 39.03 ± 5.38 and R7: 42.03% ± 14.16 were significantly improved after treatment ($p < 0.05$). Also the melanin content of the skin was decreased (49.41% ± 9.12). The skin layers were denser in the dermis and also in the epidermis (skin density: 30.21% ± 10.16 and skin thickness: 41.12% ± 13.21) ($p < 0.05$). The results revealed the decrease in the percent change of the skin color (30.34% ± 9.30) and wrinkle (area: 25.84% ± 6.43 and volume: 30.66% ± 8.12)($p < 0.05$). Similarly, the

physician and patient's assessment were confirmed the obtained outcomes. Conclusion: In conclusion, the microneedle RF technique is practicable, effective and safe method for periorbital dark circles treatment.

M. Meunier, M. Bracq, J. Tiguemounine, G. Maramaldi, A. Scandolera, R. Reynaud, **Skin Cellular Reprogramming as an Innovative Anti-Aging Strategy for Cosmetic Application: A Clinical Study of Sericoside**, Front. Biosci. (Landmark Ed) 2023; 28(6): 112

Background: While our body ages, skin cells progressively lose their pluripotency and proliferative capacities, as well as remodeling driver role, among other activities. This loss of capacities leads to visible aging signs such as wrinkles, under-eye bags or even aging spots. We studied if the stimulation of cell pluripotency and proliferation by a natural molecule could be an innovative anti-ageing strategy for skin rejuvenation. Methods: The activity of sericoside, a compound extracted from the bark of Terminalia sericea roots, was evaluated at a concentration of 0.02% in vitro. This assessment involved transcriptomic analysis on fibroblasts after 24 hours, as well as proliferation tests on aged fibroblasts after 72 hours. A clinical study was then conducted on 40 volunteers between the ages of 35 and 55. For four weeks, volunteers applied a cream twice daily containing either sericoside or blank emulsion (control group). Skin elasticity was measured by cutometry with R2 parameter. Skin texture and roughness was analyzed by an in vivo 3D scanner. Results: Transcriptomic analysis showed that sericoside improved the set of gene expressions involved in cell cycle (+85% MKI67), cell proliferation (+250% IGF1), DNA repair (+56% OGG1), pluripotency transcription factors (+36% NANOG) and stem cells maintenance (+200% SOX2). We substantiated a decrease of proliferation factor with aged cells compared to young cells by 50%, while sericoside increased this proliferation factor by +46%, a similar rate to that of a 22-year-old donor. Clinically, the anti-aging effects of sericoside were evident: the use of sericoside resulted in a 17% increase in skin elasticity and a 10% reduction in skin roughness, underscoring the smoothing effect with sericoside. Conclusions: The study highlighted an innovative anti-aging strategy that involves re-activating cells' memory to reprogram cell pluripotency by stimulating the natural tools available in our DNA.

M.G. Ryabkov, M.N. Egorikhina, N.A. Koloshein, K.S. Petrova, M.G. Volovik, N.Y. Orlinskaya, Aleksandra O. Moskovchenko1, I.N. Charykova, D.Y. Aleynik, D.D. Linkova, I.E. Pogodin, I.I. Kobyakova, I.Y. Arefyev, **Effectiveness and Safety of Transplantation of the Stromal Vascular Fraction of Autologous Adipose Tissue for Wound Healing in the Donor Site in Patients with Third-Degree Skin Burns: A Randomized Trial**, Med J Islam Repub Iran. 2023 (21 Jun);37.70

Background: The quality of the wound healing at the donor site significantly determines the overall condition of the burn patient, the extent of wound fluid and protein losses, the severity of any systemic in-flammatory reaction, and the intensity of the pain syndrome. It is known that the stromal vas-cular fraction (SVF) has a beneficial effect on the healing of wound defects. This study is aimed at assessing the safety and effectiveness of the application of the SVF of autologous adipose tis-sue to stimulate wound healing of the donor site in patients with burns. Methods: This placebo-controlled clinical study included 38 patients with third-degree thermal skin burns. The patients underwent liposuction, enzymatic isolation of the SVF, and intradermal injection of the preparation into the wounds in the donor site, followed by tewametry, cutome-try, thermography and biopsy after 12 days. Quantitative indicators were compared using the Mann-Whitney test for unrelated groups and the Wilcoxon test for related groups. Spearman's rank correlation coefficient (RS) was used to assess the correlation Results: Epithelization of the wounds in all patients was seen over an average area of 88 (84;92) %, there being no significant differences between the actual and the control wound sites for this parameter. Transdermal water loss in the test wound sites was 2 times lower than in the control sites (P = 0.001). The wound donor sites regained their temperature distribution faster than the control sites (P = 0.042). Histological preparations of the skin of the wound sites revealed that their epidermal layer was 19% thicker compared to the controls (P = 0.043). It should be noted that five adverse events related to manipulations in the postoperative period were registered. Conclusions: Transplantation of SVF autologous adipose tissue into the wound area in most clinical cases proceeded without complications. The area of epithelialization of wound areas af-ter the introduction of SVF did not change, although a significant decrease in transdermal water loss was observed in the wound areas with an improvement in their thermoregulation and an increase in the thickness of the epidermis.

M. Alfertshofer, N. Engerer, K. Frank, N. Moellhoff, D.L. Freytag, S. Cotofana, **Multimodal Analyses of the Aging Forehead and Their Clinical Implications**, 2023 Jun 14;43(7): p. 531-540

Background: Recent research has indicated that in the upper face a delicate arrangement exists between the muscles of facial expression and the skin. This arrangement allows for immediate transmission of movements following muscle contraction, resulting in skin movements and skin rhytid

formation. Objectives: To investigate age-related changes of the biomechanical unit formed by facial muscles, their connective tissue envelope, and the skin of the upper face. Methods: A total of 76 Caucasian volunteers (30 males, 46 females) with a mean age of 42.2 years (SD 18.6) and a mean body mass index of 24.58 kg/m2 (SD 3.7) were investigated. Three upper facial regions were analyzed for skin firmness and elasticity with cutometric assessment, vertical and horizontal skin vector displacement using 3-dimensional imaging, and muscle activity with surfacederived electromyography. Results: Study participants of older age (>42.2 years), when compared with younger participants (≤42.2 years), showed increased skin firmness, at 0.20 mm vs 0.30 mm (P < .001); decreased skin elasticity at 53.2% vs 69.0% (P < .001); increased vertical (not horizontal) skin mobility at 3.56 mm vs 1.35 mm (P < .001); and decreased surface-derived electromyography (sEMG) signal of the frontalis muscle with 174 μV vs 309 μV (P = .039). Conclusions: This study reveals that age-related changes occur in each component of the biomechanical unit formed by facial muscles, connective tissue envelope, and skin in the upper face. Knowledge and understanding of such changes can allow for more targeted and individualized surgical and nonsurgical aesthetic treatments.

*J.H. Yoo, J.S. Lee, J.H. Jang, J.I. Jung, E.J. Kim, S.-Y. Cho*i, **AGEs Blocker™ (Goji Berry, Fig, and Korean Mint Mixed Extract) Inhibits Skin Aging Caused by Streptozotocin-Induced Glycation in Hairless Mice**, Prev. Nutr. Food Sci. 2023;28(2): p. 134-140

Glycation is a cause of skin aging. This study investigated in a glycation-induced skin aging mouse model the effects on skin and mechanism of action of AGEs Blocker™ (AB), which contains goji berry, fig, and Korean mint mixed extract. This study sought to demonstrate the antiglycation effect of streptozotocin, thereby improving skin aging, by measuring advanced glycation end products (AGEs) and various skin parameters, including collagen; matrix metalloproteinases (MMPs); inflammatory cytokines; activities of oxidative enzymes; and skin wrinkles, elasticity, and hydration. This study found that skin wrinkles, elasticity, and hydration improved with AB. Particularly, the oral administration of AB suppressed AGEs, receptors of AGEs, and carboxymethyl lysine in blood and skin tissue. In addition, AB increased the activities of antioxidative enzymes, reduced inflammatory cytokines, suppressed MMP-9 expression, and increased the contents of collagen and hyaluronic acid, ultimately suppressing skin wrinkles and increasing skin elasticity and hydration. Therefore, AB can inhibit skin aging through its antiglycation effect and is thus considered a good ingredient for skin care products.

LIPOID Liposome C Eco: innovative natural product, PERSONAL CARE Magazine, June 2023, p-6-7

Encapsulation of cosmetic active ingredients in skin-friendly particles potentiates their skin interaction and results in a superior and long-lasting cosmetic effect. LIPOID Liposome C Eco is an innovative natural product containing ascorbyl glucoside (2-O-alphaD-glucopyranosyl-L-ascorbic acid), a derivative of Vitamin C. Vitamin C is a powerful antioxidant, neutralizing and removing harmful free radical molecules and enhancing collagen formation. It inhibits the enzyme tyrosinase, thereby reducing melanogenesis and counteracting skin hyperpigmentation.1 Ascorbyl glucoside is converted into ascorbic acid (Vitamin C) in the skin, providing a longlasting cosmetic effect.2

E.H. Park, D. Jung, J.H. Won, J. Seong, J. Na, **Effects of winter indoor environment on the skin: Unveiling skin condition changes in Korea**, Skin Research & Technology, 2023;29:e13397

Background: InKorea, winter can cause skin dryness due to low relative humidity (RH); moreover, indoor heating devices promote moisture loss and air pollution. If dryness persists, dead skin cells accumulate, leading to skin problems; therefore, careful skin care is required. This study aimed to compare changes in skin conditions when exposed to an indoor environment for a short period of 6 h in winter, and to suggest proper winter skin care practices. Methods: A randomized, split-face clinical study was conducted in which healthy female participants with normal skin were exposed to an indoor environment with a heater turned on for a short period at least 6 h per day in thewinter season, and cream was applied to one side of the face. Skin temperature, hydration, sebum, transepidermal water loss (TEWL), elasticity, texture, pores, redness, and wrinkles were measured at the treated and nontreated sites. Results: After 6 h of exposure, skin temperature, pores, roughness, redness, and wrinkles significantly increased ($p < 0.05$) on the face, whereas TEWL significantly increased on the forearm ($p < 0.05$). However, sebum secretion appeared to function as a barrier to maintain homeostasis in the facial skin. Elasticity, pores, texture, and wrinkles in the cream-treated ceramide site improved compared to those in the nontreated site ($p < 0.05$). The moisture content was also significantly higher in the forearm ($p < 0.05$). Conclusion: Changes in skin parameters of participants with healthy skin were observed even after short-term exposure to an indoor environment in winter. Creams containing ceramide maintain skin homeostasis and protect the skin barrier; therefore, it is recommended to use such creams to prevent skin damage and maintain healthy skin, particularly during prolonged exposure

to indoor environments during winter.

G. Fatturini, S. Zanzoterra, **Youthful Skin**, COSSMA 6/2023

Fighting skin ageing is one of the top priorities of facialtreatments. A new active ingredient developed by Roelmi HPC now might be the solution: a microbiota-friendly cellenergiser, designed to optimise mitochondrialactivation.

M. Riggs, K.C. Holley, H. Knaggs, S. Powell, B. Cook, G. Diwakar, **Clinical improvement of appearance of cellulite and skincharacteristics witha non-invasive biphasic pulsed microcurrent device system**, EURO COSMETICS 5-23

Low Level alternating current (AC) or direct current (DC) microcurrent based treatment devices have been in use for over a century to improve muscle contraction, wound healing, and pain. Over the last decade the microcurrent treatment modality is increasingly being used for improvement of skin appearance, which includes skin tone, elasticity and reducing overall hyperpigmentation on face and body. To the best of our knowledge, the studies examining the benefits of non-invasive low level microcurrent treatment on cellulite have not been previously demonstrated. Cellulite is a skin condition in which the adipocyte (fat) globules aggregate and enlarge causing degradation of dermal matrix, vasoconstriction and blocking of lymphatic drainage. These enlarged hypodermal fat cells push against the dermis and epidermis resulting in a rippled or cottage cheese appearance of skin. Cellulite mostly appears in the upper triceps area of the arm, abdomen, and upper thighs. Cellulite affects women more than men. Here we report results from a 12-week clinical study using a combination of non-invasive biphasic pulsed microcurrent device system (MDS) comprising treatment body serum and posttreatment body lotion demonstrating significant improvement in appearance of cellulite on arms and upper thigh when compared to subjects who used the microcurrent device system alone.

X. Shu, W. Huo, L.Zou, Z. Li, Y. Tang, **Treatment of Stretch Marks Using a New Formulation Combining Nanofractional Radiofrequency Plus Magnetic Nanofractional Radiofrequency,** Dermatol Ther (Heidelb) (2023) 13: p. 1277–1288

Introduction: Stretch marks are common atrophic dermal scars with significant physical and psychological effects. Therefore, there is a need for effective cosmetics and procedures for stretch mark treatment. This study aimed to evaluate the efficacy and safety of a novel treatment for stretch marks that is made up of topical formulations containing beta-glucan combined with nanofractional radiofrequency. Methods: This randomized, blinded control trial enrolled 64 Chinese women aged 20–45 years at > 6 months after delivery with obvious white or silver abdominal stretch marks. Participants were randomly allocated to group A (blank group), group B (topical product group), group C (product combined with nanofrac ional radiofrequency), and group D (vehicle combined with nanofractional radiofrequency). The stretch mark width, skin elasticity, skin color, skin thickness, and collagen density were noninvasively measured. Two trained assessors evaluated the severity, color, outline, and relaxation of the striae. Results: Group C showed the best treatment efficacy, with no adverse effects observed during the study period. Conclusion: Our findings indicate that stretch mark treatment using topical formulations containing beta-glucan, combined with nanofractional radiofrequency plus magnetic nanofractional radiofrequency, is tolerable and effective.

C.-Y. Wu, C.-Y. Ho, Y.-H. Yang, **Developing Biomarkers for the Skin: Biomarkers for the Diagnosis and Prediction of Treatment Outcomes of Alzheimer's Disease**, Int. J. Mol. Sci. 2023, 24

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by memory decline and cognitive impairment. Research on biomarkers can aid in early diagnosis, monitoring disease progression, evaluating treatment efficacy, and advancing fundamental research. We conducted a cross-sectional longitudinal study to see if there is an association between AD patients and age-matched healthy controls for their physiologic skin characteristics, such as pH, hydration, transepidermal water loss (TEWL), elasticity, microcirculation, and ApoE genotyping. The study used the Mini-Mental State Examination (MMSE) and Clinical Dementia Rating-Sum of the Boxes (CDR-SB) scales as references to quantify the presence of disease, if any. Our findings demonstrate that AD patients have a dominantly neutral pH, greater skin hydration, and less elasticity compared to the control subjects. At baseline, the tortuous capillary percentage negatively correlated withMMSE scores in AD patients. However, AD patients who carry the ApoE E4 allele and exhibit a high percentage of tortuous capillaries and capillary tortuous numbers have shown better treatment outcomes at six months. Therefore, we believe that physiologic skin testing is a rapid and effective way to screen, monitor progression, and ultimately guide the most appropriate treatment for AD patients.

T. Techapichetvanich, W. Manuskiatti, S. Wongdama, N. Viriyaskultorn, J.B. Li, N. Jantanapornchai,

Nonablative monopolar radiofrequency for the reduction of facial pores and sebum excretion in Thai patients: A novel approach, Lasers Surg Med. 2023;55: p. 528–535

Background: Enlarged facial pores are visible topographic features of the skin that have been associated with cutaneous photoaging and increased sebum production. It has remained a common dermatologic concern, gaining a significant number of in-clinic consults. Available treatment modalities often operate on a single mode of action, consequently offering limited and short-term outcomes. Objective: This study aimed to evaluate the long-term efficacy and safety of a nonablative monopolar radiofrequency (NMRF) for pore tightening and sebum output reduction in Thai patients. Methods: Nineteen patients with enlarged pores underwent two sessions of NMRF treatments at 4-week intervals. The measurements of pore volume, skin texture, average pore size, sebum production, and skin elasticity were quantified using Antera® 3D imaging system, dermoscopic image analysis with ImageJ software, Sebumeter® and Cutometer®. Clinical evaluation by two dermatologists was done using blinded clinical photographs. All objective and subjective assessments were done at the baseline, a month after the first treatment, and during follow-up visits 1, 3, and 6 months after the last treatment. Adverse effects were also recorded during each visit. Results: Seventeen out of the 19 subjects completed the study protocol. The mean pore volume significantly reduced by 24% from the baseline at 1 month after the first treatment ($p < 0.016$). The pore volume continued to decrease by 34% and 38% a month ($p < 0.001$) and 6 months ($p < 0.001$) following the final treatment, respectively. Sebum excretion likewise significantly decreased from baseline by 39% ($p = 0.002$) and 36% ($p < 0.001$), 3 and 6 months after the second treatment, respectively. Skin texture and elasticity also significantly improved following two NMRF sessions. The objective assessments of the pore appearance corresponded to subjective clinical evaluations. The treatment was well-tolerated without significant side effects, such as dyspigmentation, textural alteration, and scarring. Conclusion: NMRF appears to be effective and safe for the reduction of pore size and sebum production, with therapeutic outcomes persisting up to 6 months after two treatment sessions.

R. Di Lorenzo, L. Grumetto, A. Sacchi, S. Laneri, I. Dini, **Dermocosmetic evaluation of a nutricosmetic formulation based on Curcuma**, Phytother Res, 2023 May;37(5): p.1900-1910

Endogenous and exogenous factors can alter the skin layer and appearance, determining skin aging. The extracts and isolated molecules from food matrixes can be used to formulate "healthy" antiaging cosmetics. Two different cosmetic approaches can be used to achieve the antiaging effect. It is possible to use topical products based on food extract (cosmeceutical approach) or take a food supplement and apply a topical cosmetic product based on food extract on the surface to be treated (nutricosmetic approach). This work evaluated in vivo the antiaging potential of a nutricosmetic formulation (cream + food supplement) and a cosmeceutical cream based on Curcuma. The choice of the commercial Curcuma extract to be used for experimental purposes was based on the curcuminoid content determined by an HPLC test. Curcuminoids are the bioactive compounds responsible for Curcuma's antioxidant and antiinflammatory properties. Their levels in Curcuma extracts vary according to the storage condition, variety, and pedoclimatic cultivation conditions. The Tewameter® TM300 was used to evaluate the Trans Epidermal Water Loss (TEWL), the Corneometer® CM 825 to determine the moisturizing effect, the Cutometer® to estimate the skin firmness and elasticity, the Dermascan to assess the collagen index, and the Visioface® 1000D to evaluate the wrinkles. The nutricosmetic product showed potential as moisturizing, anti-age, and anti-wrinkle action better than the cosmeceutical product alone.

L. Awad, B.J. Langridge, F.H.K. Jeon, E. Bollen, P.E.M. Butler, **A comparison of commercially available synthetic skin substitutes for surgical simulation training**, GMS Journal for Medical Education 2023, Vol. 40(5)

Objective: Simulation training provides an important opportunity to accelerate surgical skills acquisition whilst safeguarding patients. This study compares the suitability of different synthetic skin substitutes for use in surgical simulation training. Design: Data was collected for eight commercially available synthetic skin substitutes and included cost, delivery time, subjective assessment of fidelity by surgeons and trainees, and objective comparison with the biomechanics of human skin was made through cutometry and durometry measurements. Cutometry and durometry data was collected from three healthy adults from the forearm, forehead and back, with measurements being repeated in triplicate. Subjective assessment of skin pad quality was collected using an 8-criteria questionnaire, graded using a 5-point Likert scale for fidelity to normal skin.R esults:The questionnaire assessment was completed by 30 trainees and practitioners. Overall, felt pads received the poorest outcomes in all criteria; cutometry and durometry results demonstrate poor similarity to skin, and felt received the lowest scores in the questionnaire, although the cheapest. Foam dressings were similar in both cutometric and durometric properties to skin of the face, back and arm. Clinical outcomes of foam dressings were similar

to the most expensive commercial skin pad. Conclusions: Bilaminar foam-based dressings provide a low cost, high fidelity non-biological simulation of skin for surgical training, which is non-inferior to more expensive specifically designed products. Many products designed to act as skin substitutes for surgical simulation fail to adequately replicate the anatomical and mechanical properties of skin.

Ò. Expositó, A. Guirado, M. Buchholz, A. Gallego, M. Mas, P. Riera, D. Luna, S. Laplana, T. Ruiz, S. Ruiz, M. Gibert, **Photoprotecting skin microbiota against ageing,** PERSONAL CARE Magazine, May 2023, p. 40-43

The skin microbiota plays a key role in skin homeostasis and the skin microbial ecosystem evolves with age.1'3 Furthermore, the microbiome is highly relevant regarding the regulation of skin functions when the skin is exposed to sun radiation.Various microorganisms of the skin microbiota have been identified for having especially important functions in protecting the skin in front of UV radiation: *Staphylococcus epidermidis, Micrococcus luteus, Bifidobacterium spp.* and *Malassezia furfur 45* The metabolism of these microorganisms contributes in the protection of our skin against the exposure to sun radiation.

Y.G. Koh, J. Seok, J.W. Park, K.R. Kim, K.H. Yoo, Y.J. Kim, B.J. Kim, **Efficacy and safety of oral palmitoleic acid supplementation for skin barrier improvement: A 12-week, randomized, double-blinded, placebo-controlled study**, Heliyon 9 (2023)

Background: Palmitoleic acid (omega-7) has been reported to be effective primarily for metabolic disorders. Recently, it has been reported to help improve quality of life (QoL) by improving skin symptoms.Objective: The aim of this randomized, double-blinded, placebo-controlled clinical study is toevaluate the effcacy and safety of oral palmitoleic acid in improving skin barrier, elasticity, andwrinkle formation in adult women. Methods: In this randomized, double-blind, placebo-controlled clinical study, 90 healthy participants were enrolled and received 500 mg/day palmitoleic acid (intervention) or corn oil without palmitoleic acid (control) for 12 weeks. Skin hydration and transepidermal water loss and skin elasticity, surface roughness, eye wrinkle volume, and wrinkle severity were measured at 6-weekintervals to assess the skin barrier function and effcacy in wrinkle improvement, respectively.Results: After 12 weeks, skin hydration and transepidermal water loss signifcantly improved in the intervention group compared to the control group. Skin elasticity, surface roughness, eye wrinkle volume, wrinkle severity, and participant-assessed clinical improvement score did not signifcantly improve compared with the control group.Conclusion: Oral palmitoleic acid effectively improves the skin barrier function improvement, which may enhance QoL in aging adults.

G. Cohen, J. Jakus, M. Portillo, R. Gvirtz, N. Ogen-Shtern, E. Silberstein, T. Ayzenberg, S. Rozenblat, **In vitro, ex vivo, and clinical evaluation of anti-aging gel containing EPA and CBD**, J Cosmet Dermatol. 2023;22: p. 3047–3057

Background: Skin aging manifestation, such as coarse wrinkles, loss of elasticity, pigmentation, and rough-textured appearance, is a multifactorial process that can be exacerbated by air pollution, smoking, poor nutrition, and sun exposure. Exposure to UV radiation is considered the primary cause of extrinsic skin aging and accounts for about 80% of facial aging. Extrinsic skin aging signs can be reduced with democosmetic formulations. Both cannabidiol (CBD) and eicosapentaenoic acid (EPA) have been previously suggested as potent active dermatological ingredients. Aims: The objective of the current research was to evaluate the compatibility of both agents in the prevention and treatment of skin aging. First, the impact of both agents was assessed using standard photoaging models of UV-induced damage, both in vitro (HaCaT cells) and ex vivo (human skin organ culture). Then, a clinical validation study ($n = 33$) was performed using an optimized topical cream formulation tested at different time points (up to Day 56). Results: EPA was found to potentiate the protective effects of CBD by reducing the secretion of prostaglandin E2 (PGE2) and interleukin-8 (IL-8), two primary inflammatory agents associated with photoaging. In addition, a qualitative histological examination signaled that applying the cream may result in an increase in extracellular matrix (ECM) remodeling following UV radiation. This was also evidenced clinically by a reduction of crow's feet wrinkle area and volume, as well as a reduction of fine line wrinkle volume as measured by the AEVA system. The well-established age-dependent subepidermal low-echogenic band (SLEB) was also reduced by 8.8%. Additional clinical results showed significantly reduced red spots area and count, and an increase in skin hydration and elasticity by 31.2% and 25.6% following 56 days of cream application, respectively. These impressive clinical results correlated with high satisfaction ratings by the study participants. Discussion and Conclusions: Collectively, the results show a profound anti-aging impact of the developed formulation and strengthen the beneficial derm-cosmetic properties of CBD-based products.

A. Kołodziejczak, H. Rotsztejn, **Objective, measurable assessment of the elasticity of the skin**

around the eyes following the carboxytherapy treatment, Journal of Cosmetic Dermatology, Vol. 22, No. 5, 2023, p. 1560-1564

Background: Carboxytherapy is one of the most popular procedures used in dermatology. The treatments are known to be minimally invasive and highly effective for various skin disorders. Therefore, the research carried out in the paper is purposeful and addresses an important area of aesthetic therapies. Aims: Objective, apparatus-based assessment of the effect of carboxytherapy on skin elasticity around the eyes. Patients/Methods: The study included a group of 39 Caucasian individuals aged 35–55 years. Participants were subjected to a series of five carboxytherapy treatments of eye area at weekly intervals. The Cutometer measuring probe was used to assess skin elasticity. Additionally, photographic documentation was out using the Fotomedicus system. Results: In this study, statistically significant increase in R2 parameter was found as the result of applied treatment. This parameter is considered to be the most important indicator of changes in skin elasticity. In 29 out of 39 subjects, the carboxytherapy treatment significantly improved skin tension and elasticity. Such therapy may also exert a beneficial effect on flexibility since in 28 participants the favorable change in the R7 parameter was visible. Conclusions: The objective analysis of the impact of carboxytherapy treatment on parameters determining skin elasticity revealed that this therapy can be used as an anti-aging method in the eye area. Obtained results are in agreement with other biochemical, histological, and photographical documentation analyses of the effect of carboxytherapy on skin, performed by independent researchers.

B. Yeni, A. Dermietzel, C. Varnava, P. Wiebringhaus, M. Aitzetmueller, M.-L. Klietz, T. Hirsch, M. Kueckelhaus, **Biomechanische Eigenschaften transgener Haut nach lebensrettender Regeneration der Epidermis durch kombinierte Gen- und Stammzelltherapie**, Journal der Deutschen Dermatologischen Gesellschaft. 2023;21: p. 245–254

Hintergrund: Im Jahr 2017 beschrieben wir die erste lebensrettende Regeneration einer nahezu vollständigen Epidermis durch kombinierte Gen- und Stammzelltherapie. Kürzlich berichteten wir über eine ausgezeichnete Langzeitstabilität dieser transgenen Epidermis. Zur Charakterisierung der aus diesem experimentellen Ansatz resultierenden Hautqualität und ihrer potenziellen Anwendung bei anderen Erkrankungen berichten wir hier über die Langzeitergebnisse hinsichtlich der biomechanischen Eigenschaften der Haut. Patienten und Methodik: Eine detaillierte Analyse der biomechanischen Eigenschaften, einschließlich Hautelastizität, Anisotropie und Friktion, wurde an mehreren Körperstellen 24, 36 und 60 Monate nach der ersten Transplantation durchgeführt. Zunächst wurden die Körperstellen mit den stabilen nicht-transgenen Bereichen verglichen. Im Weiteren erfolgte ein Vergleich mit einer Kontrollgruppe aus 13 hautgesunden Probanden. Die Messung von Hautelastizität, Anisotropie und Friktion erfolgte mit nichtinvasiven Messungen. Ergebnisse: Die biomechanischen Hauteigenschaften der transgenen Epidermis zeigten ähnliche Ergebnisse im Vergleich zur verbleibenden nicht-transgenenHaut und zur gesunden Kontrollgruppe. Die Hautelastizität zeigte vergleichbareErgebnisse wie bei der Kontrollgruppe. Die Friktion der Haut nahm sowohl in den transgenen als auch in den nicht-transgenen Bereichen im Vergleich zurKontrollgruppe ab. Schlussfolgerungen: Die neuartige kombinierte Gen- und Stammzelltherapie zeigt hervorragende funktionelle Langzeitergebnisse der vollständig regenerierten transgenen Epidermis. Wegen dieser Ergebnisse sollten weitere Anwendungen dieser Technologie, wie die Behandlung von Verbrennungen, Gegenstand zukünftiger Forschung sein.

Y.P. Latul, A.W. Kastelein, B.C. de Graaf, Z. Guler, J.-P.W.R. Roovers, **Non-invasive biomechanical assessment of the prolapsed vaginal wall: an explorative pilot study on cutometry and indentometry**, Scientifc Reports, (2023) 13:2751

The clinical assessment of pelvic organ prolapse (POP) and associated treatment strategies is currently limited to anatomical and subjective outcome measures, which have limited reproducibility and do not include functional properties of vaginal tissue. The objective of our study was to evaluate the feasibility of using cutometry and indentometry for non-invasive biomechanical assessment of the vaginal wall in women with POP. Both techniques were applied on the vaginal wall of 20 women indicated for surgical correction of POP stage two or higher. The primary outcome was the measurement success rate. Measurements were considered successful if biomechanical parameters were generated after a maximum of three attempts. Secondary outcomes included acquisition time, number of attempts to obtain a successful measurement, and biomechanical parameters. Measurements were successfully performed on the anterior vaginal wall of 12 women with cystocele and the posterior vaginal wall of eight women with rectocele. The success rate was 100% for both techniques and acquisition time was under 1 minute for all 20 measurements. Tissue fast elasticity of the posterior vaginal wall (rectocele) was signifcantly higher than that of the anterior vaginal wall (cystocele) and negatively correlated with age ($r = -0.57$, $P < 0.05$). In women with POP, measuring the biomechanical properties of the vaginal wall using cutometry and indentometry is technically feasible. Objective evaluation of biomechanical

properties may help to understand the pathophysiology behind surgical outcomes, providing an opportunity for the identifcation of patients at risk for (recurrent) prolapse, and individualized treatment decisions.

G. Fattorini, S. Zanzottera, **Active ingredient for smiling beauty,** PERSONAL CARE MAGAZINE, April 2023

The viability of skin cells is a highly significant factor in cosmetics. Skin ageing and the resultingblemishes are known to be related with a decline of energy, which can typically be measured on the basis of the amount of adenosine triphosphate (ATP) produced by mitochondria. In fact, when skin cells lose their vigour, a loss of vitality makes for dull and tired complexion; as a result, ageing signs are highlighted and expression lines appear. To remedy the problem of cell ageing, it is therefore necessary to formulate compounds able to stimulate the viability of skin cells, enhancing cellular energy.

S. Leoty-Okombi, M. Gault, L. Aversa, N. Pelletier, C. Thiel, V. Andre-Frei, **Biotics as game-changer for healthy skin ageing**, PERSONAL CARE MAGAZINE, April 2023

Care products with biotic ingredients have gained enormous popularity since they are known for improving health and wellness and are associated with eco-friendliness. More specifically, consumers are seeking products that naturally target the biological ageing process of the skin. Two new biotic active ingredients derived from the *Lactobacillus crispatus* (LC) bacterium are supporting cosmetics manufacturers in successfully responding to this trend.

S.-Y. Pu, Y.-L. Huang, C.-M. Pu, Y.-N. Kang, K.D. Hoang, K.-H. Chen, C. Chen, **Effects of Oral Collagen for Skin Anti-Aging: A Systematic Review and Meta-Analysis**, Nutrients 2023, 15

This paper presents a systematic review and meta-analysis of 26 randomized controlled trials (RCTs) involving 1721 patients to assess the effects of hydrolyzed collagen (HC) supplementation on skin hydration and elasticity. The results showed that HC supplementation significantly improvedskin hydration (test for overall effect: $Z = 4.94$, $p < 0.00001$) and elasticity (test for overall effect: $Z = 4.49$, $p < 0.00001$) compared to the placebo group. Subgroup analyses demonstrated that theeffects of HC supplementation on skin hydration varied based on the source of collagen and the duration of supplementation. However, there were no significant differences in the effects of different sources ($p = 0.21$) of collagen or corresponding measurements ($p = 0.06$) on skin elasticity. The study also identified several biases in the included RCTs. Overall, the findings suggest that HC supplementation can have positive effects on skin health, but further large-scale randomized control trials are necessary to confirm these findings.

Ò. Expósito, **Microbiota and Photoageing,** COSSMA 4/2023, p. 34-37

In recent years, the role of the cutaneous microbiota in modulating skin homeostasis has been described. Less wellknown is the role of the microbiome in protecting the skin from sun exposure. A healthy and balanced skin microbiota helps to protect the skin from the harmfuleffects of solar radiation. A microbiome that is out of balance can exacerbate photo-induced skin ageing. Researcher Oscar Exposito explains how a new ingredient can rebalance the skin and protect it from photo-induced ageing.

S. Leoty-Okombi, C. Kalem, M. Gault, A. Courtois, N. Pelletier, L. Aversa, **Biotic ingredients with a proven skin anti-aging effect - Two active ingredients based on *Lactobacillus crispatus* that help reduce the signs of skin aging**, HPC Today, Vol. 18(3) 2023

Demand for anti-aging cosmetic products is thriving - consumers are increasingly interested in healthy aging and natural safe ingredients. In this context, biotic ingredients are gaining popularity because they are associated with health, wellness and eco-friendliness. Two new biotic ingredients based on the *Lactobacillus crispatus* bacteria are now enabling cosmetics producers to respond to this trend. These solutions are among the first biotic ingredients derived from bacteria that are naturally present on the skin, and which decrease with aging. When applied onto the skin, the two specific *Lactobacillus crispatus* derived actives provide clinically proven antiaging benefits.

R. Duroux, A. Jain, M. Tabert, J. Attia, **An upcycled fraction of Melaleuca alternifolia essential oil regenerates the skin through the skin melatonin pathway and improves sleep quality**, International Journal of Pharmaceutics 638 (2023)

Trans-epidermal water loss (TEWL) has been the most widely used method to assess the integrity of the skin barrier and evaluate the irritation potential or the protective properties of topical products for many years. It detects the amount of water that diffuses across the stratum corneum (SC) to the external environment. As one of the most important functions of the skin is to keep water inside the body, an increase in TEWL is used to indicate the skin's impaired barrier function. So far, a variety

of commercial instruments are available to measure the TEWL. Their applications mainly focus on the in-vivo TEWL measurements for dermatological examinations or formulation development. Recently, an in-vitro TEWL probe has also been commercially released enabling preliminary tests with excised skin samples. In our study, we first aimed to optimize the experimental procedures for detecting the in-vitro TEWL of porcine skin. Secondly, different kinds of emulsifiers were applied to the skin, including polyethylene glycol-containing emulsifiers (PEG-ylated emulsifiers), sorbitan esters, cholesterol, and lecithin. Sodium lauryl sulfate (SLS) was used as a positive control, and water as a negative control. Based on the findings, we established a protocol for accurately measuring the in-vitro TEWL values, emphasizing that the temperature of the skin sample should be constantly maintained at 32 ℃. Subsequently, the influences of emulsifiers on the in-vitro TEWL were analyzed. They indicated a significant skin barrier impairment of PEG-20 cetyl ether, PEG-20 stearyl ether, and SLS on in-vitro skin. Furthermore, we interestingly found that there consistently was an alteration of the TEWL values, even after the application of water to the skin. Our findings are of special interest, as the European Medicines Agency (EMA) recommends the use of in-vitro TEWL to determine skin barrier intactness during Franz cell experiments. Thus, this study provides a validated protocol for measuring the in-vitro TEWL and elucidates the impact of emulsifiers on the skin barrier. It also improves the understanding of tolerable variations of in-vitro TEWL and offers recommendations for its use in research.

Y.I. Lee, S.G. Lee, I. Jung, J. Suk, C. Baeg, S.-Y. Han, J.Y. Seo, D. Jung, Y. Jeon, J.H. Lee, **Topical Application of Peptide Nucleic Acid Antisense Oligonucleotide for MMP-1 and Its Potential Anti-Aging Properties**, J. Clin. Med. 2023, 12, 2472.

Matrix metalloproteinase-1 (MMP-1) is a zinc-containing endopeptidase that degrades dermal collagen and other extracellular matrix molecules. It is recognized as one of the most important indicators of cellular senescence and age-related skin changes. Here, we introduced a novel MMP-1 peptide nucleic acid (PNA) derivative—PNA-20 carboxyethyl fluorene (CEF)—which can interact with and consequently silence the MMP-1 gene sequence. The investigation on the efficacy of PNA-20 CEF in MMP-1 silencing in human dermal fibroblasts revealed significantly decreased expression of MMP-1 at both gene and protein levels. Treatment with PNA-20 CEF showed significantly increased expression of collagen I protein, indicating its potential role in preventing the degradation of collagen I and consequently combating the skin aging process. Its topical application on 3D human skin tissue showed successful absorption into the epidermis and the upper dermis. Furthermore, the additional 4-week single-arm prospective study on 21 Asian women revealed improvements in facial wrinkles, skin moisture, elasticity, and density after the use of the topical PNA-20 CEF cosmeceutical formulation. Additional in-vitro and ex-vivo studies are needed for a comprehensive understanding of the skin anti-aging effects of MMP-1 PNA.

A. Lubczyńska, A. Garncarczyk, D. Wcisło-Dziadecka, **Effectiveness of various methods of manual scar therapy,** Skin Research & Technology, Volume 29, Issue 3, March 2023

Background: The skin is a protective barrier of the body against external factors, and its damage leads to a loss of integrity. Normal wound healing results in a correct, flat, bright, and flexible scar. Initial skin damage and patient specific factors in wound healing contribute that many of these scars may progress into widespread or pathologic hypertrophic and keloid scars. The changes in cosmetic appearance, continuing pain, and loss of movement due to contracture or adhesion and persistent pruritis can significantly affect an individual's quality of life and psychological recovery post injury. Many different treatment methods can reduce the trauma and surgical scars. Manual scar treatment includes various techniques of therapy. The most effectiveness is a combined therapy, which has a multidirectional impact. Clinical observations show an effectiveness of manual scar therapy. Material and methods: The aim of this work was to evaluate effectiveness of the scar manual therapy combined with complementary methods on the postoperative scars. Treatment protocol included two therapies during 30 min per week for 8 weeks. Therapy included manual scar manipulation, massage, cupping, dry needling, and taping. Results: Treatment had a significant positive effect to influence pain, pigmentation, pliability, pruritus, surface area, and scar stiffness. Improvement of skin parameters (scar elasticity, thickness, regularity, color) was also noticed. Conclusion: To investigate the most effective manual therapy strategy, further studies are needed, evaluating comparisons of different individual and combined scar therapymodalities.

R. Santoprete, V. Hourblin, A. Foucher, O. Dufour, D. Bernard, Y. Domanov, B. Querleux, A. Potter, **Reduction of wrinkles: From a computational hypothesis to a clinical, instrumental, and biological proof,** Skin Research & Technology, Volume 29, Issue 3, March 2023

Background: Facial wrinkles are clear markers of the aging process, being chronological, photo-induced, or reflecting repetitive facial expressions. The aim of this study is to provide new insights into

the biophysical and biological mechanisms involved in the formation, prevention, or elimination of the expression wrinkles. Materials and methods: We use a computational model to get a better understanding of the wrinkle mechanical behavior and evolution after skin softening and suggesting a possible antiaging mechanism. Then, we provide a clinical demonstration of the antiwrinkle effect of a long-term application of a 20% glycerol in a moisturizer formula (GBM) versus its vehicle on crow's feet. Skin hydration, elasticity, and wrinkles visibility were evaluated by a combination of clinical and instrumental in vivo data, inverse finiteelement analysis, and proteomic data. Results: The computational model shows a predominantly compressive stress beneath the wrinkle and its significant decrease by the softening of stratum corneum. The associated clinical study confirmed a significant increase of skin hydration and elasticity as well as a decrease of wrinkle visibility after 2 and 4 months as application for both formulas; this effect being stronger for GBM. A softening effect on stratum corneum and dermis was also observed for the GBM. Furthermore, proteomic data revealed an effect of upregulation of four proteins associatedwith desquamation, cell-glycan extracellular interactions, and protein glycation/oxidation, functions related to the tissue mechanics and adhesion. Conclusions: We provide an in vivo demonstration of the anti-ageing benefit of glycerol at high dose (20%) reflected by a cumulative skin surface softening effect. The use of high moisturizing potent formulations should bring additional performance to other conventional moisturizing formulations.

K. Narra, S.K. Naik, A.S. Ghatge, **A Study of Efficacy and Safety of Ashwagandha (Withania somnifera) Lotion on Facial Skin in Photoaged Healthy Adults**, Cureus 15(3), 2023

Background: Facial skin has an essential cosmetic function in both men and women, and photoaged skin can affect the quality of life in healthy people. Ashwagandha (*Withania somnifera*) which is also called Indian ginsenghas adaptogenic properties and is used in traditional Indian medicine to maintain balance, energize, and rejuvenate. Objective: This randomized, double-blind, and placebo-controlled study assessed the efficacy and safety of topical application of lotion containing 8% standardized Ashwagandha root extract on improvement of skin parameters in the photoaged facial skin of healthy subjects. Methods. Fifty-six healthy men and women aged between 18 and 60 years with Fitzpatrick phototype III-VI skin gradewere randomized to receive the topical application (lotion on facial skin) of either Ashwagandha 8% (AG,n=28), or an identical placebo (PL, n=28) for 60 days. The primary outcome was the change from baseline on day 60 in the scores for global physician assessment scoring for the five dermatological signs (skin wrinkles, pores, hydration/moisture, skin brightness/tone, and pigmentation) on facial skin. Secondary outcomes were changes from baseline in the transepidermal water loss (TEWL), melanin index, hydration, and skinelasticity (R2 ratio). Another efficacy outcome was quality of life using the health-specific Short Form Health Survey-12 (SF-12). Safety was assessed using local reactions and adverse events. Three (1 AG, 2 PL) patients were lost to follow-up and per-protocol (PP) data included 53 patients (27 AG, 26 PL). For measurement data, repeated measures analysis of variance (ANOVA) was used to assess treatment effect at different time periods in the PP dataset (n=53). Two groups were compared for differences using a t-test for continuous data or a Mann-Whitney 'U' test for ordinal data. Adverse events were compared between two groups using the chi-square test. Results: Greater reduction ($p<0.0001$) in total physician assessment scores from baseline to day 60 was observed with AG (-74.69%) compared to PL (-48.68%). There was a greater improvement in TEWL, skin hydration, and skin elasticity (R2 ratio) with AG as compared to placebo ($p<0.0001$). However, the change in melanin index was similar in the two groups at the end of day 60 ($p=0.969$). The percentage increase in melanin index from baseline to day 60 in the PP dataset was by -2.82% with AG and -1.78% with PL, whereas the percentage reduction in TEWL from baseline to day 60 in the PP dataset was by -15.12% with AG and -8.34% with PL. Similarly, greater percentage improvements were seen with AG as compared to PL for skin hydration (20.66% with AG and 9.5% with PL) and elasticity was assessed by the R2 ratio (16.34% with AG and 3.73% with PL). Adverse events were comparable in the two groups. Conclusions: Topical application of a lotion containing Ashwagandha standardized root extract improves the skin condition and quality of life in photoaged healthy individuals. Further studies with different skin types and standard comparators are warranted to substantiate these claims of benefit.

K. Miyamoto, Y. Inoue, X. Yan, S. Yagi, S. Suda, M. Furue, **Significant Reversal of Facial Wrinkle, Pigmented Spot and Roughness by Daily Application of *Galactomyces* Ferment Filtrate-Containing Skin Products for 12 Months—An 11-Year Longitudinal Skin Aging Rejuvenation Study**, J. Clin. Med. 2023, 12, 1168

Facial skin aging is an important psychophysical and social concern, especially in women. We compared facial parameters reflecting aging of the skin in 1999 and 2010 in 86 female volunteers. Then, all subjects applied three Galactomyces ferment filtrate-containing skin care products (G3 products; SK-II Facial Treatment Essence, SK-II Cellumination Essence, and SK-II Skin Signature Cream) twice daily for 12 months (M), with the skin parameters being measured at 2 M, 8 M, and 12 M during this period.

Facial skin aging parameters such as wrinkles, hyperpigmented spots, and roughness significantly deteriorated during the 11-year interval. This 11-year aging process was associated with reduced hydration and increased transepidermal water loss (TEWL). Notably, treatment with G3 products significantly and cumulatively increased skin hydration with a correlated reduction of TEWL during the 12 M treatment period. Such treatment also significantly and cumulatively reversed the 11-year facial skin aging in the three parameters of wrinkles, spots, and roughness. These results suggest that facial skin retains the potential to recover from the aging process when it is applied with appropriate cosmetic agents.

R.R. Aruan, H. Hutabarat, A. Astasari Widodo, M.T.C.C. Firidiyono, C. Wirawanty, L. Fransziska, **Double-blind, Randomized Trial on the Effectiveness of Acetylhexapeptide-3 Cream and Palmitoyl Pentapeptide-4 Cream for Crow's Feet**, Clin Aesthet Dermatol. 2023;16(2): p. 37–43.

Background: Crow's feet is one of the signs of skin aging. Many studies regarding skin aging have been carried out in Caucasians, as for Asians, there are different genotypes and phenotypes. Some anti-aging treatments carry a slightly higher risk of side effects and irritation in Asian skin. Currently, the use of topical active peptides for anti-aging, Acetylhexapeptide-3 (AHP-3) and Palmitoyl pentapeptide-4 (PPP-4), has been widely developed. This study aimed to investigate the anti-aging e_ ects of AHP-3 and PPP-4 on the Asian patient with crow's feet. Methods: This study was a double-blind randomized trial using 21 Indonesian female subjects aged 26 to 55 years for eight weeks and divided into three groups: AHP-3 cream, PPP-4 cream, and placebo. The cream was applied twice daily to the periorbital area. The three groups were assessed using Corneometer, Tewameter, Cutometer, digital photography and Crow's Feet Grading Scale. Results: Based on clinical photos and data, improvements were found in several subjects using AHP-3 and PPP-4. PPP-4 appeared to demonstrate better results when compared to AHP-3 based on data, clinical photos, and self-assessment questionnaire. Conclusion: PPP-4 demonstrated better results when compared to AHP-3 and placebo. This initial study provides an opportunity for further study with a more adequate number of samples and duration.

A. Samadi, M. Movaffaghi, F. Kazemi, T. Yazdanparast, S.A. Nasrollahi, A. Firooz, **Tolerability and efficacy assessment of an oral collagen supplement for the improvement of biophysical and ultrasonographic parameters of skin in middle eastern consumers**, J Cosmet Dermatol. 2023;22: p. 2252–2258

Background: Topical skin care products often do not reach the deeper layers of the skin, and oral hydrolyzed collagen is one of the newest and most popular systemic supplementations for skin rejuvenation. However, there are limited information in case of Middle Eastern consumers. Objective: The purpose of this study was to evaluate the tolerability and efficacy of an oral collagen supplement for improvement of skin elasticity, hydration, and roughness in Middle Eastern consumers.Methods and Materials: It was a 12-week, before-after clinical study, conducted on 20 participants (18 women and 2 men) aged 44.15 ± 5.36 years with skin type III–IV. Skin elasticity parameters (R0, R2, R5, and R7), skin hydration and friction, as well as the thickness and echo density of the dermis, were measured after six and 12 weeks daily intake of the study product, as well as 4 weeks after stopping its use (week 16). Participants' satisfaction was assessed on the basis of their answers to the standard questionnaire, and tolerability of the product was assessed by monitoring the adverse effects. Results: A significant improvement was detected in R2, R5, and skin friction at week 12 (p-values 0.041, 0.012 and <0.01, respectively). At week 16, the values remained at an increased level, which indicates the persistence of the results. The increase of dermis density in week 16 was also significant (p-value = 0.03). Moderate overall satisfaction was reported with the treatment, and a few gastrointestinal complications were reported. Conclusion: The study demonstrated that oral collagen peptides could significantly improve the skin elasticity, roughness, and dermis echo density, and they also proved to be safe and well-tolerated.

L. Duteil, C. Queille-Roussel, H. Issa, N. Sukmansaya, J. Murray, F. Fanian, **The Effects of a Non-crossed-linked Hyaluronic Acid Gel on the Aging Signs of the Face versus Normal Saline: A Randomized, Double-blind, Placebo-controlled, Split-faced Study**, JOURNAL OF CLINICAL AND AESTHETIC DERMATOLOGY, February 2023, Volume 16, Number 2

Background: Skin bio-revitalization improves skin quality globally; it permits the rejuvenation of the skin by increasing hydration and by reconstructing an optimal physiological environment for the skin cells together with a micro-filling effect. OBJECTIVE: To assess the comparative efficacy of a non-cross-linked hyaluronic acid (NCHA) preparation (M-HA®10, FILLMED Laboratories, France) on fine lines reduction and on skin hydration, radiance and mechanical properties, after three sessions of multiple intradermal injections, active versus placebo, on the face of subjects presenting aging signs. Methods: Thirty healthy subjects received filler injections on one side and a control solution (saline) on the

contralateral side of the face. Fine lines depth, skin hydration, and mechanical properties were evaluated using instrumental methods. Skin radiance, cheek fold and crow's feet were scored clinically. In addition, Investigator and subject satisfaction rates were evaluated by the Global Aesthetic Improvement Scale and a subject self-assessment questionnaire. Results: Ten days after the last multi-injection session, the following significant results were observed compared to the control: a reduction of both crow's feet wrinkle depth (in the 110 to 1000µm range, -10% for NCHA and +7% for control) and clinical scoring of cheek wrinkles, and increases in skin radiance and hydration (+35%) and also skin firmness (+27%). The Investigator found that NCHA either improved or much improved the aesthetic aspect on 82% of subjects whereas no improvement was found on the saline side. Subjects found that NCHA significantly reduced wrinkles and increased both skin firmness and elasticity. Conclusion: Intradermal injection of NCHA can improve the quality of facial skin with aging signs by reducing fine wrinkles and improving hydration, firmness and radiance.

L. Rocha Mota, I. da Silva Duarte, T. Rodrigues Galache, K.M. Dos Santos Pretti, O. Chiarelli Neto, L. Jansiski Motta, A. C. Ratto Tempestini Horliana, D. de Fátima Teixeira da Silva, C. Pavani, **Photobiomodulation Reduces Periocular Wrinkle Volume by 30%: A Randomized Controlled Trial**, Photobiomodul Photomed Laser Surg., 2023 Feb;41(2): p. 48-56

Objective: This study aimed to evaluate red and amber light-emitting diode protocols for facial rejuvenation at the same light dose. Background: The demand for minimally invasive cosmetic procedures to address skin aging has grown throughout the world. In vitro red and amber photobiomodulation (PBM) has been shown to improve collagen synthesis. Meanwhile, red PBM has already been studied in clinical trials; however, a comparison of the use of different wavelengths at the same light dose to reduce periocular wrinkles has not yet been performed. Methods: This split-face, randomized clinical trial recruited 137 women (40-65 years old) presenting with skin phototypes II-IV and Glogau photoaging scale types II-IV. The individuals received 10 sessions for 4 weeks of red (660 nm) and amber (590 nm) PBM (3.8 J/cm), one at each side of the face. The outcomes, measured before and after the treatments, were the periocular wrinkle volume measured by VisioFace RD equipment; hydration measured by the Corneometer CM 825; skin elasticity measured by the Cutometer Dual MPA 580; and quality of life determined by adapted versions of validated questionnaires [Melasma Quality of Life Scale-Brazilian Portuguese (MelasQoL-BP) and Skindex-29]. Results: There was a significant reduction in wrinkle volume after red (31.6%) and amber (29.9%) PBM. None of the treatments improved skin hydration and viscoelasticity. Both questionnaires showed improvements in participants' quality of life. Conclusions: PBM, both at red and amber wavelengths, is an effective tool for rejuvenation, producing a 30% wrinkle volume reduction. The technique has strong potential in patients with diabetes or those presenting with keloids, conditions for which highly inflammatory rejuvenating procedures are not indicated. Clinical trial registration number: REBEC-6YFCBM.

F.J. Klimitz, H Neubauer, A. Stolle, S. Ripper, S.C. Daeschler, M. Aman, A. Boecker, B. Thomas, U. Kneser, L. Harhaus, **Objective Burn Scar Assessment in Clinical Practice Using the Cutometer©: Introduction and Validation of a Standardized Measurement Protocol**, Journal of Burn Care & Research January/February 2023

An objective burn scar assessment is essential to informed therapeutic decision-making and to monitor scar development over time. However, widely employed scar rating scales show poor inter-rater reliability. For this study we developed a standardized measurement protocol for the Cutometer© applicable for objective burn scar assessment in everyday clinical practice. We developed a measurement protocol for the Cutometer© MPA 580 including a scar site relocation technique based on anatomical landmarks. The protocol emerged through several steps: Identifying key factors for valid and reliable measurements, preliminary testing, specification of technical details, refning the protocol and fnal testing. Consecutively, the protocol was validated for inter-rater reliability by assessing 34 burn scars in 17 patients by four clinicians and computing an Intraclass Correlation Coeffcient (ICC). Parameter *R*0, representing scar pliability, was identifed as the best suited output parameter yielding excellent inter-rater reliability for average measures (ICC 0.92 [95% CI 0.86; 0.96]) and acceptable reliability for single measures (ICC: 0.74 [0.61; 0.84]). The pressure applied on the measuring probe was identifed as an influential confounding factor for reliable measurements. Rater gender did not influence reliability of measurements. The introduced standardized measurement protocol for the Cutometer© MPA 580 enables an objective and reliable burn scar assessment for clinical as well as research purposes.

L. Rocha Mota, I. da Silva Duarte, T. Rodrigues Galache, K.M. Dos Santos Pretti, O. Chiarelli Neto, L. Jansiski Motta, A.C. Ratto Tempestini Horliana, D. de Fátima Teixeira da Silva, C. Pavani, **Photobiomodulation Reduces Periocular Wrinkle Volume by 30%: A Randomized Controlled**

Trial, Photobiomodul Photomed Laser Surg, 2023 Feb;41(2): p. 48-56

Objective: This study aimed to evaluate red and amber light-emitting diode protocols for facial rejuvenation at the same light dose. Background: The demand for minimally invasive cosmetic procedures to address skin aging has grown throughout the world. In vitro red and amber photobiomodulation (PBM) has been shown to improve collagen synthesis. Meanwhile, red PBM has already been studied in clinical trials; however, a comparison of the use of different wavelengths at the same light dose to reduce periocular wrinkles has not yet been performed. Methods: This split-face, randomized clinical trial recruited 137 women (40-65 years old) presenting with skin phototypes II-IV and Glogau photoaging scale types II-IV. The individuals received 10 sessions for 4 weeks of red (660 nm) and amber (590 nm) PBM (3.8 J/cm), one at each side of the face. The outcomes, measured before and after the treatments, were the periocular wrinkle volume measured by VisioFace RD equipment; hydration measured by the Corneometer CM 825; skin elasticity measured by the Cutometer Dual MPA 580; and quality of life determined by adapted versions of validated questionnaires [Melasma Quality of Life Scale-Brazilian Portuguese (MelasQoL-BP) and Skindex-29]. Results: There was a significant reduction in wrinkle volume after red (31.6%) and amber (29.9%) PBM. None of the treatments improved skin hydration and viscoelasticity. Both questionnaires showed improvements in participants' quality of life. Conclusions: PBM, both at red and amber wavelengths, is an effective tool for rejuvenation, producing a 30% wrinkle volume reduction. The technique has strong potential in patients with diabetes or those presenting with keloids, conditions for which highly inflammatory rejuvenating procedures are not indicated.

J. Kim, Y.I. Lee, S. Mun, J. Jeong, D.-G. Lee, M. Kim, H.W. Jo, S. Lee, K. Han, J.H. Lee, **Efficacy and Safety of Epidermidibacterium Keratini EPI-7 Derived Postbiotics in Skin Aging: A Prospective Clinical Study**, Int. J. Mol. Sci. 2023, 24, 4634

The present study investigated the effect of topical application of Epidermidibacterium Keratini (EPI-7) ferment filtrate, which is a postbiotic product of a novel actinobacteria, on skin aging, by performing a prospective randomized split-face clinical study on Asian woman participants. The investigators measured skin biophysical parameters, including skin barrier function, elasticity, and dermal density, and revealed that the application of the EPI-7 ferment filtrate-including test product resulted in significantly higher improvements in barrier function, skin elasticity, and dermal density compared to the placebo group. This study also investigated the influence of EPI-7 ferment filtrate on skin microbiome diversity to access its potential beneficial effects and safety. EPI-7 ferment filtrate increased the abundance of commensal microbes belonging to Cutibacterium, Staphylococcus, Corynebacterium, Streptococcus, Lawsonella, Clostridium, Rothia, Lactobacillus, and Prevotella. The abundance of Cutibacterium was significantly increased along with significant changes in Clostridium and Prevotella abundance. Therefore, EPI-7 postbiotics, which contain the metabolite called orotic acid, ameliorate the skin microbiota linked with the aging phenotype of the skin. This study provides preliminary evidence that postbiotic therapy may affect the signs of skin aging and microbial diversity. To confirm the positive effect of EPI-7 postbiotics and microbial interaction, additional clinical investigations and functional analyses are required.

V. Rego Moraes, M. Oliveira Melo, P.M.B.G. Maia Campos, **Evaluation of Morphological and Structural Skin Alterations on Diabetic Subjects by Biophysical and Imaging Techniques**, Life 2023, 13, 579

Diabetes causes increased production of advanced glycation end products (AGEs), which may lead to irreversible damage to collagen fibers, and early and more accentuated signs of skin aging. Thus, the objective of this study was to evaluate diabetic skin’s mechanical and morphological characteristics and compare these to healthy skin. Twenty-eight female participants aged between 39 and 55 years were enrolled: half had type 2 diabetes, and the others were healthy. Wrinkles, transepidermal water loss (TEWL), stratum corneum water content, skin color, elasticity, morphological and structural characteristics of epidermis and dermis echogenicity were evaluated using biophysical and skin imaging techniques. Higher TEWL values were observed in participants with diabetes, who also showed lower skin elasticity and wrinkles with greater volume, area, and depth. In addition, the Reflectance Confocal Microscopy (RCM) imaging analysis showed that all participants with diabetes presented polycyclic papillae and deformed and amorphous collagen fibers. The obtained data showed significant differences between healthy and diabetic skin and could help develop more specific topical treatments to improve the treatment of skin conditions in people with diabetes. Finally, RCM is an advanced imaging technique that allows for a more profound analysis of diabetic skin, which could assist in the evaluation of dermocosmetic treatments to improve the skin alterations caused by this disease.

A. Markiewicz-Tomczyk, E. Budzisz, A. Erkiert-Polguj, **A Subjective and Objective Assessment of Combined Methods of Applying Chemical Peels and Microneedling in Antiaging Treatments**, J. Clin. Med. 2023, 12, 1869

Combined methods of applying chemical peels and antioxidants could be an option for skin rejuvenation with no down-time. The penetration of active substances can be enhanced by microneedle mesotherapy. The study was conducted on a group of 20 female volunteers, aged 40–65 years. All volunteers received a series of eight treatments performed every seven days. The whole face was first treated with azelaic acid; following this, the right side received a 40% solution of vitamin C and the left side 10% vitamin C with microneedling. Hydration and skin elasticity were markedly improved, with better results observed on the microneedling side. Melanin and erythema index decreased. No significant side effects were seen. The combination of active ingredients and delivery techniques have great potential to enhance the effectiveness of cosmetic preparations, probably by multidirectional ways of action. In our study, we demonstrated that both 20% azelaic acid + 40% vitamin C treatment and 20% azelaic acid + 10% vitamin C + microneedle mesotherapy efficiently improved the assessed parameters of aging skin. However, the use of microneedling mesotherapy as a means of direct delivery of active compound to the dermis enhanced the effectiveness of the studied preparation.

Ò. Exposito, A. Guirado, R. Vallecillo, A. Gallego, M. Mas, P. Riera, D. Luna, S. Laplana, T. Ruiz, S. Ruiz, M. Gibert, **Noni active for skin microbiota rejuvenation**, PERSONAL CARE MAGAZINE, February 2023

Traditionally, the hallmarks of ageing included a variety of aspects from the telomere shortening, the oxidative stress and the cellular senescence until epigenetics, among others. Nowadays, we know that the skin microbiota plays a key role in cutaneous homeostasis, and the skin microbial ecosystem evolves with age. The skin microbiota also ages. The cutaneous microbiota evolves as we age, so the skin microbial profiles can predict our age with a margin error precision of four years. Thus, the skin microbiota ages, and the characteristic trait of this process is that its behaviour changes to virulence. This change with its relationship with the host affects the ageing, including the skin. The resulting microbial postbiotic is rich in senile biome markers (SBMs).

L. Ma, Y. Niu, C. Yuan, T. Bai, S. Yang, M. Wang, Y. Li, L. Shao, **The Characteristics of the Skin Physiological Parameters and Facial Microbiome of "Ideal Skin" in Shanghai Women**, Clinical, Cosmetic and Investigational Dermatology 2023: 16, p. 325–337

Purpose: Everyone pursues perfect skin, but there exist significant differences between cultures, and no commonly accepted standards have been established. Therefore, our study attempted to define the "ideal skin" of oriental women and analyze the relationship between different skin physiological parameters and microbiomes. Patients and Methods: Based on our customized grading standard, the VISIA CR photos of 111 young women aged from 18 to 25 in Shanghai were collected and scored by the severity of pores, acne, spots, and wrinkles. The volunteers were then divided into "ideal skin" (W1), "normal skin" (W2), and "undesirable skin" (W3) groups. The physiological parameters of facial skin were measured by non-invasive instrumental methods, and the skin microbiome was analyzed by 16S rRNA and ITS high-throughput sequencing. Results: From "ideal skin" to "undesirable skin", the skin physiological parameters, α-diversity, and composition of the facial microbiome showed noticeable regular changes. Compared with the "normal skin" (W2) and "undesirable skin" (W3), the "ideal skin" (W1) group had lower sebum content, TEWL, melanin, hemoglobin, and roughness but higher hydration content and skin pH value. Furthermore, the Shannon index of skin bacteria was significantly increased in W1 (P = 0.004), suggesting that the ideal skin had higher species diversity. From W1 to W3, the species composition was changed significantly. The abundance of *Actinobacteria* was increased, while *Proteobacteria* and *Bacteroidetes* were decreased. Correspondingly, the abundances of lipophilic *Propionibacterium* and *Malassezia* were increased, while the abundances of *Stenotrophomonas, Pseudomonas, Ralstonia*, and *Streptococcus*, were significantly decreased. Additionally, Spearman correlation analysis revealed strong correlations between the physiological parameters and the microbiota. Notably, the Shannon index of skin bacteria was significantly positively correlated with skin hydration (P = 0.03) but negatively correlated with the abundance of *Cutibacterium* (P = 0.000), hemoglobin content (P = 0.025), and sebum content (P = 0.5). Therefore, the skin hydration content and the abundance of *Cutibacterium* played an important role in maintaining the α-diversity and skin homeostasis. Conclusion: Ideal skin had better water-oil balance and barrier function, higher microbial diversity, and more reasonable species distribution. Therefore, daily skincare needs to control skin oil and maintain skin microecological balance to achieve ideal skin conditions for young women aged 18–25 years old.

H. Falholt Elvebakken, A. Bech Bruntse, C. Vedel, S. Kjærulff, **Topical *Lactiplantibacillus plantarum***

LB244R® ointment alleviates skin aging: An exploratory trial, J Cosmet Dermatol. 2023;22: p. 1911–1918

Background: The skin is of vital importance for health and well-being. As people age, the skin undergoes visual and morphological changes such as wrinkling, loss of elasticity, increased pigmentation, and decreased cell turnover. This is not only visually unappealing to many but can also pose health issues. Aim: In this study, a probiotic ointment (PO) containing live lactic acid bacteria (LAB) (Lactiplantibacillus plantarum LB244R®) was investigated for its ability to alleviate symptoms of skin aging in an exploratory clinical trial. Methods: The PO was applied twice daily for 56 days by 21 subjects. Anti-aging efficacy was evaluated by skin ultrasonography, skin biomechanical properties, skin hydration, and clinical evaluations at day 0, 28, and 56. Results: Sub-epidermal low echogenic band thickness decreased (0.261 ± 0.069 mm to 0.247 ± 0.055 mm) after 56 days. Dermal density increased (324.689 ± 57.506 pixel/mm2 to 367.831 ± 75.790 pixel/mm2). Skin hydration increased (34.1 ± 6.9 to 51.3 ± 10.0 AU). Additionally, skin firmness increased, as shown by decreasing values (0.264 ± 0.038 to 0.228 ± 0.037 mm). Skin elasticity increased (0.578 ± 0.045 to 0.618 ± 0.044). Trans-epidermal water loss decreased (9.1 ± 2.0 g/h/m2 to 8.5 ± 1.3). All clinical evaluations, Crow's feet, spot score, smoothness score, and complexionradiance, were improved. Conclusion: The PO improved all measured parameters with statistical significance after 56 days of application, clearly demonstrating the potential of the PO as an antiaging agent and reaffirming the potential of topical probiotic LAB. Future studies need to elucidate the mode of action of anti-aging effects by probiotics, but at present time, this study paves the way for the use of probiotic LAB topically to alleviate aging of the skin.

K. Shoji, A. Kameda, K. Furuichi, **Effects of Milk Amazake on Skin Elasticity, Hydration, and Transepidermal Water Loss: An 8-Week DoubleBlind, Randomized, Controlled Trial**, Journal of Oleo Science, 72, (3) p. 329-335 (2023)

Amazakes made from rice and *koji* mold are rich in nutrients, such as groups of vitamin B, minerals, essential amino acids, and oligosaccharides, and can improve skin moisturization. However, there are few reports on milk amazake, made from milk and *koji* mold. Therefore, in this double-blind, randomized controlled trial, we investigate the effect of milk amazake on skin function. Healthy women and men (n = 40) were randomly allocated to the milk amazake or placebo group. The test beverage was consumed once daily for 8 weeks. Skin elasticity, hydration, and transepidermal water loss (TEWL) were measured at baseline and at weeks 4 and 8, and all subjects completed the trial. Skin elasticity (R2 and R5) at 8 weeks was significantly increased in the milk amazake group compared with baseline. In addition, changes in R5 in the milk amazake group were significantly higher than those in the placebo group. Conversely, TEWL, an evaluation item of skin moisturizing function at 8 weeks, was significantly decreased in the active group compared with baseline. In conclusion, milk amazake may be useful as a functional food for improving skin function.

M. Chopin-Doroteo, E. Krötzsch, **Soap or alcohol-based products? The effect of hand hygiene on skin characteristics during the COVID-19 pandemic**, J Cosmet Dermatol. 2023;22: p. 347–353

Background: Different strategies for hand skin hygiene have been used to prevent the spread of SARS-CoV-2. However, frequent hand sanitization has been associated with skin damage. The present study aimed to evaluate hand hygiene habits during the COVID-19 pandemic and the effect of the repetitive use of soap or alcohol-based products on skin characteristics. Methods: We conducted a survey regards hand hygiene habits acquired during theCOVID-19 pandemic. Also, we performed cutometry in a cohort of individuals who cleansed their volar forearms every 30 min, during 4 h, using soap or alcohol-based products. Results: We received 138 responses from people with medium-high educational level who reported a 2.5-time increase in the frequency of hand cleansing ($p < 0.0001$) that resulted in skin damage. An in vivo analysis of skin moisture and elasticity was also performed among 19 health workers and students. In general, skin moisture decreased with every cleansing, mainly after 2 h of washing with soap ($p < 0.01$), while skin elasticity only reduced after 4 h of treatment ($p < 0.05$). Alcohol-based solution or alcohol-based gel (70% ethanol, both) did not affect skin moisture or elasticity during testing. Conclusion: It is known that the excessive use of soap or alcohol-based products causes dermatological issues. The present study demonstrates that non-medicated soap significantly affects skin moisture and elasticity, probably because the soap removes the hydrolipidic protective barrier, favoring transepidermal water loss, where the lack of the appropriate stratum corneum hydration also affects skin elasticity, mainly associated with changes in epidermal structure.

Q. Wang, F. Hu, X. Hu, Y. Xie, L. Du, R. Ye, **The synergistic effect of retinyl propionate and hydroxypinacolone retinoate on skin aging**, J Cosmet Dermatol. 2023;22: p. 2040–2049

Background: Aging is responsible for the majority of skin and soft tissue remolding in humans. Retinol and its derivatives or retinoids effectively intervene skin aging process. Nevertheless, retinoids

usually induce skin intolerance, especially among the Chinese, and thus, their application to prevent skin aging is yet to be well accepted. The study of optimal composition and concentration of retinoids is necessary to offer strong antiaging efficacies with minimum irritations. Therefore, a better understanding of retinol and its derivatives is acutely needed to develop strategies to combat skin aging.Objective: In this study, we aimed to determine the optimal ratio of two retinol derivatives— hydroxypinacolone retinoate (HPR) and retinyl propionate (RP) in terms of dermal remodeling and skin aging prevention— and to investigate their synergistic antiaging effects both in vitro and in vivo. Methods: An in vitro human foreskin fibroblast (HFF-1) cell model was established to evaluate the cell viability of HPR and/or RP treatment. In addition, the antiaging and retinol receptor genes expressions in HFF-1 cells cotreated with HPR and RP were quantified. The in vivo adverse reaction evaluation of skincare serums containing various levels of retinol or the optimal HPR and RP combination termed Gravi-A was performed by 24 h patch tests in 33 subjects prior to the clinical research. Last but not the least, clinical research with 42 Chinese urban women was conducted to assess the in vivo antiaging efficacy of the skincare serum containing this optimal retinoid combination. Results: The combination of HPR and RP at the weight ratio of 5:9 was shown to achieve the optimal in vitro antiaging performance. Coadministration of 5 μg/mL HPR nd 9 μg/mL RP to HFF-1 cells promoted their proliferation at 24 h and synergistically enhanced the expressions of type IV collagen, CRBP-I, and RARB genes. In addition, the skincare serum containing HPR and RP combination at 5:9 weight ratio demonstrated superior in vivo anti-wrinkle and skin elasticity improvement benefits without any adverse reactions, while retinol in the same concentration exerted much higher adverse effect. Skin wrinkles, skin smoothness, TEWL, skin elasticity R2 and R5 were improved by 8.3%, 11.9%, 25.7%, 14.5%, and 22.6%, respectively, after 8-week use. Conclusion: Our results indicated the advanced antiaging effect of HPR and RP combination both in vitro and in vivo. In addition, little adverse effect was observed in this study, in comparison with retinol. This combination named as Gravi-A is a potential therapeutic strategy to prevent skin aging, especially for Chinese women.

V. Nobile, I. Schiano, L. Germani, E. Cestone, P. Navarro, J. Jones, N. Caturla, **Skin Anti-Aging Efficacy of a Four-Botanical Blend Dietary Ingredient: A Randomized, Double Blind, Clinical Study**, Cosmetics 2023, 10, 16

Plant polyphenols have been found to be effective in preventing or reducing different skin alterations. A dietary approach based on these compounds could be a safe and effective method to slow down or prevent age-associated deterioration of skin appearance and function. In a previous study, a specific combination of four botanical extracts (pomegranate, sweet orange, herba *Cistanche,* and *Centella asiatica*) exhibited potential anti-aging effects in a dermal fibroblast cell model. The present study aims to clinically evaluate the safety and anti-aging efficacy of this new botanical ingredient (eternalyoung®). To this end, a 12-week randomized, double-blind, placebo-controlled study was carried out in 60 Caucasian women with evident signs of both chronoand photoaging. Product efficacy was measured as follows: skin moisturization (corneometer), transepidermal water loss (tewameter), skin radiance, and color (spectrophotometer), skin elasticity and firmness (cutometer), skin roughness (image analysis), and skin thickness (ultrasound). Both intergroup and intragroup analysis proved that the daily intake of 225 mg of the active ingredient was enough to produce visible and structural improvements to the skin and to the signs of aging without any side effects. Statistically significant improvements compared to the placebo group were observed as early as 4 weeks regarding wrinkle depth, elasticity, firmness, skin thickness, skin moisturization, transepidermal water loss, and dark spots pigmentation. In addition, the subjects who consumed the blend reported better scores on the self-assessment questionnaires. Our results suggest that the intake of the test product can positively affect the appearance, barrier function, and skin density of aged skin after 12 weeks of treatment.

B. Yeni, A. Dermietzel, C. Varnava, P. Wiebringhaus, M. Aitzetmueller, M.-L. Klietz, T.Hirsch, M. Kueckelhaus, **Transgenic skin biomechanical properties following frst lifesaving epidermal regeneration using combined gene and cell therapy**, JDDG: Journal der Deutschen Dermatologischen Gesellschaft. 2023;21: p 245–252

Background: In 2017, we reported the first life-saving regeneration of virtually an entire epidermis by combined gene and stem cell therapy. Recently, we demonstrated excellent long-term stability of this transgenic epidermis. Skin quality in this experimental approach and its potential application in other conditions were elucidated here regarding long-term outcomes of biomechanical properties. Patients and methods: Analysis of biomechanical properties including skin elasticity, anisotropy and friction was performed on multiple body sites 24, 36 and 60 months following transplantation. Firstly, the sites were matched against and compared to remaining stable non-transgenic areas as well as to a control group of 13 healthy subjects. Parameters for skin elasticity, deformation and friction were assessed non-invasively. Results: Biomechanical properties of the

transgenic epidermis showed encouraging results in comparison to both the remaining stable non-transgenic skin as well as healthy controls. Skin elasticity was comparable to the controls. Skin friction showed some decrease in both transgenic and non-transgenic areas as compared to the controls. Conclusions: The excellent functional outcomes of the transgenic epidermis demonstrate stable long-term results of this novel combined gene and stem cell therapy for epidermal regeneration. Thus, other applications for this technology, such as treatment of specific burns, should be explored.

L.T. Thuy Le, B.-K. Kim, P.N. Chien, K.-W. Choi, H.-B. Kim, U.-J. Hwang, H.S. Han, C.-Y. Heo, **Investigating the Anti-Aging Effects of Caviar Oil on Human Skin**, in vivo 37: p. 2078-2091 (2023)

Background/Aim: As the largest organ of the human body, the skin serves as a critical barrier against environmental damage. However, many factors, such as genetics, sun exposure, and lifestyle choices can lead to skin damage creating wrinkles, sagging, and loss of elasticity. The use of skincare products containing natural ingredients has become increasingly popular as a way to combat the signs of aging. Caviar oil is one such ingredient that has gained attention due to its rich composition of fatty acids, vitamins, and minerals. The objective of this study was to investigate the potential anti-aging effects of caviar oil and to develop a product, Cavi Balm, which could potentially reduce wrinkles and skin sagging. Materials and Methods: An in vitro model using the 3T3-L1 cell line was employed to assess the effect of caviar oil on adipocyte differentiation. An ex vivo study using human skin tissue was conducted to investigate the impact of caviar oil on collagen and elastin formation and the expression of matrix metalloproteinase-1,2,9 (MMP-1, MMP-2, MMP-9). Furthermore, 102 participants were enrolled in five clinical studies to evaluate the anti-aging efficacy of our product, “Cavi Balm”, in facial and neck wrinkles, facial and eye area lifting, and various skin parameters, such as skin moisture, skin elasticity, skin density, skin tightening relief, skin clarity, and skin turnover. Results: In vitro, caviar oil enhanced adipocyte differentiation, and increased lipid accumulation inside the cells. The ex vivo analysis revealed that caviar oil reduced the expression levels of MMP-1, MMP-2, and MMP-9, and increased the formation of elastin and collagen I, III. Moreover, in the clinical study, Cavi Balm improved skin parameters after one-time use, with more significant effects observed after four weeks of usage. Conclusion: Caviar oil has a substantial impact on mitigating skin aging and holds potential for application in anti-aging products.

R. Lubart, A. Lipovsky, **Immediate and Long Term Clinical Benefits of a Novel Topical Micronized Collagen Face Cream**, Journal of Cosmetics, Dermatological Sciences and Applications, 2022, 12, p. 153-163

Collagen has been a component of skin care formulations for many years, and over this time, there have been numerous claims of its efficiency. Collagen protein is responsible for firm strong skin, but since collagen fibers are too large to penetrate the stratum corneum (SC), topical creams containing collagen fibers remain on the skin surface without affecting skin quality. To overcome the poor penetration of collagen fibers, we prepared in the past micronized collagen fibers that were proven to reach the epidermis layer while inserted in a cream. In the present paper, we have performed a clinical study that analyzes the effect of the micronized fibrillar collagen containing cream on skin. Fifty five healthy female volunteers were enrolled and completed the study. The anti-ageing, firming, elasticity and moisturization efficacy of the cream were measured using Profilometer, Cutometer and Corneometer respectively. The results showed a significant improvement in skin hydration firmness and elasticity, a significant reduction in fine lines and wrinkles was also observed.

Y. Wang, Y. Song, **Effcacy of Combined Treatment with Intense Pulsed Light and Erbium Fractional Laser in Striae Gravidarum**, Clinical, Cosmetic and Investigational Dermatology 2022:15, p. 2817–2824

Purpose: Laser and intense pulsed light (IPL) treatments are preferred over invasive procedures due to less pain. This study looked at the effcacy and safety of IPL and Erbium fractional laser for patients with striae gravidarum (SG). Patients and Methods: All 60 patients with SG were successfully enrolled in the study. IPL treatment was followed by Erbium fractional laser (wavelength 2940 nm) treatment at 4-week intervals for a total of three treatments. SG elasticity was assessed with a SEM575 custom instrument and patients were scored for SG span with an Antera 3D multifunctional skin imaging analyzer. A 3D skin impact system was used to assess patients’ epidermal thickness. A visual analog scale (VAS) was used to assess patients’ pain scores during the treatment period. Improvement in stretch marks was assessed with the Global Aesthetic Improvement Scale (GAIS). The occurrence of adverse events was recorded at a follow-up of 3 months. Patient satisfaction with the outcome of the treatment was also recorded. Results: Area of stretch marks decreased from 7.89 ± 0.49 cm2 pre-treatment to 4.94 ± 1.16 cm2 post-treatment ($P < 0.001$). The grayness values and atrophy of stretch marks were reduced after treatment. Furthermore, skin elasticity and thickness at the lesions of patients

increased signifcantly after the treatment (P < 0.001), while the width of the stretch marks signifcantly decreased (P < 0.001). The VAS score was 5.45 ± 1.31, the incidence of adverse events was 25%, and patient satisfaction with the effcacy was 96.67%. Conclusion: IPL combined with Erbium fractional laser improves the area and atrophy of SG, lightens the color, and increases the elasticity and thickness of the skin, with high treatment safety and remarkable clinical results.

K. Wu, Z. Liu, W. Wang, F. Zhou, Q. Cheng, Y. Bian, W. Su, B. Liu, J. Zha, J. Zhao, X. Zheng, **An artificially designed elastin-like recombinant polypeptide improves aging skin**, Am J Transl Res 2022;14(12): p. 8562-8571

Background: As a substrate for cell growth, elastin can promote the regeneration and remodeling of the epidermis, which plays an important role in delaying skin aging. However, elastin proteins are more than 700 amino acids long and cannot be absorbed through the skin, which prevents the direct utilization of elastin in the prevention and treatment of aging skin. Methods: We designed an elastin-like recombinant polypeptide (ELR) which could be absorbed through the skin based on the property of hexapeptide VGVAPG. Thirty healthy Chinese Han female participants which met the criteria were enrolled in this study and all of them completed the tests including elasticity, tightness, and wrinkle detection. The participants used this polypeptide for 4 weeks and were tested in three visits: one day before trial started (D0), and 14 and 28 days after the trial (D14 and D28, respectively). Paired t-tests or Wilcoxon signed-rank tests for non-parametric measures were used to determine the difference between D0 and D14, or D0 and D28. Results: The skin elasticity level in the thirty participants was significantly increased after using ELR for 28 days (P=0.024), and the average value of skin firmness (Uf) declined from 3.313 (D0) to 3.292 (D14) and 3.265 (D28), although there was no statistically significant difference between treatment and pre-treatment. Furthermore, the wrinkle count (D14: P<0.001; D28: P<0.001), wrinkles volume (D14: P<0.001; D28: P=0.008), and wrinkles area (D14: P<0.001; D28: P<0.001) of Crow's feet were significantly improved by using ELR for 14 days or 28 days. Conclusion: Continuous use of ELR could significantly improve skin elasticity and reduce wrinkles.

J. Sim, S.D. Gong, G. Kang, M. Jang, H. Yang, J. Park, Y. Kim, H. Lee, H. Jung, Y. Kim, C. Jeon, H. Ahn, M. Kim, J. Choi, H. Lee, H. Jung, **Enhanced Micro-Channeling System via Dissolving Microneedle to Improve Transdermal Serum Delivery for Various Clinical Skincare Treatments,** Pharmaceutics 2022, 14, 2804

Topical liquid formulations, dissolving microneedles (DMNs), and microscale needles composed of biodegradable materials have been widely used for the transdermal delivery of active compounds for skincare. However, transdermal active compound delivery by topical liquid formulation application is inhibited by skin barriers, and the skincare efficacy of DMNs is restricted by the low encapsulation capacity and incomplete insertion. In this study, topical serum application via a dissolvable micro-channeling system (DMCS) was used to enhance serum delivery through micro-channels embedded with DMNs. Transdermal serum delivery was evaluated after the topical-serum-only application and combinatorial serum application by assessing the intensity of allophycocyanin (APC) loaded with the serum in the porcine skin. APC intensity was significantly higher in the skin layer at a depth of 120–270 μm upon combinatorial serum application as compared to topical-serum-onlyapplication. In addition, the combinatorial serum application showed significantly improved efficacy in the clinical assessment of skin hydration, depigmentation, improvement of wrinkles, elasticity, dermal density, skin pores, and skin soothing without any safety issues compared to the serum-only application. The results indicate that combinatorial serum application with DMCS is a promising candidate for improving skincare treatments with optimal transdermal delivery of active compounds.

J. Droux, **Nature-inspired innovation: from resurrection plants to skin resilience,** Cosmetic Business, December 2022

Resurrection plants grow in deserts, where they have developed original biological pathways to resist drought and hot temperatures. When they are unable to find enough water in their surrounding environment to maintain normal biological processes, they dehydrate and put themselves in a pause mode until better environmental conditions return.

S. Faloni Andrade, T. Matos Ferreira, T. Fontes, S. Lopes, C. Ferreira-Pego, L.M. Rodrigues, **Dietary Patterns and Skin Physiology**, SPFisiologia Confrence, Coimbra, November 2022

The impact of dietary patterns on skin functions is still unclear. We examined cutaneous physiology characteristics between vegan-vegetarian (VG) and omnivorous (OM) participants, involving 122 healthy participants, both sexes, 82 OM (32.0 ± 13.1 y.o.) and 40 VG (34.0 ± 9.62 y.o) with similar Body Mass Indices. The protocol was previously approved by the institutional Ethical Commission. Main indicators were transepidermal water loss (TEWL), hydration, and biomechanics skin parameters in five

anatomical sites (forehead, cheek, neck, hand, and leg). Carotene skin content was determined in the hand palm by MultipleSpatially Resolved Reflection Spectroscopy. The food group intake was assessed using a validated Food Frequency Questionnaire. The dietary patterns and their impact on the skin were compared using MannWhitney test and correlations were investigated by the Spearman rank correlation coefficient ($p<0.05$). The carotenoid content was significantly higher in the VG group. TEWL has shown higher values in the VG group but significant differences could only be detected in the neck and leg. Concerning skin biomechanical parameters and hydration we could not find significant differences between the two groups. Looking for a potential relationship between the most frequent foods consumed by the two groups and skin physiology we found that vegetables, vegetable drinks, milk, yogurt, and cheese had a significant positive relationship with epidermal water balance. Alcoholic beverages and fast food showed a significant negative relationship with the same variables. Other significant correlations included a VG group positive correlation with the carotenoid content, and a OM group a negative correlation with red meat, viscera, alcoholic beverages, and sugar-sweetened beverages consumption. These results clearly suggest that skin physiology can beinfluenced by regular dietary patterns and should be further investigated.

P. Kubik, J. Jankau, R Rauso, H. Galadari, M. Protasoni, W. Gruszczyńsk, Dariusz Grzanka, M. Smolińska, P. Antosik, M.-L. Piesiaków, L. Kodłubańska, A. Zagajewska, B. Łukasik, G. Stabile, N. Zerbinati, **HA PEGylated Filler in Association with an Infrared Energy Device for the Treatment of Facial Skin Aging: 150 Day Follow-Up Data Report**, Pharmaceuticals 2022, 15, 1355

Background: The face is the area most exposed to the normal course of skin aging, both intrinsically and extrinsically. The aim of the study was to evaluate the cellular and clinical response of a therapeutic protocol aimed at countering facial skin aging. Materials and Methods: Twenty female patients with facial skin laxity and photodamage underwent combined therapy including mesotherapy using non-cross-linked hyaluronic acid with calcium hydroxyapatite and an infrared energy-based device treatment with subsequent implementation of PEG-cross-linked hyaluronicacid soft tissue fillers. To evaluate the benefits, patients underwent histological, immunological, and biomechanical evaluations before the treatment and at 21 and 150 days after the treatment. Results: The histological results at 21 days and 150 days after the procedure showed an increase in the number of fibroblasts and angiogenesis. As for the immunological aspect, it was shown that the treatment has an immunomodulating action, avoiding the activation of CD4 and CD8 cells. Biomechanical data showed that, at 150 days after treatment, the average changes in skin elasticity increased by 72% and the skin hydration increased by 49%. Conclusions: A combination of an infrared energybased device treatment with both non-cross-linked hyaluronic acid and novel PEG-cross-linked hyaluronic acid leads to numerous positive cutaneous changes after histological, immunological, and biomechanical evaluations.

S.Y. Joo, Y.S. Cho, J.W. Yoo, Y.H. Kim, R.I. Sabangan, S.Y. Lee, C.H. Seo, **Clinical Utility of the Portable Pressure-Measuring Device for Compression Garment Pressure Measurement on Hypertrophic Scars by Burn Injury during Compression Therapy**, J. Clin. Med. 2022, 11, 6743

Compression therapy for burn scars can accelerate scar maturation and improve clinical symptoms (pruritus and pain). This study objectively verified the effect of pressure garment therapy in maintaining a therapeutic pressure range for hypertrophic scars. Sixty-five participants (aged 20~70 years) with partial- or full-thickness burns, Vancouver scar scale score of ≥4, and a hypertrophic scar of ≥4 cm x 4 cm were enrolled. Compression pressure was measured weekly using a portable pressure-monitoring device to regulate this pressure at 15~25 mmHg for 2 months. In the control group, the compression garment use duration and all other burn rehabilitation measures were identical except for compression monitoring. No significant difference was noted in the initial evaluations between the two groups ($p > 0.05$). The improvements in the amount of change in scar thickness ($p = 0.03$), erythema ($p = 0.03$), and sebum ($p = 0.02$) were significantly more in the pressure monitoring group than in the control group. No significant differences were noted in melanin levels, trans-epidermal water loss, or changes measured using the Cutometer® between the two groups. The efficacy of compression garment therapy for burn-related hypertrophic scars can be improved using a pressure-monitoring device to maintain the therapeutic range.

J.L. Schiefer, F.G. Aretz, P.C. Fuchs, R. Lefering, P. Yary, C. Opländer, A Schulz, M. Daniels, **Comparison of Long-Term Skin Quality and Scar Formation in Partial-Thickness Burn Wounds Treated with Suprathel® and epicite^{hydro}® Wound Dressings**, Medicina 2022, 58, 1550

Background and Objectives: Scar formation after burn trauma has a significant impact on the quality of life of burn patients. Hypertrophic scars or keloids can be very distressing to patients due to potential pain, functional limitations, or hyper- or hypopigmentation. In a previous study comparing

Suprathel® and the new and cheaper dressing epicite$^{hydro®}$, we were able to show that pain reduction, exudation, and time until wound-healing of partial-thickness burn wounds were similar, without any documented infections. No study exists that objectively measures and compares skin and scar quality after treatment with Suprathel® and epicitehydro® at present. Materials and Methods: In this study, the scar quality of 20 patients who had been treated with Suprathel® and epicite$^{hydro®}$ was objectively assessed using the Cutometer®, Mexameter®, and Tewameter®, as well as subjectively with the Patient and Observer Scar Assessment Scale, 3, 6, and 12 months after burn injury. Results: In all performed measurements, no significant differences were detected in scar formation after treatment of partial-thickness burn wounds with the two dressings. Conclusions: Both the newer and less expensive wound-dressing epicite$^{hydro®}$ and the well-known wound-dressing Suprathel® resulted in stable wound closure and showed good cosmetic results in the follow-up examinations.

L. von Oppen-Bezalel, J.S. Jurenka, **Unleashing the power of Nigellasativa black seedoil**, PERSONAL CARE MAGAZINE, October 2022, p. 89-92

Oil from the small black seeds of *Nigella sativa* has been studied for its antiinflammatory, antioxidant, and anti-ageing benefits. To harness the power of *the N. sativa* seed oil, its active constituent, thymoquinone, and their demonstrated benefits, a patent-pending cold-pressed extract high in thymoquinone has been developed to deliver full-spectrum black seed oil, standardized to 3% thymoquinone and very low free fatty acids. Branded as B'utyQuin for cosmetic use, this coldpressed black seed oil has been studied in vitro to determine mechanisms related to mitochondrial biogenesis and revitalization. This has been followed by clinical researchto establish the safety, compatibility, and efficacy of B'utyQuin as a topical anti-ageing cosmetic aid for human skin. This placebo-controlled clinical trial demonstrates topical application to a variety of healthy skin types over 28 days yields statistically significant improvements in skin hydration, luminosity, firmness, and elasticity, when compared to a placebo cream, resulting in a more flawless appearance.

N. Kaul, **Clinical testing for a booming men's sector**, Personal Care Magazine, October 2022

The male grooming industry is growing at a rapid pace Entlre ailes of drug stores are dedicated to men s grooming products. Product demand in the skin care, hair care, and fragrance Industries has grown dramatically and is expected to keep pace in the coming years. Whether this growth stems from celebrity advertising or social media influence, one thing is clear: men have come a long way from the days of merely using a soap bar as face and body wash. The modern man stands ready and willing to invest in skin and hair products that maintain their health and youth.

T. Ezure, S. Amano, K. Matsuzaki, **Fat infiltration into dermal layer induces aged facial appearance by decreasing dermal elasticity,** Skin Research & Technology, October 2022

Background: Facial morphology changes with aging, producing an aged appearance, but the mechanisms involved are not fully established. We recently showed that subcutaneous fat infiltrates into the dermal layer with aging, but it is not yet clear whether and how this drastic change of the dermal layer influences facial appearance. Purpose: We aimed to establish the role of fat infiltration in producing an aged facial appearance and to clarify the mechanism involved. Methods: We analyzed the severity of fat infiltration in cheek skin of 30 middle-aged female volunteers by means of ultrasonography. Severity of the nasolabial fold, an established age-related morphology, was evaluated based on our photographic grading criteria as a measure of aged appearance. Skin elasticity was measured with a Cutometer. Results: Fat infiltration to the dermal layer was detected at the cheek skin noninvasively by means of ultrasonography. Fat infiltration severity, measured as the minimum depth of the fat inside the dermal layer from the skin surface, was positively correlated with the magnitude of the nasolabial fold. Further, fat infiltration severity was significantly negatively correlated with dermal elasticity. Conclusions: Our results suggest that fat infiltration into the dermal layer is a critical factor inducing aged appearance of the face. The infiltrated fat decreases the dermal elasticity, which exacerbates nasolabial folds, namely producing an aged facial appearance.

G. Salti, G. Siquier-Dameto, S. Rharbaoui, D.M. Hernandez Malgapo, S. Innocenti, M. Manni, **An Interim 6-Month Analysis of the Dermatologic Effects and Midface Volume Correction With XTRCL Filler in a Prospective, Single-Center Study**, Dermatol Surg 2023;49: p. 943–948

Background: Hyaluronic acid-based filler injections with parenteral anesthetics have become the standard in treating midface volume deficits. There are currently limited data on the effects of these types of fillers on skin density, thickness, and firmness. Objective: This study aimed to assess the efficacy of XTRCL filler in improving skin quality and tissue volume in women with midface volume loss. Materials and Methods: In this prospective, noncomparative, single-center study, 50women aged between 40 and 60 years with midface volume loss were recruited. The primary endpoint was the

improvement in investigator-assessed Global Aesthetic Improvement Scores (GAIS) 1 month after treatment. Secondary endpoints include objectivemeasurements of skin density, thickness, and quality measurements, facial and/or cheek volume augmentation, subjective GAIS, and device evaluation from after the first injection until 6 months, and the documentation of injection site reactions and adverse events. Results: XTRCL use led to significant improvement in midface volume deficits, and skin quality and skin thickness. Injector and subject satisfaction with the treatment were documented and only mild-to-moderate adverse reactions were reported.

A. Zabihi, S. Pashapour, M. Mahmoodi, **Cell Therapy and Investigation of the Angiogenesis of Fibroblasts with Collagen Hydrogel on the Healing of Diabetic Wounds**, Turk J Pharm Sci 2023;20(5): p. 302-309

Objectives: A diabetic ulcer is a common disease in patients with diabetes. Because of antibiotic resistance, new therapeutic alternatives are being considered in diabetic foot patients to reduce complications and mortality. This study aimed to evaluate the effect of collagen hydrogel on the wound-healing process in diabetic rats. Materials and Methods: Diabetic wounds were induced with streptozotocin in all 42 male Wistar rats. The rats were divided into four groups: (a) treated with fibroblast cells, (b) collagen hydrogel, (c) collagen cultured with fibroblast cells, and (d) a control group. Microscopic and histological (hematoxylin and eosin staining and Mason trichrome staining), measurement of wound surface with image J, skin density and thickness by the ultrasound probe, and skin elasticity with cutometer tool were used to evaluate wound healing at days 14 and 21 after the treatment. Results: The results showed that treating diabetic wounds with fibroblasts cultured in collagen hydrogel greatly reduces inflammatory responses in the skin tissue and significantly accelerates the healing process. In addition, 21 days after the start of treatment, skin elasticity, thickness, and density were higher in the collagen + fibroblast group than in the control group. Conclusion: In addition, the results of the present study show that diabetic wound dressing can significantly reduce the inflammatory phase in the wound healing process by increasing the speed of collagen synthesis, skin density and elasticity, and angiogenesis.

M.B. Young, W. Lai, T. Kononov, A.S. Zahr, **A Rejuvenating treatment targeting "tech neck" lines and wrinkles in Chinese women: A prospective, open-label, single-center study**, J Cosmet Dermatol. 2023;22: p. 226–235

Background: Aging of neck and jawline skin is caused by intrinsic and extrinsic factors and is evidenced by wrinkling, laxity, skin dyspigmentation, loss of the mandibular contour, accumulation of submental fat, density loss, and prominent platysma bands. Early intervention with topical cosmeceuticals, especially in younger subjects with "tech neck," can offer a solution and potentially mitigate aging of the neck and jawline. Aim: The objective of this prospective, open-label, single-center clinical study was to assess the efficacy and tolerability of a topical anti-aging neck treatment (TNT) in a cohort of Chinese women with mild to moderate signs of aging on the neck and jawline. Subjects/Methods: This study was approved by an ethics committee and involved healthy Chinese subjects. Thirty-five female subjects, 25–50 years old, with mild to moderate signs of aging of the neck and jawline were recruited. Subjects applied the TNT to the neck and jawline twice daily for 84 days. Long-term efficacy and tolerability, clinical photography, bioinstrumentation, and a self-assessment questionnaire were performed at baseline and post-baseline. Results: The TNT significantly improved horizontal neck fold lines and neck skin elasticity, hydration, gloss/radiance, and skin tone evenness post-baseline. Clinical photography and ultrasound corroborated these findings. The product was well perceived and well tolerated by subjects. Conclusion: This study demonstrated the TNT was effective against both extrinsic and intrinsic aging of the neck and jawline. The TNT provides a topical solution for Chinese women concerned with an aging appearance of the neck including "tech neck."

C. Gonindard, A. Werle, E. Magdeleine, S. Delaunois, C. Delluc, R. Te Halle, L. Guillotin, H. Chajra, M. Frechet, **Biomimetic Active Resurrects Skin's Adaptability to Climate Change**, Cosmetics & Toiletries, October 2022, p. 30-40

Skin and its microbiota are the body's primary barriers against external aggressions. Unfortunately, environmental stress can profoundly alter the skin's defense capacity, disrupting its homeostasis. These stresses initiate the generation of high levels of oxidative species, rendering cells more prone to damage such as protein alterations and DNA breakage. Moreover, the skin's metabolic capacities are lowered, resulting in a decrease in collagen synthesis, while elements of the extracellular matrix are degraded more rapidly, resulting in a fragile skin structure. Taken together, signs of premature aging arise and skin appears less healthy.

*Y. Du, C. Doraiswamy, J. Mao, Q. Zhang, Y. Liang, Z. Du, R. Vasantharaghavan, M. Kumar Josh*i,

Facial skin characteristics and concerns in Indonesia: A cross-sectional observational study, Skin Reasearch & Technology, Volume 28, Issue 5, September 2022, p. 719-728

Background: Facial skin characteristics and appearance vary according to ethnicity. While much of this knowledge is derived from the Caucasian population, lately there have been efforts to gain such understanding in various regions in Asia. In this paper, we have built an understanding of such features in Indonesia. In Indonesia, a section of females wears a traditional veil (hijab) to cover the scalp and part of face. The influence of the hijab on facial skin attributes was also investigated. Methods: In a cross-sectional observational study design involving 419 female volunteers in Jakarta, Indonesia, facial skin attributes (colour, radiance, hydration, trans-epidermal water loss [TEWL], wrinkles, fine lines, pores, and sebum levels) and conditions (melasma, post-inflammatory hyperpigmentation (PIH), solar lentigines/ senile lentigines, seborrheic keratoses and acne) were assessed by trained operators and dermatologists using standard validated instruments and scales. Results: With age, facial skin colour showed darkening in cheek; forehead on the other hand showed slight lightening. The skin evenness and radiance decreased, substantially. Aging attributes measured in terms of lines, wrinkles, and under-eye dark circles showed deterioration with age; the decline was progressively faster than colour change. Facial image data analysis corroborated these findings. Skin hydration remained similar across the age groups even though the skin barrier function measured in terms of TEWL improved with age. Sebum levels in the skin were similar up to the age of 50 but declined in the next group of 50–60 year. Pore severity increased with age. Melasma, seborrheic keratosis and PIH showed a high prevalence (>~50%) at the young age group (20–30 years), itself. Melasma prevalence attained 100% in the age group of 41–50 year and onwards, and its severity similarly showed a steady rise with age. PIH on the other hand showed a steady decline with age. Solar lentigines prevalence (~30%) did not change much across age groups, and the severity scores were similar in age groups up to 50 year but increased substantially in 51–60-year

A. Stolle, L. Harhaus, H. Ziegenthaler, **Abschlussbericht zum Vorhaben „Evaluation eines ICF-orientierten Rehabilitationskonzepts thermische Verletzungen“** (FR-0268), 22.09.2022

Ziele: Eine Brandverletzung kann schwerwiegende Folgen für alle Lebensbereiche eines Betroffenen haben. Die Verbesserung der Möglichkeiten zur Teilhabe ist Kernthema der Rehabilitation, die zunehmend mehr in den Fokus der Aufmerksamkeit rückt. Trotzdem existieren bis dato keine Studien, in denen ein verbrennungsspezifisches Rehabilitationsprogramm umfassend evaluiert wird. Daher wurde die Etablierung einer Verbrennungsrehabilitation erstmals an einer bg-lichen Einrichtung zum Anlass genommen, um eine solche Evaluation vorzunehmen. Dies auch mit dem Ziel, im Anschluss an die Studie ein evaluiertes und standardisiertes Behandlungsprogramm anderen Kliniken bereitstellen zu können. Methodik: Bei der Studie handelt es sich um ein prospektives Kohortendesign, das multizentrisch an zwei Kliniken (BG Klinik Ludwigshafen, Moritz Klinik) durchgeführt wurde. Eingeschlossen wurden n=103 gesetzlich unfallversicherte Patientinnen (n=4) und Patienten (n=99) nach thermischer Verletzung. Der Altersdurchschnitt lag bei 44 Jahren (IQR 35-56) und das Ausmaß der verbrannten Körperoberfläche (VKOF) bei 14,55% (IQR 5,75-25). Die Auswahl der Messinstrumente erfolgte in Anlehnung an die Bereiche der International Classification of Functioning, Disability and Health (ICF). Als Hauptzielvariable der Domäne Körperfunktion wurde die gesundheitsbezogene körperliche Lebenszufriedenheit des Short Form Health Survey SF-36 erhoben. Zusätzlich wurden objektive Werte wie z.B. Fitnesstest, Bewegungsausmaß, Kraftgrade erhoben. Für den Bereich Teilhabe wurde als Hauptzielvariable die gesundheitsbezogene psychische Lebenszufriedenheit des SF-36 erhoben und weitere Maße wie die Rückkehr zum Arbeitsplatz. Im Bereich Kontextfaktoren wurden als Hauptzielvariable die Skala Affekt und Beziehung des Burn Specific Health Scale-Brief (BSHS-B) erhoben und als sekundäre Outcomes die wahrgenommene soziale Unterstützung (Fragebogen zur sozialen Unterstützung F-SozU), die allgemeine (Symptom Checklist SCL-90-R) und die posttraumatische psychische Belastung (Impact of Event Scale-Revised IES-R). Die Untersuchungen erfolgten zu Beginn und am Ende der Rehabilitation sowie nach drei und 12 Monaten. Der Effekt der Rehabilitation wird im Prä-Post Vergleich überprüft und der Effekt der neu etablierten Rehabilitation (BG Klinik Ludwigshafen) auf Nicht-Unterlegenheit mit der schon lange bestehenden Rehabilitation (Moritz Klinik) geprüft. Die Analyse des Rehabilitationsprozesses wird anhand der individuellen Reha-Ziele, dem Grad der Zielerreichung, der Häufigkeit von Zieländerungen und der Zufriedenheit mit der Behandlung durchgeführt. Ergebnisse: Im Prä-Post-Vergleich zeigt sich ein guter und nachhaltiger Effekt der Rehabilitation an beiden Kliniken. Im Bereich Körperfunktion haben sich sowohl die subjektive Einschätzung der gesundheitsbezogenen körperlichen Lebensqualität (SF-36, $p<0,000$) als auch die objektiven Messwerte z.B. Handkraft, Bewegungsausmaß, Kraftwerte nach der Rehabilitation deutlich verbessert. Auch die psychische Belastung ist am Ende der Rehabilitation etwas reduziert (SF-36 psychische Summenskala), dies bleibt allerdings im Langzeitverlauf nicht bestehen ($p=0,204$). Bei der sozialen Teilhabe zeigt sich eine signifikante Verbesserung auf der Skala Affekt und

Beziehungen des BSHS-B (p=0,013). Bezüglich der beruflichen Teilhabe sind nach einem Jahr 73,6% der Stichprobe wieder voll arbeitsfähig und weitere 10,3% in Belastungserprobung. Mit der Behandlung in der Rehabilitation sind die Patientinnen und Patienten hoch zufrieden. Den Reha-Zielen sehen sie sich am Ende der Rehabilitation deutlich näher gekommen oder haben diese vollständig erreicht. Bezüglich der Zuordnung zu den ICF Bereichen betreffen die Ziele der Patientinnen und Patienten zu 66,8% die Domäne Körperfunktion und zu 33,2% die Domäne Aktivität und Partizipation. Fazit: Mit der vorliegenden Studie wird wissenschaftlich der positive und nachhaltige Effekt des untersuchten spezifischen Rehabilitationskonzepts für Brandverletzte nachgewiesen, welches in dieser Form auch anderen Kliniken zur Verfügung gestellt werden kann.

L. Sanchez, C. Thiebaut, ***Caesalpinia spinosa* for skin ageing protection**, PERSONAL CARE MAGAZINE, September 2022, p. 91-93

The term 'skin ageing exposome' refers to the external and internal factors and their interactions, affecting a human individual as well as the response of the human body to these factors that lead to biological and clinical signs of skin ageing. The skin exposome triggers oxidative stress, which causes protein glycosylation and the formation of advanced glycosylation endproducts (AGEs).

T. Ezure, S. Amano, K. Matsuzaki, N. Ohno, **A New World of Anti-Aging Skincare Targeting the Face-Wrapping "Tensional Network": "Ring-Collagen" - Paradigm Shift of Skin Analysis: From Visualizing Tangible to Intangible Targets**, 32nd IFSCC Congress London, September 2022

Background: Facial skin tightly "wraps" internal structures to retain facial morphology. However, the physical properties of the facial wrapping system are unknown, since intangible physical dynamics is inaccessible to current technology. Thus, we aimed to establish technology to visualize skin's physical dynamics, apply it to clarify the wrapping force, and develop an impactful anti-aging solution. Methods: Skin deformation/recovery was observed by X-ray micro-CT. Gene expression analysis (microarray/RNA-seq/real-time PCR) and immunohistochemistry were conducted in facial skin and cell/organ-culture systems. Skin physical/physiological properties and our skincare solution were evaluated in volunteers. Results: Skin 4D-physical dynamics was digitally reconstructed by artificial-intelligence-based skin movement tracking. Moreover, our high-speed autostereoscopy enables operating this digital skin in real-space, allowing free/intuitive analysis of complex physical dynamics (designated "skin-mechanics reality"). Skin-mechanics reality revealed ring-shaped high-tension areas in facial dermis. These consist of ring-shaped collagen, designated "ring-collagen", encircling a proteoglycan (PG) layer around fine hairs. Ring-collagen creates center-directed tension due to its characteristic fiber direction, and generates a tensional network that tightly "wraps" the face to maintain facial morphology. Ring-collagen deteriorates with aging, resulting in aged-appearance.Surprisingly, application of young skin's physical environment to organ-cultured skin ("environmental transplantation") regenerated ring-collagen via Wnt16 secretion (from hair follicles), which increases the PG layer. In volunteers, this treatment improved skin-wrapping force and aged-appearance. Conclusion: We realized 4D-visualization of intangible physical properties in real-space: "skin-mechanics reality". This enabled us to discover "ring-collagen", which produces facial wrapping force, fundamental machinery maintaining facial morphology. By targeting ring-collagen, we developed "environmental transplantation" as novel anti-aging skincare.

E. Doridot, E. Pinard, M. Leonard, C. Bondil, P. Mondon, **Characterisation of knee ageing by fringe projection, standardised pictures and viscoelastic methods**, 32nd IFSCC Congress London, September 2022

Skin ageing and its quantification is very well known on face. However, other sites are also very visible, and the knee is one of them. With age, knees become drier, wrinkled and suffer of ptosis. Our aim was to set up illustrative and quantitative methods to show and measure knee wrinkle changes through ageing and to get a reproducible and reliable method for, then, the evaluation of anti-ageing products. We developed specific methods, first is a standardised acquisition with a photographic bench, second consisted in performing 3D acquisitions by fringe projection equipment (AEVA). Moreover, we used existing devices for testing skin visco-elasticity and density (ElastiMeter®, Cutometer® and Ultrasound DermaScan® C). 30 female volunteers aged 21 to 71 years old were recruited and submitted to various acquisitions on knees. The photographic and the fringe projection benches allowed us to build up a 2D and 3D atlas with six age categories. For both roughness and elasticity analyses, we saw a high correlation with age. On the contrary, our try-out with ultrasound device did not show any clear differences in the dermis skin density between young and aged volunteers. We confirmed that wrinkles and elasticity on the knee are age dependent. Moreover, amongst various quantification methods, we found that fringe projection and Cutometer® parameters are the best to precisely quantify knee ageing.

F. Havas, S. Krispin, M. Cohen, E. Loing, M. Farge, T. Suere, J. Attia-Vigneau, **An innovative extract of the microalga *Haematococcus salinus Dunal*. to fight GlycAging™ and protect the skin from intense solar irradiation**, 32nd IFSCC Congress London, September 2022

Background: Glycation and the resulting buildup of Advanced Glycation End products (AGEs) (Glyc-Aging™), driven *inter alia* by solar radiation, are recognized as key contributors to skin aging. *Haematococcus salinus Dunal*. is a halophile microalga, adapted to intense solar radiation through carotenoid production. A supercritical CO2 extract of this alga, containing the colorless carotenoids phytoene and phytofluene, captures the alga's natural adaptation to protect skin from photoaging and Glyc-aging™ through anti-glycative and anti-inflammatory properties. Methods: Normal human skin explants were treated with extract over 10 days. AGE receptor (RAGE), glyoxalase-1 and key inflammation regulator NRF2 were quantified by immunohistochemistry. IL6 and IL8 were measured by ELISA. Glycation was induced using methylglyoxal (MG), and AGE N-epsilon-(carboxymethyl)lysine (CML) was quantified by immunohistochemistry. A double-blind, placebo-controlled clinical trial under high solar exposure (peak summer beachgoers) assessed: glycation (AGE Reader®); anti-inflammatory effects (Doppler laser microcirculation with histamine stimulation); red, UV spots (VISIA-CA); wrinkling, roughness (AEVA-HE); and biomechanics (Cutometer®). Results: *Ex vivo*, the extract strongly reduced MG-induced CML formation, reduced RAGE levels, significantly reduced IL6 and IL8, and increased NRF2. Clinically, under intense solar exposure, vs. placebo, the extract: significantly reduced glycation; reduced inflammation (reduced red spots; increased resiliency to histamine challenge), UV spotting, skin roughness; improved skin elasticity and firmness; and strongly improved wrinkling – both preventing solar-induced damage and bringing a net improvement vs. D0. Conclusion: These results demonstrate the value of this extract, containing the colorless carotenoids phytoene and phytofluene, as an antiglycative, anti-inflammatory, and anti-aging active, including in high solar irradiation contexts.

N. Grimaldi, A. Vasconcelos, C. Bellacanzone, J. Nestor, A. Ginestá, **Facing the future of cosmetics: the first mitochondria-targeted delivery system for antiaging treatments**, 32nd IFSCC Congress London, September 2022

Background: Mitochondria are responsible to produce the 90% of the cell energy, in the form of ATP. While producing energy, mitochondria generate ROS as by-products, which are neutralized by endogenous antioxidants (i.e. CoQ10). Unfortunately, with the age the antioxidants production decrease, and ROS are accumulated, causing cells damage and death. Supplemented CoQ10 is a perfect ally to counteract skin aging, since it has both energizing and antioxidant effects. However, CoQ10 full potential can be only exploited when this is effectively delivered to mitochondria. Thus, at Infinitec (Evonik), we have recently developed a cutting-edge delivery system, named Trojan®, to encapsulate CoQ10 and effectively deliver it to mitochondria within fibroblast. Methods: Physicochemical characterization (DLS, TEM, XPS) has been performed to prove the formation of PLGA particles and the surface functionalization with two peptides to target mitochondria within fibroblast. In vitro assay together with confocal and fluorescence microscopy has been used to test the efficacy of Trojan®Q10. Finally, the clinical efficacy of Trojan®Q10 was proved assessing the skin firmness and elasticity in the crow's feet area through Cutometer®. Results: Trojan®Q10 can reach mitochondria within fibroblast, as showed by confocal microscopy, while the antioxidant activity has been demonstrated by restoring the mitochondria membrane potential, reducing the ROS level and increase the collagen IV and VII production. Finally, clinical study showed the efficacy of topical treatment with Trojan®Q10 to increase skin firmness and elasticity. Conclusion: Trojan®Q10 effectively transport CoQ10 to fibroblast mitochondria where can behave as antioxidant leading to a final anti-aging activity.

M. Meunier, A. Scandolera, M. Bracq, J. Sandré, G. Maramaldi, R. Reynaud, **Skin cellular youth reprogramming as an innovative anti-ageing strategy for cosmetic ingredient,** 32nd IFSCC Congress London, September 2022

Background: During ageing, cells progressively lose their pluripotency, proliferative capacities, and remodelling driver role among other activities, leading to apparition of visible ageing signs such as wrinkles, eye-bags or even ageing spots. Methods: *In vitro*, the activity of the compound Sericoside from the bark of the roots of *Terminalia sericea* was evaluated at 0.02% through a transcriptomic analysis performed on fibroblasts after 24 hours, proliferation tests on senescent fibroblasts after 72 hours. Then, a clinical study was conducted on 40 volunteers aged between 35 and 55 years' old who applied twice daily a cream containing or not Sericoside for 4 weeks. Skin elasticity and fatigue were measured with a Cutometer® with R2 and R9 paramaters respectively. Skin texture and roughness was analysed by DermaTOP-Blue method. Results: Transcriptomic analysis evidenced that Sericoside would improve cell cycle (+85% MKI67), cell proliferation (+250% IGF1), DNA repair (+56% OGG1), pluripotency transcription factors (+36% NANOG) and stem cells maintenance (+200% SOX2). We evidenced a decrease of proliferation factor for senescent cells compared to young cells by - 50% while Sericoside

increased this proliferation factor by +46%, a similar rate to that of a 22 years old donor. Clinically, we evidenced Sericoside's anti-ageing effect which increased skin elasticity by +20%, reduced skin fatigue by -17% and reduced skin roughness by -10%, translating a soothing effect for Sericoside. Conclusion: Thanks to this study, we proved that re-activating cell memory to reprogram cells pluripotency by stimulating the natural tools available in our DNA is an innovative antiageing strategy.

I. Dolečková, P. Orzol, K. Vašíčková, S. Karel, L. Petrovičová, G. Huerta-Angeles, M. Štěpánová, V. Velebný, **The anti-acne and anti-ageing activity of a new hexapeptide in complex with zinc and its comparison to retinol**, 32nd IFSCC Congress London, September 2022

Background: In this study, we evaluated a new hexapeptide in complex with zinc (Zn-peptide) for its ability to inhibit key acne-related processes *in vitro* and to improve the appearance of the acne-prone skin *in vivo* and compared it with retinol. Materials and methods: The hexapeptide was prepared by solid phase peptide synthesis and zinc sulfate was used for the preparation of the Zn-peptide complex. Expression of the selected genes was evaluated using quantitative RT-PCR in HaCaT or NIH-3T3 cells irradiated or not irradiated with UVB and treated with Zn-peptide. The antimicrobial activity was determined spectrophotometrically using *C. acnes* culture. We also performed a split-face, placebocontrolled in vivo study on 40 Caucasian volunteers with acne-prone skin treated with 13 µg/mL Zn-peptide or 0.2 % retinol for 6 weeks and evaluated various skin parameters.Results and discussion: Zn-peptide inhibited all four key processes in acne pathogenesis *in vitro*: downregulated 5α-reductase involved in sebum production, suppressed keratinization and showed anti-inflammatory and antimicrobial effects. In the vivo study Zn-peptide significantly reduced number of inflammatory lesions, skin pores, skin redness, sebum level and *C. acnes* number. We also observed anti-ageing effect represented by wrinkle reduction, elasticity improvement and collagen increase. The effects of Zn-peptide were comparable or better than that of 0.2 % retinol. No negative adverse effects were observed in contrast to retinol which irritated the skin at the beginning of treatment and worsened skin barrier function. Conclusion: Zn-peptide proved to be a new retinol alternative exerting anti-acne and antiageing properties with no negative side effects.

H. Vergnaud, Z. Charton, M. Ma, M. Sun, M. Beauferey, N. Eladan Bertein, D. Blumenthal, E. Loescher, L. Caisey, G. Gazano, **Skin color diversity and skin quality of Chinese women**, 32nd IFSCC Congress London, September 2022

Skin color is a key aspect (even tone, without pigmented spots, and transparent skin) in the concept of Chinese beautiful skin. Even if skin color overlaps between ethnic groups, Asian skin color has its specificities and diversity. The aim of this study was to measure and identify skin color and skin quality typologies among the diversity of Asian skin color as identify in the literature. A 2-phases study was set up. First, we conducted a literature review of skin color, focused on Asian skin color. Secondly, a pre-inclusion study was run with 176 Chinese women with the objective to select about 100 women to represent the full range of Asian skin color as identified in the literature. Skin color and skin quality items were quantified on 102 women among them. 10 publications corresponding to more than 8000 subjects were gathered to obtain a map of the Asian skin color, showing that Asian skin color tends to be lighter and a little bit quite yellower, with important differences between countries, cities and between women. Skin color characterization on 102 women highlighted that Chinese skin has a great variety of colors and qualities, with modulation of skin items from skin color, skin color homogeneity to translucency, hydration, elasticity and firmness but also pores, allowing to identify several typologies of skin. The skin color with its skin quality items is a key tool for understanding the diversity of concerns and needs of Chinese women.

S. Noushini, **Firming and Antiaging Effects of a Novel Facial Aqueous Serum Containing L-Ascorbic Acid**, 32nd IFSCC Congress London, September 2022

L-Ascorbic acid, the active form of vitamin C has many functions as a cosmetic ingredient including skin lightening, promoting collagen synthesis and inhibiting lipid peroxidation. Therefore, it helps to plump and soften the appearance of fine lines and wrinkles on the skin's surface and considered as one of the best antiaging ingredients in cosmetic industry. Although ascorbic acid is a superstar ingredient for the skin, it is very unstable and is easily oxidized in aqueous solutions and cosmetic formulations. To stabilise ascorbic acid and maintain potency until usage, we developed an advanced technology and manipulated the aqueous environment with a unique combination of water, ethanol and dimethyl isosorbide to markedly slow oxidation of the ascorbic acid, providing a stable storage and delivery environment. To evaluate the efficacy of the serum, clinical trials were conducted on 14 panellists with lack of firmness on the face. A serum with 14% ascorbic acid combined with matrikine peptides were used once a day over a period of 3 months and 6 months. Both based on panellists evaluations of the product and objective image analysis using a Visia Skin Analysis, the serum delivered

good to notable results in terms of skin texture, skin brightening, reduction of wrinkles and fine lines and appearance of firmness in 93% of panellists after 3 month and 100% of panellists after 6 month. The evaluation of the skin's firmness was also conducted on 20 panellists with lack of firmness on the face using a Cutometer. The test concluded that after 28 and 56 days of once-daily use, the product induced a significant improvement in cutaneous firmness parameter.

P. Ward, T. Welsby, A. Corcoran, L. McLundie, R. Goodwin, S. Long, **Changes to abdominal striae distensae (stretch marks): Biophysical measurements and histological examination by in vivo confocal microscopy following 8 weeks use of a cosmetic product**, 32nd IFSCC Congress London, September 2022

Striae distensae are commonly formed on the abdomen, thighs and some other body sites and the aetipathogenesis is multifactorial, including following pregnancy or as a result of significant changes in body mass, genetic pre-disposition, growth spurts in puberty or as an association with Marfans or Cushings syndromes. They are twice as common in females, compared to males, and display as linear scars, initially with a significant erythematous appearance and often with itch (striae rubra or striae gravidarum), which fades to silvery grey over a period of several years (striae alba). Histologically, the change from striae rubra to alba involves distension and tearing of elastic fibres, initial inflammatory cell involvement and eventual thinning of the epidermis. Several treatments are available that claim to improve the appearance of striae including laser ablation, intense pulsed light and other minor surgical approaches. In addition, there are several cosmetic products available that similarly claim to improve the visible appearance of striae. In this study, we will present results from a study to evaluate the biophysical changes in the skin of females with striae gravidarum that were less than 3 years since formation and whether regular use of a topical cosmetic product over 8 weeks could lead to changes in the biophysical measurements. Thirty female volunteers were recruited from the test panel at Cutest Systems Ltd, Cardiff, U.K. who met the inclusion and exclusion criteria and who consented to enter the study. Baseline measurements of skin moisturization using a Corneometer™, skin elasticity using a Cutometer™ and skin colour adjacent to and over the striae, using a Chromameter™ were made. In addition, standardized digital images were taken of the striae with a Canon DSLR and controlled lighting and volunteers completed self-evaluation questionnaires. In addition to the biophysical measurements, dermatoscopic images and invivo confocal images were taken of selected striae using a Canfield VisioMed D200™ and Vivascope 150™ instrument respec. The volunteers were given a cosmetic body product (cream) to apply to the abdomen twice daily for 8 weeks. The volunteers were asked to return to the clinic after 4 weeks and again after 8 weeks of use for repeat measurements. The dermatoscopic images and invivo confocal images were taken only after 8 weeks. Data were compared statistically using ANOVA for multiple comparisons (Tukey-HSD method). Changes in moisturization of the skin were statistically significant at both 4 weeks and 8 weeks ($p<0.001$ for both), with Corneometer measurements changing from 26.55+6.12 a.u. at baseline to 36.09+10.50 a.u. after 8 weeks. Skin colour measurements using the Chromameter™ a* values on the target striae changed from 5.35+1.63 units at baseline to 5.24+2.02 a.u. after 8 weeks, which was statistically significant ($p=0.023$). These preliminary data demonstrate an improvement in biophysical skin parameters following regular use of the cosmetic product. We will present the histological comparisons and clinical evaluation by the dermatologist and the complete dataset from the study in the full paper, in order to determine whether use of a cosmetic product for 8 weeks can result in clinically relevant changes in the appearance of striae and whether this is associated with histological changes as imaged using in vivo confocal microscopy.

M.C. Reimberg, H. Chajra, M. Frechet, ***In vivo*** **performance of a social and environmentally sustainable blend of Brazilian Kaolin**, 32nd IFSCC Congress London, September 2022

Background: Clays are used since ancient times for medicinal and beauty purposes and their mineral compositions depend on their geological origins. Clays originated from volcanic soil are colored and rich in minerals while clays derived from the Amazonian lateritic soil are richin minerals and organic matter. Combining these different sources of clays opens the way to the creation of an infinite variety of clays with amazing cosmetic and aesthetic properties. This work demonstrates new skin benefits and multifunctional properties of Brazilian clays containing kaolinites, "the kaolin" for cosmetic applications. Methods: Proof of concept clinical study: skin hydration (Corneometer™), TEWL (Tewameter™), sebum (Sebumeter™) and firmness /tensor (Cutometer™). Short term or long term of product use respectively after 4 hours or 7 days of consecutive use. Results: The positive impact of kaolin on skin health was demonstrated such as the maintenance of hydration, protection of skin barrier function and increase of skin firmness (tensor effect). The use of kaolin was not associated with an increase in sebum secretion, a phenomenon classically observed with the use of clays and known as "rebound effect" due to the constant use of clays. Conclusion: The positive attributes show that kaolin can be used in multifunctional

formulations, even for skin care. Kaolin provides also rheological stability for the formulations and can bring benefits to the mineral make up, color cosmetic products, face products, besides sunscreens, BB creams and CC creams. New formulations and uses of kaolin can be addressed with several benefits for skin and hair care.

*Z. Zhou, M. Guo, Y. Guo, F. Ya*ng, **Rice fermented liquid as an alternative for water that retains skin moisture and its application for cosmetics**, 32nd IFSCC Congress London, September 2022

Background: Fermentation is a technology that creates new substances or metabolites by conversion using the metabolic pathways of microorganisms and is applied in various fields such as foods and cosmetics. We focused on the combination of rice and yeast as microbial fermentation and developed a rice fermented liquid. The aim of this study is to evaluate the effects of rice fermented liquid on skin moisture and elasticity.Methods: The double-blind, placebo-controlled, left-right randomized clinical trial was carried out. A lotion formulation including 94.5% rice fermented liquid or a blank was topically applied to the left or right half face in healthy twenty-five volunteers twice daily for 8 weeks. The water content in the stratum corneum (SC), transepidermal water loss(TEWL) and skin elasticity was measured using noninvasive devices at baseline, 4 and 8 weeks. Facial analysis was also performed at the same time. Results: Application of the lotion containing rice fermented liquid for 8 weeks significantly increased the water content in the SC and the number of skin textures as compared with that of the blank. The lotion tended to decrease TEWL. In an age-stratified analysis, the lotion tended to improve skin elasticity in subjects aged under 50 years. Conclusion: Rice fermented liquid is useful as a functional water having the ability to retain skin moisture and elasticity.

Y. Ying, L. Yanan, J. Ligang, C. Yuyan, **Improvement of aged skin in Chinese subjects with a cream containing five peptides**, 32nd IFSCC Congress London, September 2022

Background: Some peptides are developed and utilized in cosmetics, but little in vivo efficacy of the finished cosmetics containing peptides was reported, especially in the Chinese population. Five different peptides as effective ingredients were formulated to evaluate the anti-wrinkle efficacy ex vivo and in vivo. Methods: Systematic studies were conducted to verify the anti-aging efficacy of the peptides-containing cream. An ex vivo study was performed on human skin explants via topical surface application. In the clinical trial, thirty-one healthy Chinese females with visible facial wrinkles were enrolled and instructed to apply the cream for 8 weeks. Skin aging parameters were measured at 0, 4, and 8 weeks. Subject self-assessments were conducted via questionnaire at each visit. Results: The results showed the peptides-containing cream treated ex vivo skin produced an increased expression of collagen fibers (collagen I & III) in the dermis, and collagen IV and XVII in the dermal-epidermal junction structure. Global facial anti-aging efficacy was demonstrated by instrumental data and self-assessments. The cheek lines, nasolabial folds, and forehead wrinkles experienced significant reduction to varying degrees at early 4 weeks. At 8 weeks, the dermal density and thickness were significantly increased. The test cream was well accepted by subjects due to its mildness throughout the study. Conclusion: Collagen content increasing ex vivo and the dermal density and thickness increasing in vivo mutually confirmed its anti-aging mechanism of preventing collagen breakdown and boosting collagen synthesis.

S. Hettwer, E. Besic Gyenge, B. Suter, B. Obermayer, **A multi-sensorial active ingredient to reduce stress and improve skin condition**, 32nd IFSCC Congress London, September 2022

Background: The recently discovered olfactory receptors on skin cells paved the way to develop cosmetic active ingredients which stimulate those receptors and drive keratinocyte differentiation and maturation. As such, scents can not only stimulate the brain and act de-stressing but can also act positively on the skin. Methods: A scenting cosmetic active ingredient from the resurrection bush *Myrothamnus flabellifolia* (INCI: Caprylic/Capric Triglyceride, Myrothamnus Flabellifolia Leaf/Stem Extract) was used for studies stimulating the mood of test subjects and to investigate the effects on skin. Characterisation of the scent profile has been done with a panel of 12 trained people. The composition of the essential oil fraction was determined by GC-MSD. Double-blind, placebo controlled studies were performed (n = 25 - 75). Mood parameters were evaluated by hormone measurements of saliva, questionnaire and EEG recording. Skin parameters were evaluated with standard equipment. Corneometer values were mapped on the images of representativefaces by means of computer aided colour mapping. Investigation of bitter taste receptor activation on keratinocytes was assessed by measuring the calcium influx and the cAMP level.Conclusion: Myrothamnus extract was able to improve the mood of study participants using an emulsion containing 3 % of the active. It further improved skin parameters like hydration, TEWL and anti-ageing parameters. The mode of action combines subconscious smelling via olfactory sensory neurons in the nose and activation of bitter receptors on keratinocytes. This combination is the first-of-its-kind approach of a cosmetic active ingredient to

destress the mind and skin at the same time.

J.P. de la Roche, A. Barata, M.R. de Mora, I. Cordon, **Harnessing marine organic osmolytes for better ageing**, PERSONAL CARE MAGAZINE, September 2022, p. 32-36

Marine life extends beyond the ocean waters to the rocky coastline. A living marine micro-ecosystem develops on this hard substrate: the epilithic holobiont. This supra-organism composed of phytoplankton and its microbiota is a source of natural organic moisturisers. By applying Phycosphere Biodynamic® Technology we biomimic the extreme environment where this holobiont lives.The organic osmolyte-rich extract is extracted to create Osmocean Phycoskin®, an original moisturising and dermoprotective bioactive ingredient reduces the impact of photoageing and restores the skin's natural well-ageing.

S.-R. Park, J. Han, Y.M. Yeon, Y. Na, Y. Kang, E. Kim, B.-F. Suh, **Effects of one year of daily face mask wearing on the skin during the coronavirus disease 2019 pandemic**, Skin Reasearch & Technology, Volume 28, Issue 5, September 2022, p. 729-739

Background: As coronavirus disease 2019 (COVID-19) continues, the long-term daily use of masks is increasing. A full year includes the four seasons of spring, summer, autumn, and winter. Skin may have been affected by the seasons and further affected by the use of masks. In a previous study, we confirmed the short-term and 6-month effects of wearing face masks. In this study, we investigated how certain characteristics of the skin change when wearing a mask for 1 year. Furthermore, we compared skin covered by the mask (mask-skin zone) to skin that was not covered. Materials and methods: The participants were 18 healthy adults (8 men; 10 women) who were asked to wear masks in their daily lives from June 2020 to June 2021. During this period, participants' skin characteristics, such as trans-epidermal water loss, skin hydration, skin elasticity, skin keratin amount, skin pore area, skin temperature, skin redness, and skin color, were measured five times. Results: Trans-epidermal water loss, skin keratin amount, skin pore area, skin color, and skin elasticity changed significantly during the year. Furthermore, trans-epidermal water loss, skin hydration, skin keratin amount, skin pore area, and skin color were significantly different between the mask-wearing and non-mask-wearing areas of the face. Conclusion: The skin characteristics of the mask-skin zone can be affected by long-term wearing of a face mask under lifestyle and environmental conditions. During the COVID-19 pandemic, skin care for the mask-skin zone is also necessary for people who do not wear masks on a daily basis.

S. Preis, L. Schmidt, L. Tizek, M. Schielein, V. Lang, R. Bleuel, A. Duswald, S. Sitaru, A. Blasini, C. Gasteiger, L. Merdha, Z. Kurgyis, B. Kuschel, E. Hauenstein, M. Sander, S. Niedermeier, D. Argiriu, S. Engel, Y. Skabytska, R.L. Silva, M. Hils, B. Evers, S. Kaesler, H. Hufnagel, M. Köberle, Y. Amar, A. Zink, T. Biedermann, **Munich atopy prediction study (MAPS): protocol for a prospective birth cohort addressing clinical and molecular risk factors for atopic dermatitis in early child-hood**, BMJ Open 2022;12:e059256

Introduction: The pathogenesis of atopic diseases is highly complex, and the exact mechanisms leading to atopic dermatitis (AD) onset in infants remain mostly enigmatic. In addition to an interdependent network of components of skin development in young age and skin barrier dysfunction underlying AD development that is only partially understood, a complex interplay between environmental factors and lifestyle habits with skin barrier and immune dysregulation is suspected to contribute to AD onset. This study aims to comprehensively evaluate individual microbiome and immune responses in the context of environmental determinants related the risk of developing AD in the frst 4 years of a child's life. Methods and analyses: The 'Munich Atopic Prediction Study' is a comprehensive clinical and biological investigation of a prospective birth cohort from Munich, Germany. Information on pregnancy, child development, environmental factors, parental exposures to potential allergens and acute or chronic diseases of children and parents are collected by questionnaires together with a meticulous clinical examination by trained dermatologists focusing on allergies, skin health, and in particular signs of AD at 2 months after birth and then every 6 months. In addition, skin barrier functions are assessed through cutometry, corneometry and transepidermal water loss at every visit. These measurements are completed with allergy diagnostics and extensive microbiome analyses from stool and skin swabs as well as transcriptome analyses using skin microbiopsies. The aim is to assess the relevance of different known and yet unknown risk factors of AD onset and exacerbations in infants and to identify possible accessible and robust biomarkers.

I.M. Gidado, M. Qassem, I.F. Triantis, P.A. Kyriacou, **Review of Advances in the Measurement of Skin Hydration Based on Sensing of Optical and Electrical Tissue Properties**, Sensors 2022, 22, 7151

The presence of water in the skin is crucial for maintaining the properties and functions of the

skin, in particular its outermost layer, known as the stratum corneum, which consists of a lipid barrier. External exposures can affect the skin's hydration levels and in turn, alter its mechanical and physical properties. Monitoring these alterations in the skin's water content can be applicable in clinical, cosmetic, athletic and personal settings. Many techniques measuring this parameter have been investigated, with electrical-based methods currently being widely used in commercial devices. Furthermore, the exploration of optical techniques to measure hydration is growing due to the outcomes observed through the penetration of light at differing levels. This paper comprehensively reviews such measurement techniques, focusing on recent experimental studies and state-of-the-art devices.

L. Kleine-Börger, M. Hofmann, M. Kerscher, **Microinjections with hyaluronic acid in combination with glycerol: How do they influence biophysical viscoelastic skin properties?**, Skin Research & Technology, July 2022

Background: Skin quality improvement with hyaluronic acid microinjections is increasing as a clinical treatment indication and as a scientific issue. This present study assessed changes in biomechanical viscoelastic skin properties after microinjections with the skin quality booster CPM-HA20G (Belotero Revive). Materials and methods: Fifteen subjects have been randomized in a 2:1 ratio to receive either three treatments (total 3 ml per side) or a single-dose treatment (total 1.5 ml per side) with CPM-HA20G at dermal level into the lower cheeks via microinjections. Treatments were provided 4 weeks apart. Biophysical measurements were performed describing the viscoelastic skin properties and the underlying skin structure. The measurements were performed before injection (week 0) and on follow-up visits 4, 8, 16, 24, and 36 weeks after the last injection treatment. Results: One ($p = 0.028$) as well as three ($p = 0.003$) consecutive treatments with CPMHA20G improved statistically significant skin firmness (R0). For the multiple-treatment group improved significant differences were observed for skin fatigue (R3; $p = 0.007$) and skin density ($p = 0.017$) with stable skin thickness levels ($p > 0.05$), too. There were zero-to-weak correlations between skin thickness and biomechanical skin properties (R0, $rs = 0.084$; R3, $rs = 0.093$). Conclusion: Overall, microinjections with CPM-HA20G improved biomechanical viscoelastic skin properties with a stronger and more pronounced effect in the multiple-treatment group. The observed changes may explain some of the skin quality improvements observed after treatment with CPM-HA20G.

M. Kerscher, S. Wagner-Schiffler, E. Magnus Noah, T. Fischer, D. Greiner-Krüger, S. Sattler, T. Kaptan, A. Drabik, G. Hamed, J. Reinecke, J. Wehling, **Cell-Free Blood Cell Secretome (BCS) Counteracts Skin Aging: Multi-Center Prospective Regenerative Aesthetic Medicine Study Using Exokine®**, Clinical, Cosmetic and Investigational Dermatology 2022:15, p. 1157–1173

Background: The "Inflammation Theory of Ageing" identifies pro-inflammatory cytokines and oxidative damage as one cause of cellular and mitochondrial deterioration and aging. Cell-free blood cell secretome (BCS) also known as autologous conditioned serum (ACS) has shown anti-inflammatory and regenerative mode of action in musculoskeletal disorders and radicular compression. Aim: To confirm that BCS can improve signs of skin aging from a previous study in a multi-center setting. Methods: Prospective, one-armed, multi-center interventional therapeutic study. Ninety-five women with skin firmness loss were treated with four intra-dermal injection sessions in both cheeks at 0, 2, 4 and 6 weeks. BCS was processed with Exokine® medical device according to manufacturer's instructions. Primary endpoints were cutometric R0 and R3 at 12 and 24 weeks. GAIS, FACE-QTM, Patient Attractivity Self-Assessment and safety were evaluated. Results: Mean skin firmness (R0) improved significantly from baseline 0.40 mm to 0.38 mm at week 12 and to 0.36 mm at week 24. Mean skin tiring (R3) improved significantly from baseline 0.45 mm to 0.42 mm at week 12 and to 0.40 at week 24. FACE-QTM "Satisfaction with Skin" significantly improved from baseline to weeks 12, 24 and 48. So did "Satisfaction with Facial Appearance" and "Psychological and Social Function". "Satisfaction with Decision" and "Satisfaction with Outcome" were stable at week 24 and 48. At week 48 patients assessed their age 1.68 years younger vs Baseline. FACE-QTM aging appraisal improves from Baseline 52.94 to 65.23 at week 48. GAIS, by both physicians and patients, confirm improvement of skin. Conclusion: For up to 48 weeks four intra-dermal injections with cell-free BCS increase facial skin firmness and resilience to tiring and patients' satisfaction with their facial appearance and skin. Patients perceive their face as younger. BCS has the ability to sustainably rejuvenate facial skin safely.

F. Rastrelli, G. Bifulco, C. Rastrelli, **Biomimetic booster for sustainable sunscreen**, PERSONAL CARE Magazine, June 2022, p. 70-73

Sunscreens are well known to prevent damage related to environmental stress, including UV-A and UV-B rays. Chronic and prolonged exposure to sunlight causes damaging effects: UV-B are responsible for erythema and sunburn, while UV-A causes photo-ageing, acute and chronic photodermatosis and immunosuppression. UV filters are molecules or molecular complexes that absorb,

reflect, or disperse radiation and they represent the main protection measures against UV. They are divided into two main types: organic (chemical) and inorganic (physical) filters, due to their molecular nature and mechanism of action. Chemical filters absorb radiations while physical filters are mineral particles that reflect and diffuse them.

N. Engerer, K. Frank, N. Moellhoff, M. Alfertshofer, R.E. Giunta, J.B. Green, P.Z. Lorenc, G.K. Chaney, D. Ehrl, S. Cotofana, **Aging of the Neck Decoded: New Insights for Minimally Invasive Treatments**, Aesthetic Plast Surg, June 2022

Background: Many signs of aging manifest in the neck region, including platysmal bands, excess skin, horizontal neck lines and decreasing contour of the neck. While the clinical signs of an aged neck are well-known, data determining the underlying aging process are limited. Objective: To decode aging of the neck. Materials and methods: This prospective study investigated elasticity and firmness of skin, muscle activity and skin displacement upon muscular contraction in the neck in 77 young-, middle- and old-age individuals. Objective outcome measures, including 3-dimensional imaging, cutometry and surface electromyography, were utilized for all assessments. Results: Mean firmness of skin decreased significantly from young to old individuals (0.37 ± 0.13 mm, 0.30 ± 0.12 mm and 0.26 ± 0.12 mm in young, middle and old subjects, respectively; $p < 0.001$). Gross elasticity decreased significantly from 75.1 ± 13.0% in young subjects, to 64.53 ± 15.7% in middle-aged subjects and 55.79 ± 13.0% in old subjects ($p < 0.001$). The mean y-axis skin displacement increased from 2.48 ± 4.33 mm in young subjects, to 3.11 ± 4.49 mm in middle-aged subjects and 3.61 ± 5.38 mm in old subjects ($p = 0.006$). The mean signal-to-noise ratio decreased significantly from 16.74 ± 5.77 µV in young subjects, to 14.41 ± 4.86 µV in middle-aged subjects and to 12.23 ± 5.99 µV in old subjects ($p < 0.001$). Conclusion: This study provides insights into the interplay between skin elasticity, muscular activity and the reflected movement of the skin of the neck. Appreciation of these age-related changes lays the fundament for aesthetic treatments in this delicate region.

R. Shawahna, **Effects of a grapeseed oil (Vitis vinifera L.) loaded dermocosmetic nanoemulgel on biophysical parameters of facial skin: A split-face, blinded, placebo-controlled study**, J Cosmet Dermatol, June 2022

Background: Worldwide, grapes (Vitis vinifera L.; family: Vitaceae) are one of the most important fruits. Grapeseed oil is rich in bioactive constituents that could be beneficial to the health and aesthetic features of human skin. Objective: This study was conducted to evaluate the effects of a novel grapeseed oil-loaded dermocosmetic nanoemulgel on biophysical parameters of facial skin. Methods: This was a split-face, blinded, placebo-controlled study. A novel grapeseed oil-loaded dermocosmetic nanoemulgel was developed and its effects on the biophysical parameters of the facial skin were evaluated and compared to those of a placebo formulation on the cheeks of 15 healthy volunteers. Melanin, erythema, sebum production, fine and large facial pores, moisture, and elasticity levels were measured using Mexameter®, Corneometer®, Sebumeter®, Cutometer®, and VisioFace®. Measurements were made on weekly basis for 12 weeks. Results: Compared to the placebo, the novel grapeseed oil-loaded dermocosmetic nanoemulgel received significantly higher sensory scores with regard to appearance, color, odor, consistency, adhesion, sensation, cohesiveness, and spreadability (p-value < 0.05). Additionally, the novel nanoemulgel continuously and significantly reduced skin melanin, erythema, sebum production, and fine and large pores (p-value < 0.05). On the other hand, the novel nanoemulgel continuously and significantly increased skin moisture contents and elasticity (p-value < 0.05). Conclusion: The novel grapeseed oil-loaded dermocosmetic nanoemulgel had attractive cosmetic attributes that could be useful for improving imperfections of the human skin. Future studies are still needed to test and evaluate the benefits of this novel grapeseed oil-loaded dermocosmetic nanoemulgel in disease conditions.

L. Shao, S. Jiang, Y. Li, Y. Shi, M. Wang, T. Liu, S. Yang, L. Ma, **Regular Late Bedtime Signifcantly Affects the Skin Physiological Characteristics and Skin Bacterial Microbiome**, Clinical, Cosmetic and Investigational Dermatology 2022:15, p. 1051–1063

Background: Late bedtime is a common form of unhealthy sleep pattern in adulthood, which influences circadian rhythm, and negatively affects health. However, little is known about the effect of regular late bedtime on skin characteristics, particularly on skin microbiome. Objective: To investigate the changes and effects of the regular late bedtime on skin physiological parameters and facial bacterial microbiome of 219 cases of Chinese women aged 18–38 years living in Shanghai. Methods: Based on the Self-Evaluation Questionnaire, bedtime was categorized as 11:00 PM; thus, the volunteers were divided into early bedtime group (S0) and late bedtime group (S1). The physiological parameters of facial skin were measured by non-invasive instrumental methods, and the skin microbiome was analyzed by 16S rRNA high-throughput sequencing. Results: The skin physiological parameters of the

late bedtime group exhibited signifcant decrease in skin hydration content, skin frmness (F4) and elasticity (R2), while TEWL, sebum and wrinkle signifcantly increased. The result indicated that late bedtime signifcantly impaired the integrity of skin barrier, damaged skin structure, and disrupted water–oil balance. Furthermore, the analysis of α-diversity, Sobs, Ace and Chao index were found to signifcantly decrease ($P < 0.05$) in the late bedtime group, suggesting that late bedtime reduced both the abundance and the diversity of facial bacterial microbiota. Moreover, the abundance of *Pseudomonas* increased signifcantly, while *Streptococcus*, *Stenotrophomonas*, *Acinetobacter, Haemophilus, Actinomyces* and *Neisseria* decreasedsignifcantly. In addition, Spearman correlation analysis revealed strong correlations between the microbiota and the physiologicalparameters. Notably, the abundance of *Pseudomonas* signifcantly positively correlated with skin frmness and elasticity, butsignifcantly negatively correlated with skin hemoglobin content, melanin content and skin hydration. Conclusion: Bedtime is an important factor in maintaining skin health. Regular late bedtime not only damages the skin barrier and skin structure but also reduces the diversity and composition of facial bacterial microbiome.

T.K. Leo, E.S. Sing Tan, F. Amini, N. Rehman, E.S. Chye Ng, C.K. Tan, **Effect of Rice (*Oryza sativa* L.) Ceramides Supplementation on Improving Skin Barrier Functions and Depigmentation: An Open-Label Prospective Study**, Nutrients 2022, 14, 2737

Ceramides plays a crucial role in maintaining skin barrier function. Although foregoing evidence supported beneficial effects of topical ceramides for restoration of the skin barrier, studies on oral ceramides are extremely scarce, with most published data collected from in vivo and in vitro models. Thus, this study aimed to evaluate the efficacy of rice ceramides (RC) supplementation to improve skin barrier function and as a depigmenting agent through comprehensive clinical assessments. This study investigated the beneficial effects of orally administered RC supplementation in 50 voluntary participants. Skin hydration, firmness and elasticity, transepidermal water loss (TEWL), melanin index (MI), erythema index (EI), sebum production, pH, and wrinkle severity were assessed at baseline and during monthly follow-up visits. RC supplementation was found to significantly ($p < 0.01$) improve skin hydration, sebum production, firmness and elasticity, and wrinkle severity for three assessed areas, namely the left cheek, dorsal neck, and right inner forearm. Additionally, RC significantly ($p < 0.01$) reduced the rates of TEWL, levels of MI and EI. Analyses of data indicated that participants at older age were more responsive towards the effect of RC supplementation. Our findings suggest that RC supplementation can effectively improve skin barrier function, reduce wrinkle severity, and reduce pigmentation.

G. Boyer, G. Bellemère, C. de Belilovsky, C. Baudouin, **Mapping of the biophysical properties of pregnant women abdomen skin: a pilot study**, ISBS Congress Berlin, June 2022

During pregnancy mechanical stretching of abdomen skin due to baby growth is very important and could lead to stretch mark (also known as striae distensae). Recent work demonstrated that biomechanical proper ties of healthy abdomen skin change drastically during pregnancy and that these properties remain altered 4 months after delivery1. It remains unclear if these observed modifcations are homogeneous on the abdomen area or if a specifc area is more affected.

S. Faloni de Andrade, T. Matos Ferreira, T. Fontes, S. Lopes, R. Menezes, C. Ferreira-Pêgo, L.M. Rodrigues, **Associating skin variables to dietary patterns**, ISBS Congress Berlin, June 2022

The link between nutrition and skin physiology has been explored in the last few years. However, the effect of dietary patterns on skin health is still unclear. Here we investigate potential differences in the cutaneous physiology related to omnivorous and vegan-vegetarian regimens and relate with the relevant food groups. Eighty seven healthy volunteers both sexes were recruited after informed written consent. These included 63 omnivores (OM) (28.60±11.35 y.o.) and 24 vegetarian-vegan (VG) (39.80±7.48 y.o.) with similar Body Mass Index (23.20Kg/m2±4,16 and 23.20 Kg/m2±3.22, respectively). Representative variables were transepidermal water loss (Tewameter® CK electronics), epidermal hydration (Moisturemeter® DTec), and biomechanics (Cutometer® CK electronics) measured in five anatomical sites (forehead, cheek, neck, hand, and leg). Skin carotenes were also measured by the Multiple Spatially Resolved Reflection Spectroscopy (MSRRS) (Biozoom® GmbH). Food group intake was assessed using a validated Food Frequency Questionnaire. The statistical analysis was done by Jamovi® Software. The dietary patterns and their impact on the skin were compared using Mann–Whitney test and correlations were investigated by the Spearman rank correlation coefficient ($p<0.05$). Vegetable based diets are believed to bring multiple health benefits. Regarding skin physiology we could not find significant differences between the two groups, including the carotenoid content. TEWL was consistently higher in the VG group but significant differences could only be detected in the neck and leg. Looking for a potential relationship between the most frequent foods consumed by these two groups

of participants and skin physiology we found that vegetables, vegetable drinks, milk, yogurt, and cheese showed a significant positive relationship with epidermal water balance. By opposition, alcoholic beverages and fast food showed a significant negative relationship with those variables. The VG group depicted a positive correlation with the carotenoid content, while red meat, viscera, alcoholic beverages, and sugar-sweetened beverages consumption typical of the OM group depicted a negative correlation. Our results are still exploratory being obvious that larger samples are needed for consistency. Nevertheless it is clear that dietary patterns might influence skin physiology and that this theme should be further explored.

G. Clauteaux, **Fighting "inflammaging": holy basil polyphenols**, PERSONAL CARE Magazine, June 2022, p. 63-67

Holy basil is one of the most famous and respected medicinal plants in ayurvedic medicine where it is named Tulsi. Its goal is to rebalance doshas (energies) to strengthen the connection between our mind and body. This very special plant has interested Laboratoires Expascience in the struggle against, inflammaging' effects on the skin.

A. Charpentier, **How testing innovations is meeting beauty trends**, PERSONAL CARE Magazine, June 2022, p. 25-28

For many years now, every cosmetic product launched on markets around the world has been validated for its safety and efficacy in accordance with the cosmetic regulations of each country. Product performance is changing along with consumer expectations, shopping habits, beauty routines and lifestyles. For the past two years, the health crisis has had an impact on the use of hand hygiene products specifically and on care and make-up products with new products resistant to the conditions of wearing a mask and the increase on the surface of the skin of temperature, humidity, $C0_2$ and friction. In addition, after the decrease in human activities related to confinement, large cities are regaining significant levels of pollution that have a significant impact on the condition of the skin.

S. Sangthong, P. Pintathong, P. Pongsua, A. Jirarat, P. Chaiwut, **Polysaccharides from *Volvariella volvacea* Mushroom: Extraction, Biological Activities and Cosmetic Efficacy**, J. Fungi 2022, 8, 572

Abstract: Polysaccharides from Volvariella volvacea (VVP) were investigated for their cosmetic-related activities and in vivo efficacy for use as a multifunctional active cosmetic ingredient. Three different polysaccharide extraction methods, including hot water shaking (HS), microwave-assisted (MA) and ultrasonic-assisted (UA), were used. Extractable yield, polysaccharide contents and biological activities, including antioxidant, anti-tyrosinase and anti-elastase activities, were compared. The polysaccharides from HS provided the highest extraction yield (15.58 0.96% w/w) and the highest beta-glucan content (18.80 0.81% w/w). The HS polysaccharides also possessed the highest inhibitory effects toward lipid peroxidation (IC50 of 0.0378 mg/mL), tyrosinase (51.46 mg KAE/g), and elastase (604.21 73.66 mg EGCG/g). The cytotoxicity of the VVP was determined for safe use. A cosmetic gel cream containing VVP was developed and 0.2% VVP formulation was observed to be the most stable in color. UV protection factors, skin irritation by single patch test, and in vivo efficacy, including skin moisturization, anti-wrinkle and whitening, were measured. The VVP showed no cytotoxicity against human dermal skin fibroblast. The gel cream containing VVP provided less sun protection factor; however, it significantly exhibited the skin benefits of increasing moisture, gross elasticity, net elasticity, and skin firmness. Improvements to skin roughness, scaliness, wrinkles and in melanin content were also depicted gradually along 8 weeks. V. volvacea, therefore, could be a good source for polysaccharides being used as a moisturizing, anti-wrinkle, and whitening agent in cosmetic preparations.

N. Li, X.-X. Yang, R.-Y. Yang, F. Yi, **Study of the characteristics of facial skin tone status in 1092 young Chinese females according to the ITA°**, J Cosmet Dermatol. 2022 May;21(5): p. 2073-2081

Background: The ITA° is the gold standard for skin tone classification. Different skin tones are often associated with different skin characteristics and issues. Different skin types are often associated with different skin characteristics and issues in China. Aims: To study the population's skin color distribution and accompanying skin problems according to the ITA° classification standard. Methods: A total of 1092 women aged 22-42 years were recruited in 7 cities in China. All biophysical parameter measurements (SM, CM, TWEL, pH, R2, GLOSS_DSCT, MEXA, ERYTH, ITA°; 9 indexes total) were quantified with noninvasive instruments. All volunteers provided consent before enrollment. Result: The main skin color categories were light (II), very light (I), intermediate (III), and tan (IV). The results demonstrated that the characteristics of the facial skin based on the ITA° were significantly different among cities and age groups and were associated with different skin issues. Conclusions: Lighter skin

was associated with worse skin elasticity; intermediate skin was associated with worse skin hydration content and was most prone to being oily; and darker skin was associated with poor barrier function. Established principal component regression (PCR) indicated that pH, gloss GLOSS_DSC, MEXA, ERYTH, TEWL, and SM had significant effects on the ITA°.

.S. Han, J.W. Park, S.Y. Kim, K.H. Yoo, S.Y. Choi, B.J. Kim, **Safety and efficacy of high-intensity focused ultrasound for treatment of periorbital, perioral, and neck wrinkles: Prospective open single-center-single-arm confirmatory clinical trial**, Dermatol Ther, 2022 May;35(5)

Periorbital, perioral, and neck wrinkles are one of the most common concerns of aging skin. We evaluated the efficacy and safety of high-intensity focused ultrasound (HIFU) device with a 5.5-MHz transducer and a 2.0-mm focal depth for improving periorbital, perioral, and neck wrinkles. A total of 102 participants were enrolled, and 34 each were assigned to the periorbital, perioral, and neck groups. All subjects were treated with HIFU three times at 2-week intervals at the corresponding treatment site. Objective measurements and clinical evaluations were performed at 10 and 16 weeks after treatment. Based on the primary efficacy evaluation, the mean Cutometer R7 value was significantly increased at 10 weeks post-treatment compared to baseline in all treated groups. In addition, all other Cutometer values, PRIMOS and Antera 3D camera evaluation results, classification of wrinkle assessment results, and Subject Global Aesthetic Improvement Scale also showed that the periorbital, perioral, and neck wrinkles were significantly improved at 10 and 16 weeks post-treatment. No permanent adverse effects were observed during the follow-up period. HIFU treatment using 5.5-MHz transducers (2.0-mm focal depth) could be an effective and safe treatment modality for the treatment of periorbital, perioral, and neck wrinkles.

S.-Y. Huang, Q.-Y. Qi, F. Huang, L.-D. Zhou, Y.-N. Lu, **Feeling peachy: resin extract for the skin**, PERSONAL CARE GOBAL, p. 77-79, May 2022

Subjects of different ages and suitable health were selected for clinical evaluation of the instant wrinkle-removing function of a peach resin extract. It was found that both 5% and 10% concentrations can significantly improve the firmness of the skin of the finger and that that the 10% concentration can significantly improve skin elasticity. Five minutes after application, wrinkles in the corners of the eyes were significantly improved. In both cases the effect was most obvious in two hours and was maintained after eight hours.

M.T. Truchuelo, Ú. Pielasinski-Rodriguez, M. Vitale, **Evaluation of Effectiveness and Tolerance of a Cosmeceutic Regimen Based on Topical Retinoids**, Journal of Clinical & Experimental Dermatology Research, Vol.13 Iss.2, April 2022

Aim: Treatment of aging is challenging. Topical retinol is one of the actives with the most published evidence onits efficacy. The aim of the study was to determine the efficacy and tolerance of a protocol based on the use of high concentrations of retinol (0.5% and 1%). Materials and methods: A prospective pilot study of clinical experience was conducted in 20 volunteers with some degree of skin aging. They used a treatment protocol for 12 weeks, consisting in a progressively increasing concentration of retinol at nights (beginning 0,5% and 1% within the subsequent weeks) combined with a nourishing cream based on growth factors and sunscreen at daytime. Five evaluations were registered (D0, D15, D50, D70, D90). Objective measurements were made (cutometer, tewameter and Visia) together with the determination of the severity of aging, patient and investigator global assessment (PGA and IGA), and improvement in skin aging based on patient and investigator opinion and side effects on a semiquantitative scale (0-3). Results: A significant improvement in skin firmness was obtained starting at D50, reaching its maximum increase (20%) at D90. This improvement was consistent with researcher and patient determinations and with the improvement obtained in D90 on the RAO Goldman aging scale. Regarding tolerance, the increase in transepidermal water loss was, as expected, higher between visits at the beginning of the study. Side effects were greater at D50 when the retinol-based formulation was applied more frequently, but decreased subsequently. In most of the patients the side effects were null or slight in all visits. Conclusion: This specific regimen of retinization consisting of the progressive use of high concentrations of retinol (0.5% and 1%), showed efficacy in improving the firmness and visible signs of skin aging. Furthermore, it was very well tolerated by most of the patients.

T.-C. Hsiao, F.-W. Pan, C.-F. Hsiao, X.-L. Wang, Y.-Y. Gao, Y.-F. Zhang, Y. Chen, **Effective Components of the *Prunus Speciosa* Flower Extract on Blue Light Filtration, Whitening and Skin Repair,** IFSCC Magazine, Volume 25 (1), April 2022

Prunus speciosa of the Rosaceae family has shown promising results for skin health. In 2013, the “Guangzhou Cherry Blossom” was named after the city of Guangzhou, China. This singleleafed pink flower is the most weatherproof and heat-tolerant of all varieties of cherry blossom. Natural active

ingredients extracted from Prunus speciosa flower, such as flavonoids and quercetin, had proved to be the most effective at blue light fltration, skin whitening and skin repair. Skin adaptive responses helped to increase repair of light-induced damage. Prunus speciosa flower extract (PSFE) inhibited tyrosinase activity and reduced melanin content in experiments in vitro. To study skin barrier effects, sodium lauryl sulfate was used to irritate the skin in 3D models in order to establish an alternative human patch test. At the same time, a clinical trial was conducted using PSFE facial cream twice daily for 28 days. Changes in skin moisture content, melanin content and elasticity were studied in 20 human subjects. The skincare effects of PSFE reported in human clinical trials demonstrated by changes in skin moisture content, melanin content and skin elasticity. PSFE has good blue light-fltering properties and inhibits tyrosinase activity, achieving a whitening effect. Thus PSFE shows promising performance as a functional ingredient for photoaging defense and inflammation relief in skin repair products.

F.W. Timmermans, S.E. Mokken, J.-M. Smit, M.-B. Bouman, T.C. van de Grift, M.G. Mullender, E. Middelkoop, **The impact of incisional negative pressure wound therapy on scar quality and patient-reported outcomes: A within-patientcontrolled, randomised trial**, Wound Repair Regen, 2022 Mar;30(2): p. 210-221

Literature provides a moderate level of evidence for the beneficial effects of incisional negative pressure wound therapy (iNPWT) on scar quality. The purpose of this study was to establish if iNPWT results in improved scar outcomes in comparison to the standard of care. Therefore, a within-patient randomised controlled, open-label trial was conducted in transgender men undergoing gender-affirming mastectomies. A unilateral side was randomised to receive iNPWT (PICO™, Smith&Nephew) without suction drains and contrastingly the standard dressing (Steri-Strips™) with suction drain. Scar quality and questionnaires were bilaterally measured by means of objective assessments and patient-reported outcome measures (PROM) at 1, 3 and 12 months. Objective scar outcomes were scar pliability (Cutometer®), colouration (DSM-II) and scar width (3-D imaging). PROM outcomes were related to scars (POSAS and SCAR-Q) and body satisfaction (BODY-Q). From 85 included patients, 80 were included for analyses. No significant difference between treatments was seen in the quantitative outcomes of scar pliability, colour, and width. For qualitative scar outcomes, several significant findings for iNPWT were found for several subscales of the POSAS, SCAR-Q, and BODY-Q. These effects could not be substantiated with linear mixedmodel regression, signifying no statically more favourable outcome for either treatment option. In conclusion, this study demonstrated that some PROM outcomes were more favourable for the iNPWT compared to standard treatment. In contrast, the quantitative outcomes showed no beneficial effects of iNPWT on scar outcomes. This suggests that iNPWT is of little benefit as a scar-improving therapy.

S.Y. Lee, Y.S. Cho, L. Kim, S. Y. Joo, C.H. Seo, **The Intra-rater reliability and validity of ultrasonography in the evaluation of hypertrophic scars caused by burns**, Burns, 2022 Mar 29:S0305-4179(22)00067-5

Purpose: Hypertrophic scars that occur after burns are less flexible and less elastic than normal skin. Objective measurement tools are required to assess hypertrophic scars after thermal injury. Cutometer® MPA 580 has been widely used for evaluating the properties of hypertrophic scars. Ultrasonography can evaluate elasticity, stiffness, and structure of tissues simultaneously using elastography and B-mode. This study aimed to investigate the intra-rater reliability and validity of elastography to visualize hypertrophic scars. Methods: Sixteen participants with a total of 96 scars were evaluated. The measurement sequence was elastography, Cutometer®, and elastography every 10 min. We then analyzed the intra-rater reliability using intraclass correlation coefficients (ICC). The results measured using elastography on the hypertrophic scars and surrounding normal skin were compared. The relationships between the elastographic and Cutometer® measurements using the 2-and 8-mm probes were compared. Results: The intra-rater reliability of elastographic measurements was acceptable for clinical use in terms of strain ratio (SR), shear-wave elastography (SWE), shear-wave speed (SWS), and SWE ratio (ICC = 0.913, ICC=0.933, ICC = 0.842, and ICC = 0.921). The average SWS and SWE in hypertrophic scars were significantly greater than that for normal skin ($p < 0.001$ and $p < 0.001$). SWE showed correlations with the R0 ($r = -0.32$, $p = 0.002$) and R8 ($r = -0.30$, $p = 0.003$) measured with the 8-mm probe. The SWE ratio was correlated with the R7 ($r = -0.34$, $p = 0.001$) measured with the 2-mm probe. The thickness of hypertrophic scars showed correlations with the R5 ($r = 0.33$, $p < 0.001$), R6 ($r = 0.44$, $p < 0.001$) and R8 ($r = -0.35$, $p < 0.001$) measured with the 8-mm probe. R0-R9 measured with 2-mm Cutometer® probes were not correlated with scar thickness ($r < 0.30$, $P > 0.05$). The total scores of mVSS showed correlations with the R0 ($r = 0.35$, $p < 0.001$), R1($r = 0.32.$, $p = 0.001$), R3 ($r = 0.38$, $p < 0.001$), R4 ($r = 0.38$, $p < 0.001$), R8 ($r = 0.34$, $p = 0.001$), and R9 ($r = 0.34$, $p = 0.001$) measured with the 2-mm probe. R0-R9 measured with 8-mm Cutometer® probes were not correlated with mVSS ($r < 0.30$, $P > 0.05$). The thickness of hypertrophic scars showed correlations

with the SWE ($r = 0.38$, $p < 0.001$) and SWE ratio ($r = 0.35$, $p < 0.001$). Elastographic findings were not correlated with mVSS ($r < 0.30$, $P > 0.05$). Conclusion: In this study, together with the Cutometer®, ultrasound was confirmed as an evaluation tool that can objectively compare and analyze the difference between normal skin and hypertrophic scars.

X. Shu, R. Wan, W. Huo, Z. Li, L. Zou, Ying Tang, L. Li, X. Wang, **Effectiveness of a Radiofrequency Device for Rejuvenation of Aged Skin at Home: A Randomized Split-Face Clinical Trial**, Dermatol Ther (Heidelb) (2022) 12: p. 871–883

Introduction: Several techniques, including the use of radiofrequency (RF) devices, are currently utilized for the treatment of skin aging. This study aimed to evaluate the anti-aging effects imparted by a home-based RF beauty device and to compare these results with those of a marketed anti-aging cosmetic in vivo. Methods: Thirty-three women aged 35–60 years were enrolled in this randomized, controlled, split-face trial. This study involved a 12-week trial with five repeated measurements (at baseline, 2, 4, 8 and 12 weeks). One side of the face was randomly selected to be part of the experimental group and treated with the RF beauty device, while the other side was considered as control and was treated with an anti-aging cosmetic. Treatment safety was evaluated. Skin wrinkles, hydration, radiance, elasticity, color and thickness were evaluated using noninvasive equipment. Results: Thirty-two participants completed the study; one withdrew for personal reasons. Compared with the anti-aging cosmetic-treated facial side, the experimental side showed statistically significant improvements in wrinkles, skin radiance, color and thickness ($p < 0.05$). Conclusions: The home-based RF beauty device was safe and effective for rejuvenation. The device was more effective than the commercially available anti-aging cosmetics.

H.M. Kim, Y.M. Lee, E.H. Kim, S.W. Eun, H.K. Sung, H. Ko, S.J. Youn, Y. Choi, W. Yamada, S.M. Shin, **Anti-Wrinkle Efficacy of Edible Bird's Nest Extract: A Randomized, Double-Blind, Placebo-Controlled, Comparative Study**, Front. Pharmacol., Volume 13, March 2022

This study aimed to evaluate skin health's functional improvement, such as wrinkles, elasticity, moisture, and whitening, and safety following the consumption of "edible bird's nest extract" for 12 weeks by women. This single-center, double-blinded, parallel-group, placebo-controlled study included women aged 40–60 years. Our primary purpose was to assess improvement in skin wrinkles, elasticity, and moisture after 12 weeks using an SV700, cutometer, and corneometer, respectively, compared to baseline measurements. Our secondary purpose was to evaluate skin wrinkle, elasticity, and moisture changes at 4 and 8 weeks from baseline using the aforementioned equipment, and measure transdermal water loss and melanin and erythema indexes using a tewameter and mexameter, respectively. Experts performed the visual evaluation of skin wrinkles at 4, 8, and 12 weeks from baseline. The participants were randomly allocated in a 1:1 ratio into the edible bird's nest extract or the placebo group with 43 participants each, where they consumed 100 mg of the extract or placebo, respectively, daily for 12 weeks. The outcomes were measured at every visit. In this study, upon comparing changes in the skin elasticity value between the two intake groups at 12 weeks of ingestion, skin elasticity in the edible bird's nest extract group decreased significantly compared with that in the placebo group. Adverse reactions were absent in both groups. In the case of laboratory test results, changes before and after the ingestion of the extract were within the normal range, thus indicating no clinically significant difference. The edible bird's nest extract was effective in improving skin wrinkles. Moreover, it is beneficial for skin health and can be used as a skin nutritional supplement. Compared with the placebo, the edible bird's nest extract was identified as safe.

S. Yoon, M. Kim, S. Shin, J. Woo, D. Son, D. Ryu, J. Yoo, D. Park, E. Jung, **Effect of *Cirsium japonicum* Flower Extract on Skin Aging Induced by Glycation**, Molecules 2022, 27, 2093

Advanced glycation end products (AGEs) have recently been increasingly discussed as one factor of skin aging. In this study, we investigated the effects of *Cirsium japonicum* flower (CFE) extract on glycation in relation to skin aging and skin elasticity. Moreover, we learned the main active constituent of CFE that has effects against glycation. To demonstrate the effects of CFE on glycation, we carried out an in vitro glycation study, 3-dimensional culture, and clinical study. As a result, CFE inhibited formation of AGEs in both bovine serum albumin (BSA)/glucose glycation system and aldehyde-derived glycation system. Moreover, CFE reduced N"-(carboxymethyl), lysine (CML), and carbonylated proteins that increased by glycation. Furthermore, CFE broke crosslinks of collagen–AGEs and inhibited the increase of matrix metalloproteinase-1 (MMP-1) gene expression by AGEs. In the 3D culture condition, CFE restored the reduction of collagen gel contraction by glycation. Moreover, apigenin was detected as the main active constituent in CFE that has anti-glycation effects. In the clinical study, we confirmed that CFE has effects on skin wrinkles and skin elasticity. Our findings suggest that CFE can be used as

a cosmetic or cosmeceutical ingredient for improving skin elasticity and wrinkles. Regulation of AGEs can be an interesting target for anti-aging.

J.I. Seo, H.I. Ham, J.H. Baek, M.K. Shin, **An objective skin-type classification based on non-invasive biophysical parameters**, J Eur Acad Dermatol Venereol, Volume 36, Issue 3, March 2022, p. 444-452

Background: Despite the invention of various non-invasive bioengineering tools, skin-type analysis has largely been based on subjective assessments. However, advancements in the functional cosmetic industry and artificial intelligence-assisted dermatology are creating a greater demand for an objective skin-type classification system. Objectives: To propose an objective skin-type classification system solely based on non-invasive, bioengineering devices; provide reference values applicable to the Korean population; and compare our reference values with those of published studies. Methods: Biophysical parameter measurements were obtained from the 2018 International Skin Characteristics Data Bank Project conducted by the Foundation of Korea Cosmetic Industry Institute. The participants were 434 healthy South Korean adults. Each participant was assessed using eight bioengineering devices (Tewameter®, pH-meter®, Corneometer®, Sebumeter®, Cutometer®, Spectrophotometer®, PRIMOS® lite, and Janus®). The measurements were divided into tertiles to determine reference points. Results: Our objective skin-type classification consists of five main categories (sensitivity, hydration, oiliness, elasticity, and skin tone) and five corresponding subcategories (erythema, roughness, pores, wrinkles, and pigmentation, respectively). Each skin type was assigned based on the reference point of the biophysical parameter, which was established as the tertile value associated with 'unfavourable' skin characteristics. Individuals were categorized as having sensitive skin when the TEWL scores were over 18.0 g/m^2/h or the pH was over 5.45; dehydrated skin when the corneometric value measured below 47.17 A.U.; oily skin when the sebumetric value exceeded 70 µg/cm^2; and loose skin when the cutometric R^2 value was below 0.68 E/mm. Conclusions: This study is the first to provide a comprehensive skin-type classification system based solely on non-invasive biophysical parameters. As measurement data accumulate, the reference points will progress to become more accurate, and they will be subdivided according to gender, age, and ethnic group. Therefore, our classification system serves as a basis for artificial intelligence-based skin-type analysis.

N. Akhtar, **Development of stable tocopherol succinate-loaded ethosomes to enhance transdermal permeation: In vitro and in vivo characterizations**, J Csmet Dermatol, March 22

Background: Tocopherol succinate (TS) represents synthetic derivative of α-tocopherol (vitamin E), it act as anti-aging, moisturizing, and antioxidant. Ultraviolet (UV) photo stability of TS is low, and it cause skin irritation. Aim: To develop tocopherol succinate loaded ethosomal gel for topical TS delivery and to evaluate its moisturizing and anti-aging effects. Method: Cold method technique was used to produce ethosomal formulations (N = 9) by varying ethanol and lipid concentrations (F1-F9). The most optimized formulation (F5) was selected for further study on the basis of characterization. F5 Formulation was incorporated into gel. Ex vivo permeation study was done by using Franz diffusion cell. Non-invasive in vivo study was performed using corneometer for the evaluation of skin moisture content and skin mechanical properties by using cutometer, for 12 weeks on human subjects (N = 13). Results: Particle size (PS), zeta potential (ZP) and polydispersity index (PDI), Entrapment efficiency were found to be 179.1 nm, -13.7 mV and 0.345, and 99.71%, respectively. Transmission electron microscopy (TEM) depicted spherical ethosomal particles. Ethosomal gel and control gel were evaluated for conductivity and pH. Rheological analysis revealed a non-Newtonian flow. The release profile showed initial burst and then, sustained release, release data followed Korsmeyer-Peppas model. TS-loaded ethosomal gel appeared physically stable and showed significant results in terms of skin capacitance and mechanical properties. Conclusion: The prepared ethosomal gel formulation containing TS is more stable with enhanced antioxidant, moisturizing properties, and increased TS deposition into the skin layer.

Y.-J. Kim, J.O. Lee, S.-Y. Kim, J.M. Lee, E. Lee, J. Na, K.-H. Yoo, S.-J. Park, B.J. Kim, **Effect of A. polygama APEE (Actinidia polygama ethanol extract) or APWE (Actinidia polygama water extract) on wrinkle formation in UVB-irradiated hairless mice**, J Cosmet Dermatol, March 2022

Background: Actinidia polygama (silver vine) is considered a medical plant which has been used in oriental medicine. It has been used for the treatment of pain, gout, rheumatoid arthritis, and inflammation. Few studies reported on the effect of Actinidia polygama (silver vine) on skin photoaging. Objective: To evaluate the anti-photoaging effect of the ethanol and water extracts of A. polygama (APEE and APWE, respectively) in UVB-irradiated hairless mice. Methods: SKH-1 hairless mice were exposed to UVB irradiation (30~60 mJ/cm), following orally APEE or APWE oral administration for 10 weeks. We examined the effect on winkle improvement by a measuring Fullscope, PRIMOS,

Craniometer and Cutometer. Furthermore, we analyzed histological changes in mouse dorsal skin through hematoxylin and eosin (H&E) and Masson's trichrome (MT) staining. The expression of matrix metalloproteinase (1, 3, and 9) expression was analyzed by immunoblotting. Results: Oral administration of APEE or APWE at 100 or 200 mg/kg in UVB-irradiated mice alleviated the symptoms of skin aging, such as wrinkling, epidermal hyperplasia, and water loss. In addition, the APEE or APWE oral administration increased skin elasticity by enhancing the production of type I collagen, elastin, and hyaluronic acid synthase and downregulating matrix metalloproteinase (1, 3, and 9) expression. Conclusion: Based on results for our study, APEE or APWE could protect the UVB-mediated skin wrinkle and is new target for the developing anti-wrinkle cosmetics.

Y.-M. Ham, S.-A. Yoon, H. Hyeon, H.-B. Hyun, S.-C. Kim, B. Go, Y.-H. Jung, W.-J. Yoon, **Clinical Evidence of Effects of Green Mandarin (Putgyul) Extract on Skin Aging: A Randomized, Double Blind, Placebo-Controlled Study**, Nutrients 2022, 14, 1352

Green mandarins are widely consumed unripe as mandarin oranges (Citrus unshiu Marcov.), which exhibit anti-inflammatory and anti-wrinkle effects by inhibiting the production of inflammatory cytokines and matrix metalloproteinase. A randomized, double-blind, placebo-controlled clinical study was performed to verify the skin improvement efficacy and safety of green mandarin extract (PTE). For the standardization of PTE, narirutin was set as a marker compound, and PTE with a constant narirutin content was prepared for the study. After randomizing subjects with periorbital wrinkles, they were orally administered PTE (300 mg/day) or a placebo for 12 weeks. Periorbital wrinkles were measured using PRIMOSCR SF. Skin elasticity, moisture content, transepidermal water loss, and gloss were also measured. In the study results, the depth, volume, and skin roughness of the periorbital wrinkles were significantly improved compared to the control group ($p = 0.011$, 0.009, and 0.004, respectively). The survey confirmed that the skin condition improved after PTE consumption for 12 weeks. No adverse reactions associated with PTE were observed during the study period. Thus, the results demonstrate that PTE effectively improves UV-induced skin wrinkles. Therefore, it is considered that PTE has sufficient value as a functional food ingredient that can prevent skin aging.

A. Nikolis, K.M. Enright, L.E. Avelar, S. Rice, H. Sinno, D. Rizis, S. Cotofana, **A Prospective, Multicenter Trial on the Efficacy and Safety of Poly-L-Lactic Acid for the Treatment of Contour Deformities of the Buttock Regions**, JDD online, March 2022

Background: There is a significant emphasis on minimally invasive whole-body rejuvenation throughout the world. Recently, gluteal aesthetics have become an increasingly common patient concern. Although the application of poly-L-lactic acid (PLLA) to the face is already well known, there are relatively fewer publications on its use in other corporeal regions. This study aims to extend previous findings by evaluating the efficacy and safety of PLLA in the treatment of contour (including lifting) deformities of the buttock region. Methods: This was a prospective, multicenter (3 sites), single cohort, open-label clinical trial. Thirty female subjects were treated with PLLA in the bilateral buttocks, with three treatment sessions, each spaced one month apart and followed for six months after completion of the treatment regimen. At each visit, various safety and clinical efficacy parameters were collected, these included: Global Assessment of Improvement Scale (GAIS), subject satisfaction, skin hydration, elasticity, scaliness, roughness, and 3-dimensional imagery. Results: Six months following the last treatment, 84.00% of patients were rated as having “improved” or more on the physician assessed GAIS, accompanied by a 96.00% patient satisfaction rate. Approximately three vials of PLLA, per buttock and treatment were used. There were no serious adverse events throughout the duration of the trial, nor adverse events related to the investigational device. The most common subject-reported adverse events included pain during treatment (Mean: 70.97%) and bruising (Mean: 28.80%). Objective improvements were persistent after treatment in measurements of skin elasticity (improved 63.5% - 82.5% from weeks 16-32), hydration (increased ~11 Corneometer® units by week 16), roughness (decreased 36.95% at week 32), and scaliness (desquamation; decreased 60.41% at week 32). Conclusions: PLLA is safe and effective for the indication of buttock contouring and improving parameters of skin health. PLLA can provide long-lasting effects with a high level of patient and physician satisfaction.

Y. Sakata, H. Mayama, Y. Nonomura, **Friction dynamics of moisturized human skin under non-linear motion**, Int J Cosmet Sci, Feb;44(1): p. 20-29

Objective: Evaluating friction in human skin is important to assess its condition and the effects of skincare cosmetics. In this study, we evaluated the friction dynamics of moisturized skin to show the effects of moisturization on its mechanical properties. Methods: Friction force was evaluated using a sinusoidal motion friction evaluation system. The skin of the upper arm of 20 subjects was rubbed using a contact probe. The water content of the stratum corneum and the softness of the skin were measured using a Corneometer and a Cutometer, respectively. Results: When human skin was treated with water

or 10 wt% glycerol aqueous solution, the friction coefficients increased by 0.23 ± 0.01 and 0.17 ± 0.14, respectively, and the delay times (normalized by calculating the time interval from contact with the probe to the friction response divided by the friction time for one round trip) increased by 0.048 ± 0.034 and 0.055 ± 0.024, respectively. Three different friction profiles were observed: (a) a stable pattern, in which a smooth profile was observed during the sliding process; (b) an oscillation pattern, in which significant oscillation was obtained; and (c) a stick pattern, in which the friction coefficient increased even during the deceleration process. In the case of untreated skin, the oscillation pattern was observed for the majority of subjects. The appearance rate of the stick pattern increased by 80.3% ± 29.4% after treatment with 10 wt% glycerol aqueous solution. These characteristic friction profiles can be explained by a two-step friction model consisting of two modes: (a) friction at the skin surface and (b) the delayed response due to skin deformation. Conclusion: Moisturizing the skin with water or 10 wt% glycerol aqueous solution increased the friction coefficient and delay time, dramatically changing the friction profile. These changes were considered to be due to the swelling and softening of the stratum corneum and the increased true contact area between the contact probe and the skin surface.

D. Léger, C. Gauriau, C. Etzi, S. Ralambondrainy, C. Heusele, S Schnebert, A. Dubois, D. Gomez-Merino, M. Dumas, **"You look sleepy…" The impact of sleep restriction on skin parameters and facial appearance of 24 women**, Sleep Medicine 89 (2022), p. 97-103

Background: Total sleep deprivation has a visible impact on subjective facial appearance. However, there is a lack of knowledge on how moderate sleep restriction objectively impairs skin quality and facial aspect. Methods: Twenty-four healthy good-sleeping women, aged 30e55, volunteered for this study on the impact of sleep restriction (SR) on their facial skin. SR was limited to 3 h per night for 2 consecutive nights. We assessed the following parameters at the same time of day, before and after SR: sebumetry (Sebumeter SM 815), hydration (Corneometer CM 825), trans-epidermal water loss (Tewameter TM 210), biomechanical properties (Cutometer MPA 580), pH (PH-meter 900), desquamation quantification (DSquameter and microscopy), and image analysis (ColorFace - Newtone Technologies). We also obtained skin samples (swab) for malondialdehyde quantification (MDA). Results: We observed that some skin parameters are significantly associated with SR in both the morning and afternoon, including: lower hydration ($p < 0.001$), increased trans-epidermal water loss (PIE) ($p < 0.001$), and decreased extensibility (Uf; p ¼ 0.015) and viscosity (Uv; $p < 0.001$) of the skin. The average pH increased from 4.8 (±0.2) to 4.9 ± 0.4; $p < 0.001$. For face photography, brightness and saturation also significantly decreased with SR in mornings and afternoons ($p < 0.001$ for all tests). Finally, we observed a significant decrease in isolated corneocytes after desquamation associated with SR ($p < 0.001$ for all tests). SR was also associated with significantly increased MDA levels ($p < 0.001$ for all tests). Conclusions: Two nights of SR significantly altered the skin and facial appearances in our test group of typically good-sleeping women.

S.M. Henning, J.B. Guzman, G. Thames, J. Yang, C.H. Tseng, D. Heber, J. Kim, Z. Li, **Avocado Consumption Increased Skin Elasticity and Firmness in Women - A Pilot Study**, J Cosmet Dermatol. 2022

Background: Avocados are a rich dietary source of monounsaturated fatty acids, carotenoids, and phenolic compounds. Clinical studies have demonstrated that oral consumption of carotenoids improved skin aging. However, no studies have investigated whether oral intake of avocado will reduce skin aging. Objectives: We therefore performed this pilot study to assess whether oral consumption of one avocado daily for 8 weeks can reduce skin aging in healthy overweight women assessing skin physical characteristics and resistance to UVB radiation. Methods: Thirty-nine female participants (age 27–73 years) with Fitzpatrick skin type II-IV were randomly assigned to consume either one avocado daily or continue habitual diet for 8 weeks. Facial skin elasticity, firmness, pigmentation, sebum, and hydration were determined using a cutometer on the forehead and under eye. Minimal erythema dose (MED) was determined by standardized protocol at inner arm. Results: Elasticity and firmness were increased at forehead comparing 8 weeks to baseline in the avocado group. Comparing avocado to control, change in firmness marker from baseline to week 8 indicated a significant increase in forehead skin firmness in the avocado group. We did not observe any change in hydration, pigmentation, sebum, and UVB resistance between the avocado and control group, although changes in melanin and erythema were observed in both groups over time. Conclusions: Our findings suggest that daily oral avocado consumption may lead to enhanced elasticity and firmness of the facial skin in healthy women. Further studies of other skin locations are required to establish the connection between avocado consumption and skin aging.

W. Liu, L. Jie, D. Liu, E.T. Makino, J. Krutmann, R.C. Mehta, **Protective effects of a day/night dual-antioxidant serum on skin: A randomized, regimen-controlled study in Chinese women exposed**

to air pollution, J Cosmet Dermatol. 2022

Background: Chronic exposure to air pollution can negatively affect skin health. Aims: To assess the efficacy of the LUMIVIVE® System (LVS), a skincare system consisting of individual day and night serums, in Chinese women exposed to air pollution. Patients/Methods: In this single-center, vehicle-controlled study, eligible females (mean age, 49.02 years) were randomized 1:1 to treatment group (LVS plus basic moisturizer) or control group (basic moisturizer). Skin color, sebum content, barrier function, elasticity, and texture were measured at baseline and at each follow-up visit (days 28, 56, and 84). Air pollution parameters were collected throughout the study. Results: Air pollution levels, including PM2.5 and NO2, were consistently high during the study. The treatment group showed significantly higher skin color L* ($p \leq 0.0001$) and lower a* values ($p \leq 0.05$) at all follow-up visits compared with the control group, indicating lower skin pigmentation and redness, respectively. Skin color L* and a* values remained unchanged over time for the control group but were significantly different at all follow-up visits compared to baseline ($p \leq 0.0001$ and $p \leq 0.05$, respectively) for the treatment group. There was an increasing trend for sebum content in the control group, which was not observed in the treatment group. Both groups showed improvements over time in other skin physiology parameters. Conclusions: The current analysis demonstrates the efficacy of LVS plus basic moisturizer compared with basic moisturizer alone to reduce skin pigmentation and redness, as well as to mitigate sebum production, in Chinese women exposed to air pollution.

K. Zduńska-Pęciak, A. Kołodziejczak, H. Rotsztejn, **Two superior antioxidants: Ferulic acid and ascorbic acid in reducing signs of photoaging - A split-face comparative study**, Dermatol Ther, 2022 Feb;35(2)

The assessment of the signs of photoaging in mexametric (melanin and erythema index), corneometric (hydration level), and cutometric (elasticity) examination after the treatment with ascorbic acid and ferulic acid. This study was conducted in a group of 20 women aged 39-61 (mean age 54), with Fitzpatrick skin types II and III. The study included a series of eight treatments performed once a week. Two layers of peeling, based on 14% ferulic acid (left half of the face) and 12% l-ascorbic acid serum (right half of the face) were applied. To determine skin parameters: moisture, elasticity, melanin level, and erythema intensity, the Multi Probe Adapter Systems (Courage + Khazaka electronic GmbH, Köln, Germany) were used. Additionally, before and after the series of treatments, photographs were taken with the standardized photographic system Fotomedicus (Elfo®). The results of mexametric measurement for melanin level and erythema intensity were statistically significant ($p < 0.0001$) for both acids. Slightly greater lightening of the skin was demonstrated for ascorbic acid. The results of corneometric measurement of hydration level for ferulic acid and ascorbic acid were both statistically significant ($p < 0.0001$). First beneficial changes in improved elasticity could be observed as early as after 8 weeks but the increase in flexibility grew with time (after 12 weeks). These changes affected both acids and all measurement points. The changes in parameters were highly statistically significant ($p < 0.0001$). Based on the conducted research, it is not possible to state which of the tested acids is more effective in reducing the symptoms of photoaging. Both acids (ascorbic and ferulic), which have a high antioxidant potential, affect the measurable parameters of the skin: pigmentation (melanin index), erythema (erythema index), skin hydration, and elasticity.

I.R. Almeida, A.C. Gonçalves, F.B. Corrêa, J.C.D. Castro, E.C.O. Guirro, J.A. Farina Junior, P.S. Coltro, **Evaluation of Clinical and Biomechanical Features of Scars Resulting from the Treatment of Burn Contractures Comparing Acellular Dermal Matrices: A Randomized Clinical Trial**, Ann Surg, January 2022

Objective: To compare clinical and biomechanical features of scars resulting from the treatment of burn contractures using different acellular dermal matrices (ADM). Summary background data: Extensive burns often lead to severe sequelae, such as skin contractures, that can be treated using ADM to improve the quality of these scars. Methods: A prospective, randomized and controlled clinical trial was performed including patients with burn contractures at least one-year post-burn, treated using split-thickness skin graft (STSG). These patients were randomized into four groups: Control (received only STSG without ADM), Integra (ADM + STSG), Matriderm (ADM + STSG), and Pelnac (ADM + STSG). Exclusion criteria were loss of follow-up and graft integration failure. The evaluation was performed using the Vancouver Scar Scale (VSS), the durometer, and the cutometer in areas of normal skin, hypertrophic scar, and surgical scar, at least one year after the surgery. Results: In the VSS, durometer, and cutometer evaluation, there was no difference in the comparison of surgical scars among groups. Analyzing each group, with an intraindividual evaluation comparing areas of normal skin with surgical scars, the results suggested a possibility of a surgical scar hardness closer to normal skin for Integra and Matriderm groups measured with the durometer. In the cutometer evaluation, surgical scars were not comparable to areas of normal skin. Conclusions: This study suggests that there is no

difference in the quality of scar assessed through the analysis of clinical and biomechanical features comparing acellular dermal matrices (Integra, Matriderm, and Pelnac) and only split-thickness skin graft without a dermal matrix.

H.J. Lee, S. R. Park, D.I. Kwon, M.S. Park, D.H. Lim, **Depth profiling of epidermal hydration inducing improvement of skin roughness and elasticity: in vivo study by confocal Raman spectroscopy**, J Cosmet Dermatol, January 2022

Introduction: Skin hydration in the stratum corneum plays an important role in skin condition, and skin efficacy properties are influenced by its hydration level. However, few studies have identified the correlation between changes in skin hydration content and skin characteristics by skin depth level. Aims: This study aims to determine how changes in skin hydration at specific depth levels affect skin condition by long-term tracking changes in hydration of stratum corneum and viable epidermis after usage of moisturizer. Methods: Ten volunteers were recruited and subjected to in vivo confocal Raman spectroscopy to perform water content profiling at skin depths of up to 52 μm. Mechanical properties of skin were measured using Cutometer and Antera 3D. Skin-elasticity and roughness values observed before and after 15 days of moisturizing emulsion use were compared to demonstrate the correlation between observed changes in skin efficacy parameters and skin water content at specific depths. Results: Significant increase in relative water content at specific depths was observed in this study. Among mechanical properties of skin, only R4, R6, and R8 parameters demonstrated significant changes. Additionally, rates of change in values of the R6 and R8 parameters revealed a high correlation with water content changes at viable epidermis depths below the stratum corneum. On the other hand, skin roughness parameter showed a correlation with water content changes at the outermost layer of stratum corneum. Conclusion: Results of this study indicate that skin elasticity is influenced by its hydration level at viable epidermis depths and skin roughness at stratum corneum each. This suggests that monitoring depth profiles of water content using in vivo confocal Raman spectroscopy provides a breakthrough in tracking the skin efficacy effect of topically applied substances.

*S.H. Kim, J.H. Kim, S.J. Lee, M.S. Jung, D.H. Jeong, K.H. Lee***, Minimally invasive skin sampling and transcriptome analysis using microneedles for skin type biomarker research,** Skin Research & Technology, January 2022

Background: Minimally invasive skin sampling is used in various fields. In this study, we examined whether it was possible to obtain skin specimens using biocompatible microneedles composed of sodium hyaluronate and performed transcriptome analysis. Materials and methods: Thirty-three subjects with different skin conditions, such as skin aging, skin hydration, skin pigmentation, oily skin and sensitive skin, were recruited. Skin types were evaluated based on age, non-invasive measurement devices, 10% lactic acid stinging test and visual assessment; the skin specimens were sampled from the face using microneedles. Total RNA was extracted, and microarray was performed. Correlations between various biomarkers and skin condition parameters were analysed. Results: Several skin-type biomarkers are correlated with age, non-invasive device measurements, LAST score and visual assessment of acne lesions. Representatively, COL1A1 (Collagen type 1 alpha 1 chain), FN1 (Fibronectin 1) and PINK1 (PTEN-induced putative kinase protein 1) for skin aging, FLG (Filaggrin), KLF4 (Kruppel-like factor 4) and LOR (Loricrin) for skin hydration, GPNMB (Glycoprotein non-metastatic melanoma protein B), MLANA (Melan-A) and TYR (Tyrosinase) for skin pigmentation, IGF1 (insulin-like growth factor-1), MPZL3 (Myelin protein zero like 3) and AQP3 (Aquaporin 3) for oily skin and PGF (placental growth factor), CYR61 (cysteine-rich angiogenic inducer 61), RBP4 (retinol-binding protein 4), TAC1 (Tachykinin precursor 1), CAMP (Cathelicidin antimicrobial peptide), MMP9 (Matrix metallopeptidase 9), MMP3, MMP12 and CCR1 (C-C motif chemokine receptor 1) for sensitive skin. Conclusion: Microneedle skin sampling is a new and minimally invasive option for transcriptome analysis of human skin and can be applied for diagnosis and treatment efficacy evaluation, as well as skin type classification.

M. Sulovsky, D. Müller, V. Prinz, N. Moellhoff, M. Cajkovsky, N. Duschek, K. Frank, **A prospective open-label, multicentre study evaluating a non-cross-linked hyaluronic acid based soft-tissue filler in the correction of lateral canthal and perioral lines**, J. Cosmet Dermatol, 2022;21: p. 191-198

Objective: The aim of this investigation was to assess the effectiveness of a non-cross-linked hyaluronic acid based soft-tissue filler in the correction of lateral canthal lines and periorbital lines. Material and methods: A total of 59 female Caucasian patients with a mean age of 52.6 ± 9.0 years were enrolled in this prospective open-label, multicentre study and received intradermal injections of a soft-tissue filler at baseline, after 3 and 6 weeks. Aesthetic improvement and patient satisfaction, skin hydration, skin firmness and skin elasticity, as well as adverse events were assessed at 3, 6, 8, 12 and 16 weeks. Results: At baseline, the lateral canthal skin firmness was 0.206 ± 0.07 mm and increased

after 8 weeks to 0.087 ± 0.08 mm with p < 0.001, while the perioral skin firmness was 0.205 ± 0.09 mm and increased after 8 weeks to 0.116 ± 0.08 mm with p < 0.001. Increases in skin hydration were observed after 8 weeks in both areas, however, did not reach statistical significance at any point. At week 8, 12 and 16 a majority (93.1%, 91.1% and 73.7% respectively) of the patients stated that they were 'satisfied' or 'very satisfied' with the treatment. Conclusion: Overall, the skin firmness and skin visco-elasticity showed significant increases in the lateral canthal and perioral region. Moreover, albeit not statistically significant, skin hydration increased in both areas after 8 weeks. The procedure has been shown to be safe and satisfactory for the treated patients; however, emergence of oral herpes should be added to the safety profile of intradermally applied hyaluronic acid treatments.

P. Tumsutti, M. Maiprasert, P. Sugkraroek, R. Wanitphakdeedecha, A. Bumrungpert, **Effects of a combination of botanical actives on skin health and antioxidant status in post-menopausal women: A randomized, double-blind, placebo-controlled clinical trial**, J Cosmet Dermatol. 2022;21: p. 2064–2072

Background: Skin aging is one of the most concerning issues during the post-menopausal period. Despite the promising effects of hormonal therapy, there is still concerned about the long-term outcomes from the treatment. Therefore, nutraceuticals that contain estrogenic and antioxidative effects have gained a lot of attention as an alternative therapy for slowing down skin age-related changes in women after menopause. Objective: This study was aimed at evaluating the effects of a combination of nutraceuticals on skin health and antioxidant status in women after menopause. Methods: Post-menopausal women aged 45–60 years old were enrolled and randomly allocated (n = 110) equally to either treatment or placebo group (n = 55 per group). The test product, a nutraceutical containing a blend of Glycine max, Cimicifuga racemosa, Vitex agnus-castus, and Oenothera biennis extracts, was administered over a 12-week period, with dermatological parameters evaluated at baseline, week 6, and week 12 of the study. Additionally, glutathione (GSH) and malondialdehyde (MDA) levels were detected at baseline and week 12 to evaluate the antioxidant status. Results: At week 6, skin roughness was significantly improved in the treatment group (n = 50 completed), while at week 12, a significant improvement and large effect sizes observed in skin elasticity (Cohen's d = 1.56, [SDpooled = 0.10]), roughness (d = 1.53, [0.67]), smoothness (d = −1.33, [34.65]), scaliness (d = −0.80 [0.095]), and wrinkles (d = −1.02 [13.68]) compared to placebo (n = 51 completed). Moreover, GSH was significantly increased (d = 1.54 [32.52]) whereas MDA was significantly decreased (d = −1.66, [0.66]) in the test group, compared to placebo. Blood biochemistry, along with vital signs, did not differ between groups, and no subjects reported any adverse throughout the trial. Conclusion: These data indicate the supplementation with the formulated blend of four herbal extracts is supportive of skin health and antioxidant status in women of menopausal age.

M. Safa, A. Natalizio, C.K. Hee, **A Prospective, Open-Label Study to Evaluate the Impact of VYC-12L Injection on Skin Quality Attributes in Healthy Volunteers**, Clinical, Cosmetic and Investigational Dermatology 2022:15 411–426

Purpose: Age-related changes in skin structure and function can negatively impact skin quality. VYC-12L is a crosslinked hyaluronic acid fller for treating fne lines and improving hydration and elasticity. The goal of this study was to understand skin quality, histologic, and genomic changes underlying long-term clinical benefts of VYC-12L treatment. Patients and Methods: In this prospective, nonrandomized, open-label study, 11 healthy men (n = 2) and women (n = 9) received intradermal VYC-12L treatment on the volar forearm. Clinical probes assessed skin quality at baseline and months 1 and 3 posttreatment. Punch biopsies were collected 1 and 3 months post-treatment to evaluate histologic and genomic changes. Safety was evaluated throughout. Results: Participants had a mean age of 41 years and Fitzpatrick skin phototypes II (54.5%) and III (45.5%). At months 1 and 3, VYC-12L-treated skin had higher hydration in the stratum corneum than untreated skin. Cutometer measurements indicated treated skin that was frmer and more resistant to deformation. Histology showed increased epidermal AQP3 and Ki67 expression 1 and 3 months post-treatment and a qualitative increase in papillary dermal collagen I at month 3. Genomic analyses demonstrated treatmentrelated upregulation of genes involved in adipocyte differentiation, lipid metabolism, keratinocyte renewal, and dermal extracellular matrix (ECM) maintenance. Injection site reactions were mild-to-moderate in severity and resolved by month 1. Five participants reported 19 adverse events; most (68.4%) were related to the biopsy and none to VYC-12L. Conclusion: VYC-12L produced changes in hydration, frmness, and ECM density and composition consistent with improved skin properties, demonstrating that VYC-12L can act as a substrate for tissue repair.

V. Nobile, E. Spartà, V. Zanoletti, F. Sandolo, E. Cestone, **Efficacy Evaluation of a Cosmetic Product for the Periocular Area in Caucasian Women Aged Over 40 Years Old**, Clinical, Cosmetic and

Investigational Dermatology 2022:15

Purpose: The present study was aimed at evaluating the efficacy of a cosmetic product in improving the appearance of periocular skin. Patients and Methods: An open-label study on 40 female subjects showing clinical signs of skin aging in the periocular area (including bags under the eye and dark circles) was conducted. At day 0 and day 28 the bags under eye volume, dark circles color, skin texture, skin moisturization, skin elasticity, and skin radiance were measured. The instrumental measurements were integrated by clinical analysis carried out by a board-certified dermatologist and by a self-assessment questionnaire carried out by each subject participating in the study. Results: After 28 days of product use the volume of the bags under the eye was decreased by 6.8% (p = 0.005), the dark circle color red and blue component improved by 7.1% (p = 0.001) and 4.0% (p = 0.001), respectively, wrinkle depth and skin roughness decreased by 15.8% (p = 0.001) and 6.3% (p = 0.011), respectively, skin moisturization increased by 11.7% (p = 0.000), the skin distensibility decreased by 8.9% (p = 0.000), the overall skin elasticity increased by 10.4% (p = 0.000), and the skin radiance increased by 16.3% (p = 0.000). The instrumental measured effects were also confirmed by the clinical analysis of the dermatologist and the selfassessment questionnaire output. Conclusion: Conclusions: our results suggest that the test product is effective for periocular skin aesthetics (reduction of imperfections undermining the periocular area) and wellness.

M. van Nuffel, C. Meulyzer, B. Gheysen, A. Böhrer, M. Anthonissen, E. van den Kerckhove, I. Degreef, **Palmar skin elasticity measured by the Cutometer MPA 580 is decreased in mild Dupuytren's disease compared to healthy controls**, Hand Ther, 2022 Mar;27(1): p. 14-21

Introduction: Involvement of the palmar skin is often seen in patients with Dupuytren's disease (DD) with severe finger contractures. However, skin elasticity may be already decreased earlier in the disease. The Cutometer MPA 580 could provide an objective skin measurement tool to assess this decrease in elasticity. Linking objective skin measurements to functional outcome measures could lead to better prediction of disease progression. We set up a study to investigate if the Cutometer was able to detect differences in skin elasticity between patients with mild Dupuytren's disease and healthy controls. Methods: A cross-sectional analytical study was performed. Three assessors measured skin elasticity (palmar hand) on two sites using the Cutometer on 30 patients with mild DD and 30 healthy controls. Student's t-test was used to evaluate differences in skin elasticity and a linear model to evaluate interactions between the groups and sites. Results: Significant differences in skin elasticity were found between DD patients and controls, as well as differences based on the location examined. Discussion: Similar to other skin conditions, the Cutometer MPA 580 was able to demonstrate a significant lower elasticity in the palmar skin in DD patients compared to healthy controls. A decrease in skin elasticity in different locations of the hand correlated with areas that often pose problems in the treatment of more severe DD. The Cutometer could potentially be a tool to identify these areas earlier in the disease.

Y. Huang, J. Sanz, N. Rodríguez, X. Duran, A. Martínez, X. Li, P. Foro, M. Conde, M. Zhao, F. Liu, A. Reig, J. Dengra, I. Membrive, P. Pérez, M. Algara, **Quantitative assessments of late radiation-induced skin and soft tissue toxicity and correlation with RTOG scales and biological equivalent dose in breast cancer**, Clinical and Translational Oncology (2022) 24: p. 836–845

Purpose: Radiation-induced toxicity (RIT) is usually assessed by inspection and palpation. Due to their subjective and unquantitative nature, objective methods are required. This study aimed to determine whether a quantitative tool is able toassess RIT and establish an underlying BED-response relationship in breast cancer. Methods: Patients following seven diferent breast radiation protocols were recruited to this study for RIT assessment with qualitative and quantitative examination. The biologically equivalent dose (BED) was used to directly compare diferent radiation regimens. RIT was subjectively evaluated by physicians using the Radiation Therapy Oncology Group (RTOG) late toxicity scores. Simultaneously an objective multiprobe device was also used to quantitatively assess late RIT in terms of erythema, hyperpigmentation, elasticity and skin hydration. Results: In 194 patients, in terms of the objective measurements, treated breasts showed higher erythema and hyperpigmentation and lower elasticity and hydration than untreated breasts ($p < 0.001$, $p < 0.001$, $p < 0.001$, $p = 0.019$, respectively). As the BED increased, Δerythema and Δpigmentation gradually increased as well ($p = 0.006$ and $p = 0.002$, respectively). Regarding the clinical assessment, the increase in BED resulted in a higher RTOG toxicity grade ($p < 0.001$). Quantitative assessments were consistent with RTOG scores. As the RTOG toxicity grade increased, the erythema and pigmentation values increased, and the elasticity index decreased ($p < 0.001$, $p = 0.016$, $p = 0.005$, respectively). Conclusions: The multiprobe device can be a sensitive and simple tool for research purpose and quantitatively assessing RIT in patients undergoing radiotherapy for breast cancer. Physician-assessed toxicity scores and objective measurements revealed that the BED was positively associated with the severity of RIT.

Y.I. Lee, S.G. Lee, I. Jung, J. Suk, M.-H. Lee, D.-U. Kim, J.H. Lee, **Effect of a Topical Collagen Tripeptide on Antiaging and Inhibition of Glycation of the Skin: A Pilot Study**, Int. J. Mol. Sci. 2022, 23, 1101

The glycation process has been recognized as one of the critical parameters that accelerate signs of skin aging, especially in skin exposed to environment factors, such as ultraviolet radiation. Although previous studies showed the anti-inflammatory and antiaging properties of the hydrolyzed collagen tripeptide (CTP), its exact mechanism is not fully understood. Therefore, in this study, we sought to investigate the effect of a topical CTP on facial skin. Our group designed a 4 week prospective, single-arm study of 22 Asian women who applied topical CTP. We observed significant improvements in skin wrinkles, elasticity, and density with a reduction in skin accumulation of advanced glycated end products (AGEs) at week 4 without any adverse effects. The in vitro study revealed a preventive effect of the topical CTP on the accumulation of AGEs, denatured collagen production, and reactive oxygen species in dermal fibroblasts. Moreover, treatment with the CTP decreased induction of matrix metalloproteinases while increasing the collagen 1 level. These results suggest that the application of a topical CTP might improve clinical aging.

U. Ifeanyi, S.G. Danby, R. Lewis, M.J. Carré, R. Maiti, **Effect of seasonal change on the biomechanical and physical properties of the human skin**, Journal of the Mechanical Behavior of Biomedical Materials, 127, 2021

In this study, the effect of one cycle of winter to summer seasonal transition on the mechanical and physical properties of skin was investigated in vivo. Fourteen healthy skin volunteers aged between 22 and 42 years were studied at the volar lower and upper arms. The findings indicate a 22.15% and 34.29% decrease in trans-epidermal water loss (TEWL) and the average epidermal roughness (AER), respectively. Also, improved skin properties were observed such as a 25.48% rise in average epidermal hydration (AEH), 22.59% in skin thickness, 38.64% and 21.92% in melanin and redness, respectively, as well as an 8.25% rise in its firmness and 23.14% in elasticity when strained with axial deformations. An inverse correlation was established between TEWL and AEH with a linear relationship between stratum corneum roughness versus TEWL as well as thickness and hydration. Also, the skin firmness exhibited a direct proportionality with TEWL and an inverse correlation with skin hydration where these relationships were stronger in summer than in winter. Furthermore, time-dependent results demonstrated three-staged elastic, viscoelastic and creep deformations with high, moderate and low strain rates respectively at both anatomical locations. The winter season displayed lower skin firmness and elasticity of 0.37mm and 0.04mm compared to 0.40mm and 0.06mm in summer accordingly. Anatomically, the two arm regionsdisplayed different results with the upper arm having more consistent results than the lower arm. These results will find relevance in sensor skins and exoskeletons in Medicare, robotic and military technologies as well as innovations in cosmetics and dermatology.

R. Shariff, Y. Du, M. Dutta, S. Kumar, S. Thimmaiah, C. Doraiswamy, A. Kumari, V. Kale, N. Nair, S. Zhang, M. Joshi, U. Santhanam, Q. Qiang, A. Damodaran, **Superior even skin tone and anti-ageing benefit of a combination of 4-hexylresorcinol and niacinamide**, International Journal of Cosmetic Science, December 2021

Objectives: To demonstrate the synergistic effect of 4-hexylresorcinol (4-HR) with niacinamide in boosting anti-melanogenic efficacy in vitro and establish the in vivo efficacy and safety of the combination in a human trial. Methods: Primary human epidermal melanocytes and 3D pigmented skin equivalents were treated with 4-HR, niacinamide, and their combinations for their effect on pigmentation. This was followed by a randomized, double-blind, split-face clinical study in Chinese subjects, and effects on skin tone, hyperpigmentation, fine lines and wrinkles, hydration, and skin firmness were measured for a 12-week study period. Results: In vitro tyrosinase enzyme activity studies showed that 4-HR is one of the most potent tyrosinase inhibitors. The combination of 4-HR and niacinamide showed a synergistic reduction in melanin production in cultured melanocytes and lightened the 3D skin equivalent model. In vitro as well as in the human trial, the combination of 4-HR and niacinamide showed significantly improved efficacy over niacinamide alone on hyperpigmentation spots as measured by L*, the visual appearance of fine lines and wrinkles in crow's feet and perioral area and skin firmness, with no product-related adverse events. Conclusions: A formulation containing a combination of 4-HR and niacinamide delivered superior skin tone and anti-ageing benefits significantly better than niacinamidalone with no adverse events. This study demonstrates that a product designed to affect multiple pathways of melanogenesis, inflammation, and ageing may provide an additional treatment option, beyond hydroquinone and retinoids, for hyperpigmentation and ageing.

V. Galati, R. Vonthein, F. Stang, P. Mailaender, T. Kisch, **Split thickness skin graft versus application of the temporary skin substitute suprathel in the treatment of deep dermal hand burns: a**

retrospective cohort study of scar elasticity and perfusion, Int J Burn Trauma 2021;11(4): p. 312-320

Two therapeutic options for deep dermal hand burns are autologous split-thickness skin graft (STSG) following tangential excision and the application of the temporary wound dressing Suprathel following removal of burn blisters. We compared elasticity and perfusion of burn scars after both types of therapy at least one year after completion of treatment. A case series of 80 patients of our department with deep dermal hand burns between 2013 and 2018 was examined in the year 2019 at least one year after completion of treatment (24 females and 56 males with a median age of 47.6 years). The clinical assessment of the scar was performed with the Vancouver Scar Scale (VSS) and Patient and Observer Scar Assessment Scale (POSAS) and the objective assessment with suction cutometry (MPA 580) and an O2C device on both hands. Our statistical analysis showed no statistically significant differences for the R2 and R5 elasticity values between the two types of therapy. The 95% confdence intervals for the ratios of elasticity, and microcirculatory perfusion parameters and scar scale scores of burn scars to respective healthy areas of skin after STSG and Suprathel-therapy mostly covered 1. Subgroup analysis of R2 viscoelasticity and analyses with adjustments for scar compression therapy, nicotine consumption, age, palmar or dorsal localization of the burn scar and interactions of age with smoking and localization gave similar results. The adjusted analysis of SO2 showed statistically signifcant lower SO2 values, 9% less, after STSG compared to Suprathel treatment. Split-thickness skin graft following tangential excision and the application of Suprathel following removal of burn blisters may be equivalent options for treatment of deep dermal hand burns. To detect possible small differences, further studies with larger samples are required.

Y. Ye, Y. Li, T. Bi, L. Jiang, **Improvement of urban eye skin in Chinese female by supramolecular retinol plus acmella oleracea extractcontaining product**, J Cosmet Dermatol, November 2021

Background: Studies on the anti-wrinkle effects of retinol have been widely reported, but there are few reports on the infraorbital dark circles reducing effects. Objective: To evaluate the efficiency and tolerance of one novel formulation containing supramolecular retinol plus acmella oleracea extract in Chinese urban eye skin. Methods: Thirty-three women with dark circles and visible fine wrinkles around the eyes, aged 20-45 years, were enrolled and instructed to use the formula for 6 weeks. Instrumental measures and subject assessment were obtained at baseline and at 3-week intervals. Results: After 6 weeks, Mexameter MX18 results demonstrated a statistically significant 13.8% decrease in MI (melanin index) value, and Colorimeter CL400 results demonstrated a statistically significant 0.5% increase in L* (lightness) value, which proved the efficacy of reducing dark circles. Primos-Lite data showed that the wrinkles parameters of Ra, the wrinkle area %, and number of the wrinkles under the eyes and crow's feet revealed significant reduction to varying degrees. Cutometer results showed that R2 value increased significantly by 13.0%, indicating the benefits of firmer skin. In addition, subject assessment revealed that at the end of 6 weeks, the eye skin was noticeably improved. Conclusions: By clinical evaluation and subject assessment, the novel formulation containing supramolecular retinol plus acmella oleracea extract can effectively diminish the collective signs of stressed urban eye skin for Chinese female in terms of dark circles, fine wrinkles, and sagging skin with good tolerance.

E. Besic Gyenge, S. Hettwer, B. Obermayer, **Minimal Care – Spa-Feeling für Haut und Haare**, SOFW Journal 11/21, 147 Jahrgang, Thannhausen, 15. November 2021

Skinimalism oder minimal skin care ist ein neuer Trend, der in der Kosmetikwelt Einzug hält. Zum einen geht es darum, so wenig verschiedene Inhaltsstoffe wie möglich in kosmetische Produkte zu formulieren, zum anderen aber auch darum, mit z.B. nur einem Wirkstoff maximale Schönheitseffekte zu erzeugen. Hier stellen wir zwei Hydration-Produkte vor, die genau das leisten können. Im Skin Care und auch im Hair Care Bereich.

Y.-K. Lim, C.-J. Jung, M.-Y. Lee, I.-J. Moon, C.-H. Won, **The Evaluation of Efficacy and Safety of A Radiofrequency Hydro-Injector Device for the Skin around the Eye Area**, J. Clin. Med. 2021, 10, 2582

In recent years, variable rejuvenation techniques, such as hyaluronic acid (HA) fillers and radiofrequency (RF) devices, have become popular. We evaluated the RF hydro-injector (RFHI) device that simultaneously delivers both a microneedle intradermal RF treatment and a HA filler injection to overcome the disadvantages of HA filler and RF devices alone. This study aimed to assess the efficacy and safety of the RFHI device for the rejuvenation of the periorbital area, including the lateral canthal lines (LCLs) and the infraorbital area. A total of 24 subjects were enrolled in this study and underwent 2 to 3 treatments using the RFHI device. The investigator's global assessment of the lateral canthal line (IGA-LCL) and the global esthetic improvement scale (GAIS) were used to evaluate the improvement in the LCL. Cutometer® was used to evaluate the skin's elasticity, and the Antera 3D image capture

system® was used to evaluate the degree of wrinkles, roughness, and pore volume. At the 8 week follow-up after the first treatment session, both the IGA-LCL and GAIS showed significant improvement. The improvement in the wrinkles, roughness, and pore volume, measured by the Antera 3D image capture system®, was statistically significant. No serious adverse event was reported. This RFHI device, which delivers both microneedle intradermal RF treatment and HA filler injection, is effective and safe for periorbital rejuvenation.

M. Kerscher, W. Prager, T.C. Fischer, G.G. Gauglitz, T. Pavicic, U. Kühne, M. Kravtsov, M. Hofmann, H. Dersch, S. Sattler, **Facial Skin Revitalization with Cohesive Polydensifed Matrix-HA20G: Results from a Randomized Multicenter Clinical Study**, Plast Reconstr Surg Glob Open 2021;9

Background: There is a growing interest in the application of hyaluronic acid (HA) derivatives in skin quality improvement. The aim of this study was to confrm safety and effectiveness of cohesive polydensifed matrix-hyaluronic acid + glycerol (CPMHA20G; Belotero Revive) in revitalization of early-onset photodamaged facial skin. Methods: A total of 159 subjects with early signs of facial photodamaged skin were randomized in a 2:1 ratio to multiple- or single-dose treatment with CPMHA20G. Effectiveness assessments included biophysical measurements of skin hydration; elasticity, frmness, and roughness; investigator- and subject-assessed Global Aesthetic Improvement Scales; and FACE-Q Skin Changes and Treatment Satisfaction questionnaires. Results: In both treatment groups, skin hydration improved from baseline to all follow-up visits in subjects with dry or very dry skin. This improvement was signifcant at week 16 after initial treatment in the multiple-dose group (P = 0.0013). Investigator- and subject-reported outcomes showed that the majority of subjects across all skin hydration types benefted from treatment, with higher satisfaction rates observed in the multiple-dose group. According to investigator-assessed Global Aesthetic Improvement Scale, 90.7% of subjects at week 12 in the multipledose and 74.6% of subjects at week 4 in the single-dose group were rated as at least “improved.” All related treatment-emergent adverse events were transient, expected injection-site reactions of mild to moderate intensity. Conclusions: Effectiveness of CPM-HA20G for skin hydration in subjects with dry or very dry skin was demonstrated up to 9 months after last injection. Overall, CPMHA20G demonstrated effective and safe use in facial skin revitalization among subjects with early-onset photodamaged skin.

T. Esposito, T. Mencherini, F. Sansone, G. Auriemma, P. Gazzerro, R.V. Puca, R. Iandoli, R.P. Aquino, **Development, Characterization, and Clinical Investigation of a New Topical Emulsion System Containing a *Castanea sativa* Spiny Burs Active Extract**, Pharmaceutics 2021, 13, 1634

The study focused on the development and characterization of an O/W emulsion for skincare containing *Castanea sativa* spiny burs extract (CSE) as functional agent. The emulsion was stable and had suitable physicochemical and technological properties for dermal applicationand CSE showed no cytotoxicity in spontaneously immortalized keratinocytes (HaCaT) at active concentrations. A single-blind, placebo-controlled, monocentric study was designed to evaluate the skin tolerability and the skin performance of the CSE-loaded emulsion on healthy human volunteers. An improvement was observed in skin biomechanical properties such as hydration, skin elasticity and a reduction in the periorbital wrinkles in 30 days without altering the skin barrier function, sebum, pH, and erythema values. A significant skin moisturizing effect was detected while the skin barrier function was preserved. The selected natural ingredient combined with the designed formulation and the optimized preparation method has led to a final product that satisfies the physico-chemical and technological requirements underlying the safety of use and the formulative stability over time. With no negative skin reactions and highly significant effects on skin elasticity, wrinkles, and moisturization, the CSE-based emulsion achieved very satisfying outcomes representing a promising functional formulation for skin care.

S. Ramirez, I.B. Kwang Puah, **Effectiveness of combined microfocused ultrasound with visualization and subdermal calcium hydroxyapatite injections for the management of brachial skin laxity**, J Cosmet Dermatol. 2021;20: p.3871–3879

Background: There is no publication to date on the combined use of microfocused ultrasound with visualization (MFU-V) and calcium hydroxylapatite (CaHA) for brachial skin laxity.Aim: To assess the effectiveness of combining MFU-V with diluted/hyperdiluted CaHA in a single session for treating brachial skin laxity. Subjects/Methods: Female subjects who had skin laxity in the brachial regions and who desired non-surgical intervention were enrolled into this prospective, singlearm pilot study. MFU-V (Ultherapy®, Merz North America, Inc. Raleigh, N.C.) was applied using the 4.0 MHz-4.5 mm and 7.0 MHz-3.0 mm depth transducers, followed by subdermal injections of diluted (1:1)/hyperdiluted (1:2) CaHA (Radiesse®, Merz North America, Inc). Subjects were followed for six months after treatment. Objective biophysical skin assessments were conducted using a cutometer (Cutometer® Dual 580 MPA; Courage & Khazaka, Cologne, Germany). Subjective assessments included the arm visual analogue

scale (VAS), global aesthetic improvement scale (GAIS), and subject global satisfaction scale. Results: Twelve subjects participated in the study. The mean R0 reading (measure of skin firmness) progressively improved from 0.515 mm at baseline to 0.433 mm at 24 weeks ($p < 0.05$ for 12 and 24 weeks). The mean R2 reading (measure of skin elasticity) and mean arm VAS improved significantly from baseline at all visits ($p < 0.05$ for all). The majority of subjects at each visit showed improved arm appearance and were satisfied with their treatment. Both procedures were well-tolerated. Conclusions: Combined use of MFU-V with diluted/hyperdiluted CaHA demonstrates significant improvements in both objective and subjective measures of brachial skin laxity.

H.-L. Jo, J. Han, B.-F. Suh, E. Kim, **Digital aging: Skin Changes by digital device**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Visible light is emitted from natural and artificial sources. As a major natural source, solar radiation contains a large proportion of visible light. Visible light exposure from artificial sources can originate from a variety of instruments, including computers, smartphones, televisions, and light-emitting diodes (LEDs).1 With the rapid technological development of the modern society, skin aging is also connected to digital. In the past, there have been many discussions about extrinsic aging such as sunlight, but recently, aging caused by digital devices such as smartphones has emerged as an issue. Recently, in the UK, it is being pointed out that the selfie craze is the main cause of skin aging, and it is drawing attention. Our previous studies have reported that repeated exposure to blue light energy can cause skin damage including increase of erythema index and melanin index and decrease of skin hydration and transparency.2 However, there is no clinical test report on the visible light source emitted by digital devices. In this study, we have studied that the harmful skin effects on visible light source emitted by digital devices.

T.-C. Hsiao, F.-W. Pan, X.-F. Lin, X.-L. Wang, Y.-Y. Gao, Y. Chen, **Effective Components of the *Prunus Speciosa* Flower Extract on Blue Light Filtration, Whitening and Skin Repair**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

The *Prunus Speciosa Guangzhou, Rosaceae* has shown promising results for skin health. In 2013, the “Guangzhou Cherry Blossom” was named after the city of Guangzhou, China. The single-leafed pink flower is the most weather proof and heat-tolerant of all varieties of Cherry Blossom. Natural active ingredients extracted from Prunus Speciosa Flour (PSFE), such as flavonoids, quercetin, have proved to be the most effective at blue light filtration、 skin whitening and repair. Skin adaptive responses help to increase production from light-induced damage. The PSFE achieves the inhibition of tyrosinase activity and melanin content in vitro experiments. In order to study skin barrier effects, sodium lauryl sulfate (SLS) was used to irritate the skin of 3D models to establish an alternative human patch test. At the same time, a clinicaltrial was conducted using PSFE facial cream twice a day for 28 days. The changes inskin moisture, melanin content and skin elasticity of 20 human subjects were studied.

S.-Y. Huang, Y.-N. Lu, Y. Xiong, J. Tian, **Instant Skin Firming and Anti-Wrinkle Effect of The *Prunus persica* (peach) Gum Extract**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Skin aging is a complex biological process, which is produced by two basic processes: internal aging (affected by genetic factors, cell metabolism, hormones and metabolic processes) and due to long-term exposure to light, pollution, ionizing radiation, chemicals and toxins external aging. Research demonstrated that *Prunus persica* (peach) gum extract (PG) has anti-aging and moisturizing efficacy. The effect of PG on skin firming, elasticity and wrinkle was verified *in vivo*. Results show that PG increases infant and lasting skin firming, skin elasticity and reduces skin wrinkle from 5 min to 8 h.

M. Massufero Vergilio, S. Arandas Monteiro e Silva, J. Rodrigues Pinto, G. Ricci Leonardi, **The correlation between cutometry and 50 MHz high-frequency ultrasound skin techniques**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

High-frequency ultrasound (HFUS) skin imaging analysis is a non-invasive technique that allows a unique approach to the analysis of the skin and its layers, [2]. In other hand, skin mechanical properties evaluation provide objective and biologically significant information on the mechanical properties of the skin such as elasticity, firmness and tightening effect, with particular focus on changes caused by aging [3], [4]. In this context, the purpose of this study was to identify whether the traditional cutometry is correlate with HFUS parameters.

Z. Zhou, Y. Guo, M Guo, Z. Miao, J. Zhang, F. Yang, W. Zhang, Weiyang, X. Li, **Formulating “Clean Beauty” cosmetics with natural origin ingredients**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

The skin, like the other organs, is subject to a complex physiological process of aging. Intrinsic

or chronological aging is the consequence of a genetically programmed senescence and of biochemical alterations due to endogenous factors. The aging process is characterized by a slow-down in the regeneration of cells and extracellular matrices, a gradually loss of dermal collagen and elastic fibers resulting in dermal and epidermal atrophy, dryness, a reduction in elasticity and firmness of the skin, the appearance of fine lines and wrinkles hyperpigmentation or hypopigmentation blemishes. Extrinsic aging, on the other hand, is due to environmental attack such as pollution, sun light irradiation (including UV radiation) and diseases.

C. Messaraa, R. Thibault, D. McNamee, S. Hurley, L. Doyle, A. Mansfield, **Exploratory investigation on the characteristics of Mexican Women's skin**, Poster at the IFSCC conference, Cancun, Mexico, October 18-28 2021

Mexico population stems from a rich mosaic of various ethnic background and ancestries. In skin research, its population has been captured under several terms, some of them not always adequate. "Hispanics" for instance, rather define people of Spanish descendant. "Latin Americans" applies to persons or communities of Latin American geographic origin, which have a heterogeneous ancestry. "Latino", a shortened term from Spanish "Latino Americano" is applied for both people living in the U.S. who are of Latin American origin and their U.S.-born descendant.

Z. Qiao, S. Huang, F. Leng, Y. Bei, Y. Chen, M. Chen, Y. Hu, Y. Huang, Q. Xiang, **Analysis of the Bacterial Flora of Sensitive Facial Skin Among Women in Guangzhou**, Clinical, Cosmetic and Investigational Dermatology 2021:14, p. 655–664

Background: Sensitive skin (SS) is easily irritated by various environmental stimuli, and epidemiological surveys surprisingly fnd that self-perceived SS is widespread worldwide. Objective: To investigate whether SS is linked to changes in the skin bacterial population using 16S rRNA sequencing and bioinformatic analysis. Patients and Methods: According to both the Huaxi SS Questionnaire and Lactic Acid Stimulation Test, 60 female volunteers in Guangzhou were classifed into normal skin (NS) and SS groups. Skin barrier parameters were assessed by the CK skin tester. The DNA of the bacterial flora on the facial skin surface was extracted and was subjected to 16S rRNA sequencing. Results: The skin hydration was signifcantly lower in the SS group compared to the NS group (P =0.032). Based on 16S rRNA sequencing and bioinformatic analysis, the number of operational taxonomic units (OTUs) signifcantly decreased in the SS group (P =0.0235, SS vs NS). The relative abundance of *Neisseriaceae* in SS group decreased significantly (P <0.05, SS vs NS), while that of *Neisseria* (within the *Neisseriaceae* family) increased signifcantly (P <0.05, SS vs NS). Conclusion: SS is accompanied by a decrease in species diversity and richness, which may be relevant to the weakening of the microbial barrier (due to the increase of *Neisseria* or the decrease of *Neisseriaceae*). Thus, corresponding treatment for *Neisseriaceae* may be a new idea in the treatment of SS.

D.B Abbas, C. Lavin, E. Fahy, M. Griffin, N. Guardino, M. King, K. Chen, H.P. Lorenz, G.C. Gurtner, M.T. Longaker, A. Momeni, D.C. Wan, **Standardizing dimensionless cutometer parameters to determine in-vivo elasticity of human skin**, Adv Wound Care (New Rochelle). 2021 Oct 8

Objective: Skin fibrosis places an enormous burden on patients and society, but disagreement exists over methods to quantify severity of skin scarring. A suction cutometer measures skin elasticity *in vivo*, but it has not been widely adopted because of inconsistency in data produced. We investigated variability of several dimensionless parameters generated by the cutometer to improve their precision and accuracy. Approach: Twenty adult human subjects underwent suction cutometer measurement of normal skin (NS) and fibrotic scars (FS). Using Mode 1, each subject underwent five trials with each trial containing four curves. R0/2/5/6/7 and Q1/2/3 data were collected. Analyses were performed on these calculated parameters. Results: R0/2/5/6/7 and Q1/2 parameters from curves 1 to 4 demonstrated significant differences, whereas these same parameters were not significantly different when only using curves 2-4. Individual analysis of all parameters between curve 1 and every subsequent curve was statistically significant for R0, R2, R5, R6, R7, Q1, and Q2. No differences were appreciated for parameter Q3. Comparison between NS and FS were significantly different for parameters R5, Q1, and Q3. Innovation: Our study is the first demonstration of accurate comparison between NS and FS using the dimensionless parameters of a suction cutometer. Conclusions: Measured parameters from the first curve of each trial were significantly different from subsequent curves for both NS and FS. Precision and reproducibility of data from dimensionless parameters can therefore be improved by removing the first curve. R5, Q1, and Q3 parameters differentiated NS as more elastic than FS.

S. Hettwer, E. Besic Gyenge, **Skin Reset - TCM-inspired Reishi Mushroom to Reprogram Signs of Aging**, Cosmetics & Toiletries, October 2021, p. 33-40

Skin is a complex tissue with different layers of cells and extracellular structures. With age, the

epidermis and dermis become thinner and can no longer perform the same functions as they did when the skin was younger. Each person's lifestyle has a significant influence on the youthful appearance of skin such as exercise, a healthy diet, avoiding the sun or applying sunscreen regularly— all of these factors can significantly slow the signs of aging.

Y. Pan, X. Ma, Y. Song, J. Zhao, S. Yan, **Questionnaire and Lactic Acid Sting Test Play Different Role on the Assessment of Sensitive Skin: A Cross-sectional Study**, Clinical, Cosmetic and Investigational Dermatology 2021:14, p. 1215–1225

Background: Questionnaires and lactic acid sting test (LAST) are two widely used methods to identify sensitive skin. However, the self-perceived sensitive skin by questionnaires was not consistent with the determination of LAST. Objective: The aim of the study was to measure the biophysical properties noninvasively of sensitive skin evaluated by questionnaire and LAST and to investigate their correlations with the scores of questionnaire and LAST. Methods: A total of 209 healthy Chinese females completed the study. Self-assessment questionnaire and LAST were both performed to identify sensitive skin. Epidermal biophysical properties, including skin hydration, transepidermal water loss (TEWL), sebum content, erythema index (EI), a* value, L* value, skin elasticity, and skin pH, were measured with noninvasive instruments. Results: The frequency of sensitive skin was 50.2% and 66.0% by questionnaire and LAST, respectively. Subjects with self-assessed sensitive skin had a slightly higher LAST positive rate. Skin hydration, sebum content, a* and EI values were signifcantly higher in the selfassessed sensitive skin group, while TEWL, a* and EI values increased but L* value decreased with signifcance in the LAST positive group. The LAST stingers among sensitive skin subjects had higher EI but not in the healthy skin subjects. In addition, questionnaire scores positively correlated with skin hydration, sebum content, a* and EI values, while a positive relationship of LAST scores with TEWL, a* and EI values was observed. The scores of questionnaire and LAST both negatively related to L* value. Conclusion: Self-assessed questionnaire is associated with sensitive skin featured by oily and red face without impaired barrier function, whereas LAST is suitable to identify fragile skin barrier and enhanced blood flow on the face. Combination of both methods to diagnose sensitive skin might be more reliable.

A. Barrionuevo-Gonzalez, S. Trapp, R. de Salvo, M. Reitmann, E. Cassar, S. Rharbaoui, F. Reber, H. Stettler, **Three New Dexpanthenol-Containing Face Creams: Performance and Acceptability after Single and Repeated Applications in Subjects of Different Ethnicity with Dry and Sensitive Skin,** Cosmetics 2021, 8, 93

Three novel face creams containing dexpanthenol with different lipid contents were developed for dry skin sufferers: a day face cream (DFC), a day face cream with sun protection (DFC-SPF), and a night face cream (NFC). Three identically designed studies (N = 42–44 each) were conducted with healthy adults of three ethnicities (African, Asian, Caucasian) with dry/sensitive skin. Effects on stratum corneum (SC) hydration, SC lipid content, and skin elasticity were quantified by established noninvasive methods during the 4-week studies. After single and repeated oncedaily applications of the face creams, facial hydration significantly increased from baseline. On day 28, the mean increments in skin hydration amounted to 27%, 26%, and 27% ($p < 0.0001$ each) for DFC, DFC-SPF, and NFC, respectively. Favorable effects of DFC, DFC-SPF, and NFC on facial moisturization were observed in all three ethnic groups. The enhancements in SC hydration were not paralleled by improvements in skin elasticity parameters but lipid analyses showed significant increases in SC cholesterol, SC free fatty acid, and/or SC ceramide levels. All three face creams were well tolerated and achieved a high product satisfaction and acceptability by study participants. Our findings support the once-daily use of the face creams in adults of different ethnicities with dry and sensitive skin.

S.-R. Park, J. Han, Y. Min, Y. Na, Y. Kang, E. Kim, B.-F. Suh, **Long-term effects of face masks on skin characteristics during the COVID-19 pandemic**, Skin Research and Technology, Volume 27, Issue 5, September 2021

Background: Nowadays, face masks are a crucial part of our daily life. Previous studies on their impact on the skin usually focused on the adverse effects of face masks. Few studies have assessed their influence on skin characteristics. In a previous study, we identified the short-term effects of wearing face masks. Herein, we describe the longterm skin effects of face masks, for a period of 6 months. Materials and methods: Healthy volunteers (19 men and women), who wore face masks, participated in the study from June 2020 to December 2020. In all participants, skin characteristics such as trans-epidermal water loss (TEWL), skin hydration, skin elasticity, skin pore area, skin keratin amount, skin temperature, skin redness, skin temperature, skin redness, and skin color were measured three times. Results: TEWL, skin hydration, skin elasticity, skin pore area, skin keratin amount, and skin color changed significantly after 6 months. TEWL, skin hydration, skin pore area, skin keratin amount, and skin color were significantly different between the maskwearing and non-mask-wearing areas.

Conclusion: Long-term daily use of face masks can alter skin characteristics. Specialcare should be focused on the mask-wearing regions.

Y. Endo, H. Yoshida, Y. Akazawa, K. Yamazaki, Y. Ota, T. Sayo, Y. Takahashi, **Antiwrinkle efficacy of 1-ethyl-*β*-*N*-acetylglucosaminide, an inducer of epidermal hyaluronan production**, Skin Research and Technology, Volume 27, Issue 5, September 2021

Background: Hyaluronan (HA) has a unique hydration capacity that contributes to firmness and bounciness of the skin. Epidermal HA declines with skin aging, which may lead to clinical signs of aging including skin wrinkles and loss of hydration and elasticity. Recently, we developed a new cosmetic agent 1-ethyl-*β*-*N*-acetylglucosaminide (*β*-NAG2), which enhances HA production in cultured human keratinocytes. The aim of this study was to explore antiaging potential of *β*-NAG2 in reconstructed human epidermal models and human clinical trial. Materials and methods: The amount of HA in *β*-NAG2-treated epidermal models by topical application was analyzed by enzyme-linked immunosorbent assay (ELISA)-like assay. A randomized, double-blind and placebo-controlled study was conducted in Japanese females (n = 33) by topically treating each side of the face with a lotion formulated with *β*-NAG2 or placebo for 8 weeks. Results: Topically applied *β*-NAG2 dose dependently increased HA production in epidermal models. Treatment with *β*-NAG2-formulated lotion significantly improved skin hydration and elasticity and reduced skin wrinkling in crow's foot areas when compared to the placebo formulation. Conclusion: Topically applied *β*-NAG2 promoted epidermal HA production in vitro and showed antiwrinkle activity in vivo accompanying the improvement in skin hydration and elasticity. Our study provides a novel strategy for antiwrinkle care through *β*-NAG2-induced epidermal HA production.

D. Sachs, A. Wahlsten, S. Kozerke, G. Restivo, E. Mazza, **A biphasic multilayer computational model of human skin**, Biomechanics and Modeling in Mechanobiology (2021) 20: p. 969–982

The present study investigates the layer-specifc mechanical behavior of human skin. Motivated by skin's histology, a biphasic model is proposed which diferentiates between epidermis, papillary and reticular dermis, and hypodermis. Inverse analysis of ex vivo tensile and in vivo suction experiments yields mechanical parameters for each layer and predicts a stif reticular dermis and successively softer papillary dermis, epidermis and hypodermis. Layer-specifc analysis of simulations underlines the dominating role of the reticular dermis in tensile loading. Furthermore, it shows that the observed out-of-plane defection in ex vivo tensile tests is a direct consequence of the layered structure of skin. In in vivo suction experiments, the softer upper layers strongly infuence the mechanical response, whose dissipative part is determined by interstitial fuid redistribution within the tissue. Magnetic resonance imaging-based visualization of skin deformation in suction experiments confrms the deformation pattern predicted by the multilayer model, showing a consistent decrease in dermal thickness for large probe opening diameters.

L. Kongpanichakul, A. Chuangsuwanich, N. Kongkunnavat, W. Tonaree, **Effcacy of Low-temperature Plasma for Treatment of Facial Rejuvenation in Asian Population**, Plast Reconstr Surg Global Open, Sep 2021

Background: Plasma, the fourth state of matter, has been widely proposed in antiaging medicine. The usage of low-temperature plasma (LTP), which converts nitrogen gas into plasma, demonstrates releasing of several growth factors and promotion of tissue regeneration. The nonchromophore-dependent property and preservation of skin architecture after treatment make LTP an interesting tool for facial rejuvenation. This study aimed to investigate the effcacy of LTP for facial rejuvenation. Methods: A prospective cohort study involving 40 women who received full face LTP treatment once a week for 5 consecutive sessions. The melanin index, erythema index, and elasticity index were measured by Mexameter and Cutometer, respectively. The Fitzpatrick wrinkle scale and quartile grading scale were assessed by two plastic surgeons. Results: All patients were between 26 and 55 years old and had mild-to-moderate Fitzpatrick wrinkle scale scores. The Fitzpatrick wrinkle scale scores showed a mean improvement of 0.47 and 0.89 at 4 and 12 weeks posttreatment ($P < 0.001$). Statistically signifcant improvements in melanin index, erythema index, and elasticity index at periorbital and perioral areas were found at 4 and 12 weeks after treatment ($P < 0.001$). Most subjects had quartile grading scale improvement of 51%–75% at 4 and 12 weeks after treatment. Patients reported a greater than 75% improvement in dyspigmentation, wrinkles, and elasticity in 60%, 50%, and 57.5% of subjects, respectively. Conclusion: LTP is another choice for facial rejuvenation, wrinkles reduction, and dyspigmentation with signifcantly improved results.

N. Kaul, **Clinical testing for a booming men's sector,** PERSONAL CARE Magazine, September 2021, p. 25-28

The male grooming industry is growing at a rapid pace. Entire aisles of drug stores are dedicated

to men's grooming products. Product demand in the skin care, hair care, and fragrance industries has grown dramatically and is expected to keep pace in the coming years. Whether this growth stems from celebrity advertising or social media influence, one thing is clear: men have come a long way from the days of merely using a soap bar as face and body wash. The modern man stands ready and willing to invest in skin and hair products that maintain their health and youth. Globe News Wire reports the men's grooming market worldwide will reach $183.2 Billion by 2027, with the U.S. market alone estimated at $38 Billion, and China Forecast to grow at 6.9%.1 As men continue to open their wallets for new and improved grooming products, brands catering to this market are stepping up to meet those needs by expanding offerings to include anti-ageing, SPF and antiacne products. Customisation of products is proving equally important, such as specialized regimens for every combination of skin and hair.

*E. Peters, P. Moortga*t, **Electronic Micro-needling on Mature Burn Scars: A Case Series Report,** Poster 2021

Previously scars were treated with a stamp from the dermaroller, which despite the pain, caused the scars to heal. However improvement of this method was needed. This started a desire for a better machine that has more power and better patient interaction/effect. This resulted in a Cheyenne Classic, which is normally used for tattoos.

H.G Azaryan, K.M. Khachikyan, A. Taha, E. Badawy, **Comparative analysis of effects induced by hyaluronic acid and its combined formula on skin functional parameters in second-degree photoaging**, J Cosmet Dermatol, 2021 Aug;20(8): p. 2542-2551

Background and aims: The study aimed to compare the effectiveness of intradermal injections of modified hyaluronic acid (mHA) and combined injections of platelet-rich plasma (PRP) and mHA (HA-PRP) on clinical and functional parameters in women with second-degree photoaging. Methods: Seventy-six healthy female participants diagnosed with second degree of skin photoaging were involved in two interventional study groups. The first group was treated with "bio-reparative" method (mHA) and the second group with "combined HA-PRP therapy". Additionally, 20 practically healthy women, with the first degree of photoaging according to Glogau classification, constituted the control group. Parameters of facial skin were evaluated in all groups before and after the injections. The patients in both interventional groups were compared based on skin therapy outcomes, using corneometry, sebumetry, cutometry, transepidermal water loss (TEWL), and skin pH assessments. A post-interventional analysis was conducted to evaluate the level of satisfaction in physicians and study participants in accordance with GAIS. Intragroup and between-group analysis for the selected parameters was performed. Results: Compared with the control group, the combined therapy group did not show significant difference in parameters ($p > 0.05$) and the scores were significantly improved compared to mHA group ($p < 0.001$). Control and HA-PRP-treated groups were different only in sebumetry scores (SigDev = 2.1%). Significant difference was observed in the GAIS scores for patients between the interventional groups ($p = 4.03297E-11$ and 3.4093E-09, respectively). Conclusion: Implementation of combined therapy is significantly effective compared to the mHA therapy alone. The higher efficacy is derived from significant recovery of functional parameters and GAIS survey results.

W. Peng, X. Zhang, X. Kong, K. Shi, **The efficacy and safety of fractional CO_2 laser therapy in the treatment of burn scars: A meta-analysis**, Burns. 2021 Aug 20

Although we have numerous publications about the effect of fractional CO_2 laser therapy for burn scars, quantitative data about its efficacy and safety are sparse. The purpose of this meta-analysis was to assess the efficacy and safety of fractional CO_2 laser therapy for the treatment of burn scars. Pertinent studies were identified by a search of PubMed, Embase and Web of Science up to 20 September 2020. Weighted mean difference (WMD) was conducted to combine the results, and a random-effect model was used to pool the results. Publication bias was estimated using Begg and Egger's regression asymmetry test. Twenty articles were included. Our pooled results suggested that fractional CO_2 laser therapy significantly improved the Vancouver Scar Scale (VSS) score (WMD = -3.24, 95%CI: -4.30, -2.18; $P < 0.001$). Moreover, the Patient and Observer Scar Assessment Scale (POSAS)-patient (WMD = -14.05, 95%CI: -22.44, -5.65; $P = 0.001$) and Observer (WMD = -6.31, 95%CI: -8.48, -4.15; $P < 0.001$) also showed significant improvements with the treatment of fractional CO_2 laser therapy. Fractional CO_2 laser significantly reduced scar thickness measured with ultrasonography (WMD = -0.54, 95%CI: -0.97, -0.10; $P < 0.001$). For other outcomes, including pigmentation, vascularity, pliability, and height of scar, vascularity and relief, laser therapy was associated with significant improvements. However, only the cutometer measure R2 (scar elasticity) (WMD = -0.06, 95%CI: -0.10, -0.01; $P = 0.023$) was significantly improved with the laser therapy, but cutometer measures R0 (scar firmness) (WMD = 0.03, 95%CI: -0.04, 0.09; $P = 0.482$) was not. Side effects and complications induced by fractional CO_2 laser were mild and tolerable. Fractional CO_2 laser therapy significantly improved both

the signs and symptoms of burn scars. Considering potential limitations, more large-scale, well-designed RCTs are needed to verify our findings.

C.V. Lavin, D.B. Abbas, E.J. Fahy, D.K. Lee, M. Griffin, N.M. Diaz Deleon, S. Mascharak, K. Chen, A. Momeni, G.C. Gurtner, M.T. Longaker, D.C. Wan, **A comparative analysis of deferoxamine treatment modalities for dermal radiation-induced fibrosis**, J Cell Mol Med. 2021;25: p. 10028–10038

The iron chelator, deferoxamine (DFO), has been shown to potentially improve dermal radiation-induced fibrosis (RIF) in mice through increased angiogenesis and reduced oxidative damage. This preclinical study evaluated the efficacy of two DFO administration modalities, transdermal delivery and direct injection, as well as temporal treatment strategies in relation to radiation therapy to address collateral soft tissue fibrosis. The dorsum of CD-1 nude mice received 30 Gy radiation, and DFO (3 mg) was administered daily via patch or injection. Treatment regimens were prophylactic, during acute recovery, post-recovery, or continuously throughout the experiment (n = 5 per condition). Measures included ROS-detection, histology, biomechanics and vascularity changes. Compared with irradiated control skin, DFO treatment decreased oxidative damage, dermal thickness and collagen content, and increased skin elasticityand vascularity. Metrics of improvement in irradiated skin were most pronounced with continuous transdermal delivery of DFO. In summary, DFO administration reduces dermal fibrosis induced by radiation. Although both treatment modalities were efficacious, the transdermal delivery showed greater effect than injection for each temporal treatment strategy. Interestingly, the continuous patch group was more similar to normal skin than to irradiated control skin by most measures, highlighting a promising approach to address detrimental collateral soft tissue injury following radiation therapy.

F. Havas, S. Krispin, M. Cohen, M. Shevach, N. Borenstein-Auerbach, E. Loing, J. Attia-Vigneau, **Restore and Renew – Inula Helenium Powers Up Skin's Anti-pollution Defenses,** Cosmetic & Toiletries, August 2021

Sources of air pollution include industry and vehicle exhaust, cigarette smoke, open fires, paints, pesticides and more. According to the Word health Organistation (WHO), 95 % of the world population is exposed to air pollution including particulates, aromatic hydrocarbons and volatile organic compounds.

Y. Endo, H. Yoshida, Y. Akazawa K.Yamazak, Y. Ota, T. Sayo, Y. Takahashi, **Antiwrinkle efficacy of 1-ethyl-*β*-*N*-acetylglucosaminide, an inducer of epidermal hyaluronan production**, Skin Research & Technology, August 2021

Background: Hyaluronan (HA) has a unique hydration capacity that contributes to firmness and bounciness of the skin. Epidermal HA declines with skin aging, which may lead to clinical signs of aging including skin wrinkles and loss of hydration and elasticity. Recently, we developed a new cosmetic agent 1-ethyl-*β*-*N*-acetylglucosaminide (*β*-NAG2), which enhances HA production in cultured human keratinocytes. The aim of this study was to explore antiaging potential of *β*-NAG2 in reconstructed human epidermal models and human clinical trial. Materials and methods: The amount of HA in *β*-NAG2-treated epidermal models by topical application was analyzed by enzyme-linked immunosorbent assay (ELISA)-like assay. A randomized, double-blind and placebo-controlled study was conducted in Japanese females (n = 33) by topically treating each side of the face with a lotion formulated with *β*-NAG2 or placebo for 8 weeks. Results: Topically applied *β*-NAG2 dose dependently increased HA production in epidermal models. Treatment with *β*-NAG2-formulated lotion significantly improved skin hydration and elasticity and reduced skin wrinkling in crow's foot areas when compared to the placebo formulation. Conclusion: Topically applied *β*-NAG2 promoted epidermal HA production in vitro and showed antiwrinkle activity in vivo accompanying the improvement in skin hydration and elasticity. Our study provides a novel strategy for antiwrinkle care through *β*-NAG2-induced epidermal HA production.

W. Rungseevijitprapa, B. Yingngam, C. Chaiyasut, **Improvement of Biophysical Skin Parameters of Topically Applied Fermented Soybean Extract-Loaded Niosomes with No Systemic Toxicity in Ovariectomized Rats**, Pharmaceutics 2021, 13, 1068

Despite the known beneficial impacts of estrogen used as hormone replacement therapy to ameliorate signs of skin aging in postmenopausal women, its compliance rates are low. A significant amount of estrogen may be absorbed into the blood circulation and can lead to systemic actions. Soy isoflavone exhibits biological activities similar to synthetic estrogen because it is a heterocyclic phenolic compound. The disadvantage of most topical ingredients based on isoflavone is that they contain biologically inactive glycoside forms, which must be converted to a readily absorbed aglycone for the topical application. The purposes of this study were to develop niosomes-loaded *Aspergillus oryzae*-

fermented soybean extract (FSE) to enhance skin absorption with proven systemic side effect compared to estrogen application. Skin hydration and viscoelasticity of 75 days post-ovariectomized (OVX) Wistar rats following 84-day topical treatment with various tested gel formulations containing fermented soybean extract (FSE) were evaluated. The tested formulations were gel + FSE nanoniosomes, gel FSE microniosomes, gel + FSE (200 µg FSE/9 cm2/rat), gel + blank nanoniosomes (a negative control), and gel + 17β-estradiol (E2) nanoniosomes (a positive control, 20 µg E2/9 cm2/rat). Changes in vaginal cornifications and weights of uteri, livers, and kidneys in the OVX rats and signs of primary skin irritation in the rabbits were evaluated for their toxicities. Results showed that FSE-loaded nanoniosomes improved the skin hydration and viscoelasticity better than gel + FSE microniosomes and gel + FSE, respectively, but lower than those of gel + E2 nanoniosomes ($p < 0.05$). Unlike all gel + E2 nanoniosomes, the FSE formulations showed no changes in vaginal cells and weights of uteri, livers, and kidneys and no signs of skin irritation. In conclusion, The FSE niosomebased gels should be promising candidates for delivering phytoestrogens against signs of skin aging with no systemic toxicities.

D. Maroto-Morales, T. Montero-Vilchez, S. Arias-Santiago, **Study of Skin Barrier Function in Psoriasis: The Impact of Emollients**, Life 2021, 11, 651

Psoriasis is a chronic multi-systemic inflammatory disease that affects the epidermal barrier. Emollients can be used as a coadjutant therapy for psoriasis management, but little is known about how the epidermal barrier function in psoriatic patients is modified by moisturizers. The objective of this study is to evaluate the effect of Vaseline jelly and a water-based formula on epidermal barrier function in psoriatic patients. Thirty-one patients with plaque-type psoriasis and thirty-one gender and age-matched healthy controls were enrolled in the study. Temperature, transepidermal water loss (TEWL), stratum corneum hydration (SCH), pH, elasticity and the erythema index were measured using non-invasive tools before and after applying Vaseline jelly and a water-based formula. TEWL was higher in psoriatic plaques than uninvolved psoriatic skin (13.23 vs. 8.54 g·m-2·h-1; $p < 0.001$). SCH was lower in psoriatic plaques than uninvolved psoriatic skin and healthy skin (13.44 vs. 30.55 vs. 30.90 arbitrary units (AU), $p < 0.001$). In psoriatic plaques, TEWL decreased by 5.59 g·m-2·h-1 ($p = 0.001$) after applying Vaseline Jelly, while it increased by 3.60 g·m-2·h-1 ($p = 0.006$) after applying the water-based formula. SCH increased by 9.44 AU after applying the water-based formula ($p = 0.003$). The use of emollients may improve epidermal barrier function in psoriatic patients. TEWL is decreased by using Vaseline, and SCH is increased by using the water-based formula.

T. Yazdanparast, K. Yazdani, S.A. Nasrollahi, L. Izadi Firouzabadi, P. Humbert, A. Khatami, A. Firooz, **Biophysical and ultrasonographic changes in pityriasis rosea compared with uninvolved skin**, International Journal of Women's Dermatology 7 (2021) 331–334

Background: Pityriasis rosea (PR) is a common, self-limited, inflammatory papulosquamous skin disease with a possible viral etiology. Objective: The goal of this study was to evaluate skin biophysical properties in patients with PR compared with uninvolved skin to better understand the pathogenesis of PR. Methods: Stratum corneum hydration, transepidermal water loss, surface friction, pH, sebum, melanin, erythema, temperature, elasticity parameters (R0, R2, R5), thickness, and echodensity of the epidermis and dermis were measured on lesions of classic PR in 21 patients and compared with control sites (average of uninvolved perilesional and symmetrical skin) with a paired t test. Results: Stratum corneum hydration ($p < .001$), R0 ($p = .003$), R2 ($p = .001$), R5 ($p = .003$), and echodensity of the dermis ($p = .006$) were significantly lower, whereas transepidermal water loss ($p = .001$), pH ($p < .001$), and erythema ($p < .001$) were significantly higher in PR lesions. There was no significant difference in friction index, sebum, melanin content, temperature, thickness of the epidermis and dermis, and echodensity of the epidermis between PR and normal skin. Conclusion: PR skin is characterized by certain alterations in biophysical properties, which are mostly correlated with histologic changes. These changes may be helpful in early, noninvasive diagnosis of PR.

K. Mizukoshi, M. Kuribayashi, K. Hirayama, J. Yabuzaki, M. Kurosumi, Y. Hamanaka, **Examination of age-related changes of viscoelasticity in the dermis and subcutaneous fat layer using ultrasound elastography,** Skin Research & Technology, Volume 27, Issue 4, July 2021, p. 618-626

Background: Using ultrasound elastography, the present study aimed to measure the viscoelasticity in each skin layer and to determine the relationship between the measured value, age, and body mass index (BMI). Materials and Methods: The present study included 77 Japanese women. We calculated the BMI and measured the facial cheek via elastography. With the use of the elastographic image, the dermis was divided into two layers, and the subcutaneous fat layer was divided into five equal sections according to the depth, ultimately obtaining seven layers. Furthermore, the thickness and viscoelasticity of each divided layer were measured. Results: The analysis of echo images

revealed that the thickness of the upper dermis layer decreased with age, whereas that of the subcutaneous fat layer tended to increase with age and BMI. As measured by elastography, the viscoelasticity of both the lower dermis and the upper subcutaneous fat layer decreased with age. As the BMI increased, the viscoelasticity of the lower subcutaneous layer also increased, but that of the upper subcutaneous layer decreased. Conclusions: The present study revealed the relationship between aging and viscoelasticity in the lower dermis and the relationship between aging, BMI, and viscoelasticity in the upper subcutaneous fat layer.

M. Mendes Fossa Shirata, P.M. Berardo Gonçalves Maia Campos, **Sunscreens and Cosmetic Formulations Containing Ascorbyl Tetraisopalmitate and Rice Peptides for the Improvement of Skin Photoaging: A Double-blind, Randomized Placebo-controlled Clinical Study**, Photochem Photobiol., 2021 Jul;97(4): p. 805-815

Photoprotective formulations containing substances with antioxidant properties in combination have been used as a strategy for the improvement of photoaged skin conditions. However, there is a lack of studies evaluating the clinical efficacy of these substances in young women with signs of photoaging. Thus, the objective of the present study was to evaluate the clinical efficacy of sunscreens and cosmetic formulations containing ascorbyl tetraisopalmitate and rice peptides for the improvement of skin photoaging in young women. A double-blind, randomized placebocontrolled clinical efficacy study was conducted on 60 female subjects aged 20-30 years with skin changes related to photoaging and without photoprotective habits. The hydrolipidic layer conditions and structural and morphological characteristics of the skin were evaluated by Photoprotective formulations containing substances with antioxidant properties in combination have been used as a strategy for the improvement of photoaged skin conditions. However, there is a lack of studies evaluating the clinical efficacy of these substances in young women with signs of photoaging. Thus, the objective of the present study was to evaluate the clinical efficacy of sunscreens and cosmetic formulations containing ascorbyl tetraisopalmitate and rice peptides for the improvement of skin photoaging in young women. A double-blind, randomized placebocontrolled clinical efficacy study was conducted on 60 female subjects aged 20-30 years with skin changes related to photoaging and without photoprotective habits. The hydrolipidic layer conditions and structural and morphological characteristics of the skin were evaluated by biophysical and skin imaging techniques. The results showed that the daily use of the formulations under study improved the skin conditions by increasing skin hydration and dermis echogenicity. In addition, the application of the active substances reduced skin hyperpigmentation and increased epidermal cell renewal. In summary, the present study showed the importance of daily application of sunscreens and formulations with antioxidant properties for the prevention and attenuation of skin changes related to photoaging in young women.

J. Kim, S. Yoo, O.-S. Kwon, E.-T. Jeong, J.M. Lim, S.G. Park, **Influence of quarantine mask use on skin characteristics: One of the changes in our life caused by the COVID-19 pandemic**, Skin Research & Technology, Volume 27, Issue 4, July 2021, p. 599-606

Background: The influence of various environmental factors on skin properties is well known. However, there is a lack of research into the effect of quarantine masks on skin properties, even though the use of masks has significantly increased after the COVID-19 outbreak. Therefore, this study aimed to investigate the influence of mask use on skin properties. Materials and Methods: Twenty subjects were enrolled in this study. The subjects used approved quarantine masks for 6 hours a day for 2 weeks. We measured eight skin biophysical parameters: temperature, redness, pore volume, texture, elasticity, trans-epidermal water loss (TEWL), sebum content, and pH, and evaluated acne lesions before and after using quarantine masks. The evaluation was performed on the mask-wearing area of the face. Results: Skin temperature, redness, and TEWL increased significantly after a 6-hour mask use, while the sebum content increased marginally. Skin elasticity was reduced by the use of masks over 1 and 2 weeks, whereas the pore volume and the number of acne lesions increased after a 2-week mask use. The skin changes caused by mask use showed sex-based differences in the skin elasticity (after 6 hours), redness, and roughness (after 2 weeks). Conclusions: The use of quarantine masks causes a change in the skin temperature, redness, and TEWL in the short term and in skin elasticity, pores, and acne in the long term.This study revealed that prolonged mask use could have negative effects on the skin.

C. Phillipart, B. Hendrickx, S. Rhabaoui, A. Natalizio, S. Boisnic, P. Micheels, S. Gauthier, P. Douette, L. Hermitte, **Safety and efficacy of a carboxymethyl chitosan dermal injection device for the treatment of skin defects: a first-in-man, pilot, comparative, split-body study**, Eur J Dermatol July-August 2021; 31(4): p. 549-58

Background: Injectable soft-tissue devices are increasingly used for improving skin defects and deficiencies related to ageing. Objectives: To assess the safety and efficacy of KIO015, a new injectable soft-tissue device formulated with carboxymethyl chitosan for the intradermal treat ment of skin defects associated with ageing. Materials & Methods: Twenty-two subjects (40-65 years) were randomized to eceive injections in the neckline of KIO015 and a non-cross-linked HA-based device, and were followed for up to 10 months. Injection site reactions (ISRs) and adverse events (AEs) were documented. Skin improvement was assessed instrumentally and clinically. Skin biopsies at injection zones in the lower back were taken at Day 28for histopathology and immunohistochemistry analyses, to further assess product performance. Histomorphometric analyses on rabbits and in vitro assessment of KIO015 antioxidant capacity were also conducted. Results: KIO015 was very well tolerated. Only expected and transient ISRs were observed; mainly erythema and hematoma. No adverse local effects or foreign body granuloma were observed histologically. Both clinical and instrumental evaluations confirmed the performance of KIO015. The skin was firmer andmore elastic. Skin hydration showed significant improvement three days after injection. KIO015 exhibited superior overall maintenance of skin hydration after 10 months as compared to HA. These clinical results were supported by in vitro trials and implantation tests in the rabbit. Conclusion: The results from this pilot study support the use of KIO015 as an innovative alternative to HA-based devices for intradermal treatment of skin disorders.

M.A. Nilforoushzadeh, M. Heidari-Kharaji, S. Alavi, M. Nouri, N. Nikkhah, F. Jahangiri, M. Mahmoudbeyk, A. Peyrovan, B. Baiat Tork, E. Torkamaniha, S. Zare, **Transplantation of autologous fat, stromal vascular fraction (SVF) cell, and platelet-rich plasma (PRP) for cell therapy of atrophic acne scars: Clinical evaluation and biometric assessment**, J Cosmet Dermatol, 2021 Jul

Background: Scarring is an unfortunate result of acne because it causes the psychological and cosmetic problems for the patients. Unfortunately, no single treatment is suitable, and using multiple methods may have a better result. The autologous fat and stromal vascular fraction (SVF) cells and their secretory factors can enhance the angiogenesis, collagen synthesis, and migration of fibroblasts, therefore regenerate hurt tissues. Moreover, other treatments for acne scarring, such as platelet-rich plasma (PRP), induce the increase in scare. Aims: This study aimed to verify the effectiveness of transplantation of autologous fat, SVF cells, and PRP as cell therapy techniques on atrophic acne scars. Patients/methods: This study included 9 adult patients with atrophic acne scars on face. All patients received the transplantation of autologous fat, stromal vascular fraction (SVF) cells, and PRP. The treatment outcome was measured by biometric assessment (VisioFace 1000 D, Colorimeter, multi-probe adapter Cutometer, Tewameter, Mexameter, and skin ultrasound imaging system), and also, the satisfaction of patients was evaluated. The patients were followed 6 months after the treatment. Results: There was a significant improvement in the skin pores, spots, skin lightness and melanin content of skin, skin elasticity, and TEWL (transepidermal water loss) after 6 months of the treatment. Furthermore, denser skin layers were observed both in the epidermis and in the dermis. Moreover, 66.6% of patients showed good satisfaction after the treatment. Conclusion: In brief, the transplantation of autologous fat, SVF cells, and PRP is an effective cell therapy for atrophic acne scars.

S.-R. Park, J. Han, Y.M. Yeon, N.Y. Kang, E. Kim, **Effect of face mask on skin characteristics changes during the COVID-19 pandemic**, Skin Research & Technology, Volume 27, Issue 4, July 2021, p. 554-559

Background: Previous studies have demonstrated the possibility of adverse effects of prolonged wearing of personal protective equipment in healthcare workers. However, there are a few studies about the effects on skin characteristics after wearing a mask for non-healthcare workers. In this study, we evaluated the dermatologic effects of wearing a mask on the skin over time. Materials and Method: Twenty-one healthy men and women participated in the study. All participants wore masks for 6 hours consecutively. Three measurements were taken (a) before wearing the mask, (b) after wearing the mask for 1 hour, and (c) after wearing the mask for 6 hours. Skin temperature, skin redness, sebum secretion, skin hydration, trans-epidermal water loss, and skin elasticity were measured. Results: The skin temperature, redness, hydration, and sebum secretion were changed significantly after 1 and 6 hours of wearing a mask. Skin temperature, redness, and hydration showed significant differences between the mask-wearing area and the non–mask-wearing area. Conclusion: Mask-wearing conditions and time can change several skin characteristics. In particular, it is revealed that the perioral area could be most affected.

G. Dell'Acqua, F. Germani, **Fighting AGEs Formation - Upcycled Artichoke Inhibits Glycation, Increases Skin Firmness**, Cosmetics & Toiletries, July/August 2021, p. 44-51

Recently, interest in upcycling organic material such as agricultural and food waste into valuable ingredients including cosmetic actives and polymers has increased. Waste disposal has been

associated with greenhouse gas emission bility to convert waste or waste byproducts of industrial production into new products with commercial value fits well into the growing trend for sustainability and the circular economy. And opportunity abounds, considering waste accumulates throughout the food supply chain—from initial agricultural production to manufacturing and fnal household consumption, as evidenced by one European Union report on food waste. Although the proportion of food waste in different phases of the supply chain varies per country, agriculture, manufacturing and household are at the top, overall, for food waste

N. Ngamdokmai, N. Waranuch, K. Chootip, K. Jampachaisri, C.N. Scholfield, K. Ingkaninan, **Efficacy of an Anti-Cellulite Herbal Emgel: A Randomized Clinical Trial**, Pharmaceuticals 2021, 14, 683

Cellulite describes unsightly skin overlying subcutaneous fat around thighs and buttocks of post-pubescent females. A herbal 'emgel' containing volatile oils and extracts of A traditional Thai herbal compress was tested in a double-blind, placebo-controlled trial with 18 women aged 20–50 year with severe cellulite. Appearance of cellulite (primary outcome), thigh circumferences, skin firmness, and cutaneous blood flow (secondary outcomes) were assessed at baseline, 2, 4, 8 and 12 weeks with a 2-week follow-up. Herbal emgel applied onto the thigh skin twice daily reduced cellulite severity scores in every time point. The score was reduced from 13.4 ± 0.3 (baseline) to 12.1 ± 0.3 (week 2) and 9.9 ± 0.6 (week 12). All secondary outcomes improved with both placebo and herbal emgels suggesting that ingredients in the base-formulation might be responsible. Querying of participants, analysis of their diaries, and physical monthly inspections found no adverse events. The herbal emgel safely improved the appearance of cellulite, while the base emgel may play a role for other endpoints. Further studies on the active constituents and their mechanism of action are needed to further explore these factors.

T.-F. Hsu, Z.-R. Su, Y.-H. Hsieh, M.-F. Wang, M. Oe, R. Matsuoka, Y. Masuda, **Oral Hyaluronan Relieves Wrinkles and Improves Dry Skin: A 12-Week Double-Blinded, Placebo-Controlled Study,** Nutrients 2021, 13, 2220

Hyaluronan (HA) is present in all connective tissues and organs, including the skin and joint fluid. However, few clinical trials have comprehensively evaluated the impacts of oral HA on skin conditions, including wrinkles and moisturization. In this study, we conducted a placebocontrolled, randomized, double-blind trial of daily HA (120 mg) intake for 12 weeks in 40 healthy Asian men and women (aged 35–64 years). Skin condition was determined by the evaluation of wrinkles, stratum corneum water content, the amount of transepidermal water loss, elasticity, and through image analysis. After 12 weeks, skin condition was significantly improved in terms of wrinkle assessment, stratum corneum water content, transepidermal water loss, and elasticity in the HA group compared to the placebo group. Regarding the percentage change from baseline, wrinkle assessment, stratum corneum water content, and skin elasticity were significantly improved in the HA group versus the placebo group after 8 and 12 weeks of ingestion. The present findings indicate that oral ingestion of HA may suppress wrinkles and improve skin condition.

M. Kerscher, D. Hertz-Kleptow, A. Drabik, T. Kaptan, J. Reinecke, **Cell-Free Blood Cell Secretome (BCS) Counteracts Skin Aging and Restores Firmness and Elasticity**, J Drugs Dermatol. 2021;20(6): p. 682-688

Background: Blood Cell Secretome, BCS (also Autologous Conditioned Serum, ACS) is efficacious in treatment of musculoskeletal disorders. It contains inflammation resolving cytokines, growth factors, exosomes, and lipid mediators. Skin aging is associated with reduced TGF-ß signaling and collagen synthesis and chronic (subacute) inflammation, among other factors. Pre-clinically, BCS counteracts these mechanisms, suggesting it as a treatment against cutaneous aging. Objective: This 24-week study evaluated the effects of deep dermal to immediate sub-dermal micropuncture injections of cell-free BCS in patients with age-related reduced facial skin elasticity. Methods: In this prospective, single-armed, mono-center study, 21 women underwent 4 BCS treatment sessions over 12 weeks with follow-up at 24 weeks. The primary endpoint was skin elasticity measured by cutometry. Secondary endpoints were safety, skin hydration, and aesthetic assessments using global aesthetic improvement scale. Results: Skin firmness increased significantly between baseline and 12 weeks ($P<0.001$) and further increased by 24 weeks ($P<0.001$). Skin tiring was congruently reduced ($P<0.001$). Skin hydration and aesthetic ratings improved significantly. No BCS-related adverse reactions occurred. Conclusion: BCS treatment resulted in increased firmness and hydration, usually attributed to younger skin. BCS is potentially the first cell-free autologous therapy for skin rejuvenation derived from patients' own blood.

S. Faloni de Andrade, P. Rijo, C. Rocha, L. Zhu, K. Chen, L.M. Rodrigues, **High Resolution Sonography confirms that essential oils benefit epidermal water barrier *in vivo*,** Poster at the ISBS Digital Congress 2021, 3-5 June 2021, Berlin, Germany

Essential oils are complex mixtures of volatile low molecular weight compounds (terpenoids and phenylpropanoids) extracted from plants and are responsible for the characteristic aroma in those plants. Despite the wide use of these in cosmetic and dermatological formulations, information about its mechanism of action and efficacy is still insufficient.

B. Müller, E. Mazza, C. Schiestl, J. Elrod, **Longitudinal monitoring and prediction of long-term outcome of scar stiffness on pediatric patients**, Burns & Trauma, 2021, 9

Background: Hypertrophic scarring after burn injury is one of the greatest unmet challenges in patients with burn injuries. A better understanding of the characteristics of scar maturation and early prediction of the long-term outcome of scarring are prerequisites for improving targeted therapies and pivotal for patient counselling. Methods: Repeated measurements of scar stiffness in 11 pediatric patients were performed over the course of 1 year using 2 suction devices, the Cutometer and the Nimble. In addition, the observer pliability score of the Patient and Observer Scar Assessment Scale was applied. This longitudinal study allowed quantification of the ability of each of the measured parameters to reflect scar maturation, as indicated by change in skin pliability/stiffness, over time (using linear regression); the ability to distinguish individual patients (intraclass correlation coefficient (ICC)); the correlation of the devices (Spearman correlation coefficient); and the ability to predict longterm scar maturation based on early scar assessment (using receiver operating characteristic). Results: All the tools used showed significant longitudinal decrease of scar stiffness from 3 months until 12 months after the injury. The Nimble (ICCpatientNimble = 0.99) and the Cutometer (ICCpatientCuto = 0.97) demonstrated an excellent ability to distinguish between individual patients. The Nimble seemed to be able to predict the 12-month pliability of scars based on early (3-month) measurements (area under the curve (AUC)12mPOSAS = 0.67; AUC12mC = 0.46; AUC12mN = 0.79). Conclusions: The results of this preliminary study suggest that all 3 tools provide suitable means to quantify alterations in scar stiffness over time. Initial evidence suggests the Nimble is most favorable for predicting changes in stiffness associated with long-term scar maturation. Further studies with a larger sample size are required to validate tissue suction as a clinical tool for analysis of changes of scar stiffness over time.

R.E. García Pasiminio, ***Lecythis Minor* - A Major Resource for Skin/Hair Benefits and Social Progress**, Cosmetics & Toiletries, June 2021

Global demand for natural ingredients and cosmetics has raised interest in exploring materials from a variety of biodiversities. Considering their beauty benefits,1 these naturally sourced ingredients can support the development of innovative and environmentally sustainable products while also affording an opportunity to support social progress by benefting the communities in these environments. The biodiversity of Colombia provides one such opportunity.

K. Goldie, M. Kerscher, S. Guillen Fabi, C.Hirano, M. Landau, T.S. Lim, H. Woolery-Lloyd, K. Mariwalla, J.-Y. Park, Y. Yutskovskaya, **Skin Quality – A Holistic 360° View: Consensus Results**, Clinical, Cosmetic and Investigational Dermatology 2021:14, p. 643–654

Introduction: Skin quality is an important component of human attractiveness. To date, there are no standardized criteria for good skin quality. To establish a consensus for good skin quality parameters and measurement and treatment options, a virtual skin quality advisory board consisting of a global panel of highly experienced aesthetic dermatologists/ aesthetic physicians was convened. Methods: A total of 10 dermatologists/aesthetic physicians served on the advisory board. A modifed version of the Delphi method was used to arrive at consensus. Members accessed an online platform to review statements on skin quality criteria from their peers, including treatment and measurement options, and voted to indicate whether they agreed or disagreed. Statements that did not have agreement were modifed and the members voted again. Consensus was defned as: strong consensus = greater than 95% agreement; consensus = 75% to 95% agreement; majority consent = 50% to 75% agreement; no consensus = less than 50% agreement. Results: There was strong consensus that good skin quality is defned as healthy, youthful in appearance (appearing younger than a person's chronological age), undamaged skin and that skin quality can be described across all ethnicities by four emergent perceptual categories (EPCs): skin tone evenness, skin surface evenness, skin frmness, and skin glow. The EPCs can be affected by multiple tissue layers (ie, skin surface quality can stem from and be impacted by deep structures or tissues). This means that topical approaches may not be suffcient. Instead, improving skin quality EPCs can require a multilayer treatment strategy. Conclusion: This global advisory board established strong consensus that skin quality can be described by four EPCs, which can help clinicians determine the appropriate treatment option(s) and the tissue or skin layer(s) to address. Skin quality is important to human health and wellbeing and patients' perception for the need for aesthetic treatment.

S.H. Pérez Damonte, M.A. Moyano, M. Nuñez, .A.I. Segall, **Effects of α-lipoic acid on the biomechanical properties of the skin**, World Journal of Advanced Research and Reviews, 2021, 10(02), p. 057–070

Background: The Cutometer MPA 580® (Courage and Khazaka, Germany) is a well-established instrument for the accurate and reproducible measurement of the biomechanical properties of the skin. The purpose of this study was to assess the effect of 4 formulations containing 2.5% and 5.0% of α-lipoic acid and ascorbic palmitate or butylhydroxytoluene on skin elasticity and firmness and to assess the equivalence between alternative parameters (Q0, Q1 and Q3) and the traditional parameters R0, R2, R5, R6, all determined with the same cutometer. Methods: Measure of in vivo firmness and elasticity of the skin was performed using R and Q parameters measured in the same device. Results: Different statistical analysis were applied to the results obtained from the parameters (Q0, Q1 and Q3) and the traditional parameters R0, R2, of the in vivo measurements after the application of the four formulations during 28 days. A correlation between both types of measurements was demonstrate. Conclusion: A four-week treatment with a cream containing 5% α-lipoic acid improves the biomechanical characteristics of the skin, thus contributing to the protection against photo-aging. Both methods of measurement proved to be equivalent.

S.Y. Lee, S.Y. Joo, Y.S. Cho, G.Y. Hur, C.H Seo, **Effect of extracorporeal shock wave therapy for burn scar regeneration: A prospective, randomized, double-blinded study**, Burns, 2021 Jun;47(4):821-827

Purpose: This study aimed to investigate the regeneration effect of extracorporeal shock wave therapy (ESWT) on hypertrophic scar regeneration using objective measurements. Methods: This was a double-blinded, randomized, controlled trial of 48 participants who had undergone autologous split-thickness skin grafting (STSG) with same artificial dermis. The ESWT group (n=25) received shock waves with low-energy flux density (0.05-0.30mJ/mm^2). The interval between treatments is a 1-week. The ESWT group also received recommended treatment. The control group (n=23) only received standard treatment. We measured skin characteristics before treatment and after 6 weeks for both groups. Results: No significant intergroup difference was noted at the initial evaluations ($p>0.05$). The pre- to post-treatment change in the scar thickness ($p=0.03$) and erythema ($p=0.03$), greater reduction was found in the ESWT group than control group. The pre- to post-treatment change in the sebum level ($p=0.02$), more increase was found in the ESWT group. We found no significant differences in the change measurements between the two groups for melanin levels ($p=0.62$) and transepidermal water loss (TEWL) ($p=0.94$). The changes (skin distensibility, biological skin elasticity, gross skin elasticity, and skin viscoelasticity) measured with the Cutometer showed no significant differences between the two groups ($p=0.87$, $p=0.32$, $p=0.37$, and $p=0.29$, respectively). Conclusion: This is the first report of ESWT on hypertrophic scar after burn using objective tools (melanin, erythema, sebum, TEWL, elasticity and thickness). ESWT has objective beneficial effects on burn-associated scar characteristics.

A. Roca, M. Aso-Perez, B. Martinez-Teipel, J. Bosch, **Balancing epigenetics for skin wellbeing**, PERSONAL CARE MAGAZINE, June 2021

Rather than looking younger, the more mature generations want to feel at one with their age and show off the very best version of themselves. Since more than 90% of decisions are made subconsciously, Provital - with its everlasting commitment to innovation and technological progress in the interests of caring for people – used Artificial Intelligence to demonstrate the emotional impact that its active ingredient Wonderage had on the subconscious of 47 volunteers, providing a holistic approach to an ingredient with a physical improvement on skin luminosity, hydration and density achieved by its effect on the epigenetic signature and on the endogenous hyaluronic acid production. Because overall wellbeing is seen as integrative beauty that embraces both the physical aspect and emotional health. Because happiness is the key to beauty

A. Kołodziejczak, H. Rotsztejn, **Efficacy of fractional laser, radiofrequency and IPL rejuvenation of periorbital region**, Lasers Med Sci 2021

The purpose of this study was to assess skin elasticity, the reduction in the number and the depth of wrinkles and changes in the other skin defects (bags under the eyes, dark circles under the eyes, skin hyperpigmentation in the ageing eye area following the use of non-ablative fractional laser, bipolar radiofrequency and intense pulsed light). Moreover, the study was also comparison which device brought better results than the others. This study included 71 patients (66 women, 5 men), aged 33–63 years (the average age was 45.81 years) with skin phototypes II and III. Twenty-four patients received five treatment sessions with a 1410-nm non-ablative fractional laser in 2-week intervals, 23 patients received five treatment sessions with a bipolar radiofrequency in 1-week intervals and 24 patients received five treatment sessions with an intense pulsed light in 2-week intervals. The treatment

was applied on the skin in the eye area. The Cutometer (Courage + Khazaka electronic) reference test was used as an objective method for the assessment of skin elasticity. A questionnaire was used to compare baseline state with changes that occurred after the series of treatment sessions. The results of cutometric measurements of R2, R6 and R7 parameters and the results of questionnaires indicated that non-ablative fractional laser therapy, bipolar radiofrequency and intense pulsed light improved skin elasticity. Of the three treatments, the most significant percentage improvement in the R6 parameter was demonstrated by non-ablative fractional laser therapy which gave better final results than the other methods ($p < 0.0001$). No other statistically significant relationships were found between RF and IPL. In the (subjective) opinion of study participants (questionnaire), all used methods resulted in the reduction of the amount and the depth of wrinkles. However, they did not observe significant impact of individual treatment method on the signs of skin ageing, including discolorations within eye area, bags (fatty hernia), dark circles (vascular/pigmentary) and oedema (predisposition to water retention). Non-ablative fractional laser therapy, bipolar radiofrequency and intense pulsed light improved skin elasticity and the reduction of wrinkles. The most significant improvement of elasticity was demonstrated by laser therapy. It seems necessary to expand the group with the effect of individual treatments against bags and dark circles under the eyes.

N. Nakagawa, N. Shimizu, T. Sugawara, S. Sakai, **The relationship between habitual physical activity and skin mechanical properties,** Skin Research & Technology, Volume 27, Issue 3, May 2021, p. 353-357

Background: Physical activity (PA) is important for body health. A few reports suggested that PA also influenced skin structure and components. Little data are available on the influence of PA on skin mechanical properties (SMP). Here, we investigated the relationship between PA and SMP. Methods: Twenty-five healthy Japanese female subjects (31.0 ± 3.3 years) were enrolled in the study. To monitor the 24-hr pulse rate, a wrist watch-type pulse monitor was used. PA intensity was divided into five PA intensity zones (max, anaerobic, aerobic, fat combustion, and warm-up) by the pulse monitor. The average values of the time spent on each intensity for 70 days were calculated. To measure SMP, a Cutometer was used at the end of the monitoring. R0 indicated the height of the maximal skin deformation, and R6 was the ratio between viscoelastic and elastic deformation. Results: R0 was positively correlated with the time spent in four of the five PA intensity zones (max, anaerobic, aerobic, and fat combustion), whereas R6 was negatively correlated with the time spent in these four PA intensity zones. The time of warm-up did not correlate with SMP. Conclusion: These results suggest that habitual moderate-to-vigorous PA influences SMP.

I. Dolečková, A. Čápová, L. Machková, S. Moravčíková, M. Marešová, V. Velebný, **Seasonal variations in the skin parameters of Caucasian women from Central Europe,** Skin Research & Technology, Volume 27, Issue 3, May 2021, p. 353-357

Background: The human skin is greatly affected by external factors such as UV radiation (UVR), ambient temperature (T), and air humidity. These factors oscillate during the year giving rise to the seasonal variations in the skin properties. The aim of this study was to evaluate the effect of seasons, environmental T, relative and absolute humidity on the skin parameters of Caucasian women, perform a literature review and discuss the possible factors lying behind the found changes.Materials and Methods: We measured stratum corneum (SC) hydration, transepidermal water loss (TEWL), sebum level, erythema index, and elasticity parameters R2 and R7 on the forehead and the cheek of Caucasian women from the Czech Republic throughout the year. We also performed a non-systematic literature review focused on the seasonal variations in these skin parameters. Results: We confirmed a well-documented low SC hydration and sebum production in winter. In spring, we found the lowest TEWL (on the forehead) and the highest SC hydration but also the highest erythema index and the lowest elasticity presumably indicating skin photodamage. For most of the skin parameters, the seasonal variations probably arise due to a complex action of different factors as we extensively discussed. Conclusion: The data about the seasonal variations in the skin parameters are still highly inconsistent and further studies are needed for better understanding of the normal skin changes throughout the year.

A. Nkengne, J. Robic, B. Leng Lua, **Self-perceived and objective measurements of facial puffiness in Chinese women**, Skin Research & Technology, Volume 27, Issue 3, May 2021, p. 385-392

Background: Facial puffiness, caused by mild or normal fluid retention, commonly experienced by women, may not pose a health risk, but it can be a cause of cosmetic concern. The objectives of this study were to determine whether self-perceived facial puffiness can be measured objectively. Materials and Methods: A total of 151 Chinese women between 20 and 68 years of age were recruited. Facial water content, skin thickness, and elasticity were measured at two time points within a day (visit one occurred when the participants perceived they had facial puffiness; visit two occurred when the

participants perceived their facial puffiness had subsided). Participants were also given a rating scale to selfevaluate their puffiness and firmness at different regions of the face. Results: The participants could perceive a difference in facial puffiness between the two visits. Water content and skin thickness were significantly higher in all regions of the face for all participants during the first visit. Skin elasticity was also significantly different between visits one and two. There was a significant increase in water content and skin thickness in the lower eyelid region in women who were older than 40 years. Conclusion: This is the first study to show that self-perceived facial puffiness can be measured objectively and that skin elasticity can change significantly when facial puffiness subsides.

H. Stettler, R. de Salvo, R. Olsavszky, E.A. Nanu, V. Dumitru, S. Trapp, **Performance and Tolerability of a New Topical Dexpanthenol-Containing Emollient Line in Subjects with Dry Skin: Results from Three Randomized Studies**, Cosmetics 2021, 8, 18

Three studies were conducted with three new dexpanthenol-containing emollients containing increasing lipid contents (Emollients 1–3) to assess their performances in healthy adults with dry skin. All three studies (N = 42 each) followed virtually the same design. A single skin application of the study product was performed followed by once-daily usage. Skin hydration, transepidermal water loss (TEWL), skin biomechanical properties, and lipid content of the stratum corneum (SC) were regularly assessed over the 28-day study period; a subset (N = 22) underwent a sodium lauryl sulfate (SLS) challenge prior to product application. All three emollients were well tolerated and showed good performances with only minor differences in instrumental measurements. After single and prolonged once-daily applications of Emollients 1–3 to dry skin and dry SLS-damaged skin, skin hydration significantly increased from baseline (BL) (by 38.1–72.4% in unchallenged skin, $p < 0.001$ for all three). This was paralleled by significant increases in skin elasticity parameters. Usage of Emollients 1 and 3 caused increases from BL in SC cholesterol (by 9.8–12.5%, $p < 0.05$ for both) and SC free fatty acid levels (by 3.7–26.3%, $p < 0.05$ for both) at the end of the study. No sustained effects on TEWL were recorded. Our findings support the once-daily use of all three emollients in adults with dry skin.

H. Heo, J. Madhavan, S. Eun, H. Jung, H. Lee, **Pre-Clinical Evaluation of Proprietary Lutein, Zeaxanthin, and Rosemary Formulation for Its Dermal Protective Activity in Male Swiss Albino Mice**, Prev. Nutr. Food Sci. 2021;26(4): p. 425-433

This study aimed to evaluate the efficacy of the proprietary lutein, zeaxanthin, and rosemary formulation for its dermal protection against ultraviolet (UV) irradiated skin dehydration. A total of 48 male Swiss albino mice of 8~12 weeks of age were divided into eight groups of 6 mice: mice in group 1 (G1) were considered the normal control, without treatment and without skin shaving; mice in G2 had their skins were shaved, but did not receive treatment; mice in G3were the pathological control; mice in G4 were treated as standard (hyaluronic acid); mice in G5~G8 were treated with low and high doses of 2 different test substances, respectively. Mice were anaesthetized and then depilatory was applied on the dorsal skin area (2 cm×2 cm) on alternate days, then UV/blue light irradiation was carried out for 15 min for 6 weeks. Collagen type 1 gene expression was determined via densitometric analysis, skin elasticity was assessed, and stratum corneum water contents were measured using a cutometer and corneometer. Skin hydration was assessed through transepidermal water loss, and several serum biochemical parameters (collagenase, hydroxyproline, hyaluronic acid, and ceramide levels) were determined to assess the skin moisturizing activity of the product. Images for assessing photoaging were considered between different groups on day 42. All these subjective parameters reached statistical significance ($P< 0.05$) in groups treated with the proprietary lutein and rosemary formulation compared with the placebo-treated group. In conclusion, the proprietary lutein, zeaxanthin, and rosemary formulation showed better protection of skin subjected to UV irradiated skin dehydration.

M.A. Nilforoushzadeh, S. Zare, S. Farshi, M. Mahmoudbeyk, M. Nouri, F. Jaffary, N. Nikkhah, **Clinical, biometric, and ultrasound assessment of the effects of the autologous fibroblast cells transplantation on nasolabial fold wrinkles**, J Cosmet Dermatol,. 2021 Apr 27

Background: Feeling beautiful and staying young have always been important to the people. Therefore, an extensive body of research has focused on the efforts made to remove the skin problems, especially wrinkles. Fibroblast cells of the skin are the various autologous cells currently used in repairing several wounds, scars, and skin aging. Thus, the present study was conducted to assess the efficacy of the transplantation of the fibroblast cells in eliminating the facial wrinkles using the biometric assessment and to optimize the application of this technique in this treatment. Methods: The present study was conducted on 22 male and female patients aged between 35 and 60 years old. Samples were collected from the retro-auricular region, and the fibroblast cells were isolated and cultured. Subjects received three injections with autologous fibroblasts at 2-week intervals. The patients were followed up for 6 months, and structural changes in their wrinkles were assessed by the sonography and the

VisioFace software, cutometer, tewameter, and colorimeter. Results: The results obtained using the VisioFace software showed the significant phenotypic changes in the patients after the nasolabial injections (81.42 ± 23.97 vs. 60.91 ± 21.91, p = 0.0001). The results showed a significant increase in the total skin density (13.73 ± 6.30 vs. 26.27 ± 7.93, p = 0.0001), dermis density (11.28 ± 5.21 vs. 31.88 ± 7.96, p = 0.0001), epidermis density (27.68 ± 23.15 vs. 49.21 ± 45.68, p = 0.046), and dermis thickness (798.09 ± 133.51 μm vs. 905.59 ± 240.67 μm, p = 0.036) compared to pre-treatment. Conclusion: The findings of the study revealed that the injection of autologous fibroblasts can be effective in restoring the aging skin, especially in the nasolabial region, and can be used as a safe rejuvenating strategy.

A. Samadi, S. Ahmad Nasrollahi, M. Nateghi Rostami, Z. Rezagholi, F. Abolghasemi, A. Firooz, **Long-term effects of two 24-hour moisturizing products on skin barrier structure and function: A biometric and molecular study**, Health Science Reports, 2021;4

Introduction: Recently, there are a few moisturizers showing hydrating effects up to 24 hours after single application. Aquaporin 3 might be associated with the degree of skin hydration. We aimed to assess the effects of two brands of 24-hour moisturizers on the skin barrier function, as well as the AQP3 gene expression. Method: Two moisturizers were applied once daily by 20 participants age 36.15 ± 9.55 years. Upper right and left forearms were randomly assigned to application of each product, whereas the right lower forearm served as control site for application of a cream base formulation. Biophysical assessments including trans epidermal water loss (TEWL), skin hydration, pH, surface lipids, and elasticity parameters were performed before intervention, 1, 4, and 24 hours after single application, following 2 weeks daily application and 1 week after termination of use. Also 5-mm punch biopsies were performed from application sites of product B and cream base formulation in for five participants after 2 weeks of application. Results: A single treatment with both products led to 24-hour increase in skin moisture in comparison with the control site (P-value <.01). Daily application of both products for 14 days also led to significant improvement in skin moisture (P-value <.01), TEWL (P-value <.01), and elasticity parameters. The increase in skin hydration was associated with upregulation of AQP3 gene expression in treated area for one of the formulations (P-value = .04). Conclusion: The tested 24-hour moisturizers only need to be applied once daily to improve skin barrier function and hydration and up-regulate AQP3 mRNA expression.

N. Cameli, M. Silvestri, M. Mariano, E. Berardesca, **Effects of food supplements and a topical solution containing nanosilicon on skin hydration, barrier function, and elasticity**, J Cosmet Dermatol, 2021 Apr;20 Suppl 1: p. 32-35

Background: Silicon is an abundant element in the human body and plays an important role in the skin, taking part in the synthesis of collagen and glycosaminoglycans. The use of nanotechnology methods, which processes materials at an atomic and molecular scale, has allowed the development of nanosilicons. Aims: The study evaluates the effectiveness of a food supplement and a topical solution containing nanosilicon in improving skin hydration and elasticity. Methods: A total of 30 female subjects were randomized to receive the placebo (n = 15) and the active compound (n = 15). All enrolled subjects took the food supplement twice a day for 20 days and then once a day for the next 20 days, and they also had to apply the nanosilicon solution on the right forearm four times a day. Evaluation of several parameters was performed after 20 and 40 days through the use of non-invasive instrumental methods (Corneometer® CM 825, Cutometer® MPA 580, Visioscan® VC, Tewameter® TM 200). Results: Both treatment groups showed a statistically significant improvement in barrier function and in skin hydration on the right forearm after 20 days; increase in skin elasticity was observed only in the group taking the active compound. Conclusions: The study showed that the administration of a food supplement and a topical solution, both containing nanosilicon, improves hydration, elasticity, and skin barrier function.

P. Orzol, I. Doleckova, J. Starigazdova, G. Huerta-Angeles, V. Velebny, **Safe and strategic – Hyaluronic and retinoic acid derivate allays aging and acne,** Cosmetics & Toiletries, April 2021, p. 61-70

Retinoids are a group of active molecules comprising vitamin A and its natural and synthetic derivatives. Commonly used in cosmetic products, these lipophilic molecules bind to specific nuclear receptors that modulate the expression of genes involved in cellular proliferation and differentiation, e.g., of keratinocytes, which can normalize desquamation. The topical application of retinoic acid, for one, has been shown to improve clinical features of aged skin by reducing wrinkles and diminishing hyperpigmentation.

M. Dąbrowska, I. Nowak, **Noninvasive evaluation of the influence of aucubin-containing cosmetic macroemulsion on selected skin parameters**, J Cosmet Dermatol, 2021 Mar;20(3),:p. 1022-1030

Background: Objective evaluation of skin condition on the basis of noninvasive methods has become obligatory and may be a good strategy for verifying the efficiency of new cosmetic active ingredients. Aim: The aim of this study was to assess the influence of aucubin-containing cosmetic macroemulsion on skin parameters using the skin testing equipment. Patients/methods: The study was carried out on the group of 25 female volunteers of the mean age 27 ± 2 years. The skin parameters were measured using the following devices: Tewameter® TM 300 (transepidermal water loss, TEWL), Corneometer® CM 825 (skin hydration), Cutometer® MPA 580 (skin elasticity), Visioscan® VC 98 (skin topography), and Visioline® VL 650 (skin macrorelief). All measurements were performed on the inner part of the left forearm. Results: The skin parameters measured revealed the beneficial influence of aucubin on TEWL and skin hydration level. The application of aucubin-enriched cream caused more significant improvements of all determined SELS parameters, in comparison with cream without it. An analogous tendency was noticed in the case of skin macrorelief parameters; the addiction of the active ingredient led to a decrease in the value of total wrinkle area and diminished the mean length and depth of single wrinkles. Conclusions: Noninvasive methods of skin testing have provided a possibility of objective evaluation of the action of new active ingredients in cosmetic formulations. The study has proved the positive influence of aucubin on effectiveness of cosmetic macroemulsions, diminishing TEWL, increasing skin hydration level, and improving the values of SELS and skin macrorelief parameters.

T. Pattayadeekul, T. Pawcsuntorn, T. Nararatwanchai, **The efficacy and safety of autologous stromal vascular fraction transplantation for infraorbital skin rejuvenation: A clinical prospective study**, Journal Cosmet Dermatol, March 2021

Background: The stromal vascular fraction of fat tissue contributes to its rejuvenation properties. The stromal vascular fraction is a minimal processed cell population. Therefore, it is purportedly a suitable cell therapy for skin rejuvenation. Objectives: This clinical trial aimed to evaluate the efficacy and safety of transplantation of autologous stromal vascular fraction to aging skin in the infraorbital region. Patients/methods: Nineteen patients were candidates for stromal vascular fraction isolation and transplantation. They underwent lipoaspiration of the abdomen to obtain samples of fat tissue. The stromal vascular fraction was thereafter harvested and transplanted in each infraorbital area. The patients' outcomes were measured and were based on surface evaluation of wrinkles, surface evaluation of scaliness, and melanin evaluation with a Mexameter. The red blood cell volume and skin elasticity were measured with an erythrometer and cutometer, respectively. Results: Three months and 6 months after autologous stromal vascular fraction transplantation, the elasticity, wrinkle, and pigmentation of the infraorbital skin improved significantly, but not surface evaluation of scaliness and erythema. The phenotype also improved in the infraorbital skin area, as evaluated by physicians. Conclusion: The stromal vascular fraction of adipose tissue represents an attractive cell source. In our study, preliminary data showed that clinical outcomes were also generally satisfactory with no serious adverse effects. Thus, stromal vascular fraction cells are safe for clinical rejuvenation use. We encourage future evidence-based controlled studies to maintain a strong focus on the efficacy and safety profile of stromal vascular fraction therapy.

J.Y. Hong, J.H. Kim, T.R. Kwon, J.K. Hong, K. Li, B.J. Kim, **In vivo evaluation of novel particle-free polycaprolactone fillers for safety, degradation, and neocollagenesis in a rat model**, Dermatol Ther, 2021 Mar;34(2)

Dermal fillers have become popular due to the increased demand for skin rejuvenation products. Polycaprolactone (PCL), a newly developed bioresorbable medical polymer, has emerged as a durable and safe dermal filler. However, available PCL fillers cause irritation; carrier gels can coagulate PCL particles, block the injection needle, and cause nonhomogeneity of particle suspensions that could be responsible for the observed side effects. To relieve pain, premixing PCL filler with lidocaine. However, this formulation changes the property of the CMC portion of the PCL filler, and possibly results in an uneven suspension of the PCL particles. Hence, a particle-free PCL homogeneously solubilized in water was developed to overcome these limitations. This study aimed to assess the in vivo safety, biodegradability, and neocollagenesis ability of a novel PCL filler, DLMR01 using a rat model. Fillers were characterized after injecting a vehicle control or DLMR01 using a digital camera, folliscope, and a three-dimensional profiling system. Biopsy was performed to evaluate biocompatibility and neocollagenesis. Skin elasticity was measured using a Cutometer. DLMR01 caused no needle occlusion by particle aggregation or laborious injectability. Filler nodules dispersed to surrounding tissues within 6 hours without further granuloma formation. Histological inspection revealed no tissue residual material or foreign body reaction during the 12-week test period. DLMR01 increased dermal thickness, collagen regeneration, and skin elasticity. In conclusion, this study demonstrates the potential of DLMR01 for dermal rejuvenation in a rat model.

D.M Turer, I.B James, B.E DiBernardo, T**emperature-Controlled Monopolar Radiofrequency in the Treatment of Submental Skin Laxity: A Prospective Study**, Aesthet Surg J. 2021 Mar 6

Background: Laxity of the submental area is a common cosmetic complaint of the aging population. Objectives: The objective was to determine the safety and effectiveness of a temperature-controlled minimally invasive percutaneous monopolar radiofrequency device to improve dermal laxity and achieve lift. Methods: A total of 72 subjects (35-65 years old) with mild to moderate skin laxity in the submental area were included in this single-center prospective study (New Jersey, USA). All subjects received one treatment at baseline with an average subdermal temperature of 63°C. The primary endpoint was the proportion of subjects with at least a 20 mm 2 decrease in surface area at Day 90 based on 3D photography. Secondary endpoints included skin elasticity measured by a cutometer, assessment by a blinded physician panel using 2D photographs, and physician and subject-reported outcomes. Results: At Day 90, 72.1% (95% confidence interval: 62.2-84.0%, P < 0.001) of subjects achieved at least a 20 mm 2 lift of the submental area. All values for skin elasticity (R2, R5, R7) showed significant improvement by 180 days as measured by cutometer. 74.2% of subjects were graded by the independent panel as "Improved" at 90 days. (62.0-84.2%, P<0.001). The treatment was well tolerated, and only one possibly related serious adverse event was reported (pharyngeal inflammation). Conclusions: Treatment with temperature-controlled monopolar radiofrequency alone is a safe and effective treatment to achieve submental lift for at least six months.

Y.-S. Sheen, H.-Y. Huang, Y.-H. Liao, **The efficacy and safety of an antiaging topical serum containing hesperetin and sodium cyclic lysophosphatidic acid: A single-center clinical trial**, J Cosmet Dermatol, March 2021

Background: Skin aging is characterized by dehydration and degradation of the structural components in the dermis. It has been demonstrated that hesperetin possesses collagen synthesis and antioxidant properties and sodium cyclic lysophosphatidic acid (NcPA) increases skin moisture through upregulating the synthesis of hyaluronic acid. Aims: To evaluate the efficacy and safety of a serum containing hesperetin 0.1% and NcPA 0.1% for photoaged skin. Patients/methods: The trial consisted of a 12-week topical application of the test product twice daily. A total of 35 female subjects were enrolled. The primary outcome was the change of skin hydration and elasticity, which were determined by Corneometer and Cutometer measurements. Skin biopsy for histological evaluations and subject's self-assessment were conducted. Results: At week 12, a significant improvement of stratum corneum hydration ($p = 0.015$) and skin elasticity ($p < 0.001$) was detected comparing to baseline. The skin biopsy showed significantly improved scores of hyaluronic acid levels ($p = 0.034$) and elastic fiber structure ($p = 0.023$). Moreover, the test product resulted in a significant subject-reported overall satisfaction rate 94.3% after 12-week application ($p = 0.005$). Conclusion: Skin care product containing hesperetin and NcPA showed significant antiaging effects on skin hydration and elasticity.

A. Roca, M. Perez-Aso, B. Martinez-Teipel, J. Bosch, **Glowing Review - Monk Fruit Encourages Epigenetic Well Aging**, Cosmetics & Toiletries, March 2021, p. 53-62

Aging is characterized by the accumulation of macromolecular damage, impaired tissue renewal and progressive loss of physiological integrity. Over the past decade, a growing number of studies also has revealed that progressive changes to epigenetic information have a major influence on the aging process. Lifestyle habits, diet, pollution and other environmental factors all impact the human life span by altering epigenetic information. Therefore, given the reversible nature of epigenetic mechanisms, these studies provide promising avenues for healthy aging.

*H. Kim, S.Y. Park, D.K. Chung***, Effect of the Oral Administration of Common Evening Primrose Sprout (*Oenothera biennis L.*) Extract on Skin Function Improvement in UVB-Irradiated Hairless Mice**, Pharmaceuticals 2021, 14, 222

Most of the studies on common evening primrose (*Oenothera biennis L.*) are focused on its oils (isolated from seed, root, and stem tissues). We aimed to investigate the effect of the oral administration of OBS-E on the improvement of skin function in skin-damaged hairless mice exposed to excessive ultraviolet B (UVB) radiation owing to the preliminary in vitro findings regarding the antioxidant, anti-wrinkle, and skin moisturizing activities of OBS-E. OBS-E administration for 14 weeks did not significantly affect the body weight or clinical signs. Significant reductions were observed in wrinkle parameters (area, number, length, and depth, and metalloproteinase levels) in OBS-E-administered mice compared with those in UVB-irradiated control mice. OBS-E significantly increased skin elasticity and hyaluronic acid content, but it significantly decreased transepidermal water loss. Histomorphometrical analysis revealed that OBS-E significantly reduced the epidermal thickness, area of the collagen-occupied region, and number of microfolds and inflammatory and mast cells. These

results demonstrate that OBS-E can effectively enhance skin functions in terms of ameliorating wrinkle formation, promoting skin-moisturization, enhancing skin barrier function, and inhibiting inflammatory reactions. The obtained results provide good starting point for the continuation in the process of developing new inner beauty products based on OBS-E.

E. Besic Gyenge, S. Hettwer, B. Suter, B. Obermayer, **Genderless cosmetics with gender-specific efficacy**, PERSONAL CARE, March 2021, p. 50-52

Unisex was yesterday's trend – genderless beauty is here to stay. The definition of gender has become very fluid. It now goes beyond simply 'male' and 'female', taking the form of a desire for acceptance and empowerment in one's own person. Man, woman, transgender and those who fall under any other definitions of gender should be able not only to share fashion but also their lotions and potions. From the consumers' point of view, this makes cosmetics more practical and sustainable. Nevertheless, genderless cosmetics should not be defined in terms of non-binary fragrances but rather by their mode of action, which should adapt to the respective needs of various skin types. However, where to start? Can genderless skin care truly cater to the distinct needs of male and female skin? Are there differences between male and female skin? With this in view, our approach has been to develop Reforcyl®-Aion, an active ingredient with the capability to spring clean skin cells, activating and rejuvenating them, improving overall skin appearance and positively influencing the personal perception of beauty. Reforcyl-Aion meets the individual needs of skin regardless of gender or age.

B. Hersant, M. SidAhmed-Mezi, C. Aboud, J. Niddam, S. Levy, T. Mernier, S. La Padula, J.-P. Meningaud, **Synergistic Effects of Autologous Platelet-Rich Plasma and Hyaluronic Acid Injections on Facial Skin Rejuvenation**, Aesthetic Surgery Journal, February 2021, Vol 41(7), p. 854–865

Background: Many therapeutic options are currently available for facial skin rejuvenation, but little evidence exists about the efcacy of combining such procedures. Objectives: The aim of this study was to assess and investigate the synergistic effect of hyaluronic acid (HA) and autologous platelet-rich plasma (a-PRP) injections on facial skin rejuvenation. Methods: For this randomized controlled prospective study, 93 eligible patients were enrolled and randomized into 3 intervention groups to undergo a series of 3 treatment sessions with either a-PRP, HA, or a mixture of a-PRP and HA (Cellular Matrix; Regen Lab) injected into facial cheeks. Results: A total of 93 patients were included. Treatment with Cellular Matrix led to a very signifcant improvement in the overall facial appearance compared with treatment with a-PRP or HA alone ($P < 0.0001$). Participants treated with Cellular Matrix showed a 20%, 24%, and 17% increase in FACE-Q score at 1, 3, and 6 months posttreatment, respectively. For the HA group, the improvement in FACE-Q score was 12%, 11%, and 6% at 1, 3, and 6 months posttreatment, respectively, whereas for the a-PRP group the improvement was 9%, 11%, and 8% at 1, 3, and 6 months posttreatment, respectively. Biophysical measurements showed signifcantly improved skin elasticity for the Cellular Matrix group compared with the groups receiving a-PRP or HA alone. No serious adverse events were reported. Conclusions: Combining a-PRP and HA seems to be a promising treatment for facial rejuvenation with a highly significant improvement in facial appearance and skin elasticity compared with a-PRP or HA alone.

E.T Makino, K. Kadoya, R. Chung, L. Jiang, M. Mikati, R.C Mehta, **Efficacy and Tolerability of a Novel Topical Treatment for Neck: A Randomized, Double-blind, Regimen-Controlled Study,** J Drugs Dermatol. 2021 Feb 1;20(2): p. 184-191

The neck plays a telling role as an age indicator. Due to its anatomy and function, neck skin ages differently than facial skin and special considerations need to be taken when providing treatment. A randomized, double-blind, regimen-controlled study was conducted to assess the efficacy and tolerability of a novel topical cosmetic cream (NCC) specifically tailored to address the signs of skin aging of the neck and dé colletage. Twice daily application of NCC significantly improved skin sagging/laxity of the neck as well as the appearance of fine and coarse lines/wrinkles, crepiness, tactile roughness, overall skin texture, hyperpigmentation, skin tone evenness, and radiance. NCC also significantly improved the appearance of fine and coarse lines/wrinkles, tactile roughness, hyperpigmentation, skin tone evenness, and radiance of the dé colletage. Investigator assessments were corroborated by objective cutometer measurements that demonstrated improved skin firmness and elasticity. In vitro analysis in human 3D skin models show that stimulation of neocollagenesis and neoelastogenesis as well as support of cellular proteostasis through proteasome and autophagy activation are potential mechanisms of action for the observed clinical outcomes.

E. Öksüm Solak, G. Emel Gökçek, D. Kartal, N. Kalay, S. Levent Çinar, G. Savaş, M. Borlu, **The relationship between the severity of coronary artery disease and skin measurement parameters,** Skin Research & Technology, Volume 27, Issue 1, January 2021, p. 101-107

Purpose: This study aimed to investigate the relationship between skin parameters and CAD. Materials and Methods: The study included 50 patients diagnosed with coronary artery disease as the patient group and 45 volunteers without any known coronary artery disease as the control group. The participants' skin TEWL, pH, temperature, electrical capacitance, sebum, and elasticity values were measured using noninvasive methods at the forehead, back, and forearm. Findings: Skin temperature was significantly higher in the back and forehead regions in the patient group. No difference was found between the sebum values of the patient and control groups at the back and forehead. A significantly higher result was obtained for the forearm area. The pH was significantly lower in the patients' forearm, although the obtained values were within the normal range. The TEWL was significantly higher in patients in all three regions. In terms of flexibility, R2 was significantly higher in the back and forehead regions of the patient group, and the R6 was significantly higher in the patient group in all three regions. In addition, there was no correlation between skin parameter and SYNTAX score increase measurements. Conclusion: It can be suggested that skin sebum and TEWL measurements can be accepted as cheap and noninvasive methods of predicting CAD.

H. Ohshima, M. Kurosumi, H. Kanto, **New solution of beauty problem by *Staphylococcus hominis*: Relevance between skin microbiome and skin condition in healthy subject**, Skin Res Technol. 2021;00: p. 1–9

Background/aims: Recently, it was suggested that skin microbiome is related to some skin disease. The possibility of affecting the skin might be high, but there were few reports of the influence on the skin condition in healthy subjects. Our aim was to evaluate the relationship between skin condition and skin microbiome in healthy subjects. Methods: Experiment 1: 293 Japanese healthy women were divided into two groups, good skin properties and poor skin properties by 14 skin physiology parameter values on the cheek using noninvasive method. Differences of abundance of bacterial species on the cheek between the two groups were evaluated. Experiment 2: 11 Japanese healthy women were applied *Staphylococcus hominis* (*S. hominis*) on halfside of cheek for eight times in 1 month. Difference of change of physiology parameter values comparing to placebo side was evaluated. Results: Experiment 1: Multiple skin bacterial species were found to be significantly relevant in 14 physiology parameters. The abundance of *S. hominis* on the cheek with good skin properties group was significantly higher than poor skin properties group. Experiment 2: The application of *S. hominis* improved significantly the conspicuous pore number, melanin index, and the wrinkle count compared to placebo side. Conclusion: We found many skin bacterial species that might improve the skin condition in healthy women. In particular, *S. hominis* might have the potential to improve multiple skin beauty problems.

G.G. Hillebrand, P. Dimitriu, K. Malik, Y. Park, D. Qu, W.W. Mohn, R. Kong, **Temporal Variation of the Facial Skin Microbiome: A 2-Year Longitudinal Study in Healthy Adults**, Plast. Reconstr. Surg. 147: 50S, 2021

Background: The human skin microbiome is highly personalized, depending on, for example, body site, age, gender, and lifestyle factors. The temporal stability of an individual’s skin microbiome—its resiliency and robustness over months and years—is also a personalized feature of the microbiome. The authors measured the temporal stability of the facial skin microbiome in a large cohort of subjects. In addition to measuring microbiome dynamics, they tracked facial skin condition using noninvasive, objective imaging and biophysical measures to identify signifcant facial features associated with temporal changes in microbiome diversity and composition. Methods: The authors used 16S ribosomal RNA amplicon sequencing to track cheek and forehead skin microbiome diversity and composition annually over a 2-year period (2017–2019) in 115 healthy adult men and women. Skin metadata included facial features, such as wrinkles, hyperpigmentation, porphyrins, and skin color tone, as well as biophysical parameters for stratum corneum barrier function, pH, hydration, and elasticity. Results: Across the subject population, the facial skin microbiome composition and diversity were relatively stable, showing minor variation over the 2-year period. However, for some subjects, composition, diversity, and relative abundance of specifc organisms showed substantial changes from one year to the next, and these changes were associated with changes in stratum corneum barrier function and follicular porphyrins. Conclusions: For healthy people, facial skin microbiome diversity and composition are relatively stable from year to year. Tracking the temporal changes in the microbiome along with skin phenotypic changes allows for a deeper understanding of the skin microbiome’s role in health and disease. These results should be helpful in the design of longer-term intervention trials with microbiome-based skin care treatments.

C. Uhl, D. Khazaka, **Pomiar Rzeczywistego Wieku Skóry,** CHEMIA I BIZNES. 1/2021

Nagłówki w czasopismach i blogi coraz częściej ogłaszają, że „50 lat to nowe 30". Czy to faktycznie prawda? Czy osoby „po pięćdziesiątce" rzeczywiście są dziś bardziej sprawne fzycznie i umysłowo – i wyglądają młodziej – niż kiedyś?

T. Montero-Vilchez, M.-V. Segura-Fernández-Nogueras, I. Pérez-Rodríguez, M. Soler-Gongora, A. Martinez-Lopez, A. Fernández-González, A. Molina-Leyva, S. Arias-Santiago, **Skin Barrier Function in Psoriasis and Atopic Dermatitis: Transepidermal Water Loss and Temperature as Useful Tools to Assess Disease Severity**, J. Clin. Med. 2021, 10, 359

Multiple diagnostic tools are used to evaluate psoriasis and atopic dermatitis (AD) severity, but most of them are based on subjective components. Transepidermal water loss (TEWL) and temperature are skin barrier function parameters that can be objectively measured and could help clinicians to evaluate disease severity accurately. Thus, the aims of this study are: (1) to compare skin barrier function between healthy skin, psoriatic skin and AD skin; and (2) to assess if skin barrier function parameters could predict disease severity. A cross-sectional study was designed, and epidermal barrier function parameters were measured. The study included 314 participants: 157 healthy individuals, 92 psoriatic patients, and 65 atopic dermatitis patients. TEWL was significantly higher, while stratum corneum hydration (SCH) (8.71 vs. 38.43 vs. 44.39 Arbitrary Units (AU)) was lower at psoriatic plaques than at uninvolved psoriatic skin and healthy controls. Patients with both TEWL > 13.85 g·m-2h-1 and temperature > 30.85 ◦C presented a moderate/severe psoriasis (psoriasis area severity index (PASI) ≥ 7), with a specificity of 76.3%. TEWL (28.68 vs. 13.15 vs. 11.60 g·m-2 h-1) and temperature were significantly higher, while SCH (25.20 vs. 40.95 vs. 50.73 AU) was lower at AD eczematous lesions than uninvolved AD skin and healthy controls. Patients with a temperature > 31.75 ◦C presented a moderate/severe AD (SCORing Atopic Dermatitis (SCORAD) ≥ 37) with a sensitivity of 81.8%. In conclusion, temperature and TEWL values may help clinicians to determine disease severity and select patients who need intensive treatment.

W.Pangkanon, P. Yenbutra, N. Kamanamool, A. Tannirandorn, M. Udompataikul, **A comparison of the efficacy of silicone gel containing onion extract and aloe vera to silicone gel sheets to prevent postoperative hypertrophic scars and keloids**, J Cosmet Dermatol. 2021;20: p. 1146–1153

Background: Hypertrophic scars and keloids are postsurgery problems. Some studies showed that onion extract and aloe vera might be beneficial for postoperative scars. However, few of the randomized clinical trials were investigated. Aims: To compare the efficacy of silicone gel containing onion extract and aloe vera (SGOA) to silicone gel sheets (SGS) to prevent postoperative hypertrophic scars and keloids. Methods: The prospective randomized assessor-blind controlled trial was conducted with 40 patients who had undergone surgery. The patients were divided into two groups: one treated with SGOA, the other with SGS. The patients were evaluated after 1, 2, and 3 months. The objective assessment was to determine the incidences of scarring, erythema, and melanin values using Mexameter, and pliability through Cutometer. The subjective assessment consisted of the patient and observer scar assessment scale (POSAS) and patient satisfaction. Results: After the 12-week follow-up, there was no statistically significant difference in the scarring incidence rate of both groups. There were no statistical differences in the POSAS score, erythema, and melanin value between both groups. Using objective assessment, pliability in the SGOA group was statistically significantly higher compared to the SGS group. Pain and itchiness significantly decreased in both groups. No adverse effects were reported in either group. Conclusion: Silicone gel containing onion extract and aloe vera is effective as SGS for postoperative scar prevention.

J.N. Li, S.M. Henning, G. Thames, O. Bari, P.T. Tran, C.-H. Tseng, D. Heber, J. Kim, Z. Li, **Almond consumption increased UVB resistance in healthy Asian women**, J Cosmet Dermatol. 2021;20, p. 2975–2980

Background: Almonds are a rich source of phenolic and polyphenolic compounds, which have antioxidant activity. In vitro and in vivo studies have demonstrated that topical application of almond oil and almond skin extract reduces UVB-induced photoaging. Ultraviolet-B (UVB) protection by oral almond consumption has not been previously studied in humans. Objectives: To investigate whether oral almond consumption can increase resistance to UVB radiation and reduce skin aging in healthy Asian women. Methods: Thirty-nine female participants (18-45 years) with Fitzpatrick skin type II-IV were randomly assigned to consume either 1.5 oz of almonds or 1.8 oz of pretzels daily for 12 weeks. Minimal erythema dose (MED) was determined using a standardized protocol, which determined the minimal radiation needed to induce erythema on the inner arm following UVB exposure. Facial skin texture was evaluated by two dermatologists using the Clinician's Erythema Assessment scale and Allergan Roughness scale. Facial melanin index, hydration, sebum, and erythema were determined

using a cutometer. Results: The MED was increased in the subjects consuming almonds compared to the control group consuming pretzels. There were no differences noted between the groups consuming almonds versus pretzels in Allergan roughness, melanin, hydration, or sebum on facial skin. Conclusions: Our findings suggest that daily oral almond consumption may lead to enhanced protection from UV photodamage by increasing the MED.

M. Evans, E.D. Lewis, N. Zakaria, T. Pelipyagina, N. Guthrie, **A randomized, triple-blind, placebo-controlled, parallel study to evaluate the efficacy of a freshwater marine collagen on skin wrinkles and elasticity,** J Cosmet Dermatol. 2021;20: p. 825–834

Background: Collagen is the primary component in human skin. With age, there is loss of skin elasticity and collagen, resulting in wrinkle formation and reduction in skin appearance. Aims: The objective of this randomized, triple-blind, placebo-controlled study was to evaluate the safety and efficacy of a hydrolyzed marine collagen (Vinh Wellness Collagen, VWC) on aspects of skin health and quality in women between 45 and 60 years of age. Patients/Methods: Assessments of skin wrinkles, elasticity, and self-reported appearance were conducted using the VISIA skin analysis system, Cutometer®, and Skin Quality Visual Analogue Scale. Outcomes were assessed at weeks 0 (baseline), 6, and 12. Results: After 12 weeks, participants supplemented with VWC had a significant 35% reduction in wrinkle score ($P = .035$) from baseline. Participants in the VWC group showed a 24% greater reduction in wrinkles on the right side of the face than those on placebo. A planned subgroup analysis based on age showed women 45-54 years had a significant 20% and 10% improvement in cheek skin elasticity from baseline to week 6 ($P = .016$) and 12 ($P = .022$), respectively. At week 12, participants in the VWC group reported greater percentage improvements in overall skin score (9%) and wrinkle (15%), elasticity (23%), hydration (14%), radiance (22%), and firmness (25%) scores vs placebo. Conclusion: Supplementation with VWC was found to be safe and well-tolerated. The results of this study support the use of fish-derived hydrolyzed collagen for the improvement of skin health in an aging population.

A.S.M. Wurm, **Hautelastizität und Hautperfusion nach Gesichtsverjüngung mittels Erbium-Yag-Laser**, Dissertation an der Klinik für Hand-, Plastische-, Rekonstruktive und Verbrennungschirurgie, Universität Tübingen, Germany, 2021

Angesichts der Zunahme der durchschnittlichen Lebenserwartung wächst die alternde Bevölkerung rasant. Obwohl die Haut nur etwa 8% der gesamten Körpermaße ausmacht, ist sie der deutlichste Indikator des Alterns. Im Gesicht ist der Prozess durch die Entstehung feiner Falten und einer Abnahme der Elastizität durch Abnahme und Umverteilung der Muskelmasse sowie des Weichteilgewebes erkennbar (Donofrio, 2000). Skin Resurfacing entwickelt sich zu einem immer beliebteren Verfahren, um temporär den Prozess des Alterns zu verzögern. Unter dem Begriff Skin Resurfacing versteht man eine allgemeine Verbesserung des Hautbildes durch Straffung der Haut, Verkleinerung der Poren, Aufhellung von Pigmentierung sowie einer Minderung von kleinen Falten. Mithilfe dieser Maßnahmen erzielt man eine optische Hautverjüngung (Jasin, 2002).

Y.J. Tak, D.K. Shin, A.H. Kim, J.I. Kim, Y.L. Lee, H.-C. Ko, Y.-W. Kim, S.Y. Lee, **Effect of Collagen Tripeptide and Adjusting for Climate Change on Skin Hydration in Middle-Aged Women: A Randomized, Double-Blind, Placebo-Controlled Trial**, Frontiers in Medicine, January 2021, Volume 7

Introduction: Although collagen is widely used in various forms as a functional ingredient in skin care products, the effect of oral supplementation of collagen tripeptides (CTPs) on human skin is unclear. Moreover, the majority of the positive outcomes of CTP reported so far have not considered the effect of weather conditions. Therefore, we tested the effect of CTP and adjusting for climate change on skin properties in middle-aged women.Materials and Methods: A randomized controlled trial was conducted with 84 women between 40 and 60 years of age. Participants were randomized to receive placebo or 1,000 mg CTP daily for 12 weeks. CTP was prepared from the skin of Nile Tilapia by the digestion method using collagenase from non-pathogenic bacteria of the genus Bacillus. Skin hydration, wrinkling, and elasticity were assessed at baseline and after 6 and 12 weeks with adjustments for temperature, humidity, and ultraviolet A exposure during the evaluation time using weather data from the regional meteorological office. Results: Of the 82 participants, 74 completed the trial without adverse effects. Compared with the control group, trans-epidermal water loss was reduced more in the CTP group after 12 weeks ($P < 0.05$). At 12 weeks, even after adjustment for humidity, temperature, and UVA in the region, the difference of the two groups in TEWL remained statistically significant (adjusted for humidity and temperature, $P = 0.024$; adjusted for UVA, $P = 0.032$; adjusted for temperature, high temperature, and ultraviolet A, $P = 0.031$). In terms of skin hydration, more improvement was evident in the CTP group than in the control group. In the subgroup analysis, subjects under 50 years of age showed a significant improvement in total score and moisture in the subjective skin improvement

questionnaire after taking CTP for 12 weeks. Application of CTP was well-tolerated, and no notable adverse effect was reported from both groups. Discussion: Our findings suggest that oral ingestion of CTP from the Skin of Nile Tilapia (Oreochromis niloticus) is well-tolerated and helps reduce water loss in in middle-aged women.

J. Lee, E.T. Jeong, J.-M. Lim, S.G. Park, **Development of the facial glycation imaging system for in situ human face skin glycation index measurement**, J Cosmet Dermatol. 2021;20: p. 2963–2968

Background: The accumulation of advanced glycation end products has been proposed as a causative agent of skin aging, but there are no conventional devices for quantifying advanced glycation end-product accumulation in facial skin. Aims: This study aimed to develop a convenient and accurate in situ advanced glycation end-product measurement system for the human face. Methods: We developed a facial glycation imaging system, which consisted of illumination (white light-emitting diode, ultraviolet light-emitting diode) and image acquisition modules to capture face images. Advanced glycation end product–related autofluorescence and total skin reflectance were calculated to obtain the skin glycation index using an image analysis algorithm. Correlations between the skin glycation index and facial skin elasticity and age were examined in 36 healthy Korean women. Results: The facial glycation imaging system was validated against a volar forearm skin autofluorescence measurement device, that is, the AGE Reader mu, with forearm skin glycation index ($R = 0.64$, $P < .01$). Cheek elasticity was negatively correlated with cheek skin glycation index ($R = -0.56$, $R = -0.57$, and $R = -0.61$, $P < .01$ for R2, R5, and R7, respectively). Age was significantly correlated with forearm skin glycation index ($R = 0.44$, $P < .01$) and cheek skin glycation index ($R = 0.48$, $P < .01$). Conclusion: We successfully developed a novel in situ facial skin glycation index measurement device. Our convenient and accurate system enables in situ skin glycation index monitoring for skin aging studies such as those on anti-glycation cosmetics.

C.H. Lee, E.M. Jin, H.S. Seo, T.-U. Ryu, S.P. Hong, **Efficacy and Safety of Treatment with Fractional 1,064-nm Picosecond Laser with Diffractive Optic Element for Wrinkles and Acne Scars: A Clinical Study**, Ann Dermatol 33(3), p. 254-262, 2021

Fractional picosecond lasers is effective for the treatment of wrinkles or acne scars. Objective: To investigate the safety and efficacy of treatment with a fractional 1,064-nm picosecond laser with a diffractive optic element for facial wrinkles and acne scars. Methods: This prospective open-labeled trial comprised 22 subjects with facial wrinkles or acne scars. Subjects received three laser treatments with a fractional 1,064-nm picosecond laser at 3-week intervals. The efficacy and safety were evaluated at every visit and 2 months after the final treatment (14 weeks from the first treatment session). Global photographic assessments were performed by three blinded dermatologists and the subjects. Skin profilometry was performed using three-dimensional digital photographs; viscoelasticity was measured. Results: The overall mean global improvement scores assessed by the dermatologists at weeks 3, 6, and 14, were 1.8±1.46, 2.5±1.88, and 3.5±1.84, respectively, and those assessed by the subjects were 2.7±2.08, 4.1±2.24, and 5.0±2.52, respectively. Skin profilometry showed significant improvements in the skin wrinkles, texture, depressions, and pores. The gross elasticity and skin firmness significantly improved by 10.96% and 9.04%, respectively. The major adverse reactions were erythema, pruritus, and petechiae, which disappeared within 2~3 days. Conclusion: The fractional 1,064-nm picosecond laser is an effective and safe therapeutic modality for skin rejuvenation.

M. de Tollenaere, E. Chapuis, L. Lapierre, M. Bracq, J. Hubert, C. Lambert, J. Sandré, D. Auriol, A. Scandolera, R. Reynaud, **Overall renewal of skin lipids with Vetiver extract for a complete anti-ageing strategy**, International Journal of Cosmetic Science, 2021, 43, p. 165–180

Objective: Skin lipids are essential in every compartment of theskin where they play a key role in various biological functions. Interestingly, their role is central in the maintenance of hydration which is related to skin barrier function and in the skin structure through adipose tissue. It is well described today that skin lipids are affected by ageing giving skin sagging, wrinkles and dryness. Thereby, developing cosmetic actives able to reactivate skin lipids would be an efficient ant-ageing strategy. Due to the strong commitment of our scientists to innovate responsibly and create value, they designed a high value active ingredient named here as Vetiver extract, using a ground-breaking upcycling approach. We evidenced that this unique extract was able to reactivate globally the skin lipids production, bringing skin hydration and plumping effect for mature skin. Method: In order to demonstrate the global renewal of lipids, weevaluated the lipids synthesis on cutaneous cells that produce lipids such as keratinocytes, sebocytes and adipocytes then on Reconstructed Human Epidermis and skin explants. We evaluated the expression of proteins involved in ceramides transport and barrier cornification. We then evaluated hydration and sebaceous parameters on a panel of mature volunteers. Results: We firstly demonstrated that Vetiver extract induced sebum production from human sebocytes cells lines but also improved its

quality as observed by the production of specific antimicrobial lipids. Secondly, we demonstrated that Vetiver extract was able to restore skin barrier with the increase of skin lipids neosynthesis on Reconstructed Human Epidermis and skin explants. We also evidenced that Vetiver extract stimulated the lipids transport and epidermal cornification. Finally, Vetiver extract showed a significant effect on adipogenesis and maturation of adipocytes at in vitro and ex vivo models. We confirmed all these activities by showing that Vetiver extract improved sebum production and brought hydration through an increase of lipids content and their conformation. Vetiver extract induced an improvement of skin fatigue and a plumping effect by acting deeply on adipose tissue. Conclusion: In conclusion, we developed an active ingredient able to bring anti-ageing effect for mature skin by a global increase of skin lipids.

S. Anggraeni, M. Ayu Umborowati, D. Damayanti, A. Endaryanto, C.R. Sigit Prakoeswa, **Role of *Centella asiatica* and ceramide in skin barrier improvement: a double blind clinical trial of Indonesian batik workers**, Journal of Basic and Clinical Physiology and Pharmacology, 2020

Objectives: Batik dyes contain irritant chemicals that increase the risk of skin barrier disruption. This study aims to determine the effect of *Centella asiatica* and ceramide in transepidermal water loss (TEWL), hydration of the stratum corneum and skin acidity (pH). Methods: This was a double blind clinical trial of 30 Indonesian batik workers who suffered from skin dryness, but had no clinical manifestation of contact dermatitis. Subjects were given cream containing *C. asiatica* or ceramide that formulated and randomly labeled by manufacturer (PT Paragon Technology and Innovation). Both subjects and researchers were blinded to the type of the cream. Cream was applied to the hands and arms twice a day. Biological function of the skin (TEWL, stratum corneum hydration level, and skin acidity) was examined by Cutometer dual MP-580. Baseline was recorded in the first examination, followed by second and third examinations at two and four weeks after treatment. Results: After four weeks treatment, there were significant improvement of *C. asiatica* application in evaluation of corneometer palmar (p=0.007; CI 95%), corneometer dorsum (p=0.001; CI 95%), and skin acidity dorsum (p=0.017; CI 95%). Ceramide application also gave significant improvement of corneometer palmar (0.038; CI 95%), skin acidity palmar (p=0.001; CI 95%), TEWL dorsum (p=0.023; CI 95%), corneometer dorsum (p=0.002; CI 95%) and skin acidity dorsum (p=0.011; CI 95%). There were no significant differences of *C. asiatica* effectiveness compared to ceramide in skin barrier improvement. Conclusions: *C. asiatica* and ceramide can improve skin barrier hydration in order to prevent the risk of contact dermatitis in batik workers.

M. Majeed, S. Majeed, R. Jain, L. Mundkur, H.R. Rajalakshmi, P. Subhash Lad, P. Neupane, **An Open-Label Single-Arm, Monocentric Study Assessing the Efficacy and Safety of Natural Pterostilbene (*Pterocarpus marsupium*) for Skin Brightening and Antiaging Effects**, Clinical, Cosmetic and Investigational Dermatology 2020:13, p. 105–116

Background: Both intrinsic and environmental factors play a role in premature ageing of the skin. Natural extracts have been extensively used to reduce the signs of ageing in recent years. Pterostilbene is a natural analog of resveratrol with therapeutic properties against numerous diseases mainly due to its ability to reduce reactive oxygen species. Methods: We studied the anti-aging and skin brightening effect of a 0.4% formulation of natural pterostilbene in healthy volunteers (N=38) in an open-label, single-arm, monocentricstudy for 8 weeks. The melanogenesis inhibitory, anti-tyrosinase and anti-collagenase and anti-elastase properties of pterostilbene were evaluated in vitro. Results: Natural pterostilbene showed significant inhibition of melanogenesis in vitro. Pterostilbene cream (0.4%) was highly effective in reducing markers of aging and induces even skin tone. The product was effective in reducing wrinkles and fine lines, improved skin hydration elasticity and showed no adverse effects. Conclusion: Our results suggest that natural pterostilbene is a safe and effective ingredient for use in cosmetic preparation to reduce the markers of skin ageing and brighten the skin tone.

I.B.S. Sitohang, S. Ninditya, **Systemic Glutathione as a Skin-Whitening Agent in Adult**, Hindawi Dermatology Research and Practice Volume 2020

Objectives. To compare the efficacy and safety profiles of systemic glutathione as a skin-whitening agent in adults from several randomized controlled trials (RCTs). Methods. *is study is an evidence-based case report with literature search conducted on Clinical Key, Cochrane, Journal of the American Academy of Dermatology, Taylor and Francis Online, ScienceDirect, and PubMed databases. *ree relevant RCTs were extracted and assessed for validity, importance, and applicability. Results. From 3 included trials, one of the studies opposed glutathione as a skin-whitening agent. However, the other two showed significant results only to some parts of the body or to certain age groups. As a skin-whitening agent, studies showed that glutathione yielded other cosmetic benefits as it may improve skin elasticity and reduce skin wrinkles. Furthermore, glutathione was well tolerated in oral preparations, but not in parenteral preparations. Conclusions. Highestevidence literatures showed that glutathione is not

beneficial enough as a skin-whitening agent as it was only effective in some parts of the body and did not elicit long-lasting effects. However, its safety profiles in oral preparations were well tolerated. More researches regarding the time needed for skin color to return to its original state following drug withdrawal need to be conducted as it is yet to be discovered.

M. Streker, M. S. Thill, M. Kerscher, **Einfluss oraler Kollagen-Peptide auf die Hautqualität am ganzen Körper**, Akt Dermatol 2020; 46: 87–93

Die Hautalterung ist ein komplexer Prozess, der sowohl extrinsischen als auch intrinsischen Einflüssen unterliegt. Neben sichtbaren Zeichen wie Falten und einem Verlust an Elastizität spielen sich insbesondere in der Dermis molekulare Veränderungen ab. Ein wesentlicher Faktor ist die Minderung der Qualität und Quantität von kollagenen Fasern sowie weiteren extrazellulären Matrixbestandteilen. Bereits in früheren In-vivo-Human-Studien wurde eine Verbesserung der Hautqualität im Gesicht durch die orale Supplementierung mit Kollagenpeptiden nachgewiesen. Es konnte mittels objektiver, validierter dermatologischer Mess methoden bestätigt werden, dass die orale Aufnahme von speziellen Kollagen-Peptiden über einen längeren Zeitraum die Hautphysiologie (Lipidgehalt der Hautoberfläche, Stratum-corneum-Hydratation, Hautelastizität, Hautglätte und Hautdichte) positiv beeinflusst. In der vorliegenden 12-wö- chigen Studie wurden die positiven Effekte eines Nutraceuticals mit bioaktiven Kollagen-Peptiden (ELASTEN®) auf die Hautqualität erstmals am gesamten Körper (Gesicht, Dekolleté, Arm und Oberschenkel) untersucht.

J. Manosroi, C. Chankhampan, W. Kitdamrongtham, J. Zhang, M. Abe, T. Akihisa, W. Manosroi, *A. Manosroi,* **In vivo anti-ageing activity of cream containing niosomes loaded with purple glutinous rice (Oryza sativa Linn.) extract**, Int J Cosmet Sci, 2020 Dec;42(6): p. 622-631

Objective: To evaluate the anti-ageing activity of cream containing the methanolic purple glutinous rice extract loaded in niosomes. Methods: The in vitro biological activities of the purple glutinous rice extracted by methanol maceration were determined. The extract loaded in niosomes and the cream containing the niosomes were developed. The in vivo anti-ageing activity in 20 human volunteers including skin hydration, pigmentation, roughness and elasticity after daily application for 28 days compared to at initial was evaluated by Corneometer, Mexameter, Visiometer and Cutometer, respectively. Results: The purple glutinous rice extract showed free radical scavenging (SC), lipid peroxidation inhibition (IPC), metal ion chelating (CC) and tyrosinase inhibition (IC) values at 32.31 ± 1.28, 57.40 ± 2.12, 85.05 ± 5.43 and 43.89 ± 2.14 mg/mL which were 0.00031, 0.011, 0.0078 and 0.0016 times of the standards (0.01 ± 0.00, 0.62 ± 0.14, 0.66 ± 0.05 and 0.07 ± 0.01), respectively. The purple glutinous rice extract contained 0.35 µg of anthocyanin/1 mg of the extract determined by HPLC. After loaded in niosomes, the solubility of the extract was not only increased in various solvents, but also the chemical stability in different environments (weak base, reducing agent and acid salt) was improved. The cream formulation containing niosomes loaded with 1%w/v of the purple glutinous rice extract indicated the anthocyanin remaining percentages after 6 cycles of heating and cooling test at 52.28% of the initial. For in vivo anti-ageing activities, cream containing niosomes loaded with the extract gave significant decreased melanin index and skin roughness reduction of -14.05 and -9.95% of the initial, respectively. The % changes of the increased skin hydration, skin elastic extension and skin elastic recovery when applied on human volunteers' skin with this formulation were +48.73, -24.51 and +35.98%, respectively. Conclusion: The cream containing niosomes loaded with the 1%w/v methanolic purple glutinous rice extract gave not only the suitable in vitro antioxidant activity and physical stability of the active anthocyanin, but also the superior in vivo anti-ageing activity on human skin compared to the cream base and before application which can be further developed as a novel anti-ageing cosmeceutical product.

M.E.H. Jaspers, P. Moortgat, **Objective Assessment Tools: Physical Parameters in Scar Assessment**, in L. Téot et al. (eds.), Textbook on Scar Management, 2020

Several types of problematic scars can be identifed: hypertrophic scars, keloids, contractures, and adherent scars. All these scars require specialized treatment. However, the need for innovation and novel treatment is paramount to further reduce the burden of these scars and to ultimately attain scarless healing.

T. Yazdanparast, K. Yazdani, S.A. Nasrollahi, M. Nazari, R. Darooei, A. Firooz, **Differentiation of inflammatory papulosquamous skin diseases based on skin biophysical and ultrasonographic properties: A decision tree mode**l, Indian J Dermatol Venereol Leprol. 2020 Nov-Dec;86(6):752

Background: The biophysical and ultrasonographic properties of the skin change in papulosquamous diseases. Aims: To identify biophysical and ultrasonographic properties for the differentiation of five main groups of papulosquamous skin diseases. Methods: Fifteen biophysical and

ultrasonographic parameters were measured by multiprobe adapter system and high-frequency ultrasonography in active lesions and normal control skin in patients with chronic eczema, psoriasis, lichen planus, pityriasis rosea and parapsoriasis/mycosis fungoides. Using histological diagnosis as a gold standard, a decision tree analysis was performed based on the mean percentage changes of these parameters [(lesion-control/control) ×100] for differentiation of the diseases. Results: The accuracy of the decision tree model for differentiation of five diseases was 67% which developed based on changes in stratum corneum hydration, epidermal thickness, skin pH, melanin index, R0 (reciprocal of firmness) and erythema. Among the flowcharts for pairs of diseases, three models for differentiation had high accuracy (> 95%): those of psoriasis from lichen planus, pityriasis rosea, and parapsoriasis/mycosis fungoides. Limitations: Validation studies on a larger sample size in situations where the diagnosis is unclear are needed to confirm the accuracy and applicability of decision trees. Conclusion: Skin biophysical and ultrasonographic properties may help in the differentiation of papulosquamous diseases as simple and non-invasive tools.

D.J. Son, J.C. Jung, Y.M. Choi, H.Y. Ryu, S. Lee, B.A. Davis, **Wheat Extract Oil (WEO) Attenuates UVB-Induced Photoaging via Collagen Synthesis in Human Keratinocytes and Hairless Mice**, Nutrients 2020, 12, 300

The efficacy of wheat extract oil (WEO), standardized to glucosylceramides, for protectingagainst ultraviolet B (UVB)-induced damage of skin barrier function was assessed using the SHK-1 hairless mouse model and two human skin cell lines, namely, CCD-986sk and HeCaT. The ability of repeated oral administration of 30, 60, and 120 mg of WEO/kg/day for 12 weeks to prevent skin damage of SKH-1 hairless mice induced by UVB irradiation was evaluated. The results demonstrated that UVB-induced water evaporation (transepidermal water loss, TEWL) was significantly decreased by WEO. Similarly, UVB-induced losses in moisture and skin elasticity were improved by WEO supplementation. WEO attenuated the tissue procollagen type I, hyaluronic acid (HA), and ceramide reductions induced by UVB treatment as well. Collagen concentrations in skin tissue were increased in the WEO-treated mice, while UVB-induced epidermal thickening was reduced. In vitro studies using HeCaT human keratinocytes confirmed increased HA and collagen synthesis in response to WEO treatment. This may occur via WEO suppression of matrix metallopeptidase-1 (MMP-1), since its induction by UVB treatment was diminished in treated CCD- 986sk cells. Oral administration of WEO improves skin barrier function in UVB-irradiated mice by attenuating damage typically observed in photoaging. This research further clarifies the clinical benefits previously observed by dietary WEO consumption.

L.M. Rodrigues, J.W. Fluhr, **EEMCO Guidance for the in vivo Assessment of Biomechanical Properties of the Human Skin and Its Annexes: Revisiting Instrumentation and Test Modes**, Skin Pharmacol Physiol 2020;33:44–59

Biomechanics of the skin is an important subject in skin research. It has been studied for many decades involving various technologies and methods to characterize and quantify mechanical properties of the skin under different in vivo conditions. The present EEMCO paper reviews the current relevant information, providing practical orientation to researchers dedicated to in vivo assessment of biomechanics of skin and its annexes. We discuss the available noninvasive instruments, including their principles and variables. A correspondence between the descriptors nomenclature proposed by Agache and the designation for the suction-based standard instruments is proposed. The addressed properties include skin softness/stiffness, firmness, elasticity, elastic and viscoelastic properties, extensibility, resilience, anisotropy, acoustical shock wave hardness, friction (in relation to topographic properties), thickness, fiber/stress-mechanics (bending, cyclic, tensile, fatigue, or torsion), and hardness. We provide the relation of these properties to biomechanical descriptors and in some cases to SI units. Practical guidance for the proper use of these instruments, limitations, and possible interpretations are provided, while discussing the meaning of descriptive or “phenomenological” variables. For studies intended to quantify the effect of an intervention with regard to mechanical properties, we recommend a minimum of 30–40 participants, based on normal distribution of the data sets. Some important limitations are recognized, including the lack of standardization of procedures and calibration of instruments, which compromises the relevance and real nature of the descriptors/parameters obtained with these devices. The present work highlights an approach to a better practice and a sciencesupported biomechanical assessment of human skin, hair, and nails.

M. Karlsson, M. Elmasry, I. Steinvall, F. Sjöberg, P. Olofsson, **Scarring at Donor Sites after Split-Thickness Skin Graft: A Prospective, Longitudinal, Randomized Trial**, ADV Skin Wound Care 2020; 33: p. 1–5.

Objective: To investigate if previous findings on the association between dressing treatments and subjective opinion on final donor site scar outcome using the Patient and Observer Scar Assessment Scale (POSAS) can be confirmed objectively. The previous study showed that patients dressed with hydrofiber covered with film were more satisfied with their donor site scars than patients receiving porcine xenograft or polyurethane foam dressings. Methods: Scar outcome measurements were assessed by a blinded observer using POSAS and the Cutometer dual MPA 580 device to measure the viscoelasticity of skin. Results: A total of 17 participants were included in this study, five of whom were treated with hydrofiber, six with polyurethane foam, and another six with porcine xenograft. There were no significant differences among groups in any of the POSAS items or in the viscoelasticity measurements made with the Cutometer. Conclusions: The investigators could not confirm previous associations between dressing treatment and long-term donor site scars. No associations between donor sites' healing times and final scarring were found. Hypopigmentation was reported in 15 of 17 donor sites evaluated.

T. Mosquera, S. Peña, P. Álvarez, P. Noriega, **Changes in Skin Elasticity and Firmness Caused by Cosmetic Formulas Elaborated with Essential Oils of Aristeguietia glutinosa (matico) and Ocotea quixos (ishpingo). A Statistical Analysis**, Cosmetics 2020, 7, 95, December 2020

External factors such as prolonged exposure to solar radiation and environmental pollution accelerate the aging process of the skin, and this process is a challenge for pharmacological science. To counteract the effects of skin photoaging, the cosmetic industry has introduced natural topical products that have proved to be effective in reducing signs of age. In this sense, a statistical analysis was conducted on the changes in the properties of firmness and elasticity of the skin caused by cosmetic formulas (lotion and cream) elaborated with essential oils of Aristeguietia glutinosa (matico) and Ocotea quixos (ishpingo) in which the concentration of the oils in two cosmetic products (lotion and cream) varied to be tested in vivo, through the measurement of elasticity and firmness in three times T1 (0 day), T2 (28 days) and T3 (56 days), and in two age groups according to the Glogau scale (30 to 40 and 41 to 50 years). The results showed positive changes in the values of elasticity and firmness of the skin in the presentation of the lotion whose concentration was 20% Aristeguietia glutinosa (matico) and 80% Ocotea quixos (ishpingo), with a minimum application time of 28 days.

L. Gao, H. Kang, Y. Li, M. Lu, W. Song, Y. Wang, K. Li, L. Wang, G. Wang, **Clinical Efficacy and Safety of 3DEEP Multisource Radiofrequency Therapy Combined with Fractional Skin Resurfacing for Periocular Skin Aging**, J Clin Aesthet Dermatol. 2020;13(3): p. 41–44

Background: The early signs of skin aging usually occur in the periocular region. Objectives: This retrospective analysis evaluated the efcacy and safety profle of a multisource 3DEEP radiofrequency (RF) technology (EndyMed, Caesarea, Israel) in combination with fractional skin resurfacing (FSR) for the treatment of periocular skin aging. Methods: A total of 15 patients with periocular aging underwent monthly treatment sessions of 3DEEP and FSR for three months. Sessions were administered at the Department of Dermatology at Xijing Hospital in Xi'an, China. Indices of skin moisture level, transepidermal water loss (TEWL), skin elasticity, wrinkles, pore size, and skin texture were determined before and after treatment using the Visia® (Canfeld Imaging Systems, New Jersey), Multiprobe Adapter (CK, Cologne, Germany) and Antera3D® (Miravex, Dublin, Ireland) systems. Results: Skin moisture level, elasticity, wrinkles, pore size, and texture improved relative to baseline ($p<0.01$). There was no signifcant difference in TEWL before and after the treatments ($p>0.05$). Patient satisfaction was 86.67 percent. Patients experienced varying degrees of transient edema, erythema, scabbing, and occasional hyperpigmentation; all adverse effects resolved within 2 to 10 days post-treatment. Conclusion: ENDYMED 3DEEP in combination with FSR appears to be safe and effective in treating periocular skin aging. Randomized controlled trials with a larger patient group are needed to confrm our fndings.

T. Yazdanparast, K. Yazdani, S.A. Nasrollahi, L. Izadi Firouzabadi, P. Humbert, A. Khatami, M. Kassir, A. Firooz, **Biophysical and ultrasonographic changes in early patch/plaque stage of mycosis fungoides, compared with uninvolved skin,** Skin Research & Technology, Volume 26, Issue 6, November 2020, p. 859-866

Background: The goal of this study was evaluation of the skin biophysical properties in early patch/plaque stage of mycosis fungoides (MF) and its comparison with uninvolved skin in order to gain a better understanding of the pathogenesis of diseases. Materials and Methods: The stratum corneum hydration, transepidermal water loss (TEWL), surface friction, pH, sebum, melanin, erythema, temperature, elasticity parameters (R0, R2, R5), thickness, and echo density of epidermis and dermis were measured on lesions of 21 patients and compared with controls (average measures of uninvolved perilesional and symmetrical skins) by paired sample *t* test. Results: Stratum corneum hydration ($P <$

0.001) and echo density of dermis ($P = 0.044$) were significantly lower, whereas pH (P-value = 0.007), erythema ($P < 0.001$), and melanin content ($P = 0.007$) were significantly higher in lesions. There was not any significant difference in TEWL, friction index, sebum, temperature, R0, R2, R5, thickness of epidermis and dermis, and echo density of epidermis between lesions and normal skin. Conclusion: Parapsoriasis/MF lesions are specified by a set of certain changes in biophysical properties which are mainly correlated with histological changes. These sets of alterations may help in noninvasive, early diagnosis of parapsoriasis/MF.

E. Sofrona, L.-A. Tziveleka, M. Harizani, P. Koroli, I. Sfiniadakis, V. Roussis, M. Rallis, E. Ioannou, **In Vivo Evaluation of the Wound Healing Activity of Extracts and Bioactive Constituents of the Marine Isopod Ceratothoa oestroides**, Mar. Drugs 2020, 18, 219

Wound healing is a fundamental response to tissue injury and a number of natural products has been found to accelerate the healing process. Herein, we report the preparation of a series of different polarity (organic and aqueous) extracts of the marine isopod Ceratothoa oestroides and the in vivo evaluation of their wound healing activity after topical administration of ointments incorporating the various extracts on wounds inflicted on SKH-hr1 hairless mice. The most active extract was fractionated for enrichment in the bioactive constituents and the fractions were further evaluated for their wound healing activity, while their chemical profiles were analyzed. Wound healing was evaluated by clinical assessment, photo-documentation, histopathological analysis and measurement of biophysical skin parameters, such as transepidermal water loss (TEWL), hydration, elasticity, and skin thickness. The highest levels of activity were exerted by treatment of the wounds with a fraction rich in eicosapentaenoic acid (EPA), as well as myristic and palmitoleic acids. Topical application of the bioactive fraction on the wounds of mice resulted in complete wound closure with a skin of almost normal architecture without any inflammatory elements.

A.M. Marchena, L. Franco, A.M. Romero, C. Barriga, A.B. Rodríguez, **Lycopene and Melatonin: Antioxidant Compounds in Cosmetic Formulations**, Skin Pharmacol Physiol, 2020;33(5): p. 237-243

Background: The use of antioxidants has become a common practice in the development of antiaging cosmetics. Objective: The aim of this study was to evaluate the clinical efficacy of cosmetic formulations containing lycopene and melatonin antioxidants. Method: Thirty-six healthy women from 32 to 65 years were enrolled in this study. The study was carried out for 10 weeks, 2 preconditioning weeks with a control cream without antioxidants, and 8-week test with creams containing antioxidants in study. A multifunctional skin physiology monitor (Courage & Khazaka electronic GmbH®, Germany) was used to measure skin sebum content, hydration, elasticity, erythema index, and melanin index in 4 different regions of the face. Results: There were significant differences between them.

K. Li, F. Nicoli, C, Cui, W.J. Xi, A. Al-Mousawi, Z. Zhang, A. Balzani, L. Neill, R. Sorge, Y. Tong, Y. Zhang, **Treatment of hypertrophic scars and keloids using an intralesional 1470 nm bare-fbre diode laser: a novel efcient minimally-invasive technique**, Scientifc Reports, (2020) 10:21694

Hypertrophic and keloid scars result from abnormal wound healing and can have a variable response to a number of available treatment modalities. The evolution of laser treatments in recent years has shown a wide range of clinical applications including their use in the treatment of scars. We investigated the efectiveness of a 1470 nm diode laser using an intralesional optical fbre deliverydevice in the treatment of hypertrophic and keloid scars. We evaluated its safety and efcacy as a novel and minimally invasive treatment alternative for scar modulation and volume reduction. A prospective cohort study was performed involving 21 patients with hypertrophic scars (HS) (n = 9) and keloids (n = 12) resulting from various aetiology. Patients were treated with one to three treatment sessions. Comprehensive evaluations were performed using the Vancouver Scar Scale, Doppler ultrasound, Cutometer, Mexameter and PeriCam PSI. Scar thickness was reduced by an average of 0.308 ± 0.138 cm ($p < 0.001$). In particular the two subgroups showed a signifcant 27.7% and 28.2% reduction in scar thickness of HS and Keloids, respectively. Scar frmness showed a signifcant improvement of 1.2% ($p < 0.05$) for HS, though for keloids this was 0.4% ($p = 0.26$). Keloids had a signifcant reduction in pigmentation at 21.3%. Blood perfusion had a signifcant reduction of 29.6% in HS and 22.7% in Keloids. Overall VSS total score improvement of 42% in the HS and at 37.9% in the Keloid subgroup. No adverse events such as hypo/hyperpigmentation, skin infection, or recurrence were reported. This study shows that the intralesional 1470 nm bare-fbre diode laser signifcantly improved hypertrophic and keloid scars based on both subjective and objective analyses and supportsthis type of laser therapy as a safe and efective minimally-invasive treatment option.

B. Walzel, T. Shah, B. Senti, U. Batz, S. Bänziger, **Natural matrikine-like peptides for skin rejuvenation**, PERSONAL CARE ASIA PACIFIC, September 2020

A person's perceived age is determined by physical traits on face and neck. These traits mostly reflect the integrity of the extracellular matrix, which provides structure, homogeneity and elasticity to skin. Matrikines are dermal messenger peptides that instruct skin cells to reorganise and build up the extracellular matrix. So far, synthetic matrikines have been used in cosmetics. Now, for the first time, Lipoid-Kosmetik AG investigated and isolated natural matrikines-like peptides from cedar nuts and presents them in a novel anti-ageing concentrate: PhytoCodine®. Here we show that plant-derived, matrikine-like peptides mimic the activity of matrikines that naturally occur in our skin. Plant-derived, matrikine-like peptides activate the formation of extracellular matrix components, optimise skin structure, and improve age-related properties of mature skin, such as elasticity, density, wrinkles and sagging. Altogether, PhytoCodine® is the first concentrate of plant-derived, natural matrikine-like peptides. It reprograms fibroblasts to build up extracellular matrix components characteristic of younger looking skin and thereby directly contributes to a person's perceived age.

M.M. Constantin, S. Bucur, E.D. Serban, R. Olteanu, O.G. Bratu, T. Constantin, **Measurement of skin viscoelasticity: A non-invasive approach in allergic contact dermatitis,** Experimental and Therapeutic Medicine 20: 184, 2020

Non-invasive bioengineering technologies are constantly being developed, as they can provide useful insights and contribute to the improvement of medical care and scientifc education. The purpose of this study was to assess skin viscoelasticity using the suction chamber method in patients with allergic contact dermatitis vs. healthy subjects, before and after applying a moisturizer safety testing cream. This was a prospective controlled study over a 3-year period (March 2016-March 2019), with 81 subjects being divided in two balanced groups: Patients with allergic contact dermatitis and healthy subjects, respectively. The skin viscoelasticity was determined for all subjects with Cutometer®, using the suction method, by performing a dynamic assessment of parameters before and after applying a moisturizing cream. The results indicate a decrease in the elasticity parameters in both groups, indicating an improvement of the elastic proper- ties under the treatment. Skin capacity to return to its previous form after the deformation, i.e., pure elasticity and biological elasticity, showed overall elevated values in the group with contact dermatitis, demonstrating the effcacy of the emollient cream after applying it for 28 days (increase by 11.7 and 4.9% respectively, compared with baseline, when patients had dry, untreated skin). However, in healthy subjects, these param- eters do not achieve important values, but they remain rather stable over time with a very slight improvement (6.6% after 28 days). The Cutometer is an easy to use, effcient and widely used instrument for measurements in studies that perform a quantitative assessment of the effectiveness of different formu- lations intended for application on the skin.

W. Kawałkiewicz, M. Matthews-Kozanecka, M. Janus-Kubiak, L. Kubisz, D. Hojan-Jezierska, **Instrumental diagnosis of facial skin - a necessity or a pre-treatment recommendation: in aesthetic medicine**, J Cosmet Dermatol, Jul 2020

This paper presents the possibilities of pre-treatment instrumental diagnosis for assessing the condition of various facial skin areas. Tests which aimed at determining the firmness and elasticity of facial skin were conducted. Analysis of skin parameters in selected facial areas in adults over a wide age range was performed using the Cutometer Dual MPA 580 probe. Parameters R0, R2, R5, R7, R8, R9 were analysed. The following results were obtained: R0 (0.20-0.33) mm; R2 (0.66-0.82) a.u.; R5 (0.60-0.92) a.u.; R7 (0.37-0.52) a.u.; R8 (0.10- 0.27) mm; R9 (0.03-0.05) mm. The R0 parameter showed no statistically significant correlation between skinfirmness and age. On the basis of the other parameters it can be concluded that skin elasticity and an ability to return to its original shape around the eyes, on the cheeks and around the lips is greater in younger patients than in older groups. There were no statistically significant differences within each age group between the right and left sides of the face. Skin firmness described by the R0 parameter is constant in the studied groups and independent of age. Skin elasticity, and an ability to return to its original shape around the eyes, on the cheeks and around the lips, is greater in younger patients. The ageing process simultaneously affects the entire facial skin.

Moderne Hautanalyse - Die ungeschminkte Wahrheit, Fit for Fun, Juli 2020

Ein geschultes Auge sieht der Haut auf Anhieb das Wichtigste an – aber nicht alles. Präzise Informationen über den Hautzustand liefern diese fünf technischen Geräte.

K. Zduńska-Pęciak, H. Rotsztejn, **The effectiveness of ferulic acid and microneedling in reducing signs of photoaging: a split-face comparative study**, Dermatol Ther, Jul 2020

Background: Photoaging is closely related to UV-induced oxidative stress. Ferulic acid is a plant-based antioxidant with anti-aging activity. Combining ferulic acid peel with microneedling enhances its transdermal penetration. This study was designed to evaluate the efficacy of 14% ferulic acid peel combined with microneedling for facial photoaging. Materials and methods: 16 women aged 45-60 with Fitzpatrick skin type II and III, were enrolled in this trial. All patients received 8 treatment sessions with a full face application of chemical peeling based on 14% ferulic acid in 1-week intervals. During each session, on the right half of patient's face, peeling application was followed by microneedling. Efficacy was measured using MPA (Courage+Khazaka electronic). The measurement of hydration, elasticity, melanin index and erythema index were taken before treatments, after 8th session and 1 month after the last application. Results: The objective evaluation showed statistically significant improvement in all measured skin parameters ($p<0,05$), after ferulic acid peel application, as well as ferulic acid peel followed by microneedling. Combined therapy showed significantly greater improvement especially in skin elasticity, comparing to peeling administered alone. Conclusion: Ferulic acid has a significant bleaching, anti-redness, smoothing and moisturizing activity. When combined with microneedling, the efficiency is increased, in particular regarding skin elasticity.

P. Moortgat, M. Anthonissen, U. van Daele, T. Vanhullebusch, K. Maertens, L. de Cuyper, C. Lafaire, J. Meirte, **The effects of shock wave therapy applied on hypertrophic burn scars: a randomised controlled trial**, Scars, Burns & Healing, 2020, Volume 6: p. 1–10

Introduction: A wide variety of non-invasive treatments has been proposed for the management of hypertrophic burn scars. Unfortunately, the reported efficacy has not been consistent, and especially in the first three months after wound closure, fragility of the scarred skin limits the treatment options. Extracorporeal shock wave therapy (ESWT) is a new non-invasive type of mechanotherapy to treat wounds and scars. The aim of the present study was to examine the objective and subjective scar-related effects of ESWT on burn scars in the early remodelling phase. Material and methods: Evaluations included the Patient and Observer Scar Assessment Scale (POSAS) for scar quality, tri-stimulus colorimetry for redness, tewametry for trans-epidermal water loss (TEWL) and cutometry for elasticity. Patients were randomly assigned to one of two groups, the low-energy intervention group or the placebo control group, and were tested at baseline, after one, three and six months. All patients were treated with pressure garments, silicone and moisturisers. Both groups received the ESWT treatment (real or placebo) once a week for 10 weeks. Results: Results for 20 patients in each group after six months are presented. The objective assessments showed a statistically significant effect of ESWT compared with placebo on elasticity ($P = 0.011$, $\eta 2P=0.107$) but revealed no significant effects on redness and TEWL. Results of the clinical assessments showed no significant interactions between intervention and time for the POSAS Patient and Observer scores. Conclusion: ESWT can give added value to the non-invasive treatment of hypertrophic scars, more specifically to improve elasticity when the treatment was already started in the first three months after wound closure.

G. Sadowski, J. Sadowski, **Safety and Efficacy of a Novel Antiaging Skin Care Regimen Containing Neutraceuticals and Growth Factors on the Facial Skin of Women: A 12-Week Open-label Study**, JCAD Journal of Clinical and Aesthetic Dermatology, June 2020, Volume 13, Number 6

Background: Due to both intrinsic and extrinsic damage, the skin is where easily noticable signs of aging manifest. OBJECTIVE: We sought to assess the effects of two complex novel topical formulations, L'Unique Miracular Facial Serum (LMFS) and L'Unique Skin Essence (LSE) (Nourishing Biologicals LLC, St. Augustine, Florida) on hydration, frmness, elasticity, wrinkling, and pore size of facial skin after initial application and then after four, eight, and 12 weeks of use. Methods: An open-label study was conducted on subjects (N=32) between the ages of 45 and 65 years (mean: 57 years). Subjects were treated with a twice-daily application of LMFS and LSE for a total of 12 weeks following a one-week washout period. The test products were gently applied in a circular motion to the face each morning and evening. Measurements of skin hydration, transepidermal water loss (TEWL), and skin elasticity and frmness and three-dimensional skin surface evaluations were performed at each visit. Skin lift and pore size assessments were also completed using clinical photography. Subjective outcomes were assessed by a posttreatment product efciency survey at the end of each visit. Results: Objective instrumental measurements showed statistically signifcant improvements in skin hydration (20.19%), TEWL (25.96% at 15 minutes), frmness (24.77%), skin elasticity (11.40%), and skin lift (5.41%) with product use. Improvements in pore size and wrinkle depth were not statistically signifcant. Conclusion: Use of the test products produced significant improvements in skin hydration, TEWL, frmness, and skin elasticity with associated improvements in facial skin appearance.

C. Uhl, D. Khazaka, **Measuring skin's "true age"**, PERSONAL CARE June 2020, p. 66-68

The human desire to look young is as old as mankind and our skin plays central role in this craving. Even in ancient civilizations, people developed formulations for creams, tonics and bath additives to keep skin young and beautiful. The physiological process of skin ageing involves structural, biochemical and functional changes. Starting at approximately age 25, the content of collagen and other components of the connective tissue, such as elastin or hyaluronic acid, in the skin continuously decreases. This gradually results in a loss of bound water, leading to a deterioration of the water-protein interaction and an alteration of the overall protein stability.

N. Hazwani Mohd Ariffin, R. Hasham, **Assessment of non-invasive techniques and herbal-based products on dermatological physiology and intercellular lipid properties**, Heliyon 6 (2020)

Skin is the largest external organ of the human body. It acts as a barrier to protect the human body from environmental pollution, mechanical stress, and excessive water loss. The defensive function resides primarily on top of the epidermis layer commonly known as stratum corneum (SC). Human SC consists of three major lipids, namely ceramide, free fatty acid, and cholesterol that comprise approximately 50%, 25%, and 25% of the total lipid mass, respectively. The optimal composition of SC lipids is the vital epidermal barrier function of the skin. On the other hand, skin barrier serves to limit passive water loss from the body, reduces chemical absorption from the environment, and prevents microbial infection. In contrast, epidermal lipids are important to maintain the cell structure, growth and differentiation, cohesion and desquamation as well as formation of a permeability barrier. Multiple non-invasive in vivo approaches were implemented on a regular basis to monitor skin physiological and intercellular lipid properties. The measurement of different parameters such as transepidermal water loss (TEWL), hydration level, skin elasticity, collagen intensity, melanin content, sebum, pH, and tape stripping is essential to evaluate the epidermal barrier function. Novel non-invasive techniques such as tape stripping, ultrasound imaging, and laser confocal microscopy offer higher possibility of accurate and detailed characterisation of skin barrier. To date, these techniques have also been widely used to determine the effects of herbal plants in dermatology. Herbal plants have been traditionally used for ages to treat a variety of skin diseases, as reported by the World Health Organisation (WHO). Their availability, lower cost, and minimal or no side effects have created awareness among society, thus increase the demand for natural sources as the remedy to treat various skin diseases. This paper reviews several non-invasive techniques and evaluations of herbal-based product in dermatology.

M.A. Nilforoushzadeh, S. Alavi, M. Heidari-Kharaji, A.R. Hanifnia, M. Mahmoudbeyk, Z. Karimi, F. Kahe, **Biometric changes of skin parameters in using of microneedling fractional radiofrequency for skin tightening and rejuvenation facial**, Skin Res Technol., Jun 2020

Background Fractional radiofrequency (RF) has been used for skin rejuvenation and tightening by dermatologists and cosmetic surgeons in recent years. Methods Twenty female patients (mean age of 51.9 years) with Fitzpatrick III to VI skin phototypes who desired to undergo skin lift/tightening received six sessions of fractional microneedle RF treatment and were assessed at baseline and then 3 months after the last session for biometric characteristics using a Colorimeter, Visioface 1000D, Tewameter, Cutometer, Mexameter, and Sebumeter and a skin ultrasound imaging system to evaluate the transepidermal water loss (TEWL), skin pores, color, melanin content, erythema, sebaceous content, and thickness and density of the epidermis and dermis. Patient satisfaction with visual analog scale (VAS) was also measured. Results The results showed that skin pores and spots decreased significantly. TEWL also decreased significantly (by 18.44%). Meanwhile, skin density increased significantly (R7, by 44.41%). The ultrasonographic assessments showed that both the density and thickness of the dermis and epidermis were increased. The changes in the other parameters were not significant. Conclusion FR increases the density and thickness of the dermis and thus also increases the collagen content and decreases skin pores and TEWL.

A. Charpentier, **Clinically supporting 'antiage' and 'pro-age' claims**, Personal Care Europe, June 2020

Claims of personal care evolve following trends and various innovations in the field of the active ingredient development, the finished product formulation and the way both are evaluated, demonstrating their performances. Since 2014, the cosmetics industry is gradually leaving the era of anti-ageing behind. Today, most consumers are more in the mood for a well ageing, slow ageing or pro ageing approach. The philosophy of the 'pro-ageing' movement has sought to remove all 'anti' claims because, according to this concept, women over 50 are not interested in looking younger; they want to look healthy and be honest about their age. Some brands have used the idea of "improves the appearance of skin quality", and "restore the skin comfort", for example. A new vocabulary of renewal, regeneration, plumpness and "glow" now dominates the language of the beauty industry.

F. Bracone, A. de Curtis, A. di Castelnuovo, R. Pilu, M. Boccardi, S. Cilla, G. Macchia, F. Deodato, S. Costanzo, L. Iacoviello, G. de Gaetano, A.G. Morganti, K. Petroni, C. Tonelli, M.B. Donati, C. Cerletti, **Skin toxicity following radiotherapy in patients with breast carcinoma: is anthocyanin supplementation beneficial?**, Clinical Nutrition, 2020

Background: The EU-supported ATHENA project stems from a previous study suggesting that moderate wine consumption reduced the side-effects of radiotherapy (RT) in breast cancer patients, an effect possibly due to non-alcoholic anthocyanin fractions of wine. Objective: To evaluate the role of anthocyanins on RT skin side effects in breast cancer patients. Methods: Randomized, controlled, double-blind clinical trial. Patients were assigned to an intensity modulated radiation therapy (IMRT) either for three or five weeks, then randomized to receive three times a day a water-soluble anthocyanin (125 mg)-rich extract of corn cob or a placebo. Supplementation started one week before till the end of RT. Skin characteristics were detected by a standardized, noninvasive Cutometer® dual-MPA580, providing quantitative indices of skin maximal distensibility (R0), elasticity (R2, R5, R7) and viscoelasticity (R6); a Mexameter® MX18 probe evaluated the skin erythema (Er) and melanin (M). Measures were performed before (T0), at the end of RT and of supplementation (T1), and 1, 6 and 12 months after RT (T2-T4). Acute and late skin toxicity were scored according to the RTOG/EORTG scale. Selected biomarkers were measured at T0 and T1. Results: 193 patients previously assigned to 3- or 5-week RT schedules were randomized to eitheranthocyanin (97) or placebo (96) supplementation. RT induced changes in skin parameters: R0, R2, R5 and R7 decreased, while R6 increased; the changes in R0 and R6 continued in the same direction up to one year, while the others recovered towards basal values; Er and M peaked at T1 and T2, respectively, and returned to basal values at T4. Comparable skin changes were apparent in anthocyanin and placebo groups. A moderate RT-induced increase in total and HDL cholesterol and triglycerides was prevented by anthocyanins. Conclusions: Anthocyanin supplementation did not prevent RT-induced local skin toxicity. The supplementation was well tolerated and safe.

L. Téot, T.A. Mustoe, E. Middelkoop, G.G. Gauglitz (Editors): **Textbook on Scar-Management - State of the Art Management and Emerging Technologies** (ebook), Springer 2020

The interest in wound healing goes back to the beginning of history and has not diminished throughout the centuries also because practical implications of wound healing studies have remained very relevant for public health. During the last century, much progress has been made in the understanding of basic mechanisms of skin wound healing, and it has been realized that healing processes evolve similarly in various organs. It has been established that fbrotic diseases are regulated by analogous mechanisms, albeit less controlled, compared to those regulating wound healing. Moreover, many advances, such as the use of antiseptics and, later, of antibiotics, as well as the introduction of skin transplants have facilitated the treatment of wounds. It has been shown that wound healing evolution depends on several factors including the type of injury causing the damage, the tissue and/or organ affected, and the genetic or epigenetic background of the patient. This Compendium has the merit of discussing a broad spectrum of topics, including the general biology of wound healing, modern diagnostic approaches, and therapeutic tools, applied to many different clinical situations. It should be of interest to teachers, students, and clinicians working in different aspects of wound healing biology and pathology. I am sure that it will rapidly become an important reference book in these fields.

S. Yoo, M.-R. Kim, T.-Y. Kim, S.J. Hwang, J.-M. Lim, S.G. Park, **Relationship of transcutaneous oxygen tension with age and skin elasticity in Korean women**, Skin Research & Technology, Volume 26, Issue 3, May 2020, p. 325-328

Background: Oxygen has several positive effects on the skin, including improving collagen synthesis and accelerating wound healing. However, only a few studies have investigated the relationship between skin oxygenation and skin aging parameters. Therefore, this study aimed to assess the correlation between skin oxygenation and skin aging parameters-elasticity, hydration, sebum, color (lightness, redness), and blood perfusion— in Korean women. Materials and Methods: We evaluated the transcutaneous partial pressure of oxygen, also known as transcutaneous oxygen tension ($TcP0_2$), and skin aging parameters, including elasticity, hydration, sebum, color (lightness or redness), and blood perfusion, in the cheek of 34 healthy women (aged 20-69 years) and assessed the correlation between $TcP0_2$ and other skin aging parameters using IBM SPSS Statistics 25 software (SPSS Inc). Results: Facial $TcP0_2$ was negatively correlated with age ($P < .05$). There were positive correlations between facial $TcP0_2$ and elasticity parameters ($P < .01$). We noted no correlation between facial $TcP0_2$ and skin lightness; however, skin lightness tended to slightly improve with increasing $TcP0_2$. Skin aging parameters, including hydration, sebum, skin redness, and blood perfusion, showed no correlations with $TcP0_2$. Conclusion: In Korean women, facial TcP02 tends to decrease with increasing age and is

positively correlated with gross, net, and biological skin elasticity. Therefore, this study demonstrated that oxygen tension of facial skin can be a major causative factor of skin aging.

T. Chu, N.-L. Wu, C.-Y. Hsiao, H.-J. Li, T.-Y. Lin, C.-H. Ku, C.-F. Hung, **An isoflavone extract from soybean cake suppresses 2,4-dinitrochlorobenzene-induced contact dermatitis**, J Ethnopharmacol, May 2020

Ethnopharmacological relevance: Numerous epidemiological and clinical studies have demonstrated the protective role of dietary isoflavones against development of several chronic diseases. ISO-1, one fraction of isoflavone powders derived from soybean cake, is reported to attenuate inflammation and photodamage. Aim of the study: Contact dermatitis is a common inflammatory skin disease, which accounts for most occupational skin disorders. Instead of oral administration, we aimed to explore the effects of topical ISO-1 application on contact dermatitis by using 2,4-dinitrochlorobenzene (DNCB)-stimulated HaCaT keratinocytes and DNCB-induced mouse dermatitis as models. Materials and methods: In the in vitro study, we first evaluated the biologic effects of DNCB on HaCaT keratinocytes. HaCaT keratinocytes were treated with 2,4-dinitrochlorobenzene (DNCB), and cell viability was measured by MTT assay. Then, we detect the prominent induction of IL-8 mRNA expression after DNCB and ISO-1 treatment by reverse transcription polymerase chain reaction (RT-PCR), and release of IL-8 from HaCaT keratinocytes was measured by ELISA assay. HaCaT keratinocytes were pretreated with ISO-1 and then treated with DNCB, phosphorylation of JNK, p38, ERK and IκBα was analyzed by Western blot. In the in vivo study, the hairless mice were used for an induced contact dermatitis model. The surface changes in the dorsal skin after DNCB and ISO-1 treatment were recorded using photography, and TEWL, erythema were measured using an MPA-580 cutometer. Blood was also collected from mice for measurement of white blood cell counts. Results: Results showed ISO-1 inhibited DNCB-induced IL-8 production and also suppressed DNCB-induced phosphorylation of JNK and p38, and IκBα in HaCaT. In the animal model of DNCB-induced contact dermatitis, topical ISO-1 treatment significantly decreased DNCB-induced erythema and transepidermal water loss (TEWL) in mouse skin. ISO-1 also reduced DNCB-induced skin thickening and increase of white blood cell count. Conclusions: ISO-1 is promising for improvement of DNCB-induced inflammation and skin barrier impairment, suggesting the potential application of topical ISO-1 for inflammatory dermatoses.

D.-B. Myung, J.-H. Lee, H.-S. Han, K.-Y. Lee, H.S. Ahn, Y.-K. Shin, E. Song, B.-H. Kim, K.H. Lee, S.H. Lee, K.-T. Lee, **Oral Intake of *Hydrangea serrata* (Thunb.) Ser. Leaves Extract Improves Wrinkles, Hydration, Elasticity, Texture, and Roughness in Human Skin: A Randomized, Double-Blind, Placebo-Controlled Study**, Nutrients 2020, 12, 1588

Previously, we reported that the hot water extract of Hydrangea serrata leaves (WHS) and its active component, hydrangenol, possess in vitro and in vivo effects on skin wrinkles andmoisturization. We conducted a randomized, double-blind, placebo-controlled trial to clinicallyevaluate the effect of WHS on human skin. Participants (n = 151) were randomly assigned to receive either WHS 300 mg, WHS 600 mg, or placebo, once daily for 12 weeks. Skin wrinkle, hydration, elasticity, texture, and roughness parameters were assessed at baseline and after 4, 8, and 12 weeks. Compared to the placebo, skin wrinkles were significantly reduced in both WHS groups after 8 and 12 weeks. In both WHS groups, five parameters (R1–R5) of skin wrinkles significantly improved and skin hydration was significantly enhanced when compared to the placebo group after 12 weeks. Compared with the placebo, three parameters of skin elasticity, including overall elasticity (R2), net elasticity (R5), and ratio of elastic recovery to total deformation (R7), improved after 12 weeks of oral WHS (600 mg) administration. Changes in skin texture and roughness were significantly reduced in both WHS groups. No WHS-related adverse reactions were reported. Hence, WHS could be used as a health supplement for skin anti-aging.

A. Ayatollahi, A. Firooz, A. Samadi, **Evaluation of safety and efficacy of booster injections of hyaluronic acid in improving the facial skin quality**, Journal of Cosmetic Dermatology, May 2020

Background: Skin boosting with small particles of hyaluronic acid (HA) is a new method of skin rejuvenation. Aim: Here we aim to evaluate the efficacy and safety of booster injections of non-cross-linked HA in improving the facial skin quality. Methods: 20 men and women age 40.15 ±6.63 years were treated with 3 injections of noncross-linked HA (1-2 ml) with intervals of 3 weeks. Skin hydration and elasticity parameters were evaluated before intervention and one week and 4 months later. Facial skin improvement also evaluated using Physician's Global Assessment score (PGA). Results: skin hydration increased one week and 4 months after last treatment, ($p > 0.05$). Skin firmness (R0) reduced significantly at week 1 and month 4 (p-value = 0.01 and 0.00). Skin tiring effect /Fatigue (R3) showed significant decrease at week 1 and month 4 (p-value=0.01 and 0.00 respectively). Four months after last

treatment skin gross elasticity (R2) and net elasticity (R5) also increased significantly (p-value=0.00) PGA one week and four months after last treatment were 2.33 ±0.76 and 1.35± 0.49 out of 4, respectively. Adverse effects were mostly transient and mild in severity. Conclusion: Booster therapy with HA is a safe and well tolerated procedure and results in improvement in skin elasticity and relative increase in skin hydration.

F. Perin, K. Chalothorn, P. Tachalerdmanee, **Mechanical properties of skin and exploration methods**, PERSONAL CARE ASIA PACIFIC, May 2020

Our skin constitutes the interface between the interior of the body and the outside world, covering between 1.5 and 2.0 m^2 and weighing almost 4 kg in adults. Its thickness ranges between a few tenths of millimeters and 5-6 mm for areas submitted to high stresses and loads such as the soles of the feet. This organ (encompassing cells, fibres, sebaceous and sweat glands, hairs, nerves, blood vessels) ensures numerous essential functions such as maintaining homeostasis and protecting the organism from external aggressions (mechanical, thermal, chemical, bacterial, etc.) It is sometimes said that it is the silence of organs that defines their health. This is probably why we almost forget the mechanical function of the skin. This is unfair when we consider its incredible ability to absorb shocks, to support all internal body tissues, to stretch so as to allow movements, changes of posture and variations of body volume in the case of pregnancy for instance. This article aims to bring light to this critical mechanical function and to present the different methods which can be used for its exploration and measurement.

F. Wandrey, D. Schmid, F. Zülli, **Clearing senescent cells for rejuvenated skin**, Personal Care Europe, April 2020

Cellular senescence is one of the hallmarks of ageing. Senescent cells that reside in the dermis as a result of the ageing process and oxidative stress, secrete pro-inflammatory factors that further contribute to ageing. Therefore, eliminating senescent cells has emerged as a promising anti-ageing therapy in the medical field in the past few years. This novel concept known as 'senolytics' helps to clear tissues of senescent cells without affecting healthy cells in order to reduce inflammation and rejuvenate the tissue. For the first time, this concept has been adapted for cosmetics. An extract from organic alpine rose leaves demonstrated a clear senolytic activity on senescent fibroblasts. In placebo-controlled clinical studies, the alpine rose extract prevented the formation of protein carbonyls, one of the most harmful irreversible modifications of proteins, upon UVA irradiation. In addition, treatment with alpine rose extract significantly reduced skin redness and increased elasticity.

A. Tito, C. Zappelli, M. Angelillo, M.G. Colucci, F. Apone, **New ingredient from *Rosa rugosa* delays skin ageing**, Personal Care Europe, April 2020

Skin ageing is an inevitable physiological process, determined by several concomitant factors, resulting in a thinner and drier skin, in the formation of fine wrinkles, and a gradual dermal atrophy. During this process the skin cells become senescent, they slow down their metabolism and the production of structural matrix components. The Growth Differentiation Factor 11 (GDF11) has been recently identified as a pro-youth factor in several cell types, and in particular it was shown its involvement in the restoration of a young phenotype in skin fibroblasts, by stimulating important ExtraCellular Matrix proteins. Furthermore, its key role in modulating mitochondrial functions in skin cells during ageing has been highlighted. In the present article, we describe the characterisation of a plant extract, obtained from *Rosa rugosa* tissue cultures, able to produce a 'rejuvenating' effect in aged skin fibroblasts by inducing GDF11 expression and synthesis. The extract was also capable of increasing the expression of PGC1- alpha, the master regulator of the mitochondrial biogenesis, and other important genes involved in the pathway, leading to an improvement of cell metabolism and longevity.

S.I. Jang, My. Lee, J. Han, J. Kim, A.R. Kim, J.S. An, J.O. Park, B.J. Kim, E. Kim, **A study of skin characteristics with long-term sleep restriction in Korean women in their 40s**, Skin Res Technol., March 2020, Volume 26, Issue 2, p. 193-199

Background: Previous studies have demonstrated increased pore size and darkening skin color with total sleep deprivation. There are many studies of skin characteristics with short-term sleep restriction, but there are few studies on skin characteristics when sleep is restricted more than three consecutive days. This study evaluated skin changes with sleep limited to 4 hours per night for six nights. Materials and Methods: The study included 32 Korean women in their 40s. Skin hydration, desquamation, barrier recovery, texture, gloss, transparency, elasticity, crow's feet, frown lines, and color were measured. Individual sleep time was monitored by smartwatches. Subjects slept 8 hours per night for six nights in week one and 4 hours per night for six nights in week two. Results: Skin hydration was significantly reduced after 1 day of sleep deprivation, and it continued to decrease. Skin gloss,

desquamation, transparency, elasticity, and wrinkles were significantly aggravated after 1day of sleep deprivation. Skin texture was significantly aggravated on the fourth day of sleep restriction. Elasticity was most affected by reduced sleep, with a standardized coefficient of -.320, indicating a significant decrease over time as compared to other characteristics. Conclusion: Skin hydration was gradually decreased with sleep restriction. Skin texture did not change after only1day of sleep restriction. It is a new finding that elasticity decreases more than other skin characteristics with prolonged sleep restriction.

M.S. Motwani, K. Khan, A. Pai, R. Joshi, **Efficacy of a collagen hydrolysate and antioxidants-containing nutraceutical on metrics of skin health in Indian women**, J Cosmet Dermatol. 2020

Background: The skin's aging process involves a decreased biosynthesis of extracellular matrix proteins (predominantly collagen) compounded by damage from environmental and intrinsic stressors. The Indian population is susceptible to skin damage given its geography and increasing urbanization or a genetic disposition. Previous studies have investigated nutrients such as collagen peptides, vitamins and phytonutrient- rich botanical extracts for their individual benefits on skin. Aims: This study examined the collective effect of a proprietary blend of these nutrients (in Nutrova Collagen+Antioxidants; NCA) on skin parameters, which has not been previously studied, especially in an Indian context. Patients/Methods: 34 healthy, Indian women (mean age = 39.5 years) were given a placebo daily for 30 days to establish a baseline, followed by NCA for two intervals of 30 days. 3D image reconstruction allowed the analysis of skin topography and blemishes. Instrumental measurements also included skin firmness, elasticity, hydration, and transepidermal water loss. Clinical evaluation was used to grade blemishes, wrinkles and periorbital hyperpigmentation. Results: Based on instrumental evaluation, NCA significantly reduced wrinkle width, open pores, skin roughness, and the colour of hyperpigmented blemishes, while improving skin hydration, firmness and barrier function from baseline to Day 30 and Day 60. NCA also increased elasticity at Day 30. Clinical evaluation showed that periorbital hyperpigmentation and wrinkles reduced significantly. Conclusion: NCA is effective for improving overall skin health in Indian women. These results show that targeted nutrient supplementation can improve skin health and further research over extended durations is merited.

Y. Mofid, G. Faleweei, C. Chartier, L. Machet, E. Vierron, V. Gissot, V. Tauveront, G. Georgescou, P.-A. Dujardin, M.-C. Machet, T. Kervarrec, F. Patat, F. Ossant, A. Maruani, **High-Frequency Transient Elastography Prototype to Assess Skin (Dermis) Fibrosis: A Diagnostic Study in Patients with Venous Insufficiency and Controls**, Ultraschall Med, 2020 Mar 18

Purpose High-frequency transient elastography (HF-TE) is a noninvasive technique for assessing shear-wave speed and finally elasticity in thin tissue such as the skin. It has never been validated for monitoring fibrotic skin diseases. The purpose was to evaluate the potential of HF-TE to assess skin fibrosis in patients with chronic venous disorders (CVD). Materials and Methods This clinical study enrolled 48 patients at various stages of CVD and 48 paired healthy volunteers. Subjects underwent a clinical examination with an evaluation of Rodnan's fibrosis skin score. We studied the dermis thickness measured using ultrasound (US) and elasticity measurements using cutometer and HF-TE studied according to 3 cutaneous zones positioned on the leg. The area under the receiver operating characteristic curve (AUC) was calculated to evaluate the diagnosis performance for a combined parameter (PRL) based on a logistic regression model using both elasticity and dermal thickness. Results Patients with CVD had significantly higher values of skin elasticity than healthy subjects, 134.5kPa and 132.1kPa vs. 91.3kPa, respectively. The dermis thickness also increased with escalation in CVD stage for all studied zones. The PRL parameter had an AUC value of 0.79 for all zones and stages of CVD clustered. The discriminating power of PRL increased with escalation of the CVD stage; with an AUC value of up to 0.89 for evolved stages, and a sensitivity and specificity of 0.79 and 0.89, respectively. Conclusion HF-TE, coupled with a US measurement of dermis thickness, made it possible to propose a new biomarker, which proved to be a good diagnostic tool for skin fibrosis.

M. Ijaz, N. Akhtar, **Fatty acids based α-Tocopherol loaded nanostructured lipid carrier gel: In vitro and in vivo evaluation for moisturizing and anti-aging effects**, J Cosm Dermatol, March 2020

Background: α-Tocopherol is a potent antioxidant present in the skin. Its concentration decreases with age, synthetically available α-tocopherol is viscous, irritating to skin and unstable toward oxidation and ultraviolet, (UV) light. Aims: To develop fatty acids based nanostructured lipid carrier (NLC) gel loaded with α-tocopherol and to evaluate its moisturizing and anti-aging properties. Methods: Lauric acid, oleic acid, and Tween-80 were used as solid lipid, liquid lipid, and surfactant, respectively. Seven formulations (F0-F6) were developed by using different concentration of ingredients. Most optimized formulation (F2) was selected for further study on the basis of characterization. Dialysis tube

method was used for release study. F2 was incorporated in gel, and then, in vitro and noninvasive in vivo study regarding skin moisture content by corneometer and skin mechanical properties by cutometer for 12 weeks on human volunteers (n = 13) was conducted. Results: Size, polydispersibility index (PDI), zeta potential, and %entrapment efficiency (%EE) of optimized formulation (F2) were found 82 nm, 0.261, -28.6, and 94.88 ± 1.16, respectively. Particles were spherical in shape. The release profile showed initial burst and then sustained release, and release data were best fitted to weibull model. α-tocopherol loaded NLC gel (NLCG) appeared physically stable for 12 weeks at room temperature and showed significant results in terms of skin capacitance and mechanical properties. Rheological assessment showed non-Newtonian behavior. Conclusion: Fatty acids based NLC proved to be a promising carrier of photochemically unstable lipophilic vitamin E with enhanced moisturizing and anti-aging properties.

G. Bifulco, F. Rastrelli, G. Rastrelli, G. Tosti, **Postbiotics in Anti-Ageing Care**, COSSMA 3, 2020, p. 16-19

Recently, the use of living probiotics- tyndallized bacteria and lysates- and prebiotics has been blooming. However, the production of stable, reproducible and safe formulations containing most of these ingredients remains a topic of discussion. Big effort is currently devoted in elucidating the interactions between beneficial microbes and skin.

W. Sangsuwan P. Asawanonda, **Four-weeks daily intake of oral collagen hydrolysate results in improved skin elasticity, especially in sun-exposed areas: a randomized, double-blind, placebo controlled trial**, J Dermatol Treat, March 2020

Background: Topical as well as oral 'collagen' is widely popularized and claimed to possess anti-aging properties for the past several years. Few placebo-controlled trials exist.Objectives: *Primary*: To evaluate the effect of collagen hydrolysate (CH) ingestion for 4 weeks on skin elasticity. *Secondary*: To compare the effects of CH ingestion on skin elasticity between sun-exposed and sun-protected areas.Materials and methods: This study was a prospective, randomized, double-blind placebo-controlled trial comparing the effects of daily intake of 5-g oral CH and placebo in post-menopausal women. Participants were evaluated for skin elasticity, using cutometer at baseline, 2 and 4 weeks after randomization and 4 weeks after discontinuation of study agents.Results: A total of 36 participants were enrolled. Skin elasticity measured from left and right cheeks in participants receiving CH increased compared to placebo (p=.006, .03, respectively). After 4 weeks of discontinuation of study agents (week 8), skin elasticity measured from both left and right cheeks remained different between CH and placebo group (p=.01, .004, respectively).Conclusions: We demonstrated significant improvement of skin elasticity in sun-exposed areas after 4 weeks ingestion of marine CH. The improvement of elasticity remained 4 weeks after discontinuation of study agents. There were no severe adverse effects during the study.

V.Z. Lim, A.A. Yong, W.P.M. Tan, X. Zhao, M. Vitale, C.L. Goh, **Efficacy and Safety of a New Cosmeceutical Regimen Based on the Combination of Snail Secretion Filtrate and Snail Egg Extract to Improve Signs of Skin Aging**, Journal of Clinical and Aestetic Dermatology, March 2020, Volume 13, Number 3

Background: Two extracts derived from the gastropod Cryptomphalus aspersa have been shown to have dermal regeneration properties: SCA® (secretion fltrate) with fbroblast growth factor-like activity and IFC®-CAF (cellular activating factor), a snail egg extract with skin stem cell activation activity. Objective: The objectives of this study were to evaluate the synergic antiaging activity and tolerability of SCA and IFC-CAF in a combined regimen compared to vehicle as a placebo control. Methods: A three-month, single-center, double-blinded, randomized, vehicle-controlled trial assessed the effects of a daily skincare routine divided into two treatment phases, as follows: intensive (1 month) and maintenance (2 months). Fifty women, aged 45–65 years, with signs of photoaging were randomized to receive either the active ingredients (n=30) or vehicle (n=20). Clinical evaluations included objective measurements of barrier function and skin hydration, elasticity, and color/brightness. Subjective assessments were conducted according to the Rao-Goldman and Glogau scales for wrinkles, the Patient Global Assessment (PGA) scale and Investigator Global Assessment (IGA) scale. Results: Subjects in the active treatment group experienced reductions in transepidermal water loss and significant improvements in skin roughness, frmness, and elasticity. Both groups showed significant improvements in fne lines and wrinkles. PGA and IGA assessments indicated greater improvement in the active treatment group. Conclusion: The active snail extract treatment appears to be effective in improving signs of skin aging in women 45 to 65 years old. Larger randomized, controlled studies are needed to confrm our results.

N. Lourith, M. Kanlayavattanakul, **Formulation and clinical evaluation of the standardized Litchi chinensis extract for skin hyperpigmentation and aging treatments**, Ann Pharm Fr, 2020 Mar;78(2): p. 142-149

Introduction: The standardized litchi extract had been revealed on phytochemical actives, in vitro and cellular activities against aging and darkening of skin. However, a formulation containing the extract has never been developed as per clinical evaluated. Materials and methods: The litchi serum was developed, safety and efficacy were clinically evaluated in human volunteers. The stable and none irritated 0.05 and 0.1% litchi serums were randomized-single blind placebo control clinical applied on the inner forearm of 29 volunteers for a consecutive 112 days and monitored by Mexameter® MX18, Cutometer® MPA 580 and Visioscan® VC 98. Results: Skin lightening efficacy of the 0.1% and 0.05% litchi serum was significantly ($P<0.001$ and $P<0.05$) higher than the placebo. Skin elasticity and wrinkle reduction was significantly ($P<0.05$ and $P<0.005$) achieved by the 0.1% litchi serum. The efficacy of litchi serums was confirmed by a split-face, randomized, single-blind controlled that the 0.1% litchi serum was significantly ($P<0.05$) better than the 0.05% one of all examined parameters. Conclusion: Safety and efficacy of litchi extract are clinically confirmed for hyperpigmentation and aging of skin treatments.

W.K. Cho, H.-I. Kim, S.-Y. Kim, H.H. Seo, J. Song, J. Kim, D.S. Shin, Y. Jo, H. Choi, J.H. Lee, S.H. Moh, **Anti-Aging Effects of *Leontopodium alpinum* (Edelweiss) Callus Culture Extract through Transcriptome Profiling**, Genes 2020, 11, 230

Edelweiss (*Leontopodium Alpinum*) in the family Asteraceae is a wildflower that grows in rocky limestone places. Here, we investigated the efficacy of edelweiss callus culture extract (Leontopodium Alpinum callus culture extract; LACCE) using multiple assays from in vitro to in vivo as well as transcriptome profiling. Several in vitro assay results showed the strong antioxidant activity of LACCE in response to UVB treatment. Moreover, LACCE suppressed inflammation and wrinkling; however, moisturizing activity was increased by LACCE. The clinical test in vivo demonstrated that constant application of LACCE on the face and skin tissues improved anti-periorbital wrinkles, skin elasticity, dermal density, and skin thickness compared with the placebo. The RNA-Sequencing results showed at least 16.56% of human genes were expressed in keratinocyte cells. LACCE up-regulated genes encoding several KRT proteins; DDIT4, BNIP3, and IGFBP3 were involved in the positive regulation of the developmental process, programmed cell death, keratinization, and cornification forming skin barriers, which providemanyadvantages in thehumanskin. By contrast, down-regulated genes were stress-responsive genes, including metal, oxidation, wounding, hypoxia, and virus infection, suggesting LACCE did not cause any harmful stress on the skin. Our comprehensive study demonstrated LACCE is a promising agent for anti-aging cosmetics.

S.P. Loureiro Luna, A. Schoen, P. H. Esteves Trindade, P. Barreto da Rocha, **Penetration Profiles of a Class IV Therapeutic Laser and a Photobiomodulation Therapy Device in Equine Skin**, J Equine Vet Sci, Feb 2020

Photobiomodulation therapy (PBMT) effects depend on the energy settings and laser penetration. We investigated the penetration time profiles of two different light therapy devices, at the dark and light skin regions in horses. Six light skin and six dark skin adult clinically healthy Arab and Quarter horses were used. A cutometer was used to measure the width of the skin fold from both sides of the cervical area, followed by three measurements of the thickness of the same skin fold by transversal and longitudinal ultrasonography (US). The depth of light penetration was compared based on the percentage of penetration versus power, between a portable PBMT device versus a class IV laser device. The laser mean power output was measured with an optical power meter system for 120 seconds after penetrating the skin. Skin width and laser penetration were compared among equipment by paired "t" test. There was no difference in the width of the skin fold between measurements acquired by the cutometer against either longitudinal or transversal US or between the US measurements at cervical versus metacarpus area. Light penetration was greater in both kinds of skins in the PBMT (0.01303 ± 0.00778) versus class IV laser ($0.00122 \pm$ SD 0.00070) ($P < .001$). The PBMT device provided a greater energy penetration than the class IV laser in unclipped light and dark skin, suggesting that the former may produce a better therapeutic effect. The color of the skin changes penetration profiles of PBMT.

R.L. Evans , S. Bates, R.E. Marriott, D.S. Arnold, **The impact of different hair-removal behaviours on the biophysical and biochemical characteristics of female axillary skin**, International Journal of Cosmetic Science, 2020, 42, p. 436–443

Objective: The impact of hair removal on the biophysical and biochemical characteristics of human axillary skin is not fully understood. This study investigated the effect of different hair-removal techniques on biophysical parameters and the concentrations of key inflammatory biomarkers in the

axillae of female Thai subjects. Axillary hair was removed by shaving, plucking or waxing. Methods: Following a 2-week washout phase without hair removal, subjects underwent visual assessment for erythema and skin dryness in one (randomized) axilla, then hair was removed from the axilla by shaving, plucking or waxing according to each subject's established habit. Erythema and dryness were assessed again 30 min after hair removal, and buffer scrubs collected from depilated and non-depilated axillae and analysed for inflammatory cytokines; after a further 48 h, erythema, dryness and post-inflammatory hyperpigmentation (PIHP) were assessed in the depilated axilla. Biophysical assessments (skin hydration, barrier integrity, elasticity and roughness) were made in depilated and non-depilated axillae. Results: All three hair-removal techniques induced an increase in axillary erythema and skin dryness. Shaving was associated with significantly less erythema ($P < 0.01$), but significantly greater skin dryness ($P < 0.05$) versus the other techniques 30 min after hair removal. There were no between-technique differences in PIHP or biophysical parameters. Interleukins IL-1a and IL-1RA concentrations increased, and IL-8 concentration decreased following hair removal by each technique. Conclusion: This is the first study to identify the principal cytokines associated with the inflammatory process triggered by axillary hair removal. A single hair-removal treatment did not appear to induce PIHP or further biophysical changes to the skin.

N. Muizzuddin, R. Benjamin, **Beauty from within: Oral administration of a sulfur-containing supplement methylsulfonylmethane improves signs of skin ageing**, International Journal for Vitamin and Nutrition Research, February 2020

Abstract: Background: Methylsulfonylmethane (MSM) is an organosulfur compound with known benefits for joint health, sports nutrition, immune function, and anti-aging formulations and is gaining popularity as a nutritional supplement for the support of hair, skin and nails. Methods: The study was conducted in two steps; in Part I (pilot study) a panel of 20 participants ingested either 3 g a day of MSM or placebo capsules for 16 weeks. Visual and subject self assessment of wrinkles and skin texture as the predominant sign of ageing was observed. In Part II (dose-response study), 63 participants ingested either 1 g or 3 g per day of MSM for 16 weeks. Expert clinical grading, instrumental measurements and consumer perception was used to evaluate skin conditions like lines and wrinkles. Additionally, instrumentational analysis was conducted using corneometer and cutometer for investigation of skin hydration, firmness and elasticity. Results: Part I of the study clearly indicates that oral ingestion of MSM (3 g/d) reduces signs of ageing like facial wrinkles ($p < 0.05$) and skin roughness ($p <0.05$) as compared to placebo. Detailed analysis in Part II instrumentation assessments showed a significant ($p < 0.05$) improvement from baseline in the severity of facial wrinkles, as well as improved skin firmness, elasticity and hydration with MSM. Some of these parameters exhibited a good dose response indicating that the higher (3 g/d) of the supplement was more effective than the lower dose of 1 g/d, but generally the lower dose of 1 g/d appeared to be sufficiently effective in reducing the facial signs of ageing. Conclusion: This study indicated that MSM is effective in reducing visual signs of skin ageing even at a low dose of 1 g/d.

F. Havas, S. Krispin, N. Borenstein-Auerbach, E. Loing, **Slowing the cellular clock**, Cosmetics & Toiletries, Vol. 135, January 2020, p. 49-57

Skin is the bamer separating the body from the outer environment, protecting against water loss and external aggressions. Skin's condition is the most visible indicator of health and general status, and of age...or youth. Extrinsic and intrinsic factors affect skin aging. Extrinsic factors include exposure to sunlight or pollution, and repetitive muscle movements. Intrinsic aging represents physiological changes over time, occurring at variable, genetically determined rates. The combined effects of aging over the human lifespan lead to a loss of structural integrity and physiological function in the skin. Aged skin is susceptible to dryness, wrinkling, loss of elasticity and hyperpigmentation, among others.

P. Rattanawiwatpong, R. Wanitphakdeedecha, A. Bumrungpert, M. Maiprasert, **Anti-aging and brightening effects of a topical treatment containing vitamin C, vitamin E, and raspberry leaf cell culture extract: A split-face, randomized controlled trial**, J Cosmet Dermatol. 2020 Jan

Background: Skin aging has many manifestations such as wrinkles, uneven skin tone, and dryness. Both intrinsic and extrinsic factors, especially ultraviolet light-induced oxidative radicals, contribute to the etiology of aging. Human skin requires both water- and lipid-soluble nutrient components, including hydrophilic and lipophilic antioxidants. Vitamins C and E have important protective effects in the aging process and require exogenous supply. Raspberry leaf extracts contain botanical actives that have the potential to hydrating and moisturizing skin. Topical products with these ingredients may therefore combine to provide improved anti-aging effects over single ingredients. Objectives: To evaluate the anti-aging and brightening effects of an encapsulated serum containing vitamin C (20% w/w), vitamin E, and European raspberry (Rubus idaeus) leaf cell culture extract.

Methods: Fifty female volunteers aged 30-65 years were allocated one capsule of serum for topical application on one side of the face for 2 months, in addition to self-use of facial skin products. Both test (treated) and contralateral (untreated) sides were dermatologically assessed after 4 and 8 weeks. Skin color (melanin index), elasticity, radiance, moisture, and water evaporation were measured by Mexameter MX18®, Cutometer®, Glossymeter GL200®, Corneometer CM825®, and Tewameter TM300® instruments, respectively (Courage + Khazaka Electronic GmbH). Skin microtopography parameters, smoothness (SEsm), roughness (SEr), scaliness (SEsc), and wrinkles (SEw), were measured by Visioscan® VC98 USB (Courage + Khazaka Electronic GmbH), and gross lifting effects were measured by VECTRA® H1 (Canfield Scientific), and adverse reactions and satisfaction were also assessed. Results: Skin color, elasticity, and radiance were significantly improved. The smoothness, scaliness, and wrinkles were also revealed significant improvement. Mild adverse reactions were tingling and tightness. Conclusions: The vitamin C, vitamin E, and raspberry leaf cell culture extract serum has anti-aging and brightening effects of skin.

I. Lacatusua, D. Istratia, N. Bordeib, M. Popescub, A.M. Seciuc, L.M. Pantelid, N. Badea, **Synergism of plant extract and vegetable oils-based lipid nanocarriers: Emerging trends in development of advanced cosmetic prototype products**, Materials Science & Engineering C 108 (2020) 110412

Phytochemicals are priceless sources of bioactive compounds with multiple health benefices. The main objective of the current investigation was to develop nanostructured herbal formulations conditioned as appropriate hydrogel (HG) conferring an enhanced transdermal absorption of bioactive compounds from selective extracts and vegetable oils. The direct impact of research is represented by the identification of prototype products which manifest an improved therapeutic response, by means of cumulative antioxidant, anti-inflammatory and antiacne actions, without causing any side health effects. The combinatorial effect of Carrot Extract (CE) and Marigold Extract (ME) – Nanostructured Lipid Carriers (NLC) based on rosehip oil or black cumin oils was accompanied by a high biocompatibility and a significant ability to capture both short- and long-life free radicals. HG-NLC-ME-CE has been shown to be an efficient carrier with a differentiated potential for in vitro release of the two active principles, e.g. it delayed the release of carotenoids while the hydrophilic active (azelaic acid, AA) was faster released. The HG-NLC efficacy in skin inflammation treatment (demonstrated by in vitro and in vivo tests) revealed a reduced expression of inflammatory cytokines (IL-1β and TNF-α), more pronounced in the case of TNF-α. Moreover, a superior in vivo anti-inflammatory effect of HG-based NLC-CE/ME-AA as compared to that obtained for a commercial product was detected, i.e. after 3 h of HG-NLC treatment, a significant reduction of rat paw edema was quantified. In pre-clinical studies, the quantification of the hydration and elasticity effects in the viable epidermis provided the evidence of the high potential of developed prototypes, suitable for implementation in the market area. The degree of skin hydration and skin elasticity were remarkable enhanced after topical application of developed prototypes, a hydration effect up to 74% being determined and a skin elasticity reaching 90%. The knowledge acquired from this investigation could be utilized by the cosmetic industry to design novel topical products with improved quality and health benefices, endowed with antioxidant, anti-inflammatory and anti-acne actions and with desired hydration and elasticity profiles, in order to achieve better therapeutic efficacy and no drug toxicity.

B. Müller, L. Ruby, S. Jordan, M.B. Rominger, E. Mazza, O. Distler, **Validation of the suction device Nimble for the assessment of skin fibrosis in systemic sclerosis**, Arthritis Research & Therapy (2020) 22:128

Objectives: Skin fibrosis is a main hallmark of systemic sclerosis (SSc). Clinical assessment is done semi-quantitatively using the modified Rodnan skin score (mRSS). Objective measurements for quantifying skin fibrosis could complement the mRSS to achieve higher reproducibility. The aim of this study was to explore the potential of suction measurements to detect structural changes in the skin that are associated with skin fibrosis. Methods: This clinical trial included 30 SSc patients and 30 healthy volunteers (HC). We validated a novel suction device—the Nimble—to quantify skin stiffness in comparison to the Cutometer using the OMERACT filter. Results: A significant difference ($p < 0.05$) between the skin stiffness of HC and SSc patient groups was found for each location measured. The correlation between the measurements of forearm skin stiffness and the mRSS values was high for the Nimble ($r = 0.82$) and moderate for the Cutometer ($r = 0.58$). A ROC analysis showed good ability for the Nimble to distinguish between SSc patients with and without skin involvement (AUC = 0.82). Both suction devices provided excellent reliability in all measurements on HC and SSc patients and proved face validity and feasibility. Conclusion: Suction devices assessing skin stiffness, such as the Nimble, show clear potential to objectively quantify skin fibrosis in SSc patients and might be promising outcome measures complementing established methods such as the mRSS.

H.H. Homann, T. Ohmann, C. Seelmann, **Abschlussbericht zum Vorhaben „Einfluss perkutaner Kollageninduktion mittels Medical Needling bei Patienten mit Verbrennungsnarben“ – Eine prospektive kontrollierte Interventionsstudie (FR-260)**, BG Klinikum Duisburg, 31. Januar 2020

Ziel der Studie war es, zu untersuchen, ob das Verfahren des Medical Needlings bei Verbrennungsnarben zu einer dauerhaften Verbesserung der Narben- und Lebensqualität führen kann. Aktivitäten/Methoden Studiendesign: prospektive kontrollierte Interventionsstudie Studienpopulation: 5 Patienten (3 männlich, 2 weiblich, Ø Alter: 38,8 ± 10,9 Jahre, Ø BMI: 32,1 ± 4,9 kg), insgesamt 15 Hautstellen. Die Verbrennungsnarben mussten seit mindestens 2 Jahren ausgeheilt sein und es durfte zuvor noch kein Medical Needling stattgefunden haben.Die erste Datenerhebung fand einen Monat vor dem Needling statt (t0). Die Hautstellen wurdendaraufhin einen Monat lang mit einem Vitaminöl zur OP-Vorbereitung eingerieben. Die zweite Datenerhebung fand direkt vor der Behandlung statt (t1), die dritte (t2) einen Monat nach dem Needling und die vierte und letzte (t3) sechs Monate nach dem Medical Needling. Das Primärziel der Studie ist die Quantifizierung der subjektiven Verbesserung der Narbenqualität 6 Monate nach der Behandlung anhand des POSAS. Sekundärziel war zum einen die objektive Erfassungder Narbenqualität anhand von Messungen mit dem Cutometer und zum anderen die subjektive Erfassung der Narbenqualität anhand der VSS und die Erfassung der Lebensqualität anhand des BSHS B und des SF36. Die Ergebnisse der Studie lassen darauf schließen, dass das Medical Needling einen kurzfristigen Einfluss auf Hauteigenschaften der Narbenareale zum Zeitpunkt t2 zu haben scheint. Somit könnte tatsächlich eine Kollageninduktion angestoßen worden sein. Anhand der objektiven Messungen mit dem Cutometer und den subjektiven Einschätzungen anhand des POSAS und des VSS können wir diesen Effekt, zumindest zum Zeitpunkt t3, nicht bestätigen. Auch in Bezug auf die Lebensqualität konnte kein signifikanter Unterschied festgestellt werden. Ein möglicher kumulativer Effekt, der durch wiederholtes Medical Needling zustande käme und deutlich messbare Veränderungen der Hauteigenschaften mit sich bringen könnte, wurde in der Studie nicht erfasst. Die geringe Anzahl an longitudinal untersuchten Hautstellen lässt keine zuverlässige Aussage über studienbedingte Veränderungen der Verbrennungsnarben zu. Somit kann anhand der vorliegenden Studienergebnisse kein Einfluss des Medical Needling auf die Narben- und Lebensqualität der Patienten gezeigt werden.

A. Khatami, T. Yazdanparast, S.A. Nasrollahi, A.M. Mohammadi, S. Yadangi, A. Khamesipour, M. Kassir, A. Firooz, **Biophysical and ultrasonographic changes of acute Old World cutaneous leishmaniasis skin lesions in comparison with uninvolved skin: A possible tool for non-invasive early detection and treatment outcome assessment**, J Cosmet Dermatol. 2020;19: p. 1627–1635

Background: Patients are increasingly aware of the aesthetic appearance of aging hands. Aims: To evaluate efficacy and safety of a hyaluronic acid gel for improving skin quality in aged skin of the dorsal hand. Methods: This was a 15-month randomized, multi-center, evaluator-blinded, split-hand, no treatment-controlled study. Three treatments with hyaluronic acid gel were administered in the same hand in adult Chinese subjects with grade 2 or 3 (mild or moderate aging) on the Hand Grading Scale (HGS). The primary objective was to evaluate the difference at 3 months between treated and untreated hands, based on the blinded evaluator's HGS assessment. Secondary assessments included the Global Aesthetic Improvement Scale (GAIS), biophysical measurements (skin elasticity, skin roughness and hydration), and subject satisfaction. Safety was evaluated by incidence of adverse events.Results: A total of 100 subjects were enrolled. Clinically relevant differences in HGS favored HA gel (P < .0001). At 15 months, 87%-96% of treated hands were still improved according to GAIS (per evaluator and subject, respectively). Objective measures of skin quality improved, confirmed by evaluators and highly satisfied subjects. Treatment was well tolerated. Conclusions: Hyaluronic acid treatment improved skin quality and reduced the aging appearance of the hand, with high subject satisfaction.

Y. Wu, Y. Tian, J. Xu, S. Zhong, R. Wang, W. Wu, **A randomized study showing improved skin quality and aesthetic appearance of dorsal hands after hyaluronic acid gel treatment in a Chinese population**, J Cosmet Dermatol. 2020;19: p. 1627–1635

Background: Patients are increasingly aware of the aesthetic appearance of aging hands. Aims: To evaluate efficacy and safety of a hyaluronic acid gel for improving skin quality in aged skin of the dorsal hand. Methods: This was a 15-month randomized, multi-center, evaluator-blinded, split-hand, no treatment-controlled study. Three treatments with hyaluronic acid gel were administered in the same hand in adult Chinese subjects with grade 2 or 3 (mild or moderate aging) on the Hand Grading Scale (HGS). The primary objective was to evaluate the difference at 3 months between treated and untreated hands, based on the blinded evaluator's HGS assessment. Secondary assessments included the Global Aesthetic Improvement Scale (GAIS), biophysical measurements (skin elasticity, skin roughness and hydration), and subject satisfaction. Safety was evaluated by incidence of adverse events. Results: A total of 100 subjects were enrolled. Clinically relevant differences in HGS favored HA gel (P < .0001).

At 15 months, 87%-96% of treated hands were still improved according to GAIS (per evaluator and subject, respectively). Objective measures of skin quality improved, confirmed by evaluators and highly satisfied subjects. Treatment was well tolerated. Conclusions: Hyaluronic acid treatment improved skin quality and reduced the aging appearance of the hand, with high subject satisfaction.

P. Perugini, M. Bleve, R. Redondi, F. Cortinovis, A. Colpani, **In vivo evaluation of the effectiveness of biocellulose facial masks as active delivery systems to skin**, J Cosmet Dermatol. 2020;19: p. 725–735

Background: In recent years, bacterial cellulose (BC), or biocellulose, a natural polymer synthesized by certain bacteria, has attracted great interest in dermatology and cosmetic applications. Several bioactive ingredients are currently loaded into BC masks. However, only a few studies have reported the effectiveness of such delivery systems. Aim: The aim of this study was to evaluate the effect on skin parameters of three biocellulose masks formulated to have different cosmetic effects (anti-aging, lifting, and cell renewal). In particular, skin moisturizing, skin color, skin viscoelastic properties, skin surface smoothness, wrinkle reduction, dermal homogeneity, and stratum corneum renewal were evaluated. Materials and methods: The study involved 69 healthy Caucasian female volunteers between 25 and 64 years, who were divided into three different studies. Biocellulose facial masks were applied using the split-face method three times a week for 4-8 weeks depending on the study. Results: The results obtained from this work highlight that biocellulose masks are very well tolerated. A significant decrease in skin roughness and wrinkle breadth, and an improvement in dermal homogeneity and firmness, was observed after 2 months of treatment with “anti-aging” masks. A significant improvement in skin firmness and elasticity was observed after 1 month of treatment with “lifting” masks. Furthermore, a 1-month treatment with “cell renewal” masks promoted the production of new skin cells through a mild exfoliating action. Conclusions: This study highlights that biocellulose masks are effective delivery sys tems to successfully release into the skin several types of active compounds exerting many beneficial effects.

J.M. Carroll, S. Hanna, L.C. Guenther, N. Boucher, **Comparison of topical antiaging creams in the management of lateral canthal lines**, J Cosmet Dermatol. 2020;19: p. 694–704.

Objective: This study compared an antiaging treatment with two currently marketed cosmetic antiaging products for the treatment of lateral canthal lines ("crow's feet"). Methods: Healthy female volunteers (72) aged of 54.6 years (mean) having fine-tomoderate wrinkles in the lateral canthal areas were randomized to one of three treatments applied daily over 28 days: Group A (Purgenesis™ Day Cream, Purgenesis™ Eye Cream, and Purgenesis™ Night Cream); Group B (Prevage® Eye Lotion, Prevage® Day Cream, and Prevage® Night Cream); or Group C (La Mer®Eye Balm, Crème de La Mer®, and La Mer® Night Cream). The effects on anti-wrinkle properties and for sensory attributes and general performance were evaluated on Days 1, 7, and 28. Results: Skin hydration improved significantly at all time points in Groups A and B, and at Day 28 in Group C. Group A patients experienced significant improvements in measured skin elasticity parameters at Day 28; extensibility and maximum amplitude were significantly better at Day 28 in Groups B and C. Benefits were also seen in profilometric parameters with statistical significance only in Group A Volunteer tolerance was good with all three treatments, although moderate and high levels of adverse events were numerically higher in Group B than in Groups A or C, and levels of slight discomfort were significantly more prevalent in Group B. Conclusion: The Purgenesis™ antiaging treatment significantly improved skin hydration, elasticity, and profilometry parameters during a 28-day study. This therapy was found to be well tolerated and effective in countering the cutaneous signs of aging.

E.N. Goltsova, O.A. Shemonaeva, **Hybrid cooperative complexes of H-HA and L-HA (Profhilo®) and the BAP technique for facial skin bioremodeling: a clinical experience at the NEO-Clinic (Tyumen, Russia)**, Esperienze Dermatologiche 2019 December;21(2-4):47-53

Background: Hyaluronic acid (HA) is increasingly in demand as a dermal agent for the correction of age-related soft tissue defects, such as skin laxity, loss of hydration, wrinkle formation and roughening of skin texture. IBSA Pharmaceuticals’ Profhilo® is the frst BDDE-free injectable formulation of thermally-stabilized, cooperative hybrid HA complexes which effcacy has been proven both *in vitro* and in several independent published clinical studies.This monocentric retrospective observational study tests the effcacy and tolerability of the clinical use of Profhilo according to the specifcally-developed 5-injection point Bio-Aesthetic Points (BAP) technique for facial skin bioremodeling and treatment of laxity of the malar and submalar areas. Methods: Ten female patients with visible signs of facial skin aging were treated with injections of Profhilo® in 3 sittings at 4-week intervals. Photographical evidence, 3D microstructure capture and quantitative data on skin hydration levels and elasticity were collected at the time of treatment and 1 month after its completion. Patients’ and doctors’ subjective evaluations of the

treatment's aesthetic result were recorded according to the GAIS scale. Results: At 1 month after treatment, photographical evidence and 3D Complexion analysis highlighted a clear reduction in wrinkle depth and smoothing of skin texture. Corneometry analysis showed a statistically signifcant 29% improvement in skin hydration, and cutometry analysis recorded a statistically signifcant 25.1% increase in skin compliance (R0) and 47.4% increase in skin elasticity. Both patient and doctor satisfaction levels were high, with average GAIS scores of 2.6 and 2.8, respectively. Conclusions: Overall the treatment was well tolerated, and no notable side effects were recorded.

F. Alvim Sant'anna Addor, **Topical effects of SCA® (*Cryptomphalus aspersa* secretion) associated with regenerative and antioxidant ingredients on aged skin: evaluation by confocal and clinical microscopy**, Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 133–140

Purpose: This was an open-label, single-center clinical study to evaluate a topical association of SCA® (*Cryptomphalus aspersa* secretion) with regenerative and antioxidant ingredients, according to the type and area of the face, on the improvement of signs of skin aging. Patients and methods: One hundred and twenty female participants aged between 40 and 65 years, with facial aging complaints (presence of static, dynamics wrinkles, loss of elasticity, and skin frmness) were randomized into two groups according to the type of skin: normal–oily and normal–dry, and 40 participants were randomized for evaluation of the periocular area (with the presence of wrinkles, expression lines, and dark circles) with both types of skin. The groups received serum for normal–oily skin, a cream for normal–dry skin, and a cream for periocular and eyelid skin (eye area). All the participants were evaluated by a dermatologist and submitted to hydration evaluation by corneometry, elasticity and frmness measures complementarily, and images were collected in confocal reflectance microscopy. Results: Topical skin treatment with the association of SCA with antioxidant ingredients (green coffee oil, olive oil, ectoine, hyaluronic acid, and peptides) was able to promote signifcant clinical and subjective improvement of all signs of skin aging. This improvement was presented at the epidermal level, with improved hydration levels measured by corneometry and epidermal thickness, and at the dermal level, with improvement of the frmness and elasticity parameters, measured by cutometry, from 45 days of use. Conclusion: All the evaluated topical formulations seemed to be an effective alternative for the progressive treatment of signs of skin aging, since they demonstrate a real improvement of dermal–epidermal structure and function with high safety margin for long-term use.

D. Hertz-Kleptow, A. Hanschmann, M. Hofmann, T. Reuther, M. Kerscher, **Facial skin revitalization with CPM®-HA20G: an effective and safe early intervention treatment**, Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 563–572

Background: Hyaluronic acid (HA) fillers are popular for the treatment of signs of facial skin aging. Objective: The objective of this study was to confirm the performance and safety of a new cohesive polydensified matrix HA filler ([CPM®-HA20G, Belotero Revive®, lidocaine-free], Merz Pharmaceuticals GmbH, Frankfurt, Germany) for the treatment of early signs of facial skin aging by use of biophysical measurements as well as subject and investigator satisfaction. Methods: Twenty-five healthy female subjects with signs of facial skin aging were enrolled in this open-label, rater-blinded, observational post-market clinical follow-up study, and received 20 micropuncture treatments of 50 µL CPM®-HA20G each into the lower cheek area at three injection visits 4 weeks apart. Objective biophysical assessments were conducted to demonstrate effects on viscoelastic properties of the skin, surface roughness, tone and radiance, and hydration, at baseline and at all follow-up visits up to 36 weeks. Results: CPM®-HA20G significantly increased gross elasticity of the skin (at weeks 9 and 12), skin firmness (up to week 24), skin tone and radiance and skin hydration (all up to 36 weeks). Significant reduction of skin fatigue (up to 9 weeks), skin roughness (up to 28 weeks), and redness (up to 36 weeks) was also observed. Subjects and blinded investigator were highly satisfied with the treatment outcomes. The treating investigator reported a high level of satisfaction with the ease of injection and the clinical performance of the device. Moreover, data demonstrated a good safety profile of the device. Conclusion: CPM®-HA20G is considered to be an effective and safe HA injectable for skin revitalization in patients suffering from signs of skin aging and loss of skin elasticity. It seems to be a perfect early intervention approach in patients that do not need volumizing treatment and a combination approach in older patients with more pronounced aging.

C. Schrammek-Drusio, **Anamnese & Hautanalyse**, medical skincare, 2019/20

Eine professionelle Hautanalyse ist die Grundlage jeder zielführenden Anti-Aging Behandlung. Denn jeder Hauttyp und –zustand hat verschiedene Anforderungen. Die Kosmetikerin benötigt dafür fundiertes Detailwissen und natürlich Erfahrung. Zur exakten Analyse ist darüber hinaus auch eine auch eine apparative Grundausstattung unverzichtbar.

C. Granger, S. Aladren, J. Delgado, A. Garre, C. Trullas, Y. Gilaberte, **Prospective Evaluation of the Efficacy of a Food Supplement in Increasing Photoprotection and Improving Selective Markers Related to Skin Photo-Ageing**, Dermatol Ther (Heidelb), December 2019

Introduction: Skin exposure to ultraviolet radiation (UVR) can cause oxidative stress, particularly in the absence of adequate protective measures or in individuals with a sensitive skin type. Most commonly, protection from UVR entails the use of topical sunscreens. Sunscreens, however, have various limitations. The objective of this study was to evaluate the efficacy and tolerability of an oral food supplement containing a combination of actives withmainly antioxidative properties (vitamins A, C, D3, E, selenium, lycopene, lutein, as well as green tea, polypodium and grape extracts) in the context of photoprotection. Methods: Photoprotective efficacy was assessed in a 12-week-long, open, prospective and monocentric clinical study with 30 subjects (27 women and 3 men) having a Fitzpatrick skin type I-III and manifesting clinical ageing signs. The study included several visits (14, 28, 56, and 84 days after starting supplement intake), in which photoprotection was evaluated by the measurement of the minimal erythema dose (MED), while the antioxidant capacity of the skin was assessed through ferric reducing antioxidant power (FRAP) and malondialdehyde (MDA) assays. Additionally, several skin parameters (including radiance, elasticity, and moisture) were evaluated. Product evaluation was performed throughout the length of the study by means of a self-assessment questionnaire, and safety was monitored through a self-recording of all observed adverse reactions. Results: The MED levels increased significantly compared to baseline throughout the study visits, reaching an increase of + 8.1% at T84, p\ 0.001. FRAP results also indicated a significant increase in the antioxidant capacity of the skin compared to baseline (+ 22.7% at T84, p\ 0.001), while the MDA assay showed a significant decrease in MDA concentration compared to baseline (- 6.4% at T84, p\ 0.001) which, in line with the FRAP results, indicated enhanced antioxidative protection of the skin. All assessed skin parameters, including radiance (+ 36.1% at T84, p\ 0.001), gross elasticity (+ 13.2% at T84, p\ 0.001), net elasticity (+ 28.0% at T84, p\ 0.001), and moisture (+ 13.8% at T84, p\ 0.001) were also significantly improved. The product was well tolerated as no adverse events were attributed by the investigators to the use of the product. Additionally, the global score obtained from the selfassessment questionnaires provided overwhelmingly positive feedback from the study subjects. Conclusions: The food supplement evaluated in this study was effective and well-tolerated by the subjects, demonstrating a beneficial effect in terms of photoprotection, enhancing the antioxidative status of the skin and improving general skin condition.

S. Yamawaki, **Scar Evaluation**, in R. Ogawa (Edt): Total Scar Management: From Lasers to Surgery for Scars, Keloids, and Scar Contractures, Springer December 2019

Scars induce cosmetic disfgurements, functional disorders, and psychological problems. The treatment of scars is challenging for plastic surgeons. Many treatment modalities are available for scars, including surgical excision, steroid injection, silicone gel sheeting, pressure treatment, and laser treatment. Thus, it is essential to robustly assess the outcomes of scar treatment. Assessment tools for scars fall into two categories, namely subjective assessment using scar rating scales and objective assessment using devices. We introduce the most common assessment methods in this chapter.

M. Boccardi, F. Bracone, F. Deodato, A. De Curtis, G. Macchia, S. Cilla, A. Di Castelnuovo, A. Ianiro, C. Cerletti, A.G. Morganti, M.B. Donati, **Preliminary results of anthocyanin supplementation in breast cancer radiotherapy: impact on skin side effects**, Poster EP-1287 at 38 ESTRO Milan, 2019

The role of anthocyanins has been studied in the prevention of radiotherapy (RT) side effects. In a prospective randomized study (Athena Project-FP7 European Union), we verified the impact of anthocyanin supplementation on acute and mediumterm skin side effects of RT in breast cancer (BC) patients.

S. Heraud, A. Delalleau, A. Houcine, B. Guiraud, D. Bacqueville, B. Payre, M.-B. Delisle, S. Bessou-Touya, O. Damour, **Structural and Biomechanical Characterization of a Scaffold-Free Skin Equivalent Model via Biophysical Methods**, Skin Pharmacol Physiol. 2019 Dec 18: p.1-13

Aims: Among in vitro skin models, the scaffold-free skin equivalent (SFSE), without exogenous material, is interesting for pharmacotoxicological studies. Our aim was to adapt in vivo biophysical methods to study the structure, thickness, and extracellular matrix of our in vitro model without any chemical fixation needed as for histology. Methods: We evaluated 3 batches of SFSE and characterized them by histology, transmission electron microscopy (TEM), and immunofluorescence. In parallel, we investigated 3 biophysical methods classically used for in vivo evaluation, optical coherence tomography (OCT), and laser scanning microscopy (LSM) imaging devices as well as the cutometer suction to study the biomechanical properties. Results: OCT allowed the evaluation of SFSE total thickness and its different compartments. LSM has a greater resolution enabling an evaluation at the cell scale and the orientation of collagen fibers. The viscoelasticity measurement by cutometry was possible on our thin

skin model and might be linked with mature collagen bundles visible in TEM and LSM and with elastic fibers seen in immunofluorescence. Conclusion: Our data demonstrated the simplicity and sensitivity of these different in vivo biophysical devices on our thin skin model. These noninvasive tools allow to study the morphology and the biomechanics of in vitro models.

A. Hameed, N. Akhtar, H.M. Shoaib Khan, M.Asrar, **Skin sebum and skin elasticity: Major influencing factors for facial pores**, Journal of Cosmetic Science, Volume 18, Issue 6, December 2019, p. 1968-1974

Objective: The current research work was initiated to develop anti-aging phytocosmetic formulation of phytoantioxidant, to evaluate their effect on human skin, and to link R parameters of skin with skin sebum and aging. Methods: According to COLIPA, 10 healthy male volunteers, aged between 20 and 30 years, having no skin infection or other hypersensitivity disorders, were included in the study. The effect of formulation was evaluated on skin pores and skin elasticity on cheeks for 90 days at regular interval. Various parameters of visible facial pores were assessed using the Skin VisioFace®, Cutometer®, Elastometer®, and Sebumeter®. These data were compared and correlated to examine the possible relationship between visible facial pores, skin elasticity, and skin sebum. Results: From R0 to R9, R0, R5, and R9 were negatively correlated with elasticity while R7 shows a positive correlation with elasticity. R7 parameter of Cutometer® was negatively correlated with facial large pores (r=−0.337, P=0.033). R9 parameter of Cutometer® was significantly positively correlated with facial large pores (r=0.54, P=0.000). Conclusion: We could assume that the enhancement of skin elasticity would be the fundamental strategies in the prevention of size and count of visible facial pores (fine and large) by the application of formulation containing natural compounds.

F. Niforos, P. Ogilvie, M. Cavallini, C. Leys, J. Chantrey, M. Safa, S. Abrams, R. Hopfinger, A. Marx, **VYC-12 Injectable Gel Is Safe And Effective For Improvement Of Facial Skin Topography: A Prospective Study**, Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 791–798

Objective: Evaluate safety and effectiveness of VYC-12 (Juvéderm Volite; an injectable crosslinked hyaluronic acid gel designed to improve skin quality attributes such as surface smoothness and hydration) for facial intradermal injection. Materials and methods: In a prospective, single-arm study, subjects with moderate/severe cheek skin roughness per Allergan Skin Roughness Scale (ASRS) received VYC-12 in the cheeks and forehead, and/or neck, with touch-up treatment to correct asymmetry 30 days later and optional repeat treatment 9 months after last treatment. The primary effectiveness measure was ASRS responder rate (percentage of cheeks with ≥1-point improvement from baseline) at month 1. Skin hydration was instrument-assessed. Results: Of 131 subjects treated, 31 (23.7%) received touch-up treatment. ASRS responder rate was 96.2% at month 1, 76.3% at month 4, 34.9% at month 6, and 87.1% after repeat treatment. Responder rate in cheeks with severe baseline roughness was 93.8%, 83.1%, and 52.3% at months 1, 4, and 6, respectively. Skin hydration improved significantly ($P<0.01$) from baseline at all timepoints through month 9. Injection site responses were as expected. All treatment-related adverse events were mild/moderate. Conclusion: VYC-12 safely and effectively improved skin smoothness up to 6 months and hydration lasting 9 months.

N. Braun, S. Binder, H. Grosch, C. Theek, J. Ulker, H. Tronnier, U. Heinrich, **Current Data on Effects of Long-Term Missions on the International Space Station on Skin Physiological Parameters**, Skin Pharmacol Physiol 2019; 32: p. 43-51

Background: Skin reaction to spaceflight has not really been studied yet, although the skin has a very important barrier function to protect the body and can contribute to a more general understanding of physiology. It is proposed here to make a more thorough investigation of the skin during longterm spaceflight, using noninvasive techniques. Aims: The aim of the present Skin-B study is to investigate the kinetics and range of possible skin modifications during long-duration spaceflights and their recovery. Methods: In order to investigate the effect on skin physiological parameters during spaceflight, measurements were carried out on 6 astronauts with respect to skin hydration, transepidermal water loss/n barrier function, and surface evaluation of the living skin in orbit. Additional measured parameters on the ground were skin elasticity, skin density and thickness, as well as microcirculation. Results: Data from the Skin-B subjects (n = 6) contradict the results obtained in the previous pilot study SkinCare (n = 1 subject).In the present study, no deterioration of the skin was found but rather an improvement in skin hydra tion and skin barrier function, and no changes or improvement in the appearance of the skin surface. Furthermore, the skin density and skin thickness as well as skin elasticity values were unchanged from pre-flight values. Conclusion: In conclusion, we found that spaceflight under present conditions has no negative impact on skin physiological parameters.

F. Spada, A.H. Lui, T.M. Barnes, **Use of formulations for sensitive skin improves the visible signs of aging, including wrinkle size and elasticity**, Clinical, Cosmetic and Investigational Dermatology 2019:12, p. 415–425

Background: Sensitive skin affects an increasingly large proportion of the population and is less tolerant to frequent and prolonged use of cosmetics. This study investigates the antiaging effects of a skin care system developed for use on sensitive skin. Methods: A total of 30 healthy Caucasian females, aged 32–72, were enrolled in this doubleblind randomized placebo-controlled split-face study. A routine consisting of twice daily topical applications of the test cleanser and test moisturizer or placebo or positive control products was followed for 28 days, with parameters measured at baseline and at 7-day intervals. Objective skin assessments for hydration, transepidermal water loss (TEWL), skin surface topography, elasticity and safety assessment were conducted. Results: Wrinkle surface, length and depth significantly improved by 34.8±4.7% (P<0.001), 19.0±3.2% (P<0.05) and 24.3±3.5% (P<0.05), respectively, after 28 days of skin care treatment with the test cleanser and test moisturizer. R2 (gross elasticity), R5 (net elasticity) and R7 (biological elasticity) significantly increased by 32.8±6.5% (P<0.001), 47.3±8.6% (P<0.001) and 50.6±5.1% (P<0.001), respectively, while R6 (viscoelastic portion) significantly decreased by 33.4±4.6% (P<0.001) after 28 days. Skin hydration was also found to increase significantly after 28 days by 42.2±8.5% (P<0.01), but there was no change in TEWL. No adverse events were reported. Conclusions: A novel skin care routine developed for use on sensitive skin significantlyimproves the signs of aging including hydration, wrinkle size and elasticity without significant adverse effects.

R. Lubart, I. Yariv, D. Fixler, A. Lipovsky, **Topical Hyaluronic Acid Facial Cream with New Micronized Molecule Technology Effectively Penetrates and Improves Facial Skin Quality: Results from In-vitro, Exvivo, and In-vivo (Open-label) Studies**, J Clin Aesthet Dermatol. 2019;12(10): p. 39–44

Background: Topical hyaluronic acid (HA) has shown effectiveness in maintaining skin hydration. Topical creams containing HA are widely available, but their efcacy is limited by their lack of penetration into the skin due to the large molecule size of HA, the result of being formulated into a cream base. Objective: In this three-part study (in vitro, ex vivo, and in vivo), molecule sizes, penetration levels, and antiaging qualities of a topical HA facial cream that was formulated using a new technology that micronizes HA molecules (m-HA) were assessed. Methods and Results: Particle sizes of m-HA were evaluated using electron microscopy, which showed varying sizes, the smallest of which was 100nm in diameter. The antioxidation capabilities of m-HA were measured using electron spin resonance and were found to be higher than original HA. Skin penetration of the m-HA formulation was evaluated via immunohistochemical staining of porcine skin samples, which demonstrated penetration of the formulation into the stratum corneum and the deep epidermal layers toward the dermis. Antiaging qualities of the m-HA formulation were assessed in an open-label clinical study that included 36 healthy adult women. Skin parameters were measured objectively (e.g., Corneometer, Cutometer) and subjectively via patient questionnaire, results of which indicated signifcant improvements in facial skin hydration, elasticity, and wrinkle depth. Conclusion: The topical HA facial cream with m-HA technology demonstrated penetration into the epidermal skin layer, and, to our knowledge, our formulation is the frst HA facial cream to achieve this. Clinical application of the facial cream demonstrated objective and subjective improvements in facial skin quality of healthy adult female subjects. Our results support the use of this new HA facial cream with m-HA technology as an effective antiaging topical therapy. Larger randomized, controlled studies are needed to confrm our fndings.

A.K. Langton, H.K. Graham, C.E.M. Griffiths, R.E.B. Watson, **Ageing significantly impacts the biomechanical function and structural composition of skin**, Experimental Dermatology, 2019;28: p. 981–984

Skin ageing is a complex process involving the additive effects of skin's interaction with its external environment, predominantly chronic sun exposure, upon a back- ground of time-dependent intrinsic ageing. Here, using non-invasive cutometry and ballistometry, we explore the consequences of ageing on the biomechanical function of skin in otherwise healthy White Northern European volunteers. Intrinsic skin age- ing caused biomechanical decline; skin loses both resilience ($P < 0.01$) and elasticity ($P < 0.001$), which is characterised histologically by modest effacement of rete ridges ($P < 0.05$) and disorganisation of papillary dermal elastic fibres. At photoexposed sites, biomechanical testing identified significant loss of biomechanical function— particularly in the aged cohort. Photoaged forearm displayed severe loss of resilience ($P < 0.001$) and elasticity ($P < 0.001$); furthermore with repetitive testing, fatigue ($P < 0.001$), hysteresis ($P < 0.001$) and viscous “creep” ($P < 0.001$) were exacerbated. Histologically, both young and aged forearm displayed flattening of rete ridges and disruption to the arrangement of elastic fibres. We conclude that maintenance of skin architecture is inherently associated with optimal biomechanical properties. Modest perturbations to skin architecture—as exemplified by intrinsic

ageing—result in mod- erate functional decline. Chronic sun exposure causes fundamental changes to the clinical and histological appearance of skin, and these are reflected by an extreme alteration in biomechanical function.

N. Nishimura, S. Inoue, K. Yokoyama, S. Iwase, **Effect of spraying of fine water particles on facial skin moisture and viscoelasticity in adult women**, Skin Res Technol. 2019;25: p. 294-298

Background/purpose: It is known that the elderly and adult women with reduction in sebum secretion have reduced skin barrier function, drying of the skin in a low humidity environment is accompanied by physiological distress. As our hypothesis, when fine water particles are sprayed on the skin, the water content of the corneal layer is significantly increased. In the present study, we examined the ability of fine water particles to improve facial skin moisture levels in adult women. Methods: We examined skin conductance, transepidermal water loss (TEWL), and skin elasticity as an index of skin barrier function at the cheek in 17 healthy adult women in the spraying of fine water particles, in the environment temperature at 24°C and 34.5% relative humidity. Results: The skin conductance of stratum corneum after 120 minute of spraying, A condition (peak particle size below 0.5 pm) was 119.7 ± 25.1%, B condition (peak particle size 1.8 pm) was 100.4 ± 31.7%, C condition (peak particle size 5.4 pm) was 110.1 ± 25.0%, and the A condition was significantly higher than the B condition. Also, skin elasticity in the A condition tended to be higher value than in the other conditions. Transepidermal water loss (TEWL) after 120 minute of spraying showed a lower value in the A condition than in the other conditions.In the A condition, the skin conductance steadily maintained their initial levels up to 360 minute after spraying. Conclusion: Especially, by spraying smallest fine water particles, skin barrier function at the cheek was improved. These data indicated that non-charged fine water particles played an important role on moisten skin in a low humidity environment.

Y. Song, Y. Pan, H. Wang, Q. Liu, H. Zhao, **Mapping the face of young population in China: Influence of anatomical sites and gender on biophysical properties of facial skin**, Skin Res Technol. 2019;25: p. 333-338

Background: Facial skin exhibits unique biophysical properties, which are influenced by anatomical regions and genders. The aim of this study was to comprehensively assess the regional and gender differences in facial skin biophysical parameters among Chinese population. Materials and Methods: The 12 skin biophysical parameters at four distinct facial skin sites (forehead, cheek, canthus and chin) were measured in a normal population (n = 212) with 42 males and 141 females aged 18-29 years living in Beijing. These parameters consisted of skin hydration, transepidermal water loss, sebum content, erythema/melanin indices, L*a*b* color, skin gloss and elasticity, all quantifying with non-invasive instruments. Results: The results demonstrated that the characteristics of the facial skin were significantly different between the regions and genders. The forehead had weaker skin barrier function but secreted the most sebum content, while the cheek was the driest and brightest region on the face. The canthus was the most hydrated area and the chin displayed higher sebum secretion, darker skin color and less elastic. The females showed more hydrated, less oil, lighter and more elastic facial skin compared with males. Conclusion: This study indicates that the young Chinese facial skin significantly varies with face anatomical regions and differs between genders.

H. Cortes, J.J. Magana, O.D. Reyes-Hernandez, N. Zacaula-Juarez, M. Gonzalez-Torres, W. Diaz-Beltran, M.C. Leon-Trejo, L. Carino-Calvo, G. Leyva-Gomez, M. Gonzalez-Del Carmen, **Non-invasive analysis of skin mechanical properties in patients with lamellar ichthyosis**, Skin Res Technol. 2019;25: p. 375-381

Background: Reliable methods for the quantitative evaluation of skin of patients with ichthyosis are critically needed. Our purpose was to evaluate the biomechanical parameters of skin in a cohort of patients with clinically diagnosed lamellar ichthyosis. Materialsand methods: Twenty-two patients diagnosed with lamellar ichthyosis were studied. Ichthyosis plaques located in upper distal limbs were assayed, and a nearby anatomical region without plaques from the same patient was employed as control.Skin biomechanical properties were studied through a non-invasive device (Cutometer ' ' MPA 580). Results: Ichthyosis plaques had higher values for the Uf-Ua parameter and lower values for the Ua/Uf, Ur/Ue, and Ur/Uf parameters. Adults and children showed similar statistical differences.There wereno significant differencesin data from men, whereas in women differences for all of the parameters were found. There was a significant decrease in the hydration and an increase in melanin index in the ichthyosis plaques. Conclusion: Our results suggest that analysis of parameters Uf-Ua, Ua/Uf, Ur/Ue, Ur/Uf, hydration, and melanin index could be employed for quantitative monitoring of skin. Therefore, the non-invasive method applied may be suitable for evaluation of skin of patients with ichthyosis in response to medical treatments.

L. Bolke, G. Schlippe, J. Gerß, W. Voss, **A Collagen Supplement Improves Skin Hydration, Elasticity, Roughness, and Density: Results of a Randomized, Placebo-Controlled, Blind Study**, Nutrients 2019, 11, 2494

The purpose of this randomized, placebo-controlled, blind study was to investigate the effects of the drinkable nutraceutical ELASTENfi (QUIRIS Healthcare, Gütersloh, Germany) on skin aging and skin health. Drinking ampoules provides a blend of 2.5 g of collagen peptides, acerola fruit extract, vitamin C, zinc, biotin, and a native vitamin E complex. This controlled interventional trial was performed on 72 healthy women aged 35 years or older. They received either the food supplement (n = 36) or a placebo (n = 36) for twelve weeks. A skin assessment was carried out and based on objective validated methods, including corneometry (skin hydration), cutometry (elasticity), the use of silicon skin replicas with optical 3D phase-shift rapid in-vivo measurements (PRIMOS) (roughness), and skin sonography (density). The verum group was followed for an additional four weeks (without intake of the test product) to evaluate the sustainability of the changes induced by the intake of the test product. The test product significantly improved skin hydration, elasticity, roughness, and density. The differences between the verum group and the placebo group were statistically significant for all test parameters. These positive effects were substantially retained during the follow-up. The measured effects were fully consistent with the subjective assessments of the study participants. The nutraceutical was well tolerated.

D. Ap O Modena, C. Nogueira da Silva, T.C.P. Delinocente, T.B. de Araújo, T.M. de Carvalho, C. Grecco, Re. Gomes Moreira, G. Campos, J.R. de Souza, R. Michelini Guidi, **Effectiveness of the Electromagnetic Shock Wave Therapy in the Treatment of Cellulite**, Dermatology Research and Practice, Volume 2019

In the past centuries, the human body was undervalued; nowadays, however, it is overvalued, and thus the manifestation of the dissatisfactions regarding the body has been increasing. Most of the time, these dissatisfactions are related to cellulite, which is most common in women. Its treatment is one of the challenges which encourage the development of new therapeutic modalities, among them the shockwave therapy. Objective. To evaluate the efcacy of ESWT in the treatment of cellulite in gluteus and posterior of thigh. Method. Tis is a prospective and comparative study, in which volunteer women who attended the criteria of inclusion were selected and who were subjected to 10 sessions of ESWT. Te following were performed as an evaluation method: anthropometry, perimetry, skin viscoelasticity with the Cutometer, thickness of hypodermis with diagnostic ultrasound, analysis of the scale of severity of cellulite (CSS), and quality of life by the Celluqol questionnaire. Te evaluations occurred before the frst session (baseline), afer 6 and 10 sessions, and during a follow-up of 3 months afer the last session. Te statistical test applied was the ANOVA one-way with post hoc of Tukey (P-value < 0.05). Results. Tere was signifcant improvement (P<0.05) for CSS, for the variable referring to gross elasticity and skin deformation ability evaluated in the Cutometer and improvement of quality of life represented by Celluqol. Te result was maintained particularly in the follow-up of 3 months afer the end of the treatment. Conclusion. Te results presented demonstrated the efectiveness and safety of ESWT in the treatment of cellulite and in the decrease of the degrees, improvement of the aspect of the skin, and reestablishment of quality of life.

M. Sano, S. Hirakawa, Y. Yamanaka, E. Naruse, K. Inuzuka, T. Saito, K. Katahashi, T. Yata, T. Kayama, H. Tsuyuki, N. Yamamoto, H. Takeuchi, N. Unno, **Development of a Noninvasive Skin Evaluation Method for Lower Limb Lymphedema**, Lymphatic Reasearch and Biology, 2019

Background: The skin's condition is altered in lymphedema patients, and evaluating this change is important. Some noninvasive methods for evaluating skin condition have been reported, especially in upper limb lymphedema. However, evaluating the skin in lower limb lymphedema remains challenging and is often limited to palpation. We aimed to develop a noninvasive skin evaluation method for lower limb lymphedema patients. Methods and Results: Twenty-five lower limb lymphedema patients were included. Skin induration and elasticity were measured using Indentometer IDM 400 and Cutometer MPA580. The relationship between the properties of skin from the healthy forearm and thigh, those of the affected thigh, and age was analyzed. Predicted skin induration age (IA) and elasticity age (EA) were calculated from the forearm, whereas actual values were calculated from the thigh, and the differences (DIA and DEA) were assessed. Patients were classified according to the International Society of Lymphology clinical staging system, and the differences in DIA and DEA were analyzed among the three groups (healthy, stage I/IIa, and stage IIb/III). Skin biopsy was performed in five unilateral lower limb lymphedema patients, and the dermal elastic fiber area was determined using microscopy with Elastica van Gieson staining. DEA significantly increased with disease progression, but DIA did not change significantly. Microscopy revealed elastic fiber filamentous changes, with decreased elastic fiber areas in lymphedema-affected skin. Conclusion: To our knowledge, this is the first report to evaluate lower limb skin elasticity in lymphedema quantitatively and noninvasively. DEA is useful for

evaluating skin condition progression in lymphedema patients.

C. Cho, E. Cho, N. Kim, J. Shin, S. Woo, E. Lee, J. Hwang, J. Ha, **Age-related biophysical changes of the epidermal and dermal skin in Korean women**, Skin Res Technol. 2019; 25: p. 504-511

Introduction: The clinical characteristics of skin were investigated to study the interrelationship and changes in the biophysical properties of the epidermal and dermal layers associated with aging using noninvasive methods. Methods: Our study included 100 healthy women aged between the early 20s and late 60s. Biophysical characteristics of skin such as color (brightness and spots), transparency, wrinkle on crow's feet, elasticity, hydration, sebum content, glossiness, and transepidermal water loss measured under controlled conditions. Results: This study performed in a Korean population demonstrated that aging significantly affects human skin in terms of parameters such as wrinkles, skin color, elasticity, and epidermal hydration. Age-related changes in skin hydration showed varying patterns between the epidermis and dermis. Skin color showed heterogeneous characteristics between the upper and lower epidermal layers associated with aging. Skin elasticity and wrinkles were observed to show and inversely proportional relationship in the early 40s. Conclusions: We confirmed the significant influence of aging on the biophysical properties of skin and determined the distinct age-related biophysical changes in the epidermal and dermal layers of skin using noninvasive method. This study indicates the need for further research to investigate the distinctive age-related changes in characteristics of the epidermal and dermal layers of human skin.

H. Cortés, J.J. Magaña, O.D.Reyes-Hernández, N. Zacaula-Juárez, M. González-Torres, W. Diaz-Beltrán, M.C. León-Trejo, L. Cariño-Calvo, G. Leyva-Gómez, M. González-Del Carmen, **Non-invasive analysis of skin mechanical properties in patients with lamellar ichthyosis**, Skin Res Technol. 2019; 25: p. 375-381

Background: Reliable methods for the quantitative evaluation of skin of patients with ichthyosis are critically needed. Our purpose was to evaluate the biomechanical parameters of skin in a cohort of patients with clinically diagnosed lamellar ichthyosis. Materials and methods: Twenty-two patients diagnosed with lamellar ichthyosis were studied. Ichthyosis plaques located in upper distal limbs were assayed, and a nearby anatomical region without plaques from the same patient was employed as control. Skin biomechanical properties were studied through a non-invasive device (Cutometer® MPA 580). Results: Ichthyosis plaques had higher values for the Uf-Ua parameter and lower values for the Ua/Uf, Ur/Ue, and Ur/Uf parameters. Adults and children showed similar statistical differences. There were no significant differences in data from men, whereas in women differences for all of the parameters were found. There was a significant decrease in the hydration and an increase in melanin index in the ichthyosis plaques. Conclusion: Our results suggest that analysis of parameters Uf-Ua, Ua/Uf, Ur/Ue, Ur/Uf, hydration, and melanin index could be employed for quantitative monitoring of skin. Therefore, the non-invasive method applied may be suitable for evaluation of skin of patients with ichthyosis in response to medical treatments.

S.H. Kim, S.J. Lee, J.W. Lee, H.S. Jeong, I.S. Suh, **Clinical trial to evaluate the efficacy of botulinum toxin type A injection for reducing scars in patients with forehead laceration**, Medicine (2019) 98:34(e16952)

Skin damage by either trauma or surgical intervention inevitably results in scar formation. In some patients, facial scars can be cosmetically disfiguring and may cause functional impairment and psychosocial withdrawal.[1] Cutaneous scars are generally distinguished from surrounding normal skin by differences in color, thickness, contour, compliance, overall cosmetic, and functional damages such as contracture formation. Not only the disfigurement contributes to the undesirable appearance, but also to prolonged contracture, itching, or tingling which intervenes in the daily-living of patients. Young and Hutchison found that patients were usually dissatisfied with their surgical scars, irrespective of sex, age, ethnicity, or geographical location and that 91% of them would value even a small improvement in their scars.[2] Although surgeons make every effort to prevent widening, hypertrophy, hypo- or hyperpigmentation of scars, in some situations (massive trauma or burn) the situations is out of their hands, resulting in horrible sequalae. Despite numerous methods, such as excision, steroid administration, radiation, laser, and pressure therapy, having been introduced until now, scar management has always been a troublesome and challenging task for surgeons.

B. Hersant, M. Sid-Ahmed, L. Braud, M. Jourdan, Y. Baba-Amer, J.-P. Meningaud, A.-M. Rodriguez, **Platelet-Rich Plasma Improves the Wound Healing Potential of Mesenchymal Stem Cells through Paracrine and Metabolism Alterations**, Stem Cells International, Oct 2019

Chronic and acute nonhealing wounds represent a major public health problem, and replacement of cutaneous lesions by the newly regenerated skin is challenging. Mesenchymal stem

cells (MSC) and platelet-rich plasma (PRP) were separately tested in the attempt to regenerate the lost skin. However, these treatments often remained inefficient to achieve complete wound healing. Additional studies suggested that PRP could be used in combination with MSC to improve the cell therapy efficacy for tissue repair. However, systematic studies related to the effects of PRP on MSC properties and their ability to rebuild skin barrier are lacking. We evaluated in a mouse exhibiting 4 full-thickness wounds, the skin repair ability of a treatment combining human adipose-derived MSC and human PRP by comparison to treatment with saline solution, PRP alone, or MSC alone. Wound healing in these animals was measured at day 3, day 7, and day 10. In addition, we examined in vitro and in vivo whether PRP alters in MSC their proangiogenic properties, their survival, and their proliferation. We showed that PRP improved the efficacy of engrafted MSC to replace lost skin in mice by accelerating the wound healing processes and ameliorating the elasticity of the newly regenerated skin. In addition, we found that PRP treatment stimulated in vitro, in a dose-dependent manner, the proangiogenic potential of MSC through enhanced secretion of soluble factors like VEGF and SDF-1. Moreover, PRP treatment ameliorated the survival and activated the proliferation of in vitro cultured MSC and that these effects were accompanied by an alteration of the MSC energetic metabolism including oxygen consumption rate and mitochondrial ATP production. Similar observations were found in vivo following combined administration of PRP and MSC into mouse wounds. In conclusion, our study strengthens that the use of PRP in combination with MSC might be a safe alternative to aid wound healing.

M. Kubiak, P. Mucha, H. Rotsztejn, **Comparative study of 15% trichloroacetic acid peel combined with 70% glycolic acid and 35% trichloroacetic acid peel for the treatment of photodamaged facial skin in aging women,** J Cosmet Dermatol., 2019 Oct

Background: Photoaging (extrinsic aging) is caused by environmental exposure to ultraviolet radiation. Superficial and medium-depth chemical peels with trichloroacetic acid (TCA) are performed to reduce wrinkles, hyperpigmentation, dryness, and erythema caused by photoaging process. Aim: The aim of this study was to compare the efficacy and tolerability of 15% TCA peel against the combined 70% glycolic acid and 35% TCA for the treatment of photodamaged facial skin. Patients/methods: Forty female patients with types II and III of Glogau photoaging scale were divided into two groups of twenty subjects (GA/TCA and 35% TCA). The GA/TCA group was treated with combination peeling of 70% GA and 15% TCA, whereas the 35% TCA group was treated with monopeeling of 35% trichloroacetic acid. Each patient was submitted to five sessions of these peels, with an interval of 14 days between each session. The following skin aging parameters were examined before treatments, before each session, and 3 months after the last application: hydration, elasticity, melanin index, and erythema index (MPA-5; Courage-Khazaka, Germany); and depth and volume of wrinkles (PRIMOS; GFMesstechnik GmbH, Germany). Results: Both peel methods achieved significant improvement in all skin parameters: elasticity, hydration, melanin index, and erythema index. Significant differences between the GA/TCA and 35% TCA groups were found only for hydration and melanin index. GA/TCA was characterized by significantly higher values of the hydration parameter and lower values of melanin index compared with 35% TCA. Combination peel GA/TCA did not cause dryness, edema, or intensive lysis of the epidermis, and the frequency of peel-induced erythema did not increase with the addition of glycolic acid, but with higher concentration of the TCA solution. However, subject-perceived improvements of the 35% TCA peel did not differ significantly from subject-perceived improvements of combination peel treatment. Adverse events requiring intervention or discontinuing treatment were not observed in either group. Conclusion: The addition of glycolic acid before 15% TCA chemical peel application significantly enhanced TCA-induced improvement in photoaging parameters (increase in skin elasticity and hydration; reduction in melanin index and erythema index), and subject-perceived improvements. However, 35% TCA peel is more effective in reducing wrinkles, despite a lower tolerability. Both medium-depth chemical peels including 15% TCA in combination with 70% GA and 35% TCA alone proved to be useful for the removal of epidermal or superficial lesions and to improve the texture of photodamaged facial skin (grade II-III Glogau photoaged skin).

M. Napoli, S. Gervason, J.-Y. Berthon, E. Filaire, **Psycholobiological approach for a positive skin ageing: target senescence cells to boost emotion**, presentation at the 25th IFSCC Conference Milan, October 2019

The world's population isgetting older. According to Euromonitor, as of 2019, 1.7 billion people globally, or 23% of the global population, is aged 50 or above. Life expectancy is rising around the globe. The average global life expectancy is 72.3 years with some countries exceeding this average, such as Japan at 84.1 years, the United Kingdom at 81.3 years and the United States at 79 years. Thus, population ageing has become a global phenomenon in recent decades. Even if people are living longer, they have a growing desire to be healthier. Healthy living is no longer a sub-culture; it is a prominent part of mainstream culture globally across all industries, ranging from sleep devices to supplements,

healthy snacks and beverages... The pursuit of healthier lifestyles is driven by a desire for two things: the ability to live a quality life in the present and the ability to live a long life in the future. It is the distinction between prolonging life and prolonging quality of life, which differentiates the topics of health and ageing. Thus, the desire to be healthier is changing the narrative of ageing, moving away from fighting the signs of ageing to focusing on "looking and feeling good at any age". This shift is most evident in the beauty industry. Terms such as 'successful ageing', 'active ageing' and 'positive ageing' are now part of the discourse with regards to growing older. From this trend, a new dermo-cosmetic concept emerged, well ageing, which focuses on wellness in order to maintain health capital. This concept is linked to the psychophysiological approach.

K. Saito, F. Fujita, A. Yamaguchi, K. Motonami, Y. Yamamoto, T. Shimada, M. Toriyama, R. Utami, Y. Suzuki, M. Tominaga, K.J. Ishii, **A new anti-inflammatory agent from a traditional Japanese spa: The role of TRPM4 in immune responses in keratinocytes and its activating agent**, presentation at the 25th IFSCC Conference Milan, October 2019

The immune system is essential in protecting the human body against attacks by harmful viruses and bacteria and exposure to certain antigens. However, excessive immune reactions in the skin lead to inflammation and cause skin troubles such as dryness, decreasing elasticity, and pore conspicuousness in the skin. Hariya et al. reported that the inflammatory cytokine interleukin 1 receptor antagonist (IL-1ra)/ IL-1α ratio was higher in female subjects with sensitive skin than in healthy control subjects. That ratio also correlated with the values for transepidermal water loss (TEWL), an index of the skin's barrier function. Matrix metalloproteases (MMPs), which degrade collagen and lead to sagging or wrinkles in the skin, are activated by inflammatory cytokines under exposure to ultraviolet (UV) rays, resulting in decreased skin elasticity. It was also reported that women with abundant large facial pores showed high TEWL values and high sebum content with significant amounts of free fatty acids. Oleic acid increases intracellular calcium ion concentration in keratinocytes, induces abnormal keratinization, and induces IL-1α in keratinocytes, suggesting that it causes parakeratosis around the facial pores. Keratinocytes produce IL-1α that initiates immune reaction and enhances keratinocytes growth by stimulating the growth factor production by fibroblasts. Keratinocytes also release cytokines in response to non-infective environmental factors such as chemical substances and UV irradiation as well as injury or infection. As a result, unnecessary immune reactions occur. Therefore, it is important to properly regulate immune responses in keratinocytes as excessive activation of keratinocytes may cause abnormal proliferation, resulting in skin problems.

C. Matsuda, R. Uematsu, M. Ogura, Y. Hada, H. Iwano, S. Sawakio, **Correlation between proteasome activity and ECM components synthesis and improvement effect of skin elasticity by adzuki bean extract**, presentation at the 25th IFSCC Conference Milan, October 2019

The proteasome is a large multi-protein complex that plays a central role in protein degradation. Proteasome activity decreases with age, and proteasome inhibition results in increased production of MMPs and decreased collagen synthesis in fibroblasts. Although proteasome may plays an important role in maintaining ECM components, there have been few studies investigating the correlation between proteasome activity and synthesis of ECM components other than collagen. To elucidate new mechanisms of sagging on the face with age, we focused on the correlation between proteasome activity and ECM components synthesis. It was revealed that inhibition of proteasome activity reduced gene expression of collagen, hyaluronan synthase and elastin in fibroblasts. This result suggests that proteasome plays an important role in maintaining ECM components. Therefore, a decline of proteasome activity may lead to increased wrinkles and sagging with age. Furthermore, we found that adzuki bean extract had an effect that improved the elasticity of the skin by activating proteasome. Adzuki bean extract effectively increased proteasome activity, collagen synthesis and gene expression of hyaluronan synthase and elastin in fibroblasts. Moreover, it improved the elasticity and tactile elasticity of the face *in vivo*. Together, the findings suggest that adzuki bean extract increases ECM components synthesis by increasing proteasome activity and that this effect appears even *in vivo*.

K. Takagaki, Y Matsumoto, M. Sawane, Y. Hara, A. Miyake, K. Kajiya, **Holistic Beauty -3-Dimensional Macroscopic Visualization of Vasculature in Skin and its Physical Relevance in Skin-Aging,** presentation at the 25th IFSCC Conference Milan, October 2019

There seems to be ever increasing interest for "holistic beauty" in the cosmetic field, which refers to the idea that skin is not a separate organ but is physically and functionally connected to the body through its vascular, immune, and endocrine systems. Oriental medicine has the view that skin is a mirror of the rest of the body. This perhaps shows that the connection between the skin and body has long been emphasized in Asia. Following this, in western medicine, as William Osler stated, "A man is as old as his arteries." Vascular function is particularly related to the aging process, which includes the

skin. However, the relevance of blood vessels to the process of skinaging, including their physical properties, still remains to be elucidated. In this study, we succeeded in making a 3-dimentional (3D) "macroscopic" visualization of capillaries in human skin. It revealed that capillaries are densely and uniformly networked in the upper dermis – particularly with a regular loop structure just below the epidermis – and were reduced with photo-aging. This innovative visualization of the skin's 3D capillary structure allowed the examination of the relationship between the capillaries and physical features of the skin, like elasticity, with *in vivo* testing using optical coherence tomography angiography and a newly established *in vitro* model. This work suggested that elasticity was strongly correlated with the density and size of capillaries. Furthermore, our *ex vivo* skin culture model clearly demonstrated that type I collagen was found closely surrounding the blood vessels, suggesting a possible mechanism of increased elasticity by vessel-associated collagen production. These results indicate that blood vessels play an important role in maintaining skin elasticity. Previous studies have argued that skin elasticity is only controlled by dermal matrix components like collagen, elastin, and hyaluronic acids. Here, for the first time, we revealed both *in vivo* and *in vitro* that capillaries can control the skin's physical properties. This data seems to explore a new avenue of understanding in the skin's physical properties which could allow us to provide expanding holistic solutions to promote better skin health and greater beauty.

M. Benvegnu, C. D'Erceville, I. Bonnet, D. Hérault, A. Mine Solène, V. Frei, **The Sustainable Rambutan Program: A Multiple Valorization to Foster a Better Local Impact,** presentation at the 25th IFSCC Conference Milan, October 2019

In the global trend of responsible living, consumer's beauty routine is one key field where consumers seek for products with ecological and social engagements. The future cosmetic solutions should be developed with an environmental consciousness while keeping the same high level of in vitro demonstrated biological efficacy and clinical performance. Responsible living is a daily challenge, women and men want to give their skin and hair special care to counter environmental impacts, but not to the detriment of the planet. Consumers are now searching for more ethical cosmetic products, which are as healthy for them as they are for the earth. Consequently, the cosmetic industry has taken up the trends of the demand of modern consumers and their growing environmental awareness to continue developing sustainable solutions. This industry expects more responsible cosmetic ingredients from suppliers who can assure a reliable supply chain and social commitment, and who will not compromise on the level of effectiveness. This is the starting point of our work. Capitalizing on our experience acquired with a previous Argan program, we identified a plant and built a new specific supply chain in cooperation with a long-standing local partner in Vietnam. We identified rambutan, also called *Nephelium lappaceum*, a well-known tree in Asia, that grows in the humid tropics. Out of the fruit itself, we discovered that other by-products of the rambutan plant may possess interesting properties for our skin's health and beauty.

V.R. Morares, P.M.B.G. Maia Campos, **Characterization of Nondiabetic and Diabetic Type 2 Skin in the Aging Process Using Biophysical and Skin Imaging Techniques**, presentation at the 25th IFSCC Conference Milan, October 2019

The aging process is a biological, multifactorial and complex phenomenon that includes intrinsic and extrinsic factors. The intrinsic factors are correlated with genetic and metabolism and the extrinsic factors are caused by sun exposition, pollution and other. Both processes results in skin aging, where signs as wrinkles, expression lines, changes in dermal thickness can be observed. Advanced glycation end products – AGEs, are originated from no enzymatic reactions which involves the reduction of sugars and amino groups of proteins and aminoacids. Collagens are essential proteins since they are responsible for the extracellular matrix structure. The AGEs cause modifications on the matrix, once the skin collagen deteriorates by crosslinking process. People with Diabetes have more AGEs in the tissue due to the high glucose concentration, which can cause skin damages. Thus, diabetic patients are more predisposed to signs of early aging than healthy people. In this context, it is very important the better comprehension of the diabetic skin in comparison to the no diabetic one. Thus, the aim of this study was to evaluate the clinical changes in the diabetic type 2 skin by biophysical skin imaging techniques.

F. Carlomagno, **Effectiveness of a Biotechnological Active Ingredient for Cosmetics Targeting Skin Microbiota Protection,** presentation at the 25th IFSCC Conference Milan, October 2019

The skin is the largest organ of the human body in surface, mainly serving as a physical barrier which protects the body from external aggression. An adult's skin hosts an average population of 1,000 billion microorganisms among fungi, viruses and bacteria. This fauna lives and moves on the skin surface as well as in the superficial layers of the epidermis to down to the hair follicles and glands. Microorganisms form a complex ecosystem collectively referred to as skin microbiota. This tiny, but important micro-world is essential for the skin to main it healthy and to work as a perfect barrier. A

distinctive combination of microorganisms all over our body is peculiar for all of us, although scientists point out that skin microbiome varies a lot during our lives. This variation is linked to age, changes of lifestyle and to the external stressors we are submitted to (4). Different body sites can also have completely different skin microbiota configurations, both inter- and intra-personally, linked to the peculiar characteristics of that precise micro-environment. For example, just focusing on the face, studies show that there are great differences between forehead and cheek skin microbiota, due to the existence of moist, dry and sebaceous skin sites (5). Despite continuous changes in its composition, when the body is healthy, skin microbiota seems to be an equilibrium between protective and pathogens microorganisms. These live together in a complex community and have a number of different symbiotic interactions. If we consider bacteria, the most important and frequent phyla living on human skin are Actinobacteria, Firmicutes, Proteobacteria and Bacteroidetes, without huge differences among ethnicities. Further, looking more deeply into specific taxonomic classification, as class or genus or species, we can find differences among peoples' microbiomes even by looking at subjects with very similar age, lifestyle, and from the same ethnicities. The general truth for everyone's healthy condition seems to be the homeostasis of skin microbiota with its singular peculiarities.

E. Lee, J.Y. Lee, S. Woo, Y. Noh, J. Shin, P. Ruan, J. Ha, **Variation of Biophysical Parameter with Skin Aging from Distinct Geographic Locations in South Korean and Chinese women**, presentation at the 25th IFSCC Conference Milan, October 2019

There are the differences of skin properties with aging in various ethnic groups. Within the same ethnic group, it is also important to understand that the change of skin with aging as well as skin characteristics be influenced by external environment, such as climatic condition, UV radiation and environmental pollution. The purpose of this study was to investigate the alteration of biophysical parameter with aging in different locations.

H. Yoshida, K. Yamazaki, A. Komiya, M. Aoki, S. Kasamatsu, T. Murata, T. Sayo, M.Z. Cilek, Y. Okada, Y. Takahashi, **Inhibitory effects of Sanguisorba officinalis root extract on HYBID (KIAA1199)-mediated hyaluronan degradation and skin wrinkling**, International Journal of Cosmetic Science, 2019, 41, p. 12–20

Objectives: Hyaluronan (HA), an important constituent of extracellular matrix in the skin, has many biological activities such as hydration that contributes to firmness and bounciness of the skin. We have reported that reduction in HA in the papillary dermis and over-expression of HYBID (HYaluronan Binding protein Involved in hyaluronan Depolymerization, alias KIAA1199 or CEMIP), a key molecule for HA degradation in skin fibroblasts, are implicated in facial skin wrinkling in Japanese and Caucasian women. However, little or no information is available for substances which inhibit the HYBID-mediated HA degradation. Methods: Inhibition of Sanguisorba officinalis root extract and ziyuglycoside I, one of the components of Sanguisorba officinalis root extract, to the HYBID-mediated HA degradation was assessed by size-exclusion chromatography of HA depolymerized by stable transfectants of HYBID in HEK293 cells (HYBID/HEK293 cells) or normal human skin fibroblasts (Detroit 551 cells and NHDF-Ad cells). The HYBID mRNA and protein expression was examined by quantitative real-time PCR and immunoblotting in the skin fibroblasts treated with Sanguisorba officinalis root extract, and size distribution of newly produced HA was evaluated by preparing metabolically radiolabelled HA. A double-blind, randomized and placebo-controlled study was carried out in the 21 healthy Japanese women, who were topically treated with the formulation containing Sanguisorba officinalis root extract or the placebo on each side of the face including crow's foot area. Results: Sanguisorba officinalis root extract, but not ziyuglycoside I, abolished HYBID-mediated HA degradation by HYBID/HEK293 cells. Sanguisorba officinalis root extract also inhibited HYBIDmediated HA degradation in skin fibroblasts by down-regulating HYBID mRNA and protein expression. Although control untreated skin fibroblasts produced polydispersed HA, the cells treated with Sanguisorba officinalis root extract produced only high-molecularweight HA. Treatment with Sanguisorba officinalis root extract-formulated lotion significantly improved skin elasticity, and reduced skin wrinkling scores at the outer eye corner compared with the placebo formulation. Conclusion: Sanguisorba officinalis root extract showed an antiHYBID-mediated HA degradation activity and anti-wrinkle activity on human facial skin, which is accompanied by the improvement in elasticity. Our study provides the possibility of a new strategy to inhibit HYBID-mediated HA degradation for anti-wrinkle care.

A. Gimenez, O. Laporta, E. Canadas, E. Gonzalez, R. Delgado, **The eyes: a reflection of genderless beauty**, PERSONAL CARE NORTH AMERICA, October 2019, p. 18-20

Given the expansion of masculine products for facial skin care on the shelves around the world, eye contour ranges are in the spotlight as they can help reduce unwanted bags, dark circles and fatigue signs, offering excellent improvements in facial appearance. The skin surrounding the eyes is one of the

most delicate of the body, which is why it can experience more accentuated aging changes that easily worsen the appearance of such important area. Eyeseryl® peptide acts son the mechanisms of glycation, vascular permeability and lipid accumulation, to minimize the presence of eyebags and dark circles and reduce skin damage in the fragile eye contour. As the clinical studies show, the ingredient is a good candidate to introduce in skin care formulations to improve the overall eye contour region of both men and women.

Ò. Expósito, M. Pérez, A. Gallego, T. Ruiz, M. Mas, P. Riera, D. Luna, S. Laplana, **First Generation of Biomimetic Plant Membrane Lipids to Fight Energetic Ageing**, söfw journal, 145, 10/19

During ageing, as well as under stress situations, the cellular energy of the skin, and its vitality, decrease, causing what it is known as energetic ageing. The new active Olea VitaePLF (INCI name: Olea Europaea (Olive) Callus Culture Lysate) made from plant stem cells of wild olive tree sprouts, achieves the activation of the energetic rejuvenation cycles, through a new mechanism of action: the stimulation of Mitochondrial Synapses. This active represents the first generation of biomimetic plant cell membrane lipids: the Phyto-Lipidic Fractions (PLF), with a unique lipidic composition, that stimulates the communication between mitochondria, to boost the energy and vitality levels of the epidermal cells, increasing the production of structural proteins to obtain a clear anti-wrinkle, firming and repairing effect. Several *in vitro* and *in vivo* studies were performed to support these claims.

Y. Regueira, J.D. Fargo, D. Tiller, K. Brown, C. Clements, B. Beacham, E. Brignone, M.S. Sommers, **Comparison of Skin Biomechanics and Skin Color in Puerto Rican and Non-Puerto Rican Women**, PRHSJ Vol. 38 No. 3, September, 2019, p. 170-175

Objective: Skin biomechanics are physical properties that protect the body from injury. Little is known about differences in skin biomechanics in racial/ethnic groups and the role of skin color in these differences. The purpose of this study was to determine the relationship between skin biomechanics (viscoelasticity, hydration) and skin color, when controlling for demographic and health-related variables in a sample of Puerto Rican and non-Puerto Rican women. Methods: We performed a secondary analysis of data from 545 women in a longitudinal, observational study of skin injury in Puerto Rico and the United States. Data included measures of skin viscoelasticity, skin hydration, skin color, demographic, and health-related variables. Skin color was measured by spectrophotometry (L* - lightness/darkness, a*- redness/greenness, b* - yellowness/blueness). The sample was 12.5% Puerto Rican, 27.3% non-Puerto Rican Latina, 28.8% Black, 28.6% White, and 2.8% Other. Results: Regression analyses showed that: 1) higher levels of skin viscoelasticity were associated with lower age, higher BMI, and identifying as non-Puerto Rican Latina as compared to Puerto Rican; (all $p < .001$); and 2) higher levels of hydration were associated with lower L* values, higher health status, lower BMI, and identifying as non-Puerto Rican Latina, White, or Other as compared to Puerto Rican (all $p < .05$). Conclusion: When adjusting for skin color, Puerto Rican women had lower viscoelasticity and hydration as compared to other groups. Puerto Rican women may be at long-term risk for skin alterations, including pressure injury, as they age or become chronically ill.

D. Khazaka, C. Uhl, **In-house tests complement CRO final product testing,** PERSONAL CARE EUROPE. September 2019

Before a cosmetic product is offered on the market, final tests are obligatory for the manufacturer to prove its safety and to substantiate the various claims on the products, e.g. reduces wrinkles up to 20%, increases skin hydration for 24 h. There are no limits to modern claims. All over the world, contract research organisations (CROs) varying from small laboratories to vast multinational institutes offer their services to the cosmetic manufacturers to perform all kind of tests and compile the final necessary product documentation.

S. Léglise, **Ageing tackled by strengthening cell function**, PERSONAL CARE EUROPE. September 2019

One might well call *Angelica archangelica,* the herbaceous plant from northern Europe that is particularly suited to lower temperatures "magical angelica". Its spicy, musky smell had a reputation in the Middle Ages for warding off evil spells! In the Renaissance, the root was recognised for its digestive properties, and the essential oil for its ability to induce sweating; it was also used against infections and epidemics such as the plague; while "angel grass" or its sister "angelica sinensis" is used in traditional Asian medicines. Edible, it is still used mixed with candied fruit in desserts (the French town of Niort is famous for its candied Angelica sticks), and in several famous liqueurs and luxury perfumes.

C. d'Erceville-Dumond, I. Bonnet, Solene Mine, F. Trombini, C. Kalem, V. Andre-Frei, **Rambutan bioactives for hair and skin**, PERSONAL CARE EUROPE. September 2019

BASF is sourcing the raw materials for three new highly effective natural skin and hair care ingredients from two of Vietnam's first organic-certified rambutan gardens. The bioactives are extracted from the fruit's peels, leaves and seeds- potential byproducts of fruit cultivation that are usually discarded. This form of upcycling benefits both the environment and local rural communities.

P. Pericu, C. Gherardi, H. Lambers, **Discovering the invigorating osmolyte**, PERSONAL CARE EUROPE. September 2019

Next to GENENCARE OSMS BA (Betaine), DuPont Industrial Biosciences has now added GENENCARE ' OSMS MI (INCI name: Inositol also known as myo-inositol) to the family of all-natural osmolytes. Like betaine, myo-inositol, is highly purified and suitable for many skin care applications. It is extracted from non-GM sugar beet, 100% biobased and Cosmos and Natrue certified. This article focuses on myo-inositol and describes the many versatile functions of this ingredient in particular how it is involved in the regulation of three main elements in skin: energy, oxygen and water. This is reflected and supported by an improved skin elasticity of the face in a large clinical test where an OAA/ cream with 3% myo-inositol was applied for 5 weeks and compared to a placebo cream and to the start of treatment.

X. Zeng, X. Li, X. Wang, X. Wen, X. Jiang, **The effect of Zanthoxylum bungeanum maxim extract on crow's feet: A double-blind, split-face trial,** Dermatologic Therapy 32(6), September 2019

Introduction: As one of the most obvious signs of aging, wrinkles have long been the concern of many people and continue to be a major topic in dermal-cosmetic industry. Accordingly, there is a need to develop products with good efficacy and safety profile. The Zanthoxylum bungeanum Maxim (ZBM) extract is a natural food which may possess the property of a toxin-like botulinum. Objective: To evaluate the efficacy and safety of a formulation that contains 2% ZBM pericarp extract in the treatment of wrinkles. Methods: 20 females aged 35 to 60 years old were enrolled in this randomized, vehicle-controlled, double-blind and split-face trial. The trial lasted for 30 days, when participants randomly used formulations containing 2% ZBM extract on one side of the temporal canthus and vehicle formulation on the other side. Skin roughness, skin hydration and skin elasticity were evaluated by Primospico, Corneometer® CM825 and Cutometer® MPA580, respectively. Results: The formulation containing 2% ZBM extract has a significant short-term anti-crow's feet effect compared with vehicle. No adverse effect was shown during the study. Conclusion: Topical application of 2% ZBM extract is tolerable and can be used as an effective cosmetic agent for short-term wrinkle treatment.

M. Lefort, L. Heider, V. Bicard-Benhamou, H. Hanau, **Youth in full bloom**, Cosmetics & Toiletries, Vol. 134, No. 8, p. 18-30

Red Poppy Extract for Under-eye Circles and Sagging: *Papaver rhoeas,* better known as com poppy, field poppy or red poppy, is abundant in nature, with 50-120 different species known worldwide. The common variety is large and showy, with four vivid red petals and a black, central base. While it often is grown as an ornamental plant, it also serves functional purposes. For example, the petals of *Papaver rhoeas* can be used to sooth coughs, whereas the seeds can be used as a food ingredient or for oil production.

S. Laneri, R. di Lorenzo, A. Bernardi, A. Sacchi, I. Dini, ***Aloe barbadensis*: A Plant of Nutricosmetic Interest**, Natural Product Communications Volume 15(7): 1–6

Aloe barbadensis Miller (Aloe Vera Linne) products have long been employed in health foods and for medical purposes. It has antiinflammatory, antifungal, antioxidant properties, which indicates excellent potential in antiaging cosmetic and skin protection products. The objective of this study is to evaluate the antiaging efficacy of dermocosmetic formulations containing *A. barbadensis* extract on young and mature skin using biophysical and skin imaging techniques. Twenty healthy adult volunteers participated in the study, aged between 20 and 65. The cream formulation, with 10% (w/w) of *A. barbadensis* extract, and placebo, were applied to the face of the volunteers. The effects were evaluated in terms of skin hydration and barrier effect by the measurement of transepidermal water loss (TEWL), derma firmness, and elasticity. The formulation containing *A. barbadensis* extract significantly improves water contained in the stratum corneum, firmness, elasticity of the skin, and decreased TEWL.

J.E.P. Prötschke, **Die Behandlung hypertropher Verbrennungsnarben mittels fraktioniertem CO2-Laser: Eine objektive Evaluation des Therapieerfolgs**, Dissertation an der medizinischen Fakultät der Ludwig-Maximilians-Universität zu München, 2019

Das Verbrennungstrauma zählt in westlichen Ländern zwar mittlerweile nicht mehr zu den Hauptunfallarten, ist allerdings weiterhin eine häufige und alltägliche Unfallform, durch die jährlich tausende Menschen zu Schaden kommen. Gemäß den Daten der Gesundheitsberichtserstattung des

Bundes (GBE) wurden in deutschen Krankenhäusern 2014 im Rahmen der ICD Ziffern T20-T32 17282 individuelle Fälle von Verbrennung oder Verätzung kodiert. Mit knapp 5000 betroffenen Fällen machte der Bereich Schulter/Arm/Hand (ICD T22 und T23) fast ein Drittel der Fälle aus. Auf das Gesicht entfielen knapp 2000 Fälle.

V. Chowjarean, P.P. Phiboonchaiyanan, S. Harikarnpakdee, P. Tengamnuay, **A natural skin anti-ageing serum containing pseudobulb ethanolic extract of *Grammatophyllum speciosum*: a randomized double-blind, placebo-controlled trial,** International Journal of Cosmetic Science 41(6), August 2019

Objective: Grammatophyllum speciosum is utilized to treat sore throats and bronchitis In Thai folk medicine. This study evaluated the in vitro activity and clinical efficacy of a G. speciosum pseudobulb decoction. Methods: Measure of in vitro anti-aging activity was performed using non-cell based assays as well as in CRL 2097 human fibroblast cells. A prophetic patch test method was used to determine skin irritation in 24 healthy Thai volunteers. A randomized double-blind, placebo-controlled trial was conducted with 24 subjects for 56 days after facial application to evaluate efficacy. The results were measured with Visioface® and Cutometer® MPA 580 as well as by visual observations. Results: The total content of the antioxidant polyphenols in G. speciosum ethanolic extract (GSE) was 48.19 ± 0.39 mg EGCG equivalent per gram. The GSE possessed potent and higher anti-elastase activity more than EGCG. The extract was able to protect human fibroblasts against superoxide anion-induced cell death at the concentration of 10 μg/mL. In a clinical study, facial application of the serum containing 0.5% GSE was found to safely increase skin distensibility in healthy volunteers. Skin viscoelasticity and wrinkle volume were also significantly reduced ($p < 0.05$). Conclusion: Thus, both the in vitro and the clinical studies have illustrated the anti-wrinkle/anti-aging benefits of GSE on human skin.

M.S. Sommers, Y. Regueira, D.A. Tiller, J.S. Everett, K. Brown, E. Brignone, J.D. Fargo, **Understanding Rates of Genital Injury: Role of Skin Color and Skin Biomechanics**, J Forensic Leg Med. 2019 August ;66: p. 120–128

Purpose. A series of studies suggest that non-Hispanic White women have significantly more injuries than non-Hispanic Black women after sexual assault and consensual sexual intercourse. One explanation for this difference is that the degree of skin protection may vary as skin mechanics and skin pigmentation vary. The aim of the study was to determine the association among genital-anal injury, skin color, skin viscoelasticity and skin hydration in women following consensual sexual intercourse when controlling for age, smoking history, body mass index (BMI), sun exposure, and health status. Procedures: We employed a prospective cohort study design to enroll women 21 years of age or older at two study sites. They underwent two data collection sessions, baseline and follow-up after consensual sexual intercourse. Baseline genital-anal injury identification occurred with a standard forensic examination (direct visualization, nuclear staining with toluidine blue contrast, and colposcopy examination) and measurements of other variables (skin color, skin viscoelasticity, skin hydration, age, smoking history, body mass index [BMI], sun exposure, and health status). Participants were then asked to have consensual sexual intercourse with a male partner of their choice and to return for a second forensic examination for injury detection. Genital-anal injury was regressed on skin color, skin viscoelasticity, skin hydration, age, smoking history, BMI, sun exposure, and health status. Findings: We enrolled 341 participants, 88 non-Hispanic White (25.8%), 54 non-Hispanic Black (15.8%), 190 Hispanic/Latina (55.7), and 9 Other Identities (2.6%). At baseline the genital-anal injury prevalence was 57.77% and at follow-up after consensual sexual intercourse, injury prevalence was 72.73%. External genital injury prevalence was associated with increased L* (lightness) values (Adjusted Odds Ratio [AOR] = 1.98, 95% Confidence Interval [CI] = 1.03, 4.04) and decreased skin elasticity (AOR = 0.96, 95% CI = 0.93, 0.99) at baseline. Increased skin hydration was associated with a significantly higher frequency of external, internal, anal, and total genital-anal injuries (Adjusted Rate Ratio [ARR] > 1.27) at follow-up. Also at the follow-up examination, Hispanic/Latina participants had significantly lower external genital and total genital-anal injury prevalence and frequency as compared to non-Hispanic White participants (AOR < 0.40). Conclusions: Our findings provide qualified support for the importance of skin color during the forensic examination. Women with lighter skin tones may have skin that is more easily injured than women with darker tones. In contrast, external genital injuries may be more easily identified in women with light as compared to dark skin, a situation that is important in both the health care and criminal justice systems. Additionally, women with decreased viscoelasticity and increased hydration may be more easily injured. These findings support the need to develop forensic procedures that are effective in people across the range of skin colors and to interpret forensic findings considering the innate properties of the skin.

J. Elrod, B. Müller, C. Mohr, M. Meuli, E. Mazza, C. Schiestl, **An effective procedure for skin stiffness measurement to improve Paediatric Burn Care**, Burns, Volume 45, Issue 5, August 2019, p. 1102-1111

Background: The objective evaluation of scar quality plays a crucial role in improving burn surgeryand scar rehabilitation. Suction-based skin measurements were proposed as a method toobjectively determine the mechanical properties of scars, yet their use is limited, in particular for paediatric burn care. A new device was developed which provides essentialadvantages for scar assessment. The aim of this study was to assess its reliability, intra-and interobserver variability. Methods: The new device, “Nimble”, consists of a lightweight probe that measures the negativepressure needed to obtain a predefined tissue elevation, revealing information on thestiffness of the tissue. 29 former paediatric burn patients were included. Three observersmeasured the tissue stiffness of a predefined location on the scar and on healthy skinusing the Nimble, and the established suction device, the Cutometer. The reliability ofboth instruments in distinguishing between healthy skin and scar was assessed bymeans of the intraclass correlation coefficient. Results: The Nimble successfully differentiated between scar tissue and healthy skin in 92%, theCutometer in 80% of the patients ($p<0.05$). Inter- and intraobserver variability of the Nimble (ICCs) were excellent. For the majority of the calculated ICC values the Nimble exceeded the Cutometer. Conclusion: The new device enables reliable and safe measurement of the stiffness of scars. Measurements are less susceptible to patient non-compliance and observer dependency.The Nimble might therefore constitute an easy to use tool for the systematic assessmentof scars, thus supporting decision-making in paediatric burn care.

A. Pérez Davó, M.T. Truchuelo, M. Vitale, J. Gonzales-Castro, **Efficacy of an Antiaging Treatment Against Environmental Factors: *Deschampsia antarctica* Extract and Hightolerance Retinoids Combination**, J Clin Aesthet Dermatol. 2019; 12(7): E65–E70

Background: Effects of environmental contaminents, such as air pollution and cigarette smoking on skin include increased oxidation, subclinical inflammation, and degradation of the dermal matrix, which can accelerate the skin aging process. Objective. An open-label, prospective study was conducted to assess the efficacy and tolerability of a topical anti-aging regimen comprising high-concentration retinoids, *Deschampsia antarctica* extract, and niacinamide in participants living in a heavily polluted (Level III, World Health Organization) city. Methods. Twenty-two female Caucasian volunteers with Fitzpatrick Skin Types III and IV were treated for 90 days with the topical anti-aging regimen. Subjective clinical assessments using the Rao-Goldman Scoring for Facial Aging, Patient’s Global Assessment (PGA), and Investigator’s Global Assessment (IGA). Additionally, objective instrumental assessments for wrinkles using Visia® (Canfield Scientific, Parsippany, New Jersey) and Visioline® (Courage+Khazaka Electronic GmbH, Cologne, Germany) and viscoelasticity and firmness using Cutometer® (Courage+Khazaka Electronic GmbH) were completed at baseline, Day 30, and Day 90. Results. At Day 30, wrinkles in the periocular area significantly improved by 35.7 percent (p=0.003) compared to baseline. At the end of the study (Day 90), a significant improvement in firmness (41.7%) and viscoelasticity (12.8%) were observed. Tolerance for treatment was assessed as “good “ or “very good” in 86.5 percent of the volunteers. Conclusion. This novel antiaging treatment regimen could potentially serve as an effective and long-term topical treatment option for improving signs of facial aging and protecting the skin from external factors associated with acceleration of the skin aging process, such exposure to UV radiation, air pollution, and cigarette smoke. Larger and longer-term, randomized, controlled clinical trials in more diverse population samples are needed to confirm our results.

F. Carlomagno, S. Zanzottera, **Empowering the Micro-World of the Skin Microbiota: Appraoches to Maintain Nature’s Ideal Homeostasis for Betterment of Cosmetic Products,** Euro Cosmetics, 6-2019, p. 18-22

Skin is a complex environment where billions of microorganisms live providing a unique environment for each host, collectively referred to as the skin micriobiota. Skin microbiota is, therefore, the result of an equilibrium between protective and pathogens species of those microorganisms. However, this balance can be disrupted by stressors. The alteration of skin microbiota, known as dysbiosis, has been associated with skin disorders. This article is designed to demonstrate different approaches to the prevention of skin microbiota dysbiosis.

S.H. Kim, S.J. Lee, H.J. Kim, J.H. Lee, H.S. Jeong, I.S. Suh, **Aging-related changes in the mid-face skin elasticity in East Asian women**, Arch Craniofac Surg Vol.20 No.3, 158-163

Background: Age-related changes in facial skin is a major concern in women. This study aimed to objectively evaluate normal skin elasticity and age-related differences in the faces of East Asian women. There are no standard values for data related to normal skin on East Asian women. Methods: We studied 129 healthy East Asian women without a history of cosmetic procedures or surgeries. Skin

elasticity was assessed at the cheek and lower eyelid points, which were as sessed on both the right and left sides of the face. Results: The age of the subjects showed significant negative correlations with the R2 and R7 parameters, which represent skin elasticity after deformation. Conclusion: We therefore concluded that the primary decrease in skin elasticity in East Asian women occurs in the midface region.

H. Dobrev, **Value of non-invasive bioengineering investigations of the human skin in vivo,** Dissertation in Dermatology and Venerology at the University of Plodiv, 2019, Bulgaria

The skin is the largest organ of the human body. It has a surface area of about 2 m^2 and a weight of about 16% of the body weight. Skin is a great visual field. Most of the changes that occur in it are visible and accessible to dermatologists. For centuries, the dermatologist's eyes and fingers have been his main diagnostic tools. Old physicians are known to describe the rash elements with great love, diligence and methodicality, especially with regard to morphological details. Today, this descriptive phase in the evolution of dermatology has lost its dominance. According to Prof. J. Serup, "*The dermatologist's eyes and hands are already becoming archaic diagnostic tools.*" With the introduction of modern skin bioengineering methods, there has been a transition from the "visible" to the "invisible". From the "visual" field, dermatology is increasingly becoming an "instrumental" field. The advantage of the new research methods created is that they enable the detection of invisible changes in skin functions, as well as their objective and quantitative measurement. This dissertation is devoted to the new methods of skin functional diagnostics. It illustrates the practical application of some of them in the field of dermatology and cosmetic science based on the experience of the sector of "Functional diagnostics of the skin" at the Department of Dermatology and Venereology, University Hospital "St. George", Plovdiv, Bulgaria. The literature review part provides an overview of current bioengineering methods for functional skin diagnostics. The apparatus used to carry out the present work is described in detail. Additionally, two little-known aspects of skin bioengineering research are presented - protocol and research ethics. Data on Bulgarian experience in the field of skin functional diagnostics have also been reported

M.T. Truchuelo, M. Vitale, **A cosmetic treatment based on the secretion of Cryptomphalus aspersa 40% improves the clinical results after the use of nonablative fractional laser in skin aging**, J Cosmet Dermatol., 2019 Jun

Introduction: The main purpose of this study was to evaluate whether the application of a cosmetic treatment based on the secretion of *Cryptomphalus aspersa* (SCA) enhances the clinical results, tolerance, and skin regeneration after nonablative laser treatment in patients with moderate photoaging. Methods: Randomized, double-blind, split-face trial in 20 patients with moderate aging. Two sessions with fractional nonablative laser were performed, and the cosmetic treatments (SCA 40% on one hemiface and vehicle on the other) were applied immediately after laser session and daily during the study (28 days). Tewameter, Cutometer, Visioscan, VisioFace, photography, dermoscopy, and clinical evaluation were assessed. Side effects were also evaluated. Results: A significant decrease in the density of microcolumns (25%, 71%, 32%, and 61% less density, respectively, at T3 $P = 0.008$, T7 $P = 0.002$, T22 $P < 0.001$, and T24 $P < 0.001$) was observed on the side treated with SCA compared to the vehicle-treated side. Cutaneous elasticity, area of wrinkles, and hydration on the SCA-treated side also showed a significant improvement compared to the vehicle-treated side. Both the researcher and patients observed a significant improvement on the side treated with SCA compared to the vehicle-treated side. Significantly fewer side effects (erythema, burning, and dryness) were also detected. Conclusion: A cosmetic product with SCA 40% applied immediately after laser and for a period thereafter enhances and accelerates repair of damage produced by the laser and significantly reduces related adverse effects. In addition, SCA treatment could improve clinical results. In conclusion, we suggest that SCA enhances the effectiveness of laser in the treatment of cutaneous aging.

M. Qassem, P. Kyriacou, **Review of Modern Techniques for the Assessment of Skin Hydration**, Cosmetics 2019, 6, 19

Skin hydration is a complex process that influences the physical and mechanical properties of skin. Various technologies have emerged over the years to assess this parameter, with the current standard being electrical probe-based instruments. Nevertheless, their inability to provide detailed information has prompted the use of sophisticated spectroscopic and imaging methodologies, which are capable of in-depth skin analysis that includes structural and composition details. Modern imaging and spectroscopic techniques have transformed skin research in the dermatological and cosmetics disciplines, and are now commonly employed in conjunction with traditional methods for comprehensive assessment of both healthy and pathological skin. This article reviews current techniques employed in measuring skin hydration, and gives an account on their principle of operation and applications in skin-related research.

T. Yazdanparast, K. Yazdani, P. Humbert, A. Khatami, S.A. Nasrollahi, H. Zartab, L. Izadi Firouzabadi, A. Firooz, **Biophysical and ultrasonographic changes in lichen planus compared with uninvolved skin**, International Journal of Women's Dermatology 5 (2019), p. 100–104

Background: Lichen planus (LP) is a chronic inflammatory disease of the skin. Currently, noninvasive techniques are used to evaluate biophysical properties of the skin in vivo. Objective: In this study, we aimed to evaluate skin biophysical properties in patients with LP and make a comparison between involved and uninvolved skin to provide a better understanding of the pathogenesis of LP. Methods: The stratum corneum hydration, transepidermal water loss, pH, erythema, melanin, sebum, friction, temperature, elasticity parameters (R0, R2, R5), and thickness and echo-density of the epidermis, dermis, and subepidermal low echogenic band were measured on lesions of classic LP in 21 patients and compared with the average of perilesional and symmetrical uninvolved skin (as control) with a paired t test. Results: Stratum corneum hydration (p = .002), sebum (p = .04), R0 (p = .005), and echo-density of the dermis (p = .005) were significantly lower, but pH (p = .007), melanin content (p b .001), erythema (p b .001), temperature (p = .01), thickness of dermis (p = .02), and subepidermal low echogenic band (p b .001) were significantly higher in LP lesions. Conclusion: An evaluation of its biophysical, biomechanical, and ultrasonographic characteristics showed that the skin is an objective, noninvasive, and quantitative measuring tool that can be used to provide valuable information about skin changes in classic LP.

M. Nawaz, H.M. Shoaib Khan, N. Akhtar, T. Jamshed, R. Qaiser, H. Shoukat, M. Farooq, **Photodamage and Photoprotection: An *In vivo* Approach Using Noninvasive Probes**, Photochemistry and Photobiology 95(5), May 2019

Solar radiations trigger the physiological alteration in skin which progress toward photoaging. Sunscreens are known to be effective against the photodamaging effects of sunlight. The purpose of this study was to evaluate the extent to which aging signs caused by real-life sunlight exposure could be avoided by comparing various parameters between sun-exposed and sun-protected skin using noninvasive probes. Female volunteers (n = 11) after getting their consent were provided with marketed sunscreen product to apply onto their skin for 6 months. Measurements were scheduled every 15 days from the baseline reading for 6 months. Cutometer, Mexameter and Corneometer were used for evaluation of facial skin parameters. Clinical evaluations showed the effects of sunlight exposure on different skin parameters by comparing sun-protected and unprotected skin, where Gross elasticity (R2), Net elasticity (R5), Viscoelasticity (R6) and Biological elasticity (R7) showed insignificant results, while Hydration, Melanin and Erythema showed significant results. Sun-exposed skin presented 0.72%, 0.66%, 0.77%, 1.39%, 1.99%, 2.01% and 3.15% changes in R2, R5, R6 and R7, melanin, erythema and hydration, respectively, which were potentially prevented by sunscreen application. Premature aging is inhibited by following photoprotective regimen on routine basis, emphasizing the potential benefit of sunscreen against early aging signs.

H. Azaryan, **Comparative Aanalysis of the Effiencency of the Skin Functional Statement Correction Methodas in Women with 3rd Degree of Photo Aging**, Georgian Med News, 2019 May;(290): p. 100-107

The purpose of this study was to conduct a comparative analysis of the effectiveness of isolated and combined use of intradermal injections of bioreparant (hyaluronic acid modified with vitamin C, glutathione and cysteine) and platelet-rich autologous plasma on functional indicators of the face skin of women with signs of 3-rd degree of photoaging. In this study, 120 women with 3-rd degree of photoaging were examined (mean age 34.5±1.54) and divided into 3 groups in accordance with the applied therapy method (isolated and combined use of plasma therapy and bio reparation). The study of the functional parameters of the skin, including corneometry (determination of the degree of epidermal hydration), sebometry (assessment of the sebum regulating function of the epidermis), cutometry (determination of the deformation and elastic properties of the skin), TEWL (determination of the transepidermal water loss level), mexametry (assessment of skin pigmentation) and pH-metry (assessment of the skin acid-base balance) was performed in all examined patients. The obtained results testify to various shifts in functional parameters, caused by the use of various therapeutic approaches. A comparative analysis of the data obtained has provided a basis for concluding that efficacy of the autologous plasma and modified hyaluronic acid combined implementation is significantly higher compared to the isolated application of these methods.

H. Zhong, C. Hong, Z. Han, S.J. Hwang, B. Kim, Z. Xu, J. Lee, K.H. Kim, M.H. Jin , C. Zou, **Erjingwan Extracts Exert Antiaging Effects of Skin through Activating Nrf2 and Inhibiting NF-κB**, Hindawi Evidence-Based Complementary and Alternative Medicine Volume 2019

In oriental medicine, mixtures of medical plants are always used as prescriptions for diseases. Natural products extracted from herbs have great potential antiaging effects. Previous studies and clinical trials have shown several critical functions of Erjingwan (EJW), such as nourishing Yin, kidney tonifying and aging-resistance. We assumed that EJW extracts exerted the antiaging effects through nourishing Yin. We examined the antiaging effects of EJW extracts on healthy human skin by noninvasive measurements. Ten we estimated the cell proliferation and DPPH radical scavenging rate. Western blotting analysis was used to determine the expressions of matrix metalloproteinase-1 (MMP-1), type I collagen (COL1A2), p-NF-κB, NF-κB, p-IκBκ, IκBκ, p-Nrf2, and HO-1. EJW extracts did not affect moisture content, TEWL and skin chroma, while it significantly improved skin glossiness and skin elasticity. Moreover, EJW extracts could downregulate the MMP1 expression and upregulate the COL1A2 expression. In addition, it promoted the Nrf2 pathway while it inhibited the NF-κB pathway. With the application of cream containing EJW extracts, the skin aging state was significantly improved. Furthermore, in vitro studies showed that EJW extracts contributed to the repair of skin after injury. Taken together, the antiaging effects of EJW extracts were related to its antioxidant and anti-inflammatory abilities.

M. Kanlayavattanakul, N. Lourith, P. Chaikul, **Youth in Yields - Jasmine Rice Extract Whitens, Protects and Smooths Skin,** Cosmetics & Toiletries, Vol. 134, No, 5, May 2019, p. 26-33

The demand from consumers for natural products including cosmetics continues to inrease. Eco-friendly, organic and sustainable options are in the mainstream of this trend. Moreover, active phenolics derived from natural sources are playing an important role in the safety and efficacy of cosmetics. In relation, rice, or Oryza sativacv. Indica (Oryzeae), is well-known as the major staple in Asian cuisine. It has long been used in traditional Asian medicines as well as Italian remedies, including for aesthetic benefits for skin.

L.O. Gueitas, C.C. Benevenulo, R.B. Rigon, F.C. Alvés, G.R. Leonardi, **Avaliação da firmeza e textura da tele através de técnicas biofísicas e análise de imagem,** Congresso Colamiqc, São Paulo, May 21-23, 2019

Hâ uma grande necessidade de técnicas que complémenentem a avalição das propriedades viscoelásticas da pele com intuito de melhor a avalição da flackiez cutânea de forma global através da anãlise de diferentos aspectos da condição e morfologia da pele

K.C. Lee, A. Bamford, F. Gardiner, A. Agovino, B. ter Horst, J. Bishop, L. Grover, A. Logan, N. Moiemen, **Burns objective scar scale (BOSS): Validation of an objective measurement devices based burn scar scale panel**, Burns (2019)

Aims: Hypertrophic scars in burn survivors are a major cause of morbidity but the development of evidence based treatments is hampered by the lack of objective measurements of these scars. The objective of our study is to investigate the most accurate parameters for objective scar assessment and to create a combination score to facilitate the use of a panel of objective scar measurement tools. Methods: Three independent assessors evaluated fifty five scar sites on fifty five burn patients with both the subjective modified Vancouver Scar Scale (mVSS) and a panel of objective measurement tools including the DSM II Colormeter, Cutometer, Dermascan high frequency ultrasound. The sensitivity and specificity of the objective scar parameters in predicting a mVSS score of 6 or more using the Receiving Operator Characteristic Area under the curve (ROC AUC) was then calculated and the most accurate parameters were combined to create an objective global scar score. Results: The ROC AUC values were found to be highest for the Dermascan scar thickness (0.897), dermal intensity and intensity ratio (0.914 and 0.919), Cutometer R0 value (0.942), and R0 ratio (0.944). For colour measurements, ratios of scar to normal skin performed better than the single parameters for both erythema and pigmentation measurements: DSM II Erythema ratio vs Erythema (0.885 vs 0.818), DSM II a* ratio vs a* (0.848 vs 0.741); DSM II Melanin ratio vsMelanin (0.854 vs 0.761), DSM II L* ratio vs L* (0.862 vs 0.767). Analysis of the ROC AUC with chisquare test values showed that the highest AUC (0.786) was obtained with the combination of the Cutometer R0, Dermascan scar thickness, intensity and their respective scar to normal skin ratios. A total score of 5 and above (out of 6 parameters) had the highest combined sensitivity (69.0%) and specificity (83.3%). Conclusion: The objective parameters for the DSM II Colormeter, Cutometer and Dermascan high frequency ultrasound were all found to have moderate to strong ROC AUC values and combination of the Cutometer R0 and Dermascan scar thickness and intensity values can be used to create an objective global scar scale that can accurately differentiate patients with hypertrophic burn scarring from non-hypertrophic scars or normal skin.

J. Elrod, D. Moellmeier, C. Schiestl, C. Mohr, K. Neuhaus, **Comparative analysis of functional and aesthetic outcomes of retroauricular full thickness versus plantar glabrous split thickness skin**

grafts in pediatric palmar hand burns, Burns (2019)

Background: Optimal management of palmar hand burns in children is controversial. We aimed to compare function and aesthetics of retroauricular full thickness skin grafts (FTSG) to plantar glabrous split thickness skin grafts (STSG). Methods: 32 palmar grafts in paediatric burn patients were analysed: 19 retroauricular FTSG (group 1) and 13 thick plantar glabrous STSG (group 2). The latter were harvested at a thickness of 0.5 mm. The resulting plantar donor defects were covered with a STSG from the scalp, a sequential surgical technique we termed the "Zurich move". Clinical examination, Cutometer and Colorimeter assessment and validated patient and observer questionnaires were used. Donor site complications and subjective complaints were recorded. Results: Colorimeter results were superior in group 2 with an erythema score of 5.73 ± 2.64 (group 1) versus 2.33 ± 1.97 (group 2, $p < 0.001$) and a pigmentation score of 9.82 ± 5.42 (group 1) and 1.89 ± 1.92 (group 2, $p < 0.001$). Observers` scar evaluation using VSS and POSAS showed significantly superior results in group 2 for almost all items. Conversely, group 1 grafts were less stiff with mean normalized tissue extension R0 of 0.80 ± 0.21 versus 0.57 ± 0.24 in group 2 grafts ($p < 0.05$). In both groups donor sites complications were rare. Conclusion: Plantar glabrous STSG showed superior functional and aesthetic results when compared to FTSG in pediatric palmar hand burns. In addition, the "Zurich Move" is safe and provides uncomplicated donor site healing on the scalp and the foot allowing rapid restoration of full function.

H. Neubauer A. Stolle, S. Ripper, F. Klimitz, H. Ziegenthaler, M. Strupat, U. Kneser, L. Harhaus, **Evaluation of an International Classification of Functioning, Disability and Health-based rehabilitation for thermal burn injuries: a prospective non-randomized design**, Trials (2019) 20: 752

Background: Severe burn injuries result in relevant restrictions of physical capacity as well as psychological and social integrity and require a specialized rehabilitation. There is a common agreement, among national as well as international burn associations, that burn rehabilitation is a complex, dynamic process which needs an interdisciplinary and specialized treatment team. There is wide agreement that more research is needed in this field. Methods/design: The aim of the study is to examine the effectiveness and efficiency of our new ICF (International Classification of Functioning, Disability and Health)-based rehabilitation for thermal injuries. Because of ethical reasons, we have chosen a prospective non-randomized design, which takes place at two different rehabilitation centers. At center A, a newly developed ICF-based rehabilitation program was established; at rehabilitation center B, a well-established rehabilitation program has existed for 20 years and is used as reference. The primary research question addresses the "Pre-post comparison of the physical and psychological outcome measurements," secondary question I looks at the "Examination of the non-inferiority of the new treatment concept with the established concept," and secondary question II is the "Analysis of the rehabilitation process based on the rehabilitation cycle." Only patients of the two burn rehabilitation centers who are insured by workers' compensation will be asked to participate in this study to avoid outcome bias by insurance status. A physical examination (physical working capacity testing, grip strength, range of motion, and scar evaluation by Cutometer and Vancouver Scar Scale) and a standardized questionnaire battery (Burn Specific Health Scale-Brief , Short Form 36, Impact of Event Scale-Revised, the German version of the Symptom Checklist, the Freiburg Social Support Questionnaire, Patient/Client Satisfaction Questionnaire, Disabilities of the Arm, Shoulder and Hand, and Lower Extremity Functional Scale) measure physical and psychological conditions. Data will be taken on admission, during stay, and on discharge of the rehabilitation program and at follow-up 3 and 12 months after discharge. A minimum of 162 participants will be enrolled in this clinical longitudinal, prospective, observational study. Discussion: The proof of the effectiveness of the ICF-based rehabilitation program for thermal injuries will give evidence in a comprehensive way for the first time in this field. As result, a standardized rehabilitation concept will be introduced, which can be provided to other rehabilitation institutions treating thermal injuries.

K.C. Lee, A. Bamford, F. Gardiner, A. Agovino B. ter Horst, J. Bishop, A. Sitch, L. Grover, A. Logan, N.S. Moiemen, **Investigating the intra- and inter-rater reliability of a panel of subjective and objective burn scar measurement tools**, Burns 45 (2019), p. 1311 – 1324

Background: Research into the treatment of hypertrophic burn scar is hampered by the variability and subjectivity of existing outcome measures. This study aims to measure the inter- and intra-rater reliability of a panel of subjective and objective burn scar measurement tools. Methods: Three independent assessors evaluated 55 scar and normal skin sites using subjective (modified Vancouver Scar Scale [mVSS] & Patient and Observer Scar Assessment Scale [POSAS]) and objective tools. The intra-class correlation coefficient was utilised to measure reliability (acceptable when >0.70). Patient satisfaction with the different tools and scar parameter importance were assessed via questionnaires. Results: The inter-rater reliabilities of the mVSS and POSAS were below the acceptable limit. For

erythema and pigmentation, all of the Scanoskin and DSM II measures (except the b* value) had acceptable to excellent intra and inter-rater reliability. The Dermascan ultrasound (dermal thickness, intensity) had excellent intra- and inter-rater reliability (>0.90). The Cutometer R0 (firmness) had acceptable reliability but not R2 (gross elasticity). All objective measurement tools had good overall satisfaction scores. Patients rated scar related pain and itch as more important compared to appearance although this finding was not sustainedwhen corrected for multiple comparisons. Conclusion: The objective scar measures demonstrated acceptable to excellent intra- and inter-rater reliability and performed better than the subjective scar scales.

M. Barbagallo, **Eco-friendly strategy to improve body silhouette,** PERSONAL CARE EUROPE, April 2019, p. 71-74

Body imperfections are 'evergreen aesthetic problems' that affect both women and men of different ages. If cellulite is a 'privilege' almost exclusive to women, given the structure of their subcutaneous adipose tissue, sagging skin, loss of tone or love handles do not make distinctions, involving both genders. Behind these imperfections there are several factors and causes such as inflammation, hormonal imbalances/ diet, genetic predispositions, sedentary lifestyle. Counteracting body imperfections is often a challenge for consumers, because it requires an important effort. Therefore, they look for multi-target products able to act as fast as they can.

M.L. Vazquez-Gonzalez, G. Rodriguez, L. Rubio, J. Nestor, E. Fernandez, L. Barbosa-Barros, O. López, **Intelligent ageing repair with skin superfoods**, PERSONAL CARE EUROPE, April 2019, p. 157-162

The many environmental factors related to modern lifestyle generate a skin imbalance that leads to premature ageing. In this study, we evaluate the capacity of a new skin delivery system based on bicosomes (named bicosome-xanthin) to provide intense detox and revert the signs of ageing. This system was specially designed to incorporate, stabilise and deliver microalgae extract into deep skin layers. Bicosomexanthin proved to be effective in protecting the skin against pollution particles and to prevent 90% of the damage caused by blue light. This extraordinary ingredient also proved *in vivo* to boost the skin's antioxidant capacity and barrier function, to accelerate epidermal cell renewal, improve skin brightness and firmness, and visibly reduce wrinkles.

A. Erkiert-Polguj, B. Algiert-Zielinska, K. Zdunska, A. Markiewicz, J. Skubalski, H. Rotsztejn, **The evaluation of elasticity after nonablative radiofrequency rejuvenation**, Journal of Cosmetic Dermatology, Volume 18, Issue 2, April 2019, p. 511-516

Background: Laxity and rhytides are manifestations of photodamage on the face and chest. Nonablative radiofrequency (RF) is one of the most common procedures used for skin rejuvenation. Aim: The aim of this study was to assess the elasticity of face and chest skin after multipolar radiofrequency. Patients/Methods: Thirty women, aged 43-68, were included in the study. Twenty women were postmenopausal and 10 were premenopausal. They received 4 treatment sessions with an application of nonablative radiofrequency in 2-week intervals. Biomechanical properties of the skin were measured with the use of a Cutometer. Results: The objective evaluation in a cutometric analysis showed a statistically significant improvement between measurements taken in the pretreatment period and 3 months after the treatment. Conclusions: The study is an objective confirmation that RF treatment improves skin elasticity. The method may appear to be beneficial for women of any age and skin types. It is a noninvasive treatment with a low risk of complications.

J. Holoubek, B. Lipový, **Our Experience with Application and Cutometric Evaluation of Collagen-Elastin Dermal Substitute Matriderm® in Local Therapy of 6-Year-Old Boy with Severe Burn Trauma**, Acta Chir Orthop Traumatol Cech, 2019;86(4): p. 286-289, Article in Czech language

The consequences of deep burns to the hands and face are the most challenging we encounter in modern reconstructive surgery. In many cases, the simple autotransplantation of full-thickness defects with split-thickness skin grafts is now considered inadequate or outdated. For this and many other reasons, the use of dermal substitution is on the rise as it provides improved cosmetic effects and skin compliance, reduces contractility and greatly approximates the histological image to normal, healthy skin. For the purpose of this article, we present a dermal substitution, Matriderm®, in the case of extensive thermal trauma in a 6-year-old boy.

E. Guaitolini, A. Cavezzi, S. Cocchi, R. Colucci, S.U. Urso, V. Quinzi, **Randomized, Placebo-controlled Study of a Nutraceutical Based on Hyaluronic Acid, L-carnosine, and Methylsulfonylmethane in Facial Skin Aesthetics and Well-being**, JCAD Journal of Clinical and Aesthetic Dermatology, April 2019, Volume 12, Number 4

Objective: The purpose of this study was to evaluate the e- cacy and safety of a multicomponent

nutraceutical (MCN) on facial skin. Methods: A randomized, placebo-controlled, single-blind trial was conducted involving two groups of female subjects a ected by facial skin photoaging. For two months, volunteers took a daily dose of MCN containing 200mg of hyaluronic acid, 500mg of L-carnosine, and 400mg of methylsulfonylmethane, or a placebo. At Day 0 (T0) and Day 60 (T60), face skin hydration, elasticity, and sebometry were measured with an instrumental skin tester, and digital images of facial wrinkles were scored. A subject-based quali-quantitative assessment evaluating satisfaction/quality of life was performed at T60. Results: The MCN and placebo groups each included 25 volunteers (mean ages: 49.3 and 47.8 years, respectively). After 60 days of MCN intake, glabella skin hydration and elasticity improved by 15.2 percent and 22.6 percent, respectively (p=0.03; p=0.004), glabella sebaceous secretion decreased by 24.2 percent (p=0.01), skin hydration and elasticity of the periocular area increased by 12.6 percent and 15.9 percent, respectively, and skin hydration and elasticity of the oral commissural area increased by 17.6 percent and 16 percent, respectively (p<0.001). No significant variation occurred in the placebo group. Wrinkle depth improved slightly in the MCN group (p=0.043 in the periocular area) but not in the placebo group. A slight improvement in joint pain and mucosae/hair appearance was reported in the questionnaire in the MCN group only. Conclusions: Our results suggest that MCN is safe and effective for facial skin aesthetics and well-being.

P. Daigle, E. Loing, **From tree skin to human skin: a circular economy concept**, H&PC Today, Vol. 14(2) March/April 2019

From tree skin to human skin, red maple extract has proved to be a good source of protective bioactive molecules. The extract protects the skin from oxidative insults and low-grade chronic inflammation, supports dermal regeneration and restores the skin barrier, for visible, clinically demonstrated, anti-ageing benefits in the form of wrinkle reduction and increased skin firmness. At the same time, red maple extract maximises bark eco-valorisation, thus improving wood circular economy.

M.M. Fossa Shirata, G.A.D. Alves, P.M.B.G. Maia Campos, **Photoageing related skin changes in different age groups: a clinical evaluation by biophysical and imaging techniques**, International Journal of Cosmetic Science, Volume 41, Issue 3, 2019

Objectives: In view of the lack of studies about the morphological and structural changes caused by solar radiation in young people, the aim of the present study was to evaluate the photoageing related changes in the skin of different age groups by biophysical and imaging techniques. Methods: Forty four healthy female subjects were divided into two age groups: Group 1 (G1): 18-35 years old and Group 2 (G2): 40-60 years old. The skin of malar region of the face was evaluated in terms of mechanical properties, disorder in the pigmentation pattern, morphological and structural changes using the Cutometer®, Colorimeter®, Visioface® and Dermascan C® devices and reflectance confocal microscopy (Vivascope®). Results: The results showed that the main changes in the skin of G1 were related to the pigmentation pattern, the papilla format and depletion of thin collagen fibres. These alterations were also observed in the skin of G2, but with more pronounced effects. Conclusion: The knowledge about the skin changes caused by photoageing obtained in this study is very important for the development of dermocosmetic products for more effective treatments particularly focused on this type of skin. Finally, objective characterization of photoageing showed the importance of photoprotective habits since the first years of life in order to retard the appearance of skin changes caused by solar radiation.

J.P. Meningaud, M. SidAhmed-Mezi, R. Billon, K. Rem, S. La Padula, B. Hersant, **Clinical benefit of using a multifractional Er:YAG laser combined with a spatially modulated ablative (SMA) module for the treatment of striae distensae: A prospective pilot study in 20 patients**, Lasers Surg Med, . 2019 Mar;51(3): p. 230-238

Background and objective: Striae distensae (SD) are cutaneous lesions that often occur on the breasts, abdomen, hips, and thighs. The aim of this study is to evaluate the effectiveness of a new technique using a non-invasive Er:YAG laser combined with Spatially Modulated Ablation (SMA) module for the treatment of SD. Study design/materials and methods: This prospective pilot clinical study included 20 patients with skin phototypes I to IV who are affected by SD. The Er:YAG 2940 nm laser with SMA module was used in scanning mode with fluences of 2.3 J/cm2 , frequency of 3 Hz, and pulse duration of 0.3 milliseconds. The laser beam is split into several microspots and penetrates only by 50 μm in the epidermis thickness. This technology induces also the generation of acoustic waves to stimulate tissue regeneration. Each patient underwent six laser sessions. An objective and subjective assessment of SD were used. All adverse events were reported. Results: Most patients reported good improvement and expressed their satisfaction with the treatment. Cutometric analysis showed significant improvement in skin elasticity at the end of study. Moreover, ultrasound analysis revealed an increase in dermal thickness (P < 0.01). POSAS scores decreased significantly at 3 and 6 months, reflecting improved skin quality. The average recovery time was 5 days, with no adverse effects reported.

Conclusion: Using Er:YAG laser (2,940 nm) with SMA technology to treat SD resulted in improved volume and textural appearance without side effects. The elasticity and thickness of the dermis also improved. The Er:YAG laser with SMA module may be considered as a novel and effective technique to treat SD lesions with minimal time recovery.

F. Barone, S. Bashey, F.W. Woodin Jr., **Clinical Evidence of Dermal and Epidermal Restructuring from a Biologically Active Growth Factor Serum for Skin Rejuvenation,** J Drugs Dermatol. 2019 Mar 1;18(3): p. 290-295

Background: Topical skin care products use various technologies to promote skin repair. Growth factors of human, animal, and plant-derived origins have clinically demonstrated the ability to repair skin by promoting collagen, elastin, and glycosaminoglycan (GAG) production to reconstruct and reinforce skin's extracellular matrix (ECM). Human skin cells respond to instructions from highly specialized proteins or hormones referred to as growth factors. These growth factors initiate cellular communication that instigates cellular replication, production, or proliferation. The production of elastin and collagen dermal connective fibers slows, and, with age, the regenerative rates of GAGs become delayed. These biological issues can be exacerbated by extrinsic factors such as sun exposure, pollutants, and various other factors. Growth factor-based products have become important topical treatment modalities for addressing signs of skin aging such as fine lines, deep wrinkles, dryness, laxity, and textural irregularities. Objective: The aim of a 12-week clinical trial of a growth factor composition was to assess its effectiveness at restoring skin health through dermal and epidermal restructuring of aged skin. Results: Data from expert grading, and from corneometer and cutometer evaluations, as well as 2D and 3D image analysis, reflected significant improvements in facial skin appearance, firmness, elasticity, and hydration. Elements that improved most dramatically in investigators' assessments included radiance, firmness, tactile elasticity, textural smoothness, overall appearance, and crow's feet. Ultrasound imaging showed continual increases in dermal and epidermal restructuring throughout the study duration. Subject assessments reflected positive product tolerability and positive perception across a broad range of efficacy attributes through 12 weeks of usage. Conclusion: The results verified the ability of a multi-modal plant and enzymatically derived growth factor-based product to achieve skin rejuvenation improvements by stimulating dermal ECM and fibrous tissue regeneration to reduce fine lines and coarse wrinkles, and improve skin firmness and elasticity, while restoring skin to a properly hydrated state.

L.-Y. Lin, S.-C. Chiou, S.-H. Wang, C.-C. Chi, **Effects of Facial Threading on Female Skin Texture: A Prospective Trial with Physiological Parameters and Sense Assessment**, Evidence-Based Complementary and Alternative Medicine, Volume 2019

Background: Facial threading is a common tradition in Taiwan, Southeast Asia (called "Bande Abru"), Middle East (called "Khite"), and Egypt (called "Fatlah"). In addition to the ability to remove facial vellus hairs, facial threading can make the skin fairer and shinier. However, there has been a lack of hard evidence regarding the effects of facial threading on the skin. Objective: To examine the effects of facial threading on skin physiology as well as visual and touch senses by using scientific instruments. Methods. A total of 80 participants were allocated to receive facial threading, application of powder only, exfoliation, and shaving. Prior to and following the assigned treatment, a noninvasive skin condition detection device was used to measure skin coarseness, hydration, melanin, and erythema index. Sense assessment and image analysis were also performed. Results: This study showed that facial threading was found to improve the facial skin roughness indices with significant decreases by 30.4%, 35.9%, and 16.7%, respectively, for the participants' forehead, cheek, and mouth corner skin. No significant adverse changes in moisture levels and skin pigment indices were detected. In addition, there was improvement in subjects' touch sense of their skin and feelings about skin color. Conclusions. Traditional facial threading can remove facial vellus hairs and lower skin roughness levels, thereby improving the skin texture. However, pricking sensation appeared during the facial threading process, which might causeconcerns about irritation.

M.E. Carrière, K.A.A. Kwa, L.E.M. de Haas, A. Pijpe, Z. Tyack, J.C.F. Ket, P.P.M. van Zuijlen, H.C.W. de Vet, L.B. Mokkink, **Systematic Review on the Content of Outcome Measurement Instruments on Scar Quality**, Plast Reconstr Surg Glob Open 2019;7:e2424

Background: Measurements of scar quality are essential to evaluate the effectiveness of scar treatments and to monitor scars. A large number of scar scales and measurement devices have been developed, which makes instrument selection challenging. The aim of this study was to provide an overview of the content (ie, included items) of all outcome measurement instruments that measure scar quality in different types of scars (burn, surgical, keloid, and necrotizing fasciitis), and the frequency at which the instruments and included items are used. Methods: A systematic search was performed in

PubMed and Embase.com up to October 31, 2018. All original studies reporting on instruments that measured at least 1 characteristic of scar quality were included and the instrument's content was extracted. Results: We included 440 studies for data extraction. Included instruments (N = 909) were clinician-reported scales (41%), measurement devices (30%), patientreported scales (26%), and combined clinician- and patient-reported scales (3%). The Observer scale of the Patient and Observer Scar Assessment Scale, the Cutometer, the Patient Scale of the Patient and Observer Scar Assessment Scale, and the modifed Vancouver Scar Scale were the most often used instrument in each of these categories, respectively. The most frequent assessed items were thickness, vascularity, pigmentation, pliability, pain, and itch. Conclusion: The results of this study lay the foundation for our future research, which includes an international Delphi study among many scar experts, and an international focus group study among scar patients, aiming to elucidate how scar quality must be defned and measured from both professional and patient perspectives.

A.K. Langton, S. Alessi, M. Hann, A. Lien-Lun Chien, S. Kang, C.E. Maitland Griffiths, R.E.B. Watson, **Aging in Skin of Color: Disruption to Elastic Fiber Organization Is Detrimental to Skin's Biomechanical Function**, Journal of Investigative Dermatology (2019) 139, p. 779-788

Skin aging is a complex process involving the additive effects of time-dependent intrinsic aging and changes elicited via skin's interaction with the environment. Maintaining optimal skin function is essential for healthy aging across global populations; yet most research focuses on lightly pigmented skin (Fitzpatrick phototypes IeIII), with little emphasis on skin of color (Fitzpatrick phototypes VeVI). Here, we explore the biomechanical and histologic consequences of aging in black African-American volunteers. We found that healthy young buttock and dorsal forearm skin was biomechanically resilient, highly elastic, and characterized histologically by strong interdigitation of rete ridges, abundant organized fibrillar collagen, and plentiful arrays of elastic fibers. In contrast, intrinsically aged buttock skin was significantly less resilient, less elastic, and was accompanied by effacement of rete ridges with reduced deposition of both elastic fibers and fibrillar collagens. In chronically photoexposed dorsal forearm, significant impairment of all biomechanical functions was identified, with complete flattening of rete ridges and marked depletion of elastic fibers and fibrillar collagens. We conclude that in skin of color, both intrinsic aging and photoaging significantly impact skin function and composition, despite the additional photoprotective properties of increased melanin. Improved public health advice regarding the consequences of chronic photoexposure and the importance of multimodal photoprotection use for all is of global significance.

*J.S. Lee, J. Ha, K. Shin, H. Kim, S. Cho***, Different Cosmetic Habits Can Affect the Biophysical Profile of Facial Skin: A Study of Korean and Chinese Women**, Ann Dermatol 31(2), p. 175-185, 2019

Background: Previous studies on the age-, climate, and skin care habit-related changes of biophysical parameters have mainly focused on Caucasians, and studies on Asians are in paucity. Objective: This study was aimed to investigate the variations of cutaneous biophysical parameters in Chinese and Korean women (northeast Asians) and to assess the association between those parameters and age, climate, and cosmetic habits. Methods: A cross-sectional study included 361 healthy Chinese and Korean women between 18 and 49 years of age in 4 cities (Guangzhou, Nanjing, and Shijiazhuang in China, and Suwon in Korea). We measured skin surface temperature, hydration, transepidermal water loss (TEWL), sebum, elasticity, skin pore, wrinkle, and skin tone (brightness) using non-invasive instruments. Demographic profiles and cosmetic habits were assessed using a questionnaire. Results: Skin elasticity and tone decreased, and pore size and wrinkle increased with age. Subjects in Suwon (Korean) showed higher hydration level, lower TEWL and lower sebum, less severe wrinkle and brighter skin than those in the 3 cities in China. After adjusting for age and region, using sunscreen everyday, wearing base makeup daily, and using moisturizers improved hydration, TEWL, and elasticity significantly. Conclusion: Women in Suwon (Korea) were found to have a better profile of biophysical parameters than women in the 3 Chinese cities, which might be attributed to cosmetic habits, besides age and climatic factors. The fact that appropriate cosmetic habits are associated with favorable skin biophysical parameters underscores the importance of daily skin care routine in preserving skin functions.

H.-Y. Cheng, L.-F. Li, **Skin Biophysical Parameters and Patch Test Results in People Predisposing to Xiaotong Tiegao Induced Irritant Contact Dermatitis**, Hindawi Evidence-Based Complementary and Alternative Medicine, Volume 2019

Background. Xiaotong Tiegao (XTT) is an ancient topical Tibetan medicine plaster which is widely used in China. Irritant contact dermatitis (ICD) caused by XTT is very common. It is still unclear why some people aremore prone to develop ICD.The aim of this study is to study the baseline skin

biophysical parameters and patch test results in individuals predisposing to XTT induced ICD. Methods. During a four-month period, 149 healthy volunteers with ICD and 50 volunteers without ICD after applying XTT were recruited. The skin biophysical parameters were measured, and contact allergy to 20 common allergens was patch tested, at two weeks after the ICD was recovered. Results.There were no significant differences in age and sex between ICD and control groups. It was found that skin median melanin value (176.50 vs 189.50, $P < 0.05$, Mann-Whitney U-test) and erythema value (319.90 ± 70.49 vs 347.93 ± 84.55, $P < 0.05$, Independent-Samples T test) were much lower in ICD than control group. Overall patch test results were not different, but the positivity rate of nickel sulfate (15.44% vs 4.00%, $P < 0.05$, Fisher's exact test) was significantly higher in ICD group. Conclusions. In conclusion, people with nickel allergy, lower values of skin melanin, and erythema are predisposing to develop ICD.

J. Suñer-Carbó, A. Calpena-Campmany, L. Halbaut-Bellowa, B. Clares-Naveros, M.J. Rodriguez-Lagunas, E. Barbolini, J. Zamarbide-Losada, A. Boix-Montañés, **Biopharmaceutical Development of a Bifonazole Multiple Emulsion for Enhanced Epidermal Delivery**, Pharmaceutics 2019, 11, 66

Efficient topical delivery of imidazolic antifungals faces the challenge of overcoming its limited water solubility and its required long-lasting duration of treatments. In this paper, a hydrophilic multiple emulsion (ME) of Bifonazole (BFZ) is shown to maximize its skin retention, minimize its skin permeation, and maintain an acceptable level of being harmless in vivo. The formulations were pharmaceutically characterized and application properties were assessed based on viscosity measurements. Non-Newtonian pseudoplastic shear thinning with apparent thixotropy was observed, facilitating the formulation retention over the skin. The in vitro release profile with vertical diffusion cells showed a predominant square-root release kinetic suggesting an infinite dose depletion from the formulation. Ex vivo human skin permeation and penetration was additionally evaluated. Respective skin permeation was lower than values obtained with a commercial O/W formulation. The combination of amphoteric and non-ionic surfactants increased the bifonazole epidermal accumulation by a factor of twenty. This fact makes the possibility of increasing its current 24 h administration frequency more likely. Eventual alterations of skin integrity caused by the formulations were examined with epidermal histological analysis and in vivo preclinical measurements of skin elasticity and water retrograde permeation. Histological analysis demonstrated that the multiple emulsions were harmless. Additionally, modifications of in vivo skin integrity descriptors were considered as negligible.

J.I. Yablonski, D.R. Winne, **Beginner's Guide to Natural Organic – Product Safety, Claims Support and Preservation**, Cosmetics & Toiletries, Volume 134, No. 2, February 2019, p. 18-31

Browsing a cosmetic counter, searching online or tuning into home shopping networks, one cannot help but notice the ever-increasing number of cosmetic and personal care products purporting to be *green*, *natural* or *organic* that are obviously targeting the rapidly growing environmentally conscious consumer and spa markets. Entire sections of exhibitions and trade shows have been dedicated.

T. Yazdanparast, H. Hassanzadeh, S.A. Nasrollah, S.M. Seyedmehdi, H. Jamaati, A. Naimian, M. Karimi, R. Roozbahani, A. Firooz, **Cigarettes Smoking and Skin: A Comparison Study of the Biophysical Properties of Skin in Smokers and Non-Smokers**, Tanaffos 2019; 18(2): 163-168

Background: Tobacco smoke is toxic for cells and could be a damaging factor to skin. The purpose of this study was to compare the biophysical properties of skin in smokers and non-smokers. Materials and Methods: The study population consisted of 28 current smokers and 24 non-smokers. The hydration of the stratum corneum, trans epidermal water loss, pH, erythema, melanin content, sebum, friction and elasticity parameters (R0, R2, R5) of skin, epidermis and dermis thickness and echodensity were measured on middle forehead, right cheek and right inner arm of participants. Also volume, surface area and depth of right nasolabial folds were measured. The mean of these values in smokers were compared with nonsmokers by independent sample T- test. Results: Gross elasticity was significantly lower in smokers on forehead ($p= 0.048$). Thickness of epidermis was higher in smokers in all measured sites but the differences were not statistically significant. Thickness of dermis was higher in smokers in all measured sites too, but only the difference on cheek was statistically significant ($p= 0.009$). Density of epidermis was lower in smokers in all measured sites, but only the difference on forehead was statistically significant ($p= 0.019$). Density of dermis was lower in smokers in all measured sites, but only the difference on arm was statistically significant ($p= 0.028$). Volume and area of nasolabial folds were higher in smokers, but only the difference of area was statistically significant ($p = 0.031$). Conclusion: Tobacco smoking could affect the biophysical parameters of skin, especially thickness and density of dermis and epidermis and nasolabial folds.

B. Nedelec, M.A. Couture, V. Calva, C. Poulin, A. Chouinard, D. Shashoua, N. Gauthier, J.A. Correa, A. de Oliveira, B. Mazer, L. LaSalle, **Randomized controlled trial of the immediate and long-term effect of massage on adult postburn scar,** Burns, 2019 Feb; 45(1): p. 128-139

Background: One objective of massage therapy applied to hypertrophic scar (HSc), is to improve the structural properties so skin possesses the strength and elasticity required for normal mobility. However, research supporting this effect is lacking. The objective of this study was to characterize the changes in scar elasticity, erythema, melanin, and thickness immediately after a massage therapy session and after a 12-week course of treatment compared to intra-individual matched control scars. Method: We conducted a prospective, randomized, single-blinded, pragmatic, controlled, clinical trial evaluating the impact of a 12-week course of massage therapy. Seventy burn survivors consented to participate and 60 completed the study. Two homogeneous, intra-individual scars were randomized to usual care control or massage therapy plus usual care. Massage, occupational or physical therapists provided massage treatment 3x/week for 12 weeks. Scar site characteristics were evaluated weekly immediately before and after massage treatment including elasticity (Cutometer), erythema and melanin (Mexameter), and thickness (high-frequency ultrasound). Analysis of covariance (ANCOVAs) were performed to test for immediate and long-term treatment effects. A mixed-model approach was used to account for the intra-individual scars. Results: Scar evaluation immediately before and after massage therapy at each time point revealed changes for all scar characteristics, but the group differences were predominantly present during the early weeks of treatment. The within group long-term analysis revealed a significant increase in elasticity, and a reduction in thickness, during the 12-week treatment period for both the control scar (CS) and massage scar (MS). The increase in elasticity reached significance at week 8 for the MS and week 10 for the CS and the reduction in thickness at week 5 for the CS and week 7 for the MS. There was no significant within group long-term differences for either erythema or melanin. There were group differences in erythema at week 8 and 11 where the CS was less erythematous than the MS. Conclusion: The immediate impact of forces applied during massage therapy may lead patients and therapists to believe that there are long-term changes in elasticity, erythema, and pigmentation, however, once baseline measures, the control scar, and time were incorporated in the analysis there was no evidence of long-term benefit. Massage therapy applied with the objective of increasing scar elasticity or reducing erythema or thickness over the long-term should be reconsidered.

C. Messaraa, L. Doyle, A. Mansfield, C. O'Connor, A. Mavon, **Ageing profiles of Caucasian and Chinese cohorts – focus on hands skin**, International Journal of Cosmetic Science, Volume 41, Issue 1, 2019

Objective: In spite of hand care being a dynamic segment of skin care, hands skin physiology has been receiving little attention in comparison to facial skin. In the present study, we aimed at gathering a comprehensive set of skin data from the dorsal part of the hand to study age related-changes in two ethnic groups (Caucasian and Chinese). Methods: Skin topographic, skin colour/colour heterogeneities, skin chromophores and skin biophysical measurements of 116 Caucasian and Chinese female volunteers aged 30– 65 years old were collected in Ireland and in China as part of a cross-sectional study. Results: Topographic alterations happened at both micro and macro scales with a noticeable delay in the onset of 10 years for the Chinese cohort. Similar evolution of skin colour with ageing was observed between the two cohorts and strong dissimilarities were seen when it came to colour heterogeneities and melanin hyper concentration, with a 20-year delay in severity for the Chinese cohort. A similar sharp drop of skin hydration occurred when reaching the 60's regardless of the group and substantial di8erences were recorded for skin biomechanical properties of the skin. Conclusion: These results provide additional insights about hand skin physiology in relation to ageingand ethnic di8erences, especially when put into perspective with what is currently known about facial ageing. This research yield additional material for hand cream product rationale and strategies for mitigating the appearance of ageing hands.

B. Algiert-Zielińska, P. Mucha, H. Rotsztejn, **Effects of lactobionic acid peel, aluminum oxide crystal microdermabrasion, and both procedures on skin hydration, elasticity, and transepidermal water loss**, J Cosmet Dermatol. January 2019

Background: Topical applications of alpha-hydroxy acids and poly hydroxy acids in the form of peels gained popularity. To enhance the effect of these substances, aluminum oxide crystal microdermabrasion can be used in one procedure. Aims: The assessment of skin hydration, elasticity, and TEWL after using lactobionic acid in the form of 20% peel and lactobionic acid in the form of 20% peel combined with aluminum oxide crystal microdermabrasion. Material and Methods: The study involved 20 Caucasian female subjects. Six treatments were performed at weekly intervals, using the Split face method-20% LA was used on the left side of the face and aluminum oxide crystal

microdermabrasion followed by 20% LA application on the right side of the face. Results: Corneometric measurement showed statistically significant differences between the hydration level for sessions 1 and 3 and 1 and 6. A higher hydration level was found on the side with the combined procedure. Tewametric measurement showed that the TEWL values were different for sessions 1 and 3 and 1 and 6-they decreased. There were no statistically significant differences between the two procedures. The cutometric measurement indicated statistically significant differences between skin elasticity for pairs in session 1 and 3 and 1 and 6. Conclusions: The results of the study indicate that the combination of LA peel with microdermabrasion increases its moisturizing effect and improves skin elasticity. The use of both procedures also contributed to the decrease in TEWL; however, greater exfoliation of the epidermis in combined procedures resulted in slightly higher TEWL values.

M. Kerscher, A.T. Nurrisyanti, C. Eiben-Nielson, S. Hartmann, J. Lambert-Baumann, **Skin physiology and safety of microfocused ultrasound with visualization for improving skin laxity**, Dove Press, January 2019 Volume 2019:12, p. 71-79

Purpose: The efficacy of microfocused ultrasound with visualization (MFU-V; Ultherapy®) has been demonstrated in clinical studies and daily practice. However, data addressing skin physiology after MFU-V treatment are lacking. This observational evaluation was aimed to assess skin physiology before and after MFU-V treatment using noninvasive biophysical measurements. Patients and methods: Twenty-two female patients with moderate-to-severe skin sagging at the jawline and submental region on the Merz Aesthetics Scale obtained a single MFU-V treatment according to protocol. Skin function measurements focused on short-term effects up to 3 days and long-term effects up to 24 weeks after treatment. Skin temperature, transepidermal water loss, skin hydration, erythema, elasticity, and skin thickness and density were evaluated under standardized conditions. Pain was assessed using a validated numeric visual analog scale. Results: Skin temperature remained in a physiologic range and no significant increase was noted at day 3 after MFU-V treatment. Transepidermal water loss, hydration, and erythema values were fairly stable and showed no significant differences at short- and long-term measurements vs baseline. At week 4 after a single MFU-V treatment, gross and net elasticity values were significantly decreased (P=0.003 and P=0.0001, respectively), followed by significantly increased values at week 12 (P=0.015, P=0.046) and week 24 (P=0.001, P=0.049). Edema due to MFU-V treatment resolved without sequelae. For all patients, pain diminished shortly after treatment. No adverse events occurred during the 24-week follow-up period. Conclusions: MFU-V treatment is well tolerated and it does not alter the epidermal barrier function or physiology of skin. Significant increase in the elasticity of skin was observed at 12 and 24 weeks after a single treatment, which reflects improvement in dermal tissue function. These short- and long-term effects are congruous with the mode of action of MFU-V due to a proven intrinsic tissue remodeling process.

Z.M. Rashaan, P. Krijnen, K.A.A. Kwa, C.H. van der Vlies, I.B. Schipper, R.S. Breederveld, **Flaminal® versus Flamazine® in the treatment of partial thickness burns: a randomized controlled trial on clinical effectiveness and scar quality (FLAM study),** Wound Repair Regen. 2019 January

Although partial thickness burns are the most frequently reported burn injuries, there is no consensus on the optimal treatment. The objective of this study was to compare the clinical effectiveness and scar quality of Flaminal® Forte to silver sulfadiazine (Flamazine®) in the treatment of partial thickness burns. In this two-arm open label multi-center randomized controlled trial, adult patients with acute partial thickness burns and an affected total body surface area of less than 30% were randomized between Flaminal® Forte and Flamazine® and followed for 12 months. Dressing changes in the Flamazine® group were performed daily, and in the Flaminal® group during the first three days post burn and thereafter every other day until complete wound healing or surgery. Forty-one patients were randomly allocated to Flaminal® Forte and 48 patients to Flamazine®. The primary outcome was time to wound healing, which did not differ between the groups: median 18 days with Flaminal® Forte (range 8-49 days) versus 16 days with Flamazine® (range 7-48 days; p=0.24). Regarding the secondary outcomes during hospital admission, there were no statistically significant differences between the groups concerning need for surgery, pain scores, pruritus, or pain-related and anticipatory anxiety. More patients in the Flaminal® group developed wound colonisation (78% versus 32%, p<0.001), but the treatment groups did not differ regarding the incidence of local infections and use of systemic antibiotics. In terms of scar quality, no statistically significant differences between both treatment groups were found regarding subjective scar assessment (Patient and Observer Scar Assessment Scale (POSAS)), scar melanin and pigmentation (DermaSpectrometer®) and scar elasticity and maximal extension (Cutometer®) during 12 month post-burn. In conclusion, time to wound healing did not differ, but the use of Flaminal® Forte seemed favourable because less dressing changes are needed which lowers the burden of wound care.

M. Kerscher, A.T. Nurrisyanti,. C. Eiben-Nielson, S. Hartmann, J. Lambert-Baumann, **Clinical and**

Biophysical Outcomes of Combining Microfocused Ultrasound with Visualization and Calcium Hydroxylapatite Filler for Facial Treatment, Dermatol Ther (Heidelb) (2019) 9: p. 135–142

Introduction: Combined cosmetic treatments are becoming increasingly popular. The objective of this clinical evaluation was to assess the long-term safety and efficacy of combining microfocused ultrasound with visualization (MFU-V) treatment with a calcium hydroxylapatite (CaHA) dermal filler to tighten skin at the submental region and contour the jawline.Methods: Women with loss of contour and skin laxity in the lower face received MFU-V treatment. If subjects did not respond satisfactorily after 12 weeks, they received CaHA to the jawline. Evaluations—which were performed by blinded raters at baseline and after 12, 24, and 48 weeks—included live Global Aesthetic Improvement Scale (GAIS) ratings, Merz Aesthetic Scale (MAS) ratings, skin parameters, and tolerability. Results: Of the 22 subjects, 9 received combined treatments. GAIS scores showed that subjects were much and very much improved (50% each) at 48 weeks. The MAS score was decreased by at least one point in 89% of subjects. Skin thickness was significantly improved after 24 weeks (p \ 0.05) and remained above baseline after 48 weeks. Skin firmness was significantly improved after 48 weeks (p \ 0.05). No unexpected adverse events were reported. Conclusion: Combined MFU-V and CaHA treatments for laxity in the lower face did not alter skin barrier function, improved appearance, and slowed visible skin aging processes for at least 48 weeks.

J.N. Kern, F. Weidemann, P.F. O'Loughlin, C. Krettek, R. Gaulke, **Mid- to Long-term Outcomes After Split-thickness Skin Graft vs. Skin Extension by Multiple Incisions**, in vivo 33: p. 453-464 (2019)

Background/Aim: Skin extension by multiple incisions (SEMI) may be superior to split-thickness skin graft (STSG) for closure of large soft tissue defects. Materials and Methods: Twenty-six patients who had undergone STSG were compared to 29 patients who had undergone SEMI on the extremities. Patient and Observer Scar Assessment Scale (POSAS), Dermatology Life Quality Index, Wound QoL (Quality of Life) and Short Form Health Survey 36 were used. Elasticity, thickness and skin sensation were comparedbetween the treated and contralateral extremity. Range of motion in adjacent joints was measured. Complication rates were compared. Results: A total of 55 patients with a meanfollow-up of 5.5 years (range=2-9 years) were examined. Patients with STSG had significantly worse scores in POSAS. The scar was thinner, less elastic and did not provide intact sensibility. Other scores, ROM and complication rates did not differ significantly. Conclusion: SEMI was superior to STSG regarding patient satisfaction and scar quality.

H.K. Graham, J.C. McConnell, G. Limbert, M.J. Sherratt, **How stiff is skin?**, Experimental Dermatology. 2019;28 (Suppl. 1): p.4–9

The measurement of the mechanical properties of skin (such as stiffness, extensibility and strength) is a key step in characterisation of both dermal ageing and disease mechanisms and in the assessment of tissue-engineered skin replacements. However,the biomechanical terminology and plethora of mathematical analysis approaches can be daunting to those outside the field. As a consequence, mechanical studies are often inaccessible to a significant proportion of the intended audience. Furthermore, devices for the measurement of skin function in vivo generate relative values rather than formal mechanical measures, therefore limiting the ability to compare studies. In this viewpoint essay, we discuss key biomechanical concepts and the influence of technical and biological factors (including the nature of the testing apparatus, length scale, donor age and anatomical site) on measured mechanical properties such as stiffness. Having discussed the current state-of-the-art in macro-mechanical and micromechanical measuring techniques and in mathematical and computational modelling methods, we then make suggestions as to how these approaches, in combination with 3D X-ray imaging and mechanics methods, may be adopted into a single strategy to characterise the mechanical behaviour of skin.

M. Ostermeier, M. Kerscher, **Der diurnale Rhythmus der Haut: Mythos oder Realität?: Evaluation mittels biopyhsikalischer Messmethoden,** Aktuelle Dermatologie 44(12): p. 539-546, Dezember 2018

Zusammenfassung Hintergrund Bisher weisen nur wenige Studien auf tageszeitabhängige Rhythmen des transepidermalen Wasserverlustes (TEWL), der Talgproduktion und des pH-Wertes hin. Detailliertere Beschreibungen des Hautbarriere-Rhythmus' könnten für die Wahl des richtigen Zeitpunktes der dermalen Applikation von pharmazeutischen und kosmetischen Wirkstoffen von großer Bedeutung sein. Es ist denkbar, dass eine Optimierung der Wirkung oder Verträglichkeit dermatologischer Behandlungen erreicht werden kann. Somit ist es Ziel dieser Studie, den diurnalen Rhythmus der Hautbarriereparameter Hautrötung, transepidermaler Wasserverlust (TEWL), Stratum corneum-Hydratation, mechanische Eigenschaften, pH-Wert und Sebum zu erfassen. Methoden Insgesamt 24 hautgesunde Probandinnen (21 – 39 Jahre) wurden innerhalb von 12 Stunden in einem

4-Stunden-Rhythmus an den Wangen und an der Stirn anhand biophysikalischer Messverfahren untersucht. Ergebnisse Die Tageszeit wirkt sich auf die Barrierefunktion der Haut aus. Der mittlere Erythem-Wert ist nachmittags signifikant höher als morgens. Anhand der Datenanalyse ist zu erkennen, dass der TEWL-Mittelwert sich abends statistisch sehr signifikant gegenüber dem Mittelwert morgens unterscheidet. Schlussfolgerung Die Erkenntnisse über die tageszeitliche Veränderung der Barrierefunktion können Aufschluss über ideale Zeitfenster verschiedener Kosmetikbehandlungen geben. Somit bietet z. B. ein erhöhter TEWL am Abend aufgrund der Permeabilität eine bessere Absorption von Wirkstoffen mit höherem Molekulargewicht.

A. Jeanneau, **Botanical Alternative**, COSSMA 12 2018

The demand for both natural and effective cosmetics is still increasing worldwide, especially in anti-ageing skin care. In this area, natural hyaluronic acid boosters flood the market to offer alternatives to hyaluronic acid fillers. Indeed, the reputation of hyaluronic acid fillers has suffered lately and is no longer compatible with cosmetic products supporting claims as “better ageing” or “ageing well”.

S.W. Jacobs, E.J. Culbertson, **Effects of Topical Mandelic Acid Treatment on Facial Skin Viscoelasticity,** Facial Plast Surg. 2018 Dec; 34(6): p. 651-656

Mandelic acid is an α-hydroxy acid with reported benefit in treating acne and hyperpigmentation. The authors have developed a topical mandelic acid formulation that subjectively improves the quality of aged skin. Although the gold standard for assessing outcomes, photographic documentation is limited by subjective interpretation. Tools for measuring physical skin properties allow for an objective assessment of changes in skin quality. The authors sought to objectively study the viscoelastic changes to the skin following treatment with topical mandelic acid, using the Cutometer MPA 580. Twenty-four patients, twenty females and four males, aged 42 to 68 years, were studied over a four-week period. Mandelic acid was applied topically to the face twice a day for four weeks. The lower eyelid skin viscoelastic properties were assessed weekly using the Cutometer. After four weeks of topical mandelic acid treatment, the elasticity of lower eyelid skin increased 25.4% ($P = .003$). Skin firmness increased 23.8% ($P = .029$). Improvement in photographic appearance correlated with these findings. Mandelic acid is another topical treatment option for improving skin quality, and is well tolerated by patients. The authors feel that the Cutometer or similar device should be used routinely in facial plastic surgery to objectively assess outcomes of various treatment modalities.

M. Yiman, Y.-C. Lee, M. Hong, L. Brownell, Q. Jia, **A Randomized, Active Comparator-controlled Clinical Trial of a Topical Botanical Cream for Skin Hydration, Elasticity, Firmness, and Cellulite,** J Clin Aesthet Dermatol. 2018; 11(8): p. 51–57

Background: The skin is where initial visual signs of aging manifest, including increased skin dryness and decreased firmness and elasticity. Cellulite, a skin condition characterized by changes in the skin morphology due to excessive lipid deposition in subcutaneous adipose tissue, is another characteristic of skin aging. Objective: We sought to assess the effectiveness of a topical botanical cream on cellulite, skin hydration, firmness, and elasticity after two, four, and eight weeks of use compared to an active comparator. Design: The study was a single-blind, randomized, controlled study conducted on subjects with mild-to-severe cellulite on the thighs. Subjects were treated with a topical botanical cream (UP1307) and an active comparator for eight weeks. A total of 44 women 18 to 59 years of age were enrolled. Test products were gently applied in a circular motion to the area identifed by subjects as the target cellulite area twice per day. Measurements: Measurements using Corneometer® (for skin hydration) and Cutometer® (for skin elasticity and firmness) were carried out at each visit in addition to expert clinical grader evaluations for cutaneous changes and cellulite. Outcomes were also assessed by patients using subject questionnaires. Results: Patients reported significant improvement in skin hydration, firmness, and elasticity over time. Findings were corroborated with objective instrumental measurements. At Week 8, 44.4- and 42.7-percent improvement in appearance of cellulite was also observed for the UP1307 cream and the active comparator group, respectively. Conclusion: Use of UP1307 cream produced significant improvements in skin hydration, firmness, and elasticity, with associated improvement in cellulite appearance. There was overall superiority of UP1307 between groups. Progressive subject perceptions of product effects are reported.

T. Yazdanparast, K. Yazdani, P. Humbert, A. Khatami, S.A. Nasrollah, H. Hassanzadeh, A.H. Ehsani, L. Izadi Firouzabadi, A. Firooz, **Comparison of biophysical, biomechanical and ultra-sonographic properties of skin in chronic dermatitis, psoriasis and lichen planus**, Med J Islam Repub Iran. 2018(5 Nov);32.108

Background: Skin biometrology is a useful method for evaluation of inflammatory skin disorders such as dermatitis, psoriasis, and lichen planus. The current study tries to compare the biophysical

features of skin in dermatitis, psoriasis, and lichen planus. Methods: By a convenient sampling method, 22 mild to moderate chronic dermatitis, 26 psoriasis, and 21 lichen planus patients were recruited in the study. Stratum corneum (S.C.) hydration, Transepidermal water loss (TEWL), pH, erythema, melanin, sebum, friction, elasticity parameters (R0, R2, and R5), skin temperature, skin thickness, and echo-density of epidermis and dermis were measured on the lesional (selected active lesion), uninvolved perilesional, and uninvolved symmetrical skin. The average of perilesional and symmetrical uninvolved parameters was used as control, while the percentage change of each parameter [(lesion – control / control) ×100] was calculated, and compared among three diseases by ANOVA test using SPSS software version 18. The significance level was set at α=0.05. Results: Comparison of percentage changes showed that the changes in TEWL, friction index, sebum content, R2 (gross elasticity), R5 (net elasticity), skin temperature, dermal thickness, and epidermal density are not significantly different among three skin diseases. But there were significant differences in three diseases considering the decrease in S.C. hydration ($p<0.001$), R0 (opposed to firmness) ($p<0.001$), and dermal density ($p<0.001$) compared to control skin. Moreover, the increase in skin pH ($p<0.001$), melanin content ($p=0.048$), erythema ($p=0.023$), and epidermal thickness ($p <0.001$) significantly differed among these diseases. Conclusion: Dermatitis, psoriasis and lichen planus lesions had specific biophysical changes. It may be helpful in their differential diagnosis.

V. Mazzarello, M. Ferrari, P. Ena, **Werner syndrome: quantitative assessment of skin aging**, Clinical, Cosmetic and Investigational Dermatology 2018: 11, p. 397–402

Background: Werner syndrome (WS) is a rare autosomal recessive disorder characterized by premature aging in adults. Although not suffcient to diagnose WS, persistent short stature and alteration of the dentition are among the few early signs that appear at puberty and can lead to a suspected diagnosis. Objective: The study aimed at quantifying the signs of WS skin aging through biophysical parameters to fnd new parameters to be applied together with clinical observations in order to diagnose the disease early. Patients and methods: The skin disorders induced by the disease were studied using noninvasive techniques: Tewameter TM300, Corneometer CM825, Skin-pH-Meter PH900, Mexameter MX16, Visioscan VC98, and Cutometer MPA580. Twenty-four patients divided into young group, WS group, and elderly group were recruited for the study. Results: The WS skin is quite similar to aged skin, with some differences concerning the barrier function and skin elasticity; for instance, a WS patient of 30 years of age has the same skin roughness of a 50/60 years old subject with a more severe skin condition leading to higher dryness, high transepidermal water loss, and less distensibility correlating with skin indurations. Conclusion: In patients with WS, the biophysical parameters can quantify the damage induced on the skin by the disease. In order to stage the degree of the disease, biophysical parameters could be used in the future as a diagnostic procedure in the initial stages of the disease as they may reveal lesions not yet clinically perceptible or in advanced stages.

H. Sano, Y. Hokazono, R. Ogawa, **Distensibility and Gross Elasticity of the Skin at Various Body Sites and Association with Pathological Scarring: A Case Study**, J Clin Aesthet Dermatol. 2018; 11(6): p. 15–18

Objective: Pathological scars, including hypertrophic scars and keloids, have a strong predilection for specifc regions of the body. Such site specifcity might reflect regional differences in skin properties. Greater knowledge about the characteristics of the skin at various body regions can promote the development of clinical approaches to skin incision and flap design and reduce the formation of cutaneous scars. It could also help elucidate the etiology of pathological scar development and progression. Thus, we measured the distensibility and gross elasticity of the skin at various body sites. Methods: Five healthy adult volunteers were enrolled. In each, the cutaneous viscoelasticity at 16 sites (forehead, superior eyelid, lower jaw, earlobe, deltoid, outside and medial side of the upper arm, palm, scapular region, anterior chest, upper abdomen, lateral abdomen, lower abdomen, lateral thigh, anterior lower leg, and planta) was examined using a Cutometer MPA 580® (Courage Khazaka electronic GmbH, Cologne, Germany). Results: The skin was particularly distensible at the medial side of the upper arm, followed by the earlobe, lower jaw, upper abdomen, lateral abdomen, lower abdomen, and superior eyelid. It was poorly distensible at the planta, followed by the anterior lower leg, palm, and forehead. The skin was poorly elastic at the earlobe, superior eyelid, planta, and palm and highly elastic at the lateral and upper abdomen, scapular region, and deltoid. Conclusions: Except for the earlobe, all regions with poorly distensible and hard skin are not prone to pathological scarring. This association between these skin properties and abnormal scarring could be useful for skin surgeons.

N. Nishimura, S. Inoue, K. Yokoyama, S. Iwase, **Effect of spraying of fine water particles on facial skin moisture and viscoelasticity in adult women**, Skin Research & Technology, November 2018

Background/purpose: It is known that the elderly and adult women with reduction in sebum secretion have reduced skin barrier function, drying of the skin in a low humidity environment is accompanied by physiological distress. As our hypothesis, when fine water particles are sprayed on the skin, the water content of the corneal layer is significantly increased. In the present study, we examined the ability of fine water particles to improve facial skin moisture levels in adult women. Methods: We examined skin conductance, transepidermal water loss (TEWL), and skin elasticity as an index of skin barrier function at the cheek in 17 healthy adult women in the spraying of fine water particles, in the environment temperature at 24°C and 34.5% relative humidity. Results: The skin conductance of stratum corneum after 120 minute of spraying, A condition (peak particle size below 0.5 μm) was 119.7 ± 25.1%, B condition (peak particle size 1.8 μm) was 100.4 ± 31.7%, C condition (peak particle size 5.4 μm) was 110.1 ± 25.0%, and the A condition was significantly higher than the B condition. Also, skin elasticity in the A condition tended to be higher value than in the other conditions. Transepidermal water loss (TEWL) after 120 minute of spraying showed a lower value in the A condition than in the other conditions. In the A condition, the skin conductance steadily maintained their initial levels up to 360 minute after spraying. Conclusion: Especially, by spraying smallest fine water particles, skin barrier function at the cheek was improved. These data indicated that non-charged fine water particles played an important role on moisten skin in a low humidity environment.

J. Pierre, G. Francois, A.M. Benize, V. Rubert, J. Coutet, F. Flament, **Mapping, in vivo, the uniformity of two skin properties alongside the human face by a 3D virtual approach**, Int J Cosmet Sci., 2018 Oct; 40(5): p. 482-487

Objective: To determine the homogeneity in the distribution of two cutaneous functions (hydration and elasticity) along the entire human face. Material and Methods: The half faces (right or left, randomly chosen) of two groups of Caucasian women weremeasured on 24 different small sites (elasticity) and 41 others (hydration), by instruments of small-sized probes (Cutometer and Corneometer, respectively). Hydration of the face was recorded at different times (up to 24 h), post application of a highly hydrating product. Results: The recorded values (left and right half faces) were further gathered and digitally positioned on a virtual feminine face and their intensity was illustrated through a colored white (lower values)-blue (higher values) scale. The reconstitution of the mapping of the two measured parameters (from the left and right sides of differentsubjects), shows a perfect symmetry vis à vis the nose axis. However, both parameters present slightly variable but significant values along the human face. Sites from the temple are less elastic than chin or forehead. The upper and lower parts of the forehead show slight disparities in their elasticity values. Cheeks are significantly less prone at retaining their imparted hydration status (lost 2 h after application of a hydrating product) as compared to sub-ocular regions or chin that retain their hydration up to 24 h. Attempts to establish a mutual relationship between the two skin properties unsurprisingly failed. Conclusion: The two studied skin properties show a slight but highly symmetric disparity along the entire human face

D. Martini, D. Angelino, C. Cortelazzi, I. Zavaroni, G. Bedogni, M. Musci, C. Pruneti, G.Passeri, M. Ventura, D. Galli, P. Mirandola, M. Vitale, A. Dei Cas, R.C. Bonadonna, S. Di Nuzzo, M.B. De Felici, D. Del Rio, **Claimed Effects, Outcome Variables and Methods of Measurement for Health Claims Proposed Under European Community Regulation 1924/2006 in the Framework of Maintenance of Skin Function**, Nutrients 2018, 10, 7

Evidence suggests a protective role for several nutrients and foods in the maintenance of skin function. Nevertheless, all the requests for authorization to use health claims under Article 13(5) in the framework of maintenance of skin function presented to the European Food Safety Authority (EFSA) have received a negative opinion. Reasons for such failures are mainly due to an insufficient substantiation of the claimed effects, including the choice of inappropriate outcome variables (OVs) and methods of measurement (MMs). The present paper reports the results of an investigation aimed at collecting, collating and critically analyzing the information with relation to claimed effects (CEs), OVs and MMs related to skin health compliance with Regulation 1924/2006. CEs, OVs and MMs were collected from both the EFSA Guidance document and from the authorization requests of health claims under Article 13(5). The critical analysis of OVs and MMs was based on a literature review, and was aimed at defining their appropriateness (alone or in combination with others) in the context of a specific CE. The results highlight the importance of an adequate choice of OVs and MMs for an effective substantiation of the claims.

S. Akita, K. Hayashida, H. Yoshimoto, M. Fujioka, C. Senju, S. Morooka, G. Nishimura, N. Mukae, K. Kobayashi, K. Anraku, R. Murakami, A. Hirano, M. Oishi, S. Ikenoya, N. Amano, H. Nakagawa, **Novel Application of Cultured Epithelial Autografts (CEA) with Expanded Mesh Skin Grafting Over an Artificial Dermis or Dermal Wound Bed Preparation**, Int. J. Mol. Sci. 2018, 19, 57

Cultured epithelial autografts (CEA) with highly expanded mesh skin grafts were used for extensive adult burns covering more than 30% of the total body surface area. A prospective study on eight patients assessed subjective and objective findings up to a 12-month follow-up. The results of wound healing for over 1:6 mesh plus CEA, gap 1:6 mesh plus CEA, and 1:3 mesh were compared at 3, 6, and 12 months using extensibility, viscoelasticity, color, and transepidermal water loss by a generalized estimating equation (GEE) or generalized linear mixed model (GLMM). No significant differences were observed among the paired treatments at any time point. At 6 and 12 months, over 1:6 mesh plus CEA achieved significantly better expert evaluation scores by the Vancouver and Manchester Scar Scales ($p < 0.01$). Extended skin grafting plus CEA minimizes donor resources and the quality of scars is equal or similar to that with conventional low extended mesh slit-thickness skin grafting such as 1:3 mesh. A longitudinal analysis of scars may further clarify the molecular changes of scar formation and pathogenesis.

A. Sakata, K. Abe, K. Mizukoshi, T. Gomi, I. Okuda, **Relationship between the retinacula cutis and sagging facial skin**, Skin Research & Technology, 2018, 24: p. 95-98

Background: Sagging skin is one of the most concerning esthetic issues for elderly individuals. Although reduced skin elasticity has been reported as the cause of sagging skin, a loss of skin elasticity alone is insufficient to explain sagging facial skin. This study investigated the mechanisms underlying sagging skin, with a focus on the subcutaneous network of collagenous fibers known as the retinacula cutis (RC). Methods: To evaluate the structure of the RC noninvasively, tomographic images of the face were obtained using magnetic resonance imaging (MRI). The RC was identified by comparing MRI results with histological specimens of human skin. A descriptive scale was used to evaluate the degree of sagging, and a device equipped with a 6-mm-diameter probe was used to measure the elasticity of deeper skin layers and evaluate the physical properties of the skin. Results: The density of RC in subcutaneous tissue correlated negatively with sagging scores and positively with elasticity. Conclusion: These results imply that a sparse RC structure contributes to a reduction in the elasticity of subcutaneous tissue, resulting in a greater degree of sagging facial skin.These findings are expected to contribute tothe understanding of the mechanisms underlying sagging skin.

M. Barbero, S. Rodríguez, I. Zaldívar, **PB Serum Wrinkle Hyaluronic Complex**, ZURKO research Laboratories Information

Facial skin is one of the most sensitive parts of our body, as it is the one that suffers the wear of weather, temperature changes, closed environments, stress, etc. Therefore, the face loses elasticity over the years and expression lines appear. The objective of the present study is to demonstrate that the exclusive lyophilized cocktail based on Keratinase KerA PB333 and hyaluronic acid, has a high capacity of reducing wrinkles and expression lines. The unique biologic active KerA PB333 acts on the skin promoting an effective and soft peeling effect, without altering skin balance or reducing its natural hydration. The Hyaluronic acid penetrates in the skin smoothing wrinkles.

J.L. Schiefer, R. Rath, E. Ahrens, D. Grigutsch, I. Gräff, J.-P. Stromps, P.C. Fuchs, A. Schulz, **Evaluation of scar quality after treatment of superficial burns of the hands and face with Dressilk or Biobrane—An intra-individual comparison**, Burns 44 (2018), p. 305 – 317

Introduction: The aesthetic outcome after burn of exposed areas such as the hand and face is of high importance. A number of wound dressings used for the treatment of superficial and partial thickness burns promise rapid wound healing and reduced scarring. Previously, wound healing of hands and faces with superficial burns treated with Dressilk1 compared to Biobrane1 was evaluated intra-individually with similar results. Nevertheless, up to date objective information regarding the scarring after superficial burns treated with Dressilk1 does not exist. Methods: Therefore, 30 patients with superficial burns of the hand and face that were treated with Dressilk1 and Biobrane1 simultaneously were included in the study. An objective scar evaluation was performed analyzing melanin and erythema levels, skin elasticity, transepidermal water loss and scar perfusion three and six and 12 months after injury. Furthermore, a subjective scar evaluation was performed with the patient and observer scar assessment scale (POSAS) and the Vancouver scar scale (VSS). Results: Dressilk1 and Biobrane1 both lead to an aesthetic pleasing outcome after superficial burns of the hands and faces. Regarding the objective scar evaluation only trans-epidermal water loss of burned hands after 6 months showed significant differences between the two dressings. However, these differences were not detected in the 12-month follow up examination. In the subjective scar evaluation no statistical differences could be found between the dressings. All patients stated high satisfaction of scar quality. Conclusion: Dressilk1 is an interesting alternative to Biobrane1 for the treatment of superficial burns of aesthetic and functional important areas.

A.K. Dabrowska, F. Spano, S. Derler, C. Adlhart, N.D. Spencer, R.M. Rossi, **The relationship between skin function, barrier properties, and body-dependent factors,** Skin Research & Technology 2018; 24: 165-174

Background: Skin is a multilayer interface between the body and the environment, responsible for many important functions, such as temperature regulation, watertransport, sensation, and protection from external triggers.Objectives: This paper provides an overview of principal factors that influence human skin and describes the diversity of skin characteristics, its causes and possible consequences. It also discusses limitations in the barrier function of the skin, describingmechanisms of absorption. Methods: There are a number of in vivo investigations focusing on the diversity of human skin characteristics with reference to barrier properties and body-dependent factors. Results: Skin properties vary among individuals of different age, gender, ethnicity, and skin types. In addition, skin characteristics differ depending on the body site and can be influenced by the body-mass index and lifestyle. Although one of the main functions of the skin is to act as a barrier, absorption of some substances remains possible. Conclusions: Various factors can alter human skin properties, which can be reflected in skin function and the quality of everyday life. Skin properties and function are strongly interlinked.

S. Iizaka, **Frailty and body mass index are associated with biophysical properties of the skin in community-dwelling older adults**, Journal of Tissue Viability (2018)

Aim of the study: This study aimed to investigate the association of frailty and body mass index (BMI) with biophysical properties of the skin in community-dwelling older people. Materials and methods: A cross-sectional study was conducted in a suburban Japanese city. Older adults aged >65 years and participating in a health checkup program were recruited (n = 128). Stratum corneum hydration, clinical manifestations of dry skin, skin elasticity and condition of the dermis (as measured by ultrasonography) were evaluated on the volar forearm. Frailty phenotype and BMI were also evaluated. Results: The mean age of participants was 74.5 years, and 96.1% were women. Skin thickness was significantly decreased in frail participants compared with non-frail participants in an age-adjusted multivariate model (p = 0.009). Frail participants showed significantly lower skin elasticity values than non-frail participants in a univariate analysis (p = 0.024), but this was not significant in the multivariate model. In participants with BMI >25kg/m2, clinical manifestations of dry skin were significantly decreased compared with BMI <21.5kg/ m2 (p = 0.002). Participants with BMI >25kg/m2 and with 21.5 kg/m2 < BMI <25kg/in2 showed significantly higher skin elasticity values than participants with BMI < 21.5kg/m2 (p = 0.014 and p = 0.042, respectively). Conclusion: Frailty was associated with decreased skin thickness and decreased skin elasticity partially via the influence of chronological aging. Low body mass was associated with increased xerosis manifestations and decreased skin elasticity in community-dwelling older adults.

F. Alvim Sant'Anna Addor, J. Cotta Vieira, C. Sirieiro Abreu Melo, **Improvement of dermal parameters in aged skin after oral use of a nutrient supplement**, Clinical, Cosmetic and Investigational Dermatology 2018:11, p. 195–201

Purpose: Skin aging is a progressive and degenerative process caused by a decrease in the physiological functions of the skin tissue. In addition, environmental factors as well as concomitant diseases and lifestyle (nutrition, sedentary lifestyle, smoking, etc) negatively impact the aging process. An association between oral administration of collagen peptides combined with vitamin C and extracts of *Hibiscus sabdariffa* and *Aristotelia chilensis* (Delphynol®) (Eximia Firmalize Age complex®) on dermal thickness was studied and the improvement in aging signs was evaluated. Patients and methods: Female adult patients received an oral nutritional supplement containing collagen peptides, vitamin C, *H. sabdariffa*, and *A. chilensis* (Delphynol) in a sachet and were instructed to consume 1 sachet diluted in 200 mL of water once daily for 12 weeks. They were evaluated clinically, by high frequency ultrasound and cutometry. Results: There was a signifcant improvement of frmness and elasticity and an increase in dermal thickness by ultrasound after 3 months of use. Conclusion: The association of collagen peptides, vitamin C, *H. sabdariffa* and *A. chilensis* (Delphynol) could improve the signs of dermal skin aging.

V. Carvalho Canela, C. Nicoletti Crivelaro, L. Zacchi Ferla, G. Marques Pelozo, J. Azevedo, R. Eloin Liebano, C. Nogueira, R. Michelini Guidi, C. Grecco, E. Sant'Ana, **Synergistic effects of Combined Therapy: nonfocused ultrasound plus Aussie current for noninvasive body contouring**, Clinical, Cosmetic and Investigational Dermatology 2018:11, p. 203–211

Background and objectives: Nowadays, there are several noninvasive technologies being used for improving of body contouring. The objectives of this pilot study were to verify the effectiveness of the Heccus® device, emphasizing the synergism between nonfocused ultrasound plus Aussie current in the improvement of body contour, and to determine if the association of this therapy with whole-body vibration exercises can have additional positive effects in the results of the treatments. Subjects and

methods: Twenty healthy women aged 20–40 years participated in the study. Ten patients received Combined Therapy treatment (G1) and the other 10 participants received Combined Therapy with additional vibratory platform treatment (G2). Anthropometric and standardized photography analysis, ultrasonography, cutometry and self-administered questionnaires of tolerance and satisfaction levels with the treatment were used. Results: Compared with baseline values, reduction of fat thickness was observed by ultrasonography in the posterior thigh area in the G1 group (P<0.05) and in the buttocks (P<0.05) and the posterior thigh areas (P<0.05) in the G2. All the treated areas in both groups showed reduction in cellulite degree in the buttocks, G1 (P<0.05) and G2 (P<0.05), and in posterior thigh areas, G1 (P<0.05) and G2 (P<0.05). Optimal improvement of skin firmness (G1, P<0.0001; G2, P=0.0034) in the treated areas was observed in both groups. Conclusion: We conclude that the synergistic effects of the Combined Therapy (nonfocused ultrasound plus Aussie current) might be a good option with noninvasive body contouring treatment for improving the aspect of the cellulite, skin firmness and localized fat. If used in association with the whole-body vibratory platform, the results can be better, especially in the treatment of localized fat. Further studies with larger sample size should be performed to confirm these results.

M. Aust, H. Pototschnig, S. Jamchi, K.-H. Busch, **Platelet-rich Plasma for Skin Rejuvenation and Treatment of Actinic Elastosis in the Lower Eyelid Area**, Cureus 10(7), 2018

Background: Treatment of the lower eyelid region to rejuvenate the skin or treat actinic elastosis often proves difficult. Established treatment options, such as hyaluronic acid injections, botulinum toxin injections, microneedling, skin resurfacing (microdermabrasion, chemical peel (exfoliation), laser treatment), as well as blepharoplasties and autologous fat transfers, can be associated with significant risks and increased patient burden. Furthermore, they may not be effective for treating the signs of skin aging or actinic elastosis, including dark rings under the eyes, a lack of volume and cutis laxa. A minimally invasive treatment approach which visibly improves the above-mentioned conditions and which involves minimal risk and patient burden would be a desirable alternative. Materials & methods: Twenty patients were treated a total of three times at monthly intervals with PRP (platelet-rich plasma). The patients were examined on the days of treatment and one month after the third injection. The PRP was obtained directly prior to treatment using the Arthrex ACP double syringe at the point of care. The injections (2 ml PRP per side) were administered laterally using 27 G 38 mm cannulas. Accurate photographic documentation and skin elasticity measurements using a cutometer were performed to objectify the subjective assessments from the patient and practitioner questionnaires. Results: A progressive improvement in the esthetic outcome and a high level of patient satisfaction were determined. The cutometer measurements showed a statistically significant higher level of skin firmness (due to increased collagen production) and a statistically significant increase in skin elasticity (thanks to increased elastin production). Other than the anticipated visible swelling directly after the PRP injection, no other undesirable side effects or complications occurred. The typical burning sensation during the injection had not been reported. Conclusion: The results indicate that a series of PRP injections in the lower eyelid region is a safe, efficient, virtually pain-free, simple and rapid treatment option for an area with otherwise limited treatment alternatives.

D.-U. Kim, H.-C. Chung, J. Choi, Y. Sakai, B.-Y. Lee, **Oral Intake of Low-Molecular-Weight Collagen Peptide Improves Hydration, Elasticity, and Wrinkling in Human Skin: A Randomized, Double-Blind, Placebo-Controlled Study**, Nutrients 2018, 10, 826

Collagen-peptide supplementation could be an effective remedy to improve hydration, elasticity, and wrinkling in human skin. The aim of this study was to conduct a double-blind, randomized, placebo-controlled trial to clinically evaluate the effect on human skin hydration, wrinkling, and elasticity of Low-molecular-weight Collagen peptide (LMWCP) with a tripetide (Gly-X-Y) content >15% including 3% Gly-Pro-Hyp. Individuals (n = 64) were randomly assigned to receive either placebo or 1000 mg of LMWCP once daily for 12 weeks. Parameters of skin hydration, wrinkling, and elasticity were assessed at baseline and after 6 weeks and 12 weeks. Compared with the placebo group, skin-hydration values were significantly higher in the LMWCP group after 6 weeks and 12 weeks. After 12 weeks in the LMWCP group, visual assessment score and three parameters of skin wrinkling were significantly improved compared with the placebo group. In case of skin elasticity, one parameter out of three was significantly improved in the LMWCP group from the baseline after 12 weeks, while, compared with the placebo group, two parameters out of three in the LMWCP group were higher with significance after 12 weeks. In terms of the safety of LMWCP, none of the subjects presented adverse symptoms related to the test material during the study period. These results suggest that LMWCP can be used as a health functional food ingredient to improve human skin hydration, elasticity, and wrinkling.

E. Tamura, J. Ishikawa, K. Sugata, K. Tsukahara, H. Yasumori, T. Yamamoto, **Age-related differences**

in the functional properties of lips compared with skin, Skin Res Technol. 2018; 24: p. 472-478

Background/aims: Lips can easily become dry and rough and their biggest problems are drying and chapping. The cause of those problems is considered to be that the stratum corneum (SC) moisture is small and its barrier function is low.However, those problems decrease in subjects as they approach 40 years of age, after which problems due to their shape and color increase. The purpose of this study was to investigate relationships between SC properties of the lips during aging and to clarify the cause(s) of lip problems. Methods: One hundred and 38 Japanese female subjects with normal skin ranging in age from 16 to 78 years were enrolled in the study. The capacitance and transepidermal water loss (TEWL) values, viscoelasticity, and color of their lips were measured and compared with their cheeks. Results: The capacitance values for the lip and the cheek increased and TEWL values for both areas decreased with age. TEWL values for the lip decreased until ~30 years of age and this is considered to be related to the problem of drying. Although the maximum amplitude Uf of the lip increased with age, the Ur/Uf had no correlation with age. As for color, the *L** and *a** values decreased with age. Conclusion: Age-related changes with regard to SC functions, viscoelasticity and color of the lips have been clarified for the first time, and it is clear that these changes are related to problems of the lips. Compared with the cheeks, differences with the lips are more apparent.

P. Rouaud-Tinguely, R. Vyumvuhore, J. Corvo, D. Boudier, M. Le Guillou, B. Clos, **Quantifying Well Aging,** Cosmetics & Toiletries**,** Vol. 133, No. 8, September 2018

The age distribution of the world's population is dramatically shifting; longevity rises while fertility rates remain flat. According to demographic studies, 2020 will be a turning point, wherein individuals 60 years and older will outnumber children younger than five. Today, it is no longer a rarity to live 80 years or more in many parts of the world. This increasing longevity has led to new challenges in the medical field. Today's population expects to live longer and in good health — i.e., without facing the declines previously associated with aging. This status is referred to as healthy aging, aging gracefully or aging well; it was defined by Rowe and Kahn as freedom from disease, high cognitive and physical functioning, and a rich social life. An added element of aging well is one's perceived age. In elderly individuals, a perceived age lower than their chronological age is associated with high survival.4 Among consumers 50 years and older, there are two main outlooks on the signs of aging. The first is negative, where individuals do not accept their age and seek to erase the signs of time; e.g., the use of anti-aging products, in attempt to look younger. The second is positive, where individuals assume aging as part of their personal identity.

A. Aubert, F. Vial, A. Lan, B. Chen, K Lee, D Kang, K Lintner, **East West synergy in cosmetics: Demonstration of an increased efficacy of an anti-ageing cream combined with Chinese Herbal Medicine,** IFSCC Congress, Munich, September 2018

This paper is based on the idea that Western “Evidence based cosmetics” (EBC) and Eastern “Traditional Chinese Medicine” (TCM), can find synergies, especially in the field of bioactive peptides. Is the mechanistic approach of EBC compatible with the holistic concepts of TCM? The paper presents a clinical study of such a combination of philosophies in anti-ageing and well-being strategies. Why peptides? Synthetic oligopeptides of defined amino acid composition and sequence have been introduced as cosmetic active ingredients about 25 years ago and have since then become a major staple of quality skin care formulations, as well as a continuing subject of research. These peptides have the great advantage of being analytically well defined, associated with high potency at very low use levels, with often high specificity of bioactivity. Increasingly, scientific literature shows that peptides also play a role in TCM, thus possibly mirroring the EBC approach to skin care activity. A short clarification of what we mean by EBC and by TCM is proposed.

Y. Seo, H. Jeong, J. Koh, **Comparison of biophysical parameters of the skin aging in face and hand**, IFSCC Congress, Munich, September 2018

Background: In today's society, improving the quality of life makes people look younger than their chronological age, and therefore increases their interest in anti-aging. Most of the aging studies have been done on facial skin and only little known about the body aging. Among body parts, the hands are exposed like a face, making them a good part to assess aging externally. So far, the studies have led to hand wrinkles, volume of cavity assessment due to loss of fat and change in elasticity and skin texture. In this study, we aimed to aging patterns by comparing facial and hand skin aging parameters. Method: A preliminary test was carried out on 9 subjects (3 each in their 20s, 40s and 60s) and the main test is planned to be carried out after confirming the possibility. Those in their 20s, 40s and 60s were divided into three groups. Skin moisture, elasticity, roughness, wrinkle grading, skin tone evenness and skin volume of cavity were evaluated. Also, the level of the advancd glycation end products (AGEs) was measured as an aging protein. Result: As a result, skin hydration was no difference between age in face

and hand, and skin elasticity, wrinkle grading, and AGEs level were difference with age in both face and hand. Skin roughness showed a tendency to increases with age in the face and hands for the 60s only, and the skin volume of cavity showed increases with age in the 60s in the case of the hands. Skin tone evenness tends to increase with age of the hands. Conclusion: This study has shown that the skin elasticity, wrinkle grading and AGEs levels are possible indicators of aging parameters in the face and hands. For further continuations of this study need a greater number of subjects to confirm correlation between aging parameters on the face and hands.

A. de Lago, E. Hernandez, T.Z. Reyes, J.R. Pinto, V.C. Albarici, G. Facchini, M.S. Silva, A. Pinheiro, A.S. Pinheiro, S. Eberlin, **Pre-clinical and Clinical evaluation of antiaging properties of a dermocosmetic formulation,** IFSCC Congress, Munich, September 2018

Studies has shown many factors, such skin inflammatory process and prolonged exposure to sunlight, could affect the skin barrier and extracellular matrix inducing a decrease in the synthesis of the major dermal proteins, collagen, elastin and hyaluronic acid, clinically characterized by wrinkles, rough skin, loss of water and skin tone. In this study, we evaluated *in vivo* effects of a dermocosmetic formulation in the increase of firmness, elasticity and hydration of the skin by instrumental techniques and perceived efficacy. Preclinical studies consisted on the production of collagen and hyaluronic acid using an *in vitro* model of human fibroblasts. Clinical evaluation was performed after 14, 30 and 60 days of treatment with the dermocosmetic product and consisted in the sensorial analysis of perceived efficacy through the application of a questionnaire answered by the participants of research. In addition, the following instrumental analysis was performed: cutometry - to evaluate skin firmness and elasticity, corneometry for hydration and image analysis to evaluate wrinkles and expression lines. Human dermal fibroblasts were incubated with noncytotoxic concentrations of dermocosmetic formulation. Cell culture medium and treatment of cell cultures were replaced each 2 days. Culture supernatants were collected after 1, 14 and 30 days incubation. The levels of total collagen and hyaluronic acid were measured using commercially available kits. ANOVA test was used followed by Bonferroni post-test with a 5% significance level. The instrumental results obtained for firmness and elasticity parameters revealed progressive increases after 14, 30 and 60 days of cosmetic treatment on the face and neck. The analysis of cutaneous hydration, evaluated after 24 hours of application, revealed a 12% increase by corneometry technique. Imaging of the depth and size of wrinkles also revealed significant reductions. In the evaluation of the perceived efficacy, over 80% of the volunteers reported improvements in the attributes of nutrition, softness, luminosity, appearance of wrinkles and expression lines, after 14, 30 and 60 days of cosmetic treatment. *In vitro* results corroborated the clinical findings demonstrating an increase in the production of total collagen and hyaluronic acid in cultures of fibroblasts treated with the dermocosmetic formulation. According to the results obtained, we can conclude that then dermocosmetic formulation has the ability to stimulate the synthesis of total collagen and hyaluronic acid when compared to untreated group. This effect is directly related to the improvement in skin support, favoring tissue repair and regeneration. In addition, the stimulation in the production of extracellular matrix components contributes to the reduction in formation of expression lines and wrinkles, one of the most important changes in skin aging, conferring an anti-aging activity to the evaluated product.

R. Kurfürst, L. Sobilo, C. Heusèle, P. Mondon, F. Ossant, O. Jeanneton, E. Lespessailles, H. Toumi, S. Schnebert, **In vitro and in vivo study of a combination of rosemary and *Albizia julibrissin* for stimulating TGFbeta inducible early gene 1 (TIEG-1) and skin regeneration,** IFSCC Congress, Munich, September 2018

Skin aging is the consequence of both intrinsic and extrinsic factors leading to a gradual alteration of skin properties. The integrity of the skin is related to the capacity of dermal and epidermal cells to respond to these aggressions, by activating pathways involved in tissue regeneration. Cutaneous tissue regeneration is dependent on TGF-beta/Smad pathway but strategies targeting TGF-beta have been challenged. In order to avoid approaches based on TGF-beta, we focused on TGF-beta inducible early gene-1 (TIEG-1), a downstream effector of the TGF-beta cascade. TIEG-1 was first identified in human fetal osteoblasts [1]. TIEG1 transcript is induced by TGF-beta treatment in osteoblasts and TIEG1 activity is essential to exert the effect of TGF-beta on cell growth and function [1]. Overexpression of TIEG1 is a positive regulator of TGF-beta signaling [2]. TIEG-1 promotes TGF-β receptor-regulated Smad2 phosphorylation, a critical step in the formation of the Smad2/4 complex and its translocation to the nucleus to regulate target gene transcription. In addition, TIEG-1 has been shown to inhibit Smad7, whose function is to feedback negatively on TGF-beta signaling [2]. These results indicate that TIEG1 increases the activity of the TGF-beta /Smad signal by both relieving the negative feedback loop through repression of Smad7 and by inducing Smad2 expression and phosphorylation [3].

M. Hisama, A. Kishita, N. Yamaguchi, C. Takeuchi, S. Matsuda, K. Yoshio, H. Kanayama, K. Masui, T. Miyazawa, R. Takimi, **Age Related Changes of Human Skin Investigated on Biophysical, Physiological and Histological Characteristics**, IFSCC Congress, Munich, September 2018

Japan's life expectancy has increased steadily over the past century, and currently stands as the highest in the world at almost eighty-four years. As life expectancy increases and with it the proportion of the aged in the population appropriate care of elderly skin becomes a medical concern of increasing importance. The skin is the largest multifunctional organ in the body. It functions as a protective physical barrier by absorbing UV radiation, preventing microorganism invasion and chemical penetration, and controlling the passage of water and electrolytes. The skin has a major role in thermoregulation of body, in addition to immunological, sensory, and autonomic functions. As skin ages, the intrinsic structural changes that are a natural consequence of passing time are inevitably followed by subsequent physiological changes that affect the skin's ability to function as the interface between internal and external environments. As numbers of the elderly increase, cosmetic dermatological interventions will be necessary to optimize the quality of life for this segment of the population. It is important to examine the associations between elderly skin condition and aging for development of anti-aging care products for elderly skin. Understanding the physiological, chemical, and biophysical characteristics of the skin helps us to arrange a proper approach to the management of skin diseases. However, it is critical to consider the influence of genetic and environmental factors on most of the skin characteristics. In this study, we investigated the comparison between the elderly skins in five different age groups on biophysical, physiological and histological characteristics by in *vivo* measurements in order to quantify aging processes on human skin.

N. Braun, S Binder, H Grosch, C Theek, J Ülker, H Tronnier, U. Heinrich, **Effect of microgravity on skin physiology: new findings,** IFSCC Congress, Munich, September 2018

The skin is the largest organ of the human body and has several functions, such as protection, thermal regulation, sensation and endocrine functions. Despite recorded skin problems in space and the fact that the skin is easily accessible and can be continuously examined by means of a large number of non-invasive test methods, investigations of the effects of space flight on skin are underrepresented so far. A first pilot study (SkinCare) was performed by Tronnier et al. on a single astronaut during a 6 month mission. Different skin compartments, namely the surface, epidermis and dermis were analyzed before, during and after the mission. Here, main skin physiological changes observed were a coarsening of the epidermis and a loss of skin elasticity confirmed by changes in the ultrasound picture on the skin. These changes appear to be reversible because after a year, the skin's condition returns to normal [1]. The aim of the present Skin B project was to validate these results on an increased number of astronauts with advanced devices and additional measurements. Therefore, measurements were carried out on 6 astronauts with respect to skin hydration, transepidermal water loss / barrier function and surface evaluation of the living skin in-orbit. Additional measured parameters on ground were skin elasticity, skin density and thickness as well as microcirculation. Thus, the Skin B experiment will complement the SkinCare experiment and aims to confirm the changes observed in the original experiment. However, the skin is not the only or primary focus of the project, but rather serves as a model for all organs covered with epithelial and connective tissue. This study will help the astronauts to prepare for a long stay in space and to set up space travels, e.g. planned exploration of the moon and deeper space.

Q. Peijin, C. Jianjie, J. Lili, D. Gan, W. Yue, **Composition and diversity of microbial community of Chinese female facial skin from different age and its association with skin characteristics,** IFSCC Congress, Munich, September 2018

Skin is the largest organ of the human body. As the interface between the body and the external environment, skin is the first line to protect the human body against the pathogen invasion. Meanwhile human skin harbors a variety of commensals, including bacteria, fungi and viruses. Each area of human body hosts its unique microbial community. Many factors contribute to the structure and function of skin microbiome, for example the host, their age, genetic variation, hygiene, life style and it shifts according to the characteristics of the micro-environments. The adverse shifts might cause a dysbiosis state and it has been reported to be associated with skin disease, such as atopic dermatitis, acne and dandruff. Therefore, exploration of skin microbiome not only helps us understand the correlation between microorganisms and the skin physiological status, but also provide a new perspective to pathogenic factors and new therapeutic targets. In previous study, skin microbiota was demonstrated that varies from different body sites and individuals. However, the reports mainly focused on the Western people and limited study on Chinese skin microbiome. In preliminary work, researchers paid more attention on skin microbiome associated with skin disorders, especially in AD patients, while the relationship between descriptive skin-related characteristics of individual (like wrinkles, hydration, *etc.*) and skin microbiota is ambiguous. In this work, 34 Chinese female volunteers living in Shanghai were recruited for facial skin

microbial community study. Skin samples were collected and Miseq gene sequencing platform was operated. To achieve overall and details of skin appearances, the skin types and characteristics were clinically graded by dermatologist and measured by instruments. The goal of this study is to characterize the composition and variability of the skin microbiota in health people divided into age groups. Moreover, the aim of study is to evaluate the association of the skin microbial distribution with skin physical and physiological properties and the interaction of microorganisms themselves. In our study, it is suggested that *Proteobacterium* is prevalent in elder group together with wrinkles. Additionally, higher trans-epidermal water loss is correlated with *S. aureus* and this may in turn to design a product to recover the skin microbiome balance. In addition, gain more knowledge about microbes interaction with each other is critical to design the skin care products with probiotics and prebiotics. These findings expand our insights in health skin microbiome and will be useful in clinical treatment near the further.

N. Zacaula Juárez, A. Galvan, Gerardo, L. Gómez, **Evaluation of the recovery of the biomechanical properties in hypertrophic burn scar: Looking for a suitable treatment and Care**, IFSCC Congress, Munich, September 2018

Background: The skin is the largest organ of the human body and serves as physical and chemical barrier to the environment. Burn injuries are one of the most common traumatic wounds, this represents a costly public health problem. Many of burned patients develops a hypertrophic scar that can cause an aesthetic and functional problems. The aim of this research was had a better understanding of the recovery of biomechanical properties in hypertrophic burn scar to find new therapeutic strategies to control adverse scarring. Method: Cutometer MPA 580 is a non-invasive an objective suction device to make measurements of scar components as melanin, erythema, hydration, sebum, elasticity and viscoelasticity. Nine patients on the upper extremities with hypertrophic burn scars were evaluated with Cutometer MPA 580 to determine the recovery of the biomechanical properties respect a counterpart without burn injury. The analysis of the different biomechanical parameter was performed with a 2 mm aperture probe and a negative pressure of 450 mbar with 2 seconds of suction and 2 seconds to relaxation in a series 10 suction/relaxation, by triplicate. Also were evaluated *stratum corneum* hydration values by Corneometer, the presence of melanin and erythema by Mexameter and sebum production by Sebumeter probe. Nine patients with an age range between 26-37 years, a skin phototype III, IV and V, a mean value 30.6% of the Total Body Surface Area (TBSA), second and third degree burns were treated with autograft. For this study, approval from the Ethics Committee of the Instituto Nacional de Rehabilitación in Mexico City was obtained (26/15) and Informed consent was obtained from all patients. Results: The results are presented as a percentage (%). In the melanin Index of hypertrophic scars, there is an increase of 13.8 % respect a counterpart without injury or hyperpigmentation in autograft. The results of the erythema index rise with 29.5% of scars, the hydration value of *stratum corneum* decreased a 19 % and the sebum production decreased a 68 % on hypertrophic scar. The relative biomechanical parameters R0 (Maximal deformation), R5 (Net elasticity) and R6 (indicates a relative contribution of viscoelastic, viscous and elastic deformation ”viscoelasticity”). The maximal deformation (R0) in hypertrophic scar decreased by 49%, there is a reduction of 33% in net elasticity (R5) and was observed a increase of 5.6% in R6 “viscoelasticity”. The biomechanical properties (R0, R5 and R6) and hydration, sebum, melanin and erythema in hypertrophic burn scar was altered. Conclusion: This data can be useful for a better diagnosis and find new strategies suitable for the treatment of hypertrophic burn scars and contribute to outpatient burn care.

T. Alkazaz, M. Danaher, J. Goodman, E. Segura, D. Scholz, **Natural Antimicrobials and the Microbial Population of the Skin Microbiome,** IFSCC Congress, Munich, September 2018

Just as every individual has a distinct fingerprint, each and every person has their own unique microbiome. The skin microbiome is an accumulation of the microbial communities that inhabit the skin and are key players in host defense. Commensal microflora on our skin is responsible for maintaining skin health through restoring immunity and communication with the lymphatic system. The action of indiscriminate microbial destruction, employed by preservatives, often unintentionally alters the thriving ecosystem of the skin microbiome. The current innovative study investigates variations in the population of microbial species after the application of antimicrobial peptides. Novel research analyzing activity of the histone deacetylase (HDAC) enzyme has concluded that some naturally derived antimicrobials are able to destroy pathogenic bacteria while maintaining commensal microflora on the skin – supporting the balance of the microbiome and promoting overall skin health.HDAC expression was used as an indicator to compare the effects of the skin’s microbiome with traditional biocides versus natural antimicrobials. The application of topical antimicrobials altered levels of HDAC expression and decreased the population of the microbiome. While this research suggested HDAC is channel of communication between microflora and the skin, the messenger of the microbial crosstalk has yet to be determined. In this study, a more conventional approach was taken to analyze the effects of the

population of species in the skin microbiome. The effect of the microbial population present on the skin with the application of three antimicrobial peptides (Leuconostoc Radish Root Ferment Filtrate, Lactobacillus Ferment, and Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract) was compared to a negative control (water) and a positive control (Triclosan). Microbiome population was determined by DANN extraction, 16S ribosomal RNA (rRNA) polymerase chain reaction (PCR) amplification and sequencing. A less conventional approach was taken in regards to panel size and evaluation during this study. Large subject panels allow for trend recognition between subjects. However, with the individuality of each person's microbiome in mind, it would be difficult to establish trends within a group of subjects. Examining the nasolabial folds of each subject isolates of the geographic location of the microbiome, however the person-to-person variation of microflora is uncontrollable. Patterns in microbial change on each test subject were evaluated individually.

T. Ezure, M. Sugahara, S. Amano, K. Matsuzaki, N. Ohno, **A New Skincare Paradigm Targeting the Skin Anti-Aging System, the "Dermal-Cell Network"-"Digital-3D Skin" Technology: A New Frontier in Internal Skin Structure Analysis,** IFSCC Congress, Munich, September 2018

Dermal cell (fibroblast) aging is a fundamental event in skin aging, leading to loss of skin firmness and an aged facial appearance. But it is unclear how thecellular condition is controlled in real skin, so there is norationalbasis forskincaretorejuvenate cells and facial appearance. We developed a revolutionary technology to observe the actual status of cells and their community in real skin. We digitally reconstructed skin at an ultrafine structure level based on a new scanning electron microscopy technique and an artificial intelligence-based auto-classification of structures (machinelearningsystem). The resulting "digital-3D skin" can be freely explored in an unprecedented way onscreen ("digital anatomy" and "digital sorting" of every structure). Inspection of this digital-3D skin revealed that fibroblasts, generally con sidered to be scattered and isolated in the dermal layer, are actually interconnected via fine dendrites, forming a network throughout the whole skin. This network, designated the dermal cell network, is degraded with aging,m leading to an aged facial appearance. Thus, the dermal cell network is a control system of fibroblasts in real skin, serving as an anti-aging system of the skin. The "digital-3D skin" technology provides a modal shift of skin analysis methodology from instrumental observation to onscreen exploration and is shareable online, providing a common resource for the cosmetics industry. Discovery of the "dermal cell network" changes the commonsense view of cosmetology, offering a new paradigm for rejuvenating skin and facial appearance by targeting the skinanti-aging system.

J. Schleusener, C.K. Nowbary, M.E. Darvin, S.B. Lohan, J. Lademann, M.C. Meinke, **Influencing the Cutaneous Carotenoid Status and Skin-physiological Parameters by Ingesting Antioxidants in the Form of Curly-hale Containing Food Supplements**, söfw journal 1144 109/18

Antioxidants are important radical scavengers protecting the body from the consequences of oxidative stress. They have to be ingested by food rich in fruits and vegetables or by food supplements. The effects of the intake of curly-kale containing food supplements on the skin are described in this paper. For this purpose, verum and placebo groups had been investigated for several months noninvasively *in vivo* by determining their cutaneous antioxidative status, their collagen-to-elastin index of the dermis, and various age-related skin parameters. While in the verum groups the cutaneous antioxidative status and the skin moisture increased significantly, only small changes were found in the placebo groups. The collagen content in the skin of the verum group showed a tendency towards increasing. Besides a healthy nutrition, a selected supplementation consisting of low-dosed natural carotenoids at a physiological concentration can improve the antioxidative capacity of the skin, thus counteracting an age-related degradation of collagen I in the dermis.

A. Esplugas, E. Ferreira, J. A. Boras, S. Pastor, **Deep Arctic Marine Extract for Deep Extracellular Matrix Engineering and Digital Anti-Aging Efficacy**, söfw journal 1144 109/18

Little of the ocean and its intertwined ecosystems have been explored, although it is the most untapped potential source for the discovery of novel cosmetic active ingredients. From an Arctic scientific expedition, a novel active ingredient was discovered (Arctalis: Pseudoalteromonas Ferment Extract) aimed at restructuring ECM key components with an excellent wrinkle smoothing and firming effect. Arctalis restores skin hydration and natural glow while also protecting skin from digital pollution or blue light.

M. Portugal-Cohen, Z. Ma'or, M. Oron, **Full Scale Customization,** Cosmetics & Toiletries, Vol 133, No. 9, September 2018

The drive for personalized consumer products is no longer a passing fad. Personalization stems from deep motivations. The emotional wish to purchase products created "especially for me" comes

across with an understanding of diversity between individuals and the prospects for more effective solutions to meet each individuals special needs. However, efforts to introduce personalized skin care— i.e., for unique skin with distinctive characteristics — on an industrial scale means products formulated for generalized needs, which could not be as effective.

M.A. Kim, E.J. Kim, H.K. Lee, **Use of SkinFibrometer® to measure skin elasticity and its correlation with Cutometer® and DUB® Skinscanner**, Skin Res Technol. 2018, Aug;24(3): p. 466-471

Background: Skin elasticity is an important indicator of skin aging. The aim of this study was todemonstrate that the SkinFibrometer® is appropriate for measuring skin biomechanical properties, and to correlate it with elasticity parameters measured using the Cutometer® and with dermisstructural properties measured using DUB Skinscanner. Materials and methods: Twenty-one individuals participated in this study. The skin of the cheek, around the eye, and the volar forearm were evaluated. To analyze correlations of elasticity parameters, the induration value against the indenter pressure of SkinFibrometer and R, Q parameters of Cutometer® were compared. Dermal echogenicity using DUB Skinscanner was compared with theinduration value of SkinFibrometer. Results: The younger age group showed more firm and elastic skin properties compared to the olderage group, and the elasticity values of the volar forearm were significantly higher than those of thecheek and around the eye region. Even though the measuring principle is different, both SkinFibrometer and Cutometer® demonstrated the same trends of skin elasticity differencesaccording to age and anatomical regions. There were significant correlations between the indurationvalue of SkinFibrometer, representing skin firmness, and R0, Q0 and R2, R5, R7, Q1, Q2 of Cutometer®, which represent skin firmness and resilience, respectively ($P < .01$). In addition, dermalechogenicity positively correlated with skin firmness determined by SkinFibrometer® ($P < .01$). Conclusion: We identified correlations between skin elasticity parameters evaluated by two differentmethods of suction and indentation, and demonstrated that the SkinFibrometer is an objective, non-invasive evaluation tool for skin stiffness and elasticity.

G. Boyer, N. Lachmann, G. Bellemere, C. De Belilovsky, C. Baudouin, **Effects of pregnancy on skin properties: A biomechanical approach**, Skin Res Technol. 2018; Aug;24(3): p. 551-556

Background: A woman's skin is dramatically affected by pregnancy. Its biomechanical properties are critical for resisting highly stressed areas. The aim of this work was to evaluate the impact of pregnancy on the mechanical properties of skin, as well as to evaluate the imprint that pregnancy leaves on the skin after delivery. Materials and Methods: Suction tests using a cutometer were performed on 15 nonpregnant women and 26 pregnant women at 8 months of pregnancy and 4 months after delivery. Areas of abdomen and thighs were studied. Results: Significant differences between the non-pregnant and 8-month pregnant groups were observed.Our data demonstrate that skin becomes less elastic and less deformable on the abdomen during pregnancy. On the thighs, a loss of elasticity and firmness was also observed. At 4 months after delivery, the skin did not return to its initial state. Conclusion: This study showed that the mechanical properties of skin changed drastically during pregnancy compared to the non-pregnant condition and that these properties remain altered 4 months after delivery. In addition to alterations in abdominal skin during pregnancy, we also observed mechanical changes on the thighs, which are less subject to stretching.

L. Rocha Mota, L. Jansiski Motta, I. da Silva Duarte, A.C. Ratto Tempestini Horliana, D. de Fátima Teixeira da Silva, C. Pavani, **Effcacy of phototherapy to treat facial ageing when using a red versus an amber LED: a protocol for a randomized controlled trial**, BMJ Open 2018; 8

Introduction: The skin undergoes morphological and physiological changes with the advancing age of an individual. These changes may be caused by intrinsic and extrinsic factors that contribute to cellular ageing and consequent skin ageing. The term photoageing is used to characterise the ageing of the skin caused by solar radiation. Clinically, the skin becomes more flaccid, thicker and hyperpigmented, while there is an early appearance of wrinkles and other skin changes, such as skin cancer. Nowadays, there are numerous treatments for ageing skin, and one of them is with the use of phototherapy, which uses light-emitting diodes (LEDs). The objective of this study will be to evaluate the percentages of reduction in the volume of periocular wrinkles when treated with red and amber LEDs. Methods and analysis: All of the participants will receive photobiomodulation to treat their periocular wrinkles. They will be using red and amber LEDs, with one colour being used on each hemiface. The facial side to be treated with each colour will be randomised. After an interval of 180 days, the participants will receive a cross-treatment. The primary variable of the study is the volume of periocular wrinkles (crow's feet), which willnbe measured by a VisioFace equipment. The secondary variables are elasticity (measured by Cutometer) and hydration (measured by Corneometer). Quality of life and self-assessment of the participants will be measured using the adapted Melasma Quality of Life scale – Brazilian Portuguese adaption (MelasQoL-BP) and Skindex-29 questionnaires. All of the variables will

be measured before and after a group of 10 sessions.

M. Held, S. Tweer, F. Medved, J. Rothenberger, A. Daigeler, W. Petersen, **Changes in the Biomechanical Properties of Human Skin in Hyperthermic and Hypothermic Ranges**, Wounds, September 2018;30(9): p. 257–262

Introduction. The prevalence of thermal skin injuries is high. Despite new research findings, skin burns and acute cold-contact injuries, together with resulting tissue damage, are not entirely understood. In particular, little is known about how these types of injuries alter the biomechanical properties of skin. Objective. This study evaluates hyperthermic- and hypothermic-induced alterations in the biomechanical properties of human skin using a skin elasticity measurement device. Materials and Methods. In 54 cases, local hypothermia (15°C and 5°C) and local hyperthermia (40°C and 45°C) were induced at the palmar forearm of healthy participants. The biomechanical properties of skin were measured using the skin elasticity measurement device before and after each temperature change at 2 different depths. Results. The skin firmness, pliability, retraction, and elasticity/calculated elasticity showed a continuous decrease in values with decreasing skin temperatures in total skin measurements and an increase in values with increasing skin temperatures in the upper layer and total skin measurements. Conclusions. As per the results, the investigators believe these hyperthermic- and hypothermic-induced alterations in biomechanical skin properties are due to increased blood flow, in addition to a reversible increase in interstitial and intracellular fluid contents, thermal contraction, and expansion of collagen and elastic fibers, all of which are precursors to irreversible damage.

L. Skedung, C. El Rawadi, M. Arvidsson, C. Farcet, G.S. Luengo, L. Breton, .M.W. Rutland, **Mechanisms of tactile sensory deterioration amongst the elderly**, Scientific Reports 8, Article number: 5303 (2018)

It is known that roughness-smoothness, hardness-softness, stickiness-slipperiness and warm-cold are predominant perceptual dimensions in macro-, micro- and nano- texture perception. However, it is not clear to what extent active tactile texture discrimination remains intact with age. The general decrease in tactile ability induces physical and emotional dysfunction in elderly, and has increasing significance for an aging population. We report a method to quantify tactile acuity based on blinded active exploration of systematically varying micro-textured surfaces and a same-different paradigm. It reveals that elderly participants show significantly reduced fine texture discrimination ability. The elderly group also displays statistically lower finger friction coefficient, moisture and elasticity, suggesting a link. However, a subpopulation of the elderly retains discrimination ability irrespective of cutaneous condition and this can be related to a higher density of somatosensory receptors on the finger pads. Skin tribology is thus not the primary reason for decline of tactile discrimination with age. The remediation of cutaneous properties through rehydration, however leads to a significantly improved tactile acuity. This indicates unambiguously that neurological tactile loss can be temporarily compensated by restoring the cutaneous contact mechanics. Such mechanical restoration of tactile ability has the potential to increase the quality of life in elderly.

I.I. Shuvo, K. Chakma, D. Toutant, **Prospect of 3D Warp Knitted Spacer Fabric and its Effect on Pressure Relieve for Reducing the Prevalence of Pressure Ulcers for Immobile Patients**, Journal of Textile Science & Engineering, Volume 8, Issue 1, 2018

Many hospitals use paper thin bed sheets with high friction coeffcients which are not ideal for patients with pressure ulcers and who are at risk of developing. These patients suffer a great deal of pain, which could have been prevented. Lying on a weak bed sheet with no regards to regulating micro-climate is a clear promoter of pressure ulcers. Another key factor of a hospital bed sheet is they are to be easily washed or disposed of because of all the unknown fluids that could seep onto the sheet. Therefore, the sheet must not only be to comfort those with pressure ulcers but to be easily washable and reusable. Again, in a hospital setting being able to easily wash the sheet and for it to hold its form is signifcant for reducing the cost of throwing away sheets less often. Therefore a theory has been proposed to design a 3D knit spacer bed sheet that will allow patients with pressure ulcers to be comfortable by ensuring a low friction coeffcient between their skin and the material. The friction coeffcient will be reduced by not only the structure but by the 70 percent polyester, 22 percent polypropylene and eight percent spandex blend. The friction coeffcient will stay low due to a high wicking and evaporation capability to ensure the skin stays dry as well as the material. The 3D knit spacer bed sheet also has a higher compressibility which distributes pressure more evenly as well as enabling a care giver to easily rotate an immobile person into a new position. The proposed bed sheet will be easily washable to ensure all bodily fluids such as vomit, blood, and others have been removed. This blanket will be slightly more expensive but is expected to last longer than a typical hospital bed sheet.

I. Popa, A.L. Watson, A. Solgadi, C. Butowski, D. Allaway, J. Portoukalian, **Linoleate-enriched diet increases both linoleic acid esterifed to omega hydroxy very long chain fatty acids and free ceramides of canine stratum corneum without effect on protein-bound ceramides and skin barrier function**, Archives of Dermatological Research (2018) 310: p. 579–589

Few studies have investigated the influence of increased amounts of dietary linoleic acid on the epidermal lipid biochemistry and TEWL in healthy subject. The influence of dietary linoleic acid on canine stratum corneum (SC) lipids was studied by feeding two groups of fve dogs differential amounts of linoleic acid (LA) for three months. SC was harvested by tape stripping and lipids were analyzed by thin-layer chromatography and mass spectrometry. The dogs that were fed the higher concentration of LA showed high increases in the contents of both linoleic acid and free ceramides in the SC, whereas the protein-bound ceramide content was unchanged. Acylacids that represent the esterifed form of linoleic acid in omega hydroxyl very long chain fatty acids (ω-OH VLCFA) accounted for most of the elevation of LA, whereas the concentration of the free form was not signifcantly changed. Corroborating the absence of change in the protein-bound ceramides content of healthy dogs SC, TEWL was nearly unaffected by the linoleic acid-enriched diet.

D. Charnvanich, V. Panapisal, W. Suwakul, An. Tansirikongkol, **Effects of age, hydration level, and cosmetic treatment on skin mechanical properties of Thai**, Thai Journal of Pharmaceutical Sciences, 2018, 42 (3): p. 146-151

Purpose: Age and skin hydration influence skin mechanical properties. However, correlation between hydration improved by cosmetic and mechanical properties is uncertain. This study aimed to investigate the relationship between age, intrinsic skin hydrations, skin hydration after topical treatment, and skin mechanical parameters of different age ranges.Patients and Methods:Atotal of 123 healthy volunteers, aged 18–55, were divided into three age groups. Skin hydration and biomechanical properties were evaluated using Corneometer® and Cutometer®, respectively. Subsequently, 61 healthy women aged 30–55 were measured for skin hydration and biomechanical parameters after 8 weeks application of microemulsion or nanoemulsion. The changes in each parameter and their correlation were evaluated. Results: Skin capacitance correlated to some mechanical parameters only in young volunteers. Only gloss elasticity (R2) presented strong negative correlation with age in 30–40-year-old volunteers while all elasticity parameters (R2, R5, and R7) showed significant negative correlations with age in 41–55 years old volunteers.Microemulsion or nanoemulsion significantly improved skin hydration; however, it did not always affect elasticity parameters. Conclusion: Skin elasticity decreased with age and changes in R2 were firstly observed. Decrease in R2 parameter could, then, be the first sign of skin aging. Skin hydration and elasticity were not related in any age. Improvement in skin hydration and elasticity by topical treatment was independent and based on individual formulation.

S*. Hettwer, E. Besic Gyenge, B. Suter, S. Breitenbach, B. Obermayer*, **Natural alternatives for retinoic-acid-like anti-ageing**, PERSONAL CARE EUROPE, June 2018

Use of vitamin A derivatives - the retinoids - is common in cosmetic formulations targeting the anti-ageing area. While retinoid acid is banned in the European Union as a cosmetic ingredient, other retinoids such as retinol are permitted. However, retinoids can provoke unwanted effects such as dry and itchy skin, especially when exposed to sunlight. Here we show that an alternative, namely natural bioflavonoids from *Madura cochinchinensis*, is able to bind the target receptors of retinoic acid and create retinoidacid-like efficacy *in vivo*.

K. Kimori, C. Konya, M. Matsumoto, **Venipuncture-Induced Hematomas Alter Skin Barrier Function in the Elderly Patients**, SAGE Open Nursing, June 2018

We aimed to compare the barrier function of the skin site with the color of hematoma induced by venipuncture and the area surrounding the skin site to help improve skin care for hospitalized elderly patients. There were 50 patients with a median age of 84 years who were included in the analysis. There was no significant difference between the hematoma site-induced venipuncture and the area surrounding the hematoma site in terms of transepidermal water loss and skin sebum level. The status of stratum corneum hydration and skin elasticity on the hematoma sites was significantly lower than that on nonhematoma sites. The median skin pH was significantly higher on hematoma sites than that on nonhematoma sites. The study variables did not reveal any significant correlation with the intensity of skin erythema. These findings showed that hematoma formation in the subcutaneous tissue affected the skin barrier function and that these sites need moisturizing skin care regardless of the intensity of skin erythema.

J. Matiasek, P. Kienzl, L.W. Unger, C. Grill, R. Koller, B.R. Turk, **An intra-individual surgical wound comparison shows that octenidine-based hydrogel wound dressing ameliorates scar appearance following abdominoplasty**, Int Wound J, 2018 Jun 29

Hypertrophic scar formation because of surgical procedures is associated with higher levels of pain, a lower quality of life, and poor cosmetic outcome and requires more resources in follow-up management. An octenidine-based hydrogel has been shown to modulate immunological function in an in vitro wound model, suggesting an improved scar formation. In this prospective, randomised, observer-blinded, and intra-patient-controlled study, 45 patients who underwent abdominoplasty or mastectomy with transverse rectus abdominis muscle (TRAM) flap reconstruction were given both a standard postoperative wound dressing on one wound side and an octenidine-based hydrogel with transparent film dressing, covered with standard postoperative dressing on the other side. Four instances of hypertrophia were reported in the gel side versus 12 in the standard dressing side. Visual Analogue Scale (VAS) pain scores taken during postoperative dressing changes showed reduced scores on the gel side at all time points. Vancouver Scar Scale (VSS) scores showed improvement in the gel side at 3, 6, and 12 months postoperatively. Skin distensibility measured using a cutometer showed significantly improved measures in gel-treated wounds, similar to measures of healthy skin. Trans-epidermal water loss (TEWL), measured using a tewameter, showed improved values on the gel side soon after surgery, with both the control and the gel side normalising after approximately 6 months. The octenidine-based wound dressing demonstrates improved wound healing associated with a lower incidence of hypertrophic scar formation.

Z. Xu, J. Dela Cruz, C. Fthenakis, C. Saliou, **A novel method to measure skin mechanical properties with three-dimensional digital image**, Skin Research & Technology, June 2018

Background: Measuring skin mechanical properties has been of great interest in the skincare industry. It is a high accuracy and non-invasive optical technique which quantitatively tracks skin movement and deformation under mechanical perturbations. Methods: A study was conducted with female subjects (25-65 years old). A refined speckle pattern applied onto the skin surface was used for DIC measurements. A unidirectional force pulled the skin at a constant velocity, while the deformation process was quantified by the DIC. Prior to the DIC measurement, Cutometer® readings were taken on the same area. The DIC protocol's reproducibility across multiple pattern applications, the measurement's repeatability, and the sensitivity in differentiating skin mechanical properties were investigated. Results: Subjects were clustered with statistical significance according to their skin mechanical properties described by six DIC metrics (μ [major strain], σ [major strain], μ [minor strain], σ [minor strain], μ [displacement], and σ [displacement]). Most measurement random errors are below 6%. This is several folds smaller in magnitude than the difference in the mean response between the clusters. Several Cutometer® parameters also showed good agreement with μ (displacement). Conclusions: DIC was able to differentiate skins of different mechanical qualities. We also proposed the physical significance of the DIC metrics. Some of the DIC metrics potentially offer new insights into skin mechanical properties that complement those revealed by conventional instruments. Accurate measurements, large measurement areas along with ease of direct visualization are substantial advantages of DIC.

H. Sano, Y. Hokazono, R. Ogawa, **Distensibility and Gross Elasticity of the Skin at Various Body Sites and Association with Pathological Scarring: A Case Study**, J Clin Aesthet Dermatol. 2018; 11(6): p. 15–18

Objective: Pathological scars, including hypertrophic scars and keloids, have a strong predilection for specifc regions of the body. Such site specifcity might reflect regional differences in skin properties. Greater knowledge about the characteristics of the skin at various body regions can promote the development of clinical approaches to skin incision and flap design and reduce the formation of cutaneous scars. It could also help elucidate the etiology of pathological scar development and progression. Thus, we measured the distensibility and gross elasticity of the skin at various body sites. Methods: Five healthy adult volunteers were enrolled. In each, the cutaneous viscoelasticity at 16 sites (forehead, superior eyelid, lower jaw, earlobe, deltoid, outside and medial side of the upper arm, palm, scapular region, anterior chest, upper abdomen, lateral abdomen, lower abdomen, lateral thigh, anterior lower leg, and planta) was examined using a Cutometer MPA 580® (Courage Khazaka electronic GmbH, Cologne, Germany). Results: The skin was particularly distensible at the medial side of the upper arm, followed by the earlobe, lower jaw, upper abdomen, lateral abdomen, lower abdomen, and superior eyelid. It was poorly distensible at the planta, followed by the anterior lower leg, palm, and forehead. The skin was poorly elastic at the earlobe, superior eyelid, planta, and palm and highly elastic at the lateral and upper abdomen, scapular region, and deltoid. Conclusions: Except for the earlobe, all regions with poorly distensible and hard skin are not prone to pathological scarring. This association between

these skin properties and abnormal scarring could be useful for skin surgeons.

A. Rigal, R. Michael-Jubeli, A. Bigouret, A. Nkengne, A. Baillet-Guffroy1, A. Tfayli, **Lipides**: **Systèmes Analytiques et Biologiques,** ISBS Conference San Diego, May 2018

Introduction: Clinical manifestations of skin aging like xerosis, wrinkles and slackness are related to underlying complex molecular phenomena in the different layers of the skin. The combinations of classical biometric measurements with more complex and informative techniques like *in vivo* Raman spectroscopy can provide interesting information on the organization of lipids in the *Stratum Corneum (SC)*, their barrier function and on water content and mobility, in order to better characterize the skin aging. Methodology: Biometric information (TEWL, corneometry, sebumetry, skin pH, mechanical stress) and Raman spectra and in-depth profiles were collected from the forehead of twenty-two young womens (18- 24 years old) and eighteen elderly womens (70-75 years old). Results and Conclusions: Important modifications on biometric skin parameters, structure of the SC and water mobility can be observed for elderly. Our results show a good association between biometric parameters and *in vivo* Raman descriptors. Interestingly, higher compacity of lipids, higher total water content and lower unbound water content are observed for elderly.

K. Mizukoshi, M. Kuribayashi, Y. Hamanaka, M. Kurosumi, **The Examination of Age-Related Changes by Visualizing and Measuring the Viscoelasticity of the Dermic and Subcutaneous Fat Layers Using Ultrasound Elastography,** Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: The viscoelasticity of the inner part of the skin which consists of many layers was not examined in detail. In this study, we visualized and digitized viscoelasticity of the skin depth wise using elastography, with the aim of ascertaining the characteristic age-related changes. Methodology: The study included 140 women aged 20 – 69 years. The region of the face measured was the left cheek. For the elastography measurement, we used the Hitachi Noblus (Hitachi, Japan). The elastographic images were divided into seven areas in the depth direction. The mean measured value was calculated within each area. Results and Conclusions: On measuring the dermic layer which was divided into two layers, in the only lower layer, viscoelasticity decreased statistically significantly with age. On measuring the subcutaneous fat layer, in the upper and middle layer, viscoelasticity decreased statistically significantly with age. In the lower layer, there were no clear age-related changes observed. The present study showed that, depth wise, for both the dermic and subcutaneous fat layer, age-related changes in viscoelasticity tended to differ.

M. Mendes Fossa Shirata, P.M. Berardo Gonçalves Maia Campos, **Evaluation of Young Skin Photoaging Using Biophysical and Imaging Techniques**, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: Photoaging is associated to an intense solar exposure, thus the photoaging signs can be observed also in the young skin, mainly in countries with high UV incidence, like Brazil. The aim of this study was to evaluate the skin changes resulted from photoaging in Brazilian young skin in comparison to photoaged mature skin. Methodology: Thirty participants were divided in two groups: the first between 18 to 35 years old and the second, 40 to 60 years old. Analyzes were performed on the randomized facial malar region. TEWL, stratum corneum water content, sebum content, high resolution imaging, echogenicity and dermis thickness, skin color and elasticity parameters were analyzed. Results and Conclusions: The obtained results showed that sun exposure can cause changes even in the young skin, with the appearance of spots and the reduction of the echogenicity of the dermis, besides there were no significant differences between young skin and mature skin in most parameters. In conclusion, signs of photoaging may be frequent even in young skin.

L. Salomão Calixto, C. Picard, G. Savary, P.M. Berardo Gonçalves Maia Campos, **Application of Topical Formulations Containing Natural Origin Actives and UV-Filters in the Prevention of Photoaging in French and Brazilian Skin**, Poster Presentation at ISBS Conference San Diego, May 2018

Introduction: The study of skin from different populations brings an essential knowledge to the development of skin treatments. The aim of this study was to evaluate the immediate effects of topical formulations using biophysical techniques and to compare the skin biology of the participants. Methodology: 36 subjects, 18 French and 18 Brazilians, were enrolled. Transepidermal water loss, stratum corneum water content, skin viscoelasticity and skin brightness were evaluated before and 60 minutes after formulations application. Results and Conclusions: Brazilian skin had a lower TEWL and less gloss on the skin surface when compared with French skin. There was no difference in hydration and viscoelastic profile. After 60 minutes, there was a significant increase in stratum corneum water content and skin brightness, a significant decrease in TEWL and no difference in skin viscoelasticity in

both groups. In conclusion, biophysical differences were found on the groups and the formulations were effective in both populations.

M. Mateu, A. Esplugas, S. Pastor, P. Carulla, M. Gorostiaga, **Tightening efficacy of a selfie-ready freezing blast,** PERSONAL CARE ASIA, May 2018, p. 46-48

Nowadays, 24 hours are not enough for busy lifestyles. Whether your little spare time is due to work and personal duties or social events, your skin needs to be taken care of. Imagine applying a cosmetic product that acts while you are dressing or deciding how to take a selfie. An on-the-go recharging beauty wind to keep up with your daily rhythm.

L. von Oppen-Bezalel, **Urban pollution protection for beautiful, balanced skin**, PERSONAL CARE EUROPE, April 2018, p. 122-124

In our urbanised and industrialised environments, we are exposed to increasingly abundant environmental pollutants. Heavy metals, PAHs and aldehydes is just a short list of toxic compounds surrounding us, having detrimental effects on our skin and body, causing respiratory diseases, headaches, asthma and skin rashes, which are just a few health aspects to mention. High Energy Visible (HEV) light including blue light is another type of 'pollution' affecting among others our skin. Our appearance is the first to be affected, with early signs of ageing, wrinkles, pigmentation spots, disrupted barrier, overall dryness and skin imperfections all associated with polluted environments. IBR-UrBioTect, an extract of *Inula helenium*, may help repair and reverse the effects of pollution, according to results of a clinical study in a smoking environment (cigarette smoke). In this study, reduction of early signs of ageing in a smoking environment has been achieved using a formula containing 1% IBR-UrBioTect. The extract has also been shown to chelate and neutralise pollutants such as heavy metals which cause accumulated damage to the skin, as efficiently protect skin cells from HEV induced ROS production. We propose here a natural and innovative solution to relieve and repair the effects of pollution on the skin and the appearance of early signs of aging in a polluted environment, promoting a lighter skin tone as well as reducing wrinkle count, and improving skin elasticity and barrier function.

A. Markiewicz, M. Zasada, A. Erkiert-Polguj, M. Wieckowska-Szakiel, E . Budzisz, **An evaluation of the antiaging properties of strawberry hydrolysate treatment enriched with L-ascorbic acid applied with microneedle mesotherapy**, Journal of Cosmetic Dermatology, April 2018

Background: Mature skin is characterized by a loss of elasticity, hyperpigmentation, and dehydration. L-ascorbic acid stimulates the synthesis of collagen type I, inhibits melanogenesis, and helps to maintain correct skin hydration. Combining microneedle mesotherapy with the application of preparations rich in vitamin C results in better therapeutic effects due to the improved absorption of active substances. The study evaluates the effectiveness of the application of strawberry hydrolysate enriched with L-ascorbic acid using microneedle mesotherapy. Materials and Methods: Seventeen volunteers aged 45-70 years underwent a series of four microneedle mesotherapy treatments with vitamin C serum, performed every 10 days. The 20% L-ascorbic acid solution (pH = 3.5) was prepared immediately before application. After the treatment, the participants gave a subjective assessment of the effectiveness. Cutometer® was used to measure skin elasticity and firmness, Corneometer® to measure skin hydration, and Mexameter® skin tone. Results: The results of the survey showed improvements in skin hydration and elasticity. In vivo studies confirmed the effectiveness of serum and the impact of the active substance on skin firmness and elasticity, the degree of hydration and skin tone. Conclusion: Microneedling with vitamin C improves skin tone, hydratation and firmness, and decreases the visibility of hyperpigmentation.

Y. Ogura, Y. Tanaka, E. Hase, T. Yamashita, T. Yasui, **Texture analysis of second-harmonic-generation images for quantitative analysis of reticular dermal collagen fibre in vivo in human facial cheek skin**, Exp Dermatol. 2018 Apr 15

Second-harmonic-generation (SHG) microscopy is a powerful tool for in vivo visualisation of collagen fibres in human skin because of its specific collagen selectivity without the need for staining, non-invasiveness and high-resolution three-dimensional imaging. Although texture analysis of SHG images is a promising method for the quantitative analysis of well-orientated collagen fibre structure in the tendon and cornea, there are few attempts to assess cutaneous ageing. In this study, we applied two texture analysis techniques, namely autocorrelation (2D-AC) analysis and two-dimensional Fourier transform (2D-FT), to evaluate the age-dependent changes in reticular dermal collagen fibres in in vivo human cheek skin. Age-dependent changes in the reticular dermal collagen fibres of female subjects in their 20s, 40s and 60s clearly appeared in these texture analyses. Furthermore, the parameter from 2D-AC analysis showed a significantly higher correlation with skin elasticity measured by a Cutometer®. These results clearly indicate that 2D-AC analysis of SHG images is highly promising for the quantitative

evaluation of age-dependent change in facial collagen fibres as well as skin elasticity. An appropriate texture analysis will help to provide quantitative insight into collagen fibre structure and will be useful for the diagnosis of pathological conditions as well as cutaneous ageing in skin.

G. Kang, T.N.T. Tu, S. Kim, H. Yang, M. Jang, D. Jo, J. Ryu, J. Baek, H. Jung, **Adenosine-loaded dissolving microneedle patches to improve skin wrinkles, dermal density, elasticity and hydration**, Int J Cosmet Sci. 2018 Apr; 40(2): p. 199-206

Objective: Although dissolving microneedle patches have been widely studied in the cosmetics field, no comparisons have been drawn with the topical applications available for routine use. In this study, two wrinkleimproving products, adenosine-loaded dissolving microneedle patches and an adenosine cream, were evaluated for efficacy, with respect to skin wrinkling, dermal density, elasticity, and hydration, and safety in a clinical test on the crow's feet area. Methods: Clinical efficacy and safety tests were performed for 10 weeks on 22 female subjects with wrinkles around their eyes. The adenosine-loaded dissolving microneedle patch was applied once every 3 days, in the evening, for 8 weeks to the designated crow's feet area. The adenosine cream was applied two times per day, in the morning and evening, for 8 weeks to the other crow's feet area. Skin wrinkling, dermal density, elasticity, and hydration were measured by using PRIMOS premium, Dermascan C, Cutometer MPA580, and Corneometer CM 825, respectively. In addition, subjective skin irritation was evaluated by self-observation, and objective skin irritation was assessed through expert interviews. Results: The adenosine-loaded dissolving microneedle patches had a similar or better efficacy than the adenosine cream. Both groups showed statistically significant efficacy for almost all parameters ($P < 0.05$). The dissolving microneedle patches had a long-lasting effect on the average wrinkle depth ($P < 0.05$), only showed efficacy in dermal density ($P < 0.05$), had an early improving effect on elasticity ($P < 0.05$), and demonstrated better hydration efficacy ($P < 0.001$). No adverse effects were observed in either group during the test period. In the clinical efficacy test of four skin-improvement parameters, adenosine-loaded dissolving microneedle patches showed the same or better effect than the adenosine cream, although the weekly adenosinedose was 140 times lower. Conclusion: The dissolving microneedle patches caused no adverse reactions. These adenosine-loaded dissolving microneedle patches are expected to be safe, effective, and novel cosmetics for skin improvement.

S. Rahrovan, F. Fanian, P. Mehryan, P. Humbert, A. Firooz, **Male versus female skin: What dermatologists and cosmeticians should know**, International Journal of Women's Dermatology 4 (2018) p. 122–130

Introduction: The skin is important for the perception of health and beauty. Knowledge of the physiological, chemical, and biophysical differences between the skin of male and female patients helps dermatologistsdevelop a proper approach not only for the management of skin diseases but also to properly take care
of cosmetic issues. The influence of genetic and environmental factors on skin characteristics is also critical to consider. Methods: A literature search of PubMed and Google was conducted to compare the biophysical and biomechanical properties of the skin of male and female patients using the keywords "skin", "hydration", "water loss", "sebum", "circulation", "color", "thickness", "elasticity", "pH", "friction", "wrinkle", "sex", "male", and "female". Results: A total of 1070 titles were found. After removing duplications and non-English papers, the number was reduced to 632. Of the 632 titles, 57 were deemed suitable for inclusion in this review. The studies show that the skin parameters of hydration, transepidermal water loss, sebum, microcirculation, pigmentation, and thickness are generally higher in men but skin pH is higher in women. Conclusions: These parameters can be considered as age markers in some cases and are susceptible to change according to environment and life style. Biometrological studies of the skin provide useful information in the selection of active principles and other ingredients of formulations to develop a specific approach for cosmetic treatments.

A. Schulz, I. Rothermund, R. Lefering, P. Christian Fuchs, J. Schiefer, **Long-term Scar Quality after Treatment of Standardized Partial-Thickness Skin Graft Donor Sites**, Advances In Skin & Wound Care, March 2018: 31: p.109-117

Background: The long-term aesthetic appearance of scars is of great importance to patients. Biobrane (Smith and Nephew, Fort Worth, Texas), a biosynthetic skin dressing, is a successfully established dressing for the treatment of superficial wounds. A new silk barrier dressing (Dressilk; Prevor, Moulin de Verville, France) has also shown good results in wound healing. This study evaluated the long-term scar quality of superficial wounds treated with these dressings. Methods: From February 2012 to May 2013, 11 patients with burns in need of skin grafting received donor site treatment. Study authors dressed 2 adjacent, standardized, partial-thickness skin graft donor sites on each participant with Biobrane or Dressilk. Scar formation on both treated areas was compared 24 months after initial

application using subjective and objective assessment methods. Results: Independent of treatment, the majority of the patients described scar quality similar to normal skin using subjective and objective evaluation tools. However, for scar perfusion, significantly lower oxygen saturation was shown in both treated areas compared with untreated skin. Conclusions: Comparatively, the 2 wound dressings showed similar results, making silk dressings an interesting alternative to biosynthetic ones.

A. Aguirre, E. Gil-Quintana, M. La Nuez, **Ovoderm® an effectve treatment to improve skin conditon in patents with altered skin barrier function,** J Skin March 2018;2(1): p. 11-14.

Alterations in the stratum corneum and therefore in the skinbarrier function are produced by diverse causes. The changes in the stratum corneum imply increases in water loss, reduction of the protective effect of the skin and also modifications in its mechanical functions. The aim of the present study was to evaluate the effectiveness of Ovoderm®, a dietary supplement consisting of eggshell membrane, to improve the skin condition of people with an altered barrier function. Sixteen volunteers with a decreased skin barrier function were randomized to daily intake 300mg of Ovoderm® or 300mg of placebo during 60 days. Transepidermal waterloss (Tewameter®), firmness (Cutometer® R0), elasticity (Cutometer® R6) and fatigue (Cutometer® R9) of the skin were measured. At the end of the study there was a significant 43% of decline in the transepidermal waterloss in the volunteers intaking Ovoderm® that was not observed in the placebo group. Participants started the study with normal-affected skin and finished it with healthy-very healthy skin values. A similar tendency was observed in the skin elasticity that was increased by 13% in Ovoderm® group while the control group showed a decrease of 11%. The skin firmness improved significantly by 66% and the fatigue declined by 36% in Ovoderm® group while no significant changes were measured in the placebo group. These results showed that oral supplementation with Ovoderm® restores the skin barrier function in people with cutaneous alterations. Ovoderm® re-establishes the transepidermal waterloss values to those observed in people with healthy skin and it increases the functionality of the skin as evidenced by the improvements in firmness and elasticity and by the decrease in fatigue. Ovoderm® is an effective treatment that could prevent and manage more effectively the alteration of the skin barrier function restoring the skins' health and its biomechanical properties.

A. de Groef, M. van Kampen, P. Moortgat, M. Anthonissen, E. van den Kerckhove, M.-R. Christiaens, P. Neven, I. Geraerts, N. Devoogdt, **An evaluation tool for Myofascial Adhesions in Patients after Breast Cancer (MAP-BC evaluation tool): Concurrent, face and content validity**, PLoS ONE 13(3), March 2018

Purpose: To investigate the concurrent, face and content validity of an evaluation tool for Myofascial Adhesions in Patients after Breast Cancer (MAP-BC evaluation tool). Methods: Concurrent validity of the MAP-BC evaluation tool was investigated by exploring correlations (Spearman's rank Correlation Coefficient) between the subjective scores (0 –no adhesions to 3 –very strong adhesions) of the skin level using the MAP-BC evaluation tool and objective elasticity parameters (maximal skin extension and gross elasticity) generated by the Cutometer Dual MPA 580. Nine different examination points on and around the mastectomy scar were evaluated. 2) Face and content validity were explored by questioning therapists experienced with myofascial therapy in breast cancer patients about the comprehensibility and comprehensiveness of the MAP-BC evaluation tool. Results: Only three meaningful correlations were found on the mastectomy scar. For the most lateral examination point on the mastectomy scar a moderate negative correlation (-0.44, p = 0.01) with the maximal skin extension and a moderate positive correlation with the resistance versus ability of returning or 'gross elasticity' (0.42, p = 0.02) were found. For the middle point on the mastectomy scar an almost moderate positive correlation with gross elasticity was found as well (0.38, p = 0.04) 2) Content and face validity have been found to be good. Eighty-nine percent of the respondent found the instructions understandable and 98% found the scoring system obvious. Thirty-seven percent of the therapists suggested to add the possibility to evaluate additional anatomical locations in case of reconstructive and/or bilateral surgery. Conclusions: The MAP-BC evaluation tool for myofascial adhesions in breast cancer patients has good face and content validity. Evidence for good concurrent validity of the skin level was found only on the mastectomy scar itself.

M. Pensalfini, J. Weickenmeierb, M. Rominger, R. Santoprete, O. Distler, E. Mazza, **Location-specific mechanical response and morphology of facial soft tissues**, Journal of the Mechanical Behavior of Biomedical Materials 78 (2018), p. 108–115

The facial tissue of 9 healthy volunteers (m/f; age: 23–60 y) is characterized at three different locations using a procedure combining suction measurements and 18 MHz ultrasound imaging. The time-dependent and multilayered nature of skin is accounted for by adopting multiple loading protocols which differ with respect to suction probe opening size and rate of tissue deformation. Over 700 suction

measurements were conducted and analyzed according to location-specific mechanical and morphological characteristics. All corresponding data are reported and made available for facial tissue analysis and biomechanical modeling. Higher skin stiffness is measured at the forehead in comparison to jaw and parotid; these two regions are further characterized by lower creep deformation. Thicker tissue regions display a tendency towards a more compliant and less dissipative response. Comparison of superficial layer thickness and corresponding mechanical measurements suggests that connective tissue density determines the resistance to deformation in suction experiments.

S. Nisbet, H. Mahalingam, C.F. Gfeller, E. Biggs, S. Lucas, M. Thompson, M.R. Cargill, D. Moore, S. Bielfeldt, **Cosmetic benefit of a biomimetic lamellar cream formulation on barrier function or the appearance of fine lines and wrinkles in randomized proof of concept clinical studies,** InternationalJournal of Cosmetic Science / Volume 41, Issue 1, 2018

Objective: Two studies were designed to evaluate the potential cosmetic benefit of a biomimetic, niacinamide containing moisturizing cream for the first time in humans. Methods: In both studies, healthy women were randomized to use two treatments, one for the left side of the body and one for the right, from three options: the test cream, a positive control or no treatment (use of standard cleanser only). Treatments were applied twice daily for 4 weeks to the face and forearms (Study 1) or the face only (Study 2). Instrumental and clinical skin assessments were performed by trained technicians. Study 1 involved tape stripping and a 5 day no treatment ('regression') period at the end of the 4 weeks. Independent lay graders were asked to grade the skin texture of subjects in Study 2 from high resolution photographs. Results: In Study 1 *(n* = 66), the test cream significantly decreased the transepidermal water loss (TEWL) values on the forearm, and in the cheek area of the face, relative to baseline and compared to no treatment, and increased skin Corneometer values. The improvements were partially retained during a subsequent 5 day period of no treatment. Increases in TEWL values on skin subjected to tape stripping were significantly lower after 4 weeks of using the test cream compared to no treatment. In Study *2 (n = 72* subjects with visible signs of ageing), there was a favourable trend in the change from baseline of a skin roughness parameter, Ra, for the test cream compared to no treatment. There were statistically significant improvements in the Fitzpatrick wrinkle score compared to no treatment, decreases in TEWL and increased Corneometer values and Cutometer values (R5 elasticity parameter). Grading of high resolution images failed to detect the improvements in skin texture (defined as pores, smoothness and unevenness) for the test cream vs. no treatment. No treatment related serious or severe adverse events were reported. Conclusion: Twice daily application of the test cream over 4 weeks had beneficial effects on skin barrier function, ppp moisturization, wrinkle dimensions and elasticity compared to no treatment. These studies provide prc concept evidence and highlight the cosmetic benefit of the biomimetic lamellar cream formulation.

T.D. Dobbs, T.H. Jovic, Z.M. Jessop, A. Kyle, H.A. Hutchings, I.S. Whitaker, **Objective and Patient-reported Assessments of Skin Grafts and Keystone Flaps—A Pilot Retrospective Cohort Study**, Plast Reconstr Surg Glob Open 2018

Background: The keystone perforator island flap provides a versatile form of reconstruction. Perceived benefits include better donor-recipient color match, less contour defect, and fewer complications. To date, there has been no high-quality evidence comparing keystone flaps to split-thickness skin grafts (SSG) from both a qualitative and quantitative point of view. Methods: The Objective and Patient Reported Assessments of Skin grafts versus Keystone flap cohort study compares keystone flaps with SSGs for the reconstruction of skin cancer defects. Patient-reported outcome measures were collected using the EuroQol 5 dimension scale and Patient and Observer Scar Assessment Scale (POSAS) questionnaires. Objective assessments of skin quality were assessed with the Courage and Khazaka system. Cost analysis was also performed. Results: Thirty-eight patients were studied: 20 keystone flaps and 18 SSGs. The keystone group had higher EuroQol 5 dimension scale scores (keystone median = 1.0; SSG median = 0.832; P = 0.641) indicating better general quality of life and lower POSAS scores indicating better disease/condition specifc quality of life (keystone mean = 27.7; SSG mean = 35.7; P = 0.323). Observer POSAS scores were signifcantly lower in the keystone group compared with the SSG group (keystone mean = 10.889; SSG mean = 17.313; P < 0.001). Preservation of sensation was signifcantly better in keystone flaps (P = 0.006). There was an average £158/$207 (15%) saving when performing a keystone flap. Conclusion: This pilot study demonstrates a number of possible benefits of keystone flaps over SSGs. The results demonstrate the need for further research comparing these reconstructive options. We propose a prospective, controlled study using the methods developed in this pilot study.

J. István, V. Tünde, **Diagnosztikai lehetőségek és jelentőségük a sebkezelésben** (in Hungarian), XXI. évfolyam, 2018. 1. Szám

A sebkezelő legfontosabb feladata, hogy a sebgyógyulás komplex folyamata menedzselése során a lehető legoptimálisabb feltételeket biztosítsa, azaz a hatékony sebgyógyuláshoz szükséges terápiás döntéseket folyamatosan meghozza. Ehhez megfelelő információra van szüksége, amely a sebkezelésben a diagnosztikus tevékenységünk fontosságára hívja fel a fgyelmet. A seb gyógyítása során akkor dolgozhatunk leghatékonyabban, vagy számíthatunk egyáltalán a seb záródására, ha az általános sebkezelési feladatok mellett megfelelő hangsúlyt fektetünk a változatos etiológiának megfelelő oki kezelésre. Súlyos hibát véthetünk - mely a kezelésünk eredményességét veszélyezteti, ha a sebkezelés diagnózis felállítása nélkül indul el, vagy ha nem megfelelő diagnózis születik.

G. Boyer, N. Lachmann, G. Bellemère, C. De Belilovsky, C. Baudouin, **Effects of pregnancy on skin properties: A biomechanical approach**, Skin Research & Technology, Feb. 2018

Background: A woman's skin is dramatically affected by pregnancy. Its biomechanical properties are critical for resisting highly stressed areas. The aim of this work was to evaluate the impact of pregnancy on the mechanical properties of skin, as well as to evaluate the imprint that pregnancy leaves on the skin after delivery. Materials and Methods: Suction tests using a cutometer were performed on 15 non-pregnant women and 26 pregnant women at 8°months of pregnancy and 4 months after delivery. Areas of abdomen and thighs were studied. Results: Significant differences between the non-pregnant and 8-month pregnant groups were observed. Our data demonstrate that skin becomes less elastic and less deformable on the abdomen during pregnancy. On the thighs, a loss of elasticity and firmness was also observed. At 4 months after delivery, the skin did not return to its initial state. Conclusion: This study showed that the mechanical properties of skin changed drastically during pregnancy compared to the non-pregnant condition and that these properties remain altered 4 months after delivery. In addition to alterations in abdominal skin during pregnancy, we also observed mechanical changes on the thighs, which are less subject to stretching.

T. Matthews-Brzozowska, M. Łącka, W. Kawałkiewicz, E. Mojs, L. Kubisz, **Minimally invasive facial skin revitalization treatment – a case study**, Journal of Medical Science 2018;87(1)

The increasing longevity of today’s societies has created a considerable need for the revitalization of facial skin undergoing the ageing processes. It is important to undertake preventive measures and start therapywhen the frst signs of ageing appear. This makes it possible to achieve a satisfactory effect while usingminimally invasive procedures. Among them, treatments based on autologous preparations occupy a sig-nifcant place, such as those using stem cells and concentrated growth factors (CGF), which have recently been introduced on the Polish market. Such a procedure was used on the patient described in this paper. In a series of instrumental studies, after three administrations of CGF-Harmony, improved values for the measurements reflecting skin elasticity were obtained, which was confrmed by instrumental examination of the skin using a Cutometer Dual MPA 580. Instrumental analysis of the mechanical parameters of facial skin makes it possible to demonstrate the effectiveness of treatment in the feld of facial aesthetic medicine.

B. Walzel, B. Senti, S. Banziger, U. Batz, **The natural solution to pollution**, PERSONAL CARE ASIA PACIFIC, January 2018

Exposure to air pollutants is one of the major threats to skin health. Contaminants attack the skin on several levels: they induce oxidative stress, they stimulate inflammatory pathways, and they accelerate the ageing process of skin. As a consequence, consumers demand functional cosmetics that prevent and repair pollution-induced skin damage. In this respect, the most promising approach is using the body's endogenous detoxification machinery, which is composed of a multitude of cell-protective and detoxifying mechanisms. These powerful systems are capable of neutralising thousands of toxic molecules per second, whereas the mere application of antioxidants is much less efficient, as one antioxidant molecule is capable of neutralising only one free radical. HerbaShield URB addresses these concerns. The COSMOS-approved multicomponent active ingredient targets three mechanisms to naturally reduce pollutioninduced skin damage: (1) It strengthens the skin's barrier through hydrogenated lecithin; (2) it protects from radical oxygen species through natural antioxidants; and (3) it enhances the endogenous detoxification machinery through natural activators of detoxifying enzymes. The presented anti-pollution ingredient is a perfect fit for anti-ageing cosmetics and to be formulated in skin care applications, such as face care, body care, and cleansing products.

P. Likhitthummaguna, P. Koonngamb, A. Seeremaspun, **Anti-aging effect of oral very high proline complex collagen (DERMOFIX®) on skin properties: a randomized, double-blind, placebo-controlled clinical study**

Taking collagen supplement to rejuvenate skin is now finding public favor due to antiaging trend. Synthesizing collagen, the body needs a specific amino acid group –Proline, Hydroxyproline and Glycine

called “Proline complex” to make a core structure of every type of collagen fiber in human body. DERMOFIX®, which is a new very high proline complex containing-collagen supplement, helps promoting collagen synthesis naturally leading to antiaging effects on skin properties as well as other collagen-containing organs. The objective is to study the anti-aging effects of the oral very high proline complex collagen (VHPCC) primarily on skin properties compared to placebo and commercially available collagen (CAV) in Thailand, and secondarily on knee joint. In this randomized, double blind, placebo-controlled clinical trial, 50 women aged 30-45 years old were randomized to receive the VHPCC 10 g, CAV 10 g or placebo 10 g once daily for 8 weeks. Six aging related skin properties, which are skin elasticity, hydration, melanin index, transepidermal water loss, smoothness and wrinkle were objectively measured at 0, 1, 2, 4, 8 weeks. Knee joint assessments, photo-shooting, blood tests for CBC, creatinine and *sirt1* gene expression level were evaluated before and after the study. Results: The VHPCC showed statistically significant improvement and gave faster effects than the CAV and placebo, in skin elasticity, hydration, melanin index, transepidermal water loss, smoothness and wrinkles. Most effects by VHPCC showed significant improvement since the first week while CAV showed improvement mostly at fourth or eighth week. Safety blood tests are normal in all groups. However, the Sirt1 gene expression did not increase in any groups. No adverse effect was reported throughout the study. Conclusion: The study demonstrated that the VHPCC (DERMOFIX®) supplement wasproved safe, gave much faster and more effective effects than CAV in anti-aging of skin properties, knee joints and collagen-containing organs.

K. Podgórna, A. Kołodziejczak, H. Rotsztejn, **Cutometric assessment of elasticity of skin with striae distensae following carboxytherapy**, J Cosmet Dermatol., 2017 Dec

Objective: The aim of the study was to evaluate the effectiveness of carboxytherapy in the treatment of striae distensae. Additionally, discomfort and side effects associated with the treatment were assessed. Material and Method: This study involved 15 women aged 22-40 years. They underwent 3 sessions of carboxytherapy at one-week intervals. Treatment was performed in skin area within stretch marks located on stomach, buttocks, and thighs. Cutometric probe was used to evaluate skin elasticity. Four measurements were performed-immediately before each treatment and one month after the last session. Photographic documentation was made before and after a series of treatment to perform clinical evaluation of changes in skin condition. Results: Statistical analysis of results obtained with the use of Cutometer (R2 and R8 parameters) demonstrated that carboxytherapy significantly improved skin elasticity within stretch marks ($P < .05$). The analysis of photographic documentation revealed 58% improvement in stretch mark visibility. The width and length of stretch marks decreased, and their color became more like the natural color of the skin. Carboxytherapy is associated with moderate pain/discomfort. The occurrence of hematoma is the main side effect of this procedure. Conclusion: Carboxytherapy seems to be an effective method of reducing stretch marks. This procedure is safe, and it can be performed without the risk of complications. Moreover, it does not require special postoperative convalescence. Photographic documentation is a method of assessment of aesthetic procedures effectiveness, which is complementary to other objective methods (eg, the use of MPA probes).

E. Merinville, C. Messaraa, C. O’Connor, G. Grennan, A. Mavon, **What Makes Indian Women Look Older—An Exploratory Study on Facial Skin Features,** cosmetics, December 2017

It remains important to investigate skin ageing signs across different skin types for targeted solutions. Limited data is available on Indian skin changes throughout ageing, hence three fields were investigated: skin features during the ageing process, their relationship with perceived age and self-declared skin ageing concerns. Photographs, skin topography, colour and biophysical measurements of 202 Indian female volunteers, 30–65 years old, were collected. Another panel of 693 naïve graders, 20–65 years old, estimated the age of photographs previously collected. Associations between 28 skin features and real/perceived age were assessed using linear correlation coefficients. Skin feature scores of an older perceived group were compared versus the scores of a younger perceived group, to establish skin features that lead to an older appearance. Additionally, the naïve graders were asked to rank 12 skin ageing concerns by importance. Twenty-four features correlated with real and perceived age. The ages of the volunteers were overestimated, especially those in their 30s. Skin features related to skin brightness suggested an older look for volunteers in their 30s. From the 40s onwards, wrinkles around the eye area, glabellar and corner of the mouth were also drivers for looking older. In the 50s, features such as upper lip wrinkles, hydration and roughness on the crow’s feet were worse in the older perceived group, while nasolabial folds suggested an older appearance in the 60s. By having identified skin features that worsen with age and contribute to an older perceived face, this research will facilitate the creation of tailored products and communication for Indian women to look after their skin concerns throughout the ageing process.

J.W. Park, **Influence of Diabetes Mellitus on the Biomechanical Properties of the Human Skin as**

Measured Using the Cutometer: A Case-Control Study, Soonchunhyang Medical Science 23(2): p. 97-103, December 2017

Objective: Longstanding diabetes mellitus has been suggested to cause several skin problems associated with biomechanical skin properties. However, the association between impaired skin properties and diabetic peripheral neuropathy (DPN) has not been clarified. This study aimed to investigate the biomechanical properties of the diabetic human skin and their relationship with DPNs. Methods: This case-control study included 39 chronic diabetic patients and 41 matched healthy controls. The diabetic group was divided into subgroups according to the presence of diabetic sensorimotor polyneuropathy (DSPN) and peripheral autonomic neuropathy (PAN) as determined by the results of nerve conduction study and sympathetic skin response test, respectively. Different skin regions were measured using the non-invasive Cutometer instrument (Courage and Khazaka Electronic GmbH, Cologne, Germany). The following skin parameters were compared between the groups: distensibility (Uf), elasticity (Ua/Uf and Ur/Uf), and viscoelasticity (Uv/Ue). The impact of DPNs, participant age, and diabetes duration on the investigated skin properties was analyzed. Results: The diabetic group showed higher Uf values, and lower Ua/Uf, Ur/Uf, and Uv/Ue values, compared to the control group. However, no significant differences in biomechanical skin properties were noted between diabetic patients with PAN and without PAN. There were also no differences in the investigated skin properties between diabetic patients with DSPN and without DSPN. Diabetes duration and participant age of both groups had a significant impact on the skin properties. Conclusion: A long-term hyperglycemic state could induce inferior biomechanical skin properties in the peripheral limbs; however, this phenomenon seems unrelated to DPNs.

A. Aguirre, E. Gil-Quintana, M. Fenaux, S. Erdozain, I. Sarria, **Beneficial Effects of Oral Supplementation with Ovoderm on Human Skin Physiology: Two Pilot Studies**, J Diet Suppl. 2017 Nov 2;14(6): p. 706-714

Collagens and hyaluronic acid have long been used in pharmaceuticals and food supplements for the improvement of skin elasticity and hydration. These compounds provide the building blocks of the skin. Ovoderm is an oral supplement obtained from eggshells that contains naturally occurring collagen and glycosaminoglycans, such as hyaluronic acid. We evaluated the efficacy of Ovoderm on skin biophysical parameters related to cutaneous aging such as elasticity, hydration, and pigmentation. Two pilot studies were run to assess the effect of daily oral supplementation with 300 mg Ovoderm on skin parameters. The first consisted of a self-assessment questionnaire intended to perform an assessment on skin, hair, and nail health after 50 days of treatment. The second measured the effect of 5-week treatment on hydration by corneometry, on elasticity with the cutometer, and on pigmentation with the mexameter. In the pilot study 1, participants were predominantly satisfied with the effects obtained on general face (100% volunteers satisfied) and body (94% volunteers satisfied) skin condition and skin properties (100% volunteers satisfied with facial skin softness, 94% with facial skin hydration, and 89% with body skin hydration) and partly with effects on hair (67% volunteers satisfied) and nail (50% volunteers satisfied) condition. The study 2 revealed a statistically significant improvement in skin elasticity (12% increase, p =.0136), a tendency to reduce skin pigmentation (5% decrease), and no significant change in skin hydration. Our study reflects that oral supplementation with Ovoderm is efficacious to reduce the gradual loss of skin elasticity characteristic of aged skin, which helps to improve the appearance of the skin.

C. Bogdan, S. Iurian, I. Tomuta, M. Moldovan, **Improvement of skin condition in striae distensae: development, characterization and clinical efficacy of a cosmetic product containing *Punica granatum* seed oil and *Croton lechleri* resin extract**, Drug Design, Development and Therapy 2017:11, p. 521–531

Striae distensae are a frequent skin condition associated with pregnancy, weight change or lack of skin elasticity. The aim of this research was to obtain a topical product containing herbal active ingredients with documented antioxidant and anti-inflammatory activity (*Punica granatum* seed oil and *Croton lechleri* resin extract) and demonstrate its positive effect on prevention and treatment of striae distensae. First, the cream base formulation was optimized through experimental design. Secondly, the cream containing the two active ingredients was investigated in an interventional nonrandomized clinical trial. The clinical outcome was assessed through biophysical parameters and ultrasonographic evaluation. The state of the skin was evaluated by biophysical measurements and ultrasonography at the beginning of the study and after 3 and 6 weeks. The experimental design was successfully used to set the best ranges for the technological and formulation factors to obtain a cosmetic formulation with optimal characteristics. The study of clinical effcacy on the optimal formulation revealed an increase in the dermis thickness, hydration and elasticity values in both groups after 6 weeks of cream application. The new oil-in-water cream containing *P. granatum* seed oil and *C. lechleri* resin extract can be helpful

in the prevention or improving of skin changes associated with striae.

S. Yui, S. Fujiwara, K. Harada, M. Motoike-Hamura, M. Sakai, S. Matsubara, K. Miyazaki, **Beneficial Effects of Lemon Balm Leaf Extract on In Vitro Glycation of Proteins, Arterial Stiffness, and Skin Elasticity in Healthy Adults**, J Nutr Sci Vitaminol, 63, p. 59–68, 2017

Glycation, a non-enzymatic glycosylation of proteins, induces tissue damage in association with various diseases and aging phenomena. Pentosidine, an advanced glycation end product, is involved in aging phenomena such as tissue stiffness. In this study, we aimed to find a potent anti-glycation food material and to verify its health benefits by clinical trial. From among 681 hot water plant extracts, lemon balm (Melissa officinalis; LB) leaf extract was selected and revealed to have more potent inhibitory activity for pentosidine formation than a representative anti-glycation agent, aminoguanidine. Rosmarinic acid (RA), a typical polyphenol in Lamiaceae plants, was identified as a major active component in LB extract (LBE). Furthermore, LBE or RA dose-dependently suppressed glycation-associated reactions such as increased fluorescence, yellowing of collagen fiber sheets, and degeneration of the fibrous structure of elastin fiber sheets. An open-label, parallel-group comparative trial was conducted in 28 healthy Japanese subjects aged 31–65 y who consumed LB tea (LB group) or barley tea (Control group) for 6 wk. The LB group showed significant reductions in brachial– ankle pulse wave velocity, reflecting arterial stiffness, and b* (yellow) color values in forearm skin compared with the Control group. A gender-stratified analysis revealed that cheek skin elasticity was significantly improved in the LB group compared with the Control group only in female subjects. It is concluded that the hot water extract of LB leaf has the potential to provide health benefits with regard to glycation-associated tissue damage in blood vessels and skin of healthy adults.

S.Y. Choi, H.J. Kwon, G.R. Ahn, E.J. Ko, K.H. Yoo, B.J. Kim, C. Lee, D. Kim, **Hyaluronic acid microneedle patch for the improvement of crows feet wrinkles**, Dermatol Ther. 2017 Nov; 30(6)

Hyaluronic acid (HA) has an immediate volumizing effect, due to its strong water-binding potential, and stimulates fibroblasts, causing collagen synthesis, with short- and long-term effects on wrinkle improvement. We investigated the efficacy and safety of HA microneedle patches for crow's feet wrinkles. Using a randomized spilt-face design, we compared microneedle patches with a topical application containing the same active ingredients. We enrolled 34 Korean female subjects with mild to moderate crow's feet wrinkles. The wrinkle on each side of the subject's face was randomly assigned to a HA microneedle patch or HA essence application twice a week for 8 weeks. Efficacy was evaluated at weeks 2, 4, and 8. Skin wrinkles were measured as average roughness using replica and PRIMOS. Skin elasticity was assessed using a cutometer. Two independent blinded dermatologists evaluated the changes after treatment using the global visual wrinkle assessment score. Subjects assessed wrinkles using the subject global assessment score. Skin wrinkles were significantly reduced and skin elasticity significantly increased in both groups, although improvement was greater in the patch group at week 8 after treatment. In the primary and cumulative skin irritation tests, the HA microneedle patch did not induce any skin irritation. The HA microneedle patch is more effective than the HA essence for wrinkle improvement and is a safe and convenient without skin irritation.

J. Comas, O. Laporta, M. Ollagnier, S. Venkataraman, R. Delgado, **A firmer skin from the elixir of life mushroom**, PERSONAL CARE EUROPE, November 2017, p. 85-87

Shiitake mushroom has been recognised throughout history for its youth-promoting benefits, even being acknowledged as an elixir of life. In terms of its application in skin care, a shiitake mushroom-based extract has been recently selected to provide rejuvenating and firming effects to the skin of the face, neck and decollete. More specifically, Actifcol advanced botanical ingredient has shown to offer a holistic care of the collagen protein, by helping increase its synthesis, improve its quality, through the PLOD1 gene, and reduce its deterioration process caused by carbamylation. When evaluated on mature skin, it showed to enhance firmness and to achieve a moreisotropic skin behaviour, typical of a younger skin.

K.B. Biswas, K. Tanaka, S. Takayama, A. Iddamalgoda, **A solution for pollution induced ageing of skin,** PERSONAL CARE ASIA PACIFIC, November 2017, p. 36-38

Environmental pollution has now become the talk of the world. It is very important to keep in mind that more than half of the world's population now lives in an urban area. It is assumed that by 2030, 60% of the world's population will be living in towns and cities, rising to 70% by 2050.' As skin is the first line of defence when it comes to air pollution contact, we should be aware of the harmful effects of pollution on skin in general. Pollution, in fact, is not a problem limited to China or India only, it is almost common, for example, in London, Paris, New York and Milan as well. As urbanisation is the main cause

of environmental pollution, it could be speculated that most of the people in the world are going to face higher levels of such pollution than ever before, and it will be very difficult for us to escape from that.

D. Schmid, F. Wandrey, F. Zulli, **Stimulating endorphins and sex hormones in the skin,** PERSONAL CARE ASIA PACIFIC, November 2017, p. 49-51

DHEA is the precursor for both sex hormones, the female oestrogen as well as the male ones, testosterone and dihydrotestosterone. Circulating DHEA is mainly produced by the adrenal glands. Production is highest when we are in our thirties but then starts to decline leading to the so called 'adrenopause' which occurs in both sexes. In the peripheral tissues, DHEA is transformed to the final sex hormones, depending on the tissue's needs. Oestrogen plays a very important role in skin health and skin ageing. It stimulates the production of collagen and elastin and inhibits the breakdown of the existing fibres. Declining oestrogen levels therefore result in laxity of the skin and a decreased general skin tonicity which leads to sagging and wrinkles. In men, the decrease of the testosterone level results at the skin level in a loss of skin density and in lower elasticity. For a couple of years it has been known that the skin not only represents a target for circulating DHEA, oestrogen, and testosterone but has itself the capacity to produce from the lipid precursor cholesterol the steroid hormone DHEA and all the final sex steroids.

L. von Oppen-Bezalel, **Detoxification and protection against pollution and UV**, PERSONAL CARE ASIA PACIFIC, November 2017, p. 59-61

Air pollution, caused mainly by industry, vehicle fumes,cigarette smoke together with high energy sunlight (UV), are known to have a detrimental effect on our skin and body, starting from our appearance, such as early signs of ageing including wrinkles, pigmentation spots, disrupted skin barrier, overall dryness and skin imperfections. Pollution and smog are not a single substance, but are rather a highly complex mixture of molecules and particles that are breathed in and absorbed through the skin. A major unmet need of the industry is for effective, natural and safe means to protect the body and the skin specifically as our outer protective layer against pollution to which it is exposed daily

U. Magnet, C. Urbanek, D. Gaisberger, E. Tomeva, E. Dum, A. Pointner,A.G. Haslberger, **Topical equol preparation improves structural and molecular skin parameters**, Int J Cosmet Sci, 2017 Oct;39(5): p. 535-542

Objective: Equol has been shown to improve skin health and regeneration, due to its antioxidative, phytoestrogenic and epigenetic characteristics. The effects of a topical intervention on skin structure, telomere length and epigenetic markers in skin cells were analysed. Methods: Sixty-four participants were divided in four groups and three of them treated topically with the following: emulsion with Equol powder (Isoflavandiol-E-55-RS®); emulsion with microencapsulated Equol (Vesisorb® Isoflavandiol-E-55-RS®) and an emulsion with lecithin (Vesisorb® placebo). A control group of 6 volunteers did not receive any intervention. The active compound was a 0.5% equol-racemate. For 58 participants, all samples were collected. Structural analysis, molecular analysis and questionnaires were performed at the start of the study and after 8 weeks of intervention, twice a day. Structural skin parameters were analysed by Visioscan® VC 98 and Cutometer® dual MPA 580. Molecular analyses from epidermal cells collected by skin stripping of the forehead included telomere length and LINE-1 methylation, following DNA extraction, bisulfite conversion and qPCR as well as high-resolution melting curve analysis. Effects of nutrition and lifestyle habits were evaluated with a standardized food and lifestyle questionnaire. Results and Discussion: The surface analysis showed significant improvements in skin roughness, skin texture and skin smoothness after both interventions. Cutometer® dual MPA 580 measurement revealed improvement of skin firmness and elasticity parameters for both preparations. A decrease in mean LINE-1 methylation (n.s.) and telomere length (sign. $P < 0.05$) was observed in the sample group with age. In the treated groups, significantly longer telomeres were observed after intervention. Whether changes in telomere length reflect changes in the regulation of telomerase, epigenetic interactions or turnover of keratinocytes needs further research. Stability and availability of preparations in skin seems to be high as not many significant differences in the activity of pure or encapsulated substances were seen. Conclusion: The results of this study indicate that equol has beneficial effects on structural as well as molecular skin parameters and encourages further investigations to decipher the epigenetic regulation of skin ageing and interactions of equol.

M.P. Wakeman, **An open-label forearm-controlled pilot study to assess the effect of a proprietary emollient formulation on objective parameters of skin function of eczema-prone individuals over 14 days,** Clinical, Cosmetic and Investigational Dermatology 2017:10, p. 275–283

Background: This study examines the effcacy of a new plant-based emollient and assesses product acceptability. Methods: Primary effcacy endpoints were improvement in transepidermal water

loss, hydration, skin elasticity and frmness, erythema, and skin roughness and smoothness as measured using the versions of Tewameter, Corneometer, Cutometer, Mexameter, and Visioscan VC98, respectively. The cream was applied twice daily by 32 participants to an area of one forearm unaffected by eczema, while the same area of the other forearm was used as a control. Measurements were taken at day 0 and day 14. Secondary endpoints assessed the acceptability of the product. Results: At the end of 2 weeks, transepidermal water loss, hydration, skin elasticity and frmness, erythema, and skin roughness and smoothness improved. All changes were statistically signifcant (p<0.01). The rate of satisfaction with the emollient properties was 82%, and the rate of absorption into the skin was 88%. Results show that the emollient hydrates and repairs eczema-prone skin with high levels of acceptability.

G. Buehrer, A. Arkudas, R.E Horch, **Treatment of standardised wounds with pure epidermal micrografts generated with an automated device**, Int Wound J, 2017 Oct;14(5): p. 856-863

In this study, we analysed the effects of pure epidermal micrografts generated with an automated device in a standardised human wound model. Epidermal micrografts were harvested using an automated device. Micrografts were then transplanted onto split-skin donor sites. The target area was only partially covered with transplants to create an intra-individual control area. Wounds were evaluated by subjective assessment as well as measurements with combined laser and white light spectroscopy and cutometry. The epidermal graft sites remained completely stable, whereas control sites offered partially unstable and blistering areas. Statistically, no measurable difference in the speed of initial reepithelialisation could be shown. However, there was an increased pliability and softness of the treated areas that correlated with the subjective impression of both investigators and patients. There was a significantly higher relative haemoglobin concentration, measurable in treated and untreated areas at 4 weeks and 6 months. Cutometry showed no differences in skin properties between treated and untreated areas. This study shows an effect of epidermal micrografts in a standardised human wound model and supports the positive impact of keratinocytes on early wound healing as described in literature. Long-term effects of epidermal grafting deserve further studies.

A. Garre, G Martinez-Masana, J. Piquero-Casals, C. Granger, **Redefning face contour with a novel anti-aging cosmetic product: an open-label, prospective clinical study**, Clinical, Cosmetic and Investigational Dermatology 2017:10, p. 473–482

Background: Skin aging is accelerated by multiple extrinsic factors: ultraviolet radiation, smoking and pollution increase oxidative activity, damaging cellular and extracellular components such as DNA, proteins, and lipids. With age, collagen and hyaluronic acid levels decline, resulting in loss of elasticity and moisture of the skin. Over time this damage leads to characteristic signs that make the skin look older: altered facial contour, sagging skin, wrinkles, and an uneven complexion. This study evaluated the anti-aging effects of a new facial cream formulated with carnosine, *Alteromonas* ferment extract, crosspolymer hyaluronic acid, and a tripeptide. Methods: An open-label intra-individual study to assess the anti-aging efficacy of the investigational product in 33 women aged 45 to 65 years. The product was applied twice daily for 56 days. Facial contour and skin deformation, elasticity, hydration, and complexion were measured with specialized equipment at baseline and days 28 and 56. Additionally, subjects completed questionnaires at days 28 and 56 on the perceived efficacy and cosmetic characteristics of the product. Results: After 56 days of use of the investigational product, a redefining effect was observed, with a significant decrease in sagging jawline (7%). Skin was significantly more hydrated (12%), firmer (29%), and more elastic (20%) (P<0.001 for all). On complexion assessment, skin texture (a measure of skin smoothness) and spots (brown and red skin lesions) also improved significantly (12% and 6% decrease, respectively). In the subjective self-evaluation, the majority of subjects reported that the skin was visibly tightened and more elastic, flexible, and moisturized (91%, 88%, 91%, and 90%, respectively). The product was well tolerated with no adverse events reported during the study. Conclusion: This new cosmetic product demonstrated anti-aging effects after 56 days of use, most notably a redefined facial contour and improved complexion. It is a safe and effective anti-aging product.

Y. Xu, R. Ma, J. Juliandri, X. Wang, B. Xu, D. Wang, Y. Lu, B. Zhou, D. Luo, **Efficacy of functional microarray of microneedles combined with topical tranexamic acid for melisma - A randomized, self-controlled, split-face study**, Medicine 2017

To evaluate the efficacy of a functional microarray of microneedles (MNs) plus topical tranexamic acid (TA) for melasma in middleaged women in China. Thirty female subjects with melasma were enrolled in this study. The left or right side of the face was chosen randomly to be pretreated with a functional microarray of MNs, followed by topical 0.5% TA solution once per week for 12 weeks. The other half-face was the control, treated with a sham device plus topical 0.5% TA solution. At baseline and at weeks 4, 8, and 12 of treatment, clinical (photographic) evaluations and parameters determined

by Visia were recorded. At baseline and week 12, patient satisfaction scores and the biophysical parameters measured by Mexameter were also recorded. Side effects were evaluated at baseline and at the end of the 12 weeks. In total, 28 women (93.3%) completed the study. The brown spots' scores measured by Visia were significantly lower on the combined therapy side than on the control side at 12 weeks after starting treatment; there was no significant difference between sides at 4 or 8 weeks. After 12 weeks, melanin index (MI) decreased significantly in both 2 groups, and the MI was significantly less on the combined side at week 12. Transepidermal water loss, roughness, skin hydration, skin elasticity, and erythema index showed no significant differences between 2 sides at baseline, 4, 8, and 12 weeks after treatment. Physicians' evaluations of photographs showed better results at week 12with combined therapy: >25% improvement was observed in the MNs plus TA side in 25 patients, and in the TA side in only 10 patients. Subjective satisfaction scores on both sides increased significantly. The participants were more satisfied with the results of the combined therapy side than the control side. No obvious adverse reactions were observed throughout the study. Combined therapy with a functional microarray of MNs and topical TA solution is a promising treatment for melasma.

C.E. Coltman, J.R. Steele, D.E. McGhee, **Effect of aging on breast skin thickness and elasticity: implications for breast support,** Skin Research and Technology 2017; 23: 303-311

Background: The skin overlying a woman's breast acts as an anatomical support structure to the breast. Although aging is known to affect the thickness and elasticity of human skin, limited research has examined age-related changes to skin covering the breast or related these changes to breast support requirements. The purpose of this study was to determine the effect of age on female breast skin thickness and elasticity. Methods: The left breast of 339 women (18-84 years), classified into four age groups (18-24 years, 25-44 years, 45-64 years, and 65 + years), was divided into four quadrants. Skin thickness (dermal layer; 20 MHz ultrasound probe) and skin elasticity (Cutometer® MPA 580) were measured for each breast quadrant and then compared to determine whether there was any significant ($P < 0.05$) effect of aging on breast skin. Results: Breast skin thickness significantly decreased from 45 years of age onwards. A significant decline in breast skin elasticity was evident from the mid 20's. Conclusion: Aging is associated with a significant decline in breast skin thickness and elasticity, which is likely to reduce anatomical breast support. Women might therefore benefit from increased external breast support (i.e. a more supportive bra) with increasing age.

C. Rosado, F. Antunes, R. Barbosa, R. Fernando, M. Estudante, H.N. Silva, L.M. Rodrigues, **About the *in vivo* quantitation of skin anisotropy**, Skin Research and Technology 2017; 23: 429-436

Background/purpose: Human skin anisotropy is difficult to quantify. The Cutiscan®, is allegedly, the first biometrical system to provide information on the elastic and viscoelastic properties, as well as on anisotropy and directionality of the human skin *in vivo.* Thus, this study aims to contribute to characterize this new device and its applicability, and to compare its behavior with two other well-known devices— the Cutometer® and the Reviscometer®. Methods: Measurements were conducted with each device inthree different anatomical sites (forehead, forearm and leg) of 20 female volunteers engaged after informed consent. The participants in the study were aged 19-73 years (mean age 37 ± 18.7 years old), and were divided in two groups (n = 10), based on their age - Group I, mean age 22 ± 1.3 years; Group II, mean age 52 ± 13.7 years. Results: All devices were useful tools to explore the anatomical and the age dependant changes in biomechanical terms, showing different discriminative capacities. Interesting correlations were established between the variables provided by the equipment. Conclusion: The Cutiscan® descriptors delivered excellent relationships with those from Cutometer® and Reviscometer®, while providing more detailed information about skin anisotropy through a full 360° analysis.

S. Weschawalit, S. Thongthip, P. Phutrakool, P. Asawanonda, **Glutathione and its antiaging and antimelanogenic effects**, Clin Cosmet Investig Dermatol. 2017; 10: p. 147–153

Background: Previous studies showed that supplementation of reduced form of glutathione (GSH, 500 mg/d) has a skin-lightening efficacy in humans. This study was designed to evaluate the influences of both GSH and oxidized form (GSSG), at doses lower than 500 mg/d, on improving skin properties. Patients and methods: A randomized, double-blind, placebo-controlled, parallel, three-arm study was conducted. Healthy female subjects were equally randomized into three groups and took GSH (250 mg/d), GSSG (250 mg/d), or placebo orally for 12 weeks. At each visit at baseline and for 12 weeks, skin features including melanin index, wrinkles, and other relevant biophysical properties were measured. Blood samples were collected for safety monitoring. Results: In generalized estimating equation analyses, melanin index and ultraviolet spots of all sites including face and arm when given GSH and GSSG tended to be lower than placebo. At some sites evaluated, subjects who received GSH showed a significant reduction in wrinkles compared with those taking placebo. A tendency toward

increased skin elasticity was observed in GSH and GSSG compared with placebo. There were no serious adverse effects throughout the study. Conclusion: We showed that oral glutathione, 250 mg/d, in both reduced and oxidized forms effectively influences skin properties. Overall, glutathione in both forms are well tolerated.

M.E. van Baar, H. Goei, C.H. van der Vlies, E. Tuinebreijer, P.M.M. Van Zuijlen, E. Middelkoop, **Predictive validity of short term scar quality on final burn scar outcome using the Patient and Observer Scar Assessment Scale,** Oral Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Objectives: Early recognition of burn patients who are prone to develop scar morbidity is important. The aim of this study was to assess the predictive validity of the Patient and Observer Assessment Scale (POSAS), in order to determine whether it can be used to predict final scar quality. Methods: Patients with a maximum TBSA burned of 20% who were treated in a Dutch burn center and participated in two scar assessments at 3 months and >18 months post-burn were included. Scar quality assessment consisted of the POSAS, Dermaspectrometer (color) and Cutometer (elasticity). Predictive validity was determined in three ways: (1) the discriminative ability to distinguish good from reduced long term scar quality, (2) correlations between POSAS items score at the two subsequent assessments and (3) linear regression was conducted to identify POSAS items as independent predictors. Additionally, reliability, construct validity and interpretability were assessed. Results: A total of 141 patients were included with a mean TBSA burned of 5.2% (SD 4.5). The ability of the Patient scale to discriminate between good and reduced long term scar quality was adequate with an area under the curve (AUC) of 0.728 (95% CI 0.640–0.804), the ability of the Observer scale was good with an AUC of 0.854 (95% CI 0.781–0.911). Correlations between items scored at 3 months and over 18 months were at least adequate. On item level, pain and stiffness (Patient) and pliability and relief (Observer) were identified as significant predictors for reduced long term scar quality. The POSAS was reliable, construct validity was adequate at three months but declined at >18 months. Conclusion: Long term scar quality after burns can be 20 EBA 17TH European Burns Association Congress ORAL PRESENTATIONS predicted by an early POSAS assessment at three months. These results might be helpful in the decisionmaking of selecting patients for outpatient follow-up in specialized burn care.

A. Schulz, P.C. Fuchs, J.P. Stromps, H. Heinel, **Bromelain based enzymatic debridement versus traditional surgical debridement in the treatment of deep dermal facial burn injury,** Oral Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Introduction: Tissue preserving debridement is essential for an optimal long term aesthetic outcome in deep dermal facial burns. Tangential burn eschar excision is still the gold standard. In the recent past promising results were reported for selective and precise eschar removal by NexoBrid, a Bromelain based enzymatic debridement agent. Methods: In a single-centre clinical trial we compared 13 versus 13 patients which received enzymatic and surgical debridement in deep dermal facial burn injury. We assessed time to complete healing, complications in healing process and scar quality after more than 12 months for both groups. Results: 77% of the facial burns that had been debrided enzymatically were found more superficial burned than initially assessed. Enzymatic debridement significantly reduced time to complete wound closure after admission (19.85 days versus 42.23 days, p=0.002), and after enzymatic eschar removal (18.92 days versus 35.62 days, p=0.042). The number of procedures to complete debridement (1.00 versus 1.77, p=0.003) and the need of autografting (15% versus 77%, p=0.002) were significantly reduced in the enzymatic debridement group. Scar quality was superior compared to surgical debridement after 12 months regarding pigmentation (p=0.016), thickness (p=0.16), relief (p=0.10), pliability (p=0.01), surface area (p=0.004), stiffness (p=0.023), thickness (0.011) and scar irregularity (p=0.011). Regarding erythema and melanin, viscoelasticity and pliability, transepidermal water loss or laser tissue oxygen saturation, haemoglobin level and microcirculation we found no significant differences for treated and untreated skin in the enzymatic debridement group. Conclusion: Compared to our current SOC we found promising results for enzymatic debridement of deep dermal facial burns with NexoBrid® regarding healing potential, time-efficient treatment and long term caring.

J. Meirte, M. Anthonissen, U. van Daele, C. Lafaire, L. de Cuyper, K. Maertens, P. Moortgat, **The effects of shockwave-therapy on burn scars, a randomised comparative trial,** Oral Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Objectives: Extracorporeal shockwave-therapy (ESWT) is emerging as a new non-invasive type of mechanotherapy to treat both wounds and scars. This study aims to investigate the added value of ESWT in the treatment of hypertrophic burn scars after delayed wound healing. Methods: Evaluations included the Patient and Observer Scar Assessment Scale (POSAS) for clinical assessment, tristimulus

colorimetry for redness and cutometry for elasticity. Patients were randomly assigned to a group and treated with pressure garments, silicone and moisturisers. The intervention group was additionally treated with ESWT once a week during 10 weeks. Patients were tested at baseline, after one, three and six months. An intention to treat analysis with the last observation carried forward was applied. Sensitivity analyses were carried out to detect significant differences between the analysis with or without the missing data. To detect significant differences between the groups a repeated measures ANOVA was used with the intervention being the between-subjects factor and time + scar outcome parameter (e.g. elasticity) being the within-subjects factor. Results: Final results for 20 patients in each group after six months are presented. Average age was 44,4 years (±18,2) in the intervention group and 39,1 years (±14,89) in the control group. Scars were on average 2,4 months (±1,42) and 2,7 months (±1,81) old. Results of the clinical assessments showed a trend towards a better performance for the intervention group with statistically significant EBA 17TH European Burns Association Congress 57 ORAL PRESENTATIONS improvement for elasticity, global opinion and total sum of POSAS scores assessed by the patient and observer. Results of the objective assessments showed a statistically significant better performance of the intervention group for elasticity assessed with cutometry (p=.011, η2p=0,107, d=-1,23) and revealed no statistically significant differences between the groups for redness assessed with tristimulus colorimetry. Conclusions: ESWT could give added value to the noninvasive treatment of hypertrophic scars especially to improve elasticity.

J. Poetschke, U. Dornseifer, M.T. Clementoni, M. Reinholz, H. Schwaiger, S. Steckmeier, T. Ruzicka, G.G. Gauglitz, **Ultrapulsed fractional CO2 laser treatment of hypertrophic burn scars: evaluation of an in-patient controlled, standardized treatment approach,** Oral Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017 and Lasers Med Sci, 2017 Jul;32(5): p. 1031-1040

Objective: In this study, we aimed to quantify the effects of fractional ablative carbon dioxide laser therapy in the treatment of widespread hypertrophic burn scars. Background: While many different pilot studies have described the potential of the technology and expert groups and current guidelines, alike, recommend its use, the level of evidence for the efficacy of fractional CO2-laser treatment for burn scars is currently very low. Methods: 10 patients (3 male, 7 female) with hypertrophic burn scars were treated with a single course of fractional CO2-laser therapy in an in-patient controlled setup, using a standardized treatment paradigm. Documentation was based on modern scar scales and questionnaires, like the VSS, POSAS and DLQI, as well as state of the art clinical measurements (PRIMOS, Cutometer). Results: Over the course of six months after treatment, VSS and POSAS scores showed significant improvement in the rating of scar parameters, as did the quality of life rating according to the DLQI. In the treated scars surface relief improved significantly, as Smax decreased by 1893µm (- 36.92%) (p = 0.0273) and Sz by 1615µm (- 36.37%) (p = 0.0488). Scar firmness in treated scars could be reduced by 30% after one treatment session, as R0 improved by 0.0797mm (+ 30.38%) (p= 0.0212). Conclusions: Fractional ablative CO2-laser treatment is a safe and efficacious option for the treatment of hypertrophic burn scars. While more treatment sessions are required for satisfying results, significant improvement is already apparent after a single course of treatment.

K.C. Lee, A. Bamford, F. Gardiner, A. Agovino, B. Ter Horst, K. Al-Tarrah, J. Bishop, L. Grover, A. Logan, N. Moiemen, **The reliability and cross validation of a panel of objective measurement tools for the burn scar,** Oral Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Introduction: Traditionally, burns scars have been measured using subjective scores however objective measurements are required to improve the reproducibility of clinical and study outcomes. This study aimed to evaluate the intra- & inter-rater reliability of a panel of objective scar measuring tools consisting of the DSM-II-Colormeter, Dermascan ultrasound & Cutometer and cross-validate them with the modified Vancouver Scar Scale (mVSS) and Patient & Observer Scar Assessment Scale (POSAS). Methods: 3 independent assessors evaluated 50 scar sites on 50 burn patients. The Intraclass Correlation Coefficient (ICC) was utilised to measure reliability (acceptable when >0.70). Pearsons correlation was used to investigate correlations between measures. Results: The inter-rater reliability of the total score & individual subscales of both mVSS & POSAS fell below the acceptable limit. DSM-II intra- & inter-rater reliability for a* & Erythema values were acceptable for the measurement of erythema but only the Erythema value correlated significantly with the mVSS vascularity subscale (Pearsons=0.325, p=0.021). L* & Melanin values (but not b* value) had acceptable intra- & inter-rater reliability for pigmentation and correlated significantly with mVSS & POSAS pigmentation subscales (p0.90). Thickness measurements correlated significantly with both mVSS Height and POSAS Thickness subscales (Pearsons=0.52 & 0.69, p<0.01) pliability subscales. Conclusion: The DSM II, Dermascan and Cutometer demonstrated acceptable to excellent intra- and inter-rater reliability and

outperformed subjective scar scales. Their significant correlations with the matching mVSS and POSAS subscales confirm that these tools are measuring the same traits but in a more objective and reliable manner.

M. Held, J.R. Rothenberger, J. Schiefer, W.P. Petersen, A.R.S. Rahmanian-Schwarz, H.E. Schaller, A. Daigeler, **Alteration of biomechanical properties of burned skin**, Poster Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Background: The prevalence of burns in the general population is high. Despite new research findings, skin burns and its resulting tissue damage are still not entirely understood. In particular, little is known about the depth-dependent alteration of skin biomechanical properties of these wounds.
Methods: Thirty-six burn wounds with six different depths were generated on the abdomen of six Göttingen minipigs. The alteration of skin biomechanical properties was evaluated objectively after 15 and 360 min using a Cutometer device. Biopsies for histological evalua-tion were taken and the depth of burn was correlated with biomechanical properties.
Results: Firmness of skin (R0), overall elasticity (R8) and calculated elasticity (Ue) demon-strated a continuous decrease with an increasing depth of burn 15 min after wound generation. Gross elasticity (R2), net elasticity (R5) and amount of elasticity of the whole curve (R7), however, showed an increase of values with increasing depth of injury. A further decrease of elasticity was demonstrated 360 min after wound generation. Conclusion: The alteration of skin biomechanical properties is a function of damaged tissue structures. The presented results demonstrate a depth-dependent decrease of principal elastic parameters with an increasing depth of burn and the results indicate progressive tissue damage over the time.

M. Anthonissen, A. Sharma, J. Meirte, C. Lafaire, L. De Cuyper, K. Maertens, P. Moortgat, **Correlation of pliability with (Visco-) elastic properties of burn scars,** Poster Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Background and objectives: Patient and Observer Scar Assessment Scale (POSAS) and Cutometer® are the most frequently used assessment tools to investigate pliability of burn scars, subjectively and objectively. We aim to investigate the correlations between POSAS pliability items and the (visco-) elastic properties of scarred skin measured with the Cutometer®. These results could provide information necessary to determine minimal clinically important differences (MCID) for POSAS pliability items and Cutometer®. Methods: Fifty-eight measurements on 20 patients with burn or surgical scars are performed. Patients completed the POSAS-P, whilst observers assessed pliability using POSAS-O and Cutometer®. Results: The Cutometer® R0 parameter was most strongly negatively correlated with both POSAS-O-pliability (r=- 0.597; p=.006). When correlating the POSAS pliability scores with the R0 values, a downwards trend is demonstrated. There appear to be 'levels' of change, only showing significant differences between the 'levels' and not between the consecutive individual scores. We observed a significant positive correlation between the observer- and patient-reported pliability scores (r=0.443; p=.001), however imperfect. Discussion: The strong correlations of the R0 parameter with POSAS pliability scores imply that the Cutometer® could also serve as an anchor to determine the MCID for the POSAS pliability parameter since a cut-off score ≥ 0.3 is present. The presence of 'levels' of change suggests that observers can distinguish between 'levels' of severity, but the differences between certain scores appears arbitrary. The significant but imperfect correlation between the observer- and patient-reported pliability scores suggest that observers and patients are not attributing the pliability in the same way. A difference in the assessment protocol for the observer and the patient could explain this. Conclusion: The Cutometer® is a valid instrument for measuring the characteristic of pliability when using the R0 parameter, and can serve as an anchor to determine the MCID for POSAS pliability.

U. van Daele, P. Moortgat, R. Clijsen, J. Meirte, M. Anthonissen, K. Maertens, P. Clarys, **Bioavailability of scarred skin during application of a vaso-active substance,** Poster Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Objectives: The skin acts as a mechanical or insulation barrier in physiotherapy interventions. The evidence of topical applications in physiotherapy is poor or lacking in skin and (burn) scar research. In this study, non-invasive skin measurements will be used to evaluate bioavailability of scarred skin during application of a vaso-active substance. Methods: Two groups consisting of 14 scar sites and 8 healthy skin sites are selected based upon predefined inand exclusion criteria. Baseline measurements on a 6cm2 scar/skin site include skin color, trans epidermal water loss, skin hydration and epidermal and dermal thickness. A filter disk saturated with a Methylnicotinate (MN) solution (0.005M) is applied for 30 seconds on the marked scar/skin site. Bioavailability is assessed by quantification of an MN-induced skin redness observed with the Chromameter® over 65 minutes after the MN application by a

standardised protocol. Change in skin color is compared using a repeated measures ANOVA. Spearman correlations between skin color and all independent variables are calculated. Between group differences are tested by the Mann-WhitneyU. Spearman correlation coefficients between skin hydration outcome measures are calculated. Results: A significant groupxtime effect for chroma a* values is demonstrated (p=0,044). A significant difference between both groups is found for the sum of total color change (p=0,02) and for dermal thickness (p=0,044). A significant difference between both groups is found for the sum of total color change (p=0,02) and for dermal thickness (p<0,0001). A correlation between the latter parameters is significant (r=,587, p=0,004). Hydration values of the Corneometer correlate significantly with the Grey Index T of the Moisture Map® (r=0,427, p=0,047). Conclusion: The dermal thickness is a determining factor for bioavailability of MN in scars. Epidermal thickness and TEWL were no significant factors of influence on skin color within the current study. The Moisture Map® can be used as an assessment tool for skin hydration, especially the Grey Index T seems a valuable parameter based upon the current primary study results.

U. van Daele, J. Meirte, M. Anthonissen, K. Maertens, C. Lafaire, L. De Cuyper, P. Moortgat, **Proof of concept for tension reducing taping as a mechanotherapy for hypertrophic post trauma and burn scars,** Poster Presentation, 17th European Burn Association Congress EBA, Barcelona, September 2017

Objective: There is strong acknowledgement that mechanical forces can regulate inflammation and fibrosis and therefore may be used therapeutically to stimulate tissue repair and remodeling. This mechanism is referred to as “mechanotherapy”. Although the pathophysiological background of mechanotherapy is well described, evidence based practical applications are lacking within scar treatment. The goal of this study is to obtain a proof of concept for a newly developed taping technique that can reduce tension on pathological post trauma and burn scars. In a previous study we developed a technique consisting of one piece of elastic therapeutic tape with a longitudinal incision made in the middle of the tape. The latter technique is most suitable for scars in between joints. The current technique is innovative for scars located over joints. Methods: Scar patients are selected based upon predefined in- and exclusion criteria. Two pieces of tape are applied in a standardised way, thus reducing tension at the scar site. The tape makes no direct contact with the scar site, thereby avoiding maceration of the scar. Distensibility, which has an inverse relationship with tension, is measured before application of the elastic therapeutic tape with a Cutometer, which measures the vertical deformation of the skin in millimetres when the skin is pulled by means of a controlled vacuum into the circular aperture of a probe. This measurement is repeated after the application of the tape, one, two and three days later. The more the skin can be deformed, the more tension is reduced on that skin site. Standard descriptive statistics including means and standard deviations are used to summarise patient demographic and presentation data. Paired sample T-tests are used to calculate the difference in the scores for distensibility. Results: Currently data collection is being finalized and results can be presented at the conference.

M. Mateu, A. Esplugas, S. Pastor, P. Carulla, M. Gorostiaga, **Tightening efficacy of a selfie-reaay freezing blast,** PERSONAL CARE EUROPE, September 2017, p. 42-44

Nowadays, 24 hours are not enough for busy lifestyles. Whether your little spare time is due to work and personal duties or social events, your skin needs to be taken care of. Imagine applying a cosmetic product that acts while you are dressing or deciding how to take a selfie. An on-the-go recharging beauty wind to keep up with your daily rhythm. Sirtalice'" is a marine ingredient from a microorganism collected near Reunion Island, where coral barriers form shallow lagoons of turquoise waters that shelter thousands of marine species. The microorganism was collected during the Malaspina expedition around the world at 3,400 m depth and 1.5°C. Sirtalice is an on-the-go freezing energy blast to help breathe out your true beauty, offering an instant lifting and a V-reshape of face contour with long-lasting efficacy.

D. Schmid, F. Wandrey, F. Zulli, **Stimulating endorphins and sex hormones in the skin,** PERSONAL CARE EUROPE, September 2017, p. 86-87

The peptide hormone beta-endorphin and the steroid hormone dehydroepiandrosterone (DHEA) play important roles in the skin. The fact that they are also synthesised locally in the skin makes them interesting targets for cosmetic ingredients. An extract of monk's pepper *(Vitex agnus-castus*) was found to perform like beta-endorphin and to stimulate the synthesis of DHEA. In a clinical study, the extract showed significant effects on skin elasticity and density.

N.G. Lapatina, T. Pavlenko, **Diluted Calcium Hydroxylapatite for Skin Tightening of the Upper Arms and Abdomen**, J Drugs Dermatol. 2017 Sep 1;16(9):900-906

Background: The collagen-stimulating properties of Radiesse® (calcium hydroxylapatite, CaHA) can be used for skin-tightening procedures by hyper-diluting the product with lidocaine or saline. Objective: To evaluate the effectiveness and safety of diluted CaHA for skin tightening in two case series of women with skin laxity in the upper arms or abdomen. Methods: For each case series, 10 female subjects were enrolled. In the upper arms, CaHA diluted 1:2 with normal saline solution and 2% lidocaine was injected subdermally using a short, linear-threading technique. Skin elasticity was assessed at baseline and Months 1 and 3 using a cutometer. In the abdominal wall, CaHA diluted 1:4 with saline solution was injected subdermally using a linear-threading technique. Subjects underwent pre- and post-treatment (70 days) ultrasound scans to determine dermal thickness around the umbilicus and sides of the abdomen. Subjects and physicians assessed treatment outcomes using the 5-point Global Aesthetic Improvement Scale (GAIS). Adverse events and tolerability were recorded. Results: Cutometry results for upper arm skin showed an increase in skin elasticity from 72 U at baseline to 82 U at Month 3 (P≤0.05). Ultrasound measures of the abdominal wall demonstrated statistically significant increases in dermal thickness after injection of diluted CaHA of 0.7 mm (umbilicus) and 0.4 mm (sides of abdomen). Diluted CaHA resulted in an overall increase in dermal thickness of 26.7% (P≤0.05). In both case series, 90% of subjects and physicians rated treatment outcomes on GAIS as much or very much improved. Treatment was well tolerated. Conclusion: Diluted CaHA improved skin elasticity and increased dermal thickness in the upper arms and abdomen after only a single treatment. The procedures were well tolerated, and subject and investigator satisfaction with treatment results was very high. Injection of diluted CaHA is an effective procedure for skin tightening in the upper arms and abdomen.

Find Beauty from Within, Household and Personal Care Today - Vol. 12(5) September/October 2017, p. 6-7

GENENCARE® OSMS MI is myo-inositol and, like GENENCARE® OSMS BA, extracted from sugar beets (Beta vulgaris). Inositol exists in 9 stereoisomers: L and Dchiro, myo, neo, scyllo, muco, cis, epi and alloinositol, of which the most prominent form, widely occurring in nature, is myoinositol. GENENCARE® OSMS MI is myo-inositol, and will be referred to as inositol in this article. GENENCARE OSMS MI is highly purified and suitable for many skin care applications.It is a water-soluble crystalline compound, extracted from non-GM sugar beet, 100% bio-based, Ecocert and Natrue certified.

M. Nomura, D. Velleman, J. Pierre, F. Flament, **Quantitating the lateral skin stiffness by a new andversatile electro-mechanical instrument. Preliminary studies**, Skin Research and Technology 2017; 23: p. 272-282

Background: A new electro-mechanical device for measuring the lateral stiffness of the skin is now available. It basically allows to recording the forces that the skin opposes to a lateral displacement (1-2 mm) of a pinching type movement. Preliminary assays of this device to various skin sites and an artificial substrate aimed at defining its major characteristics (sensitivity, reproducibility, variations according to skin site). Methods: The calibration of the device (Khelometer) and assessment of its reproducibility were carried out through theuse of elastometer substrates of various stiffness's. The device was then used, *in vivo,* at different skin sites (scalp, inner and outer forearms, cheeks) of 213 healthy Japanese women of various ages. The short-time effect of a hydrating regimen (7% glycerol) was recorded on the outer forearm. Results: This new device offers an appreciable reproducibility *in vitro* and *in vivo* (coefficient of variation of 2-4% and 5- 14%, respectively). Unlike other biophysical methods, the Khelometer " can be easily applied onto the human scalp that shows a higher stiffness than the two other skin sites, increasing with age and presence of alopecia. In all the three studied skin sites, the impact of age leads to significantly higher lateral skin stiffness (LSS, expressed as N/mm) values. The latter were found significantly different between the two sides of the forearms where the outer (sun-exposed) side showed statistically slightly higher LSS, than the unexposed inner side. LSS values found on cheeks (%0.5 N/mm) were about four times lower than those of the scalp N/mm) and about half those of forearms (»1 N/mm). The effect of a 7% glycerol based formula was recorded 20 min post application onto the forearm, leading to a slight drop in LSS (approx. 15%) as compared toa vehicle-applied skin site. Conclusion: These preliminary studies clearly indicate that this new device, applicable to any skin site, offers appreciable assets such as sensitivity and reproducibility. Accordingly, it appears as a new approach in the non-invasive biophysical measurements of the skin surface, in both advanced and applied research investigations.

E.J. Ko, J.Y. Hong, T.R. Kwon, E.J. Choi, Y.-J. Jang, S.Y. Choi, K.H. Yoo, S.Y. Kim, B.J. Kim, **Efficacy and safety of non-invasive body tightening with high-intensity focused ultrasound (HIFU),** Skin Research and Technology 2017; 23: p. 558-562

Background: Noninvasive skin-tightening devices have become increasingly popular in response to increasing demand for improvements in skin laxity and tightening with minimal risk and

recovery time. Objective: We evaluated the efficacy and safety of HIFU for skin tightening in the face and body. Methods: A total of 32 Korean subjects enrolled in this prospective clinical trial. The subjects were treated with HIFU to both cheeks, lower abdomen, and thigh. Skin elasticity was measured before and after treatment using a Cutometer (CT575, Courage and Khazaka *, Cologne, Germany). Three blinded, experienced dermatologists evaluated paired pre- and post-treatment (week 4 and 12) photographs according to the Global Aesthetic Improvement Scale (GAIS). Participants also completed selfassessments using GAIS. Subjects rated their pain on a numeric rating scale (NRS) immediately, 7 days, 4 weeks, and 12 weeks after treatment. Results: Skin elasticity measured via a Cutometer was significantly improved 12 weeks after treatment at all treated sites (P<.05). Both IGAIS and SGAIS showed significant improvements 12 weeks after treatment. Immediately after treatment the mean NRS score was 3.00±1.586, but no pain was reported at 4 and 12 weeks post-treatment. No serious adverse effects were observed during the follow-up period. Conclusion: HIFU safely and effectively improves skin elasticity and clinical contouring of the face and body.

M.O. Visscher, S.A. Burkes, D.M. Adams, A.M. Hammill, R.R. Wickett, **Infant skin maturation: Preliminary outcomes for color and biomechanical properties,** Skin Research and Technology 2017; 23: p. 545-551

Background: Newborn infant skin changes after birth but studies have focused on the epidermal barrier. Dermal properties are relevant for care, but literature on postnatal changes is sparse. We further characterized skin maturational changes in lightness, color and response to biomechanical stress. Methods: Normal skin sites from subsets of participants in a trial on the progression and stage of infantile hemangiomas were retrospectively examined. Standardized photographs were analyzed as **L*,** a*, and b* images. Biomechanics were measured with the Cutometer®. Results: Color changed significantly with increasing age. Skin was darker and redder at 2.0 vs. 5.4, 8.5 and 12.8 months. Yellow color increased, with higher values at 12.8 vs. 2.0, 3.5 and 5.4 months. Chest tissue was consistently more elastic than arm and face sites, with significantly higher elasticity for the youngest and oldest age groups. Biological elasticity, elastic recovery, and total recovery were significantly greater for the oldest subjects. Viscoelasticity and elastic deformation were lower at 5.5 vs. 8.8 and 17.6 months. Arm viscoelastic creep was highest at 2.8 months. Conclusion: Skin maturation continues into year two. Increasing elasticity and decreasing viscoelasticity may reflect increased collagen structure/function. The findings have implications for prevention of skin injury associated with mechanical forces.

A.K. Langton, H.K. Graham, J.C. McConnell, M.J. Sherratt, C.E.M. Griffiths, R.E.B. Watson, **Organization of the dermal matrix impacts the biomechanical properties of skin,** British Journal of Dermatology (2017) 177, p. 818–827

Background: Human skin has the crucial roles of maintaining homeostasis and protecting against the external environment. Skin offers protection against mechanical trauma due to the reversible deformation of its structure; these biomechanical properties are amenable to dynamic testing using noninvasive devices. Objectives: To characterize the biomechanical properties of young, black African/African-Caribbean and white Northern European skin from different anatomical sites, and to relate underlying skin architecture to biomechanical function. Methods: Using cutometry and ballistometry, the biomechanical properties of buttock and dorsal forearm skin were determined in black African/African-Caribbean (n = 18) and white Northern European (n = 20) individuals aged 18–30 years. Skin biopsies were obtained from a subset of the volunteers (black African/African-Caribbean, n = 5; white Northern European, n = 6) and processed for histological and immunohistochemical detection of the major elastic fibre components and fibrillar collagens. Results: We have determined that healthy skin from young African and white Northern European individuals has similar biomechanical properties (F3): the skin is resilient (capable of returning to its original position following deformation, R1), exhibits minimal fatigue (R4) and is highly elastic (R2, R5 and R7). At the histological level, skin with these biomechanical properties is imbued with strong interdigitation of the rete ridges at the dermoepidermal junction (DEJ) and candelabra-like arrays of elastic fibres throughout the papillary dermis. Dramatic disruption to this highly organized arrangement of elastic fibres, effacement of the rete ridges and alterations to the alignment of the fibrillar collagens is apparent in the white Northern European forearm and coincides with a marked decline in biomechanical function. Conclusions: Maintenance of skin architecture – both epidermal morphology and elastic fibre arrangement – is essential for optimal skin biomechanical properties. Disruption to underlying skin architecture, as observed in the young white Northern European forearm, compromises biomechanical function.

T. Tomova-Simitchieva, A. Lichterfeld-Kottner, U. Blume-Peytavi, J. Kottner, **Comparing the effects of 3 different pressure ulcer prevention support surfaces on the structure and function of heel and sacral skin: An exploratory cross-over trial,** International Wound Journal, 2017; p. 1–9

Special support surfaces are key in pressure ulcer prevention. The aim of this study was to measure the effects of 3 different types of mattresses (reactive gel, active alternating air, basic foam) on skin properties of the sacral and heel skin after 2 hours loading. Fifteen healthy females (median age 66 years) were included. Transepidermal water loss, skin surface temperature, erythema, stratum corneum hydration, epidermal hydration, skin extensibility, elastic function, and recovery as well as skin roughness parameters were measured under controlled room conditions before loading, immediately after loading, and 20 minutes postloading in the supine position on the different mattresses. The highest increases in transepidermal water loss, skin temperature, and erythema were observed for the foam mattress after loading, indicating higher deformation and occlusion. Cutaneous stiffness decreased in all 3 groups, indicating structural changes during loading. There was a substantial decrease of mean roughness at the heel skin in the foam group, leading to a flattening of the skin surface. Study results indicate that the type of support surface influences skin structure and function during loading. The gel and air mattress appeared to be more protective compared with the foam mattress, but the differences between the gel and air were minor.

M. Schario, T. Tomova-Simitchieva, A. Lichterfeld, H. Herfert, G. Dobos, N. Lahmann, U. Blume-Peytavi, J. Kottner, **Effects of two different fabrics on skin barrier function under real pressure conditions**, Journal of Tissue Viability 26 (2017), p. 150 -155

Background: Pressure Ulcers (PUs) are a severe form of skin and soft tissue lesions, caused by sustained deformation. PU development is complex and depends on different factors. Skin structure and function change during prolonged loading on PU predilection sites and surfaces being in direct contact with skin are likely to have an impact as well. Little is known about the influence of fabrics on skin function under pressure conditions. Objectives: To investigate skin responses to sustained loading in a sitting position and possible differences between two fabrics. Methods: Under controlled conditions 6 healthy females (median age 65.0 (61.0e67.8) years) followed a standardized immobilization protocol of a sitting position for 45 min on a spacer and on a cotton fabric. Before and after the loading period skin surface temperature, stratum corneum hydration, transepidermal water loss (TEWL), erythema, skin elasticity and 'relative elastic recovery' were measured at the gluteal areas. Results: A 45 min sitting period caused increases of skin surface temperature and erythema independent of the fabric. Loading on spacer fabric showed a two times higher increase of TEWL compared to cotton. Stratum corneum hydration showed slight changes after loading, skin elasticity and 'relative elastic recovery' remained stable. Conclusions: Sitting on a hard surface causes skin barrier changes at the gluteal skin in terms of stratum corneum hydration and TEWL. These changes are influenced by the fabric which is in direct contact to the skin. There seems to be a dynamic interaction between skin and fabric properties especially in terms of temperature and humidity accumulation and transport.

U. Schlossberger, T. Jansen, **Wirksamkeit eines neuartigen transdermalen Applikationssystems in der Therapie von gealterter und chronisch lichtgeschädigter Haut**, Dermatologie am Alter Markt, Köln, Germany

In einer offenen Pilotstudie wurde die Wirksamkeit eines neuartigen transdermalen Applikationssystems (Dermadrop®, Omega Diagnostics GmbH, Reinbek), bei dem mit Hilfe von hochkonzentriertem Sauerstoff definierte Wirkstoffe wie Hyaluronsäure in die Dermis eingebracht werden, bei Frauen mit gealterter und chronisch lichtgeschädigter Haut untersucht. Die Applikation erfolgte nach einem standardisierten Protokoll konsekutiv in 3 Sitzungen im Abstand von 1 Woche in der Periorbital- und der Oberlippenregion. Die Evaluierung fand vor Therapiebeginn, dann wöchentlich jeweils vor der Applikation sowie 1 Woche nach der letzten Applikation statt. An festgelegten Meßpunkten kamen biophysikalische Methoden zur Bestimmung verschiedener Hautfunktionsparameter wie SELS-Verfahren (Visioscan®), Cutometrie und Corneometrie (Courage u. Khazaka, Köln) zur Anwendung. Die klinischen Befunde wurden im Verlauf mit Hilfe von digitaler Photographie dokumentiert und miteinander verglichen. Die objektiven Befunde wurden mit der subjektiven Probandenzufriedenheit, die anhand von standardisierten Fragebögen ermittelt wurde, korreliert. Die Ergebnisse der Studie geben erste Hinweise auf die Wirksamkeit des Dermadrop®-Verfahrens in der Therapie von gealterter und chronisch lichtgeschädigter Haut. Es handelt sich um ein neuartiges dermatologisch-ästhetisches Therapiesystem, das eine Penetration von unterschiedlichen Wirkstoffen nicht-invasiv und schmerzfrei in die Dermis ermöglicht. Weitere Untersuchungen zur Evaluierung der Wirksamkeit des transdermalen Applikationssystems bei verschiedenen Indikationen sind vorgesehen.

H. Buntrock, M. Davids, M. Streker, M. Kerscher, **Evaluation von Wirksamkeit und Verträglichkeit eines kosmetischen Produktes mit 53% Thermalwasser, Hyaluronsäure-Fragmenten, Glycoleol und Pro-Tocopherol zur Minderung von Hautalterungssymptomen im Gesicht über 12 Wochen**

Zielsetzung: Ziel der Anwendungsuntersuchung war die Evaluation von Wirksamkeit und Verträglichkeit eines kosmetischen Präparates mit 53% Thermalwasser sowie Hyaluronsäurefragmente, Glycoleol und Pro-Tocopherol im Gesicht. Methoden: 20 hautgesunde Patientinnen (50–65 Jahre) behandelten ihre Gesichtshaut über 12 Wochen 2-mal täglich ausschließlich mit dem Prüfprodukt und einer ausgehändigten Reinigungslotion. Zur Evaluierung der Behandlungseffekte erfolgten am Untersuchungstag 0, 42 und 84 verschiedene Hautoberflächenmessungen: PRIMOS, Cutometrie und Glossymetrie sowie eine standardisierte Fotodokumentation. Die Patientinnen füllten eigenhändig einen Evaluationsbogen zum Thema Hautqualität aus. Ferner wurden zur Ermittlung der Verträglichkeit des Prüfproduktes der pH-Wert, TEWL und die Stratum corneum Hydratation gemessen. Ergebnisse: Nach 12-wöchiger Applikation des Prüfproduktes nahm die Hautfestigkeit (R0) signifikant zu (p = 0,01), die durchschnittliche Faltentiefe verringerte sich deutlich von 0,47mm (Tag 0) auf 0,35mm (Tag 84) und die Fotos zeigten zur Abschlussuntersuchung ein deutlich strafferes Erscheinungsbild sowie gefestigte Konturen. Die Patientinnen beurteilten eine signifikante Zunahme der Hautfeuchtigkeit um 22% nach 42 Tagen (p = 0,013) sowie um 19% nach 84 Tagen (p = 0,006). Außerdem empfanden sie nach 84 Tagen eine signifikant verbesserte Ausstrahlung ihrer Haut (p = 0,010), was evtl auf den leicht gestiegenen Glow zurückzuführen ist. TEWL und pH-Wert blieben über den gesamten Untersuchungszeitraum im physiologischen Bereich. Schlussfolgerung: Die Ergebnisse zeigen den positiven Einfluss einer Formulierung mit 53% Thermalwasser, Hyaluronsäure, Glycoleol und ProTocopherol auf die Hautqualität. Bei guter Verträglichkeit wurde eine deutliche Faltenreduktion sowie eine signifikante Verbesserung der Hautfestigkeit und -feuchtigkeit über drei Monate festgestellt. Zudem verbesserte sich die subjektive Wahrnehmung der Hautqualität durch die Probanden signifikant.

C. Korponya, E. Szél, Z. Behány, E. Varga, G. Mohos, Á. Dura, S. Dikstein, L. Kemény, G. Erös, **Effects of Locally Applied Glycerol and Xylitol on the Hydration, Barrier Function and Morphological Parameters of the Skin**, Acta Derm Venereol. 2017

Glycerol and xylitol hydrate the skin and improve its barrier function over a short period. We studied the effects of glycerol and xylitol on the physiological properties and morphology of the skin after longer-term application. Twelve volunteers with dry skin were examined. Three areas on the arms were determined. Area 1 served as untreated control. The vehicle was applied to area 2, while area 3 was treated twice daily with a formulation containing glycerol (5%) and xylitol (5%) for 14 days. Transepidermal water loss (TEWL), hydration and biomechanical properties of the skin were monitored. Biopsies were taken for routine histology and immunohistochemistry for flaggrin and matrix metalloproteinase-1 (MMP-1). The polyols increased the skin hydration and protein quantity of flaggrin, elevated the interdigitation index, decreased the TEWL and improved the biomechanical properties of the skin, but did not change the protein expression of MMP-1. A combination of glycerol and xylitol can be useful additional therapy for dry skin.

M.N Busche, A.-C. J. Thraen, A Gohritz, H.-O. Rennekampff, P.M. Vogt, **Burn Scar Evaluation Using the Cutometer® MPA 580 in Comparison to "Patient and Observer Scar Assessment Scale" and "Vancouver Scar Scale",** Journal of Burn Care & Research, 2017

The effect of the "Patient and Observer Scar Assessment Scale" (POSAS) and "Vancouver Scar Scale" (VSS) on patients' quality of life and their correlation with objective scar assessment tools, such as the Cutometer®, is not fully elucidated. In addition, long-term results of the dermal substitute Matriderm® used in combination with split-thickness skin grafting (STSG) remain unclear. We evaluated burn scars of 45 patients at least 2 years postburn injury using the Cutometer® MPA 580, the VSS, and the POSAS with three additional questions regarding quality of life and correlated the results. Study groups were: 1) scars following conservative treatment, 2) scars following STSG, and 3) scars following STSG in combination with Matriderm®. Cutometer® measurements demonstrated better elastic qualities in the Matriderm® group compared with the STSG group. VSS and extended POSAS were rated best for the conservative group, followed by the STSG group and the Matriderm® group. There was a signifcant correlation between POSAS and VSS, quality of life and the objective Cutometer® measurements. Conservatively treated superfcial dermal burns do not reach the elastic qualities of healthy skin, and the use of Matriderm® signifcantly improves the long-term elastic qualities of STSG in deep dermal and full-thickness burns 2 years post injury. Results from the VSS and the POSAS correlate with restrictions in the quality of life of patients and also with objective Cutometer® measurements and are therefore useful tools in scar evaluation following burn injury.

F. Medved, A. Wurm, M. Held, **Facial Microcirculatory and Biomechanical Skin Properties after Single High Energy (Er): YAG Laser Application,** Lasers in Surgery and Medicine 49: p. 891–898 (2017)

Objective: Owing to skin aging and the growing demand for skin rejuvenation, minimal invasive aesthetic treatments such as laser procedures are increasingly coming into focus. However, until now, little has been known about the objective effects of these procedures with respect to skin microcirculation or changes in skin elasticity. Study Design: Facial skin rejuvenation was performed on 32 volunteers using ablative Erbium: YAG laser. Skin microcirculation and skin elasticity have then been evaluated objectively. Methods: Microcirculation (flow, SO2, velocity, and rHB) has been analyzed before and directly after the laser session by using the O2C device. Skin elasticity has been evaluated by using the Cutometer device (Uf, Ua, Ur, and Ue) before and directly after the laser treatment, as well as 1 week and then 1, 3, and 6 months post treatment. Further, the outcome for the volunteers regarding their satisfactory level after laser treatment was evaluated. Results: Twenty volunteers were available for a complete follow-up. Microcirculation displayed statistically significant increase in all values to 2 mm depth. The biomechanical skin parameter of firmness of skin displayed statistically significant improvement in superficial skin layer after 6 months. Conclusion: Concerning microcirculation and skin elasticity the ablative Erbium: YAG laser treatment revealed similar effects on the skin like a superficial burn injury. In contrast to the determined skin elasticity parameters, firmness of skin objectively revealed a skin tightening effect after 6 months. Along with the important epidermal effect, the suitability of ablative laser treatment for skin rejuvenation has been proved in a long-term follow-up.

K. Tominaga, N. Hongo, M. Fujishita, Y. Takahashi, Y. Adachi, **Protective effects of astaxanthin on skin JCBN ournal of Clinical Biochemistry and Nutrition**, J. Clin. Biochem. Nutr., July 2017, Vol. 61, No. 1, p. 33–39

Creative Commons Attribution License, which permits unre- stricted use, distribution, and reproduction in any medium, pro- vided the original work is properly cited. Astaxanthin is a carotenoid with potent antioxidant and anti-inflammatory activity. To evaluate the anti-inflammatory effect of astaxanthin on skin deterioration, we confirmed its role in epidermal-dermal interactions in vitro. Astaxanthin treatment suppressed ultraviolet B (UVB)-induced inflammatory cytokine secretion in keratinocytes, and matrix metalloproteinase-1 secretion by fibroblasts cultured in UVB-irradiated keratinocyte medium. To verify these findings, we conducted a 16-week clinical study with 65 healthy female participants. Participants were orally administered either a 6 mg or 12 mg dose of astaxanthin or a placebo. Wrinkle parameters and skin moisture content significantly worsened in the placebo group after 16 weeks. However, significant changes did not occur in the astaxanthin groups. Interleukin-1α levels in the stratum corneum significantly increased in the placebo and low-dose groups but not in the high-dose group between weeks 0 and 16. This study was performed in Japan from August to December, when changing environmental factors, such as UV and dryness, exacerbate skin deterioration. In conclusion, our study suggests that long-term prophylactic astaxanthin supplementation may inhibit age-related skin deterioration and maintain skin conditions associated with environmentally induced damage via its anti-inflammatory effect.

J. M. Jackson. G.L. Grove. K. Allenby. T. Houser, **DFD-01 Reduces Transepidermal Water Loss and Improves Skin Hydration and Flexibility**, Dermatol Ther (Heidelb) (2017) 7: p. 507–514

Introduction: In plaque psoriasis, the benefit of topical steroids is well established. The vehicle formulation of topical steroids may also provide benefit in addition to the effects of the steroid itself. DFD-01 (betamethasone dipropionate spray, 0.05%) is a formulation composed of a topical steroid in an emollient-like vehicle that enhances penetration to the target site of inflammation in the skin. The aim of this study was to assess the effect of DFD-01 and its vehicle on skin hydration and barrier function in compromised skin and to evaluate its effect on flexibility in healthy skin. Methods: Eighteen healthy white volunteers were enrolled in each of two studies. In Study 1, dry shaving of volar forearms created a compromised skin barrier, through which transepidermal water loss (TEWL) was measured using an evaporimeter. Capacitance, a measure of epidermal hydration, was also measured at baseline and at 1, 2 and 4 h after application of DFD-01 or its vehicle formulation. In Study 2, intact skin flexibility was tested with a cutometer before and at 1, 2 and 4 h after application of DFD-01 or vehicle. Results: In Study 1, both DFD-01 and its vehicle were effective at reducing TEWL through the compromised stratum corneum. Capacitance measurements confirmed this finding; razor-chafed skin treated with either DFD-01 or vehicle exhibited levels of skin hydration similar to unshaved control skin. Study 2 found softening and greater flexibility of normal skin treated with either DFD-01 or vehicle compared with nontreated control skin samples. Conclusions: These tests suggest that the DFD-01 formulation and its vehicle are each effective at retaining moisture within a damaged skin barrier and for softening and increasing the flexibility of intact skin.

N. Cameli, M. Mariano, I. Cordone, E. Abril, S. Masi, M.L. Foddai, **Autologous Pure Platelet-Rich Plasma Dermal Injections for Facial Skin Rejuvenation: Clinical, Instrumental, and Flow**

Cytometry Assessment, Dermatol Surg. 2017 Jun;43(6): p. 826-835

Background: Platelet-rich plasma (PRP) is an emerging treatment in dermatology recently proposed for skin rejuvenation. Objective: To evaluate the efficacy and safety of autologous pure PRP dermal injections on facial skin rejuvenation, investigating the cellularity of PRP samples. Material and Methods: Twelve patients underwent 3 sessions of PRP injection at 1-month intervals. The clinical and instrumental outcomes were evaluated before (T0) and 1 month (T1) after the end of treatment by means of transepidermal water loss, corneometry, Cutometer, Visioscan, and Visioface. A flow cytometry characterization on PRP and peripheral blood (PB) samples was performed. Results: Clinical and patient evaluation showed improvement of skin texture. Skin gross elasticity, skin smoothness parameters, skin barrier function, and capacitance were significantly improved. No difference between PRP and PB lymphocyte immunological asset was observed. A leukocyte population (mainly CD3) and neutrophils depletion were documented in all the PRP samples. Conclusion: This instrumental study demonstrated that PRP poor in leukocytes can provide objective improvements in skin biostimulation. Flow cytometry showed no variability among the PRP samples using a reproducible separation system and a low content in proinflammatory cells. Although a pilot study, it may be helpful for future investigations on PRP cellularity.

S. Mac-Mary, J.-M. Sainthillier, P. Humbert, **Mesure instrumentale de l'hydratation cutanée**, EMC - Cosmétologie et Dermatologie esthétique, June 2017

L'eau joue un rôle fondamental dans les propriétés physiques de la peau en permettant d'assurer sa solidité, sa flexibilité et une perméabilité minimale pour que l'eau endogène puisse jusqu'à la surface cutanée activer les enzymes responsables de la desquamation. Dans la couche cornée, elle est fixée sur des substances hydrosolubles et hygroscopiques intracellulaires appelées *natural moisturizing factors*. Cette eau représente l'aspect statique de l'hydratation cutanée.

N. Cameli, **Platelet-rich plasma injections show efficacy in facial skin biostimulation**, Dermatologic Surgery, June 2017, Volume 43, Issue 6, p. 826–835

Background: Platelet-rich plasma (PRP) is an emerging treatment in dermatology recently proposed for skin rejuvenation. Objective: To evaluate the efficacy and safety of autologous pure PRP dermal injections on facial skin rejuvenation, investigating the cellularity of PRP samples. Materials and Methods: Twelve patients underwent 3 sessions of PRP injection at 1-month intervals. The clinical and instrumental outcomes were evaluated before (T0) and 1 month (T1) after the end of treatment by means of transepidermal water loss, corneometry, Cutometer, Visioscan, and Visioface. A flow cytometry characterization on PRP and peripheral blood (PB) samples was performed. Results: Clinical and patient evaluation showed improvement of skin texture. Skin gross elasticity, skin smoothness parameters, skin barrier function, and capacitance were significantly improved. No difference between PRP and PB lymphocyte immunological asset was observed. A leukocyte population (mainly $CD3^+$) and neutrophils depletion were documented in all the PRP samples. Conclusion: This instrumental study demonstrated that PRP poor in leukocytes can provide objective improvements in skin biostimulation. Flow cytometry showed no variability among the PRP samples using a reproducible separation system and a low content in proinflammatory cells. Although a pilot study, it may be helpful for future investigations on PRP cellularity.

C. Uhl, D. Khazaka, **Test equipment supports anti-pollution claims,** PERSONAL CARE ASIA PACIFIC, May 2017, p. 27-29 and PERSONAL CARE EUROPE, September 2017, p. 74-76

Pollution and its impact on the skin have recently become the main topic at all important cosmetic events, and products claiming to protect the skin from pollution effects are a major trend in the cosmetic and personal care industry.

M.H. Carstens, M. Pérez, H. Briceño, S. Valladares, D. Correa, **Treatment of late sequelae of burn scar fibrosis with adipose-derived stromal vascular fracton (SVF) cells: a case series**, CellR4 2017; 5 (3): e2404

We present an uncontrolled longitudinal study of fve patients with sequelae of burn scar fbrosis of the hand and upper extremity, with a minimum of one year post-burn therapy, treated with local injection of non-expanded autologous, adiposederived stromal vascular fraction (SVF) cells. The aims of this study was to determine the safety and the effcacy of the treatment, analyze pain and pruritis, flexibility and hardness, before and after the intervention. Target sites for administration of SVF cells were fnger and web space contractures. Response to treatment was evaluated by analyzing clinical and physical parameters. We scored the scars with the modifed Vancouver Scar Scale (VSS), range of motion and by measurements of scar hardness using a Durometer® and scar elasticity using the Courage-Khazaka Cutometer®. All patients demonstrated clinical improvement (increased flexibility,

scar thickness, range of motion). Of a total of 192 treatment zones, 113 were symptomatic and, of these, 97/113 (85%) demonstrated a positive clinical response. Scar hardness was assessed in 32 zones with 27 (84%) zones responsive. Net elasticity measurements improved in 81% of treatment zones. This series highlights the utility of non-expanded, adipose-derived heterogenous SVF cells population processed at the pointof-care, for the treatment of established burn scars refractory to further physical therapy to achieve enhanced functionality.

G. Nicoletti, P. Perugini, S. Bellino, P. Capra, A. Malovini, O. Jaber, M. Tresoldi, A. Faga, **Scar Remodeling with the Association of Monopolar Capacitive Radiofrequency, Electric Stimulation, and Negative Pressure,** Photomedicine and Laser Surgery, Volume 35, Number 5, 2017

Objective: A study was established to objectively assess the effects of low-intensity electromagnetic and electric stimulation plus negative pressure on mature scars. Background: Radiofrequency plus negative pressure therapy demonstrated a favorable reorganization and regeneration of the collagen and elastic fibers and was proposed for the treatment of cellulitis and skin stretch marks. Methods: Twenty-six mature scars in 20 Caucasian patients (15 females and 5 males) were enrolled in the study. The treatments were carried out with a Class I, BF-type electromedical device equipped with a radiofrequency generator, an electric pulse generator, and a vacuum pump twice a week for 3 months. Corneometry, transepidermal water loss, elastometry, colorimetry, and three-dimensional skin surface pattern were objectively assessed with Multi Probe Adapter System MPA and PRIMOS pico. A subjective assessment was carried out with the VAS and PSAS scales. Each scar was compared before and after the treatment and with the skin in the corresponding healthy contralateral anatomical area at the same times. Results: Reduction of the scar surface wrinkling and overall scar flattening were demonstrated after the treatment. The scar slightly tended to approach the color and elasticity of healthy skin too. Conclusions: The combined local treatment of mature scars with low-intensity electromagnetic and electric stimulation in association with negative pressure might suggest a favorable synergic effect on the scar collagen and elastic fiber remodeling.

K. Boron Biswas, K. Tanaka, S. Takayama, A. Iddamalgoda, **A solution for pollution induced ageing of skin**, PERSONAL CARE EUROPE, April 2017, p. 131 - 134

Environmental pollution has now becomethe talk of the world. It is very important to keep in mind that more than half of the world's population now lives in an urban area. It is assumed that by 2030, 60% of the world's population will be living in towns and cities, rising to 70% by 2050.1 As skin is the first line of defence when it comes to air pollution contact, we should be aware of the harmful effects of pollution on skin in general. Pollution, in fact, is not a problem limited to China or India only, it is almost common, for example, in London, Paris, New York and Milan as well.

E. Yenilmez, Y. Yazan, **Formulation, Characterization and in vivo Efficacy of α-Tocopherol limprinted Polymeric System for Cosmetic Application**, European International Journal of Science and Technology, Vol. 6 No. 3, April 2017

The purpose of this study was to formulate an antioxidant topical cosmetic molecularly imprinted system for skin aging and was to evaluate the formulation in vivo on human volunteers. Molecular imprinted cyclodextrins (CDs) were prepared by cross-linking cyclodextrins (CD) in the presence of a vitamin E (VE) as template molecule. Characterization studies were performed on molecularly imprinted polymers (MIP) and non-imprinted polymers (NIP). Antioxidant effects of formulations prepared were investigated by 2,2-diphenyl-1-picrylhydrazyl (DPPH) test. In vivo skin measurements were done on human volunteers including sebum, moisture, pH, net elasticity and roughness parameters. It was seen that temperature increase influced the particle size of imprinted polymers. It was determined that MIP systems have an antioxidant effect. Formulations showed a positive effect on skin roughness parameter was determined statistically ($p \leq 0.01$). The preparation method of MIP is simple and quick and it will provide opportunities in future on specific cosmetic formulations.

V. Zorin, A. Zorina, V. Cherkasov, R. Deev, P. Kopnin, A. Isaev, **Clinical-instrumental and morphological evaluation of the effect of autologous dermal fibroblasts administration,** J Tissue Eng Regen Med. 2017 Mar;11(3): p. 778-786

Basic molecular mechanisms, associated with the main cell population of the dermis - fibroblasts - are the basis of skin aging. The number of functionally active fibroblasts in the skin and their biosynthetic activity decreases with age, thus enhancement of their cell density with synthetically active cells is accepted as a one of the most effective methods. The objective of the present study was to evaluate the safety and effectiveness of intradermal administration of autologous dermal fibroblasts in a year after treatment of 17 patients, aged 45-65 years. Results obtained with modern instrumental skin diagnostic methods (vacuum cutometry, optical profilometry, VISIA photometric analysis, etc.)

demonstrate the safety and clinical effectiveness of dermal autofibroblast therapy: after transplantation, cultured autofibroblasts keep their biosynthetic activity and produce extracellular matrix for at least 12 months. As a result, remodelling of the dermis microstructures is observed, accompanied by a progressive increase of collagen content and thickness of the dermis (up to 62.5 ±6.7% in 12 months). This is clinically expressed by increase of skin elasticity (24.0 ±4.3% in periorbital area) and thickness of the skin, and by decrease in the number and depth of wrinkles (46 ±7% by the end of observation period).

A.M. Kołodziejczak, H. Rotsztejn, **Mexametric and cutometric assessment of the signs of aging of the skin area around the eyes after the use of non-ablative fractional laser, non-ablative radiofrequency and intense pulsed light**, Dermatol Ther. 2017 Mar; 30(2)

The assessment of the signs of aging within eyes area in cutometric (skin elasticity) and mexametric (discoloration and severity of erythema) examination after the treatment with: non-ablative fractional laser, non-ablative radiofrequency (RF) and intense light source (IPL). This study included 71 patients, aged 33-63 years (the average age was 45.81) with Fitzpatrick skin type II and III. 24 patients received 5 successive treatment sessions with a 1,410-nm non-ablative fractional laser in two-week intervals, 23 patients received 5 successive treatment sessions with a non-ablative RF in one-week intervals and 24 patients received 5 successive treatment sessions with an IPL in two-week intervals. The treatment was performed for the skin in the eye area. The Cutometer and Mexameter (Courage + Khazaka electronic) reference test was used as an objective method for the assessment of skin properties: elasticity, skin pigmentation and erythema. Measurements of skin elasticity were made in three or four sites within eye area. The results of cutometric measurements for R7 showed the improvement in skin elasticity in case of all treatment methods. The largest statistically significant improvement ($p < .0001$) was observed in case of laser and RF, during treatment sessions, at sites at upper and lower eyelid. The smallest change in skin elasticity for the laser, RF and IPL - $p = .017$, $p = .003$ and $p = .001$, respectively-was observed in a site within the outer corner of the eye. In all sites of measurements and for all methods, the greatest improvement in skin elasticity was demonstrated between the first and second measurement (after 3rd procedures). The majority of the results of mexametric measurements-MEX (melanin level) and ERYT (the severity of erythema) are statistically insignificant. Fractional, non-ablative laser, non-ablation RF and intense light source can be considered as methods significantly affecting elasticity and to a lesser extent erythema and skin pigmentation around the eyes. Fractional non-ablative laser is a method which, in comparison to other methods, has the greatest impact on skin viscoelasticity. These procedures are well tolerated and are associated with a low risk of side effects.

B. Hersant, J. Niddam, S. La Padula, W. Noel, K. Ezzedine, A.-M. Rodriguez, J.-P. Meningaud, **Efficacy of autologous platelet-rich plasma combined with hyaluronic acid on skin facial rejuvenation: A prospective study**, J AM ACAD DERMATOL, Volume 77, No. 3, 2017

It has been reported that hyaluronic acid (HA) and autologous platelet-rich plasma (PRP) play an important role in the tissue regeneration process by stimulating cell signaling at the injection site. The aim of this open label prospective study was to assess the clinical benefit of combining PRP and HA (PRP-HA) effectors, which have synergic effects on skin firmness and elasticity, using objective assessment by a Cutometer MPA 580 (Courage+Khazaka Electronic GmbH, Cologne, Germany) 1 of the software-evaluated skin mechanical parameter R:R5 (net elasticity) together with a validated subjective scale, the FACE-Q.

S. Shin, J.U. Shin, Y. Lee, W.Y. Chung, K.-H. Nam, T.G. Kwon, J.H. Lee, **The Effects of Multi-Growth Factors-Containing Cream on Post-Thyroidectomy Scars: A Preliminary Study,** Ann Dermatol Vol. 29, No. 3, 2017

Background: Growth factors play important roles in wound healing. However, the evidence for the effects of growth factors on post-thyroidectomy scars is limited. Objective: We performed a prospective study to assess the preventive and therapeutic effect of a multi-growth factor (MGF)-containing cream on post-thyroidectomy scars. Methods: Twenty-one patients with thyroidectomy scars applied MGF cream twice a day. We assessed the changes in erythema, pigmentation, skin elasticity, and skin hydration status using the erythema index, melanin index, cutometer, and corneometer, respectively. In addition, Vancouver scar scale (VSS) and patient satisfaction were assessed at 10 days after surgery (baseline), 2 weeks, 6 weeks, and 12 weeks after baseline. Results: The mean total VSS scores were significantly lower at 6 weeks (3.24±1.51 vs. 1.91±1.38) and 12 weeks (3.24±1.51 vs. 1.71±1.59) compared to the baseline. The degree of pigmentation was significantly lower at 12 weeks compared to the baseline, and the skin elasticity, and the skin hydration status were significantly higher at 12 weeks compared to the baseline. Over 85% of the patients were satisfied with the use of MGF

cream without any adverse effect. Conclusion: MGF cream might have additive or supportive effect for scar formation after thyroidectomy.

L. Ma, Y. Tan, S. Zheng J. Li, C. Jiang, Z. Chen, X. Wang, **Correlation study between image features and mechanical properties of Han Chinese facial skin,** Int J Cosmet Sci., 2017 Feb;39(1):p. 93~100

Objective: Mechanical properties are considered to be vital factors that influence skin physiology during ageing. Wrinkles and skin roughness are the two main features in aged skin. The purpose of this study is to characterize the relationship between facial skin mechanical properties and image features using quantitative methods. Methods: Two hundred and forty healthy male and female volunteers living in Shanghai, China (aged 20-70 years), were examined in this study. Facial images were photographed by VISIA-CR. Wrinkle volume of middle forehead and skin roughness of upper cheek were analysed by Skin Surface Analyzer (SSA) software. Mechanical parameters at the middle forehead and upper cheek were measured using Cutometer®MPA 580 and Reviscometer® RVM 600. Results: Skin wrinkles and roughness increased during ageing, where men have a higher level and earlier manifestation than women. Skin mechanical parameters R2, R5, R7 and RRT were found decreased with age. Moreover, mechanical parameters including R2, R7, RRT and anisotropy showed significant correlations with wrinkle volume and/or skin roughness. Conclusion: The facial image features including wrinkle volume and skin roughness are significantly correlated with skin elasticity and anisotropy, which could well describe the skin features of Han Chinese.

J. Fabrowska, A.Kapucinska, B. £eska, K. Feliksik-Skrobich, I. Nowak, ***In Vivo*** **Studies and Stability Study of *Cladophora Glomerata* Extract as a Cosmetic Activ Ingredient,** Acta Poloniae Pharmaceutica ñ Drug Research, Vol. 74 No. 2, p. 633-641, 2017

Marine algae are widely used as cosmetics raw materials. Likewise, freshwater alga *Cladophora glomerata* may be a good source of fatty acids and others bioactive agents. The aims of this study was to find out if the addition of the extract from the freshwater *C. glomerata* affects the stability of prepared cosmetic emulsions and to investigate *in vivo* effects of the extract in cosmetic formulations on hydration and elasticity of human skin. Extract from the freshwater *C. glomerata* was obtained using supercritical fluid extraction (SFE). Two forms of O/W emulsions were prepared: placebo and emulsion containing 0.5% of *Cladophora* SFE extract. The stability of obtained emulsions was investigated by using Turbiscan Lab Expert. Emulsions were applied by volunteers daily. Corneometer was used to evaluate skin hydration and cutometer to examine skin elasticity. Measurements were conducted at reference point (week 0) and after 1st, 2nd, 3rd and 4th week of application. The addition of *Cladophora* extract insignificantly affected stability of the emulsion. The extract from *C. glomerata* in the emulsion influenced the improvement of both skin hydration and its elasticity. Thus, freshwater *C. glomerata* extract prepared *via* SFE method may be considered as an effective cosmetic raw material used as a moisturizing and firming agent.

I. Göllner, W. Voss, U. von Hehn, S. Kammerer, **Ingestion of an Oral Hyaluronan Solution Improves Skin Hydration, Wrinkle Reduction, Elasticity, and Skin Roughness: Results of a Clinical Study**, Journal of Evidence-Based Integrative Medicine, 2017

Intake of oral supplements with the aim of a cutaneous antiaging effect are increasingly common. Hyaluronic acid (HA) is a promising candidate, as it is the key factor for preserving tissue hydration. In our practice study, we evaluated the effect of an oral HA preparation diluted in a cascadefermented organic whole food concentrate supplemented with biotin, vitamin C, copper, and zinc (Regulatpro Hyaluron) on skin moisture content, elasticity, skin roughness, and wrinkle depths. Twenty female subjects with healthy skin in the age group of 45 to 60 years took the product once daily for 40 days. Different skin parameters were objectively assessed before the first intake, after 20 and after 40 days. Intake of the HA solution led to a significant increase in skin elasticity, skin hydration, and to a significant decrease in skin roughness and wrinkle depths. The supplement was well tolerated; no side effects were noted throughout the study.

M.-A. Boucher, M. Royer, A. Jeanneau, ***Acer rubrum*** **Bark Extract, the new Natural and Eco-responsible Anti-ageing Ingredient Obtained from a Coproduct of the Canadian Forest Industry**, Global Ingredients Formulation Guide 2017

Forest industry produces large amounts of coproducts such as barks that can be valorized through the extraction of bioactive molecules commonly called “extractives”. The Canadian boreal forest biomass is a great sustainable source of new natural compounds that can be used to help maintaining or restoring skin health and fght against skin ageing. Red maple *(Acer rubrum)* is a famous Canadian tree species which has been widely used by native people for its medicinal properties. Its bark contains a high level of polyphenols that have already shown to be powerful antioxidants. This study

demonstrates that red maple bark extract is a new natural anti-ageing active with procollagen and proelastin properties. Indeed, this extract stimulates dermal regeneration by increasing collagen production while inhibiting collagenase enzyme synthesis that degrades collagen with age. Moreover, red maple bark extract increases elastin synthesis. Clinical studies reveal the complete and long-term anti-ageing effcacy of this polyphenolic extract with measured wrinkle amplitude reduction as well as visible effects on women proved by pictures before and after treatment with a cream containing the extract at 0.25%. Moreover, red maple extract improves signifcantly several biomechanical parameters of the skin after only 28 days' use of the cream.

C. Graizeau, **Natural olive-derived activehelps slow skin ageing,** PERSONAL CARE ASIA PACIFIC, January 2017, p. 34-36

The skin is protected naturally by a hydro-lipidic film. However, this is subjected to oxidative stress, which generates free radicals and reactive oxygen species (ROS). In the meantime, glycation alters the elasticity of the skin through collagen crosslinking and leads to uneven skin tone through the accumulation of advanced glycation endproducts (AGE). It is these processes of lipid peroxidation and glycation that trigger a vicious circle of ageing. Plantasens® Olive Active HP is an anti-ageing active ingredient derived from olive that acts as a protective shield. It protects against UV-induced lipid peroxidation by scavenging reactive oxygen species. It also prevents the formation of AGEs and limits collagen crosslinking. It thus helps to maintain the skin's natural balance and smooth appearance, and its elasticity. Through those mechanisms, Plantasens Olive Active HP aims to sustainably preserve the skin's natural beauty forlonger.

M.E. Jaspers, K.M. Brouwer, A.J. van Trier, M.L. Groot, E. Middelkoop, P.P. van Zuiilen, **Effectiveness of Autologous Fat Grafting in Adherent Scars: Results Obtained by a Comprehensive Scar Evaluation Protocol,** Plast Reconstr Sura., 2017 Jan:139 (1): p. 212-219

Background: Nowadays, patients normally survive severe traumas such as burn injuries and necrotizing fasciitis. Large skin defects can be closed but the scars remain. Scars may become adherent to underlying structures when the subcutical fat layer is damaged. Autologous fat grafting provides the possibility of reconstructing a functional sliding layer underneath the scar. Autologous fat grafting is becoming increasingly popular for scar treatment, although large studies using validated evaluation tools are lacking. The authors therefore objectified the effectiveness of single-treatment autologous fat grafting on scar pliability using validated scar measurement tools. Methods: Forty patients with adherent scars receiving single-treatment autologous fat grafting were measured preoperatively and at 3-month follow-up. The primary outcome parameter was scar pliability, measured using the Cutometer. Scar quality was also evaluated by the Patient and Observer Scar Assessment Scale and the DSM II ColorMeter. To prevent selection bias, measurements were performed following a standardized algorithm. Results: The Cutometer parameters elasticity and maximal extension improved 22.5 percent ($p < 0.001$) and 15.6 percent ($p = 0.001$), respectively. Total Patient and Observer Scar Assessment Scale scores improved from 3.6 to 2.9 on the observer scale, and from 5.1 to 3.8 on the patient scale (both $p < 0.001$). Color differences between the scar and normal skin remained unaltered. Conclusions: For the first time, the effect of autologous fat grafting on functional scar parameters was ascertained using a comprehensive scar evaluation protocol. The improved scar pliability supports the authors' hypothesis that the function of the subcutis can be restored to a certain extent by single-treatment autologous fat grafting.

Y.A. Yutskovskava, E.A. Kogan, **Improved Neocollagenesis and Skin Mechanical Properties After Injection of Diluted Calcium Hydroxylapatite in the Neck and Decolletage: A Pilot Study,** J Drugs Dermatol. 2017 Jan 1; 16(1): p. 68-74

Background: Calcium hydroxylapatite (CaHA; Radiesse (R)) provides safe and effective correction of moderate-to-deep lines, volume replacement, lift and contour, and induction of neocollagenesis and neoelastogenesis for improved skin quality. CaHA hyperdilution takes advantage of its skintightening properties without a volumizing effect. Objective: To evaluate the collagen- and elastin-stimulating effects of diluted CaHA in subjects with skin laxity in the neck and decolletage. Methods: Twenty subjects with skin laxity in the neck and decolletage received multiple, linear, subdermal injections of CaHA diluted with preserved saline at baseline and 4 months: 1:2 dilution (normal skin), 1:4 dilution (thin skin), and 1:6 dilution (atrophic skin). Subjects also received deep subdermal injection of CaHA (~0.1 ml) of the same dilution in the peri-auricular area for skin biopsy. Biopsy tissue was obtained at baseline, 4 months , and 7 months for immunohistochemical evaluation of neocollagenesis. Changes to skinmechanical properties were measured by ultrasound scanning and cutometry. Subject and investigator satisfaction was evaluated using the Global Aesthetic Improvement Scale. Results: Immunohistochemical analysis of biopsy tissue demonstrated signi cant increases in

collagen expression at 4 months (P less than 0.05) and 7 months (P less than 0.00001) compared with baseline. Increases in collagen III levels were also significant at 4 months (P less than 0.00001); they declined by 7 months but remained above baseline. Staining for elastin and angiogenesis signi cantly increased at 4 months (P less than 0.05 and P less than 0.01, respectively) and 7 months (P less than 0.00001 for both) compared with baseline. Immunohistochemical data correlated with improvements in skin elasticity and pliability evaluated by cutometry, and with ultrasound-assessed increases in dermal thickness. Subject and investigator satisfaction was high, and the procedure was well tolerated. Conclusion: Injection of diluted CaHA is very effective for skin tightening of the neck and decolletage.

A.K. Lanaton, H.K. Graham, J.C. McConnell, M.J. Sherratt, C.E. Griffiths, R.E. Watson, **Organisation of the dermal matrix impacts the biomechanical properties of skin**, Br J Dermatol. 2017 Jan 2

Background: Human skin has the crucial roles of maintaining homeostasis and protecting against external environment. It offers protection against mechanical trauma due to the reversible deformation of its structure; these biomechanical properties are amenable to dynamic testing using non-invasive devices. Objectives: To characterise the biomechanical properties of young, white Caucasian and black African/African-Caribbean skin from different anatomical sites; and to relate underlying skin architecture to biomechanical function. Methods: Using cutometry and ballistometry, the biomechanical properties of buttock and dorsal forearm skin were determined in black African/African-Caribbean (n=18) and white Caucasian (n=20) individuals aged 18-30 years. Skin biopsies were obtained from a subset of the volunteers (black African/African-Caribbean: n=5; white Caucasian: n=6) and processed for histological and immunohistochemical detection of the major elastic fibre components and fibrillar collagens. Results: We have determined that healthy skin from young African and Caucasian individuals has similar biomechanical properties (F3) in that skin is resilient (capable of returning to its original position following deformation; R1), exhibits minimal fatigue (R4) and is highly elastic (R2, R5 and R7). At the histological level, skin with these biomechanical properties is imbued with strong interdigitation of the rete ridges at the dermal-epidermal junction (DEJ) and candelabra-like arrays of elastic fibres throughout the papillary dermis. Dramatic disruption to this highly organised arrangement of elastic fibres, effacement of the rete ridges and alterations to the alignment of the fibrillar collagens is apparent in white Caucasian forearm and coincides with a marked decline in biomechanical function. Conclusions: Maintenance of skin architecture - both epidermal morphology and elastic fibre arrangement is essential for optimal skin biomechanical properties. Disruption to underlying skin architecture, as observed in young white Caucasian forearm, compromises biomechanical function.

A. Kreuter, T. Krieg, M. Worm, J. Wenzel, P. Moinzadeh, A. Kuhn, E. Aberer, K. Scharffetter-Kochanek, G. Horneff, E. Reil, T. Weberschock, N. Hunzelmann, **Deutsche Leitlinie zur Diagnostik und Therapie der zirkumskripten Sklerodermie**, Journal of the German Society of Dermatology, 2016

Bei der zirkumskripten Sklerodermie handelt es sich um eine heterogene Gruppe von sklerotischen Erkrankungen der Haut mit je nach Subtyp, Schweregrad und Lokalisation möglicher Beteiligung von hautnahen Strukturen wie Fettgewebe, Muskulatur, Gelenke und Knochen. Dies ist eine Aktualisierung der bereits bestehenden deutschen Leitlinie der AWMF (Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Wissenschaften) mit dem Klassifizierungsgrad S2k. Die Leitlinie gibt einen Überblick zur Definition, Epidemiologie, Klassifikation, Pathogenese, Labordiagnostik, Histopathologie sowie klinischen Scores und apparativen Diagnostik der zirkumskripten Sklerodermie. Des Weiteren erfolgen konsensbasierte Empfehlungen zum Management der zirkumskripten Sklerodermie in Abhängigkeit vom klinischen Subtyp. Die Behandlungsempfehlungen sind in einem Therapiealgorithmus dargestellt. Eine finanzielle Unterstützung zur Erstellung der Leitlinie durch die pharmazeutische Industrie erfolgte nicht. Die Leitlinie ist bis Juli 2019 gültig.

M. Kanlayavattanakul, N. Lourith, P. Chaikul, **Jasmine rice panicle: A safe and efficient natural ingredient for skin aging treatments**, Journal of Ethnopharmacology, Volume 193, 4 December 2016, p. 607-616

Ethnopharmacological relevance: While rice is one of the most important global staple food sources its extracts have found many uses as the bases of herbal remedies. Rice extracts contain high levels of phenolic compounds which are known to be bioactive, some of which show cutaneous benefits and activity towards skin disorders. This study highlights an assessment of the cellular activity and clinical efficacy of rice panicle extract, providing necessary information relevant to the development of new cosmetic products. Materials and methods: Jasmine rice panicle extract was standardized, and the level of phenolics present was determined. *In vitro* anti-aging, and extract activity towards melanogenesis wasconducted in B16F10 melanoma cells, and antioxidant activity was assessed in human skin fibroblast cell cultures. Topical product creams containing the extract were developed, and skin irritation testing using a single application closed patch test method was done using 20 Thai

volunteers. Randomized double-blind, placebo-controlled efficacy evaluation was undertaken in 24 volunteers over an 84 d period, with the results monitored by Corneometer® CM 825, Cutometer® MPA 580, Mexameter® MX 18 and Visioscan® VC 98. Results: Jasmine rice panicle extract was shown to have a high content ofp-coumaric, ferulic and caffeic acids, and was not cytotoxic to the cell lines used in this study. Cells treated with extract suppressed melanogenesis *via* tyrosinase and TRP-2 inhibitory effects, which protect the cell from oxidative stress at doses of 0.1 mg/ml or lower. The jasmine rice panicle preparations (0.1-0.2%) were safe (MII=0), and significantly ($p<0.05$) increased skin hydration levels relative to baseline. Skin lightening, and anti-wrinkle effects related to skin firmness and smoothness were observed, in addition to a reduction in skin wrinkling. Improvements in skin biophysics of both 0.1% and 0.2% extracts were showed to be comparable ($p>0.05$). Conclusions: Jasmine rice panicle extract having high levels of phenolics shows cutaneous benefits as the basis for skin aging treatments, as indicated through *in vitro* cytotoxicity assessments and skin testing in human subjects.

J. Seok, J.Y. Hona, S.Y.Choi, K.Y. Park, B.J. Kim, **A potential relationship between skin hydration and stamp-type microneed le intradermal hyaluronic acid injection in middle-aged male face**, J Cosmet Dermatol. 2016 Dec;15(4): p. 578-582

There is an increasing interest in skin rejuvenation using hyaluronic acid (HA) fillers beyond the improvement of deep wrinkles and volume deficiencies, which have been primary research foci in the past. We conducted a pilot study using a sample of six middle-aged male subjects. Using an automatic intradermal injector with 0.020 ml_ of material contained in each injection point with a total of 100 points, 2 ml_ of non-cross-HA filler was injected into the entire face at every treatment session. We administered injections of HA for a total of three sessions per subject at 2-week intervals and evaluated the results using a corneometer, TEWL, cutometer, measures of patient satisfaction, and the global aesthetic improvement scale (GAIS). Corneometer values increased steadily at each measurement, while the average value of TEWL increased in comparison with baseline after each application of the procedure. However, values returned to readings similar to those at 4 weeks after complete termination of the procedures. Cutometer values differed between the baseline and after procedures. All patients were assessed as "very much improved" or "much improved" according to GAIS, and all were pleased with the outcomes of treatment in terms of the enhancement of moisture, elasticity, and brightness.

A. Augustyniak, H. Rotsztejn, **Nonablative fractional laser treatment for the skin in the eye area - clinical and cutometric analysis**, J Cosmet Dermatol. 2016 Dec; 15(4): p. 399~406

Objective: The purpose of the research was to evaluate skin elasticity and reduction in the aging eye area using a 1410-nm nonablative fractional laser treatment, cutometric measurements and photographic documentation. Materials and Methods: This study included 24 patients (21 women, three men), aged 33-50 years (the average age was 44.6) with Fitzpatrick skin type II and III. They received five successive treatment sessions with a 1410-nm nonablative fractional laser in 2-week intervals. Biomechanical properties of the skin were measured by using Cutometer (Courage+Khazaka electronic). Measurements of skin elasticity were made in three places of the eye area. A photographic documentation was used to compare changes after the series of treatment sessions. Additionally, the patients filled in a survey in which they were asked to make a self evaluation of the administered procedure. Results: Cutometric analysis showed a significant improvement of skin elasticity. Changes in the measurements of R2 and R6 parameters indicate that the statistical significance level is mostly $P < 0.0001$ for the differences in the measurements. The analysis of clinical results of the therapy, using photographic documentation, showed a 47% decrease in the quantity and depth of wrinkles in the eye area. Conclusions: A 1410-nm nonablative fractional laser treatment seems to be an effective method aiming at reducing wrinkles in the eye area and improving tightness. Cutometric measurements provide invaluable help in the objective evaluation of the anti-aging treatment and the photographic documentation is an excellent addition to the clinical analysis.

A. Augustyniak, H. Rotsztejn, **Nonablative radiofrequency treatment for the skin in the eye area - clinical and cutometrical analysis,** J Cosmet Dermatol. 2016 Dec; 15(4): p. 427-433

Objective: The purpose of the research was to evaluate skin elasticity and reduction in the aging eye area after using a nonablative radiofrequency treatment. Material and Methods: This study included 23 patients, aged 34-58 years with Fitzpatrick skin type II and III. They received five treatment sessions with a nonablative radiofrequency in 1-week intervals. Biomechanical properties of the skin were measured using Cutometer. A photodocumentation was used to compare changes before and after the series of treatment sessions. Additionally, the patients filled in a questionnaire in which they were asked to make a self-evaluation of the procedure. Results: Cutometrical analysis showed improvement of skin elasticity. Changes in the measurements of R2 and R6 parameters indicate that the statistical significance level is mostly $P < 0.0001$ for the differences in the measurements. The comparison of

clinical changes in the therapy, based on photodocumentation, showed a33.26% improvement. Conclusions: This treatment was used to improve skin tightness and decrease the amount and depth of wrinkles. It is a noninvasive treatment, with low risk of complications. The cutometrical measurements seem to be useful to assess improvement of elasticity of the skin after cosmetology or esthetic dermatology treatments.

N.S. Sadick, Y. Harth, **A 12-week clinical and instrumental study evaluating the efficacy of a multisource radiofrequency home-use device for wrinkle reduction and improvement in skin tone, skin elasticity, and dermal collagen content**, J Cosmet Laser Ther. 2016 Dec; 18(8): p. 422~427

This study was performed in order to evaluate the safety and efficacy of a new handheld home-use multisource radiofrequency device on facial rejuvenation. Forty-seven male and female subjects were enrolled. All subjects received a NEWA 3DEEP home-use device (EndyMed Medical, Caesarea, Israel) to be used on facial skin three times per week for the first four weeks and then reduced to two times per week for the following eight weeks. Assessments included expert clinical grading for efficacy, instrumental evaluation, image analysis, and photography. Forty-five subjects completed the study; all subjects reported the treatment to be painless with only mild erythema lasting up to 15 minutes post-treatment. No other adverse events were reported. Statistically significant improvements were noted in the appearance of marionette lines, skin brightness, elasticity, firmness, lift (facial), lift (jawline), texture/smoothness, tone, and radiance/luminosity by expert visual assessment. Statistically significant improvements in skin firmness and elasticity were found using a Cutometer MPA 580, as well as in collagen and hemoglobin content of the skin using a SIAscope. The results of this study indicate that the NEWA multisource radiofrequency home-use device is effective in selfadministered skin rejuvenation.

A. Augustyniak, H. Rotsztejn, **Intense pulsed light (IPL) treatment for the skin in the eye area - clinical and cutometric analysis,** J Cosmet Laser Ther. 2016 Nov 23: p. 1-7

Objective: the aim of the research was to establish the influence of IPL treatment on skin ageing in the eye area. Material and Methods: This study included 24 women, aged 38-63 years (mean age was 48.04) with Fitzpatrick skin type II and III who underwent five successive treatment sessions with an IPL in two-week intervals. The Cutometer (Courage + Khazaka electronic) reference test was an objective method for the assessment of the biomechanical properties of the skin. The measurements were made in three places around the eye. The photo documentation was used to compare state of skin before and after three months of treatments. Additionally, patients filled in a questionnaire, which contained questions concerning self-assessment of the procedure effects. Results: Cutometric analysis showed significant improvement of skin elasticity (statistical significance level is mostly < 0.0001). The comparison of clinical changes in the therapy, based on photo documentation, showed a 25% improvement. Conclusions: This treatment was used in order to improve skin elasticity and decrease the amount and depth of wrinkles. It is a non-invasive treatment, with low risk of complications.

M.O. Visscher, S.A.Burkes, D.M. Adams, A. Gupta, R.R. Wickett, **Biomechanical Properties of Infantile Hemangiomas: Clinical Stage and Effect of Age**, Skin Research and Technology 2016; November, 22(4): p. 487-496

Background: Infantile hemangiomas (IHs) are benign vascular neoplasms with rapid capillary proliferation shortly after birth and slow involution with diminishing capillary proliferative activity, fibrosis and fatty replacement over 7 – 10 years. Methods: Hemangiomas and contralateral control sites in eighty-eight subjects were measured with a suction device, 6-mm probe and 200 millibar negative pressure. Mechanical properties were assessed versus controls and effects of body site, depth, clinical stage, histology diagnosis and time. Results. Biological elasticity, overall elasticity, net elasticity, total recovery and elastic recovery were lower for IH versus controls ($p < 0.001$). IH total deformation, elastic deformation, viscoelastic creep and residual deformation were higher than controls ($p < 0.001$). Involuting His had lower viscoelasticity than proliferating and stable lesions ($p < 0.001$) and lower viscoelastic creep than stable IHs ($p= 0.04$). IH viscoelasticity was higher at 2.3 than 12.9, 23.7 and 61.0 months and at 4.9 and 8.1 than 61.0 months. IH elastic recovery varied by body site with larger differences versus control for abdomen and leg. Elastic recovery differences from control were smaller at younger versus older ages. Conclusions. Measurement of biomechanical properties may be useful to characterize IH progression and treatment response in clinical settings.

T. Ezure, E. Yagi, S. Amano and K. Matsuzaki, **Dermal anchoring structures: convex matrix structures at the bottom of the dermal layer that contribute to the maintenance of facial skin morphology,** Skin Research and Technology 2016; November, 22(4): p. 152-157

Background/Purpose: Facial skin must be linked to underlying structures to maintain facial morphology and prevent sagging, but the mechanism of facial skin retention is largely unknown. We aimed to elucidate this mechanism.

B. Nedelec, N.J. Forget, T. Hurtubise, S. Cimino, F. de Muszka, A. Legault, W.L. Liu, A. de Oliveira, V. Calva, J.A. Correa, **Skin characteristics: normative data for elasticity,erythema, melanin, and thickness at 16 different anatomical locations,** Skin Research and Technology 2016; 22: 263-275

Background: The clinical use of non-invasive instrumentation to evaluate skin characteristics for diagnostic purposes and to evaluate treatment outcomes has become more prevalent. The purpose of this study was to generate normative data for skin elasticity, erythema (vascularity), melanin (pigmentation), and thickness across a broad age range at a wide variety of anatomical locations using the Cutometer (6 mm probe), Mexameter, and high-frequency ultrasound in a healthy adult sample.

A. Houcine, A. Delalleau, S. Heraud, B. Guiraud, B. Payre, H. Duplan, M.-B. Delisle, O. Damour, S. Bessou-Touya, **How biophysical *in vivo* testing techniques can be used to characterize full thickness skin equivalents,** Skin Research and Technology 2016; 22: 284-294

Background: The reliability of the biophysical properties of skin equivalents (SEs) remains a challenge for medical applications and for product efficacy tests following the European Directive 2003/15/EC2 on the prohibition of animal experiments for cosmetic products.

K. Mizukoshi, T. Nakamura, A. Oba, **The relationship between dermal papillary structure and skin surface properties, color, and elasticity,** Skin Research and Technology 2016; 22: 295-304

Background/purpose: The skin contains an undulating structure called the dermal papillary structure between the border of the epidermis and dermis. The physiological importance of the dermal papillary structures has been discussed, however, the dermal papillary structures have never been evaluated for their contribution to skin appearance. In this study, we investigated the correlation between the dermal papillary structure and skin color and elasticity. In addition, the relationship was validated with skin model experiments.

M. Tanaka, Y. Yamamoto, E. Misawa, K. Nabeshima, M. Saito, K. Yamauchi, F. Abe, F. Furukawa, **Effects of Aloe Sterol Supplementation on skin elasticity, hydration, and collagen score: a 12-week double-blind, randomized, controlled trail**, Skin Pharmacol Physiol 2016; 29; 309-317

Abstract: Background/Aims: Our previous study confirmed that Aloe sterol stimulates collagen and hyaluronic acid production in human dermal fibroblasts. This study aims to investigate whether Aloe sterol intake affects skin conditions. Methods: We performed a 12-week, randomized, double-blind, placebo-controlled study to evaluate the effects of oral Aloe sterol supplementation on skin elasticity, hydration, and the collagen score in 64 healthy women (age range 30-59 years; average 44.3 years) who were randomly assigned to receive either a placebo or an Aloe sterol-supplemented yogurt. Skin parameters were measured and ultrasound analysis of the forearm was performed. Results: ANCOVA revealed statistical differences in skin moisture, transepidermal water loss, skin elasticity, and collagen score between the Aloe sterol and placebo groups. The gross elasticity (R2), net elasticity (R5), and biological elasticity (R7) scores of the Aloe sterol group significantly increased with time. In addition, skin fatigue area F3, which is known to decrease with age and fatigue, also increased with Aloe sterol intake. Ultrasound echogenicity revealed that the collagen content in the dermis increased with Aloe sterol intake. Conclusion: The results suggest that continued Aloe sterol ingestion contributes to maintaining healthy skin.

K.C. Lee, J. Dretzke, L. Grover, A. Logan, N. Moiemen, **A systematic review of objective burn scar measurements,** Lee et al. Burns & Trauma (2016) 4:14

Abstract: Background: Problematic scarring remains a challenging aspect to address in the treatment of burns and can significantly affect the quality of life of the burn survivor. At present, there are few treatments available in the clinic to control adverse scarring, but experimental pharmacological anti-scarring strategies are now beginning to emerge. Their comparative success must be based on objective measurements of scarring, yet currently the clinical assessment of scars is not carried out systematically and is mostly based on subjective review of patients. However, several techniques and devices are being introduced that allow objective analysis of the burn scar. The aim of this article is to evaluate various objective measurement tools currently available and recommend a useful panel that is suitable for use in clinical trials of anti-scarring therapies.

A. Firooz, H. Zartab, B. Sadr, L. Naraghi Bagherpour, A. Masoudi, F. Fanian, Y. Dowlati, A. Hooshang Ehsani, A. Samadi, **Daytime Changes of Skin Biophysical Characteristics: A Study of Hydration,**

Transepidermal Water Loss, pH, Sebum, Elasticity, Erythema, and Color Index on Middle Eastern Skin, Iranian Journal of Dermatology, Dec. 2016

Background: The exposure of skin to ultraviolet radiation and temperature differs signifcantly during the day. It is reasonable that biophysical parameters of human skin have periodic daily fluctuation. The objective of this study was to study the fluctuations of various biophysical characteristics of Middle Eastern skin in standardized experimental conditions. Materials and Methods: Seven biophysical parameters of skin including stratum corneum hydration, transepidermal water loss, pH, sebum, elasticity, skin color, and erythema index were measured at three time points (8 a.m., 12 p.m. and 4 p.m.) on the forearm of 12 healthy participants (mean age of 28.4 years) without any ongoing skin disease using the CK MPA 580 device in standard temperature and humidity conditions. Results: A significant difference was observed between means of skin color index at 8 a.m. (175.42 ± 13.92) and 4 p.m. (164.44 ± 13.72, $P = 0.025$), between the pH at 8 a.m. (5.72 ± 0.48) and 4 p.m. (5.33 ± 0.55, $P = 0.001$) and pH at 12 p.m. (5.60 ± 0.48) and 4 p.m. (5.33 ± 0.55, $P = 0.001$). Other comparisons between the means of these parameters at different time points resulted in nonsignifcant P values. Conclusion: There are daytime changes in skin color index and pH. Skin color index might be higher and cutaneous pH more basic in the early morning compared to later of the day.

K.L. Gardien, R.E. Marck, M.C. Bloemen, T. Waaijman, S. Gibbs, M.M. Ulrich, E. Middelkoop, **Outcome of Burns Treated With Autologous Cultured Proliferating Epidermal Cells: A Prospective Randomized Multicenter Intrapatient Comparative Trial,** Cell Transplant. 2016:25,31: p.437-448

Standard treatment for large burns is transplantation with meshed split skin autografts (SSGs). A disadvantage of this treatment is that healing is accompanied by scar formation. Application of autologous epidermal cells (keratinocytes and melanocytes) may be a suitable therapeutic alternative, since this may enhance wound closure and improve scar quality. A prospective, multicenter randomized clinical trial was performed in 40 adult patients with acute full thickness burns. On two comparable wound areas, conventional treatment with SSGs was compared to an experimental treatment consisting of SSGs in combination with cultured autologous epidermal cells (ECs) seeded in a collagen carrier. The primary outcome measure was wound closure after 5-7 days. Secondary outcomes were safety aspects and scar quality measured by graft take, scar score (POSAS), skin colorimeter (DermaSpectrometer) and elasticity (Cutometer). Wound epithelialization after 5-7 days was significantly better for the experimental treatment (71%) compared to the standard treatment (67%) ($p = 0.034$, Wilcoxon), whereas the take rates of the grafts were similar. No related adverse events were recorded. Scar quality was evaluated at 3 ($n = 33$) and 12 ($n = 28$) months. The POSAS of the observer after 3 and 12 months and of the patient after 12 months were significantly better for the experimental area. Improvements between 12% and 23% ($p < 0.010$, Wilcoxon) were detected for redness, pigmentation, thickness, relief, and pliability. Melanin index at 3 and 12 months and erythema index at 12 months were closer to normal skin for the experimental treatment than for conventional treatment ($p < 0.025$ paired samples t-test). Skin elasticity showed significantly higher elasticity ($p = 0.030$) in the experimental area at 3 months follow-up. We showed a safe application and significant improvements of wound healing and scar quality in burn patients after treatment with ECs versus SSGs only. The relevance of cultured autologous cells in treatment of extensive burns is supported by our current findings.

M. Zasada, R. Debowska, M. Pasikowska, E. Budzisz, **The assessment of the effect of a cosmetic product brightening the skin of people with discolorations of different etiology,** J Cosmet Dermatol. 2016 Dec; 15(4): p. 493~502

Background: Hyperpigmentations are disorders displayed with a change in the color of the skin, its strange shape, the lack of symmetry, and irregular placement. They appear no matter on the age, gender, and often as a congenital defect. Disorder connected with overproduction of melanin by pigmentary cells. The change of color is due to endogenous and exogenous cause. Objectives: The aim of this thesis was to conduct a research in vivo. This will allow to judge the effectiveness of the cosmetic product which brightens the skin with hyperpigmentation problems. The characteristics of dermocosmetics were tested on people with various etiology of hyperpigmentation. The aim of the research was to assess the effect of the active substances used daily on skin hyperpigmentation. Methods: The tests were carried out on groups of patients with hyperpigmentations. The application of the pharmaceutical and the use of specific apparatus measurements were taken on every medical checkup. A survey was conducted to assess the changes in the face, neck, and neckline skin. The research was based on the apparatus analysis of the skin condition (MPA®, VISIA®). Results: Regular application of the pharmaceutical caused brightening of hyperpigmentations ($P < 0.05$). General improvement in skin condition was also observed - the increase in skin elasticity, smoothness, and the enhancement of hydration levels. Conclusions: Dermocosmetics for people with hyperpigmentation are an essential part of their medical treatment. In case of epidermal hyperpigmentation, the recipe of

individually chosen and tested combination of ingredients enables us to reach satisfactory results.

H. Chajra, D. Auriol, F. Joly, A. Pagnon, M. Rodrigues, S. Allart, G. Redziniak, F. Lefevre, **Reactivating the extracellular matrix synthesis of sulfated glycosaminoglycans and proteoglycans to improve the human skin aspect and its mechanical properties,** Clinical, Cosmetic and Investigational Dermatology 2016:9 p. 461–472

Background: The aim of this study was to demonstrate that a defned cosmetic composition is able to induce an increase in the production of sulfated glycosaminoglycans (sGAGs) and/or proteoglycans and fnally to demonstrate that the composition, through its combined action of enzyme production and synthesis of macromolecules, modulates organization and skin surface aspect with a beneft in antiaging applications. Materials and methods: Gene expression was studied by quantitative reverse transcription polymerase chain reaction using normal human dermal fbroblasts isolated from a 45-year-old donor skin dermis. De novo synthesis of sGAGs and proteoglycans was determined using Blyscan™ assay and/or immunohistochemical techniques. These studies were performed on normal human dermal fbroblasts (41- and 62-year-old donors) and on human skin explants. Dermis organization was studied either ex vivo on skin explants using bi-photon microscopy and transmission electron microscopy or directly in vivo on human volunteers by ultrasound technique. Skin surface modifcation was investigated in vivo using silicone replicas coupled with macrophotography, and the mechanical properties of the skin were studied using Cutometer. Results: It was frst shown that mRNA expression of several genes involved in the synthesis pathway of sGAG was stimulated. An increase in the de novo synthesis of sGAGs was shown at the cellular level despite the age of cells, and this phenomenon was clearly related to the previously observed stimulation of mRNA expression of genes. An increase in the expression of the corresponding core protein of decorin, perlecan, and versican and a stimulation of their respective sGAGs, such as chondroitin sulfate and heparan sulfate, were found on skin explants. The biosynthesis of macromolecules seems to be correlated at the microscopic level to a better organization and quality of the dermis, with collagen fbrils having homogenous diameters. The dermis seems to be compacted as observed on images obtained by two-photon microscopy and ultrasound imaging. At the macroscopic level, this dermis organization shows a smoothed profle similar to a younger skin, with improved mechanical properties such as frmess. Conclusion: The obtained results demonstrate that the defned cosmetic composition induces the synthesis of sGAGs and proteoglycans, which contributes to the overall dermal reorganization. This activity in the dermis in turn impacts the surface and mechanical properties of the skin.

J. Lademann, T. Veraou. M.E. Darvin, A. Patzelt, M.C. Meinke, C. Voit, D. Papakostas, L. Zastrow, W. Sterry, O. Doucet, **Influence of Topical, Systemic and Combined Application of Antioxidants on the Barrier Properties of the Human Skin**, Skin Pharmacol Phvsiol. 2016:29, 11: p. 41-6

Background: The formation of free radicals in human skin by solar ultraviolet radiation is considered to be the main reason for extrinsic skin aging. The antioxidants in human tissue represent an efficient protection system against the destructive action of these reactive free radicals. In this study, the parameters of the skin, epidermal thickness, stratum corneum moisture, elasticity and wrinkle volume, were determined before and after the treatment with antioxidant- or placebo-containing tablets and creams. Methods: The study included 5 groups of 15 volunteers each, who were treated for 2 months with antioxidantcontaining or placebo tablets, creams or a combination of antioxidant-containing tablets and cream. The skin parameters were measured at time point 0 and at week 8 utilizing ultrasound for the determination of epidermal thickness, a corneometer for stratum corneum moisture measurements, skin profilometry for quantifying the wrinkle volume and a cutometer for determining the elasticity. Results: The verum cream had a positive influence on epidermal thickness, elasticity and skin moisture, but the verum tablets improved the epidermal thickness only. The combined application of verum tablets and creams led to a significant improvement of all investigated skin parameters, whereas the application of placebo tablets or cream did not influence any parameters. Conclusion: The topical and oral supplementation of antioxidants can be an instrument to improve several skin parameters and potentially counteract or decelerate the process of extrinsic skin aging.

P. Pérez Villaverde, J. Sánchez Gálvez, J.M. Rumbo Prieto, M**edición De Parámetros Cutáneos A Través De Un Dispositivo No Invasivo Multi-Sonda. Estudio De Casos En Lesiones Radio,** Enferm Dermatol. 2016; 10 (28)

Objetivo: Valorar el adecuado estado de la piel a través de la medición de parámetros cutáneos por un dispositivo no invasivo multi sonda en pacientes afectados de radiodermitis (lesión radio inducida). Metodología: Estudio observacional descriptivo. Medición de parámetros cutáneos (hidratación, eritema, melanina, elasticidad) a través de un dispositivo multi-sonda y, aplicación de unprotocolo de tratamiento de cura en ambiente húmedo a pacientes con radiodermitis. Estadística

descriptiva y de dispersión. Resultados: Se evaluaron 6 casos clínicos (4 hombres y 2 mujeres) afectados de radiodermitis de grado 2-3. En el 67% de los casos se obtuvo una disminución del 74,6% del área de lesión. De todos los parámetros cutáneos evaluados, el eritema y la hidratación fueron los valores que más variabilidad presentaron en referencia al valor de control. Conclusiones: La información de los parámetros cutáneos obtenidos por el dispositivo no invasivo multi-sonda resultó ser útil para determinar la efectividad del tratamiento de cura en ambiente húmedo en lesiones radio inducidas; así como, para el seguimiento, la evolución y el pronóstico de cicatrización.

N. Cameli, M. Mariano, M. Serio, E. Berardesca, **Clinical and instrumental evaluation of a cross-linked hyaluronic acid filler dermal injection: effects on nasolabial folds skin biophysical parameters and augmentation from a single-dose, monocentric, openlabel trial**, G Ital Dermatol Venereol. 2016 Oct; 151(5): p 507-14

Background: When a hyaluronic acid dermal device to fill soft tissues is chosen, efficacy, safety and durability are key concerns. This is an open-label prospective study to instrumentally evaluate the effects of HA filler dermal injection on nasolabial folds skin biophysical parameters and augmentation. Methods: A single Italian site treated female subjects aged 40-55, for nasolabial folds, with a single standardized injection. The outcome was evaluated with objective quantitative measurements after 90 (T1) and 180 days (T2) from the injection comparing to baseline (TO) by means of Corneometer (skin hydration measurement), Cutometer (skin elasticity measurement), and Visioface devices for digital and UV computerized image analysis. Secondary endpoints were safety assessment, subject investigator satisfaction with the intervention. Assessment of aesthetic results included photographic documentation. Results: The computerized image analysis confirmed the clinical assessment showing statistically significant reduction in nasolabial folds both at T1 and T2. Visioface® indexes showed a marked and statistical significant response. An excellent profile of satisfaction of the product at T2 from investigators and patients was recorded. Skin hydration and elasticity did not show significant changes. Conclusions: In our study, a standardized HA filler dermal injection on nasolabial folds did not influence skin biophysical parameters such as skin hydration and elasticity. Nasolabial folds showed a persistent and significative response at T2 confirmed by instrumental evaluation. The tolerability and safety profile of the product was excellent.

M. Kerscher, **Bestimmung der mechanischen Hauteigenschaften**, https://www.chemie.uni-hamburg.de/bc/kerscher/Cutometrie.htm

Aufgrund ihrer komplexen Zusammensetzung aus elastischen Feststoffen und viskosen Flüssigkeiten sind die mechanischen Eigenschaften der Haut nicht ausschließlich elastisch oder viskos, sonder viskoelastisch. Typisch für viskoelastische Materialien sind nichtlineare Verformungseigenschaften bei Belastung. Außerdem ist die Verformung abhängig von der Dauer der Belastung und geht meistens mit einem Kriechphänomen einher.

J. Pardeike, R. Müller, **Bestimmung der Hautfeuchtigkeit, Hautelastizität und des Transepidermalen Wasserverlusts (TEWL),** pharmazie-lehrbuch.de

Hintergrund: Zur Bestimmung der Effektivität und Wirksamkeit von dermal zu applizierenden Arzneizubereitungen, kosmetischen Produkten und Rohstoffen sind die Bestimmung der Hautfeuchtigkeit, Hautelastizität und des transepidermalen Wasserverlusts (TEWL) weit verbreitete Methoden.

M.-A. Yoo, Y.-K. Seo, M.-K. Shin, J.-S. Koh, **How much related to skin wrinkles between facial and body site? Age-related changes in skin wrinkle on the knee assessed by skin bioengineering techniques,** Skin Reseach and Technology 2016; 22: 69-74

Background/Purpose: Skin ageing has been focused the wrinkle on the face than on the body, so most studies have been studied the change of Crow's feet for ages. Only little is known about the age-dependent changes of wrinkles on body sites. The aim of this study was to establish new grading criteria for severity of wrinkles on knees and to investigate the relationship of wrinkle severity with age- and site-dependent. Methods: The skin on the knee of thirty-eight healthy Korean female volunteers, divided into two groups young and old, were photographed. Standard photograph for body wrinkle was established (grade 0~7), and then visual assessment, skin wrinkle, and skin elasticity were evaluated on Crow's feet and the knee. We examined for any significant differences and the correlation of skin ageing parameters with age and two different sites.

M. Tanaka, Y. Yamamoto, E. Misawa, K. Nabeshima, M. Saito, K. Yamauchi, F. Abe, F. Furukawa, **Aloe sterol supplementation improves skin elasticity in Japanese men with sunlight-exposed skin: a 12-week double-blind, randomized controlled trial,** Clinical, Cosmetic and Investigational

Dermatology 2016:9, p. 435–442

Background/objective: Recently, it was confrmed that the daily oral intake of plant sterols of *Aloe vera* gel (*Aloe* sterol) signifcantly increases the skin barrier function, moisture, and elasticity in photoprotected skin. This study aimed to investigate whether *Aloe* sterol intake affected skin conditions following sunlight exposure in Japanese men. Methods: We performed a 12-week, randomized, double-blind, placebo-controlled study to evaluate the effects of oral *Aloe* sterol supplementation on skin conditions in 48 apparently healthy men (age range: 30–59 years; average: 45 years). The subjects were instructed to expose the measurement position of the arms to the sunlight outdoors every day for 12 weeks. The skin parameters were measured at 0 (baseline), 4, 8, and 12 weeks. Results: Depending on the time for the revelation of the sunlight, the b^* value and melanin index increased and the skin moisture decreased. After taking an *Aloe* sterol tablet daily for 12 weeks, the skin elasticity index (R2, R5, and R7) levels were signifcantly higher than the baseline value. There were no differences between the groups in these skin elasticity values. In the subgroup analysis of subjects aged <46 years, the change in the R5 and R7 was signifcantly higher in the *Aloe* group than in the placebo group at 8 weeks (P=0.0412 and P=0.0410, respectively). There was a difference in the quantity of sun exposure between each subject, and an additional clinical study that standardizes the amount of ultraviolet rays is warranted. No *Aloe* sterol intake-dependent harmful phenomenon was observed during the intake period. Conclusion: *Aloe* sterol ingestion increased skin elasticity in the photodamaged skin of men aged <46 years.

H. Chajra, D. Auriol, F. Joly, A. Pagnon, M. Rodrigues, S. Allart, G. Redziniak, F. Lefevre, **Reactivating the extracellular matrix synthesis of sulfated glycosaminoglycans and proteoglycans to improve the human skin aspect and its mechanical properties,** Clinical, Cosmetic and Investigational Dermatology 2016:9 p. 461–472

Background: The aim of this study was to demonstrate that a defned cosmetic composition is able to induce an increase in the production of sulfated glycosaminoglycans (sGAGs) and/or proteoglycans and fnally to demonstrate that the composition, through its combined action of enzyme production and synthesis of macromolecules, modulates organization and skin surface aspect with a beneft in antiaging applications. Materials and methods: Gene expression was studied by quantitative reverse transcription polymerase chain reaction using normal human dermal fbroblasts isolated from a 45-year-old donor skin dermis. De novo synthesis of sGAGs and proteoglycans was determined using Blyscan™ assay and/or immunohistochemical techniques. These studies were performed on normal human dermal fbroblasts (41- and 62-year-old donors) and on human skin explants. Dermis organization was studied either ex vivo on skin explants using bi-photon microscopy and transmission electron microscopy or directly in vivo on human volunteers by ultrasound technique. Skin surface modifcation was investigated in vivo using silicone replicas coupled with macrophotography, and the mechanical properties of the skin were studied using Cutometer. Results: It was frst shown that mRNA expression of several genes involved in the synthesis pathway of sGAG was stimulated. An increase in the de novo synthesis of sGAGs was shown at the cellular level despite the age of cells, and this phenomenon was clearly related to the previously observed stimulation of mRNA expression of genes. An increase in the expression of the corresponding core protein of decorin, perlecan, and versican and a stimulation of their respective sGAGs, such as chondroitin sulfate and heparan sulfate, were found on skin explants. The biosynthesis of macromolecules seems to be correlated at the microscopic level to a better organization and quality of the dermis, with collagen fbrils having homogenous diameters. The dermis seems to be compacted as observed on images obtained by two-photon microscopy and ultrasound imaging. At the macroscopic level, this dermis organization shows a smoothed profle similar to a younger skin, with improved mechanical properties such as frmess. Conclusion: The obtained results demonstrate that the defned cosmetic composition induces the synthesis of sGAGs and proteoglycans, which contributes to the overall dermal reorganization. This activity in the dermis in turn impacts the surface and mechanical properties of the skin.

L. von Oppen-Bezalel, A. Shtevi, **Rosacea and dark circle relief via palm date seed extract,** PERSONAL CARE EUROPE, September 2016, p. 65-67

IBR-CalmDeAge® is an extract from palm date (Phoenix dactylifera) seeds. The date seeds' extraction preserves the inherent botanical capital of the date seed and delivers it for the most natural active effect on the skin, resulting in a global anti-ageing effect as well as reduction of dark circles and rosacea. Ancient 2000 year-old date seeds were found in an archaeological site, planted, and were able to germinate and grow. The dormins, preserving the seed of youth for such a long period are able to slow down skin cell proliferation, slow down the biological clock and affect intrinsic ageing factors to maintain skin youthfulness.

S.Y. Choi, Y.A. No, S.Y. Kim, B.J. Kim, M.N. Kim, **Tightening effects of high-intensity focused ultrasound on body skin and subdermal tissue: a pilot study,** J Eur Acad Dermatol Venereol. 2016 Sep; 30 (9): p. 1599-602

Background: High-intensity focused ultrasound (HIFU) has been introduced as a new treatment modality for skin tightening through application mainly to the face and neck. Objectives: This pilot study assessed the efficacy and safety of HIFU for body tightening in Asian females. Methods: Six Asian female adults were enrolled in this pilot study. All subjects were treated with HIFU to the both cheek, upper arm, lower abdomen, thigh and calf using the following probes: 7 MHz, 1.5 mm focal depth; 2 MHz, 3.0 mm focal depth; 2 MHz, 4.5 mm focal depth; 2 MHz, 6.0 mm focal depth and 2 MHz, 9.0 mm focal depth. Three blinded independent dermatologists assessed results using the Investigator Global Aesthetic Improvement Scale (GAIS) using paired pre- and post-treatment (week 4) standardized photographs. Also, we evaluated skin elasticity at all treated sites using a cutometer. Participants used the subject GAIS to assess their clinical improvement after treatment and rated their pain using a visual analogue scale (VAS) immediately, 1 and 4 weeks after treatment. Results: The three blinded evaluators judged all treated sites as showing clinical improvement 4 weeks after treatment. Skin elasticity measured via cutometer was significantly improved 4 weeks after treatment at all treated sites ($P < 0.05$). All patients scored themselves subjectively as more than 'improved' on the GAIS Immediately after treatment the mean VAS score was 5.17 ± 2.48, but no pain was reported at weeks 1 and 4. No permanent adverse effects were observed during the follow-up period. Conclusion: For body tightening, we applied HIFU using transducers with a lower frequency and deep focal depth to effectively deliver ultrasound energy to skin tissues. HIFU appears to be a safe and effective treatment modality for dermal and subdermal tightening.

E.J. Kim, H.I. Kwon, U.C. Yeo, J.Y. Ko, **Lower face lifting and contouring with a novel internal real-time thermosensing monopolar radiofrequency**, Lasers Med Sci, 2016 Sep; 31(7): p. 1379-1389

As demand for a youthful appearance has increased, various techniques for face lifting and contouring have been used to reduce excess fat deposition and improve skin laxity. Recently, radiofrequency (RF)-assisted lipolysis and liposuction (RFAL) has been introduced for body and face contouring. This study aimed to evaluate the clinical improvement and safety of a new RFAL device for face lifting and contouring. A prospective study was conducted in 20 Korean patients who underwent an internal real-time thermosensing monopolar RFAL procedure. Prior to treatment and 12 and 24 weeks after treatment, digital photographs were taken, and the degree of improvement as measured by investigators and patients was recorded. Skin elasticity was measured using a Cutometer (CT575, Courage and Khazaka®, Cologne, Germany). Safety profiles were also evaluated at each visit. Results showed favorable improvement in skin laxity and fat deposition. Both investigators' evaluations and patients' evaluation showed significant improvement between 12 and 24 weeks. Although the changes in skin elasticity measured by the Cutometer were not statistically significant, all three treated regions showed a trend toward improvement. No major side effects such as infection or burn were observed. The internal, real-time thermosensing monopolar RFAL device showed clinical efficacy and safety. After further studies with more patients and longer follow-up periods, internal real-time thermosensing monopolar RF devices might become one of the popular treatment options for face lifting and contouring.

M. Lee, Y. Jung, E. Kim, H.K. Lee, **Comparison of skin properties in individuals living in cities at two different altitudes: an investigation of the environmental effect on skin**, J Cosmet Dermatol. 2016 Sep 11

Background: Skin properties vary depending on exogenous factors. Various studies have been used for comparing skin properties between cities for studying environment influence on skin properties. However, for comparison of skin properties between cities, various environmental factors have to be considered. Objectives: The purpose of this study therefore was to compare skin properties in individuals of the same ethnicity and sex (Indonesian women) between different altitudes and to interpret the environmental effect on skin. Methods: In this study, we reanalyzed the data obtained from previous study. The data were for healthy Sundanese Indonesian females [(n = 136) at Jakarta (n = 49) and Bandung (n = 87)], and the data consisted of published data (skin hydration, sebum level, pH, elasticity, and transepidermal water loss) and unpublished data [skin color (L*, a*, and b*)]. The skin parameters were measured on Indonesian females aged 20-34 using C+K devices (corneometer, sebumeter, pH meter, and cutometer), Delfin vapometer, and Minolta spectrophotometer, respectively. Results: Sundanese Jakarta (low-altitude) females had higher sebum level and greater redness (a*) value in the forehead than Sundanese Bandung (high-altitude) females. In contrast, Bandung females had higher skin pH, brighter skin color, and greater forehead skin elasticity than Jakarta females. Conclusions: The skin properties can be influenced by changing altitude because different altitudes have different environments such as air temperature, humidity, UV radiation, and so on, and it is also necessary to

investigate the factors which can influence with perceived skin condition such as skin type and skin concerning.

M. Aust, S.A. Jamchi, K.-H. Busch, **Eine sichere Behandlungsmethode für alternde Haut am Unterlid**, ästhetische dermatologie 05, 2016

Platelet-rich-Plasma (PRP) scheint als eine autologe und minimalinvasive Behandlungsmethode eine geeignete Alternative zu den bisherigen Behandlungsformen darzustellen, um eine Regeneration im Bereich der unteren Augenpartie erzielen zu können. In dem folgenden Beitrag erfolgt eine Zusammenfassung aktueller Studien und Publikationen in Bezug auf die Wirkung von PRP und die Untersuchung hinsichtlich der Elastizitäts- und Volumenzunahme der Haut im Bereich der unteren Augenpartie. Die Forschung an beschleunigter Geweberegeneration sowie neuen Methoden für eine optimierte Wundheilung hat nicht nur in den chirurgischen Fachdisziplinen in den letzten Jahren immer mehr an Bedeutung gewonnen. Auch in der ästhetischen Medizin nehmen Wundheilungsforschung und Regenerationsmedizin eine immer zentralere Rolle ein.

J. Poetschke, H.Schwaiaer, S. Steckmeier, T. Ruzicka, G.G. Gaualitz, **Anti-wrinkle creams with hyaluronic acid: how effective are they?**, (Abstract – Full article in German), MMW Fortschr Med. 2016 May 25; 158 Suppl 4: p. 1-6

Background: Anti-wrinkle creams containing hyaluronic-acid are often advertised as an efficacious option for the treatment of wrinkles and have even been presented as an option equal to some medical procedures in this regard. Evidence from conclusive and systematic research supporting those claims, however, is widely lacking. Objectives: During this trial we examined whether the daily use of anti-wrinkle creams containing hyaluronic acid has an influence on the depth of wrinkles as well as skin tightness and elasticity. Methods: We split up 20 patients into four groups, each of which were assigned an anti-wrinkle cream containing hyaluronic acid for daily use. Four different creams within different price ranges were chosen (Balea, Nivea, Lancome, Chanel). Before and after the 3 month trial, wrinkle depth was assessed using the PRIMOS(pico) (GFMesstechnik, Teltow, Germany) and skin-tightness and elasticity were evaluated using the Cutometer MP580 (Courage+Khazaka, Cologne, Germany). Additionally, after the trial, questionnaire data on patient satisfaction with their individual product was collected. Results: The depth of perioral and orbital wrinkles decreased significantly in all groups, with depth reduction ranging between 10% and 20%. Skin-tightness increased significantly in all groups, rising by 13 to 30%. Minimal significant changes in skin-elasticity could only be shown in individual groups. Conclusion: The regular use of hyaluronic-acid containing anti-wrinkle creams for over 3 months showed clear and positive effects on wrinkle-depth and skin-tightness. Due to the design of the study, however, no clear indication on the efficacy of hyaluronic acid could be shown.

M. Dumoulin, D. Gaudout, B. Lemaire, **Clinical effects of an oral supplement rich in antioxidants on skin radiance in women**, Clinical, Cosmetic and Investigational Dermatology 2016:9 p. 315-324

Background: Environmental factors impact the skin aging resulting in decrease of skin radiance. Nutrition and particularly antioxidants could help to fight against skin degradation. Objective:The aim of this study was to evaluate the effects of an oral supplement rich in specific antioxidants, SkinAx2 , on the improvement of the skin radiance in women. Methods:The open-label clinical study enrolled 35 women, aged 40-70, with facial dull complexion. Subjects were supplemented orally with a daily dosage of 150 mg of an antioxidant-rich formulation containing superoxide dismutase-rich melon concentrate, grape seed extract rich in monomers of flavanols, vitamin C, and zinc for 8 weeks. Each subject served as her own control. The C.L.B.T. test has been used to evaluate facial skin coloring (C), luminosity (L), brightness (B), and transparency (T) involved in skin radiance. Facial skin imperfections have been assessed by clinical assessment. Firmness has been evaluated by clinical assessment and cutometer measurement. Finally, an auto-questionnaire has been carried out in order to evaluate the satisfaction of the subjects concerning different parameters involved in skin radiance and the global efficacy of the supplement. Results: Skin “ red pink” and “ olive” colors were significantly improved after supplementation fP<0.0001). Luminosity was increased by 25.9% (jPcO.OOOl) whereas brightness and transparency were not affected by the supplementation. Facial skin imperfections were significantly reduced after the antioxidant-rich formulation intake (global reduction: -18.0%; P<0.0001). Indeed, dark circles, redness, and spots significantly diminished after oral treatment. Firmness and elasticity have been shown to be improved. Subjects were globally satisfied by the product (82.4%) and have found improvements on their facial skin. Furthermore, 64.7% reported to look better at the end of the supplementation. Conclusion: The oral supplement containing the antioxidant-rich formulation was found to improve skin radiance by reducing skin coloring, increasing face luminosity, reducing imperfections, and improving skin firmness in women with dull complexion.

M. Saito, M. Tanaka, E. Misawa, R. Yao, K. Nabeshima, K. Yamauchi, F. Abe, Y. Yamamoto, F. Furukawa, **Oral administration of Aloe vera gel powder prevents UVB-induced decrease in skin elasticity via suppression of overexpression of MMPs in hairless mice**, Bioscience, Biotechnology and Biochemistry, 2016 Vol. 80 No. 7, 1416-1424

This study reports the effects of oral Aloe vera gel powder (AVGP) containing Aloe sterols on skin elasticity and the extracellular matrix in ultraviolet B (UVB)-irradiated hairless mice. Ten-week-old hairless mice were fed diets containing 0.3% AVGP for 8 weeks and irradiated UVB for 6 weeks. Mice treated with AVGP showed significant prevention of the UVB-induced decrease in skin elasticity. To investigate the mechanism underlying this suppression of skin elasticity loss, we measured the expression of matrix metalloproteinase (MMP)-2, -9, and -13. AVGP prevented both the UVB-induced increases in MMPs expressions. Moreover, we investigated hyaluronic acid (HA) content of mice dorsal skin and gene expression of HA synthase-2 (Has2). In the results, AVGP oral administration prevented UVB-induced decreasing in skin HA content and Has2 expression and attenuates the UVB-induced decrease in serum adiponectin, which promotes Has2 expression. These results suggested that AVGP has the ability to prevent the skin photoaging.

R.E. Marck, K.L. Gardien, C.M. Stekelenburg, M. Vehmeijer, D. Baas, W.E. Tuinebreijer, R.S. Breederveld, E. Middelkoop, **The application of platelet-rich plasma in the treatment of deep dermal burns: A randomized, double-blind, intra-patient controlled study**, Wound Repair Regen. 2016 Jul: 24(4): p. 12-20

Platelet-rich plasma (PRP) is a fraction of blood with a platelet concentration above baseline. When platelets get activated, growth factors involved in wound healing are released. The application of PRP has shown good results in wound care, however, up to date no substantial research has been performed on the effect of PRP in burn treatment. This randomized double blind intra-patient controlled study investigates the effect of autologous PRP on wound healing in burns that require surgery with a meshed split skin graft (SSG). Fifty-two patients with various areas of deep dermal to full thickness burns, receiving surgery with a SSG were included after informed consent. Comparable study areas A and B (intra-patient) were appointed, randomized and either treated with a SSG and PRP or with a SSG alone. At day 5 to 7 postoperative, the epithelialization and graft take rate were assessed. Three, six, and twelve months postoperative, follow-up measurements were performed in the form of POSAS-questionnaires, DermoSpectroMeter, and Cutometer measurements. There was no statistically significant difference between the mean take rate nor the mean epithelialization rate at day 5-7 between the PRP-treated and control areas. However, PRP-treated wound areas showed more often better or equal epithelialization and take rates at day 5-7 than the standard treated areas. Minor effects were also seen in the reoperated and early operated subgroups. At 3, 6, and 12 months postoperative, POSAS scores from the patients and the observers, Dermaspectro-, and Cutometer measurements did not depict a significant difference between the PRP and standard treated areas. Concluding, the addition of PRP in the treatment of burn wounds did not result in improved graft take and epithelialization, nor could we demonstrate better scar quality. There was, however, a considerable variation in our clinical population.

B. Hersant, M. SidAhmed-Mezi, A. Chossat, J.P. Meninaaud, **Multifractional microablative laser combined with spacially modulated ablative (SMA) technology for facial skin rejuvenation**, Lasers Surg Med. 2016 Jul 18

Background and Objective: Due to the increasing demand for aesthetic procedures, especially facial aesthetic surgery, a new laser technology has been developed for facial skin rejuvenation and wrinkle treatment. The aim of this study was to objectively and subjectively assess the clinical efficacy and safety of Erbium:YAG laser combined with Spatially Modulated Ablation (Er:YAG + SMA) on facial skin rejuvenation. Study Design/Materials and Methods: Patients with Fitzpatrick skin type's I-IV were prospectively included. Inclusion criteria consisted of having wrinkles and irregular skin texture. All patients underwent two Er:YAG + SMA sessions (1 month apart) to stimulate tissue regeneration. Er:YAG laser emits wavelength at 2 ,940 nm and when combined with SMA, a resonance effect is produced in the dermis to promote tissue regeneration. Facial skin elasticity and firmness were objectively assessed by Cutometer at baseline and month 6 (M6). Aesthetic improvement was qualitatively assessed using digital photographs. Patient satisfaction with regard to their facial appearance was self-assessed using the validated FACE-Q scale and the patient perceived age VAS scale at baseline, M1, and M6. Side effects were investigated after each session. Results: Thirty-four patients were included, 50% (18 patients) had Fitzpatrick skin type III and 41% (14 patients) were smokers. Skin elasticity indices were significantly improved: from 0.335 ± 0.015 at baseline to 0.387 ± 0.021 at M6 (P = 0.05*) for R5 (net elasticity). Skin firmness was assessed through R7 (biological elasticity) and R6 (viscoelastic ratio) at baseline and M6: a significant increase from 0.235 ± 0.01 to

0.2709 ± 0.009 (P < 0.03**) and decrease from 0.486 ± 0.022 to 0.3918 ± 0.023 (P < 0.006***) were respectively observed. A negative value for R6 corresponded to an improved skin condition. The FACE-Q scores were significantly increased from 39.4 ± 6.7 at baseline to 45.4 ± 9.1 at M1 (P < 0.006***) and 50.4 ± 9.8 at M6 (P < 0.0001***), reflecting wrinkle reduction and enhanced rejuvenation. According to the age appraisal VAS scale, results showed that patients felt younger by -2.92 years at M1 (P < 0.0001***) and -4.13 years (P < 0.0001***) at M6. No adverse reaction was reported. Conclusion: The Er:YAG + SMA technology offers an effective and safe treatment alternative for facial skinrejuvenation. It reduces the recovery time compared to conventional lasers such as carbon dioxide laser.

P. Min, Z. Zhang, L. Grassetti, A.T. Perdanasari, M. Torresetti, Z. Pu, Y. Zhang, S. Han, R. Marsili, Y.X. Zhang, G. di Benedetto, D. Lazzeri, **Alteration of Skin Mechanical Properties in Patients Undergoing Botulinum Toxin Type A Injections of Forehead Rhytides**, Aesthetic Plast Surg. 2016 Jun:40(3): p.410-20

Background: Although application of botulinum toxin type A (BTX-A) for the treatment of forehead rhytides has become very popular, the effects of its intramuscular injections on the skin mechanical properties remain unclear. Objectives: We prospectively investigated the alterations in the mechanical properties of the skin of patients who received intramuscular injections of botulinum toxin A (BTX-A) for forehead rhytides and compared two injection doses. Methods: Of the 42 enrolled patients, one randomly assigned half received intramuscular injections of two units (group I), and the other half received four units (group II) of BTX-A in each injection point. The baseline and post-treatment skin mechanical parameters, including gross elasticity (R2), net elasticity (R5), viscoelastic ratio (R6) and biological elasticity (R7), were measured using the Cutometer(®) and compared. Results: Treatment with BTX-A resulted in significant overall alterations in the mechanical properties of skin at the injection sites of both treatment groups during the 16-week period, and no significant differences were observed between groups. Significant decreases in biological elasticity, net elasticity and viscoelasticity properties were observed at 2 weeks follow-up and began to recover at that time. All of the skin mechanical properties recovered to baseline levels by 16 weeks of follow-up in both dosage groups, which indicates that the higher dosage (4 units) did not delay relapse compared to the two-unit dosage. Conclusion: We concluded that intramuscular injections of BTX-A significantly regulated the gross elasticity, net elasticity, functional elasticity and viscoelastic elasticity at the injection point over a radius of 1.5 cm at 2, 4 and 8 weeks follow-up. The alteration in the skin measurements had completely diminished by the 16-week follow-up.

M.A. Amirkhani, A. Shoae-Hassani, M. Soleimani, S. Hejazi, L. Ghalichi, M.A. Nilforoushzadeh, **Rejuvenation of facial skin and improvement in the dermal architecture by transplantation of autologous stromal vascular fraction: a clinical study,** BioImpacts, 2016, 6(3), 149-154

Introduction: The rejuvenation characteristicsoffat tissue grafting has been established for many years. Recently it has been shown that stromal vascular fraction (SVF) of fat tissue contributes to its rejuvenation properties. As the SVF is a minimal processed cell population (based on FDA guidance), therefore it is a suitable cell therapy for skin rejuvenation. This clinical trial was aimed to evaluate the ultrastructural improvement of aging skin in the facial nasolabial region after transplantation of autologous SVF. Methods: Our study was conducted in 16 patients aged between 38 and 56 years old that wereinterested in face lifting at first. All of the cases underwent the lipoaspiration procedure from the abdomen for sampling of fat tissue. Quickly, the SVF was harvested from 100 mL of harvested fat tissue and then transplanted at dose of 2.0xl07 nucleated cells in each nasolabial fold. The changes in the skin were evaluated using Visioface scanner, skin-scanner DUB, Visioline, and Cutometer with multi probe adopter. Results: By administration of autologous SVF, the elasticity and density of skin were improved significantly. There were no changes in the epidermis density in scanner results, but we noticed a significant increase in the dermis density and also its thickness with enrichment in the vascular bed of the hypodermis. The score of Visioface scanner showed slight changes in wrinkle scores. The endothelial cells and mesenchymal progenitors from the SVF were found to change the architecture of the skin slightly, but there was not obvious phenotypic changes in the nasolabial grooves. Conclusion: The current clinical trial showed the modification of dermis region and its microvascular bed, but no changes in the density of the epidermis. Our data represent the rejuvenation process of facial skin by improving the dermal architecture.

M.S. Reisch, **Making cosmetic claims that stick**, Chemical and Engineering News online, May 2016

Cosmetic bottles line retail store shelves festooned with an array of claims. Many promise to rejuvenate and tone the face or erase skin wrinkles. Others promise to repair dull hair and make it soft and shiny. But how many of those promises are empty and what role do scientists play in making claims

that stick? Read on to get an inside look at the cosmetic chemistry labs set up to verify claims before they ever go on a bottle.

J. Poetschke, H. Schwaiger, S. Steckmeier, T. Ruzicka, G.G. Gauglitz, **Anti-wrinkle creams with hyaluronic acid: how effective are they?**, MMW Fortschr Med, 2016 May 25;158 Suppl 4: p. 1-6

Background: Anti-wrinkle creams containing hyaluronic-acid are often advertised as an efficacious option for the treatment of wrinkles and have even been presented as an option equal to some medical procedures in this regard. Evidence from conclusive and systematic research supporting those claims, however, is widely lacking. Objectives: During this trial we examined whether the daily use of anti-wrinkle creams containing hyaluronic-acid has an influence on the depth of wrinkles as well as skin tightness and elasticity. Methods: We split up 20 patients into four groups, each of which were assigned an anti-wrinkle cream containing hyaluronic acid for daily use. Four different creams within different price ranges were chosen (Balea, Nivea, Lancôme, Chanel). Before and after the 3 month trial, wrinkle depth was assessed using the PRIMOS(pico) (GFMesstechnik, Teltow, Germany) and skin-tightness and elasticity were evaluated using the Cutometer MP580 (Courage+Khazaka, Cologne, Germany). Additionally, after the trial, questionnaire data on patient satisfaction with their individual product was collected. Results: The depth of perioral and orbital wrinkles decreased significantly in all groups, with depth reduction ranging between 10% and 20%. Skin-tightness increased significantly in all groups, rising by 13 to 30%. Minimal significant changes in skin-elasticity could only be shown in individual groups. Conclusions: The regular use of hyaluronic-acid containing anti-wrinkle creams for over 3 months showed clear and positive effects on wrinkle-depth and skin-tightness. Due to the design of the study, however, no clear indication on the efficacy of hyaluronic acid could be shown.

S. Wiener, R. Bianchini, P. Matravers, S. Kligman, A. Dahl, S. Schwartz, R. Frumento, **An eight week clinical study evaluating lifting and contouring efficacy of a face cream,** JAAD**,** May 2016, Volume 74, Issue 5, Supplement 1, p. AB13

Facial aging is attributed to the detoriation and descent of cutaneous structures …

G. Maramaldi, **The silky option for natural eye and skin care,** Personal Care May 2016

The skin is made of three components: epidermis, dermis and hypodermis. The epidermis consists of four layers and completely regenerates itself in a 30-day cycle known as skin turnover time. The dermis is the main component of the skin and consists of collagen and elastin, which maintain the firmness and elasticity of skin, respectively, as well as of hyaluronic acid and water. Hyaluronic acid is a jelly-like substance filling gaps between collagen and elastin. Early changes in visco-elastic properties of the skin include sagging and increased extensibility.

F. Perin, **In vivo anti-ageing studies without protocol consensus,** Personal Care May 2016

Life expectancy in most countries has been regularly increasing over the past decades as a result of advances in medicine and economic development. But whereas the world population is ageing, the cult of youth and beauty is constantly glorified by the media. Because our skin (and its appendages) is the only body organ directly visible to others, its deteriorated appearance caused by ageing is a source of concern in many people.

T.J. Stephens, M.I. Sigler, J.H. Herndon Jr, L. Dispensa, A. le Moigne, **A placebo-controlled, double-blind clinical trial to evaluate the effcacy of Imedeen® Time Perfection® for improving the appearance of photodamaged skin**, Clinical, Cosmetic and Investigational Dermatology, March 2016, Volume 9

Objective: To assess the efficacy of Imedeen Time Perfection for improving the appearance and condition of photoaged skin in healthy women. Methods: This randomized, double-blind, placebo-controlled clinical trial enrolled healthy women, 35–60 years of age, with Fitzpatrick I–III and Glogau II–III skin types and mild-to-moderate facial fine lines/wrinkles. The eligible subjects were randomized to receive two tablets daily of either Imedeen Time Perfection (Imedeen) or a matching placebo for 12 weeks. Efficacy assessments included investigator rating of 16 photoaging parameters (ie, global facial appearance and 15 individual facial parameters and the average of all parameters), instrumentation (ie, ultrasound dermal density, moisture level of the stratum corneum, transepidermal water loss, cutometry), and subjects' self-assessment. Differences in the mean change from baseline to week 12 values on these outcomes were compared between Imedeen and placebo using analysis of variance or a paired t-test. Results: Seventy-four subjects with primarily Fitzpatrick skin type III (78%–79%) and Glogau type III (53%–58%) completed the study (Imedeen: n=36; placebo: n=38). The mean difference in change from baseline to week 12 for global facial assessment significantly favored Imedeen over placebo (−0.52; *P*=0.0017). Additionally, the mean differences in the average of all facial photoaging

parameters (−0.29), mottled hyperpigmentation (−0.25), tactile laxity (−0.24), dullness (−0.47), and tactile roughness (−0.62) significantly favored Imedeen over placebo ($P \leq 0.05$). Significantly greater increases in ultrasound dermal density (+11% vs +1%; $P \leq 0.05$) and stratum corneum moisturization (+30% vs +6%; $P \leq 0.05$) were also observed for Imedeen than for placebo. There were no significant differences on other instrumental outcomes. Conclusion: The results of this study suggest that Imedeen Time Perfection can positively affect the appearance of photoaged skin, moisturization, and skin density over 12 weeks of treatment.

L. Brancalion Catapani, A. da Costa Gonçalves, N. Morano Candeloro, L. Aparecida Rossi, E. Caldeira de Oliveira Guirro, **Influence of therapeutic ultrasound on the biomechanical characteristics of the skin**, Journal of Therapeutic Ultrasound (2016) 4:21

Background: Skin function is dependent on its biomechanical characteristics, resistance, malleability, and elasticity. Therapeutic ultrasound may increase cutaneous malleability thus and optimize the rehabilitation process on specific diseases. The aim of this study is to evaluate possible alterations of biomechanical characteristics of the normal skin after therapeutic ultrasound application. Methods: Thirty-one volunteers took part of the study, and the average age was 31.61 ± 8.37 years old. Biomechanical characteristics evaluation of the skin was performed with the Cutometer MPA 580 (Courage + Khazaka Electronic—Köln, Germany) of 2-mm probe hole and 500-mbar vacuum. Skin characteristics were analyzed before and after therapeutic ultrasound application, and the variables R0 (distensibility), R2 (gross elasticity), and R6 (viscoelasticity) were used for the study. Areas of therapeutic ultrasound application (continuous, 3 MHz, 1 W/cm2 SATA) were defined at the upper limbs and standardized using a neoprene template. Sociodemographic data of volunteers were analyzed using SPSS 15.0. To analyze the distribution of the data, the Shapiro-Wilk test was used, which showed the normal distribution for R0 values, R2 and R6. For this procedure, the PROC TTEST from SAS® 9.0 software and Minitab 16 software, with significance, was set at the 0.05 level. Results: In relation to R0, a significant increase ($p = 0.001$) was observed for the distensibility, when compared to values of pre- (0.3273 mm) and immediately post- (0.3795 mm) resource application which feature a greater distensibility. Related to R2 values, a significant increase ($p = .001$) of the gross elasticity at pre- (0.8419) and post- (0.8884) therapeutic ultrasound application was found. Conclusions: Therapeutic ultrasound promotes significant alterations of the biomechanical characteristics of the skin.

V. Mengeaud, **Évaluation de l'effet hydratant, in: A.-M. Pénse-Lhéritier (Editor): Évaluation des produits cosmétiques**, in: A.-M. Pénse-Lhéritier (Editor): Évaluation des produits cosmétiques, Lavoisier Paris, Tec & Doc, chapter 3, p. 32-57, 2016

La peau constitute Einterface principale entre l'environnement extérieur et notre organisme, qui est équipe à son extrême surface d'une très fine couche tissulaire appelée *stratum corneum* (SC) dont la fonction spécifique de «barrière» est indispensable à notre survie terrestre, Elle est non seulement protectrice vis-à-vis des agressions extérieures qu'elles soient physiques, chimiques ou microbiologiques, mais aussi capable de limiter les pertes hydriques corporelles. Ainsi, Tune des fonctions majeures de la peau est d'assurer son rôle de barrière entre l'organisme et le milieu extérieur tout en préservant des échanges avec celui-ci. La fonctionnalité de cette barrière depend donc d'un équilibre dynamique. En effet, au niveau de cette interface, sont mis en jeu des mécanismes régulés de manière dynamique et réactive, qui concourent au maintien d'un milieu interne stable alors que l'environnement extérieur subit des variations: ces mécanismes garantissent l'homéostasie cutanée.

P. Barlier, V. Couturaud, **Évaluation de l'effet antirides et des propriétés biomécaniques**, Lavoisier Paris, Tec & Doc, chapter 4, p. 58-81, 2016

En vieillissant, les organes du corps humain, dont la peau fait partie, se mettent à fonctionner de façon moins efficace. Ce processus, programmé par notre profil génétique, peut être amplifié par l'environnement et par nos habitudes de vie.

A.C. da Silva Marques, **Biometrologic Evaluation of Cosmetic Products**, Dissertation in pharmaceutical sciences at the University of Coimbra, Portugal, 2016

Given the growing importance that cosmetic products have on human's health and in our daily life, it is important to increase the control of these products, both in terms of safety and effectiveness. Taking into account that conducting animal tests for the production and validation of cosmetic products is prohibited by law, producers of these products have to resort to alternative methods. Biophysical methods have gained an important highlight in the scientific community, in particular the non-invasive methods. They allow a safe and faster evaluation of cosmetics. The purpose of this work is to describe some methods and equipments used at national and European level to test the effectiveness of cosmetic products and correlate the parameters evaluated with the alleged properties in the products. The

methods include evaluation tests of the following skin properties: hydration, elasticity, coloring, sebum production and perspiration.

A. Formann, **Eine Interventionsstudie mit dem Nahrungsergänzungsmittel Pycnogenol® und dessen physiologische und molekular-genetischen Auswirkungen auf postmenopausale Frauen,** Dissertation an der medizinischen Fakultät der Heinrich-Heine-Universität, Düsseldorf, 2016

Die Haut ist mit einer Fläche von circa 1,5 bis 2 m² das größte Organ des menschlischen Körpers.

T. Ezure, **Facial Fat as a Key Anti-aging Target,** http://www.cosmeticsandtoiletries.com/research/biology, March 2016

Enormous public and commercial interest exists for treatments that improve aging-related changes in facial morphology. There also are many skin care products designed to improve superficial changes in facial skin, such as fine wrinkles and pigmentation, but few products have been established to address substantial changes such as sagging.

H. Buntrock-Döpke, **Randomisierte doppelblinde Vergleichsuntersuchung eines monophasischen versus eines biphasischen Hyaluronsäurefillers zur Korrektur der Nasolabialfalten**, Dissertation im Fachbereich Chemie, Abteilung Biochemie und Molekularbiologie der Universität Hamburg, März 2016

Hyaluronsäure (HA) hat sich in der ästhetischen Medizin zum "Goldstandard" der injizierbaren Filler entwickelt, sodass ihre intradermale Injektion aktuell zu den am häufigsten eingesetzten minimalinvasiven Verfahren zur Augmentation von Falten, insbesondere der Nasolabialfalten (NLF), zählt. Es gibt jedoch eine große Anzahl an verschiedenen Produkten, die wesentliche Unterschiede im Herstellungsprozess, den damit verbundenen Eigenschaften (z.B. Partikelgröße, Quervernetzungsgrad, Molekulargewicht und HA-Konzentration) sowie ihrem rheologischen und histologischen Verhalten aufweisen. In Abhängigkeit vom Herstellungsprozess werden monophasische und biphasische HA-Filler unterschieden. Während die ausgezeichnete Wirksamkeit und Verträglichkeit von biphasischer NASHATM (Non Animal Stabilized Hyaluronic Acid) hinlänglich bekannt sind, gibt es nur wenige klinische Studien zum Vergleich von biphasischer NASHA und monophasischer CPM®HA (Cohesive Polydensified Matrix). Deshalb war das Ziel der vorliegenden Arbeit, die intraindividuelle in vivo Evaluierung der Langzeiteffekte eines monophasischen CPMHA-Fillers mit denen eines biphasischen NASHA-Fillers auf die Hautphysiologie, Patientenwahrnehmung und Verträglichkeit über 12 Monate darzustellen. In den randomisierten, doppelblinden Halbseitenvergleich wurden 20 Patienten im Alter von 35 bis 65 Jahren mit einer symmetrischen Ausprägung der Nasolabialfalten (WSRS für NLF Grad 3-4) eingeschlossen. Die Patienten wurden einmalig mit einem monophasischen CPMHA-Filler und einem biphasischen NASHA-Filler zu gleichen Injektionsvolumina behandelt; Touch-ups waren nicht erlaubt. Mittels validierter Scores, einem Patientenfragebogen und biophysikalischer Messmethoden wurden 2, 24 und 48 Wochen nach Studienbeginn die Faltentiefe (WSRS, Patientenfragebogen, PRIMOS®) und die ästhetische Verbesserung (GAIS, Patientenfrageboden), der Injektionsschmerz und die Patientenzufriedenheit sowie die Hautelastizität (Cutometrie, Patientenfragebogen) als auch die Hautdicke- und -dichte (Sonographie) erhoben. Zudem wurde die Faltenausprägung (WSRS) anhand standardisierter, verblindeter Fotos durch einen unabhängigen Rater beurteilt. Die Sicherheit der Behandlung wurde durch die Dokumentation unerwünschter und schwerwiegender unerwünschter Ereignisse (UE, SUE) sowie anhand eines Patiententagebuchs erfasst.

T. Venter, L.T. Fox, M. Gerber, J.L. du Preez, S. van Zyl, B. Boneschans, J. du Plessis, **Physical stability and clinical efficacy of Crocodylus niloticus oil lotion**, Revista Brasileira de Farmacognosia 26 (2016), p. 521–529

The stability and the anti-ageing, skin hydrating and anti-erythema effects of a commercialized Crocodylus niloticus Laurenti, 1768, Crocodylidae, oil lotion was determined. The lotion was stored at controlled conditions over six months during which several stability tests were performed. For the clinical efficacy studies lotion was applied on volar forearm skin (female volunteers) and compared to a liquid paraffin-containing reference product. Skin hydrating and anti-ageing effects were determined with a Corneometer®, Cutometer® and Visioscan®, following single (3 h) and multiple applications (12 weeks). The Vapometer® and Mexameter® were utilized to determine this lotion's anti-erythema effects on sodium lauryl sulfate irritated skin. The lotion demonstrated good stability over 6 months. The reference product increased skin hydration and decreased skin wrinkles to a larger extent than the C. niloticus lotion after a single application, whereas the C. niloticus lotion decreased skin scaliness better than the reference product. During the long-term study, the reference product overall increased skin hydration more than the C. niloticus lotion, whereas C. niloticus lotion increased skin elasticity to a larger extent

than the reference product. C. niloticus lotion increased skin wrinkles and decreased skin scaliness over 12 weeks. Compared to non-treated, irritated skin, C. niloticus lotion demonstrated some potential anti-inflammatory characteristics.

J.-C. Kattenstroh, **Einfluss oral zugeführter Kollagen-Peptide auf Hautfeuchtigkeit, Hautelastizitat, Faltenvolumen und Cellulite,** Aesthetische Dermatologie 2/2016

Mit zunehmendem Alter sowie durch aufiere Einfliisse wie UV-Exposition oder Nikotinabusus kommt es zu einer Beeintrachtigung der dermalen extrazellularen Matrix und des Kollagengeriists. Die Folge ist eine Abnahme der Dicke, Elastizitat und Feuchtigkeit der Haut, die mit einer verstarkten Faltenbildung einhergeht. Welchen Einfluss kurzkettige Kollagen-Peptide auf diese Parameter haben, zeigen aktuelle Studien.

R. Eberhart, C.J. Chuona, P. Zimmern, **Exploring biomechanical methods to study the human vaginal wall,** Neurourol Urodvn. 2016 Feb

Aims: To critically review studies of the biomechanical properties of connective tissue in the normal and prolapsed human vaginal wall and to identify criteria that are suitable for in vivo measurements which could improve patient management. Methods: This review covers past and current ex vivo and in vivo instrumentation and analytical methods related to the elastic and viscoelastic properties of vaginal wall connective tissues. Results: Classical methods, including digital evaluation of the vagina, histological and biomechanical studies of fresh and frozen-thawed extracts, and biomechanical cadaveric tissue studies have important limitations and have yielded inconsistent results. Newer biomechanical methods may resolve these inconsistencies. One of the more promising is transient, vacuum-induced tissue expansion and relaxation, via cutometer-like devices. The technique permits noninvasive observation, applicable to longitudinal studies of patients. In vivo and ex vivo biomechanical methods may better match vaginal wall tissue properties to help with the design of surgical mesh materials, thus improving surgical support and healing. Conclusion: Methods have been identified to characterize the in vivo biomechanical behavior of the prolapsing vagina which may serve to advance the care of affected women.

H. Haeusler, **The key to effective skincare: customized hyaluronic acid gels,** NutraCos Cosmetics; January/April 2016

A multi-faceted ingredient: Hyaluronic acid (HA) is a well-established ingredient in various cosmetic products and offers numerous benefits. It controls the proliferation of skin cells via the CD44 receptor and has anti-inflammatory effects of the skin (1). In addition, HA infuences the growth of keratinocytes, which protect the epidermis from aging, and, thanks to the double bond structure of its D-glucuronic acid moiety (2), HA also has antioxidant properties. The molecular weight of HA is a key aspect of product formulation: the smaller molecule, the deeper the penetration (3).

D. Qu, G.P. Seehra, **Improving the accuracy of skin elasticity measurement by using Q-parameters in Cutometer**, J Cosmet Sci. 2016 Jan-Feb; 67(1): p. 37-44

Abstract: The skin elasticity parameters (Ue, Uv, Uf, Ur, Ua, and R0 through R9) in the Cutometer are widely used for in vivo measurement of skin elasticity. Their accuracy, however, is impaired by the inadequacy of the definition of a key parameter, the time point of 0.1 s, which separates the elastic and viscoelastic responses of human skin. This study shows why an inflection point (t(IP)) should be calculated from each individual response curve to define skin elasticity, and how the Q-parameters are defined in the Cutometer. By analyzing the strain versus time curves of some pure elastic standards and of a population of 746 human volunteers, a method of determining the t(IP) from each mode 1 response curve was established. The results showed a wide distribution of this parameter ranging from 0.11 to 0.19 s, demonstrating that the current single-valued empirical parameter of 0.1 s was not adequate to represent this property of skin. A set of area-based skin viscoelastic parameters were also defined. The biological elasticity thus obtained correlated well with the study volunteers' chronological age which was statistically significant. We conclude that the Q-parameters are more accurate than the U and R parameters and should be used to improve measurement accuracy of human skin elasticity.

M. Aust, S. Jamchi, K.-H. Busch, **Platelet-Rich Plasma – Eine minimalinvasive Methode zur Behandlung altender Haut am Unterlid,** Face 1/2016

Nicht nur in den chirurgischen Fachdisziplinen haben Wundheilungsforschung und Regenerationsmedizin immer mehr an Bedeutung gewonnen. Auch in der Ästhetischen Medizin nehmen regenerative Behandlungsmethoden eine immer zentralere Rolle ein. Der Einsatz von

plättchenreichem Plasma stellt eine Erfolg versprechende Ergänzung zur bisherigen Auswahl dieser Möglichkeiten dar, wie insbesondere die Anwendung in der unteren Lidregion zeigt.

G.W. Nam, J.H. Baek, J.S. Koh, J.K. Hwang, **The seasonal variation in skin hydration, sebum, scaliness, brightness and elasticity in Korean females,** Skin Research and Technology 2015; 21: p. 1-8

Background/purpose: Age, gender, regional, and ethnic differences influence skin conditions. The purpose of this study was to obverse the effects of enviroments, especially the air temperature, relative humidity, air pressure, duration of sunshine, and percipitation on skin and the seasonal variation in skin hydration, sebum, scales, brightness, and elasticity in Korean females.

J.C. Bernengo, H. Adhoute, D. Mougin, **Measurement of the time off light of photons into the skin: influence of site, age and gender, correlation with other skin parameters,** Skin Research and Technology 2015; 21: p. 25-34

Background/purpose: The speed of light (time of flight) into the skin is obviously relied to its structure, and might appear as a tool for non-invasive investigation of skin physico-chemical properties, among them aging is of primary importance. Though already piblished, such time of flight measurements have never been extensively correlated with other well-documented skin parameters such as localization, the influence of gender and age, the elasticity and roughness, and the water trans-epidermal diffusion (TEWL).

S.I. Jang, E.J. Kim, H. Park, H.J. Kim, J.M. Suk, B.J. Kim, J.H. Lee, H.K. Lee, **A quantitative evaluation method using processed optical images and analysis of age-dependent changes on nasolabial lines,** Skin Research and Technology 2015; 21: p. 106-206

Background/Purpose: Nasolabial lines (NL) and wrinkles of the face are major features of aging. Wrinkles have been studied widely by morphological methods using 3-dimensional (3D) photographic analysis instrument, but NL were evaluated by visual scoring usually. To evaluate NL quantitatively, another method is needed. This study is purposed to find out quantitative method for evaluating of NL.

G.N. Stamatas, A. Lopes-DaCunha, A. Nkengne, C. Bertin, **Biophysical properties of striae distensae evaluated in vivo using non-invasive assays,** Skin Research and Technology 2015; 21: p. 254-258

Background: Striae Distensae (SD) or stretch marks are manifestations of epidermal atrophy that occurs after tissure tearing due to rapid growth or over-stretching and are characterized by distinct microstructural features. The objective of this in vivo studay was to investigate the biophysical properties of SD lesions, including skin barrier function, skin surface hydration, mechanical properties, and chromophore concentrations, compared to normal adjacent skin.

P. Dykes, **Increase in skin surface elasticity in normal volunteer subjects following the use of copper oxide impregnated socks,** Skin Research and Technology 2015;21:272-277

Background: Copper is an essential mineral involved in the formation and stabilisation of extracellular skin proteins. As copper can be absorbed through intact skin, we reasoned that using socks containing copper-impregnated fibres may have an effect on skin elasticity.

H. Haeusler, **Combinations for better results,** Cossma 12/2015

Hyaluronic acid (HA) is widely used in health and beauty applications. New research indicates some promising new findings for HA gels in topical anti-ageing cosmetics. HA is a well-established ingredient in various cosmetic products and offers numerous benefits. It controls the proliferation of skin cells via the CD44 receptor and has some anti-imflammatory effects on the skin. In addition, it influences the growth of keratinocytes, which protect the epidermis from ageing and, thanks to the double bond structure of its D-glucuronic acid moiety, it also has antioxidant properties.

I. Vervier, C. Bougaran, I. Van Reeth, **Skin tightening boosted in anti-ageing applications,** Personal Care, November 2015

Tight, moisturised skin is a universal symbol of youth and health, and the desire for skin perfection is a global beauty endeavour among consumers. Given the world's ageing population, the market for products that support the vitality and wellbeing of skin at any age can only contuinue to grow.

J-F. Nicolay, E. Coste, M. Fréchet, **Dermal-epidermal junction: a key target for anti-ageing,** Personal Care, November 2015

The dermal epidermal junction (DEJ) is a complex structure (Fig. 1) primarily responsible for epidermis to dermis attachment. The DEJ thus warrants cohesion and mechanical resistance oft he skin. It also behaves as a selective permeability barrier controlling cell migration (immune cells, for example) and molecular exchanges (growth factors and nutrients, stress signals). Epidermal cells' interaction with the DEJ regulates their proliferation, differentiation and migration, which is critical for epidermal renewal, barrier function setup, and wound healing.

A. Tuzuner, S. Akdagli, T. Sen, S. Demirci, N. Tarimci, R. Caylan, **An objective analysis of sebum, pH and moisture levels of the external ear canal skin**, American Journal of Otolaryngology (2015) 424-428

Objective: To determine sebum, pH and moisture levels of external ear canal skin, and compare the patients who complain of ear itching and the normal population for these parameters. And evaluate the improvement subjectively in the ones given dexamethasone sodium phosphate (DSP) cream or placebo-water in oil emulsion type cream, and to determine the changes in sebum, pH and moisture levels after the treatment. Methods: 32 females with the complaint of isolated external ear canal itching and 42 healthy women were included in this randomized prospective controlled study. The sebum, pH and moisture levels of ear skin of the patients and the controls were determined from baseline and following treatment. Patients used DSP in their right and the placebo in their left ears for 15 days. Subjective analysis of itching level was measured at baseline, and on 15th and 30th days using visual analog scale (VAS).

K. von Oppen-Bezalel, **Shielding against pollution for pristine clear skin,** Personal Care November 2015

A major unmet need the cosmetic industry is the effective, natural and safe means to protect and detoxify the skin against environmental pollution to which it is exposed daily. Pollution in general and air pollution specifically have detrimental effects on skin health and apprearance. Constant exposure to environmental toxins leads to accumulated damage in two main ways: DNA damage and chronic imflammation, which over time produces premature signs of ageing.

K. Azevedo Tadini, D. Garcia Mercurio, P.M.B.G. Maia Campos, **Acetyl hexapeptide-3 in a cosmetic formulation acts on skin mechanical properties - clinical study,** Brazilian Journal of Pharmaceutical Sciences, Vol. 51, N. 4, Oct./Dec., 2015

Acetyl hexapeptide-3 has been used in anti-aging topical formulations aimed at improving skin appearance. However, few basic studies address its effects on epidermis and dermis, when vehiculated in topical formulations. Thus, the objective of this study was to determine the clinical efcacy of acetyl hexapeptide-3 using biophysical techniques. For this purpose, formulations with and without acetyl hexapeptide-3 were applied to the ventral forearm and the face area of forty female volunteers. Skin conditions were evaluated after 2 and 4-week long daily applications, by analyzing the stratum corneum water content and the skin mechanical properties, using three instruments, the Corneometer® CM 825, Cutometer® SEM 575 and Reviscometer® RV600. All formulations tested increased the stratum corneum water content in the face region, which remained constant until the end of the study. In contrast, only formulations containing acetyl hexapeptide-3 exhibit a signifcant effect on mechanical properties, by decreasing the anisotropy of the face skin. No signifcant effects were observed in viscoelasticity parameters. In conclusion, the effects of acetyl hexapeptide-3 on the anisotropy of face skin characterize the compound as an effective ingredient for improving conditions of the cutaneous tissue, when used in anti-aging cosmetic formulations.

G. Schlippe; L. Bolke, W. Voss, **Einfluss oraler Einnahme von Kollagen-Peptiden auf relevante Parameter der Hautalterung: Hautfeuchtigkeit, Hautelastizität und Hautrauigkeit,** Aktuelle Dermatologie 2015; 41: 529-534

Zusammenfassung: Mit zunehmendem Alter und unter Einfluss weiterer Noxen, wie UV-Exposition und Nikotinabusus, kommt es zu einer Abnahme der dermalen extrazellulären Matrix und des Kollagengerüsts. Dies führt zu einer Abnahme der Hautdicke, Elastizität und Feuchtigkeit und damit einhergehend zu einer verstärkten Faltenbildung. Studien haben gezeigt, dass die orale Aufnahme von speziellen Kollagen-Peptiden über einen längeren Zeitraum die Hautphysiologie positiv beeinflusst. In der vorliegenden klinisch-dermatologischen Prüfung zeigte die Einnahme von kurzkettigen Kollagen-Peptiden (Prüfpräparat: ELASTEN®) über einen Zeitraum von 3 Monaten signifikant positive und nachhaltige Effekte auf die Hautparameter Elastizität, Feuchtigkeit und Hautrauigkeit.

Abstract: With increasing age, the dermal matrix and collagen content decreases which results in a loss of skin hydration, elasticity and increased wrinkling. In addition to the normal ageing process, several other factors like UV radiation or smoking negatively influence skin physiology. Prior studies

demonstrated that the oral intake of bioactive collagen peptides induces beneficial effects on human skin structure and functioning. In this study the oral intake of special collagen peptides (investigational product: ELASTEN®) for 3 months results in significant and sustainable improvements in skin parameters including skin hydration, elasticity and roughness.

G. Dobos, A. Gefen, U. Blume-Peytavi, J. Kottner, **Weight-bearing–induced changes in the microtopography and structural stiffness of human skin in vivo following immobility periods,** Wound Rep Reg (2015) 23; 37-43

Pressure ulcers (PUs) are injuries to the skin and underlying tissues, caused by sustained deformations and occur frequently in aged patients. Skin microtopography and stiffness affect the interaction of skin with contact surfaces contributing to PU development. We simulated immobility in 20 healthy females (mean age 69.9 years). Skin microtopography and stiffness were measured at the PU predilection sites before and after loading. Skin roughness decreased at the heels by 18.1% after 90 minutes (p50.022), but remained unchanged at the sacrum and the upper back. Structural elasticity and elastic deformations increased at all skin areas; changes over time were significant at the sacrum (p50.005) and the heel, (p50.002). The residual skin deformation increased at all skin areas after loading significantly at the sacrum (32.0%, p50.013) and upper back (20.6%, p50.007). The structural "biological" elasticity of the skin decreased significantly at the upper back after loading, but remained unchanged at the heels. All skin changes recovered after unloading. Results indicate that prolonged loading causes structural skin changes in humans in vivo in PU predilection sites. The pathogenesis of PUs is different at the heels, the sacral and upper back skin.

G. Schlippe, L. Bolke, W. Voss, **Einfluss oraler Einnahme von Kollagen-Peptiden auf relevante Parameter der Hautalterung: Hautfeuchtigkeit, Hautelastizitat und Hautrauigkeit,** Akt Dermatol 2015; 41: p. 529-534

Mit zunehmendem Alter und unter Einfluss weiterer Noxen, wie UV-Exposition und Nikotinabusus, kommt es zu einer Abnahme der dermalen extrazellularen Matrix und des Kollagengerusts. Dies führt zu einer Abnahme der Hautdicke, Elastizitat und Feuchtigkeit und damit einhergehend zu einer verstarkten Faltenbildung. Studien haben gezeigt, dass die orale Aufnahme von speziellen Kollagen-Peptiden über einen langeren Zeitraum die Hautphysiologie positiv beeinflusst. In der vorliegenden klinisch-dermatologischen Priifung zeigte die Einnahme von kurzkettigen Kollagen-Peptiden (Prüfpraparat: ELASTEN®) über einen Zeitraum von 3 Monaten signifikant positive und nachhaltige Effekte auf die Hautparameter Elastizitat, Feuchtigkeit und Hautrauigkeit.

K.L.M. Gardien, R.E. Marck, M.C.T. Bloemen, T. Waaijman, S. Gibbs, M.M.W. Ulrich, E. Middelkoop, **Outcome of Burns Treated with Autologous Cultured Proliferating Epidermal Cells: A Prospective Randomized Multicenter Intra-Patient Comparative Trial,** Cell Transplantation, 2015

Standard treatment for large burns is transplantation with meshed split skin autograft (SSG). A disadvantage of this treatment is that healing is accompanied by scar formation. Application of autologous epidermal cells (keratinocytes and melanocytes) may be a suitable therapeutic alternative, since this may enhance wound closure and improve scar quality. A prospective, multicenter randomized clinical trial was performed in 40 adult patients with acute full thickness burns. On two comparable wound areas, conventional treatment with SSG was compared to an experimental treatment consisting of SSG in combination with cultured autologous epidermal cells (EC) seeded in a collagen carrier. Primary outcome measure was wound closure after 5-7 days. Secondary outcomes were safety aspects and scar quality measured by graft take, scar score (POSAS), skin colorimeter (DermaSpectrometer®) and elasticity (Cutometer®). Wound epithelialization after 5-7 days was significantly better for the experimental treatment (71%) compared to the standard treatment (67%) (p=.034, Wilcoxon), whereas the take rates of the grafts were similar. No related adverse events were recorded. Scar quality was evaluated at 3 (n=33) and 12 (n=28) months. The POSAS of the observer after 3 and 12 months and of the patient after 12 months were significantly better for the experimental area. Improvements between 12 and 23% (p≤.010, Wilcoxon) were detected for redness, pigmentation, thickness, relief and pliability. Melanin index at 3 and 12 months and erythema index at 12 months were closer to normal skin for the experimental treatment than for conventional treatment (p ≤ 0.025 paired samples T-test). Skin elasticity showed significantly higher elasticity (p=.030) in the experimental area at 3 months follow-up. We showed a safe application and significant improvements of wound healing and scar quality in burn patients after treatment with EC versus SSG only. The relevance of cultured autologous cells in treatment of extensive burns is supported by our current findings.

A. Sakata, K. Abe, K. Mizukoshi, T.Gomi, I. Okuda, **Breakthrough in improving the skin sagging with focusing on the subcutaneous tissue structure, retinacula cutis,** IFSCC 2015 Zurich

Skin sagging is one of the most prominent aging signs and a concerning issue for people over middle age. Although many cosmetic products are challenging the reduction of the skin sagging by improving the dermal elasticity, which decreases with age, the effects are insufficient for giving drastic changes to the facial morphology. This study focused on subcutaneous tissue for investigating a skin sagging mechanism. Subcutaneous tissue consists of predominantly adipose tissue with fibrous network structures, called retinacula cutis (RC), which is reported to have a possibility to maintain the soft tissue structure and morphology. This study investigated the effect of subcutaneous tissue physical1property alteration due to RC1deterioration on the skin sagging. For evaluating RC structure noninvasively, the tomographic images of faces were obtained by magnetic resonance (MR) imaging. Subcutaneous tissue network structures observed by MR imaging were indicated to be RC by comparing MR images and the histological specimens of human skin. The density of RC was measured by image analysis. For evaluating sagging degree and physical properties of the skin, sagging scoring and the measurement of elasticity of deeper skin layers were performed. The density of RC was correlated with the elasticity data of deeper skin layers, and the sagging scores tended to increase with decreasing the density. These results suggested that the sparse RC structure gave a decrease in the elasticity of subcutaneous tissue layer, which consequently would be the cause of facial sagging. This study would be a pathfinder for the complete elimination of skin sagging.

S.-H. Bae, J.-J. Park, E.-J. Song, J.-A. Lee, H.-J. Kim, B. Kim, N.-S. Kim, G.-S. Choi, T.-K. Moon, **The comparison of the melanin content and UV exposure affecting aging process: seven countries in Asia,** IFSCC 2015 Zurich

Background: The skin brightness is determined according totheamount and typeofmelanin. People with darker skin have a greater amount of melanin that makes their skin less susceptible to UV damages. They live in lower latitude and receive a greater amount of the intensity of the UV radiation. So, we wanted to know how the latitude and skin brightness affect skin aging. Method: Three thousand subjects from seven countries (Korea, China, India, Thailand, Vietnam, Indonesia, and Malaysia), aged 20-59 years, participated in this study.We measured skin brightness, Ra (wrinkles parameter), and R2 (elasticity parameter) under controlled environmental conditions.

L. Phetcharat, K. Wongsuphasawat, K. Winther, **The effectiveness of a standardized rose hip powder, containing seeds and shells of *Rosa canina*, on cell longevity, skin wrinkles, moisture, and elasticity,** Clinical Interventions in Aging 2015:10, p. 1849–1856

Objective: To evaluate the effects of a rose hip powder (Hyben Vital®) made from seeds and shells on cell senescence, skin wrinkling, and aging. Methods: A total of 34 healthy subjects, aged 35–65 years, with wrinkles on the face (crow'sfeet) were subjected to a randomized and double-blinded clinical study of the effects of the rose hip powder, as compared to astaxanthin, a well-known remedy against wrinkles. During the 8-week study, half of the participants ingested the standardized rose hip product, while the other half ingested astaxanthin. Objective measurements of facial wrinkles, skin moisture, and elasticity were made by using Visioscan, Corneometer, and Cutometer at the beginning of the study, after 4 weeks, and after 8 weeks. Evaluation of participant satisfaction of both supplements was assessed using questionnaires. In addition, the effect of the rose hip preparation on cell longevity was measured in terms of leakage of hemoglobin through red cell membranes (hemolytic index) in blood samples kept in a blood bank for 5 weeks. Signifcance of all values was attained with *P*#0.05. Results: In the double-blinded study, the rose hip group showed statistically signifcant improvements in crow's-feet wrinkles (*P*,0.05), skin moisture (*P*,0.05), and elasticity (*P*,0.05) after 8 weeks of treatment. A similar improvement was observed for astaxanthin, with *P*-values 0.05, 0.001, and 0.05. Likewise, both groups expressed equal satisfaction with the results obtained in their self-assessment. The rose hip powder further resulted in increased cell longevity of erythrocyte cells during storage for 5 weeks in a blood bank. Conclusion: Results suggest that intake of the standardized rose hip powder (Hyben Vital®) improves aging-induced skin conditions. The apparent stabilizing effects of the rose hip product on cell membranes of stored erythrocyte cells observed in this study may contribute to improve the cell longevity and obstructing skin aging.

R.C. Killaars, T.R. Penha, E.M. Heuts, R.R. van der Hulst, A.A. Piatkowski, **Biomechanical Properties of the Skin in Patients with Breast Cancer Related Lymphedema Compared to Healthy Individuals**, Lvmphat Res Biol. 2015 Sep;13(3): p. 215-21

Background: Biomechanical skin changes in breast cancer-related lymphedema (BRCL) have barely been described and objectively tested. This study aims to compare the skin of upper limb lymphedema with skin of the healthy contralateral arm, in order to demonstrate changes of elasticity, viscoelasticity, and level of hydration of the skin in BCRL. The secondary aim is to investigate the correlation between biomechanical skin changes and measurements that are currently used in clinical

practice, such as volume measurement and lymph-ICF score. Methods and Results**:** Eighteen patients with BCRL and 18 healthy individuals were included in the study. A Cutometer® was used for measurements for skin elasticity and viscoelasticity on both arms of each subject. A Corneometer® was used for measurements of skin hydration. Measurements of both test groups were compared. In BCRL patients, there was a significant difference (p=<0.028) between the elasticity of the skin of the lymphedema arm compared to the healthy contralateral arm. There were no significant differences for level of skin hydration or viscoelasticity in lymphedema patients between the measurements on the skin of the lymphedematous and healthy arm. In healthy individuals, there were no significant differences for all measurements between skin of both arms. Spearman's correlation was significant (p=<0.01) for difference in volume and difference in elasticity in BCRL patients. Conclusion: This study shows an impaired elasticity for the skin of the lower arm in patients with lymphedema compared to the contralateral healthy arm. Promising evidence is suggested for the use of the Cutometer device in the diagnostic evaluation of BCRL.

F. Hashmi, C. Wright, C. Nester, S. Lam, **The reliability of non-invasive biophysical outcome measures for evaluating normal and hyperkeratotic foot skin**, Journal of Foot and Ankle Research (2015) 8:28

Background: Hyperkeratosis of foot skin is a common skin problem affecting people of different ages. The clinical presentation of this condition can range from dry flaky skin, which can lead to fissures, to hard callused skin which is often painful and debilitating. The purpose of this study was to test the reliability of certain non-invasive skin measurement devices on foot skin in normal and hyperkeratotic states, with a view to confirming their use as quantitative outcome measures in future clinical trials. Methods: Twelve healthy adult participants with a range of foot skin conditions (xerotic skin, heel fissures and plantar calluses) were recruited to the study. Measurements of normal and hyperkeratotic skin sites were taken using the following devices: Corneometer® CM 825, Cutometer® 580 MPA, Reviscometer® RVM 600, Visioline® VL 650 Quantiride® and Visioscan® VC 98, by two investigators on two consecutive days. The intra and inter rater reliability and standard error of measurement for each device was calculated. Results: The data revealed the majority of the devices to be reliable measurement tools for normal and hyperkeratotic foot skin (ICC values > 0.6). The surface evaluation parameters for skin: SEsc and SEsm have greater reliability compared to the SEr measure. The Cutometer® is sensitive to soft tissue movement within the probe, therefore measurement of plantar soft tissue areas should be approached with caution. Reviscometer® measures on callused skin demonstrated an unusually high degree of error. Conclusions: These results confirm the intra and inter rater reliability of the Corneometer®, Cutometer®, Visioline® and Visioscan® in quantifying specific foot skin biophysical properties.

M. Held, J. Rothenberger, D. Tolzmann, W. Petersen, H.-E. Schaller, A. Rahmanian-Schwarz, **Alteration of Biomechanical Properties of Skin During the Course of Healing of Partial-thickness Wounds,** Wounds 2015; 27(5): p. 123-128

The incidence of partial-thickness wounds is high and, until recently, little was known about the alteration of the biomechanical properties of the skin in these wounds during the course of healing. The aim of this study was to demonstrate the biomechanical changes in skin elasticity. Materials and Methods: Fourteen standardized skin defects were created on the back of fourteen adult male Lewis rats (Charles River Laboratories International, Inc, Wilmington, MA) using a skin dermatome. Biomechanical properties of the skin were determined every 10 days over a period of 3 months using a skin elasticity measurement device (Cutometer MPA 580, Courage and Khazaka, Cologne, Germany). Calculated elasticity (UE), firmness of skin (R0), and overall elasticity (R8) were assessed. In addition, histological evaluation was performed in regard to quality of skin. Results: After an initial decrease of UE, R0, and R8 until 30 days after surgery, the values of R0 and R8 increased between day 50 and day 60. Starting on day 60, a further decrease of values was indicated. Conclusion: The alteration of biomechanical properties of skin is a function of tissue structure. The presented results demonstrate the complex changes of skin biomechanical properties in the course of healing of partial-thickness wounds. This study could serve as a model to compare the effectiveness of different wound dressings in regard to skin elasticity. Acute trauma, burn injuries, and chronic diseases often lead to skin defects. Partial-thickness skin defects play an important role in wound management because of their high incidence. These wounds are commonly treated with a broad range of wound dressings1-6 that protect the wound from further damage, promote healing, improve functional and aesthetic outcomes, and reduce hospitalization time and medical costs.7 Wound dressings imitate important features of natural skin, such as the releasing of water vapor, acting as a microbial barrier, and providing elasticity8 to accelerate epithelialization and wound healing while avoiding dehydration of the wounds. Every type of wound, whether acute, chronic, dry, or moist, requires a specific kind of dressing.9 Synthetic as well as biological

substances, such as collagen, are used for wound coverage.10 The choice of the best wound dressing is still challenging and an objective determination of the outcomes is difficult. Skin elasticity and skin plasticity are indicators for biological age of skin. Changes in biomechanical properties of skin may be due to trauma, ultraviolet light, mechanical and chemical strain, nicotine, alcohol, genetic predispositions, diseases, and others. Stiff and clustered networks of collagen and elastic fibers may influence skin quality.11 Many factors may influence wound healing, and thus also influence the quality of newly formed skin. The authors think choice of wound dressing is a major factor that influences skin quality. In this context, the aim of the present study was to demonstrate the process of changes in biomechanical properties of skin during the course of healing of partial-thickness wounds.

J.M. Gillbro, E. Merinville, K. Cattley, T. Al-Bader, E. Hagforsen, M. Nilsson, A. Mavon, **In vivo topical application of acetyl aspartic acid increases fibrillin- 1 and collagen IV deposition leading to a significant improvement of skin firmness,** International Journal of Cosmetic Science, 2015, 37 (Suppl. 1), p. 41–46

Objective: Acetyl aspartic acid (A-A-A) was discovered through gene array analysis with corresponding Cmap analysis. We found that A-A-A increased keratinocyte regeneration, inhibited dermal matrix metalloprotease (MMP) expression and relieved fibroblast stiffness through reduction of the fibroblast stiffness marker F-actin. Dermal absorption studies showed successful delivery to both the epidermal and dermal regions, and in-use trial demonstrated that 1% A-A-A was well tolerated. In this study, the aim was to investigate whether A-A-A could stimulate the synthesis of extracellular matrix supporting proteins in vivo and thereby improving the viscoelastic properties of human skin by conducting a dual histological and biophysical clinical study. Method: Two separate double-blind vehicle-controlled in vivo studies were conducted using a 1% A-A-A containing oil-in-water (o/w) emulsion. In the histological study, 16 female volunteers (>55 years of age) exhibiting photodamaged skin on their forearm were included, investigating the effect of a 12-day treatment of AA-A on collagen IV (COLIV) and fibrillin-1. In a subsequent pilot study, 0.1% retinol was used for comparison to A-A-A (1%). The biomechanical properties of the skin were assessed in a panel of 16 women (>45 years of age) using the standard Cutometer MPA580 after topical application of the test products for 28 days. The use of multiple suction enabled the assessment of F4, an area parameter specifically representing skin firmness. Results: Twelve-day topical application of 1% A-A-A significantly increased COLIV and fibrillin with 13% and 6%, respectively, compared to vehicle. 1% A-A-A and 0.1% retinol were found to significantly reduce F4 after 28 days of treatment by 15.8% and 14.7%, respectively, in the pilot Cutometer study. No significant difference was found between retinol and A-A-A. However, only A-AA exhibited a significant effect vs. vehicle on skin firmness which indicated the incremental benefit of A-A-A as a skin-firming active ingredient. Conclusion: In this study, we showed the in vivo efficacy of 1% A-A-A both on a protein level (fibrillin and collagen IV) and on a clinical end point, specifically skin firmness, providing proof that, acetyl aspartic acid has a strong potential as an anti-ageing 'cosmeceutical' ingredient answering the needs of our key consumer base.

A. Colombin, M. Valange Comhaire, N. Frasson, I. Almeras, **Proposition of Standardization of the Conditions of Use of the Cutometer to Define the Mechanical properties of the Burned Skin**, Annals of Burns and Fire Disasters, Vol. XXVIII, Supplement EBA, September 2015

The lack of recognized tests in burn treatment in France entails difficulties to prove scientifically the interest and the efficiency of our care. The deviate use of the cutometer which is a measuring device initially planned for aesthetic care and dermatological research, could allow to obtain objective, reproducible data and non observer depending in burn treatment. The cutometer allows, thanks to a light, painless and non invasive punctiforme suction, to obtain precise characteristics on the mechanical properties of the cutaneous tissue. That is, resistance, elasticity, rate of hydration, scar quality... So, we hope to demonstrate our techniques, compare their efficiency and wonder about our practices to guarantee the best results. The reproducibility of the measures requires a specific installation and preparation of the cutaneous tissue. The specific burn care provided may disturb the results and every criteria must be determined: time after hydration, deadline after the care, aftereffect of the pressure garments, waiting time after their withdrawal... Thereby, we chose clearly the criteria of installation and determined the standardization of the conditions of use of the cutometer applied on our burn patients. We wish by this presentation to spread this new protocol and uniformise the researches resulting of different burn units.

S. Leoty-Okombi, F. Trombini, C. Bonnaud-Rosaye, V. André-Frei, **Collrepair DG – Anti-Ageing-Wirkstoff mach 20 Jahre Hautglykation rückgängig,** SOFW-Journal 141 - 09/2015

Mit Collrepair DG ist BASF ein revolutionärer Durchbruch im Bereich der Deglykation und der Beseitigung von AGEs (Advanced Glycation End Products) gelungen. AGEs bilden sich während

unseres Alterungsprozesses, und es kommt mit der Zeit zu AGE-Ansammlungen. Collrepair GD ist jedoch in der Lage, glykierte Verknüpfungen sowohl intrazellulär in den Fibroblasten als auch extrazellulär innerhalb der Haut aufzuspalten. Klinisch nachgewiesen wurde, dass Collrepair DG AGE-Ansammlungen entfernt, die in etwa einem Zeitraum von 20 Jahren entsprechen, und darüber hinaus eine etwa 17 Jahren entsprechende Gelbfärbung der Haut rückgängig machen und die Hautelastizität verbessern kann. Collrepair DG ist sowohl in Wasser als auch in Glykol löslich und für den Einsatz in Cremes, Lotionen und Tonika geeignet.

H. Haeusler, **Wirksamkeit eines Hyaluronsäure Gels zur Verbesserung des Hautbildes**; SOFW-Journal 141 - 09/2015

Zusammenfassung: Hyaloronsäure wird schon seit langer Zeit in diversen Anti-Aging-Produkten eingesetzt. Hierbei unterscheidet man die Hyaloronsäuren nach ihren Molekulargewichten. Es ist bekannt, dass Hyaloronsäuren mit molekularen Massen <200 kDa aktiv an der zellulären Signalübertragung mitwirken und dabei auch die extrazelluläre Matrix gestalten. Letztlich beeinflusst Hyaloronsäure das Wachstum von Keratinozyten, Zellen, die die Oberhaut vor Alterung schützen.

C. Trojahn, G. Dobos, A. Lichterfeld, U. Blume-Peytavi, .J. Kottner, **Characterizing Facial Skin Ageing in Humans: Disentangling Extrinsic from Intrinsic Biological Phenomena,** BioMed Research International, Volume 2015

Facial skin ageing is caused by intrinsic and extrinsic mechanisms. Intrinsic ageing is highly related to chronological age. Age related skin changes can be measured using clinical and biophysical methods. Te aim of this study was to evaluate whether and how clinical characteristics and biophysical parameters are associated with each other with and without adjustment for chronological age. Twenty-four female subjects of three age groups were enrolled. Clinical assessments (global facial skin ageing, wrinkling, and sagging), and biophysical measurements (roughness, colour, skin elasticity, and barrier function) were conducted at both upper cheeks. Pearson's correlations and linear regression models adjusted for age were calculated.

A randomized home use study in two parallel groups, consisting of 30 healthy subjects aged 35-70, to assess the efficacy of one anti-wrinkle regimen compared to a placebo regimen, Princeton Consumer Research Report 2015

The objective of this study was to determine the efficacy of an anti-wrinkle regimen when compared to a placebo regimen, and to demonstrate the overall improvement/deterioration in skin condition following two, four, and eight weeks of test article use.

A Double-blind, home-use study in approximately 45 healthy volunteers with aging, non-firm skin to assess the efficacy of different treatment dosages of vitamin C dietary supplement compared to a control group, Princeton Consumer Research Report 2015

A home-use study in 41 healthy volunteers with ageing, non-firm skin to assess the efficacy of different treatment dosages of a Vitamin C dietary supplement compared to a placebo control group. At Week 0 Subjects underwent cutometry and profilometery assessments on the peri-orbital area of the face, after which they were issued with an instruction sheet, diary cards and their group allocated product regime. Subjects were asked to use the article supplied to them as per the usage instructions with one sachet to be taken in the morning, one in the day, and one in the evening. 4 subjects in each group underwent DIC (Digital Image Capture). At weeks 4, 8 and 12 subjects returned to the study centre for further Cutometery and Profilometery assessments. The same 4 subjects of each group underwent further DIC. At Week 16 Subjects returned to the Test Centre on where they underwent post-treatment cutometry and profilometery assessments. Final DIC was undertaken on the 4 selected subjects of each group. Subjects then returned their completed diary cards and were compensated for their time. Individual scores, mean scores and standard deviations for cutometry and profilometery assessments at Weeks 0, 4, 8, 12 and 16 are presented in this report for the forty-one subjects who completed the study. It can be concluded that both treatment groups A and C showed statistically significant increases in skin firmness at all time-points and reduced the appearance of fine lines and wrinkles. Treatment group B showed no statistical change for any assessment type.

L. Tadlock, S. Rapaka, R. Wattenberg, N. Koski, M. Kearney, C. Jauquet, K. Wisuri, K. Ortblad, G. Peterson, **Evaluation of a Sonic Applicator on Skin Elasticity and Wrinkles Compared to Manual Application and Performance With Two Eye Care Products**, Pacific Bioscienses Laboratories, Product Information

Pacific Bioscience Laboratories, Inc. has developed a sonic applicator that is a handheld, rechargeable infusion system used for applying cosmetic skincare products. The sonic applicator is

designed using a magnetic motor that generates sonic pulses (at over 7500 times per minute) to move a soft applicator in a gentle massaging motion over the skin surface. Skin care products such as eye creams and serums are applied to the concave surface of the applicator and placed lightly on the skin surface. When the sonic applicator is turned on, users slowly move the applicator tip over the skin surface in small circles or figure eight movements around the eye area (e.g. crow's feet and under eye area).

D. Tran, J.P. Townley, T.M. Barnes, K.A Greive, **An antiaging skin care system containing alpha hydroxy acids and vitamins improves the biomechanical parameters of facial skin,** Clinical, Cosmetic and Investigational Dermatology 2015:8, p. 9–17

Skin aging is the result of both intrinsic aging due to the passage of time, and extrinsic aging as a consequence of environmental damage, primarily due to ultraviolet (UV) irradiation. The fne wrinkles and reduced elasticity which characterize intrinsically aged skin are exaggerated in photoaged skin, with the development of deep wrinkles and a marked loss of elasticity, as well as dryness, roughness, and dyspigmentation. Wrinkles impair the quality of life for many people due to their perceived unsightly appearance. The demand for cosmeceutical products in the US alone is expected to increase 5.8 percent per annum to $8.5 billion in 2015, driven by an aging population seeking to maintain the appearance of youth. In the mid-1990s, the antiaging effects of alpha hydroxy acids (AHAs) were recognized by the cosmeceutical industry leading to a proliferation of AHA-containing antiaging products.

Shields against pollution for pristine clear skin, IBRPristinizer® Product Information

Pollution in general and air pollution specifically affect skin health and appearance. Constant exposure to environmental toxins leads to accumulated damage to DNA and to chronic inflammation. Both leading to premature signs of aging. Preventing damage from pollutant, detoxifying them and enhancing skin ability to defend itself against pollution, is a major unmet need of the cosmetic industry we are trying to answer with the IBR-Pristinizer®.

V. Cogorno Wasylkowski, **Body vectoring technique with Radiesse® for tightening of the abdomen, thighs, and brachial zone**, Clinical, Cosmetic and Investigational Dermatology 2015:8, p. 267–273

Background: The objective of this study was to investigate the effcacy, safety, and subject satisfaction of the calcium hydroxylapatite-based dermal fller Radiesse® in a novel body vectoring technique to correct skin flaccidity in the thighs, abdomen, and brachial zones.Methods: Female subjects with self-evaluated flaccidity scores $3 on a 6-point scale (0, no flaccidity; 5, very severe flaccidity) in the zones of interest were included. Radiesse was injected according to predesigned vector maps (3 mL per thigh, 1.5 mL per hemiabdomen or brachial zone). Clinical assessments (skin density and thickness) were made by an independent reviewer at an exact position before and 5 weeks after treatment using a cutometer and an ultrascan. Subjects rated skin flaccidity before and 5 weeks after treatment on the 6-point scale and performed a pinch test to self-assess changes in skin thickness. All adverse events were recorded. Results: Twenty females (aged 28–67 years) were enrolled, contributing 36 treatment zones. Across all zones, 78% of flaccidity measurements improved after treatment. Improvements in skin flaccidity were most common in the thighs (82% of cases). An improvement in skin density versus baseline was observed in the majority across all zones, most frequently in the abdomen (88% of cases). Skin thickness in each zone also improved versus baseline for the majority, most frequently in the thighs (88% of cases). Mean self-assessed flaccidity scores at baseline were 3.6 (thighs), 3.7 (abdomen), and 3.8 (brachial zone), and 2.6, 2.7, and 3.0, respectively, posttreatment. All subjects reported a positive pinch test. In total, 47.0% of subjects had bruising after treatment, which resolved within a week. No serious adverse events were reported. Conclusion: Using this novel technique, Radiesse® had notable results on skin flaccidity, density and thickness in the thighs, abdomen, and brachial zones, and was well tolerated.

M. Mehrbani, R. Choopani, A. Fekri, M. Mehrabani, M. Mosaddegh, M. Mehrabani, **The efficacy of whey associated with dodder seed extract on moderate-to-severe atopic dermatitis in adults: A randomized, double-blind, placebo-controlled clinical trial**, J Ethnopharmacol, 2015 Aug 22;172: p. 325-32

Ethnopharmacological Relevance: Atopic dermatitis is a common chronic inflammatory skin condition that is on the rise and adversely affects quality of life of the affected individual. Dry skin and pruritus, major characteristics of this disease, are associated with the dysfunction of the skin barrier. Though mild cases of the disease can be controlled with antihistamines and topical corticosteroids, moderate-to-severe cases often require treatment with immunomodulatory drugs, which have many side effects. It is now more common to use complementary and alternative medicines in the treatment of

atopic dermatitis. In traditional Iranian medicine, the use of whey with the aqueous extract of field dodder (Cuscuta campestris Yunck.) seeds in severe and refractory cases of atopic dermatitis is common and has no side effects. The aim of this study was to assess the efficacy and safety of whey associated with dodder seed extract in the treatment of moderate-to-severe atopic dermatitis in adults. Materials and Methods: The study was a randomized, double-blind placebo control trial that was conducted on 52 patients with moderate-to-severe atopic dermatitis for 30 days. In this study patients received freeze dried whey powder with spray dried water extract of field dodder or the placebo for 15 days. At baseline (week zero), after the end of the 15 day treatment period (week three) and 15 days after stopping the drug or placebo (follow-up/week five), patients were evaluated in terms of skin moisture, elasticity, pigmentation, surface pH and sebum content on the forearm with Multi Skin Test Center® MC1000 (Courage & Khazaka, Germany) and the degree of pruritus and sleep disturbance in patients were also recorded. Results: 42 patients completed 30 days of treatment with the medicine and the follow-up period. At the end of the follow-up period a significant increase in skin moisture and elasticity in the group receiving whey with dodder was observed compared with the placebo group ($p<0.001$). There was a significant difference between the two groups regarding the pruritus after 15 days of receiving treatment or the placebo ($p<0.05$), and at the end of the 30-day study period the difference was clearly significant ($p<0.001$). Sleep disturbance showed significant changes at the end of follow-up period ($p<0.05$). There was no significant difference between the two groups concerning changes in skin pigmentation, however, a significant decrease was observed in the group receiving whey associated with dodder seed extract over time ($p<0.001$). There were no significant alterations in skin surface pH and the amount of sebum between the two groups. Temporary side effects were reported including anorexia and mild gastrointestinal problems in drug use. It is noteworthy that in this study despite the fact that patients received whey with dodder for just 15 days, moisture and elasticity of the skin continued to increase in the second half of the study (follow-up period). This shows that the effect of whey with dodder is not transient and this drug really helped skin barrier reconstruction and accelerated the healing process of skin. This positively influenced the skin parameters and consequently the improvement of pruritus and sleep disturbance. Conclusions: The results indicate that whey associated with dodder seed extract can serve as a promising alternative for the treatment of moderate-to-severe atopic dermatitis.

J.P. Bonaparte, D. Ellis, **Alterations in the Elasticity, Pliability, and Viscoelastic Properties of Facial Skin After Injection of Onabotulinum Toxin A**, Facial Plastic Surgery, July/August 2015, Volume 17, Number 4

Importance: This prospective cohort study provides evidence and information on the mechanism of action of onabotulinum toxin A on the reduction of skin elasticity and pliability. Understanding the natural course that onabotulinum toxin A has on the elasticity of skin may help physicians understand why there appears to be a progressive reduction in wrinkle levels with repeated treatments. Objective: To determine whether onabotulinum toxin A increases skin pliability and elasticity with a corresponding decrease in the contribution of the viscoelastic component of skin resistance. Design, Setting, and Participants: From October 1, 2012, through June 31, 2013, this prospective cohort study enrolled 48 onabotulinum toxin A–naive women (mean [SD] age, 55.2 [11.3] years) with a minimum of mild wrinkle levels at the glabella and lateral orbit (43 completed the study). Patients were treated at a private cosmetic surgery clinic with onabotulinum toxin A and assessed at baseline and 2 weeks, 2 months, 3 months, and 4 months after injection. Interventions: Standardized onabotulinum toxin A was administered to patients' glabella, supraorbit, and lateral orbit. Main Outcome and Measures: Skin pliability, elastic recoil, and the ratio of viscoelastic resistance (Uv) to elastic resistance (Ue). Results: For the supraorbit, there was a significant effect of time on pliability ($F = 20.5$), elastic recoil ($F = 6.92$), and Uv/Ue ratio ($F = 5.6$) ($P < .001$ for all). For the glabella, there was a significant effect of time on pliability ($F = 32.23$), elastic recoil ($F = 31.66$), and Uv/Ue ratio ($F = 10.11$) ($P < .001$ for all). For the lateral orbit, there was a significant effect of time on pliability ($F = 15.83$, $P < .001$), elastic recoil ($F = 11.43$, $P < .001$), and Uv/Ue ratio ($F = 10.60$, $P = .009$). Conclusions and Relevance: This study provides further evidence that there is an alteration in biomechanical properties of the skin after injection with onabotulinum toxin A. This effect appears to last up to 4 months in the glabella and up to 3 months at other sites. The decrease in the Uv/Ue ratio suggests onabotulinum toxin A injection does not result in an increase in tissue edema suggestive of an inflammatory reaction within the skin. However, it remains unclear whether this is due to an intrinsic property of the medication or another unrecognized mechanism. Level of Evidence: 2.

O. Zillich, **Herstellung und Bewertung kosmetischer Emulsionen mit pflanzlichen Polyphenolen. Studien zur Freisetzung, Stabilität und Wirksamkeit**, Dissertation an der Fakultät für Mathematik, Informatik und Naturwissenschaften Fachbereich Chemie der Universität Hamburg, Juli 2015

Im Rahmen der vorliegenden Arbeit wurde am Beispiel eines Modellgemisches aus verschiedenen Polyphenolklassen, die in Traubentrester erhalten sind, deren möglichen Einsatz in kosmetischen Emulsionen gezeigt. Die phenolischen Verbindungen wurden charakterisiertund unter Beachtung von Emulsionseigenschaften, Stabilität, Polyphenolfreisetzung, Hautpermeation und Wirkung auf die Haut in die Emulsionen eingearbeitet. Die untersuchten Polyphenole zeigten hoch potente, antioxidative Eigenschaften. Dabei wurden mögliche potenzielle Schutzmechanismen für die Haut gezeigt: hohe Radikalfängeraktivität (TEAC von 1,2 bis 6 µM Trolox/µM) deuten auf die Fähigkeit der Polyphenole hin, die destruktiven Reaktionen freier Radikale in der Hautgewebe zu hemmen. Die Hemmung der Lipidoxidation (Verlängerung der Induktionsperiode in 1,2 bis 2,4 Mal) konnte als Indiz für eine mögliche Schutzwirkung von phenolischen Substanzen auf die hauteigene Lipide wie beispielsweise Ceramide und Fettsäuren in der Epidermis gewertet werden und zeigte zudem eine protektive Wirkung auf ölhaltige kosmetische Formulierungen während der Lagerung. Für die Hautpermeationsuntersuchungen wurde eine Methode zur Analyse von Polyphenolen in Schweinehaut entwickelt, die eine Wiederfindungsrate von über 90 % für Quercetin, Protocatechusäure und Rutin gewährleistete. Unabhängig vom angewandten Extraktionsprotokoll konnte eine keine vollständige Extraktion von EGCG und Catechin erreicht werden. Möglicherweise sind die hochreaktiven Polyphenole anfällig für Oxidation und können stark mit hauteigenen Proteinen bzw. Enzymen interagieren, was allerdings eine Minderung der antioxidativen Aktivität zur Folge hätte. Außerdem wurde mit einer wässrigethanolischen Lösung (50/50, v/v) von Tween 20 (5 g/L) eine optimale Zusammensetzung der Rezeptorflüssigkeit ausgewählt, bei der keine Limitierung von Freisetzungs- bzw. Permeationsraten auftreten sollten. Die Untersuchung von Hautpermeation und Wirkstofffreisetzung erfolgte in den Diffusionszellen nach Franz, wobei für die in-vitro Permeation exzidierte Schweinehaut, und für die Freisetzung eine Cellulosemembran eingesetzt wurden. Bei der Untersuchung der Freiset-5 zungskinetik wurde gezeigt, dass Higuchis Modell am besten für die Beschreibung der Diffusionsvorgänge von Polyphenolen in kosmetischen Emulsionen geeignet ist. Anhand dieses Modells können Prognosen hinsichtlich der Freisetzungs- bzw. Diffusionsgeschwindigkeit in Emulsionen vorgenommen werden. Der Einfluss von Lipophilität und Molekülgröße auf die Freisetzungs- und Permeationskinetik wurde ebenfalls ermittelt. Es wurde gezeigt, dass kleinere hydrophilere Polyphenole schneller freigesetzt werden und die Haut besser durchdringen, als größere und mehr lipophile Moleküle. In Emulsionen mit niedrigeren Lipidgehalten konnten höhere Freisetzungs- und Permeationsraten für fast alle untersuchten Polyphenole ermittelt werden. Nach dem 24-stündigen Permeationsversuch wurden alle Substanzen in der Epidermis und Dermis lokalisiert, die als Zielschichten für die „ Anti-Aging“-Wirkung von Polyphenolen angesehen werden können. Im Rahmen eines vereinfachten in-vivoPermeationsversuchs konnte jedoch keine unmittelbare Korrelation mit den in-vitro-Daten hergestellt werden, wobei in diesem Versuch allerdings lediglich die Polyphenolkonzentration im äußerem Stratum Corneum nach einer 30-minütiger Exposition bestimmt werden konnte. Da eine gute Korrelation zwischen den Freisetzungs- und Hautpermeationsraten in vitro festgestellt werden konnte, wurde bei weiteren Untersuchungen lediglich die Wirkstofffreisetzung bestimmt, so dass auf den Einsatz von Schweinehaut unter anderem aus ethischen Gründen verzichtet werden konnte. Um die Auswirkungen des Ölphasengehaltes, des Emulgators und des Polyphenolgehaltes auf die Emulsionseigenschaften zu ermitteln, wurden diese Parameter bei der Emulsionsherstellung variiert und die Emulsionsstabilität, Rheologie, Freisetzungsraten und Lagerstabilität der Polyphenole untersucht. Die Polyphenole zeigten einen deutlichen Einfluss auf die Rheologie und Stabilität der Emulsionen. Dieser war ganz erheblich vom eingesetzten Emulgator abhängig, so dass die Zugabe der Polyphenole entweder zu einem instabileren (wenn als Emulgator eine Mischung aus Tween 40, Span 40, Cetylalkohol eingesetzt wurde) oder zu einem stabileren Produkt führte, wenn als Emulgator eine Mischung aus Glycerylstearatcitrat, Cetearyl Alcohol, Glyceryl Caprylate eingesetzt wurde. Mögliche Wechselwirkungen zwischen phenolischen Verbinungen und Emulgatoren wurden diskutiert. Möglicherweise lokalisieren die Polyphenole6 mit ihren OH-Gruppen an den gequollenen Polyoxyethylen Ketten von Tween 40, was seine Emulgierkapazität negativ beeinträchtigt. Allerdings konnte diese Theorie noch nicht abschließend experimentell bestätigt werden. Weiterhin zeigte sich, dass aus stabileren Emulsionen höhere Freisetzungsraten erzielt werden können, so dass eine bessere Verfügbarkeit der Polyphenole für die Permeation in die Haut gewährleistet ist. Abschließend wurde eine Humanuntersuchung durchgeführt, in der die Wirkung einer Resveratrol-haltigen Emulsion auf biophysikalische Hautparameter geprüft wurde. Nach 8 Wochen Anwendung wurde eine signifikante Zunahme der Hautelastizität und der Hautfestigkeit festgestellt, allerdings zeigte sich dies sowohl für die Resveratrol-haltige als auch für die Vehikel-Formulierung. Nach der Applikation der Resveratrol-haltigen Formulierung an den Unterarmen wurde eine signifikante Abnahme des mittleren Flächenrauwertes beobachtet. Da alle anderen Rauheitsparameter unverändert blieben, sollten Aussagen über eine „glättende“ Wirkung des Resveratrols nur mit großer Vorsicht getroffen werden. Eine Reduktion der Faltenvolumina wurde nicht festgestellt. Die abschließende Befragung der

Probanden ergab keine merklichen sensorischen Unterschiede zwischen beiden Formulierungen. Allerdings betrug die Untersuchungszeit lediglich 8 Wochen, so dass eine mögliche längerfristige Wirkung nicht erfasst werden konnte.

M. Kanlayavattanakul, N. Lourith, **An update on cutaneous aging treatment using herbs**, Journal of Cosmetic and Laser Therapy, 17:6, p. 343-352, May 2025

Skin aging is caused by several factors. Ultraviolet (UV) exposure as well as oxidative stress elevates infl ammatory mediators causing degradation of the extracellular matrix, which is regarded as the major cause of skin wrinkles, one of the signs of aging. Topical applications of active ingredients protect against dermal photodamage and scavenge radicals that can delay skin aging. Matrix metalloproteinase inhibitors against degradation of collagen, elastin, and hyaluronan are the key strategy to combat cutaneous aging. In addition, active ingredients with the efficacy to enhance extracellular matrix production, including those with UV protection effi cacy, play an important role in protecting the skin from aging. Naturally derived compounds for combating skin wrinkles are gaining more interest among the consumers as they are perceived to be milder, safer, and healthier. This article, therefore, briefly addresses the causes of skin aging and extensively summarizes on herbs appraisal for skin wrinkles treatment. Therefore, delaying aging of skin using the functional herbs would maintain the individual 's appearance with high esthetic and psychosocial impacts.

S. Schwartz, T. McCraw, R. Frumento, **A 16-week single blind trial evaluating the efficacy of a topical product on skin parameters on older subjects with thin/fragile skin**, (Poster) JAAD May 2015

Thin, fragile skin is a common condition in older adults. The condition can lead to a number of problems, from an aged appearance and a loss of firmness and elasticity to tearing and sensitivity that leads to easy bruising.

S. Bänziger, S. Hettwer, B. Suter, B. Obermayer, **Anti-Aging Moisturization,** Happi May 2015

So many sophisticated cosmetic actives have been hitting the skin care market during the past few years that we have been focused too often on what can „combat wrinkles" or „fight aging". The natural elixir, water, and the simple task of supplying the skin with extra moisture have escaped attention. Hydration may seem simple, but in fact it is a very important, yet understimated, anti-aging strategy.

J. Lozza, D. Schmid, F. Gafner, **Extremophile cells offer UV stress protection,** Personal Care April 2015

The high Alpine plant Saponaria pumila is a survival specialist. It weathered the last ice age growing on ice-free mountains peaks, so-called nunataks exposed to constantly low temperatures and high levels of UV radiation. To cope with a harsh environment S. pumila developed adaption strategies, repair mechanisms and protective compounds. These precious substances have now become available for skin care. An extract made from callus cells of S. pumila was shown to in vitro to protect dermal stem cells against UV-induced stress and to maintain their stem cell properties.

N. Stroumza, R. Bosc, B. Hersant, O. Hermeziu, J.-P. Meningaud, **Benefits of using the cutometer to evaluate the effectiveness of skin treatments in plastic and maxillofacial surgery** (Artcle in French), Rev Stomatol Chir Maxillofac Chir Oral, 2015 Apr;116(2): p. 77-81

Introduction: Evaluating skin properties is often too subjective. Using the cutometer allows one to take objective measures of certain mechanic properties of the skin such as visco-elasticity. The aim of this article is to evaluate through a review of existing literature the advantages and the limits of the cutometer and to propose an improvement. Material and methods: The selection of articles has been conducted with the PubMed database in order to identify all publicationsconcerning the cutometer up until September 2013. The analysis criteria were: (1) quantitative distribution of articles from the first publication until today; (2) qualitative distribution over the various medical fields. The articles have been organized in 3 groups: medical, surgical and burns; (3) list of biases in the interpretation of results and limits of this measuring tool. Results: One hundred and twenty-nine publications have been included. The first article regarding the cutometer was published in 1994. We observe an increase in the number of publications after 2005. Most of the articles were published in medical journals of dermatology or cosmetology (83%), only 9% of articles have been published in burn study journals and 8% in surgical journals. The pressure applied by the experimenter constitutes the main measure bias. Discussion: The use of an external device maintaining the probe with an invariable pressure corresponding to its own weight enablesmore reliable results all the while limiting the inter- and intra-individual variability.

Y. Fukushima, Y. Takahashi, Y. Hori, Y. Kishimoto, K. Shiga, Y. Tanaka, E. Masunaga, M.Tani, M. Yokoyama, K. Kondo, **Skin photoprotection and consumption of coffee and polyphenols in healthy middle-aged Japanese females**, Int J Dermatol. 2015 Apr;54(4): p. 410-8

Background: Reactive oxygen species are known to mediate skin photoaging, which results in the formation of pigmented spots and wrinkles. Coffee is the largest source of polyphenols, which supplies a large number of antioxidants in one's daily life. However, little is known about how much coffee and polyphenol consumption influences skin health. Materials and Methods: In this study, a cross-sectional survey of the diet, environmental factors, and skin conditions was conducted in healthy Japanese females to explore the influence of coffee and polyphenol consumption on skin conditions. Non-smoking, healthy female subjects with moderate sun exposure in their daily lives were recruited for this study (n = 131, age range: 30-60 years old) and recorded their food and beverage intake and life circumstances using questionnaires. The skin water content, transepidermal water loss, and elasticity were measured on the cheek of each subject using noninvasive methods: Corneometer, a Tewameter, and a Cutometer, respectively. Wrinkles and pigmented spots were evaluated using digital photograph images. Results: Consumption of coffee and total polyphenols from all sources and from coffee showed a statistically significant correlation towards a decrease in pigmented spot scores ($P < 0.05$). Subjects with high total polyphenol consumption from coffee or chlorogenic acids (the third tertile group) showed the lowest score of ultraviolet pigmented spots ($P < 0.05$). Conclusion: Coffee and polyphenol consumption was associated with low facial pigmented spots in Japanese middle-aged females. We speculated that coffee helps protect human skin from photoaging, and polyphenols, including chlorogenic acids, may contribute to the decreased hyperpigmentation of pigmented spots.

G. Nicoletti, F. Brenta, M. Bleve, T. Pellegatta, A. Malovini, A. Faga, P. Perugini, **Long-term in vivo assessment of bioengineered skin substitutes: a clinical study,** J Tissue Eng Regen Med, 2015 Apr;9(4): p. 460-468

The aim of the study was an objective in vivo assessment of skin properties after reconstruction with two artificial dermal substitutes, Integra® and Hyalomatrix®. Twenty-seven patients underwent reconstruction of 36 skin-loss sites with full-thickness skin graft, split-thickness skin graft, Hyalomatrix® bioengineered skin substitute and sequential split-thickness skin graft and Integra® bioengineered skin substitute and sequential split-thickness skin graft. Objective assessments were carried out using three instrumental devices: Multi Probe Adapter System MPA; 22 MHz ultrasound skin scan; and Primos Pico for a three-dimensional (3D) skin scan. The skin parameters under study in our sample were: corneometry, transepidermal water loss, elastometry, colorimetry, skin thickness and 3D skin surface pattern. A skin reconstruction with Hyalomatrix seemed to most closely approach the hydration, transepidermal water loss and skin surface 3D pattern of normal skin. A skin reconstruction with Integra seemed to demonstrate the best skin colour feature and elastic properties. Although no statistically significant differences were observed, the descriptive analysis of the outcomes might suggest a better cell regulation, regenerated extracellular matrix and neoangiogenesis with the use of Hyalomatrix, and the formation of a more elastic regenerated dermis, with overall better physical, mechanical and optical properties, with the use of Integra.

N. Srivastava, S. Gehlot, S. Singh, B.M. Singh, **Application of different parameters for selecting normal and abnormal skin characteristics in determination of Prakriti in infants,** Int. J. Res. Ayurveda Pharm. 6(2), Mar - Apr 2015

Prakriti (Basic physical constitution) of an individual is decided at the time of conception and subsequently during intra-uterine life, as a result of overall effect of dominant Dosha of Shukra (Sperm), Shonit (Ovum), Ahara (diet) and Vihara (regimen) of Garbhini (pregnant women), Kaalgarbhashaya (in-utero duration and condition of uterus) and Mahabhautic components. Assessment of Prakriti and Vikriti in children is essential and enables the pediatrician to evaluate metabolic imprinting, individual physiology and susceptibility to specific disease, its diagnosis, prevention, treatment as well as the prognosis after illness. There are many subjective criteria to determine the Prakriti in adults, but as far as infants are concerned, no detail description is available in Ayurvedic classics. Individual Prakriti can be determined as per the characteristics specified in Brihattrayi and Laghutrayi, which include the examination of skin, hair, nails, eyes, palm, sole and other physical and psychological features, and may be used in children for Prakriti determination. However, it can be better understood and differentiated each other by considering various methods and modern technology. Out of various characteristics of body parts, skin characteristics such as texture (roughness or smoothness, elasticity and thickness), color and temperature of skin significantly contribute in Prakriti determination. Use of objective parameters such as RGB and HSV method, Fitzpatrick Scale method and derma spectrometer for the skin color differentiation; skin-pH, stratum corneum hydration, TEWL, sebum content, cutometer and ultrasonography for skin texture as well as thermometer, thermister via pulse oxymeter for skin

temperature may be very useful tools to differentiate individual Prakriti under controlled conditions. The aim of this conceptual study was to explore importance of various methodologies for differentiating Prakritaskin characteristics from the Vaikrita skin characteristics more precisely and scientifically in infants.

C. Davi, A. Giménes, E. Canadas, N. Alminana, R. Delgado, **Anti-cellulite efficacy through circadian rhythms,** Euro Cosmetics 3-2015

Biological rhythms regulation is important: Physiological processes of living organisms are tightly organized in biological rhythms because the movement of the Earth imposes recurrent changes of the environmental conditions. As a consequence, each process takes place at the right time and happens with to appropriate frequency. When processes repeat every 24 hours they are known as circadian rhythms (e.g. the sleep-wakefulness cycle and the variations in body temperature).

F. Sugihara, N. Inoue, X. Wang, **Clinical Effects of Ingesting Collagen Hydrolysate on Facial Skin Properties**, Jpn Pharmacol Ther 2015; 43: p. 67-70

Objectives: The objective of this research was to investigate the effectiveness of daily ingestion of a specific collagen hydrolysate (CH), which contains prolylhydroxyproline (Pro-Hyp) and hydroxy-prolylglycine (Hyp-Gly), on facial skin properties. Methods: In this randomized, placebo-controlled, double-blind trial, 56 women aged 30-55 years were randomized to receive 2.5 g of CH or 5 g of placebo once daily for 8 weeks, with 28 subjects assigned to each group. The hydration, elasticity and roughness properties of facial skin were measured at week O (baseline), week 4 and week 8. Results: Levels of skin hydration, elasticity and roughness in subjects who received CH significantly improved between baseline and weeks 4 and 8, while there was no significant improvement in subjects who received placebo. Moreover, the levels of skin elasticity, roughness and the net change of skin hydration improved significantly in the CH group compared to the placebo group by both weeks 4 and 8. Conclusion: The present results suggest that daily ingestion of 2.5 g of CH improves facial skin hydration, elasticity and roughness.

T.F. Miller, ***TA-65® for Skin*** **Reduces the Appearance of Aging Effects by Increasing Firmness and Reducing Wrinkles and Redness, T.A.Sciensces,** Product Information March 2015

TA-65® for Skin is a topical cream that has been developed as a novel product containing the active ingredient TA-65®, which is a pure molecule extracted from the Chinese herb, *Astragalus*. TA-65® has been extensively studied both experimentally and clinically for the impact on health and lifestyle. *TA-65® for Skin* has been tested in a pilot clinical study for its impact on skin's function. Te study suggests that *TA-65® for Skin* improves skin's function by increasing frmness, reducing wrinkles and erythema.

X. Liu, D. Gad, Z. Lu, R. Lewis, M.J. Carré, S.J. Matcher, **The Contributions of Skin Structural Properties o the Friction of Human Finger-pads**, Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology, 229 (3), p. 294 – 311, 2015

This paper describes three series of tests that were designed to investigate how skin mechanical and structural properties, measured using a "Cutometer" and Optical Coherence Tomography, affect the frictional behaviour of human finger-pads. Firstly, the skin mechanical properties across all fingers and the palm in participants' dominant hands were assessed. Results showed that the distensibility of skin (total deformation in a suction test) is associated with stratum corneum thickness and that this in turn affects friction (thicker stratuem corneum leads to higher friction), giving a link between distensibility and friction. Tape stripping to remove the superficial layer of the skin led to increased moisture (and/or electric charge on the skin surface) led to higher friction. No accompanying changes were seen in structural properties so it was concluded that moisture was the main cause of the adhesion increase. More work is required to isolate moisture and possible changes in electric charge using alternative measurement techniques. When rubbing with sand paper, the stratum corneum thinned considerably and friction reduced. Moisture was ruled out as a cause of friction changes in this instance. Skin normal stiffness also did not change, but lateral stiffness changes have been seen in previous work when the stratum corneum thickness has been reduced so this is likely to be the cause of the reduced friction. This will be investigated further in future work using dynamic OCTmeasurements.

P. Schoch, I. Pomytkin, **Skin rejuvenating effects of interleukin-1 alpha: A cosmetic study on collagen deposition and elasticity in ageing skin**, Aesthetics, Volume 2/Issue 3 - February 2015

Objective: The aim of this study was to test the efcacy of interleukin-1 alpha (IL-1a – trademark name Dermatopoietin) on skin renewal, in volunteers with signs of skin ageing. Method: A placebo-controlled and randomized clinical study on skin renewal was conducted in 21 healthy female volunteers

(51 ±6 years) by administering a cosmetic formulation with and without IL-1a twice daily upon either the right or left forearm for eight weeks. Results: Ultrasonograms of all 21 volunteers at baseline and after 28 and 56 days of treatment with a cosmetic formulation containing IL-1a showed improvement of skin density and the partial disappearance of SLEB in all volunteers. The verum formulation containing IL-1a increased elasticity by 20.7% and 15.2% after 28 and 56 days, respectively. Verum-treated skin showed less viscoelasticity than placebo-treated skin. Conclusion: The results show experimental evidence for a structural (density) and functional (elasticity) improvement of skin by topical administration of a cosmetic formulation containing IL-1a.

H. Pham, B. Reece, M. Hines, **Loss of skin elasticity is more dependent on Fitzpatrick skin type than chronologic age,** JAAD May 2015, Volume 72, Issue 5, Supplement 1, p. AB25

The halfmark signs of skin aging include abnormal pigmentation, wrinkling and ther loss of elasticity.

R. Ohno, N. Moroishi, H. Sugawa, K. Maejima, M. Saigusa, M. Yamanaka, M. Nagai, M. Yoshimura, Y. Amakura, R. Nagai, **Mangosteen pericarp extract inhibits the formation of pentosidine and ameliorates skin elasticity**, J. Clin. Biochem. Nutr., July 2015, Vol. 57, No. 1, p. 27–32

The inhibition of advanced glycation end-products (AGEs) by daily meals is believed to become an effective prevention for lifestyle-related diseases. In the present study, the inhibitory effect of hot water extracts of mangosteen (Garcinia mangostana L.) pericarp (WEM) on the formation of pentosidine, one of AGEs, in vitro and in vivo and the remedial effect on skin conditions were measured. WEM significantly inhibited pentosidine formation during gelatin incubation with ribose. Several compounds purified from WEM, such as garcimangosone D and rhodanthenone B, were identified as inhibitors of pentosidine formation. Oral administration of WEM at 100 mg/day to volunteer subjects for 3 months reduced the serum pentosidine contents. Because obtaining skin biopsies from healthy volunteers is ethically difficult, AGE accumulation in the skin was estimated by a fluorescence detector. The oral administration of WEM significantly reduced the skin autofluorescence intensity, demonstrating that WEM also reduced AGE accumulation in the skin. Furthermore, the elasticity and moisture content of the skin was also improved by WEM. These results demon strate that intakes of WEM reduces the glycation stress and results in the improvement of skin conditions.

S. Higurashi, Y. Haruta-Ono, H. Urazono, T. Kobayashi, Y. Kadooka, **Improvement of skin condition by oral supplementation with sphingomyelin-containing milk phospholipids in a double-blind, placebo-controlled, randomized trial,** J. Dairy Sci. 98, 2015: p. 6706–6712

Sphingomyelin (SM), an essential phospholipid for the skin, is contained largely in the milk fat globule membrane surrounding milk fat, concentrated fractions of which are also generated concurrently during the manufacture of dairy products. Such an SM-containing milk phospholipid concentrate (SM-MPC) is useful for investigating the benefits of dietary SM. Here, we examined the effect of consuming SM-MPC on the condition of skin in a double-blind, placebo-controlled, randomized trial. Ninety-six healthy subjects aged 20 to 39 yr with low skin hydration were randomly assigned to 3 groups: a high-SM group supplemented with SM-MPC at a dose equivalent to 10 mg/d of SM, a low-SM group supplemented with SM-MPC equivalent to 5 mg/d of SM, and a placebo group fed a vehicle composed of olive oil and beeswax. During daily supplementation for 12 wk, parameters related to the condition of skin were evaluated at baseline and every 3 wk. Skin hydration at the heel was significantly increased at wk 9 and 12 in the low-SM group compared with the placebo group. Skin elasticity in the region below the eye was significantly increased at wk 9 in the high-SM group versus placebo. Questionnaire-based subjective perceptions of skin conditions were significantly improved for facial skin moisture at wk 3 and 12, and in the wrinkle around the eyes at wk 9 and 12 in the high-SM group versus placebo. Our results indicate that constant and long-term supplementation with SM-MPC is capable of improving the general condition of skin.

G. Imokawa, K. Ishida, **Biological Mechanisms Underlying the Ultraviolet Radiation-Induced Formation of Skin Wrinkling and Sagging I: Reduced Skin Elasticity, Highly Associated with Enhanced Dermal Elastase Activity, Triggers Wrinkling and Sagging**, Int. J. Mol. Sci. 2015, 16, p. 7753-7775

The repetitive exposure of skin to ultraviolet B (UVB) preferentially elicits wrinkling while ultraviolet A (UVA) predominantly elicits sagging. In chronically UVB or UVA-exposed rat skin there is a similar tortuous deformation of elastic fibers together with decreased skin elasticity, whose magnitudes are greater in UVB-exposed skin than in UVA-exposed skin. Comparison of skin elasticity with the activity of matrix metalloproteinases (MMPs) in the dermis of ovariectomized rats after UVB or UVA irradiation demonstrates that skin elasticity is more significantly decreased in ovariectomized rats than

in sham-operated rats, which is accompanied by a reciprocal increase in elastase activity but not in the activities of collagenases I or IV. Clinical studies using animal skin and human facial skin demonstrated that topical treatment with a specific inhibitor or an inhibitory extract of skin fibroblast-derived elastase distinctly attenuates UVB and sunlight-induced formation of wrinkling. Our results strongly indicated that the upregulated activity of skin fibroblast-derived elastase plays a pivotal role in wrinkling and/or sagging of the skin via the impairment of elastic fiber configuration and the subsequent loss of skin elasticity.

P. Rouaud, D. Boudier, E. Aymard, B. Closs, **The secret of a replenished face Dermis-hypodermis communication at the service of face's volume,** H&PC, Vol. 10(2), March/April 2015

The distribution and functionality of adipose tissue change with age, leading to a reduction of facial volumes. While ultraviolet (UV) radiation acts indirectly on deep tissues via negative cell communication, age-related effects on adipose tissue are accentuated and accelerated in photoexposed skin. In this study, the aim is (1) to understand and to characterise the negative cellular communication between UV-stressed reticular fibroblasts and adipocytes and (2) to demonstrate that a natural active ingredient obtained from the roots of peony and rich in oligosaccharides (i.e. PRE) restores the positive communication between the dermis and the hypodermis. Through innovative in vitro models, we highlight that reticular fibroblasts stressed by a solar simulator secrete a set of pro-inflammatory molecules (i.e. secretome) that inhibits adipocyte differentiation. Tested on these models, PRE restores the positive communication between reticular fibroblasts and adipocytes. Moreover, tested in vivo on photoexposed skins, this natural active ingredient corrects slack skin and restores volumes to the face.

A. Scheel-Sailer, A. Frotzler, G. Mueller, S. Annaheim, R.M. Rossi, S. Derler, **Challenges to measure hydration, redness, elasticity and perfusion in the unloaded sacral region of healthy persons after supine position**, J Tissue Viability, 2015 Mar 13

Aim of the study: To combine measurement methods of biophysical skin properties in a clinical setting and to measure baseline values in the unloaded sacral region of healthy persons after lying 30 min in supine position. Methods: Hydration (Corneometer® CM 825), redness (Mexameter® MX 18), elasticity (Cutometer® MPA 580) and perfusion (PeriFlux System 5000) of the skin in the sacral region of 10 healthy participants (median age: 26.9 years) were measured consecutively in the laying position by two trained examiners. Results: The assessment duration for all four parameters lasted about 15 min. Intra-class correlation coefficients were overall moderate to strong (hydration r = 0.594, redness r = 0.817, elasticity r = 0.719, perfusion r = 0.591). Hydration (median 27.7 arbitrary units (AU)) mainly indicated dry skin conditions. Redness (median 158.5 AU) was low. Elasticity (median 0.880 AU) showed similar values as in the neck region. Perfusion (median 17.1 AU) showed values in the range of results reported in the literature. Biophysical skin properties in the sacral region after supine position can be measured within periods of 15 min. Conclusion: The results provide baseline data for the skin of healthy persons as well as insights into skin-physiological variations. But it remains challenging to optimize measurement procedures and test protocols when transferring preclinical tests in a clinical application.

S.-Y. Byun, S.-H. Kwon, S.-H. Heo, J.-S. Shim, M.-H. Du, J.-I. Na, **Efficacy of Slimming Cream Containing 3.5% Water-Soluble Caffeine and Xanthenes for the Treatment of Cellulite: Clinical Study and Literature Review**, Ann Dermatol Vol. 27, No. 3, 2015, p. 243-249

Background: Cellulite is a 'cottage cheese-like' cutaneous change caused by subcutaneous fat bulging into the dermis that usually leads to cosmetic problems. Slimming cream containing 3.5% water-soluble caffeine and xanthenes exhibits a lipolytic effect with penetration into the dermis. Objective: To evaluate the efficacy and safety of slimming cream for the treatment of cellulite. Methods: Fifteen subjects with cellulite applied slimming cream to the thighs and inner side of the upper arms twice daily for 6 weeks. Efficacy was assessed using a standard visual scale, changes in the circumferences of the thighs and upper arms, and patient satisfaction by a questionnaire at baseline, week 3, and week 6. Safety was assessed by inquiring about adverse events through questionnaires. Results: The standard visual scale score improved significantly by 0.49 points (19.8%) at week 6. Thigh and upper-arm circumferences decreased by 0.7 cm (1.7%) and 0.8 cm (2.3%), respectively, at week 6. Slight itching and transient flushing were commonly reported, but no serious adverse event occurred. Conclusion: The slimming cream tested appears to be effective for the treatment of cellulitis without serious adverse effects. However, additional large clinical trials are required to confirm the efficacy and safety of slimming cream for the treatment of cellulitis.

E.J. Song, J.A. Lee, J.J. Park, H.J. Kim, N.S. Kim, K.S. Byun, G.S. Choi, T.K. Moon, **A study on seasonal variation of skin parameters in Korean males**, Int J Cosmet Sci., 2015 Feb;37(1): p. 92-97

Objective: The physiological characteristics of the skin are varied greatly, depending on gender, age, region and race, and many dermatologic researches have been performed through various research methods. This study aimed to examine how Korean men's skin conditions were influenced by temperature or humidity changes caused by seasonal rotations. Methods: A total of 100 healthy Korean men, age range 20-59 years, participated in the study for both summer and winter. We compared on the characteristics of skin between summer and winter. The skin hydration, skin pH and TEWL were evaluated on the forehead, cheek and forearm. The skin sebum content of the glabella, nasal ala and cheek was measured using Sebumeter(®) (SM810, Courage+Khazaka, Germany). Cutometer(®) (MPA 580 Courage+Khazaka, Germany) the elasticity was measured by on the cheeks, and PRIMOS lite(®) (Phase shift Rapid in vivo Measurement of Skin, GFMesstechnik GmbH, Germany) was used to evaluate wrinkles on crow's feet. Lastly, in addition, the skin pore of the face was measured using the Janus(®) (PSI, Korea) which is a facial analysis system. Results: The results were as follows: the comparison of hydration in summer and winter shows significant differences in their forehead, cheeks and forearm. The pH values of the skin surface were generally higher in winter, and significantly different on each site, and the sebum content was higher in summer than in winter. As a result of the pore measurement, the summer showed more pores compared to the winter, and there was a statistically significant difference in skin pores between summer and winter. The sensitivity measured by stinging test increases significantly more in winter than in summer. However, there were no seasonal differences in wrinkles and skin brightness. Conclusion: The skin surface pH, TEWL, sebum content, hydration, elasticity, wrinkles, skin pore and skin sensitivity vary with seasons and body regions in Korean men.

A. Mohamed, **Cococin rejuvenating coconut water for Skin and Hair Care,** Euro Cosmetics; 1/2-2015

Cococin CG is obtained from coconut (Cocos nucifera) and is standardized to contain atleast 30% total carbohydrates and free amino acids. It is used in hair care formulations and in rejuvenative topical preparations. It is available in liquid form. Also available is Cococin, the freeze-dried tender coconut water available in a free flowing powder form. Cococin is rich in proteins, amino acids, sugars, vitamins, minerals and growth hormones essentail to promote tissue and hair growth.

J. Weickenmeier, M. Jabareen, E. Mazza, **Suction based mechanical characterization of superficial facial soft tissues**, Journal of Biomechanics 48 (2015) 4279–4286

The present study is aimed at a combined experimental and numerical investigation of the mechanical response of superficial facial tissues. Suction based experiments provide the location, time, and history dependent behavior of skin and SMAS (superficial musculoaponeurotic system) by means of Cutometer and Aspiration measurements. The suction method is particularly suitable for in vivo, multi-axial testing of soft biological tissue including a high repeatability in subsequent tests. The campaign comprises three measurement sites in the face, i.e. jaw, parotid, and forehead, using two different loading profiles (instantaneous loading and a linearly increasing and decreasing loading curve), multiple loading magnitudes, and cyclic loading cases to quantify history dependent behavior. In an inverse finite element analysis based on anatomically detailed models an optimized set of material parameters for the implementation of an elastic-viscoplastic material model was determined, yielding an initial shear modulus of 2.32 kPa for skin and 0.05 kPa for SMAS, respectively. Apex displacements at maximum instantaneous and linear loading showed significant location specificity with variations of up to 18% with respect to the facial average response while observing variations in repeated measurements in the same location of less than 12%. In summary, the proposed parameter sets for skin and SMAS are shown to provide remarkable agreement between the experimentally observed and numerically predicted tissue response under all loading conditions considered in the present study, including cyclic tests.

Y. Koyano, G. Nakagami, S. Lizaka, T. Minematsu, H. Noguchi, N. Tamai, Y. Mugita, A. Kitamura, K. Tabata, M. Abe, R. Murayama, J. Sugama, H. Sanada, **Exploring the prevalence of skin tears and skin properties related to skin tears in elderly patients at a long-term medical facility in Japan**, International Wound Journal 2014

The identifcation of appropriate skin tear prevention guidelines for the elderly requires clinicians to focus on local risk factors such as structural alterations of the epidermis and dermis related to skin tears. The aim of this cross-sectional study is to explore the prevalence of skin tears and to explore skin properties related to skin tears in elderly Japanese patients at a long-term medical facility. After doing the prevalence study, 18 participants with skin tears and 18 without were recruited and an evaluation of their skin properties using 20-MHz ultrasonography, skin blotting and also Corneometer CM-825, Skin-pH-meterPH905, VapoMeter, Moisture Meter-D and CutometerMPA580 was undertaken. A total of 410 patients were examined, the median age was 87 years and 73·2% were women. The prevalence of skin tears was 3·9%, and 50% of skin tears occurred on the dorsal forearm. The changes in skin properties

associated with skin tears included increased low-echogenic pixels (LEP) by 20-MHz ultrasonography, decreased type IV collagen and matrix metalloproteinase-2, and increased tumour necrosis factor-α by skin blotting. In conclusion, this study suggests that increased dermal LEP, including solar elastosis, may represent a risk factor for skin tears; this indicates that skin tear risk factors might not only represent chronological ageing but also photoageing.

H. Dobrev, **Cutometer,** Non Invasive Diagnostic Techniques in Clinical Dermatology; Springer Berlin Heidelberg 2014; ISBN 978-3-642-32108-5

Introduction: The human skin prossesses a complex structure and various functions which ensure the entity between the organism and the environment. Mechanical properties of the skin are of major importance for its protective function. They vary in accordance with age, sex and body sites, in some physiological and pathological skin conditions, and change due to different external and therapeutic influences. Considerable progress in the quantification of the skin mechanical functions had been achieved for the past 20 years through the introduction of modern non-invasive bioengineering methods and devices which provide the researchers with objective, quantitative, sensitive and reproducible measurements in vivo.

B. Nedelec, J.A. Correa, A. de Oliveira, L. LaSalle, I. Perrault, **Longitudinal burn scar quantification**, Burns. 2014 Dec; 40(8): p. 1504-1512

Quantitative studies of the clinical recovery of burn scars are currently lacking. Previous reports validate the objective, precise, diagnostic capabilities of high-frequency ultrasound to measure thickness, the Cutometer(®) to measure pliability and the Mexameter(®) to measure erythema and pigmentation of scars. Thus, we prospectively quantified clinical characteristics of patient-matched, after burn hypertrophic scar (HSc), donor site scar (D) and normal skin (N) using these instruments. One investigator measured 3 sites (HSc, D, N) in 46 burn survivors at 3, 6, and 12 months after-burn. A mixed model regression analysis, adjusting p-values for multiplicity of testing, was used to compare means among sites and time points. Participants were 41.2±13.5 years old, 87% males, predominantly Caucasian, with an average of 19.5% body surface area burned. HSc thickness decreased significantly between 3 and 6, 6 and 12, and 3 and 12 months (all $p<0.0001$), but remained thicker than D and N skin (all $p<0.0001$). Pliability differed significantly between HSc, D and N sites at all time points (all $p<0.0001$), with HSc and D increasing between 3 and 12 months ($p<0.05$) but not reaching normal. HSc and D sites were significantly more erythematous than normal skin ($p<0.05$) at 3 and 6 months but D sites approached normal by 12 months. The only time points at which pigmentation significantly differed were the HSc and D sites at 6 months. Thickness, pliability, erythema and pigmentation of N skin remained similar over the 12 months. We found that post-burn HSc thickness, pliability and erythema differed significantly from D and N skin at 3, 6, and 12 months and does not return to normal by 12 months after-injury; however, significant improvements towards normal can be expected. Donor sites are redder than normal skin at 3 and 6 months but can be expected to return to normal by 12 months. Although the color of HSc and D sites change markedly with time these color changes are primarily due to changes in redness of the site, not melanin in this primarily Caucasian population.

S.Y. Choi, W.G. Kim, E.J. Ko, Y.H. Lee, B.G. Kim, H.J. Shin, Y.S. Choi, J.Y. Ahn, B.J. Kim, H.J. Lee, **Effect of high advanced-collagen tripeptide on wound healing and skin recovery after fractional photothermolysis treatment**, Clin Exp Dermatol. 2014 Dec;39(8): p. 874-80

Background: Collagens have long been used in pharmaceuticals and food supplements for the improvement of skin. Aim: We evaluated the efficacy of high advanced-collagen tripeptide (HACP) on wound healing and skin recovery. Methods: Using an in vitro model, we performed HaCaT cell migration assays and collagen gel contraction assays using HACP concentrations of 1, 10 and 100 μg/mL. In this pilot study, eight healthy volunteers were randomly divided into two groups. Both the control and experimental groups received fractional photothermolysis treatment, but in the experimental group, four subjects received 3 g/day of oral collagen peptide (CP) for 4 weeks. To assess transepidermal water loss in each patient before and after the treatment, we used a Corneometer and a Cutometer, and we also assessed the patient's Erythema Index. Results: The cell migration assay showed that HACP enhanced wound closure, but not in a dosedependent manner. The collagen gel contraction assay showed increased contractility when patients were treated with 100 μg/mL HACP, but the results were not significantly different from those of controls. We found that post-laser erythema resolved faster in the experimental group than in the control group ($P < 0.05$). In addition, the recovery of skin hydration after fractional laser treatment was greater in the experimental group than in the control group by day 3 ($P < 0.05$), and the experimental group showed significantly improved post-treatment skin elasticity compared with the controls by day 14 ($P < 0.05$). Conclusions: Collagen tripeptide treatment appears to be an effective and conservative therapy for cutaneous wound healing and skin recovery after fractional

photothermolysis treatment.

Y.S. Cho, J.H. Jeon, A. Hong, H.T. Yang, H. Yim, Y.S. Cho, D.H. Kim, J. Hur, J.H. Kim, W. Chun, B.C. Lee, C.H. Seo, **The effect of burn rehabilitation massage therapy on hypertrophic scar after burn: a randomized controlled trial**, Burns. 2014 Dec;40(8): p. 1513-20

Background: To evaluate the effect of burn rehabilitation massage therapy on hypertrophic scar after burn. Method: One hundred and forty-six burn patients with hypertrophic scar(s) were randomly divided into an experimental group and a control group. All patients received standard rehabilitation therapy for hypertrophic scars and 76 patients (massage group) additionally received burn scar rehabilitation massage therapy. Both before and after the treatment, we determined the scores of visual analog scale (VAS) and itching scale and assessed the scar characteristics of thickness, melanin, erythema, transepidermal water loss (TEWL), sebum, and elasticity by using ultrasonography, Mexameter(®), Tewameter(®), Sebumeter(®), and Cutometer(®), respectively. Results: The scores of both VAS and itching scale decreased significantly in both groups, indicating a significant intragroup difference. With regard to the scar characteristics, the massage group showed a significant decrease after treatment in scar thickness, melanin, erythema, TEWL and a significant intergroup difference. In terms of scar elasticity, a significant intergroup difference was noted in immediate distension and gross skin elasticity, while the massage group significant improvement in skin distensibility, immediate distension, immediate retraction, and delayed distension. Conclusion: Our results suggest that burn rehabilitation massage therapy is effective in improving pain, pruritus, and scar characteristics in hypertrophic scars after burn.

A. Giménez, **Mit Chronobiologie gegen Cellulite**, Cossma 12 2014

Lange Arbeitstage, zu wenig Schlaf und der Jetlag auf Urlaubsreisen gehören heutezum modernen Leben dazu. Dass unser Terminkalender meistens nicht mit unseren biologischen Uhr übereinstimmt, kann sich ungünstig auf unsere Gesundheit und unser Aussehen auswirken. Menschen sind wie alle anderen Lebewesen von inneren Prozessen abhängig, die so organisiert sind, dass sie sich an die zyklischen Veränderungen der Umwelt anpassen; diese Tatsache wird unter dem Begriff Biorhytmus zusammengefasst. Solche Prozesse, die sich im 24-Stunden-Takt wiederholen, werden zirkadiane Rhytmen genannt, wie etwa der Schlaf-Wach-Rhythmus.

L.T. Fox, J. du Plessis, M. Gerber, S. van Zyl, B. Boneschans, J.H. Hamman, **In Vivo skin hydration and anti-erythema effects of Aloe vera, Aloe ferox and Aloe marlothii gel materials after single and multiple applications**, Phcog Mag 2014;10: p. 392-403

Objective: To investigate the skin hydrating and anti-erythema activity of gel materials from Aloe marlothii A. Berger and A. ferox Mill. in comparison to that of Aloe barbadensis Miller (Aloe vera) in healthy human volunteers. Materials and Methods: Aqueous solutions of the polisaccharidic fractions of the selected aloe leaf gel materials were applied to the volar forearm skin of female subjects. The hydration effect of the aloe gel materials were measured with a Corneometer® CM 825, Visioscan® VC 98 and Cutometer® dual MPA 580 after single and multiple applications. The Mexameter ® MX 18 was used to determine the anti-erythema effects of the aloe aterial solutions on irritated skin areas. Results: The A. vera and A. marlothii gel materials hydrated the skin after a single application, whereas the A. ferox gel material showed dehydration effects compared to the placebo. After multiple applications all the aloe materials exhibited dehydration effects on the skin. Mexameter ® readings showed that A. vera and A. ferox have anti-erythema activity similar to that of the positive control group (i.e. hydrocortisone gel) after 6 days of treatment. Conclusion: The polysaccharide component of the gel materials from selected aloe species has a dehydrating effect on the skin after multiple applications. Both A. vera and A. ferox gel materials showed potential to reduce erythema on the skin similar to that of hydrocortisone gel.

A. Giménez, C. Davi, E. Canadas, N. Alminana, R. Delgado, **Nocturnin: The target for a more slender silhouette,** SOFW-Journal 10-2014

Introduction: The relevance of chronobiology; Due to the fact that the movement of the Earth imposes recurrent changes on environmental conditions, physiological processes of living organisms are tightly organized in the form of biological rhythms. This ensures that each process takes place at the right time and repeats with the appropriate frequency. Processes that repeat every 24 hours are known as circadian rhythms, such as the sleep-wakefulness cycle and the changes in body temperature.

K. Shingaki, S. Kawaguchiya, Y. Hasegawa, M. Sumitani, Y. Yamamoto, K. Torii, **Analysis of environmental factors and related molecular mechanisms that reduce cutaneous sensation and**

the development of cosmetics to prevent and improve functional decline of cutaneous sensation, IFSCC 2014 Paris

Summary: The beneficial effects of touch have been well investigated in infant psychological and physiological development and adult homeostasis. Cutaneous sensation, which facilitates the beneficial effects of touch, alters under the influence of disease and aging. However, the environmental factors that affect cutaneous sensation, their related molecular mechanisms, and the possibility of cosmetics against decline have not been well studied. In this study, we showed a significant positive correlation between age and the perception threshold of a 2000-Hz current which stimulates Aβ-fibres and a significant negative correlation between a 2000-Hz current perception threshold (CPT) and the skin's physiological parameters. In addition, ultraviolet (UV) radiation significantly increased the 2000-Hz CPT in the skin, decreased the expression of neuroprotective growth factors, and altered the expression of matrix components which are the scaffoldings of nerve fibres in the normal human dermal fibroblasts. Furthermore, we showed a significant 2000-Hz CPT decrease 1 month after treatment with cosmetics that included moisturizing ingredients and vitamins. From these results, it is suggested that chronic UV exposure induces the functional decline of cutaneous sensation by decreasing the neuroprotective functional components of the skin and that cosmetics are useful for preventing and improving the decline of cutaneous sensation.

B. Martínez Teipel, J. Boras, R. Armengol, **Induction of beige adipocytes and activation of thermogenesis as a new body remodeling mechanism,** IFSCC 2014 Paris

Introduction: Adipose tissue is mainly dedicated to the accumulation of lipids that form the energy reservoir, which can be used by our organism in case of necessity, and has also an important role in metabolism regulation. The subcutaneous adipose tissue, owing to its particular location just beneath the dermis, has visible effects on the silhouette and the cellulite appearance. Fatty tissue is formed mainly by adipocytes. Only very recently has become known that the human body harbors three types of adipocytes: the previously known white and brown adipocytes, and also a new kind not described until 2012, the beige adipocytes (Wu *et al.*, 2012). White adipocytes store the excess of free fatty acids and glycerol in the form of triglycerides. Brown adipocytes have a completely different origin than the white ones, and are specialized in oxidizing triglycerides to produce heat in the process of thermogenesis.

B. Tyszczuk, B. Szczepanik, R.K. Mlosek, S. Malinowska, R. Debowska, K. Rogiewicz, I. Eris, **The high frequency ultrasound as a tool for the assessment of anti-cellulite treatments efficacy,** IFSCC 2014 Paris

Cellulite is nowadays a common aesthetical defect, wich affects most of women worldwide. Taking into consideration the size of this phenomenon cosmetic industry is searching a new ways of fighting against it and new diagnostic tools and methods to measure anti-cellulite therpy's efficacy. Unfortunatelly reliable monitoring of anti-cellulite treatment still remains a problem. However, new diagnostic techniques such as high frequency ultrasound (HFultrasound) imaging can be usefull tool for the assesment of cellulite-reducing efficacy of cosmetics therapy.

T. Baldecchi, L. Heider, M. Lefort, C. Cargola, C. Cartiglia, A. Bonfigli, F. Pflücker, **The skin firming "Red-volution": anti-cellulite efficacy of a *Papaver rhoeas* extract**, IFSCC 2014 Paris

The intention of this paper is to report about the in vivo efficacy of a natural active ingredient based on the seeds of a special poppy species. This Papaver rhoeas extract can significantly increase skin blood micro-flow and flatten the dermo-hypodermal junction, leading to a visual improvement of cellulite conditions. The study confirms the outcome of several in vitro and ex vivo investigations in which the extract displays both a prevention of lipogenesis and an activation of lipolysis. This set of results demonstrates that this natural ingredient may offer an attractive option to design skin firming, skin shaping, face contouring or anti-cellulite cosmetic products.

M.V. Velasco, R.P. Vieira, A.R. Fernandes, M.F. Dario, C.A. Pinto, C.A. Pedriali, T.M. Kaneko, A.R. Baby, **Short-term clinical of peel-off facial mask moisturizers**, Int J Cosmet Sci. 2014 Aug;36(4): p. 355-60

Objective: This study aimed to compare the efficacy of a peel-off facial mask based on polyvinyl alcohol (PVA) with an oil-in-water (o/w) emulsion and the effect of a soybean extract fermented by Bifidobacterium animale incorporated in those formulations (5% w/w). Methods: The formulations were submitted to randomized clinical studies in volunteers to evaluate the measurement effects as (a) tensor by Cutometer®, (b) moisturizing by Corneometer® and transepidermal water loss (TEWL) by Tewameter®. These effects were determined in a short-term study (3 h) in a controlled-temperature room. Results: The tensor effect and TEWL values indicated no significant difference between the use

of facial mask and emulsion. On the other hand, the moisturizing effect of the facial mask on the stratum corneum was more significant than that of the emulsion according to Corneometer® measurements. Conclusions: Biometric cutaneous evaluation of peel-off facial masks (short-term study) showed that the masks promoted moisturizing effect of the stratum corneum more effectively than the oil-in-water emulsions. Thus, the facial masks were more efficient than emulsions in relation to moisturizing effects, but this efficiency is not related to the presence of fermented soybean extract. The results indicated that peel-off facial masks increase skin hydration in a process related to the occlusive effect.

R.A. Harper, M. Rencenberger, **Benefits of hydrolysed jojoba esters in face masks,** Personal Care July 2014

In a series of double-blind, vehicle-controlled, randomised clinical studies, Floraesters K-20W Jojoba [INCI: Hydrolyzed Jojoba Esters (and) Water (aqua)] was shown to increase skin elasticity, firmness, and hydration; decrease the number of enlarged pores and fine lines; and increase consumer preference when incorporated into nonwoven facemask solution. These data support previous findings, demonstrating the effictiveness of Floraesters K-20W Jojoba in non-woven wipe applications for skin hydration, redness reduction, and enhanced consumer preference.

A. Kreuter, N. Hunzelmann, **S2k Leitlinie Diagnostik und Therapie der zirkumskripten Sklerodermie**, AMWF online 07/2014

Bei der zirkumskripten Sklerodermie (ZS), im Englischen „localized scleroderma“ oder „morphea“ genannt, handelt es sich um ein Spektrum von sklerotischen Erkrankungen der Haut mit je nach Subtyp und Lokalisation möglicher Beteiligung von hautnahen Strukturen wie Fettgewebe, Muskulatur, Gelenke und Knochen. Ein Befall innerer Organe wie z.B. Herz, Lunge, Niere oder Gastrointestinal-Trakt tritt bei der ZS ebenso wenig wie ein Übergang in eine systemische Sklerodermie auf.

G.E. Piérard,T. Hermanns-Lê, U. Gaspard, C. Piérard-Franchimont, **Asymmetric facial skin viscoelasticity during climacteric aging**, Clinical, Cosmetic and Investigational Dermatology 2014:7, p. 111–118

Background: Climacteric skin aging affects certain biophysical characteristics of facial skin. The purpose of the present study was to assess the symmetric involvement of the cheeks in this stage of the aging process. Methods: Skin viscoelasticity was compared on both cheeks in premenopausal and postmenopausal women with indoor occupational activities somewhat limiting the influence of chronic sun exposure. Eighty-four healthy women comprising 36 premenopausal women and 48 early post-menopausal women off hormone replacement therapy were enrolled in two groups. The tensile characteristics of both cheeks were tested and compared in each group. A computerized suction device equipped with a 2 mm diameter hollow probe was used to derive viscoelasticity parameters during a fve-cycle procedure of 2 seconds each. Skin unfolding, intrinsic distensibility, biological elasticity, and creep extension were measured. Results: Both biological elasticity and creep extension were asymmetric on the cheeks of the post-menopausal women. In contrast, these differences were more discrete in the premenopausal women.Conclusion: Facial skin viscoelasticity appeared to be asymmetric following menopause. The possibility of asymmetry should be taken into account in future studies of the effects of hormone replacement therapy and any antiaging procedure on the face in menopausal women.

S.M. Jegasothy, V. Zablotniaia, S. Bielfeldt, **Efficacy of a New Topical Nano-hyaluronic Acid in Humans,** The Journal of Clinical and Aestical Dermatology, 2014;7(3): p. 27–29

Background: The aim of this study was to evaluate the efficacy of a new topical low molecular nano-hyaluronic acid preparation in treating wrinkles, skin hydration, and skin elasticity in humans. Methods: Thirty-three women with an average age of 45.2 were studied for a period of eight weeks to measure the anti-wrinkle efficacy of a new nanohyaluronic acid. The measurements were performed in the periorbital regions by investigating the three-dimensional structure using a DermaTOP for wrinkles, Corneometer for skin hydration, Cutometer for skin elasticity, and a Chroma Meter for erythema. Thereafter, standardized images were taken and evaluated by six selected and trained raters at the end of the study for reduction of visible wrinkles as well as skin color uniformity and pigmentation. Results: The results of the study showed a statistically significant moisturizing effect of the product range (lotion, serum, and cream, after 2,4, and 8 weeks of treatment. Measurement of skin roughness showed a significantly finer skin structure after two weeks of treatment, and skin elasticity showed a significant improvement after 2 and 8 weeks of treatment. Conclusion: The new nano-hyaluronic acid clearly demonstrated a significant benefit in decreasing the depth of wrinkles (up to 40%), and skin hydration (up to 96%) and skin firmness and elasticity were significantly enhanced (up to 55%) at the end of eight

weeks.

H. Kimoto-Nira, Y. Nagakura, C. Kodama, T. Shimizu, M. Okuta, K. Sasaki, N. Koikawa, K. Sakuraba, C. Suzuki, Y. Suzuki, **Effects of ingesting milk fermented by *Lactococcus lactis* H61 on skin health in young women: A randomized double-blind study**, J. Dairy Sci. 97, 2014: p. 5898–5903

We conducted a randomized double-blind trial to evaluate the effects of fermented milk produced using only *Lactococcus lactis* strain H61 as a starter bacterium (H61-fermented milk) on the general health and various skin properties of young women. Healthy female volunteers (n = 23; age = 19–21 yr) received H61-fermented milk (1010 cfu of strain H61/d) or conventional yogurt (1010 cfu of both *Lactobacillus delbrueckii* ssp. *Bulgaricus* and *Streptococcus thermophilus* per day), as a reference food, daily for 4 wk. Before and at the end of 4 wk, blood samples were taken, and skin hydration (inner forearms and cheek) and melanin content, elasticity, and sebum content (cheek only) were measured. Skin hydration at the inner forearm was higher at wk 4 than at wk 0 in both groups. Sebum content in cheek rose significantly after intervention in the H61-fermented milk group, but not the conventional yogurt group. Other skin parameters did not differ in either group. Serum analysis showed that total protein concentration and platelet count were elevated and reactive oxygenspecies decreased in both groups after the intervention. Although H61-fermented milk and conventional yogurt had similar effects on skin status and some blood characteristics of participants, an increase of sebum content in cheek is preferable to H61-fermented milk. As skin lipids contribute to maintaining the skin barrier, H61-fermented milk would provide beneficial effects on skin for young women.

P. Blanchemaison, E. Presse, R. Clement, A. Lethi, **Un nouveau traitement pour améliorer l'esthétique de la peau: les infrarouges longs,** GENESIS, N° 179, Juin 2014

Au Japon, les bains chauds dans une eau volcanique (« onsen-thérapie ») sont réputés rajeunir la peau. Un appareil à infrarouge longs utilisé dans les Spas ou en milieu médical peut-il prétendre à des résultats similaires ou supérieurs? Le vieillissement cutané du visage est un processus naturel inéluctable qui se traduit par l'apparition de rides et de ridules, de taches pigmentaires, d'une perte de fermeté et d'élasticité de la peau et d'une diminution de l'éclat du teint. Les facteurs de vieillissement peuvent être intrinsèques (génétiques, hormonaux,…) et extrinsèques (stress, agressions climatiques, pollution, tabac…). En dehors de la cosmétique, il existe aujourd'hui d'autres méthodes non invasives pour lutter contre les méfaits du temps sur la peau.

G. Maramaldi, **Lenitive and antiphotoageing properties of C.asiatica,** Personal Care, June 2014

Plant-derived elements used for pharmacological applications constitute an increasing research field. An interesting study from Italian researchers investigated a new purified extract from Madagascar gotu kola as a novel anti-inflammaging and anti-glycation agent for use against skin wrinkling and for skin protection against UV exposure. The results of this study qualify C.asiatica purified extract as an anti-ageing ingredient, addressing skin damage caused by inflammaging and glycation by relying on the synergy of triterpens and polyphenolics.

G. Peterson, C. Jauquet, K. Ortblad, K. Wisuri, L. Tadlock, S. Rapaka, **Evaluation of a sonic applicator on skin elasticity and wrinkle analysis compared to manual application and performance with 2 skin care products,** JAAD, May 2014, Volume 70, Issue 5, Supplement 1, p. AB16

Introduction and Objective: To measure changes in skin elasticity and wrinkle analysis around the eye area in 12 weeks …

M. Kieć-Świcrczyńska, D. Chomiczewska-Skóra, D. Świerczyńska-Machura, B. Kręcisz, **Impact of wet work on epidermal barrier (tewl and stratum corneum hydration) and skin viscoelasticity in nurses** (Abstract – Full article in Polish), Med Pr. 2014;65(5): p. 609-19

Background: Nurses are prone to develop hand eczema due to occupational exposure to irritants, including wet work. The aim of the study was to evaluate the impact of wet work on selected skin properties, reflecting epidermal barrier function--transepidermal water loss (TEWL) and stratum corneum hydration--and additionally skin viscoelasticity, in nurses. Materials and Methods: Study subjects included 90 nurses employed in hospital wards. Measurements were carried out within the dorsal aspect of the dominant hand, using a Cutometer MPA 580 equipped with Tewameter TM 300 and Corneometer CM 825 (Courage & Khazaka, Germany) probes. Examinations took place on hospital premises. Similar measurements were performed in the control group of females non-exposed to irritants. Results: In the examined group of nurses, mean TEWL was 15.5 g/h/m2 and was higher than in the control group (12.99 g/h/m2). After rejecting the extreme results, the difference between the groups proved to be statistically significant ($p < 0.05$). The mean value of stratum corneum hydration was lower in the examined group (37.915) compared with the control group (40.05), but the difference

was not sta tistically significant. Also results of viscoelasticity assessment showed no significant differences between studied groups. Conclusions: The results of the assessment of skin biophysical properties show that wet work exerts a moderately adverse impact on skin condition. A higher TEWL value and a lower stratum corneum hydration in workers exposed to irritants reflect an adverse impact of these factors on the epidermal barrier function.

M. Hayashi, H. Muramatsu, M. Nakano, Y. Tomizuka, M. Inoue, T. Onodera, E. Takahashi, M. Nakamura, **Evaluation of scars treated with autologous cultured epidermis JACE – Measurements of the elasticity and flexibility of the graft site using Cutometer**

We have used cultured epithelial autograft procedures for extensive burn patients at our institute. This case report presents a burn patient who was treated with meshed 6:1 split thickness autografts combined with cultured epithelial autografts. The elasticity and flexibility of the skin were measured using a special device, the Cutometer MPA580. A 19-year.old-woman suffered burn injuries when her clothing caught fire as she approached a kerosene stove. The total body surface area (TBSA) of burn was 37%. After debridement, the recipient bed preparation was managed by using artificial dermis.

G.W. Nam, E.J. Kim, Y.C. Jung, C.B. Jeong, K.H. Shin, H. K. Lee, **Differences in Skin Properties of Korean Women at the Initial Aging Phase,** Journal of Cosmetics, Dermatological Sciences and Applications, 2014, 4, p. 44-52

Many studies on aging have focused on evaluating differences between older and younger people, but only a few have focused on differences in skin properties among subjects from the same age group according to their skin aging status. In this study, we evaluated the facial skin condition and life style factors in 110 Korean women aged 25 to 35 in an attempt to evaluate factors which may affect the skin aging status in the initial aging phase. The facial skin condition of 110 healthy Korean women was assessed over two successive 6-month periods, summer and winter. Using clinical assessments including aging, wrinkles and skin's elasticity values, the subjects were divided into 7 groups. Then, various facial skin conditions and life style factors were examined between a severe aging group and mild aging group. In the severe aging group, the mean value pH was lower and the mean value of water content was slightly lower than that of women in the mild aging group. Also, the seasonal site variation in water content and sebum secretion level were significantly higher in the severe aging group than in the mild aging group. Topical sunscreen using percentage was not significantly different between the two groups. However, the number of cosmetic subject use was slightly higher in the mild aging group than in the severe aging group. The study suggested that there were several differences in skin characteristics between women in the severe aging group and in the mild aging group at the initial aging phase. Seasonal site variation between cheek and forehead was the most dominant differences. We also considered that life style factors such as cosmetic use could affect skin aging status.

O. Freis, G. Perie, A.Rathjens, **Correlating Aging with Skin's Mechanical and Optical Properties,** Cosmetics and Toiletries, April 21, 2014

The evolution of skin's biomechanical and optical properties as a function of aging and/or photoaging is one of the main targets of cosmetic and dermatological research. Many noninvasive devices to measure skin's biomechanical properties have been developed using alternative methods such as stretching, torsion, indentation and suction. Measurements of skin deformation after suction or torsion are the most widely used techniques in cosmetic research. The skin's optical properties play an important role as well, and devices measuring these characteristics assess reflected light after illumination of the skin surface. Different noninvasive methods have been proposed for evaluating skin complexion in vivo. These include quantitative measurements of skin color, using colorimetry—i.e., *L*a*b** and Individual Typological Angle (ITA°); or of the intensity of specular reflection and the back-scattering of light from the skin. The purpose of this study was to demonstrate the evolution of the measured parameters with aging, and to find the correlation between measured mechanical and optical properties of the skin.

M. Kang, L. Dong-Geol, **Dermal Flora and Density Change Using Bifidobacteriaceae-based Re-DerMAX,** SOFW Journal 140, 4-2014

Members of the genus Lactobacillus exist as residents in regions of the human body, such as he intestinal canal, mouth, and vagina. In early childhood, infacts are gem-free and are infected by bacteria during birth through the birth canal, vagina, or air. When the number of harmful bacteria increases, children are exposed to different types of diseases. In this study, investigated microorganisms that exist in human feces and further analyzed the effect of Re-DerMAX. Microbiological effects, based on whether a microorganism exhibited mutualism or parasitism, were observed by spreading Re-

DerMAX on the feces sample to evaluate this idea, Denaturing Gradient Gel Electrophoresis (DGGE) analysis was used in the D-code system for an applied test and for a test conducted on 2 groups.

J.P. Bonaparte, D. Ellis, **Skin Biomechanical Changes after Injection of Onabotulinum Toxin A: Prospective Assessment of Elasticity and Pliability**, Otolaryngology–Head and Neck Surgery, March 2014

Objective: This study aimed to test the hypothesis that the administration of onabotulinum toxin A will result in an increase in skin pliability and elasticity. Study Design: A prospective case series with planned data collection in which patients were treated with onabotulinum toxin and assessed at baseline, 2 weeks post-injection, and 2 months post-injection. Setting: A private cosmetic surgery clinic associated with a tertiary academic hospital. Subjects and Methods Forty women were prospectively enrolled to receive onabotulinum toxin A into their glabella, forehead, and lateral orbit. Outcomes were assessed at baseline, 2 weeks posttreatment, and 2 months posttreatment using the Cutometer MPA 580. Skin pliability (Uf) and the elastic recoil (Ua/Uf) were recorded as the 2 primary outcome measures. Results: There was a significant effect of onabotulinum toxin on skin elasticity (f = 47.8, $P = .001$) with a mean (+/– SE) increase in elastic recoil of 20% (4.4%) for the glabellar region ($P < .001$) and 18% (4.0%) for the lateral orbit ($P < .0001$). There was a significant effect of the treatment on skin pliability (f = 46.9, $P < .001$) with a mean (+/– SE) increase of 26% (5.4%) for the lateral orbit ($P = .001$) and 52% (8.3%) for the glabellar region ($P < .001$). Conclusion: Injection of onabotulinum toxin into the lateral orbital, forehead, and glabellar regions results in skin that has increased pliability as well as increased elastic recoil. Although this study demonstrates the positive effect of onabotulinum toxin on biomechanical parameters, it is unclear what specific histological changes are occurring within the skin.

J.P. Bonaparte, J. Chung, **The effect of probe placement on inter-trial variability when using the Cutometer MPA 580,** J Med Eng Technol. 2014 Mar;38(2): p. 85-9

There is limited data independently assessing the optimal use of the Cutometer MPA580. The purpose of this study is to test the hypothesis that the assessment of elastic recoil is significantly different when utilizing two different probe placement protocols. In protocol A, four trials were performed, in which the probe was removed from the skin between trials. In protocol B, the probe was not removed from the skin between trials. Fifty-four patients were enrolled and all completed the testing. When assessing elasticity (Ua/Uf), the inter-class correlation was 0.83 for protocol A and 0.48 for protocol B ($p < 0.001$). There was no significant difference between individual trials for protocol A. Trial one of protocol B was significantly different ($p < 0.001$) than trials 2-4 for protocol B. Trial one of protocol B was not significantly different than any trial in protocol A. The results of this study suggest that the method in which a clinician performs repeated measure testing has a significant effect on the outcome measures when using the Cutometer. Removing the probe between trials appears to result in measures with higher reliability.

N. Akhtar, N.S. Malik, B.A. Khan, Gulfishan, H.M.S. Khan, **Lactic Acid Cream: A novel approach to study the effects on skin aging of healthy human volunteers,** SOFW-Journal 140, 3-2014

Introduction: Human skin has good frictional characteristics, supporting locomotion and management by its texture. Skin has elasticity and thus can be streched and compressed (1). As aging takes place, our skin gets more wrinkles, becomes drier and less elastic. Assessment of the skin elasticity is particularly more significant, because it is not as noticeable as other signs of aging such as wrinkles (2). Noninvasive skin elasticity measurements are appropriate for an objective and quantitative evaluation of the complex effect of different dermatological and cosmetic products on epidermal mechanics and water content (3).

S. Rao, F. Muia, S. Bennett, J. V. Gruber, **Improving barrier function to address premature ageing,** Personal Care February 2014

Skin barrier function, principally the stratum corneum, is the primary line of defence against extrinsic stress such as UV-induced photo-damage, insults from microbial infections and physical deterioration resulting from ageing and environmental exposure. Scientific evidence suggests that both intrinsic and environmental factors contribute to „compromised“ skin barrier function.

R. Burgo, Y. He, L. Lampe, E. Mustafa, **Natural polymer for modern colour applications,** Personal Care February 2014

Colour cosmetic formulations continue to seek new, novel ingredients that can allow brands to create differentiated products that meet the requirements of that latest trends in the marketplace. Inolex has created and introduces LipFeel Natural, a new, patented polymer suitable for many colour cosmetic applications, particularly lip products. LipFeel Natural is completely derived from renewable and sustainable plant sources, and is produced using green chemistry principles. In this article, Inolex shows

the results of various testing to demonstrate how LipFeel Natural can confer many of the benefits sought in modern colour cosmetic applications.

S. Luebberding, N. Krueger, M. Kerscher, **Mechanical properties of human skin in vivo: a comparative evaluation in 300 men and women,** Skin Research and Technology 2014; 20: p. 127-135

Background: Previous studies have shown that the clinical genesis and onset of facial wrinkles as well as the morphology of the extracellular matrix differ between the sexes. The aim of this present clinical study was to do the first systematic assessment of gender-related differences in skin elasticity, with special focus on age-related changes. Material and Methods: 300 healthy male and female subjects (20–74 years) were selected following strict criteria including age, sun behavior or smoking habits. Skin mechanical properties were assessed at the cheek, neck, volar forearm and dorsum of the hand using a non-invasive suction device.

M.S. Woo, K.J. Moon, H.Y. Jung, S.R. Park, T.K. Moon, N.S. Kim, B.C. Lee, **Comparison of skin elasticity test results from the Ballistometer and Cutometer,** Skin Research and Technology 2014; 20: p. 422-428

Background: Long-term exposure to sunlight changes skin features like amount of facial wrinkling and skin elasticity, which is useful in estimating skin health and age-related changes. Skin elasticity is evaluated by quantitative methods such as the noninvasive suction device Cutometer, which is widely used to evaluate regional body-elasticity differences and correlate these findings with the results of other instrumental data. Few field studies have been done with the Ballistometer device, another noninvasive method for measuring skin elasticity.

S. Kirkham, S. Lam, C. Nester, F. Hashmi, **The effect of hydration on the risk of friction blister formation on the heel of the foot,** Skin Research and Technology 2014; 20: p. 246-253

Background: Friction blister research has focused on prevention and treatment approaches rather than exploring the pathophysiology of the friction blister. Increased skin hydration has been purported to be a key risk factor in friction blister development. This studay aimed to test the effect of increased skin surface hydration on the risk of friction blister creation. Methods: The skin on one foot was hydrated by soaking the foot in water. Intermittent loading was carried out until an observable change of 3°C was evident using infrared thermography. The contra latreal foot acted as a control. Skin hydration and elasticity was measured using electrical capacitance and negative pressure respectively.

F. Hacard, L. Machet, A. Caille, V. Tauveron, G. Georgescou, I. Rapeneau, M. Samimi, F. Patat, L. Vaillant, **Measurement of skin thickness and skin elasticity to evaluate the effectiveness of intensive decongestive treatment in patients with lymphoedema: a prospective study,** Skin Research and Technology 2014; 20: p. 274-281

Background: Complex decongestive physiotherapy (CDP) is used to treat patients with severe lymphoedema. The efficacy of CDP is usually quantified by calculating limb volume from repeated measurements of circumference at least 10 points before and after treatment of an affected limb. Measurement is time-consuming and operator-dependent. Objectives: To determine whether decreased dermal thickness is correlated with decreased volume after intensive CDP. Methods: A consecutive series of patients admitted for intensive CDP were studied over a 6-month period. Before and after CDP, we measured circumference, dermal thickness elasticity and finally improvement in quality of life using a visual analogue scale (VAS).

Y. Gabe, O. Osanai, Y. Takema, **The relationship between skin aging and steady state ultraweak photon emission as an indicator of skin oxidative stress in vivo,** Skin Research and Technology 2014; 20: p. 315-321

Background/purpose: Ultraweak photon emission (UPE) is one potential method to evaluate the oxidative status of the skin in vivo. However, little known about how the daily oxidative stress of the skin is related to skin aging-related alterrations in vivo. We characterized the steady state UPE and performed a skin survey. Methods: We evaluated the skin oxidative status by UPE, skin elasticity, epidermal thickness and skin color on the inner upper arm, the outer forearm, and the buttock of 70 Japanese volunteers.

E.J. Kim, J.Y. Han, H.K. Lee, Q.Q. He, J.C. Cho, L. Wei, X. Wang, L. Li, L. Wei, H. Liang, X. Gao, B.J. Kim, G.W. Nam, **Effect of the regional environment on the skin properties and the early wrinkles in young Chinese women,** Skin Research and Technology 2014; 20: p. 498-502

Background: There are ethnic differences in the skin characteristics, also the skin is susceptible to be influenced by the external environment such as UV radiation and the climates. It can be shown that the skin in same race or twins varies by the enviroment. Objectives: This study was designed to investigate the skin characteristics and the early wrinkles of young Chinese women from four different regions, and to identify the correlation among the wrinkles, the other skin characteristics, and environmental conditions. Methods: A total of 441 healthy Chinese women aged between 20 and 35 years participated in the study: 110 from Beijing, 110 from Shanghai, 111 from Wuhan, and 110 from Guangzhou. The skin hydration, sebum contents, TEWL, pH, elasticity, and wrinkles were measured on the cow's feet area.

E. Proksch, D. Segger, J. Degwert, M. Schunck, V. Zague, S. Oesser, **Oral supplementation of specific collagen peptides has beneficial effects on human skin physiology: a double-blind, placebo-controlled study**, Skin Pharmacol. Physiol. 2014; 27; p. 47-55

Various dietary supplements are claimed to have cutaneous anti-aging properties; however, there are a limited number of research studies supporting these claims. The objective of this research was to study the effectiveness of collagen hydrolysate (CH) composed of specific collagen peptides on skin biophysical parameters related to cutaneous aging. In this double-blind, placebo-controlled trial, 69 women aged 35-55 years were randomized to receive 2.5 g or 5.0 g of CH or placebo once daily for 8 weeks, with 23 subjects being allocated to each treatment group. Skin elasticity, skin moisture, transepidermal water loss and skin roughness were objectively measured before the first oral product application (t0) and after 4 (t1) and 8 weeks (t2) of regular intake. Skin elasticity (primary interest) was also assessed at follow-up 4 weeks after the last intake of CH (t3, 4-week regression phase). At the end of the study, skin elasticity in both CH dosage groups showed a statistically significant improvement in comparison to placebo. After 4 weeks of follow-up treatment, a statistically significantly higher skin elasticity level was determined in elderly women. With regard to skin moisture and skin evaporation, a positive influence of CH treatment could be observed in a subgroup analysis, but data failed to reach a level of statistical significance. No side effects were noted throughout the study.

J.H. Min, I.S. Yun, D.H. Lew, T.S. Roh, W.J. Lee, **The Use of Matriderm and Autologous Skin Graft in the Treatment of Full Thickness Skin Defects**, Arch Plast Surg 2014;41: p. 330-336

Background: For patients with full thickness skin defects, autologous Split-thickness skin grafts (STSG) are generally regarded as the mainstay of treatment. However, skin grafts have some limitations, including undesirable outcomes resulting from scars, poor elasticity, and limitations in joint movement due to contractures. In this study, we present outcomes of Matriderm grafts used for various skin tissue defects whether it improves on these drawbacks. Methods: From January 2010 to March 2012, a retrospective review of patients who had undergone autologous STSG with Matriderm was performed. We assessed graft survival to evaluate the effectiveness of Matriderm. We also evaluated skin quality using a Cutometer, Corneometer, Tewameter, or Mexameter, approximately 12 months after surgery. Results: A total of 31 patients underwent STSG with Matriderm during the study period. The success rate of skin grafting was 96.7%. The elasticity value of the portion on which Matriderm was applied was 0.765 (range, 0.635–0.800), the value of the trans-epidermal water loss (TEWL) was 10.0 (range, 8.15–11.00) g/hr/m2, and the humidification value was 24.0 (range, 15.5– 30.0). The levels of erythema and melanin were 352.0 arbitrary unit (AU) (range, 299.25– 402.75 AU) and 211.0 AU (range, 158.25–297.00 AU), respectively. When comparing the values of elasticity and TEWL of the skin treated with Matriderm to the values of the surrounding skin, there was no statistically significant difference between the groups. Conclusions: The results of this study demonstrate that a dermal substitute (Matriderm) with STSG was adopted stably and with minimal complications. Furthermore, comparing Matriderm grafted skin to normal skin using Cutometer, Matriderm proved valuable in restoring skin elasticity and the skin barrier.

H.-S. Yoon, S.-R. Lee, J. H. Chung, **Long-term Topical Oestrogen Treatment of Sun-exposed Facial Skin in Post-menopausal Women Does Not Improve Facial Wrinkles or Skin Elasticity, But Induces Matrix Metalloproteinase-1 Expression**, Acta Derm Venereol 2014; 94: p. 4–8

It is controversial whether treatment with oestrogen stimulates collagen production or accumulation in sunexposed skin. The aim of this study was to determine the effect of long-term treatment with topical oestrogen on photoaged facial skin, with regard to wrinkle severity, and expression of procollagen and matrix metalloproteinase-1 enzyme. Two groups of 40 post-menopausal women applied either 1 g of 1% oestrone or vehicle cream once daily to the face for 24 weeks. Visiometer R1–R5 values (skin wrinkles) and Cutometer values (skin elasticity) were not signifcantly improved in the oestrone group after 24 weeks of treatment. Type I procollagen immunostaining did not increase in the oestrone group compared with the control group. However, levels of matrix metalloproteinase-1 mRNA

increased robustly (10.3 times) in oestrone-treated skin compared with vehicletreated skin. Thus, treatment with topical oestrogen may be deleterious in ultraviolet-induced skin ageing, at least in part, through induction of matrix metalloproteinase-1(MMP-1) expression in human skin.

J.Y. Park, T.G. Lee, J.Y. Kim, M.C. Lee, Y.K. Chung, W.J. Lee, **Acellular Dermal Matrix to Treat Full Thickness Skin Defects: Follow-Up Subjective and Objective Skin Quality Assessments**, Arch Craniofac Surg Vol.15 No.1, 2014, p. 14-21

Background: There are several options for replacement of the dermal layer in fullthickness skin defects. In this study, we present the surgical outcomes of reconstruction using acellular dermal substitutes by means of objective and subjective scar assessment tools. Methods: We retrospectively reviewed the medical records of 78 patients who had undergone autologous split-thickness skin graft with or without concomitant acellular dermal matrix (CGDerm or AlloDerm) graft. We examined graft survival rate and evaluated postoperative functional skin values. Individual comparisons were performed between the area of skin graft and the surrounding normal skin. Nine months after surgery, we compared the skin qualities of CGDerm graft group (n=25), AlloDerm graft group (n=8) with skin graft only group (n=23) each other using the objective and subjective measurements. Results: The average of graft survival rate was 93% for CGDerm group, 92% for AlloDerm group and 86% for skin graft only group. Comparing CGDerm grafted skin to the surrounding normal skin, mean elasticity, hydration, and skin barrier values were 87%, 86%, and 82%, respectively. AlloDerm grafted skin values were 84%, 85%, and 84%, respectively. There were no statistical differences between the CGDerm and AlloDerm groups with regard to graft survival rate and skin functional analysis values. However, both groups showed more improvement of skin quality than skin graft only group. Conclusion: The new dermal substitute (CGDerm) demonstrated comparable results with regard to elasticity, humidification, and skin barrier effect when compared with conventional dermal substitute (AlloDerm).

J.-Y. Choi, S.-H. Kim, G.-J. Oh, S.-G. Roh, N.-H. Lee, K.-M. Yang, **Management of Defects on Lower Extremities with the Use of Matriderm and Skin Graft,** Arch Plast Surg 2014; 41: p. 337-343

Background: The reconstruction of large skin and soft tissue defects on the lower extremities is challenging. The skin graft is a simple and frequently used method for covering a skin defect. However, poor skin quality and architecture are well-known problems that lead to scar contracture. The collagen–elastin matrix, Matriderm, has been used to improve the quality of skin grafts; however, no statistical and objective review of the results has been reported. Methods: Thirty-four patients (23 male and 11 female) who previously received a skin graft and simultaneous application of Matriderm between January 2010 and June 2012 were included in this study. The quality of the skin graft was evaluated using Cutometer, occasionally accompanied by pathologic findings. Results**:** All 34 patients showed good skin quality compared to a traditional skin graft and were satisfied with their results. The statistical data for the measurement of the mechanical properties of the skin were similar to those for normal skin. In addition, there was no change in the engraftment rate. Conclusions**:** The biggest problem of a traditional skin graft is scar contracture. However, the dermal matrix presents an improvement in skin quality with elastin and collagen. Therefore, a skin graft along with a simultaneous application of Matriderm is safe and effective and leads to a significantly better outcome from the perspective of skin elasticity.

M.A. Adatto, R.M. Adatto-Neilson, G. Morren, **Reduction in adipose tissue volume using a new high-power radiofrequency technology combined with infrared light and mechanical manipulation for body contouring,** Lasers Med Sci (2014) 29: p. 1627–1631

A growing patient demand for a youthful skin appearance with a favorable body shape has led to the recent development of new noninvasive body contouring techniques. We have previously demonstrated that the combination of bipolar radiofrequency (RF) and optical energies with tissue manipulation is an efficient reshaping modality. Here, we investigated the efficacy and safety of a new high-power version of this combined technology, in terms of adipose tissue reduction and skin tightening. Thirty-five patients received one treatment per week over 6 weeks to their abdomen/ flank, buttock, or thigh areas and were followed up to 3 months post completion of the treatment protocol. This new device has an increased power in the bipolar RF, as this parameter appears to be the most important energy modality for volume reduction. Patient circumferences were measured and comparisons of baseline and post treatment outcomes were made. Diagnostic ultrasound (US) measurements were performed in 12 patients to evaluate the reduction in adipose tissue volume, and a cutometer device was used to assess improvements in skin tightening. We observed a gradual decline in patient circumferences from baseline to post six treatments. The overall body shaping effect was accompanied with improvement in skin tightening and was clearly noticeable in the comparison of the before and after treatment clinical photographs. These findings correlated with measurements of adipose tissue volume and skin

firmness/elasticity using diagnostic US and cutometer, respectively. The thickness of the fat layer showed on average a 29 % reduction between baseline and the 1-month follow up. The average reduction in the circumference of the abdomen/flanks, buttocks, and thighs from baseline to the 3-month follow-up was 1.4, 0.5, and 1.2 cm, respectively, and 93 % of study participants demonstrated a 1–60 % change in fat layer thickness. Patients subjectively described comfort and satisfaction from treatment, and 97 % of them were satisfied with the results at the followup visit. The application of high-power RF energy combined with infrared (IR), mechanical massage, and vacuum appears to be an effective modality for the reduction in circumferences of the abdomen/flank, buttock and thigh regions, and the improvement of skin appearance. The present study performed with a new device suggests that the underlying mechanism of action is reduction in the subcutaneous adipose tissue volume and intensification of dermal matrix density.

H.-S. Yoon, S.-R. Lee, J.H. Chung, **Long-term Topical Oestrogen Treatment of Sun-exposed Facial Skin in Post-menopausal Women Does Not Improve Facial Wrinkles or Skin Elasticity, But Induces Matrix Metalloproteinase-1 Expression,** Acta Derm Venereol 2014; 94: p. 4–8

It is controversial whether treatment with oestrogen stimulates collagen production or accumulation in sunexposed skin. The aim of this study was to determine the effect of long-term treatment with topical oestrogen on photoaged facial skin, with regard to wrinkle severity, and expression of procollagen and matrix metalloproteinase-1 enzyme. Two groups of 40 post-menopausal women applied either 1 g of 1% oestrone or vehicle cream once daily to the face for 24 weeks. Visiometer R1–R5 values (skin wrinkles) and Cutometer values (skin elasticity) were not signifcantly improved in the oestrone group after 24 weeks of treatment. Type I procollagen immunostaining did not increase in the oestrone group compared with the control group. However, levels of matrix metalloproteinase-1 mRNA increased robustly (10.3 times) in oestrone-treated skin compared with vehicletreated skin. Thus, treatment with topical oestrogen may be deleterious in ultraviolet-induced skin ageing, at least in part, through induction of matrix metalloproteinase-1 (MMP-1) expression in human skin.

Y. Piriou, A. Sirvent, A. Natalizio, F. Girard-ory, **Skin-lightening and anti-ageingeffect of a food supplement containing *Pinus pinaster* extract,** Nutrafoods (2014)

Oligomeric proanthocyanidins extracted from the bark of the French maritime pine *Pinus pinaster* (FMPBE) have been studied for a long time and demonstrated various phytopharmaceutical applications. The objectives of this study were to assess the cutaneous lightening and anti-ageing effects of FMPBE after 56 days of consumption, in healthy Asian women. The cosmetic efficacy of the product was assessed through various biometrological evaluations. This randomised, double-blind, placebocontrolled and cross-over study evidenced the safety and efficacy of the 100 mg FMPBE supplementation from 28 days of intake: in comparison to placebo, the skin on pigmentary spots became significantly lighter and less red, skin on the face was more firm and its surface was less wrinkled. After 56 days of consumption, the skin was additionally significantly more elastic and the yellow constituent of the skin decreased on the normal skin. Taken together, these results proved that FMPBE supplementation can be considered as an innovative approach to skin whitening and anti-ageing treatments. It represents an interesting alternative to topical products and supports the skin from the inside out.

F. Hashmi, **The effect of non-enzymatic glycation of keratins on the physical properties of plantar epidermis in type II diabetic and non-diabetic individuals,** Thesis University College London 2014

As keratin is the principle structure of the plantar stratum corneum, it has been postulated that changes in this protein, associated with non-enzymatic glycation, may contribute to abnormalities in the development of plantar callus in diabetes consequently leading to ulceration of plantar skin. The clinical appearance of the skin in the diabetic state has been described as being thicker and less flexible than non-diabetic skin, particularly in the hands.

J. Chung, J.P. Bonaparte, M. Odell, M. Corsten, **The effect of topically applied tissue expanders on radial forearm skin pliability: a prospective self-controlled study**, Journal of Otolaryngology - Head and Neck Surgery 2014, 43:8

Background: The use of pre-operatively applied topical tissue expansion tapes have previously demonstrated increased rates of primary closure of radial forearm free flap donor sites. This is associated with a reduced cost of care as well as improved cosmetic appearance of the donor site. Unfortunately, little is known about the biomechanical changes these tapes cause in the forearm skin. This study tested the hypothesis that the use of topically applied tissue expansion tapes will result in an increase in forearm skin pliability in patients undergoing radial forearm free flap surgery. Methods: Twenty-four patients scheduled for head and neck surgery requiring a radial forearm free flap were

enrolled in this prospective self-controlled observational study. DynaClose tissue expansion tapes (registered Canica Design Inc, Almonte, Canada) were applied across the forearm one week pre-operatively. Immediately prior to surgery, the skin pliability of the dorsal and volar forearm sites were measured with the Cutometer MPA 580 (registered Courage-Khazaka Electronic GmbH, Cologne, Germany) on both the treatment and contralateral (control) arms. Paired t-tests were used to compare treatment to control at both sites, with $p < 0.025$ defined as statistically significant. Results: There was a statistically significant increase in pliability by a mean of 0.05 mm (SD = 0.09 mm) between treatment and control arms on the dorsal site (95% CI [0.01, 0.08], $p = 0.018$). This corresponded to an 8% increase in pliability. In contrast, the volar site did not show a statistically significant difference between treatment and control (mean difference = 0.04 mm, SD = 0.20 mm, 95% CI [-0.04, 0.12], $p = 0.30$). Conclusions: This result provides evidence that the pre-operative application of topical tissue expansion tapes produces measurable changes in skin biomechanical properties. The location of this change on the dorsal forearm is consistent with the method of tape application. While this increase in skin pliability may account for the improved rate of primary donor site closure reported using this technique, the results did not reach our definition of clinical significance

E. Kim, G. Cho, N.G. Won, J. Cho, **Age-related changes in skin bio-mechanical properties: the neck skin compared with the cheek and forearm skin in Korean females**, Skin Research and Technology 2013; 19; 236-241

Background: There are many reports on regional variations in skin bio-mechanical properties, but few studies have been performed on the neck. The neck is sun-exposed and continues to move so the neck skin can be more apt to aging. Methods: The skin porperties oft he neck, cheek, and ventral forearm of 58 Korean female volunteers in good health (25-64 years old, 42.3 ± 11.7) were assessed non-invasively with skin measuring devices, and the correlation with age and wrinkles was analyzed. Results: Neck skin was more extensible, elastic and viscoelastic than the cheek. The dermal layer fort he neck skin was thinner and more intense than the cheek, but the results were opposite when compared with the skin oft he forearm. We could observe that the subcutaneous layer was divided by the fascia with regard tot he neck skin, and this thickness increased BMI-dependently.

Y. Hara, Y. Masuda, T. Hirao, N. Yoshikawa, **The relationship between the Young's moduls of the stratum corneum and age: a pilot study,** Skin Research and Technology 2013; 19; 339-345

Background/purpose: The mechanical porperties of the strum corneum play an important role in protecting the body from external physical stimuli and excessive sensitivity. However, it is difficult to analyze these mechanical properties in vivo. To resolve this problem, we carried out a numerical analysis to calculate the Young's modulus of the stratum corneum. We then investigated the relationship between the Young's modulus of the stratum corneum and age. Methods: We used a Cutometer and a Dermal Torque Meter for measuring skin mechanical parameters, and optical coherence tomography and an ultrasonic imaging system for measuring skin thickness. Based on these non-invasive results, liner elastic analysis was performed by the finite element method, and the Young's moduli of the stratum corneum and the dermis were calculated by solving an inverse problem. Using these techniques, we analyzed the correlation between the Young's modulus of the stratum corneum for the cheeks of seventy-eight Japanese aged from 20 to 68 years.

G.E. Piérard, S. Piérard, P. Delvenne, C. Piérard-Franchimont, **In vivo evaluation of the skin tensile strength by the suction method: pilot study coping with hysteresis and creep extension,** ISRN Dermatology Volume 2013; Article ID 841217, 7 pages

Measurements of a number of physical parameters characterizing human skin have been attempted over the recent decades. A diversity of devices assessing skin viscoelasticity were used both in vitro and in vivo]. They proved to be useful tools for scientists and medical practitioners. Over a large part of the body, the overall viscoelastic behaviour of the skin primaily depends on the skin connective tissue (SCT) structures present in both the dermis and the subcutis, with minimal contribution from the epidermis. The suction method is one of the most widely used approach for determining some of the biomechanical characteristics of human skin in health and disease. The progressive suction mode with a stress-versus-strain graphic recording is a convenient way in this endeavour. In this prodecure, a progressive increase in stress suction for a defined period of time is followed by a symmetrical rate of suction release. During the whole process, skin deformation defined as the strain is recorded. Typically, visoelastic materials exhibit nonlinear stress-versus-strain properties. The hysteresis loop represents the area delimited by the two curves representing the loading and relaxation phases, respectively.

S. Nishikori, J. Yasuda, K. Murata, J. Takegaki, Y. Harada, Y. Shirai, S. Fujita, **Resistance training rejuvenates aging skin by reducing circulating infammatory factors and enhancing dermal extracellular matrices**, Scientifc Reports, (2023) 13:10214

Aerobic training (AT) is suggested to be an effective anti-aging strategy for skin aging. However, the respective efects of resistance training (RT) have not been studied. Therefore, we compared the effects of AT and RT on skin aging in a 16-week intervention in 61 healthy sedentary middle-aged Japanese women. Data from 56 women were available for analysis. Both interventions significantly improved skin elasticity and upper dermal structure, and RT also improved dermal thickness. After the training intervention, expression of dermal extracellular matrix-related genes was increased in normal human primary dermal fibroblasts. AT and RT had diferent efects on circulating levels of factors, such as cytokines, hormones in serum, and metabolites, and RT increased dermal biglycan (BGN). To our knowledge, this is the first report to show different effects of AT and RT on skin aging and identify the key factors involved in RT-induced skin rejuvenation.

A. Mitarotonda, F. Johnson, L. Koch, **Clinically proven benefits of organic certified products,** Personal Care November 2013

Abstract: There is a general belief that natural and organic cosmetic products cannot deliver strong benefits and only basic clamis can be achieved. This is due to the limited number of ingredients available to those who are formulating certified products. When transposed to skin care claims, it usually means hydration and moisturisation derived benefits. When it comes to makeup, the absence of truly performing colour cosmetics can lead „green consumers“ to look at more standard brands in order to get their favourite look. With this article the authors would like to demonstrate that it is possible to develop organic certified products that are clinically proven to be effective.

E. Bagatin, H.A. Miot, J.L.M. Soares, A. Sanudo, J.P.J.M. Afonso, N. de Barros Junior, S. Talarico, **Long-wave infrared radiation reflected by compression stockings in the treatment of cellulite: a clinical double-blind, randomized and controlled study**, Int J Cosmet Sci, 2013 Oct;35(5): p. 502-509

Background: Cellulite refers to changes in skin relief on the thighs and buttocks of women, with a prevalence of 80-90%, causing dissatisfaction and search for treatment. Etiopathogenesis is multifactorial, as follows: herniation of the hypodermis towards the dermis, facilitated by perpendicular fibrous septa, changes in the dermal extracellular matrix, decreased adiponectin, genetic polymorphism, microcirculation alterations and inflammatory process. There are numerous therapeutic approaches, with little evidence of effectiveness. The long-wave infrared (LWIR) radiation interacts with water, improves microcirculation and stimulates metabolic processes. To date, the use of tissues with potential reflection of LWIR radiation has not been systematically investigated as adjuvant treatment for cellulite. Objective: To investigate the efficacy and safety of the treatment of cellulite through the use of compression stockings made with thread reflecting LWIR radiation. Patients and methods: Clinical study of therapeutic intervention, controlled and double-blind, including 30 women, aging from 25 to 40 years, with cellulite of grades II and III on the thighs and buttocks who used compression stockings, "pantyhose" model, made with reflector thread of LWIR radiation, on only one randomized side. Women under other treatments for cellulite and with venous and/or blood insufficiencies were excluded. Evaluation of efficacy by clinical parameters, photographs, Dermatology Life Quality Index (DLQI), cutometry and high frequency ultrasonography and security by observation of adverse events and venous EcoDoppler recordings. Results: DLQI scores showed significant reduction; the two-dimensional high-frequency ultrasonography showed an insignificant increase in dermal echogenicity as well as other efficacy parameters demonstrated no or slight improvement, with no differences between the sides exposed or not to LWIR; and there were no severe adverse events. Conclusion: Compression stockings, with or without thread reflector of LWIR, showed slight effects in the appearance of cellulite, but the treatment determined a positive impact on women quality of life.

O. Hevia, **An Investigation into the Anti-aging Efficacy of a Serum Containing a Red Mangrove Extract,** SOFW-Journal, 139, 10-2013

Introduction: Rhizophora mangle, more commomly known as the red mangrove, is a woody, salt water-tolerant plant that grows in topical and subtropical coastal areas throughout the world, especially in the Atlantic basin of the Americas and Caribbean. Extracts from the bark of the red mangrove (Rhizophora Mangle) plant have been used in folk medicine for centuries, and numerous studies have demonstrated that the extract prossesses antimicrobial, anti-inflammatory, and potent antioxidant activity. 1-6 Based in these findings, a proprietary extract from the seedlings of the red mangrove was developed and incorporated into a cosmetic formulation and applied topically to determine if it could exhibit any anti-aging efficacy.

D.G. Mercurio, T.A.L. Wagemaker, P.M:B.G Maia Campos, **Effects of sun exposure habits on skin aging: a multivariate analysis**, ISBS, Milan 15-16.10.2013

Summary: Skin exposure to ultraviolet (UV) radiation is related with molecular, morphological, structural and clinical changes on the skin, which characterizes photoaging. However, there are few studies that correlate sun exposure habits and objective measurements using biophysical and skin image techniques. Thus, the aim of this study was to evaluate the influence of the sun exposure habits on the biophysical and morphological characteristics of aged skin using multivariate analysis. For this, 40 healthy female volunteers (aged between 18- 30 or 40-65 years) filled a questionnaire concerning their sun exposure and protection habits during different periods of their lives. The characterization of the skin of dorsal and volar forearms was performed using objective measurements by biophysical and skin image techniques in terms of transepidermal water loss, direct measurement of the skin topography, viscoelasticity, dermis thickness and echogenicity, and structure and morphology of the epidermis by in vivo Reflectance Confocal Microscopy. Principal Component Analysis (PCA) of the values of each parameter was used to visualize the relationship between variables and groups. According to the PCA analysis, the sun exposure habits are directly related to increased dermis thickness, reduced echogenicity and elasticity.

J.C. Pittet, O. Freis, M.D. Vazquez-Duchêne, G. Périé, G. Pauly, **Evaluation of Elastin/Collagen Content in Human Dermis in-vivo by Multiphoton. Tomography – Variation with the depth and correlation with aging,** ISBS, Milan 15-16.10.2013

Summary: Problem: Several studies have reported that autofluorescence (AF) and second harmonic generation (SHG) signals generated in the superficial dermis are related with skin photoaging. In this study we have focused on the measurement of AF and SHG at two different depths of dermis and performed the comparison with two other techniques. Method: Multiphoton Confocal Microscopy (MCM) was used to quantify elastin and collagen with SHG-to-AF Aging Index of Dermis (SAAID). A 50MHz ultrasound scanner was used for the calculation of the Sub Epidermal Non Echogenic Band (SENEB). The measurements of the skin mechanical properties were performed with a cutometer. All measurements were performed on 2 groups of 30 healthy female volunteers of different ages (“Young”: 28±9 years; “Aged”: 54±11 years).

H. Ohno, N. Nishimura, K. Yamada, Y. Shimizu, S. Iwase, J. Sugenoya, M. Sato, **Effects of water nanodroplets on skin moisture and viscoelasticity during air-conditioning**, Skin Research and Technology 2013;19;375-383

Background/purpose: In air-conditioned rooms, dry air exacerbates some skin diseases, for example, senile xerosis, atopic dermatitis, and surface roughness. Humidifiers are used to improve air dryness, which often induces excess humidity and thermal discomfort. To address this issue, we investigated the effects of water nanodroplets (mist) on skin hydration, which may increase skin hydration by penetrating into the interstitial spaces between corneocytes of the stratum corneum (SC) without increasing air humidity. Methods: We examined biophysical parameters, including skin conductance and transepidermal water loss (TEWL), and biomechanical parameters of skin distension/retraction before and after suction at the forehead, lateral canthus, and cheek, with or without mist, in a testing environment (24°C, 35% relative humidity) for 120 min.

C. Galzote, R. Estanislao, M.O. Suero, A. Khaiat, M.I. Mangubat, R. Moideen, H. Tagami, X. Wang, **Characterization of facial skin of various Asian populations through visual and non-invasive instrumental evaluations: influence of age and skincare habits,** Skin Research and Technology 2013;19; 454-465

Background/purpose: We aimed to evaluate the impact of age and skincare habits on facila skin of different Asian ethnicities by comparing skin properties and skincare habits among various Asian populations of varying age groups. Methods: We evaluated approximately 100 female subjects each from a total of eight Asian cities in China, Indian, South Korea, Japan and the Philippines grouped according to age ranging from 14 to 75 years during a summer season. Facial skin was characterized using dermatological examinations of the cheek. Information regarding personal skincare habits was collected using a questionnaire.

P. Neto, M. Ferreira, F. Bahia, P. Costa, **Improvement of the methods for skin mechanical properties evaluation through correlation between different techniques and factor analysis,** Skin Research and Technology 2013;19;405-416

Background: In the past decades, many instruments have been developed to measure skin elasticity and firmness. The offer is extensive and is constantly increasing, becoming difficult to decide

which equipment and mechanical property measurement are better to portrait the desired characteristics. The aim of this study was to compare and correlate parameters assessed with different probes, based on different methodologies, to understand which probe characterizes each skin elasticity property. Methods: Measurements were performed in the abdomen region of 34 female volunteers, with three different probes: Cutometer SEM575, Reviscometer RVM600 and Frictiometer FR700. Statistical data analysis was performed by Factor Analysis on IBM SPSS Statistics 17.0.

H. Dobrev, **Novel Ideas: The Increased Skin Viscoelasticity - A Possible New Fifth Sign for the Very Early Diagnosis of Systemic Sclerosis,** Current Rheumatology Reviews, 2013, 9

Abstract: Introduction: Diagnosis of systemic sclerosis (SSc) at very early stage could allow starting an appropriate therapy and improving the patient outcome. Skin involvement is often the first non-Raynaud's phenomenon (RP) symptom. Its uncovering may play an important role for the initial diagnosis. Objective: To introduce a simplified method for non-invasive evaluation of skin mechanical properties in patients with clinically evident or suspected SSc. Material and Methods: A total of 94 patients and 162 healthy subjects were studied. According to clinical and nailfold videocapillaroscopy findings the patients were divided into four groups: 20 with edematous phase of SSc (group 1), 28 with indurative phase of SSc (group 2), 26 with suspected secondary RP (group 3), and 20 with primary RP (group 4). Mechanical properties of the volar forearm skin were evaluated using a non-invasive suction device (Cutometer) equipped with 2-mm diameter probe. The skin mechanical parameters analyzed were distensibility (Uf), elasticity (Ua/Uf) and viscoelasticity (Uv/Ue). Results: Skin distensibility was reduced and skin viscoelasticity increased in group 1-3 compared to age matched healthy controls. There were no significant changes in skin elasticity. Mechanical parameters in group 4 were normal. Comparison of individual patient's values with population 95% confidence intervals of the mean showed increased skin viscoelasticity in group 1 (100%), group 2 (93%), and group 3 (81%), whereas the incidence in group 4 was 10%. Conclusions: Noninvasive method applied is appropriate for objective and quantitative evaluation of sclerodermatous skin. In combination with nailfold videocapillaroscopy it could be predictive in pre-scleroderma patients. The increased skin viscoelasticity parameter could be proposed as the possible new fifth sign for the very early diagnosis of SSc.

J.S. Everett, M.S. Sommers, **Skin Viscoelasticity: Physiologic Mechanisms, Measurement Issues, and Application to Nursing Science,** Biol Res Nurs. 2013 July; 15(3): p. 338–346

Skin is the primary interface between health care providers and patients and is assessed clinically to predict physiological stability or instability. The biomechanical properties of human skin, most notably elasticity and viscoelasticity, are critical to its protective function. In this article, the authors describe the physiological basis for skin elasticity and viscoelasticity. The authors discuss the role of viscoelasticity in nursing science and consider avenues for scientific exploration of the skin's biomechanical properties, including applications in pressure ulcer research, injury, and healing. They also discuss the Cutometer® as one option for measurement of viscoelasticity in clinical and bench research protocols.

K.C. Holley, H. Knaggs, **Why don't I look younger?,** Euro Cosmetics, 6-2013

The number of individuals over the age of 65 will outnumber those younger than five for the first time in 2020. With this the anti-aging market continues to grow causing more and more individuals to wonder – Can I look younger? This question plagues the anti-aging population and brings skin scientists to ponder:

- Can we quantify someone who looks old or young for his/her age?
- Do Asians, who are known for ageing gracefully, show the same age patterns?
- Can aging appearance or looking old for one's age be changed or improved?

Aging is multi-factorial and cannot be attributet to one cause. The structure of the skin changes in many ways. Transepidermal water loss (TEWL) increases resulting in less skin moisture. Dry skin appears dull and fine lines are more apparent. Cell turnover also decreases. The outer most layer of keratinocytes cling to the surface for longer, adding to dullness of the skin's apperarance. It also contributes to rough skin that refelcts light less uniformly causing a loss of radiance.

J.P. Bonaparte, D. Ellis, J. Chung, **The effect of probe to skin contact force on Cutometer MPA 580 measurements,** J Med Eng Technol, 2013; 37(3): p. 208–212

The purpose of this study is to test the hypothesis that increasing the force applied on the skin by the Cutometer MP580 probe will result in a decrease in the skin elasticity measures. Specifically, this study assessed the probe intrinsic weight plus the addition of a light mass (10 g and 20 g), a moderate mass (50 g and 100 g) and a high mass (200 g and 500 g) on skin elasticity measures. Primary outcome measures Uv, Ur, Uf, Ue and Ua, along with calculated measures Uv/Uf, Ua/Uf and Ur/Uf were assessed

under each loading condition. A general linear model ANOVA with repeated measures was used to assess for differences in each outcome measure between each loading condition. Thirty-two patients were enrolled and all completed the testing. For all primary variables except Uv (p50.001), there was no statistically significant effect of adding a light mass to the probe. There was a significant effect of the addition of a moderate and heavy mass for all variables (p50.005) except Ue/Uf. These results suggest that the addition of a low mass results in no significant effect on outcome measures. However, if moderate-to-heavy additional force is applied to the probe, the outcome measures are significantly altered. Of all the variables, Ue/Uf appears to be influenced the least by alterations in force. Users should ensure light contact is made between the skin and probe during testing to avoid a false alteration in outcome measures of skin elasticity.

H.F. Selig, M. Keck, D.B. Lumenta, M. Mittlböck, L.P. Kamolz, **The use of a polylactide-based copolymer as a temporary skin substitute in deep dermal burns: 1-year follow-up results of a prospective clinical noninferiority trial**, Wound Repair Regen, 2013 May-Jun;21(3): p. 402-409

Deep dermal burns can be covered with different kind of materials and techniques; one of them is a polylactide-based temporary skin substitute. The aim of this study was to intraindividually compare its 1-year outcome with the results obtained by use of autologous skin grafts in patients suffering from deep dermal burns. A prospective noninferiority trial was designed in order to assess skin quality and scar formation by use of subjective (Vancouver Scar Scale; Patient and Observer Scar Assessment Scale) and objective (noninvasive cutometry) burn scar assessment tools. All items of the Patient and Observer Scar Assessment Scale, except vascularity, were found to be noninferior in the areas covered with the temporary skin substitute vs. autologous skin. Results of objective scar evaluation showed comparable viscoelastic parameters without reaching noninferiority. Overall, the outcome of deep dermal burns covered with a polylactide-based temporary skin substitute revealed satisfactory results in terms of scar formation and skin quality as compared with autologous skin. This paper supports its use in deep dermal burns, where autologous skin donor sites require either to be reserved for coverage of full-thickness skin defects in severe burns or to be saved for reduction of additional morbidity in selected patient collectives.

Controlled usage study to evaluate efficacy of an anti-aging product, Lifeline Skin Care Information 2013

The purpose of this study is to evaluate the performance of an anti-aging eye cream product intended to increase skin firmness and reduce the appearance of fine lines, wrinkles and crow's feet in the peri-orbital area when tested over a 28 and 56 day period. Wrinkle assessment was conducted instrumentally using a Visioscan image analysis system. Elasticity and viscoelastic properties of the skin were measured as a function of flexibility and firmness employing a Cutometer. In addition product effectiveness was subjectively evaluated using panelist self-assessment via questionnaire responses.

M. Baspeyras, C. Rouvrais, L. Liégard, A. Delalleau, S. Letellier, I. Bacle, L. Courrech, P. Murat, V. Mengeaud, A.-M. Schmitt, **Clinical and biometrological efficacy of a hyaluronic acid-based mesotherapy product: a randomised controlled study**, Arch Dermatol Res (2013) 305: p. 673–682

Data demonstrating the efficacy of hyaluronic acid (HA)-based mesotherapy for skin rejuvenation are scarce. The aim of the study is to assess the efficacy of nonreticulated HA-based mesotherapy on skin elasticity and complexion radiance. 55 women with cutaneous ageing signs included in the Full Analysis Set (FAS) population blindly received intradermal micro-injections (50 9 0.02 mL) of non-cross-linked HA filler with mannitol (Glytone 1, HA concentration: 14 mg/g) in one cheek and saline physiological solution in the other according to hemifacial randomisation in 3 monthly sessions. Elasticity (E1 and E2 stiffness parameters) and dermis thickness were measured by cutometry and 20 MHz echography, before (D0) treatment and 1 (1M) and 3 months (3M) after the last injection. A trained panel blindly scored skin complexion radiance from standardised and calibrated photographs, using 100 mm analogue scales. In the FAS population, only HA filler significantly decreased E1 at 1M (-10.9 %, p = 0.026) and 3M (-10.5 %, p = 0.035) compared with D0; its effect versus the control tended to be more persistent, with a difference between treatments at 3M close to significance (p = 0.063). E2 also decreased at 1M (-8.2 %, p = 0.027 in the per protocol population, n = 53) and 3M after HA-treatment only. Dermis thickness significantly increased after HA-treatment at 1M (?3.4 %, p = 0.028) and 3M (?4 %, p = 0.008), and after control-treatment at 1M only (?2.5 %, p = 0.015). The HA filler significantly improved complexion radiance at 3M compared with the control (p = 0.012) and for 51 % of subjects, their skin status. Non-reticulated HA-based mesotherapy significantly and sustainably improves skin elasticity and complexion radiance.

H. Aksamitova, S. Holcova, M. Hladicova, **Anti-Aging Effekt und Hautverträglichkeit einer**

multivalenten Wirkstoffkombination in einer W/O Emulsion, Kosmetische Medizin 4.13

In zwei klinischen Modellen wurde der Effekt der zweimal täglichen Anweundung einer Hautcreme mit antioxidativen und biologisch hautaktiven kosmetischen Inhaltsstoffen dokumentiert. In beiden Teilstudien betrug die Anwendungsdauer 25-35 Tage, mit einer Zwischenauswertung nach 12-16 Tagen. Im ersten Teil der Studie wurden die Effekte der Creme auf Hauttrockenheit und Hautrötung an 50 Patienten (88% weiblich) mit allergischer Diathese klinisch dokumentiert. Beide Parameter verbesserten sich hochsignifikant, bei gleichzeitig ausgezeichneter Verträglichkeit und dem Fehlen unerwünschter Effekte. Im zweiten Teil Studie wurde an 20 Probandinnen mittels physikalischer Messverfahren der Effekt auf die Hauthydratation und Hautelastizität objektiviert. Beide Parameter verbesserten sich hochsignifikant und bestätigten damit eindrucksvoll die ärztliche Beobachtung.

M. Farwicka, T. Köhlera, J. Schilda, M. Mentela, U. Maczkiewitza, V. Paganic, A. Bonfiglic, L. Riganoc, D. Bureikb, G.G. Gauglitz, **Pentacyclic Triterpenes from *Terminalia arjuna* Show Multiple Benefits on Aged and Dry Skin**, Skin Pharmacol Physiol 2014;27: p. 71–81

Background: Pentacyclic triterpenoids improve epidermal barrier function and induce collagen production. Here, their effects on cutaneous aging by means of objective instrumental measurements were elucidated. Methods: Reconstituted human epidermis, cultivated keratinocytes and fibroblasts were incubated with *Terminalia arjuna triterpenes* (*T. arjuna* bark extract), and mRNA and protein expression of various genes was determined using microarray analysis, qRT-PCR and ELISA techniques. Clinical efficacy of *T. arjuna* bark extract versus vehicle control cream was elucidated in 30 patients and transepidermal water loss (TEWL), skin hydration and elasticity were measured. Another 30 female patients in their postmenopausal phase were treated with a similar regime, and skin sebum content, cutaneous blood microcirculation and skin density/echogenicity were assessed. Results: Incubation with T. arjuna triterpenes increased FGF-2, TSP-1, TGF-β and CTGF expression, and VEGF secretion in vitro. Elevated lactate dehydrogenase release upon sodium dodecyl sulphate challenge was reversed by the application of *T. arjuna* bark extract. *T. arjuna* bark extract decreased TEWL, improved skin moisturization, reduced scaliness and led to significantly improved skin elasticity. Also, increases in blood microflow and skin sebum contentas well as improved skin thickness/echogenicity were noted on postmenopausal skin, resulting in visible reduction of sagging skin on the jowls as demonstrated by digital photography. Conclusion: *T. arjuna* bark extract appears as an innovative active ingredient that exerts versatile antiaging properties in vitro and in vivo.

M. Pflaumbaum, M. Farwick, M. Mentel, T. Köhler, J. Schild, **Red algae delays chronological ageing,** Personal Care April 2013 and January 2014

During the chronological ageing process epidermal skin stem cells become less effective, meaning that the renewing and repairing activity of the epidermis is reduced. Moreover, fewer elastic fibres are synthesised, thereby inducing a progressive loss of skin elasticity. The standardised, COSMOS certified Cyanidium caldarium red algae extract, unique in its capability to produce gamma aminobutyric acid (GABA) with proven combined activity on epidermal stem cells and elastic fibres, clearly retains youthful skin appearance and reduces the signs of chronological ageing.

A.F.P.M. Vloemans, **Aspects of burn wound care in children**, Dissertation at the Vrije Universiteit Amsterdam, van de Faculteit der Geneeskunde, 2013

This thesis focuses on burns in children, in particular on the epidemiology of children admitted to the Dutch Burn Centres, general therapeutic options to promote wound healing and on specific aspects of the conservative and surgical wound treatment. Since its foundation in 1974, research is performed in the Beverwijk Burns Centre on clinical and preclinical aspects of burn wound care. Initially this mainly concerned surgical wound care issues such as wound excision and skin grafting techniques in the context of burn survival1. Later on, attention shifted to functional and cosmetic outcome of burn treatment, more specifically the treatment of partial thickness burns in children. Part of this thesis builds on this previous research. In the course of time research further expanded to other areas of burn care, such as the impact of burn disasters and selective bowel decontamination to diminish the risk of burn wound sepsis. Nowadays many studies are initiated, supported and co-ordinated by the Association of Dutch Burn Centres (ADBC).

I. Anderson, A. Hedvall, **Relationships Between Skin Properties and Body Water Level, Master Thesis, Center for Technology in Medicine and Health**, CTMH, Stockholm, Sweden, 2013

A need for a quantitative method to determine body water level has been identified by a team of Clinical Innovation Fellows at the Centre for Technology in Medicine and Health (CTMH). A reliable way to determine body water level would bring great benefits to the healthcare sector, where no optimal

method is available at the time of writing. A possible solution is a sensor that would measure alterations in skin properties due to changes in total body water. CTMH has had an idea of such a sensor, which is evaluated in this work. At an early stage of this evaluation process, it became clear that the research regarding correlations between skin properties and body hydration level was not sufficient to warrant the initiation of a sensor development process. Therefore, the main objective of this thesis became to investigate such correlations. An extensive literature review is presented, from which an experiment was developed. The experiment was performed on four human test subjects and involved measurements of skin thickness and elasticity parameters, before and after a weight loss of 3.2-3.7 % due to dehydration. The results showed clear decreases in skin thickness and indications of alterations in skin distensibility as well as in the skin's immediate elastic response to applied negative pressure. It could also be seen that skin at different body sites does not respond in the same way - calves showed more distinct results than thighs and volar forearm. The material provided in this thesis encourages further studies of the correlation between the mentioned properties and total body water. If a predictable correlation can be found, a sensor development process could start. A reliable way to determine body water level would bring great benefits to the healthcare sector, where no optimal method is available at the time of writing.

F. Ibrahim, N. Arifin, Z.H.A. Rahim, **Effect of Orofacial Myofunctional Exercise Using an Oral Rehabilitation Tool on Labial Closure Strength, Tongue Elevation Strength and Skin Elasticity**, J. Phys. Ther. Sci. 25: p. 11–14, 2013

Purpose: This paper reports the effects of orofacial myofunctional exercise using an oral cavity rehabilitation device on physiological parameters that include labial closure strength, tongue elevation strength, and the right and left facial skin elasticity. Subjects: Seventeen females aged forty years old and above were initially recruited for this study. Thirteen performed the exercise for 14 weeks, and only 11 subjects continued the exercise for another 10 weeks. [Methods] Subjects were instructed to perform an orofacial myofunctional exercise using an oral rehabilitative device for three minutes, for four times a day. The non-parametric Wilcoxon test was conducted to examine the signifcance of physiological parameters induced by the orofacial myofunctional exercise. The measurements of the physiological parameters were carried out weekly for 14 weeks and 24 weeks after the intervention for 13 and 11 subjects, respectively. [Results] The fndings showed that there were signifcant improvements in the median values of all parameters before and after performing the orofacial myofunctional exercise for 14 weeks or more. [Conclusion] These results suggest that the orofacial myofunctional exercise can be regarded as a potential non-invasive therapy for improvements of the labial closure strength and tongue elevation strength, which indirectly provide support for the facial tissue, and enhances facial skin elasticity.

C. Uhl, D. Khazaka, **Techniques for globally approved skin testing,** Personal Care April 2013

In efficacy testing and claim support for cosmetic products, objective measurement systems became indispensable long ago, especially since subjective clinical assessments are often prone to bias and inter-observer variation. Without suitable instrumentation it is close to impossible to determine what a product is really doing for the skin. Those objective measurement methods and subjective evaluations are mutually dependent. No measurement can be performed without the subjective evaluation of the results by the user of such instrumentation. However, a pure subjective evaluation of the skin without appropriate measurement techniques is not able to achieve accurate results either. This relationship becomes clearer when looking for example at skin colour measurements. Subjectively, the human brain cannot process slight changes in colour, especially when the colours are not viewed side by side, but at different points in time. Instrumental measurement however will clearly detect such slight changes. The achieved result must then be interpreted in context with the expected outcome or the hypothesis. For this, you will always need a knowledgeable and experienced person because 'a fool with a tool is still a fool', as the late Albert Kligman used to say. This relationship between objective measurement and subjective evaluation is not only true for the determination of differences in skin colour, but also for all other skin measurement parameters important for the cosmetic industry.

*P. Larmo, V.-P.D. Tech, A. Bonfigli***, Lingonberry boosts hydration with anti-ageing benefits**, Personal Care April 2013

Lingonberry (Vaccinium vitis-idaea) is a nutritious berry that is widely abundant and harvested in wild form in the Nordic countries. In recent years, it has gained a reputation as a health-promoting superfruit. Lingonberries are used in several ways in Scandinavian cuisine: as a side dish, garnish or components of desserts. Lingonberries are rich in vitamin C and E in polyphenols including anthocyanins, proanthocyanidins and flavonols. Seeds containing ≈30% oil by dry weight, represent about 1.5% of lingonberries' fresh weight.

L. Rigano, G. Baratto, A. Portolan, A. Semenzato, M. Meloni, A. Bonfigli, M. Sironi, S. Pieraccini, N. Lionetti, **Development of a Powerful Tool for Investigation of the Structure and Functionality of the Aqueous Phase of Cosmetics**, IFSCC Magazine 3, 2013

Introduction: Among other problems, skin aging is associated with a loss of the capability of skin cells to answer and react to internal and environmental changes. Osmotic pressure and its equilibrium, involving the extracellular matrix and the cell inside, are key factors in maintenance of the homeostasis of living cells. Moreover, osmotic pressure differences between cells and their enviroment lead to the production/release of molecules (osmoprotectants) aimed at keeping the functional equilibrium of cells. Indeed, nature uses mainly such molecular structures for protecting cells, both vegetal and animal, from uncontrolled development of pressure differences between the inside and outside of cell membranes [1, 2]. This economy in the creativity of nature is due to the fact that such protection is exerted on the hydrophilic peptide bonds while different substituents which are lipophilic are not easily exposed to the hydrolytic action of water.

L. Marini, G. Crisman, V. Trashlieva, A. Krunic, P. Polizos, A. de Faveri, **Using photobiomodulation to treat premature ageing,** Prime March 2013

Abstract: Background and objective: Facial skin shows signs of ageing earlier than other anatomical areas. Predominantly non-thermal infrared A (IR-A) light emitting diode (LED) photobiomodulation has proven effective in triggering intracellular photobiochemical reactions leading to new collagen synthesis and reduction of matrix metalloproteinase-1- (MMP-1). The objective of this study was to assess the effectiveness, safety, and tolerability of a sequentially combined, continuous (CW) 835 ± 5 nm and pulsed emission (PW) 875 ± 5 nm LED facial mask array in the treatment of facial premature ageing.

B.Y. Kim, J.W. Choi, K.C. Park, S.W. Youn, **Sebum, acne, skin elasticity, and gender difference - which is the major influencing factor for facial pores?**, Skin Res Technol. 2013 Feb;19(1): e45-53

Background: Enlarged facial pores have been esthetic problems and have become a matter of cosmetic concern. Several factors are supposed to be related to the enlargement of facial pores, although scientific evaluations were not performed yet. Objective: To assess the correlation between facial pores and possible relating factors such as age, gender, sebum secretion, skin elasticity, and the presence of acne, using objective bioengineering instruments. Methods: Sixty volunteers, 30 males and 30 females, participated in this study. Various parameters of facial pores were assessed using the Robo Skin Analyzer. The facial sebum secretion and skin elasticity were measured using the Sebumeter and the Cutometer, respectively. These data were compared and correlated to examine the possible relationship between facial pores and age, sebum secretion and skin elasticity, according to gender and the presence of acne. Male gender and the existence of acne were correlated with higher number of facial pores. Sebum secretion levels showed positive correlation with facial pores. Results: The R7 parameter of skin elasticity was negatively correlated with facial pores, suggesting increased facial pores with decreased skin elasticity. However, the age and the severity of acne did not show a definite relationship with facial pores. Male, increased sebum and decreased skin elasticity were mostly correlated with facial pore development. Conclusion: Further studies on population with various demographic profiles and more severe acne may be helpful to elucidate the potential effect of aging and acne severity on facial pores.

H. Ohshima, S. Kinoshita, M. Oyobikawa, M. Futagawa, H. Takiwaki, A. Ishiko, H. Kanto, **Use of Cutometer area parameters in evaluating age-related changes in the skin elasticity of the cheek**, Skin Research & Technology, 2013 Feb;19(1): e238-42

Background/Aim: The decrease of skin elasticity on the cheek is a major concern to woman. The Cutometer has been widely used to evaluate skin elasticity and its change with aging. Cutometer parameters derived from one suction have been traditionally used to evaluate skin elasticity, and few reports describe the use of multiple suctions to obtain parameters to assess the skin elasticity of the cheek. To find the most suitable Cutometer parameter that reflects age-related changes in the elasticity of cheek skin using multiple suctions. Methods: The cheeks of 32 healthy Japanese women (mean age, 42.3 years) were assessed using the Cutometer MPA580 by measuring the skin mechanical parameters R0-R9, F2 and F3. Parameters F2 and F3 were obtained by the multiple suction method. The relationship between age and these parameters were then examined. Result: Significant negative correlations were found between the age of subjects and R2, R3, R7, R8 and F3. Of these, the correlation coefficient was best between age and F3 (r = -0.641), followed R8 (r = -0.603). Conclusion: Although R parameters have been used to evaluate skin elasticity, our study showed that F3 parameters derived from multiple suctions appear to be suitable for evaluating the elasticity of cheek skin, since this parameter is less influenced by environmental factors compared with R parameters.

G. Neudahl, **Rating of butters on TEWL, moisturisation and elasticity,** Personal Care February 2013

Butyrospermum Parkii (Shea) Butter (shea butter) is widely used in personal care and cosmetics as a moisturiser and emollient. While shea butter has grown in importance within the industry, there is little in the way of clinical studies showing its efficacy in skin care. Much of the information is based upon its composition or anecdotal in nature. Nonetheless, most cosmetic chemists are convinced that shea butter works, and works very well, as a moisturiser, improving the lipid barrier function. We believe that many other naturally occurring butters, such as Garcinia Indica Seed Butter (kokum butter), Mangifera Indica (Mango) Seed Butter (mango butter) and Theobroma Cacao (Cocoa) Seed Butter (cocoa butter), may be equal to, or better than, shea butter for reduction in transepidermal water loss (TEWL). A study was therefore undertaken to explore the effects of these butters for cosmetic use on transepidermal water loss, skin moisturisation and skin elasticity. The primary objective of the study was to determine the efficacy of these butters in skin care applications when incorporated in a standard formulation.

J.W. Choi, S.H. Kwon, C.H. Huh, K.C. Park, S.W. Youn, **The influences of skin visco-elasticity, hydration level and aging on the formation of wrinkles: a comprehensive and objective approach,** Skin Research & Technologie, 2013 Feb;19(1): p. 349-55

Background: Various skin parameters including skin visco-elasticity and hydration level affect the formation of wrinkles. Objective: The aim of this study was to investigate the comprehensive and objective relationship between age, skin visco-elasticity, hydration level, and the occurrence of wrinkles using bioengineering equipments for the first time. Methods: A total number of 97 healthy women were included in this study. Age, Fitzpatrick skin type, skin mechanical parameters obtained with Cutometer(R0~R9), hydration level measured with Corneometer, as well as wrinkle parameters (SEsm, SEr, SEsc, and SEw) assessed with Visioscan, were analyzed with the Pearson's correlation test. Results: The skin fluidity (R6) increased while the elastic recovery ratio (R7) decreased with the age. The wrinkle parameter (SEw) also increased with the age. The higher skin hysteresis values (R4 and R9) coincided with the higher SEw values. Skin hydration significantly lowered the hysteresis (R9), the wrinkles (SEw), and the depth of wrinkle furrows (R3mr). Conclusion: The elderly have less elastic skin and more wrinkles. Skin hysteresis most closely related with the degree of wrinkles. Drier skin showed more wrinkles and deeper furrows, with wider intervals. On the basis of these objective findings, we propose several skin parameters associated with wrinkles, and hypothesize the mechanism of wrinkle generation.

H. Klosová, J. Štětinský, I. Bryjová, S. Hledíkc, L. Klein, **The objective evaluation of the effect of autologous platelet concentrate on post-surgery scarring in deep burns**, Burns, January 2013

Introduction: The healing of grafted areas after surgical treatment of deep burns frequently generates mutilating scars and rises the risk of subsequent scar hypertrophy. Scar assessment based on clinical evaluation is inherently subjective, which stimulates search for objective means of evaluation. Objective: The aim of this study was to objectively evaluate the effect of using autologous platelet concentrate (APC) in combination with split thickness skin grafting (STSG) on scarring processes following surgery of deep burns as compared with application of sole STSG. Method: Selected viscoelastic properties of 38 scars on 23 patients in total were examined using the Cutometer MPA 580 under controlled conditions for long-term outcomes 1, 3, 6 and 12 months after the surgery following deep burns. Results: The findings of this study suggest that the STSG+APC combination reduces the time of scar viscoelastic properties recovery as compared with application of the sole STSG. This was statistically significant for viscoelastic parameters R2 and Q1. Conclusion: APC has been advocated to enhance scarring after surgery of deep dermal and full thickness burns. We objectively demonstrated that the viscoelastic properties of scars treated with STSG+APC combination return more rapidly to the plateau state than areas treated with STSG only.

I. Andersson, A. Hedvall, **Relationships Between Skin Properties and Body Water Level**, Master of Science Thesis in Medical Engineering, KHT Technology and health, Stockholm 2013

A need for a quantitative method to determine body water level has been identified by a team of Clinical Innovation Fellows at the Centre for Technology in Medicine and Health(CTMH). A reliable way to determine body water level would bring great benefits to thehealthcare sector, where no optimal method is available at the time of writing. A possiblesolution is a sensor that would measure alterations in skin properties due to changes in total body water. CTMH has had an idea of such a sensor, which is evaluated in this work. At an early stage of this evaluation process, it became clear that the research regarding correlationsbetween skin properties and body hydration level was not sufficient to warrant the initiation ofa sensor development process. Therefore, the main objective of this thesis became to investigate such correlations. An extensive literature review is presented, from which an experiment was

developed. The experiment was performed on four human test subjects and involved measurements of skin thickness and elasticity parameters, before and after a weight loss of 3.2-3.7 % due to dehydration. The results showed clear decreases in skin thickness and indications of alterations in skin distensibility as well as in the skin's immediate elastic response to applied negativepressure. It could also be seen that skin at different body sites does not respond in the same way - calves showed more distinct results than thighs and volar forearm. The material provided in this thesis encourages further studies of the correlation between thementioned properties and total body water. If a predictable correlation can be found, a sensor development process could start. A reliable way to determine body water level would bring great benefits to the healthcare sector, where no optimal method is available at the time of writing.

M. Riedel, **Einfluss des Silikongels DERMATIX™ auf standarddiesierte, operative Narbenbildung am Thorax,** Disseration der Klinik für Hals-, Nasen- und Ohrenheilkunde und Plastische Operationen der Universität zu Lübeck, Januar 2013

Jeder invasive Eingriff, bei dem ein Hautschnitt durchgeführt wird, ist mit einer anschließenden Wundheilung und Narbenbildung verbunden. Nach wie vor stellt die minimalste Ausbildung und Ausprägung von Narben nach Eingriffen in der plastischrekonstruktiven Chirurgie eines der entscheidenden Erfolgskriterien, sowohl für den Patienten, als auch für den behandelnden Arzt dar. In diesem Teilbereich der Chirurgie steht für Patienten in vielen Fällen eine kosmetische Korrektur der als störend empfundenen Narbe im Vordergrund. Die Prävention und Therapie hypertropher, keloider oder kosmetisch unbefriedigender Narben ist eine aufwendige, langwierige und nicht selten unbefriedigende Prozedur.

C. Schrammek-Drusio, **Haut- und Gesichtsdiagnosen – eine Kernkompetenz jeder Kosmetikerin,** dermatologie, S. 32-33

Neben dem Dermatologen ist eine kompetente Kosmetikerin die Expertin in Sachen Hautpflege. Doch wodurch zeichnet sie sich aus? Selbstverständlich ist ein umfassendes theoretisches und praktisches Fachwissen erforderlich, komplettiert durch stetige Weiterbildung. Doch wenn Kunden ins Institut kommen, möchten sie auch schnelle Analyseergebnisse und Behandlungspläne erfahren. Grundlage hierfür ist die professionelle Hautdiagnose. Denn alle sich anschliessenden Fragen, etwa welche Produkte und Behandlungen in der Kabine angewendet werden, wie das individuelle Pflegekonzept aussehen soll und welche Präparate sich für die Heimpflege empfehlen, hängen von dem Ergebnis der Hautanalyse ab. Für die kosmetische Praxis bedeutet dies das Erkennen und Einordnen des Hautgrundbildes, des Hautzustandes und der Anomalien bzw. unerwünschten Hautveränderungen.

P. Moortgat, C. Laifaire, *L. de Cyper, M. Antonissen, J. Meirte, K. Maertens,* **The effects of radial shock wave therapy on water vapor permeability rate and elasticity of burn scars: a case series report,** ISBI congress in Edinburgh

Nowadays, non-invasive or minimally-invasive treatments are preferred for the most burn patients. Burn surgery often leaves important functional and aesthetic sequelae, which can reduce the patients quality of life (1). Research on biomechanics and biophysics in general is introducing new non-invasive therapis.

D. Scharpenack, **Einfluss eines Pflegetuchs auf die Haut mit begleitender Fragebogenerhebung zur Anwendung in der Pflege**, Dissertation Universitätsmedizin der Ernst-Moritz-Arndt Universität Greifswald, Institut für Hygiene und Umweltmedizin, Germany, 2012

Die Körperwaschung ist ein wesentlicher Bestandteil der Körperhygiene und wird im stationären Setting in Form der Teilkörperwaschung/Ganzkörperwaschung von der Pflegekraft für Patienten übernommen, die sich nicht selbständig waschen können. Neben Körperpflegeutensilien und Waschschüssel mit Waschwasser kommen Handtücher und Waschlappen zum Einsatz.Der Waschlappen wird mit Seife bzw. Waschlotion sowie mit dem Wasser aus der Waschschüssel getränkt. Dabei sollte flüssige Seife gewählt werden, da es durch Verwendung von Seifenstücken eventuell zur Übertragung von Krankheitserregerndurch ein kontaminiertes Seifenstück kommen kann (Kabara u. Brady 1984, Mc Bride 1984, Hegde et al. 2006). Tägliches Duschen oder Körperwaschung mit anschließendem Eincremen der Haut sind aktuelle Empfehlungen zur Körperhygieneund leiten sich aus Untersuchungen von Bergler (1973, 1989) und Kramer et al. (1993)ab. Das Waschen und analog das Abtrocknen wird vom Kopf beginnend abwärtsdurchgeführt und mit dem Genitalbereich mit separatem Waschlappen beendet, wobei jede Waschung unter Berücksichtigung der hygienischen Grundsätze den individuellen Bedürfnissen der Patienten angepasst werden kann (Kramer et al. 2011).Um eine Verschleppung von Krankheitserregern zu vermeiden, ist die Verwendung sauberer Waschlappen und Handtücher angezeigt. Für Waschlappen werden schnell trocknende Materialien (z. B. Frottee)

empfohlen, wobei Handschuhwaschlappen wegen ihrer langsamen Trocknung ungeeignet sind. Nach Benutzung sollten Waschlappen in der Sanitärzelle oder am Waschplatz ausgebreitet aufgehängt werden, idealerweise erfolgt die Aufbereitung in einem eigenen Wasch- und Trockenraum.

H.-B. Pyun, M. Kim, J. Park, Y. Sakai, N. Numata, J.-Y. Shin, H.-J. Shin, D.-U. Kim, J.-K. Hwang, **Effects of Collagen Tripeptide Supplement on Photoaging and Epidermal Skin Barrier in UVB-exposed Hairless Mice**, Prev Nutr Food Sci, Vol 17, p. 245–253 (2012)

Collagen tripeptide (CTP) is a functional food material with several biological effects such as improving dry skin and wound and bone fracture healing. This study focused on the anti-photoaging effects of CTP on a hairless mouse model. To evaluate the effects of CTP on UVB-induced skin wrinkle formation *in vivo*, the hairless mice were exposed to UVB radiation with oral administration of CTP for 14 weeks. Compared with the untreated UVB control group, mice treated with CTP showed significantly reduced wrinkle formation, skin thickening, and transepidermal water loss (TEWL). Skin hydration and hydroxyproline were increased in the CTP-treated group. Moreover, oral administration of CTP prevented UVB-induced MMP-3 and -13 activities as well as MMP-2 and -9 expressions. Oral administration of CTP increased skin elasticity and decreased abnormal elastic fiber formation. Erythema was also decreased in the CTP-treated group. Taken together, these results strongly suggest that CTP has potential as an anti-photoaging agent.

T. Mosquera, P. Noriega, W. Tapia, S.H. Pérez, **Evaluación de la Efficacia Cosmetica de Cremas Elaboradas con Aceites Extraíodos de Especies Vegetales Amazónicas: *Mauritia flexuosa* (Morete), *Plukenetia volubilis* (Sacha Inchi) y *Oenocarpus bataua* (Ungurahua)**, LA GRANJA, *Revista de Ciencias de la Vida*, 15(2) 2012: p. 14-22

Investigaciones anteriores demuestran la actividad antioxidante de los aceites de *Mauritua flexuosa* (Morete), *Plukenetia volubilis* (Sacha inchi) y *Oenocarpus bataua* (Ungurahua), se realizaron formulaciones de cremas de aplicación cosmética y emulsiones básicas, evitando que el uso de demasiados ingredientes puedan interferir en lo que se consideran como “activos” dentro de la formulación cosmética (aceites con potencial antioxidante). Las muestras fueron evaluadas en un estudio in vivo no invasivo, utilizando una muestra de 30 mujeres que presentaban cierto grado de fotoenvejecimiento. Se realizó una evaluación clínica dermatológica y una evaluación instrumental utilizando el Cutometer MPA580, equipo que permite visualizar las modificaciones en la elasticidad y firmeza cutánea. La evaluación se la hizo al inicio yluego de cuatro semanas de utilizar el producto y los datos fueron sometidos al análisis de varianza. Los resultados del estudio demuestran que a los 28 días de tratamiento, la evaluación clínica las cremas muestran una mejorara significativa en la luminosidad y suavidad de la piel, y la evaluación instrumental indica que se logró una mejoría en la firmeza y elasticidad de la piel.

J. Lozza, D. Schmid, E. Belser, F. Zülli, **Crocus bulb extract prompts epidermis/dermis crosstalk,** Personal Care November 2012

Interactions between growth factors, skin cells and the extra-cellular matrix (ECM) are essential for tissue regeneration in wound healing as well as intrinsic ageing of the skin. Wound healing is a complex process comprising different phases such as inflammation, proliferation and remodelling, all of which require growth factors to regulate the fine balance between the synthesis of extracellular matrix and its degradation by proteases. Intrinsic skin aeging is accompanied by an accumulation of reactive oxygen species (ROS) due to an impaired mitochondrial oxidative metabolism.

G.E. Piérard, T. Hermanns-Lê, C. Piérard-Franchimont, **Scleroderma: skin stiffness assessment using the stress-strain relationship under progressive suction,** 2012 Informa Healthcare UK

In recent decades, various instrumentations were used for assessing the in vivo viscoelasticity of skin . The methods relied on various approached including the uniaxial and biaxial stretching, torsion, elevation, indentation, ballistometry, and suction procedures. The time-honored suction method aims at measuring the skin deformation caused by and loss of pressure exerted over a defined skin area. Skin deformation occurs as a function of the suction force, its time of application, and the surface area opf the stressed skin . It is regarded as the in vivo expression of the overall skin viscoelasticity.

I. Matejková, J. Cheel-Horna, M. Moravcová, T. Muthný, **New coffee phytocomplex improves skin elasticity,** November 2012 Personal Care

Skin, as an outer shell, protects the body from harmful external influences and from water and heat loss. Premature ageing is not only a health issue but also a social problem because of the development of visible changes such as wrinkles, dryness and loss of elasticity. These and other changes in the quality of the skin are partly the result of chronological ageing (i.e. they are intrinsic). Yet

external influences (premature/extrinsic ageing) can also have a major impact on skin ageing. These external factors include smoking, pollution, toxic chemicals, and lifestyle (physical activity, diet, etc.)But the most significant factor (at a rate of 80%-90%) of all that contributes to the development of changes typical for premature ageing is UV rays.

B.A. Khan, N. Akhtar, V.A Braga, **Anti-Aging Effects of Hippophae rhamnoides Emulsion on Human Skin**, Tropical Journal of Pharmaceutical Research December 2012; 11 (6): p. 955-962

Purpose: This study aimed to evaluate the effects of topically applied water-in-oil (w/o) emulsion of Hippophae rhamnoides using standard R cutometer parameters. Methods: A w/o emulsion of 1 % hydro-alcoholic extract of H. rhamnoides (formulation) and placebo control (base) were used in the study. Eleven healthy male volunteers with a mean age of 24.5 years were selected after obtaining informed consent. The subjects were assigned to blindly use either the formulation or the base for 7 consecutive weeks. The skin mechanical parameters determined with a cutometer, were R0 (first maximum amplitude), R2 (gross-elasticity), R6 (viscoelasticity), R7 (biological elasticity) and R8 (total recovery). In addition, the antioxidant activity of the formulation was evaluated by 1, 1-diphenil-2-picrylhydrazyl (DPPH) method. Results: Topical application of 1 % organic extract emulsion of H. rhamnoides improved most of the biomechanical parameters evaluated when compared to the base group ($p < 0.05$). However, skin extensibility and firmness of the active formulation- and base-treated groups (R0) were not different ($p < 0.01$). Of note, a significant correlation between the active formulation and the improvement of the skin mechanical parameters was observed. The active formulation was found to be superior than the placebo control. Conclusion: The topical antioxidant emulsion of H. rhamnoides significantly improved skin biomechanical parameters after 7 weeks of treatment. The data obtained suggest that H. rhamnoides could be an alternative pharmacological tool for treating age-related loss of skin elasticity.

N. Waranuch, S. Maphanta, W. Wisuitiprot, **Effect of microparticles containing green tea extract on facial skin improvement,** ISBS Copenhagen 2012

To clinically evaluate an effectiveness of skin cream containing green tea extract loaded chitosan microparticles for facial wrikle treatment. Method: Tewnty-nine volunteers were randomly assigned to aplly skin cream containing 1% green tea extract loaded chitosan microparticles (GT-Cs) and a placebo cream on each of their half faces for 8 weeks. Skin elasticity was evaluated by using Cutometer and the photographs of each half faces were also compared. Skin moisture and skin irritation were determined by Corneometer and transepidermal water loss (TEWL) respectively.

A. Osmola-Mankowska, A. Danczak-Pazdrowska, K. Olek-Hrab, W. Silny, A. Polanska, *A. Sadowska-Przytacka,* **Hf-usg and cutometer in monitoring of sclerodermoid cgvhd patients with joint contractures**, ISBS Copenhagen 2012

The purpose of this study was to illustrate the skin sclerotic lesions of two chronic sclerodermoid GvHD patients using two noninvasive methods. Two adult patients (23 year-old female and 52 year-old male) suffering from chronic sclerodermoid GvHD (cGvHD) were involved in the study. Typical sclerotic skin lesions affected their upper and lower extremities leading to dermatogenic contracturesand difficulty in walking. Patients were treated with the medium dose regimens of UVA1 up to total dose 1000J/cm² and 1380J/cm² respectively, delivered by GP-24H (Cosmedico, Medical Systems, Germany).

L. Palma, L. Tavares, C. Monteiro, M.J. Bujan, L.M .Rodrigues, **Diet water seems to influence skin hydration and biomechanics,** ISBS Copenhagen 2012

The feeding habits of a given population were studied, specially regarding its daily regular water intake (dient and beverages) and tried to relate with those skin biometrical variables. This transversal study involved forty healthy volunteers, female, (mean 26,45 ≠ 7,95 y.o.), after informed written consent. All procedures respected Helsinky principles and respective amendments. A Feeding Frequency Questionnaire (FFQ) previously validated for the Portuguese population was applied. Transepidermal water loss (TEWL, Tewameter TM300), epidermal hydration (Corneometer CM825) and skin's biomechanics (Cutometer SEM575) were the cutaneous variables chosen.

G. Spongiatto, C. Mello-Sampayo, M.M. Pereira, H. Silva, M.F. Otuki, B.S. Lima, L.M. Rodrigues, **Studying the impact of age in the rat's skin physiology,** ISBS Copenhagen 2012

Animal models have been useful to study specific mechanisms affecting human skin. It is the case of ageing and the micromechanical changes determining wrinkle in UV irradiated mice. These models allowed to perceive that ageing involved many peculiar mechanical responses that cannot be explained by homogeneous deformation of the skin. Nevertheless, the different life span of these species also affects the processes and this is a majoraspect to consider. This project aimed to compare

the skin properties of two Wistar rats groups with different ages – young-adult rats (n=7, 20-24 week-old, weight 379 ± 30g) and old-adult rats (n=5, 48-72 week-old, weight 520±60g).

L. Tavares, L. Palma, O. Santos, M.A. Almeida, M.J. Bujan, L.M. Rodrigues, **Looking for a global indicator of obese skin function,** ISBS Copenhagen 2012

The impairment of water balance and biomechanical behaviour of the skin seems to be consistently present in obesity, and probably related with most frequent signs and symptoms. The present work aimed to search for a global body mass index (BMI) related indicator for this functions. 51 female patients, aged between 20 and 46 (mean 29 ±7) years old, with no relevant pathologies except the overweight or obesity were involved. All procedures respected Helsinky principles and respective amendments. The Quetelet index (BMI) was calculated for each volunteer. Measurements took place under controlled conditions, in different anatomical areas (face; breast; and abdomen) and included skin hydration (Corneometer CM825), barrier function (Tewameter TM300) and biomechanical descriptors (Cutometer MPA580 and Reviscometer).

V. Zorin, A. Zorina, V. Cherkasov, R. Deev, A. Isaev, A. Nerobeev, E. Krechina, A. Alikova, S. Donetskaya, **Application of autologous dermal fibroblasts for correction of age-related changes of skin; the year of clinical observations,** ISBS Copenhagen 2012

Basic molecular mechanisms, associated with the main cell population of the dermis – fibroblasts, are the basis of skin aging. The number of functionally active fibroblasts in the skin and their bio-synthetic activity decreases with age thus augmentation of their population with the synthetically-active cells is accepted as a one of most effective methods. In the common practice of aesthetic medicine only two dermal autofibroblasts-based technologies are allowed: SPRS-therapy (Human Stem Cells Institute, Russian Federation; since July 2010) and LAVIVTM (Fibrocell Science, Inc; USA; since July 2011).

S. Pérez Damonte, M. Baptista, M.A. Moyano, M. Nunez, A. Segall, **The effect of a lipoic acid on the skin: biomechanical properties,** IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

α –lipoic acid or the reduced form dihydrolipoate are potent scavengers of hydroxyl radicals, superoxide radicals, peroxyl radicals, singlet oxygen and nitric oxide with anti-inflammatory properties Previously, we have demonstrated in vivo the effect of α-lipoic acid (0.5%) and ascorbic palmitate (0.2%) in the improvement oft he skin barrier and diminished the redness is a sensitive skin. The aims of this study were to analyze the clinical efficacy of formulations containing α-lipoic at 2.5% and 5.0% by measuring in vivo the biochemical parameters of transepidermal water loss TEWL and the color oft he skin initially and after the application.

M. Farwick, J. Schild, M. Mentel, U. Maczkiewitz, T. Köhler, **Cyanidium caladarium algae extract: a multifunctional anti-aging cosmetic ingredient with profound in vitro activity on epidermal stem cells and dermal fibroblasts,** IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

The presented studies show unique and multifunctional anti-aging activity of an aqueous Cyanidium caladarium algae extract enriched in 4 aminobutyric acid (GABA). Activities were demonstrated in different in vitro cell culture models, and further substantiated in an in vivo cosmetic study. In order to elucidate the molecular mechanism of the Cyanidium caladarium extract, several in vitro assays were conducted on different skin cell culture models. The extract proved to be highly effective on all in vitro models employed, including stem cell-like epidermal keratinocyte progenitor cells, human dermal fibroblasts and reconstituted epidermis models. Results from in vitro gene expression experiments suggest that Cyanidium caladarium extract exerts several beneficial nutritional and protective effects on the molecular level, thereby promoting (i) maintenance of the skin's stem cell potential, (ii) overall strengthening of the dermal extracellular matrix architecture, and (iii) protection from UV-induced stress.

J. Hosoi, M. Ooba, H. Miyake, T. Hiroi, E. Hara, C. Matsumoto, S. Amano, **New approach to anti-aging skincare by mechanism-based improvement of facial sagging: role of subcutaneous tissues**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Many skincare treatments have been developed to improve superficial aging-related changes of facial skin, such as finde wrinkles and pigmentation, but such treatments have hat little impact on more substantial changes of facial morphology, such as sagging, the formation of deep grooves around the mouth (nasolabial folds), loss of sharpness of facial outline, decrease of eye fissure size, fixed deep wrinkles and so on.

O. Freis, G. Perie, A. Rathjens, **Skin mechanical and optical properties in function of aging**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

The evolution of skin biomechanical and optical properties in function of aging and/or photo-aging is one of the main targets of cosmetic and dermatological research. Many different non-invasive devices using alternative measuring approaches such as stretching, torsion, indentation, and suction have been developed for biomechanical properties evaluation. The measurements of skin deformation after suction of torsion are the most widely used techniques in cosmetic research.

D. Tamburic, I. Macijauskaite, R. Parton, S. Williams, **Assessing the efficacy of high-flavanol cocoa extract: does higher concentration work better?**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

It is well documented that antioxidants have a range of positive effects on human skin. However, there is a problem with their delivery to the site of action, an issue shared with most topical actives. Due to their chemical nature, antioxidants are also inherently unstable ingredients.

W. Voss, I. Bunge, **Dermatological Reports on Cosmetics: Intensions and Possibilities**, IFSCC 2012, 15-18 Oct. 2012, Sandton, South Africa

Dermatological reports and claims in accordance with scientific criteria are of decisive value for the safety and efficacy of cosmetics. Whether a cosmetic product is well tolerated or causes irritations or allergic reactions must be proven by dermatological tests. The value of dermatological reports directly depends on the respectability of the commissioned dermatologists. Pitfalls occur, whenever non qualified scientific results are generously used for advertising campains like “dermatologically tested”, “allergy tested”, “hypo-allergen” etc. Additionally a lot of reports are scientifically insufficient. Dermatological reports on cosmetics therefore must be valid in methodology and practical execution. With Dermatest you benefit from more than 30 years of testing experience and dermatological expertise.

C.J. Chin, J.H. Franklin, B. Turner, R.V. Moukarbel, S. Chandarana, K. Fung, J. Yoo, P.C. Doyle, **A novel tool for the objective measurement of neck fibrosis: validation in clinical practice**, J Otolaryngol Head Neck Surg. 2012 Oct;41(5): p. 320-6

Background: Radiotherapy is commonly used to treat neoplasms of the head and neck, and fibrosis is a known side effect. The Cutometer is a device that quantifies properties of the skin. The goal of the study was to validate the Cutometer in normal neck tissues and then quantify fibrosis in radiated necks. Methods: We performed a prospective study of 251 patients. The elasticity and stiffness parameters were recorded. Control patients were compared to determine the correlation between their left and right sides. Next, the treatment groups were compared using a nonparametric test (Kruskal-Wallis). Results: We found a significant correlation between the left and right sides of the control patients' necks, supporting the view that the Cutometer provides reproducible measurements in the normal neck. Furthermore, the Cutometer demonstrated reduced elasticity in necks treated with radiation, surgeryradiation, and chemoradiation. No significant difference in stiffness was seen. Conclusion: The Cutometer may serve as a valuable and valid tool for the measurement of neck skin elasticity. Radiated patients have a quantifiable decrease in their skin elasticity.

L. Tavares, L. Palma, O. Santos, M.A. Almeida, M.J. Bujan, L.M. Rodrigues, **Relationship between skin hydration and elasticity in normal weighted subjects and the influence of age**, Biomed Biopharm Res. , 2012; (9) 2: 191-198

Skin is the largest organ of the human body. It is a protective organ and of all its known functions, the most significant is the capacity to adapt itself to the contours of the body. The current study aims to determine the extent to which hydration influences or is influenced by elasticity, by comparing the parameters of hydration and elasticity. A convenience sample of 42 volunteers was selected all of whom were female, healthy and with normal BMI according to WHO. The “barrier” function was characterized by the transepidermal water loss (Tewameter TM300); the superficial epidermal hydration was measured by Moisturemeter SC and Corneometer and the “envelope” function was assessed by the Cutometer MPA580 and by the reviscometer RV600. Measurements were taken on the face (zygomatic and frontal areas), in the breast and in the abdominal areas. The most significant results show that almost all hydration and elasticity parameters fluctuate with age, which corresponds to previous studies. Moreover, there is some interaction between hydration parameters and some elasticity descriptors that should be investigated in future studies.

N.M. Atlan, E. Perrodeau, G. Georgesco, R. Khallouf, L. Martin, L. Machet, **Skin tightening induced by fractional CO(2) laser treatment: quantified assessment of variations in mechanical properties of the skin,** J Cosmet Dermatol. 2012 Sep; 11 (3): 201-6

Background: Certain authors have reported the efficacy of fractional resurfacing laser treatment in patients with photodamaged skin resulting in skin tightening of treated area. Objective: To assess skin tightening after CO(2) fractional resurfacing laser treatment by measuring variations in mechanical properties in treated areas. Dermal elasticity was measured using suction applied with an in vivo skin elasticity meter (Cutometer(®)). METHODS: A prospective observational study was undertaken from January 2007 to August 2009. Laser treatment was performed with the SmartXide Dot(®) (Deka(®), Firenze, Italy) CO (2) fractional resurfacing device. Patients were offered quantified analysis using the Cutometer(®) before and after treatment.

M. Rull, C. Davi, E. Canadas, J. Cebrián, **Reversing signs of ageing in mature skin,** Personal Care September 2012

Due to the effect of several internal and external factors across the years, mature skin is physiologically different from its own young predecessor. It is clear that skin continuously suffers aggressions like photoageing, environmental factors, chronological ageing and hormonal deficiency, which end up in skin deep alterations including a loss of elasticity and firmness, an increase of flaccidity and sagginess, and a thicker and atrophic skin.

D. Whitby, J. Allen, **Facing up to ageing: what makes us apper old,** Personal Care, June 2012

Over many hundreds of years one of the key areas for the application of personal care products has been the face. The human face is exposed to the elements for most of the year, whether it be bright sunshine in the summer or cold, dry winds in the harshest of winters. It also bears the brunt of other environmental exposure from, for example, traffic fumes, cigarette smoke, etc., so suffers from the effects of both intrinsic and extrinsic ageing. Facial skin can also, through its colour and expressions, reflect many emotions and feelings.Blushing for example, resulting from dilation of blood vessels in the skin, can show embarrassment. So the face signals many different things in the way it appears to the casual observer.

P. Moussou, L. Danoux, F. Henry, **Inflammaging: the new theory in skin ageing,** Personal Care June 2012

Several research studies on aged people carried out by different research teams have highlighted the existence of a new theory in skin ageing named “inflammaging”. Skin inflammaging results from a combination of several deleterious pathways inducing a vicious cycle of micro-inflammation. A cascade of inflammatory responses results in chronic low level inflammation and leads to accumulation of molecular and cellular damages, well-known sources of skin ageing which can affect the appearance of the skin. Laboratories Sérobiologiques (LS) – now with Beauty Creations – developed the first cosmetic active - a bark extract from Eperua falcate – which targets inflammaging in a comprehensive way, by addressing the consequences of its deleterious effects on the skin in a particulary efficient manner.

J. Yoo, S. Chandarana, K. Fung, J.H. Franklin, A.C. Nichols, P.C. Doyle, **The use of autologous platelet and plasma products in salvage neck dissections: a prospective clinical study evaluating early and late wound healing**, J Biol Regul Homeost Agents, Apr-Jun 2012;26(2 Suppl 1): p. 63S-69S

Objectives: To evaluate the effect of autologous platelet and plasma adhesives (APA) on postoperative drainage and soft-tissue fibrosis following neck dissections. Design: This was a blinded comparative prospective cohort study done as two parts: part one evaluated early post-surgical outcomes and part two evaluated late tissue fibrosis. Method: Salvage neck dissections were stratified into two groups based on severity of prior treatment. High risk patients were defined as those who had previously undergone chemoradiation therapy and autologous platelet adhesives were administered to the surgical wound intraoperatively. The low risk group consisted of patients undergoing salvage neck dissections following radiation only and acted as controls. Part one evaluated postsurgical wound drainage as the primary outcome as well as length of hospital stay and complications. Part two evaluated late postoperative tissue fibrosis by comparing neck skin using the Cutometer. R2 and F0 were the specific Cutometer parameters for quantifying the viscoelastic properties of the skin. Results: Postoperative wound drainage was significantly less (253.7 vs. 345.8) in the autologous platelet adhesive group as compared to the control group (p less than 0.03). Length of stay in the APA group versus the control group was 3.13 and 3.86 days respectively (p less than 0.004). Both R2 and F0 measurements showed improved viscoelastic properties of the skin in the APA group (R2 p less than 0.05, F0 p less than 0.05).

J. Bhat on behalf of S. Lanigan, C. Whitehurst, J. Birch, **A Single -Blinded Randomised Controlled Study to Determine the Efficacy of Omnilux Revive Facial Treatment in Skin Rejuvenation**, Lasercare clinics, Birmingham, UK

The use of light technology in dermatology has grown rapidly in the last decade. There have been many developments in the use of light for the treatment of a wide variety of skin conditions from nonmelanoma skin cancers1, 2,3,4 to facial resurfacing for crows feet and photo damaged skin.5, 6,7 Historically the use of CO2 lasers has been the mainstay for facial resurfacing and skin rejuvenation since the mid 1990s. It is accepted that photoageing and the subsequent visible effects is in part due to the breakdown of collagen by metalloprotinases and oxidative damage induced by exposure to UV light.8 Subsequent treatment with CO2 lasers improves these visible signs through tissue remodelling after cutaneous injury. However the effectiveness of this technique is limited by prolonged healing times, discomfort during the procedure (requiring local anaesthesia) and the risk of complications such as pigmentary disorders.8 The popularity of laser resurfacing has therefore decreased, while the demand for new procedures that provide optimum results with minimal side effects has continued regardless. Light Emitting Diode (LED) technology has been at the forefront of new light source development in recent years. LED technology offers a new vehicle for the delivery of non-coherent light in arrays of varying shape, suitable for the treatment of large surface areas. Whelan H et al have repeatedly proven the effectiveness of LED technology in delivering an optimum light dose consistently demonstrating the efficacy of LED therapy in tissue regeneration.9, 10.

J.H. Kim, B.Y Kim, J.W. Choi, S.O. Kim, H.S. Lee, K.C. Park, S.W. Youn, **The objective evaluation of the severity of psoriatic scales with desquamation collecting tapes and image analysis**, Skin Research and Technology, May 2012; 18: p. 143–150

Background: Assessment of psoriatic scales is important to determine the severity of psoriasis. However, there are very limited numbers of objective, quantitative and observerindependent tools for measuring the severity of psoriasis. Objective: To determine whether the bioengineering parameters of the psoriatic scale can be used to assess the severity of psoriasis instead of the psoriatic severity index of scales (PSIs) score. Methods: Thirty-four patients with psoriasis were included. A representative lesion from each patient was selected and bioengineering parameters were measured using the Corneofixs. Simultaneously, the severity of the scales was assessed by the PSIs score using clinical photographs of the lesions. In addition, skin color and elasticity parameters were also measured using the Colorimeters, the Mexameters and the Cutometers. Results: Statistical differences in the scale parameters were observed between the PSIs 2 and 3 scores. Among the scale parameters, the percent area and area in mm2 were negatively correlated with the PSIs score. In addition, the Colorimeters a, b parameters and the Cutometers R9 parameters were significantly correlated with the PSIs score. Conclusions: The results of this study showed that the severity of psoriatic scales could be measured objectively using the Corneofixs.

M. Keck, H.F. Selig, D.B. Lumenta, L.P. Kamolz, M. Mittlböck, M. Frey, **The use of Suprathel(®) in deep dermal burns: first results of a prospective study**, Burns, 2012 May;38(3): p. 388-95

Introduction: While autologous skin grafting has been the standard for coverage of full-thickness areas, several options for deep-partial-thickness defects exist. With regard to economising donor sites, we compared a copolymer based on DL-lactid acid (Suprathel(®)) as temporary wound dressing with autologous skin, and analysed time to healing and scar quality in matched areas of deep-partial-thickness burn. Methods: We recruited 18 patients with a median age of 45 years (range: 25-83 years), for this prospective, non-blinded controlled non-inferiority study, suffering from deep-partial-thickness burns from November 2009 to July 2010. After early tangential excision, matched deep-partial-thickness areas were covered with 1:1.5 meshed autologous skin grafts and the copolymer for direct intra-individual comparison. Scars were evaluated by means of the Vancouver Scar Scale (VSS), the Patient and Observer Scar Assessment Scale (POSAS) and suction cutometry (MPA 580, Courage and Khazaka Electronic GmbH, Cologne, Germany) on days 30 and 90, postoperatively. Results: Fifteen days after surgery, complete wound closure was present in 44.4% (8/18) of all areas covered with copolymer and 88.9% (16/18) in the split-thickness skin graft (STSG) area (p=0.008). Evaluation of the total VSS, POSAS and cutometry satisfied the criterion of non-inferiority for Suprathel(®) on day 30. Ninety days after surgery, only the Observer Scar Scale showed that Suprathel is non-inferior to STSG, albeit the mean total VSS and Patient Scar Scale were better in Suprathel(®) areas. Conclusion: Suprathel(®) represents a solid, reliable epidermal skin substitute with longer healing times in comparison to skin grafts but comparable results concerning early scar formation. Suprathel(®) can serve as a tool in treatment portfolio for adult patients suffering from deep dermal burns. Especially in patients with extensive burns, Suprathel(®) can be used to cover the deep dermal burn wounds to save STSGs and its donor sites for the coverage of full-thickness burned areas.

R.C. Spitale, M.Y. Cheng, K.A. Chun, E.S. Gorell, C.A. Munoz, D.G. Kern, S.M. Wood, H.E. Knaggs, J. Wulff, K.D. Beebe, A.L.S. Chang, **Differential effects of dietary supplements on metabolomic profile of smokers versus non-smokers,** Genome Medicine 2012, 4:14

Cigarette smoking is well-known to associate with accelerated skin aging as well as cardiovascular disease and lung cancer, in large part due to oxidative stress. Because metabolites are downstream of genetic variation, as well as transcriptional changes and post-translational modifications of proteins, they are the most proximal reporters of disease states or reversal of disease states. Methods: In this study, we explore the potential effects of commonly available oral supplements (containing antioxidants, vitamins and omega-3 fatty acids) on the metabolomes of smokers (n = 11) compared to nonsmokers (n = 17). At baseline and after 12 weeks of supplementation, metabolomic analysis was performed on serum by liquid and gas chromatography with mass spectroscopy (LC-MS and GC-MS). Furthermore, clinical parameters of skin aging, including cutometry as assessed by three dermatologist raters blinded to subjects' age and smoking status, were measured. Results: Long-chain fatty acids, including palmitate and oleate, decreased in smokers by 0.76-fold (P = 0.0045) and 0.72-fold (P = 0.0112), respectively. These changes were not observed in non-smokers. Furthermore, age and smoking status showed increased glow (P = 0.004) and a decrease in fine wrinkling (P = 0.038). Cutometry showed an increase in skin elasticity in smokers (P = 0.049) but not in non-smokers. Complexion analysis software (VISIA) revealed decreases in the number of ultraviolet spots (P = 0.031), and cutometry showed increased elasticity (P = 0.05) in smokers but not non-smokers. Conclusions: Additional future work may shed light on the specific mechanisms by which long-chain fatty acids can lead to increased glow, improved elasticity measures and decreased fine wrinkling in smokers' skin. Our study provides a novel, medicine-focused application of available metabolomic technology to identify changes in sera of human subjects with oxidative stress, and suggests that oral supplementation (in particular, commonly available antioxidants, vitamins and omega-3 fatty acids) affects these individuals in a way that is unique (compared to nonsmokers) on a broad level.

Marine ingredients focus: a look at marine products, Personal Care, April 2012

The sea holds a huge amount of power and influence in the minds of humans. At once mysterious, alluring and terrifying, Earth's oceans also represent the birthplace of all life, both plant and animal, and are increasingly becoming a rich source of medical and personal care ingredients. In personal care, the popularity of marine-derived cosmetic ingredients is not only due to their efficacy, but also the connotations they come with. Consumers associate the sea with purity and freshness, two extremely important characteristics for personal care products, and skin care in particular. This is a deeply-ingrained association that has lead people to use sea flora as a skin care ingredient for many centuries as well as in soap, cleansers, and more recently shaving foams and shampoos.

M. Mateu, C. Davi, E. Canadas, A. Soley, R. Delgado, **Effective ingredients from marine biotechnology,** Personal Care, April 2012, p. 53-57

Cosmetic scientists are developing new ways to identify new natural sources, which enable innovative compounds with excellent cosmetic properties such as firming, restructuring, moisturising or anti-wrinkles. Biotechnology encompasses the use of microoranisms to come up with novel active ingredients that fulfil two of the demands that are leading trends in the cosmetic industry: natural and sustainable. Besides, complex molecules can be obtained, which otherwise would be impossible due to technical or economic limitations. Our approach is to take advantage of biotechnology to develop cosmetic ingredients which are naturally occurring in non-genetically modified organisms, through sustainable production while preserving the invironment, since there is no harvesting nor extracting from nature.

E. Loing, T. Suere, E. Lamarque, **Triflouroacetyl-Tripeptide-2 to Target Senescence for Anti-Aging Benefits,** Cosmetics & Toiletries, Vol. 127; No.4/April 2012

Skin aging is characterized by progressive changes in the regulation of cellular processes and miscommunication between cells and their immediate environment, the extracellular matrix (ECM) These malfunctions, which may result from physiological and/or environmental events, are most notably characterized by the increased activities of metalloproteinases (MMPs) and the reduced synthesis of their endogenous inhibitors, i.e. tissue MMP inhibitors (TIMPs), as well as the reduced biosynthesis of major ECM protein. As a result, the extracellular matrix is no longer renewed and the skin shows the effect of aging.

SARISE BIO – Eine 100% natürliche Anti-Aging-Innovation, impag Produkt Information**,** COSSMA 4/2012

SARISE BIO ist ein innovativer, 100% natürlicher Anti-Aging-Wirkstoff, ECOCERT-zertifiziert und frei von Konservierungsmitteln. Der Phytokomplex wird aus den Stielen der Sauerkirsche und den Blättern des Sommerbohnenkrautes gewonnen. Reduzierter Zellmetabolismus und oxidativer Stress sind die beiden Hauptursachen der Zellalterung. SARISE BIO ist in der Lage, gegen diese beiden Auslöser anzukämpfen. Die Wirkung wurde in klinischen Studien bestätigt. Durch eine spezielle Produktionsmethode enthält SARISE BIO einen hohen Gehalt an aktiven Molekülen wie Triterpenoide (Ursolsäure), Rosmarinsäure und Flavonoide (Quercetin). SARISE BIO neutralisiert direkt reaktive Sauerstoffspezies (ROS). Durch die Stimulation der mitochondrialen Aktivität und die dadurch bedingte Reduktion von intrazellulärem oxidativem Strss, besitzt der Wirkstoff einen zusätzlichen positivien Effekt.

A. Firooz, B. Sadr, S. Babakoohi, M. Sarraf-Yazdy, F. Fanian, A. Kazerouni-Timsar, M. Nassiri-Kashani, M.M. Naghizadeh, Y. Dowlati, **Variation of Biophysical Parameters of the Skin with Age, Gender, and Body Region,** The Scientific World Journal, Volume 2012

Background: Understanding the physiological, chemical, and biophysical characteristics of the skin helps us to arrange a proper approach to the management of skin diseases. Objective: The aim of this study was to measure 6 biophysical characteristics of normal skin (sebum content, hydration, transepidermal water loss (TEWL), erythema index, melanin index, and elasticity) in a normal population and assess the effect of sex, age, and body location on them. Methods: Fifty healthy volunteers in 5 age groups (5 males and females in each) were enrolled in this study. A multifunctional skin physiology monitor (Courage & Khazaka electronic GmbH, Germany) was used to measure skin sebum content, hydration, TEWL, erythema index, melanin index, and elasticity in 8 different locations of the body. Results: There were significant differences between the hydration, melanin index, and elasticity of different age groups. Regarding the locations, forehead had the highest melanin index, where as palm had the lowest value. The mean values of erythema index and melanin index and TEWL were significantly higher in males and anatomic location was a significant independent factor for all of 6 measured parameters. Conclusion: Several biophysical properties of the skin vary among different gender, age groups, and body locations.

P. Moussou, L. Danoux, F. Henry, **Micro-Inflammatory Vicious Cycle: A new target to delay skin aging;** IFSCC Magazine, No. 3, 2012

The age-related chronic low grade upre4gulation of the inflammatory response is a major factor underlying the cutaneous aging process. To fight against micro-inflammation and its visible consequence on skin aging, we developed a cosmetic ingredient able to modulate three key pathways: NF-kB, neuropeptides and plasmin activity. Eperua falcate extract was shown in vitro to 1) decrease the activation of NF-kB and the release of pro-inflammatory cytokine IL-8 in stimulated human keratinocytes, 2) decrease the neuropeptide CGRP release by sensory neurons, and 3) inhibit plasmin protease activity. In addition, it inhibited the release of superoxide anions, the UVA-induced oxidation of fibrolast membrane lipids and cytokine induction in UVB-irradiated keratinocytes, showing its capacity to protect epidermal cells against the environmental and oxidative stresses that aggravate the micro-inflammatory vicious cycle.

K. Selbmann, **Querschnittsstudie zur Ermittlung von biomechanischen Hauteigenschaften mittels Cutometer® und Reviscometer® zur Ableitung von Richtwerten für gesunde Haut**, Dissertation an der Ernst-Moritz-Arndt-Universität Greifswald, 2012

Die Haut, als flächenmäßig größtes, ist auch funktionell eines der vielseitigsten Organe des menschlichen Körpers. Gesunde Haut stellt wesentliche Funktionen des menschlichen Organismus sicher. Neben den Kontakt- bzw. Sinnesfunktionen sind vor allen die Schutz- und Regulierungsfunktionen von Bedeutung für den gesunden Organismus [1]. Über diese wichtigen organischen Funktionen hinaus, bestimmt die Haut das Aussehen jedes Einzelnen und damit einen wesentlichen Teil seiner Repräsentation in der Gesellschaft. Aus diesem Grund steht die Haut nicht nur im Fokus der kosmetischen, sondern auch der medizinischen Forschung. Besonders die Eigenschaft der Hautelastizität und ihre Veränderungen im Alter sind dabei von Interesse. Es gibt neben diesen physiologischen Veränderungen der Haut krankhafte Hauterscheinungen, die mit einer Änderung der biomechanischen Eigenschaften der Haut einhergehen. Die Bestimmung von Richtwerten hat deshalb große Bedeutung für die Diagnostik.

Y. Matsunaga, S. Fujiwara, Y. Mori, A. Miyake, H. Yamanishi, M. Kage, Y. Tokudome, F. Hashimoto, T. Hariya, **Development of Self-dissolving Microneedles Consisting of Hyaluronic Acid as an Anti-Wrinkle Treatment,** IFSCC Magazine 2, 2012

Microneedle technology has recently attracted considerable attention in the medical field as a means of facilitating effective transdermal delivery of vaccines and other pharmaceutical compounds with minimal invasiveness, little pain and a high degree of safety. Generally, microneedles typically consist of multiple micro-projections made of silicon, metal or polymeric materials through which a drug can diffuse in to the skin. Delivery using solid or hollow microneedles can be accomplished by piercing the skin and then applying active agents to the permeabilized skin, coating or encapsulating agents on microneedles for rapid dissolution and release in the skin.

N. Kindler, **Extrinsische und intrinsische Formen der Hautalterung - Vergleich klassischer Untersuchungsverfahren mit der Multiphotonen-Lasertomographie**, Dissertation der Medizinischen Fakultät der Friedrich-Schiller-Universität Jena, 2012

Unsere Haut und ihr Erscheinungsbild haben in der modernen Gesellschaft zunehmend an Bedeutung gewonnen. Wesentliche Gründe dafür sind einerseits das gestiegene Körperbewusstsein, im Vordergrund steht jedoch die demographische Entwicklung in den Industrienationen. Bei einer stetig steigenden Lebenserwartung mit einer oft guten körperlichen Konstitution auch im hohen Lebensalter, wird dem Thema eines jugendlichen Hautbildes immer mehr Aufmerksamkeit gewidmet. Die menschliche Haut unterliegt jedoch im Verlaufe des Lebens einer Vielzahl von unterschiedlichsten Einflüssen, die eine Veränderung des Hauterscheinungsbildes und somit eine vorzeitige Hautalterung verursachen. In der Forschung werden mittlerweile zwei Formen der Hautalterung unterschieden. Zum einen die durch äußere Einflüsse hervorgerufene extrinsische Hautalterung, deren Ursachen v.a. die UV-Strahlung und der Nikotinabusus darstellen. Zum anderen gibt es die natürliche, genetisch determinierte intrinsische Hautalterung. Bei ihr spielen der natürliche Hormonhaushalt, Veränderungen im Immunsystem und einige andere intrinsische Prozesse eine entscheidende Rolle, die noch nicht vollständig verstanden sind.

A. Manosroi, R. Chutoprapat, M. Abe, W. Manosroi, J. Manosroi, **Anti-aging efficacy of topical formulations containing niosomes entrapped with rice bran bioactive compounds**, Pharm Biol. 2012 Feb;50(2): p. 208-224

Context: Rice [Oryza sativa L. (Gramineae)] bran is a rich source of phytochemicals. Its oil also contains several bioactive components that exhibit antioxidative properties such as ferulic acid (F), γ-oryzanol (O), and phytic acid (P) which can be a new source of cosmetic raw materials. Objective: To evaluate the anti-aging effects of the gel and cream containing niosomes entrapped with the rice bran bioactive compounds. Materials and Methods: The semi-purified rice bran extracts containing F, O, and P which indicated the growth stimulation of human fibroblasts and the inhibition of MMP-2 by sulforhodamine B and gelatin zymography, respectively, were entrapped in niosomes by supercritical carbon dioxide fluid (scCO(2)) and incorporated in gel and cream formulations. The skin hydration, elasticity, thickness and roughness, and pigmentation in human volunteers after treated with these gel and creams were investigated by corneometer, cutometer, visiometer, and mexameter, respectively. Results: Gel and cream containing the semi-purified rice bran extracts entrapped in niosomes gave no sign of erythema and edema detected within 72 h on the shaved rabbit skin by the closed patch test investigated by mexameter and visual observation, respectively. These formulations also demonstrated higher hydration enhancement and improvement of skin lightening, thickness, roughness, and elasticity on the skin of 30 human volunteers within the 28-day treatment not more than 9, 27, 7, 3, and 3 times, respectively. Discussion and Conclusions: The formulations containing niosomes entrapped with the rice bran bioactive compounds gave superior clinical anti-aging activity which can be applied as a novel skin product.

A. Marini, S. Grether-Beck, T. Jaenicke, M. Weber, C. Burki, P. Formann, H. Brenden, F. Schönlau, J. Krutmann, **Pycnogenol® effects on skin elasticity and hydration coincide with increased gene expressions of collagen type I and hyaluronic acid synthase in women**, Skin Pharmacol Physiol., 2012;25(2): p. 86-92

Introduction and objectives: In recent years there has been an increasing interest in the use of nutritional supplements to benefit human skin. Molecular evidence substantiating such effects, however, is scarce. In the present study we investigated whether nutritional supplementation of women with the standardized pine bark extract Pycnogenol® will improve their cosmetic appearance and relate these effects to expression of corresponding molecular markers of their skin. Materials and methods: For this purpose 20 healthy postmenopausal women were supplemented with Pycnogenol for 12 weeks. Before, during and after supplementation, their skin condition was assessed (i) by employing non-invasive, biophysical methods including corneometry, cutometry, visioscan and ultrasound analyses and (ii) by taking biopsies and subsequent PCR for gene expression analyses related to extracellular matrix homeostasis. Results: Pycnogenol supplementation was well tolerated in all volunteers. Pycnogenol

significantly improved hydration and elasticity of skin. These effects were most pronounced in women presenting with dry skin conditions prior to the start of supplementation. The skin-physiological improvement was accompanied by a significant increase in the mRNA expression of hyaluronic acid synthase-1 (HAS-1), an enzyme critically involved in the synthesis of hyaluronic acid, and a noticeable increase in gene expression involved in collagen de novo synthesis. Conclusions: This study provides skin-physiological and for the first time molecular evidence that Pycnogenol supplementation benefits human skin by increasing skin hydration and skin elasticity. These effects are most likely due to an increased synthesis of extracellular matrix molecules such as hyaluronic acid and possibly collagen. Pycnogenol supplementation may thus be useful to counteract the clinical signs of skin aging.

D.Q. Nguyen, T.S. Potokar, P. Price, **A long term evaluation of Integra® and split thickness skin grafts in acute burns and reconstructive surgery,** Journal of Wound Technology, January 2012, No 14, p. 83-84

The field of wound healing and tissue repair has advanced rapidly in the last decade, with this there is an increasing emphasis on the importance of the functional and cosmetic outcomes following injury. Integra artificial skin is the most widely used synthetic skin substitute and is reported to have better outcomes in relation to the appearance and elasticity when compared to split thickness skin grafting (SSG) A review of the literature reveals very few trials that are based on an objective evaluation of Integra treated scars as compared to SSGs. This research aimed to provide further data on the long term outcome of Integra. All adult patients from the Welsh Burns Centre who had been sucdessfully treated with Integra were invited to attend a clinic for a follow up provided they had been healed for greater Observer scale (POS) were used to evaluate whether Integra was subjectively superior to SSG.

A.-E. Craciun, M. Moldovan, A. Rusu, C. Nita, C. Craciun, A. Tataru, **Predictors of changes in physical properties of skin in patients with diabetes mellitus,** Rom J Diabetes Nutr Metab Dis. 19(1):33-40; 2012

Introduction: The skin, the largest human organ, is often affected by diabetes mellitus (DM). We know that DM affects the hydration of stratum corneum (SC), the sebum content of the skin and to some extent, the barrier function of the epidermis and elasticity, but we do not know the factors leading to these changes. Objectives: The objectives of this study were to determine the factors associated with changes in physical properties of the skin (skin hydration degree, sebumetry, transepidermal water loss and skin elasticity) in patients with diabetes. Materials and methods: The physical properties of the skin were assessed using the Multi Probe Adapter Systems MPA (Courage-Khazaka, Germany) in 57 patients with diabetes and 46 non-diabetic.

D. Schmid, R. Sacher, E.r Belser, F. Zülli, **Stimulation of growth factor communication between epidermis and dermis by Crocus chrysanthus bulb extract,** Household and Personal Care Today n 1/2012, p. 33-36

Growth factors and cytokines are messenger compounds, in most cases proteins, that allow the communication between cells in our tissues. After binding to specific receptors on cell surfaces, growth factors activate cellular proliferation or differentiation. In the skin, growth factors orchestrate the wound-healing process and also the continuous regeneration and repair. The repair of skin damaged by a wound or after UV exposure takes place in two phases. Firstly there is an inflammatory reaction. Activation on the NF-kB pathway in the cells of the epidermis leads to the formation of inflammatory cytokines.

A. Kollmar, **UVA-1-Therapie bei Patienten mit Sklerodermie - eine retrospektive und prospektive Studie -**, Dissertation Klinik und Poliklinik für Dermatologie und Allergologie der Technischen Universität München am Biederstein, Institut für Hygiene und Umweltmedizin, Germany, 2012

Folgende Synonyme der Sclerodermia circumscripta werden üblicherweise verwendet: lokalisierte Sklerodermie, Morphaea, Morphoea. Als zirkumskripte Sklerodermie wird eine chronische, episodisch verlaufende, in der Regel auf die Haut beschränkte Bindegewebserkrankung unbekannter Ätiologie bezeichnet, mit charakteristischem klinischen Ablauf der Hauterscheinungen (Erythem ñ Induration - Atrophie) und potentiellem Systemcharakter. Die Erkrankung ist relativ selten, bei stark pigmentierten Personen sehr selten (9). Das Verhältnis von weiblichen zu männlichen erkrankten Personen ist 2:1 bis 3:1. Am h‰ufigsten sind Frauen im j¸ngeren Erwachsenenalter (20-50 Jahre) betroffen; circa 15% der Patienten sind Kinder bis zu 10 Jahren. Die Inzidenz beträgt 2-4,7/Mio. Einwohner/Jahr (3, 9). Die Ursache der Morphaea ist unbekannt. In Einzelfällen wurden Traumen oder Druck als auslösende Faktoren angeschuldigt. Diskutiert werden genetische (z.B. die Korrelation mit HLA-B8, HLA-DR1 und HLA-DR5 (3, 9, 105), HLA-DR2, HLA-B7 (30), immunologische, hormonelle, virale, toxische, traumatische, neurogene oder vaskuläre Faktoren, sind aber nicht bewiesen. Auch der

Verdacht, dass Borrelia burgdorferi, zumindest in einigen Fällen, als ätiologisches Agens in Frage kommt (2), hat sich nicht best‰tigt (3, 9, 21, 117). Allerdings zeigt das Stadium 3 der Borreliose, die Acrodermatitis chronica atrophicans, klinische Ähnlichkeiten mit der lineären Sklerodermie (30).

H. Ohshima, A. Tada, A. Kanamaru, H. Akamatsu, Y. Sakai, M. Itoh, H. Kanto, **Relevance of the directionality of skin elasticity to aging and sagging of the face,** Skin Research and Technology 2011; 17: 101-107

Forces acting in facial skin have been suggested to show directionality. Non-invasive methods of measuring this directionality may thus provide information related to aging processes. The Reviscometer RVM 600 device is capable of measuring directionality of forces on the skin. This device has not been used previously in a published study to evaluate changes in directionality of forces on facial skin with aging. The first objective of this pilot study was to investigate relationships between mechanical directionality using the Reviscometer RVM 600, the Cutometer MPA 580, and aging of the facial skin in a supine position. In addition, the study investigated relationships between mechanical directionality and “skin sagging”, which may be caused by gravity.

P. Quatresooz, F. Henry, P. Paquet, G. E. Piérard, **Photoaging under recreational sunbeds,** Skin Research and Technology 2011, 17; p. 309-313

Photoaging refers to light-induced changes in the skin that are superimposed to the alterations of intrinsic chronologic aging. Photoaging is induced by non-ionizing electromagnetic radiations, and is recognized by the combination of mottled skin melanoderma (MSM), coarse wrinkles, loss of skin firmness and solar elastosis. These changes are primarily due to chronic solar radiations. In addition, the importance of exposures to artificial sources of restricted light wavelengths is steadily increasing for lifestyle purposes in affluent cultural societies. The tanning bed procedure poses problems particularly in conditions of unsupervised and non-medical use.

N. Akthar, S. Uz Zaman, B.A. Khan, M.N. Amir, M.A. Ebrahimzadeh, **Calendula extract: effects on mechanical parameters of human skin,** Acta Poloniae Pharmaceutica – Drug Research, Vol. 68 No 5, p. 693-701, 2011

Abstract: The aim of this study was to evaluate the effects of newly formulated topical cream of Calendula officinalis extract on the mechanical parameters of the skin by using the cutometer. The Cutometer 580 MPA is a device that is designed to measure the mechanical properties of the skin in response to the application of negative pressure. This non-invasive method can be useful for objective and quantitative investigation of age related changes in skin, skin elasticity, skin fatigue, skin hydration, and evaluation of the effects of cosmetic and antiaging topical products. Two creams (base and formulation) were prepared for the study. Both the creams were applied to the cheeks of 21 healthy human volunteers for a period of eight weeks. Every individual was asked to come on week 1, 2, 3, 4, 5, 6, 7, and 8 and measurements were taken by using Cutometer MPA 580 every week. Different mechanical parameters of the skin measured by the cutometer were; R0, R1, R2, R5, R6, R7, and R8. These were then evaluated statistically to measure the effects produced by these creams. Using ANOVA, and t-test it was found that R0, and R6 were significant ($p < 0.05$) whereas R1, R2, R5, R7, R8 were insignificant ($p > 0.05$). The instrumental measurements produced by formulation reflected significant improvements in hydration and firmness of skin.

K. Schuster, **Untersuchungen zur Wirksamkeit der Behandlung von Keloiden bzw. hypertrophen Narben in vivo mit intraläsionalem Triamcinolonacetonid bzw. Silikon-Gel Folie - Eine klinische Studie an 25 Keloiden,** Dissertation an der Klinik und Poliklinik für Dermatologie und Allergologie am Biederstein, TU München, November 2011

Seit jeher stellen Narben ein physisch und psychisch beeinträchtigendes und kosmetisches Problem dar. Ästhetisch sind schlecht verheilte Narben häufig sehr störend und können eine funktionelle Behinderung sowie eine Einschränkung der Beweglichkeit an Gelenken hervorrufen.

L.J. Cruz, C. Gutierrez, C. Caniego, I.M. Ramos, **Peptides build a 3D regenerative matrix,** Personal Care November 2011, p. 67-70

Skin aging is caused by intrinsic biological factors combined with external effects (environmental impacts like UV or pollutants). Most of the skin ageing macroscopic signs (such as wrinkles, skin thinning or loss of firmness) are related to a reduction either of the quantity or quality of the extracellular matrix (ECM). Hence, the improvement of the structure of ECM is a key goal to minimise the effets of ageing and also for regeneration processes. Wound repair is an essential physiological process that plays a key role for tissue homeostasis. Any regeneration of injured or damaged skin, including damage by environmental factors, requires restoration of ECM.

G. Maramaldi, **A highly moisturising active from tamarind seed,** Personal Care November 2011, p. 101-103

Tamarind is considered as one of the most beautiful trees growing in the South-East of Asia, and is also an edible plant; its young pods are used both for nutrition and to manufacture spices. Traditionally used in the Ayurvedic medicine even today, its use as a laxative dates back to the 1500s even in Western Coutnries. The seed of tamarind has a high content of polysaccharides among which the most abundant is a branched polysaccharide of a cellulose-type backbone carrying xylose and galactoxylose substituents. This polysaccharide has been extremely well characterised (the polydispersion index being very limited, i.e. the number of molecules largely differing from the fixed molecular weight), and its use in cosmetic formulations has been assessed in terms of skin hydration, elasticity, roughness and densitiy on healthy volunteers.

A. Mehling, U. Griesbach, V. Pian, **Sensible solutions for sensitive faces,** September 2011, Personal Care, p. 41-45

The term “sensitive skin” is commonly used to describe a number of unpleasant sensations of varying intensity and which are transient in nature. People have different sensitive skin types but typically complain about skin tightness, burning, prickling or itchy sensations. These complaints can be accompanied by transient redness or skin dryness. Although these symptoms usually do not involve visible or predictable signs of irritation or immunological reactions, they can cause significant discomfort. Due to the wide variety of possible causes and the subjective nature of the responses associated with sensitive skin, it is extremely difficult to quantify.

F. McCall-Perez, T.J. Stephens, J.H. Herndon Jr., **Efficacy and Tolerability of a Facial Serum for Fine Lines, Wrinkles, and Photodamaged Skin**, Journal of Clinical Aestetics, July 2011, Volume 4, No. 7, p. 50-54

Background: Dermatology visits for the prevention and treatment of aging skin are rapidly increasing. The clinical sequelae including wrinkling, pigmentary changes, roughness, laxity, and telangiectasia can all result in the appearance of aging skin, impacting quality of life. A facial serum was developed with ingredients associated with an improvement in the appearance of fine lines and wrinkles and increase in stratum corneum barrier function. Patients were instructed to use a gentle wash before applying the formulation and a moisturizer afterwards. Objective: To assess the efficacy and tolerability of a facial serum in improving the appearance of fine lines, wrinkles, and signs of photodamage. Methods: Thirty-four female subjects (Fitzpatrick classification I–IV) with early to advanced photodamaged skin in a 12-week, single-arm, open-label clinical trial. Visits were scheduled at Baseline and Weeks 4, 8, and 12. Efficacy was assessed using visual grading of facial and periocular skin (modified 10-point scales); changes in viscoelasticity properties were assessed by cutometry. Cutaneous tolerability was evaluated both clinically and subjectively using a 4-point scale and monitoring adverse events. Digital photography documented treatment-related changes in skin appearance. Subjects completed self-assessments at Baseline and Weeks 4, 8, and 12. Results: Significant improvements in all parameters and skin condition were seen as early as Week 4 ($p \leq 0.05$). There was an 18-percent improvement in overall appearance by Week 12 ($p \leq 0.05$). Fine lines and coarse winkles improved by 27 and 15 percent, respectively (both $p \leq 0.05$). Significant improvements were also seen in uneven pigmentation, firmness/elasticity, toned/resiliency, skin radiance, tone, and tactile roughness/smoothness (10%, 11%, 18%, 21%, 16%, and 47%, respectively; all $p \leq 0.05$). By Week 12 subjects reported a 43-percent improvement in overall facial skin appearance and 24-percent reduction in mean scores for facial lines and wrinkles (both $p \leq 0.05$). Improvements were also reported in overall skin tone, firmness, dryness, appearance of pores, appearance of brown spots/facial discoloration, skin radiance, and texture (37%, 35%, 35%, 28%, 24%, 39%, 38%, respectively; all $p \leq 0.05$). There was a 71-percent reduction in erythema and 94-percent reduction in skin dryness by Week 12 (both $p \leq 0.05$). Conclusion: The facial serum, in combination with the wash and moisturizer, may be effective and well-tolerated when treating photodamaged skin and may improve the appearance of fine lines and wrinkles. Significant improvements were seen with all grading parameters as early as four weeks of usage. A controlled study is warranted to further validate these findings.

T. Ezure, E. Yagi, N. Kunizawa, T. Hirao, S. Amano, **Comparison of sagging at the cheek and lower eyelid between male and female faces.** Skin Research and Technology 2011; 17; p. 510-515

Facial Sagging is a well-known feature of aging. Age-related changes of female faces have been examined thoroughly as regards characteristics and formation mechanism, but relatively little is known about age-related male facial changes. Sagging is thought to be associated with decreased dermal elasticity in female faces, but the dermis is thicker in males and dermal blood flow is more

abundant in males than females of the same age. Therefore, the relationship of dermal condition with facial sagging may be different in males and females. However, there is little information about gender differences of dermal elasticity. Therefore, the relationship of dermal condition with sagging in male faces is unclear.

G.G. Barbarino, M. Jabareen, E. Mazza, **Experimental and numerical study on the mechanical behaviour of the superficial layers of the face,** Skin Research and Technology 2011; 17; p. 434-444

Modeling the mechanical behaviour of facial soft tissues has gained importance in recent years due to the development of 3D face models for the computational simulation of surgical intervention. The need for improved simulation accuracy and envisaged applications of these models (e.g. outcome of face lift surgeries) require a distinction between the different soft tissue layers and an accurate representation of their mechanical behaviour. Soft tissues have been investigated in vivo in different studies Specifically for the mechanical characterization of the skin, different non-invasive testing methods were used: suction, indentation, torsion and in situ tensioning devices.

W. Raab, **Narben und Keloide***,* Kosmetische Medizin 5.11

Narben bilden sich nach einer traumatischen Schädigung der Haut; die entstandenen Substanzverluste im Hautbindegewebe werden nur unvollkommen ersetzt.

R. Darlenski, T. Callaghan, J.W. Fluhr, **Antiaging and Antiwrinkle Products,** J.W. Fluhr (ed.), Practical Aspects of Cosmetic Testing; Springer-Verlag Berlin Heidelberg 2011

The chronological (intrinsic) and extrinsic aging demonstrate typical macroscopic, histological and functional characteristics. The relative improvement in different parameters characterizing aging skin cann be used in efficacy proof of antiaging and antiwrinkle cosmetic products. Different approaches to investigate the efficacy of antiaging products exist such as clinical evaluation and objective assessment with non-invasive methods and invasive procedures. A multiparametric approach is useful in the assessment of antiaging products efficacy. There is no uniform consensus on the protocol and the design of studies aiming efficacy proof of antiaging cosmetics.

J.W. Shin, D.H. Lee, S.Y. Choi, J.I. Na, K.C. Park, S.W. Youn, C.H. Huh, **Objective and non-invasive evaluation of photorejuvenation effect with intense pulsed light treatment in Asian skin**, J Eur Acad Dermatol Venereol. 2011 May; 25(5): p. 516-22

Background: Intense pulsed light (IPL) has been widely used for photorejuvenation. Although previous literature has shown clinical effectiveness of IPL treatments on cutaneous photoaging, the associated changes in the biophysical properties of the skin following IPL treatments have not been fully elucidated. Objective: The aim of this study was to evaluate changes in skin biophysical properties in patients with photoaging after IPL treatments, using non-invasive, objective skin measuring devices. Patients and Methods: A total of 26 Korean women with facial dyschromias underwent three sessions of IPL treatment at 4-week intervals. Outcome assessments included standardized photography, global evaluation by blinded investigators, patients' self-assessment and objective measurements of colour (Mexameter MX18, Chromatometer), elasticity (Cutometer), roughness (Visiometer), sebum (Sebumeter) and skin hydration (Corneometer). Results Intense pulsed light treatments produced a 15% decrease in the size of representative pigmented lesions ($P < 0.05$). Conclusions: Patients' self-assessment revealed that 84% and 58% of subjects considered their pigmented lesions and wrinkles were improved respectively. Objective colorimetric measurement demonstrated significant improvements following IPL treatments that were most remarkable after one session of IPL. Moreover, skin elasticity showed significant improvements at the end of the study. Skin wrinkles as measured using Visiometer showed a mild improvement without statistical significance. Sebum secretion and water content of skin remained unchanged. Intense pulsed light provided significant improvement in the appearance of facial pigmented lesions in Korean patients. These effects appeared to be more remarkable in improving pigmentation, skin tone and elasticity.

G. Pauly, C. Jeanmaire, L. Danoux, V. Bardey, O. Freis, A. Rathjens, **New Approaches for Collagen and Elastic Tissue to Improve Skin Firmness and Elasticity,** IFSCC Magazine 4/2011

Skin firmness and elasticity are major targets for anti-aging claims in cosmetics. The alteration of these essential functions during skin aging are mainly due to degradation of collagen and elastic tissue at different levels of the extracellular matrix of the dermis and of the dermo-epidermal junction in the skin. A global and multi-level approach to reverse this process is on the one hand to repair the damages by stimulating the synthesis of different collagens and elastic tissue components and on the other hand to preserve these macro-molecules from glycation and excessive proteolysis. Several in vitro

experiments showed the capacity of two active ingredients to increase synthesis by fibroblasts of the collagen types I, IV, V, XII, XVI, XVI-II.

B. Sohm, V. Cenizo, V. André, H. Zahouani, C. Pailler-Mattei, B. Vogelgesang, **Evaluation of the efficacy of a dill extract in vitro and in vivo**, Int J Cosmet Sci, 2011 Apr;33(2): p. 157-163

Lysyl oxidase-like (LOXL) is an extracellular enzyme that catalyses the cross-linking between microfibrils and tropoelastin (TE), thereby ensuring elastic fibre functionality. With ageing, LOXLexpression decreases, thus participating in the loss of skin elasticity. In a previous study, we showed that a dill seed extract [INCI name: Peucedanum graveolens (Dill) extract] could increase LOXL expression in cultured dermal fibroblasts. Besides, we showed a good correlation between the measurements of skin elasticity obtained in vitro and in vivo using a fully automated bio-tribometer designed to measure the biomechanical properties of soft and complex materials like skin. The aim of this study was to evaluate the ability of the dill extract to improve skin elasticity in vitro and in vivo using different models. Using the bio-tribometer, we first showed that the lateral elasticity of dermis equivalents (DEs) treated with the dill extract at 1% was significantly increased by +29% ($P < 0.01$) when compared to untreated DEs. In vivo, skin firmness and elastic recovery measured using cutometry methods were also significantly improved compared to placebo in volunteers treated for 56 days with a formula containing 1% of dill extract. Moreover, the clinical evaluation evidenced significant improvements in 'skin elasticity' compared to placebo. A majority of subjects treated with the dill extract also noted significant improvements in skin elasticity, firmness and slackness of the jaw line. Finally, mean wrinkle area and length were also significantly reduced compared to placebo after 84 days as measured using silicone replicas taken from the crow's feet. In summary, this study showed that the dill extract could improve elasticity of DEs in vitro as well as skin biomechanical properties and appearance in vivo. It also highlights the relevance of using the biotribometer as an exploratory tool for the measurement of skin elasticity in vitro.

N. Hirt-Burri, C. Scaletta, W. Raffoul, L.A. Applegate, A. de Buys Roessingh, **Ten year follow-up of Pediatric Burn Patients Treated With Biological Bandages,** Hospital of Lausanne;

This study presents the skin quality results ten years after treatment of eight children with intermediate to profound 2nd degree burns. They were treated with biological bandages produced from a clinical bank of human fetal skin cells (one organ donation, 1m² fetal skin). Children (age mean = 6 yr) were treated with one to seven bandage changes (mean of 4.1 +/- 2) following the surgeon's evaluation. No auto-graft was necessary. Overall skin quality was evaluated following the Vancouver Scar Scale model and compared with semi-quantitative biomedical devices such as the Cutometer and the Dermatospectrometer.

F. Fischer, V. Achterberg, A. März, S. Puschmann, C.-D. Rahn, V. Lutz, A. Krüger, H. Schwengler, S. Jaspers, U. Koop, T. Blatt, H. Wenck, S. Gallinat, **Folic acid and creatine improve the firmness of human skin in vivo**, J Cosmet Dermatol, 2011 Mar;10(1): p. 15-23

Background: The decrease in firmness is a hallmark of skin aging. Accelerated by chronic sun exposure, fundamental changes occur within the dermal extracellular matrix over the years, mainly impairing the collagenous network. Aims: Based on the qualitative and quantitative assessment of skin firmness, in vitro and in vivo studies were carried out to elucidate the effects of topical folic acid and creatine to counteract this age-dependent reduction in the amount of collagen. Patients/methods: Topical application of a commercially available formulation containing folic acid and creatine was performed to study effects on skin firmness in vivo using cutometric analysis. Imaging and quantification of collagen density were carried out using multiphoton laser scanning microscopy (MPLSM). To investigate the effects of these compounds on collagen gene expression, procollagen synthesis, and collagen fibril organization, complementary in vitro studies on cultured fibroblast-populated collagen gels were carried out. Results: The underlying structural changes in the collagen network of young and aged sunexposed facial skin in vivo were visualized by MPLSM. Topical application of a folic acid- and creatine-containing formulation significantly improved firmness of mature skin in vivo. Treatment of fibroblast-populated dermal equivalents with folic acid and creatine increased collagen gene expression and procollagen levels and improved collagen fiber density, suggesting that the in vivo effects are based on the overall improvement of the collagen metabolism. Conclusions: Employing MPLSM, dermal changes occurring in photo-aged human skin were visualized in an unprecedented manner and correlated to a loss of firmness. Treatment of aged skin with a topical formulation containing folic acid and creatine counteracted this age-dependent decline by exerting sustained effects on collagen metabolism. Our results support previous findings on the efficacy of these actives.

A. Thibodeau, **Anti-aging Skin Care Benefits of Saccharina longicruris Extract,** Cosmetics &

Toiletries, Vol. 126, No. 3/March 2011

Skin appearance and functionality are affected by a complex combination of factors including both genetic, i.e. intrinsic, and actinic, i.e. extrinsic or environmental. Indeed, genetic and actinic factors act together to modulate the expression of key genes involved in skin homeostasis. Intrinsic aging is genetically regulated and follows a chronological clock inside of cells, while environmental factors such as UV exposure, humidity and air pollutants are responsible for actinic aging. Together, genetic and actinic aging target important metabolic pathways in skin cells that trigger the signs of aging such as skin roughness and wrinkling. At a molecular level, it has been demonstrated that collagen synthesis is reduced in aged skin cells and in cells damaged by UV radiation.

A. Thibodeau, P. Jacobs, S. Amari, **Olive oil fatty acids: positive effects for the skin,** Personal Care, March 2011, p. 51-57

From the activity of B&T over the last 20 years we have collected vast knowledge of the effects of olive oil fatty acids on the skin showing positive benefits by reinforcing the effectiveness of the hydrolipidic film supporting the skin barrier function. In this paper we take three olive oil derivatives (Olivem 1000, Sensolene and Olivem 900) having different formulation functions and show how the olive oil fatty acids can provide positive effects on the skin in cosmetic applications.

A. Thibodeau, P. Jacobs, S. Amari, **Biomimetic ingredient offers formulation benefits,** Personal Care, March 2011, p. 115-118

The hydrolipidic film covers the surface of the skin and actively contributes to the skin surface smoothness and the skin barrier function. We have developed a biomimetic ingredient of the hydrolipidic film as per its fatty acid profile. Ethylhexyl olivate (INCI nomenclature) brings clinical benefits for numerous parameters and rheology advantages to the formulation. One single application of a formulation containing 3% ethylhexyl olivate was shown to significantly increase skin hydration (+12.2%, $p<0.05$), barrier function (+16.7%, $p<0.05$), visco-elastic properties (+6.7%, $p<0.05$) and skin surface profilometry (+11.2%, $p<0.05$) for up to eight hours. In another experiment, ethylhexyl olivate was compared to 10 different oil/emollients and ranked third for the viscosity enhancement and second for spreadability index on skin. Thanks to its molecular composition, ethylhexyl olivate creates a subtle veil naturally integrating itself within the hydrolipidic film and significantly improving skin sensorial properties. Ethylhexyl olivate stands as a key tool for formulation chemists while positively acting on skin physiological features as well as on sensorial properties.

M. Bloemen, M. van der Wal, P. Baar, P. van Zuijlen, E. Middelkoop, **Clinical Effectiveness of Dermal Substitution in Burns by Topical Negative Pressure: A Multicenter Randomized Controlled Trial**

Previous research has demonstrated clinical effectiveness of dermal substitution, however, in burn wounds only limited effect has been shown. A problem in burn wounds is the reduced take of the autograft, when the substitute and graft are applied in a one-step procedure. In other studies, application of topical negative pressure (TNP) was able to improve the take rate of an autograft. Aim of this study was to investigate if application of a dermal substitute in combination with TNP improves scar quality after burns. In a four-armed multicenter randomized controlled trial (RCT), a split-skin graft with or without dermal substitute Matriderm, and with or without TNP were compared in adult patients with deep dermal or full-thickness burns which required skin transplantation.

P. Maia Campos, D.G. Mercurio, M.D. Gianeti, A.T. Nobrega, **In vitro antioxidant activity and clinical efficacy of cosmetic formulation containing chamomile extract,** FAPESP

Botanical extracts have attracted great interest in the cosmetic area due to its rich composition and medicinal properties. Among these extracts, it can be mentioned the Matricaria chamomilla L. extract, which has been commonly used in cosmetics. Chamomile extract has being well studied once it presents therapeutic properties in terms of pharmacological applications. Various studies showed that chamomile have soothing, antiallergic, antioxidant and antiinflamatory effects. All of these properties are given by chamomile richest composition of organic components. It es added to the cosmetic formulations to provide skin moisturizing and smoothness.

L.J. Cruz, C. Gutierrez, C. Caniego, I.M. Ramos, **Intelligent targeting devices; Target delivery of cosmetic actives to specific skin cells,** Household and Personcal Care TODAY n3/2011; p. 14-17

Since the first Liposomes were introduced in the cosmetic market products in the 80's, Cosmetic Delivery Systems have been used during the last decades to enhance the properties of Cosmetic Actives. Encapsulation Technologies are a family of Delivery Systems that include a wide range of techniques, that allow isolating the substance of interest from the environment, surrounding it with a shell, or into a matrix made up of the encapsulating material. Just by encapsulating a substance in the

right way, we can increase stability, reduce toxicity, increase the biodisponibility, mask taste or odour… or just change the physical appearance. But the most elegant applications of encapsulation involve any kind of modification of the delivery of the encapsulated active material.

L. Rigano, C. Andolfatto, L. Stucchi, M. Bosco, **Hyaluronic Acid Butyric Esters for the Improvement of Skin Functionality,** Cosmetic & Toiletries Vol. 126, No. 2/February 2011, p. 104-111

The word hyaluronic is derived from the Greek hyalos meaning “glass” or “transparent” and refers to the vitreous humor, the ocular tissue from which it was first isolated by Karl Meyer and colleagues in 1934. It was later located in many other animal tissues, i.e. synovial fluid, cartilage and the umbilical cord, where it has the same structure and biological activities, described in this article. Hyaluronic acid (HA) is a linear polysaccharide of thigh molecular weight that belongs to the fmily of mucopolysaccharides or glycosaminoglycans (GAGs), the physiological constituents of the dermal connective tissue in the extracellular matrix. In adult humans, the total amount of HA is equal to approximately 15g, half of which is found in the skin.

F*. Alvim Sant’Anna Addor, S. Schalka, V. de Melo Cardoso Pereira, J. de Oliveira Filho*, **Pregnancy and predisposition to striae: correlation with the skin’s biomechanical properties**, Surg Cosmet Dermatol. 2010;2(4): p. 253-256

Introduction: Striae in pregnancy are caused by the rupture of collagen and elastic fibers, due to the distension of the skin.The dermal structures that allow the skin to expand – being responsible for the biomechanical properties of the skin such as firmness and elasticity – when ruptured, cause striae. Since pregnancy seems to change these properties in order to facilitate skin distension, there is a correlation between those parameters and the occurrence of striae during pregnancy. Objective: To investigate the correlation between the occurrence of striae and the skin's capacity to increase its elasticity. Methods: Skin firmness and elasticity was measured with a Cutometer MPA 580® device in order to investigate the occurrence of striae in 60 pregnant women. Results: A positive correlation between increased elasticity and the absence of striae was observed. Conclusions: There is a possible correlation between the occurrence of striae and the skin's capacity to increase dermal elasticity.

P. Sin, I. Stupka, P. Brychta, **Evaluation and comparison of composite and split-thickness skin grafts using Cutometer MPA580,** Annals of Burns and Fire Disasters, Vol. XXIII, No.4, December 2010

In our preliminary experiments we found that composite skin grafts consisting of allogeneic acellular dermis and thin epidermal autologous grafts applied to the excised burn wound in one stage led to better results in terms of viscoelastic properties than autologous split-thickness skin grafts. In ten burn patients we applied composite skin grafts consisting of allogeneic acellular dermis and thin epidermal autologous grafts and followed the quality of the reconstructed skin cover with a special device, Cutometer MPA580, over a period of four years. The cutometric curves demonstrated better viscoelastic properties in composite skin grafts than in conventional split-thickness skin grafts after four years.

H. Maier, A. Schmalwieser, H. Rohn, L.L. Kellner., A. Wanka, A. El Modeir, S. Felke, K. Schmid-Kubista, J. Schmidt, A. Cabaj, H. Stadlmann, J. Spiess, S. Binder, W. Fischer, H. Hönigsmann, **UV-Belastung bei der bäuerlichen Arbeit. Eine Studie im Auftrag der Sozialversicherungsanstalt der Bauern,** Medizinische Universitätsklinik Wien

Landwirte haben ein erhöhtes Risiko, an UV-induzierten Haut- und Augenschäden zu erkranken. Aufgrund der unzureichenden Datenlage werden UV-induzierte Hauttumore derzeit noch immer nicht als echte Berufskrankheiten (BK) anerkannt. Unsere Studie umfasst zwei Teile. In der epidemiologischen Untersuchung wurde bei einer repräsentativen Gruppe von Landwirten und einer Kontrollgruppe aus reinen Innenarbeitern das Wissen zu den Themen „Sonnenschaden und Sonnenschutz“ mittels eines detaillierten Fragebogens abgefragt und die Häufigkeit von UV-induzierten Haut- und Augenproblemen durch eine vollständige dermatologische und ophtalmologische Untersuchung ermittelt.

K. Yoshida, H. Yamazaki, T. Takenaka, E. Tanaka, T. Kotsuma, Y. Fujita, N. Masuda, K. Kuriyama, M. Yoshida, T. Nishimura, **Objective Assessment of Dermatitis Following Post-Operative Radiotherapy in Patients with Breast Cancer Treated with Breast-conserving Treatment,** Stahlenther Onkol 2010 No. 11

Breast cancer is one of the most frequent cancers among women in seeral western countries, and most of these patients are treated post-operatively with radiotherapy. The sensitive target is normal skin with its inherent radiosensitivity and is sometimes severely affected by irradiation. Some studies

have suggested that most patients treated with post-operative external radiotherapy for breast cancer will experience some type of skin reaction, such as skin dermatitis. However, there is currently no objective universal skin reaction rating scale, and there is always a risk of subjective factors interfering with the rating. In most previsous studies, the extent of erythema was determined with subjective means, such as visual inspection.

B. Martinez **Für alle Fälle;** COSSMA 11/2010

Will man das Fettgewebevolumen und die damit verbundene Cellulite lokal reduzieren, muss man auf die verschiedenen Prozesse (s. Kasten) einwirken, die die Fettakkumulation verursachen. Provislim ist die synergistische Kombination zweier Wirkstoffe, Fisetin und Frambinon, die genau das tun. Fisetin, ein Sirtuinaktivator, ist ein natürliches Lebensmittelflavonoid, das aus dem Buchsbaum Buxus sinica Cheng gewonnen wird, aber auch in Obst und Gemüse, besonders in Erdbeeren, vorkommt. Das Phenos Frambinon ist die Hauptgeruchskomponente in Himbeeren und wird aus der Anispflanze Pimpinella anisum gewwonnen. Aufgrund seines Wirkmechanismus ist Provislim täglich 24 Stunden im Einsatz, um lokales Fett und Cellulite abzubauen, egal ob der Verwender sich ausruht, trainiert, arbeitet, isst oder fernsieht.

Oestro Cream – Firmer and Beautiful Breast Cream, www.Oestrocream.com, 2010

Oestro cream is a natural breast enhancement cream scientifically engineered with Transdermal Technology to naturally enhance the size, shape and firmness of women's breats.

T. Ezure, S.Amano, **Influence of subcutaneous adipose tissue mass on dermal elasticity and sagging severity in lower cheek,** Skin Research and Technology 2010; 16: p. 332-338

Obesity is a significant risk factor for various cardiometabolic diseases, for example hypertension, atherosclerosis and type 2 diabetes. Subcutaneous adipose tissue lies just beneath the dermal layer, and is composed of lipid-filled cells termed adipocytes. Until recently, adipocytes were considered only as an inert fat-storing tissue, but recent studies have demonstrated that adipocytes play dynamic roles in the highly regulated processes of secreting various bioactive compounds, including steroids, hormone precursors and cytokines, collectively named adipokines.

S.S. Fong, L.K. Hung, J.C. Cheng, **The cutometer and ultrasonography in the assessment of postburn hypertrophic scar--a preliminary study,** U.S. National Library of Medicine, National Institutes of Health

Sixteen patients with various degrees of postburn hypertrophic scars were evaluated by ultrasonography and elastometry. An Aloka Echo Camera (SSD-500) with a 7.5 MHz probe and a Cutometer SEM 575 skin elastometer were used. Serial monthly examinations were performed using both pieces of equipment. In some patients, more than one scar was assessed. The assessments were correlated with clinical grading of the progress of the scars. It was noted that ultrasonography was very sensitive in the localization of scar tissues, distinguishing them from normal skin, assessment of thickness and also delineation of the extent of scar tissues. The subcutaneous part of the scar could be assessed. Cutometer SEM 575 is a new machine that applies a gentle suction to the skin to measure its viscoelasticity. It is sensitive, the inter-observer variation is low, and it could be used for the grading of a scar. These two assessment techniques compliment other methods of scar assessment and will prove useful when assessment of response to treatment is required.

Seba med Flüssig Wasch – Emulsion, **Erfahrungsbericht, *www.ciao.de***

welche eine sanfte ph - hautneutrale Reinigung verspricht und für problematische und empfindliche Haut geeignet sein soll. Zudem soll eine biologische Desodorierung garantiert sein. Gekauft habe ich das Produkt im örtlichen DM - Drogeriemarkt zu einem Preis von 4,95. Man bekommt einen Beutel mit 400 ml Inhalt. Sebamed Produkte gibt es meines Wissens auch nur bei DM und in der Apotheke. Aussehen der Verpackung . Die Emulsion befindet sich in einem knapp 18 cm hohen Beutel an dem links oben ein Drehverschluss angebracht ist. Der Hintergrund ist in einem schlichten weiss gehalten. Ganz oben rechts befinden sich Informationen zu der Verpackung, welche die Umwelt wohl nicht belastet und darunter befindet sich der Aufdruck über den ph - Wert und und noch weiter unten das Logo des Herstellers. Mittig findet man die Produktbezeichnung und darunter kann man nachlesen für welche Haut es geeignet ist. Ganz unten stehen noch etwas uninteressante Dinge und auf der Rückseite die Verpechen des Herstellers, die Inhaltsstoffe, der Inhalt, Anwendungsempfehlung und die Haltbarkeit sowie Kontakt - und Herstellerdaten. Das Design ist relativ unspektakulär und wirkt medizinisch. Hässlich finde ich es aber keinesfalls! Ein neuartiger Reinigungskomplex mit besonders milden Waschaktivsubstanzen reinigt die empfindliche Haut ohne Reizung und Austrocknung. Ein wertvoller Pflegekomplex mit Pentavitin®, Vitaminen, Aminosäuren, Glycerin und Panthenol spendet

Feuchtigkeit und pflegt die Haut. Dadurch wird die Haut schon beim Waschen spürbar glatt und geschmeidig. Der pH Wert 5,5 stärkt den natürlichen Säureschutzmantel der Haut und schützt vor Austrocknung, schädlichen Umwelteinflüssen und Krankheitserregern. Hervorragende Eignung für empfindliche und problematische Haut dermatologisch-klinisch getestet. Bei Hauterkrankungen und Seifenverbot nach Rücksprache mit dem Arzt.

S. Mac-Mary, J.-M. Sainthillier, A. Jeudy, C. Sladen, C. Williams, M. Bell, P. Humbert, **Study of Asymmetrical Facial Damage due to Cumulative UVA Exposure***,* ISBS 2010 Buenos Aires, Argentina

Published studies assessing whether asymmetrical facial UV exposure leads to any underlying differences in skin physiology and morphology are only observational. These studies demonstrate that visible signs of photot ageing are more evident on the window exposed side of the face suggesting a role for UVA in photo ageing. Aim: To assess the physiological skin changes associated with visible asymmetrical photo ageing. Methods: 10 subjects were enrolled in the study (age 64 ± 6, 8 women and 2 men), presenting with asymmetrical signs of photoageing due to overexposure of one side of their face to the sun through a window over a long period of time. Split-face biometrological assessments were performed (clinical scoring, hydration with corneometer®, mechanical properties with cutometer®, transepidermal water loss with Aquaflux®, skin relief with fringe projection, photography). Results: significant differences ($P<0.05$) were observed on clinical scores of wrinkles which were greater on the window exposed side, skin roughness assessed with fringe projection on the cheek and skin heterogeneity assessed with spectrocolorimetry on the cheekbone (the skin was less heterogeneous) and differences which tend to be significant ($p<0.1$) were observed on skin hydration (skin was dryer) as well as skin laxity (skin was laxer).

P.M.B.G. Maia Campos, M.D. Gianeti, D.G. Mercurio, L.R. Gaspar, **Assessment of Protective Effects of Cosmetics with UV-Filters, Vitamins, Ginkgo Biloba and Red Alga Extracts using Biophysical and Skin Image Techniques,** ISBS 2010 Buenos Aires, Argentina

The combination of UV filters with antioxidant substances and natural extracts with biological activity in terms of photoprotection can provide unique benefits to the skin, by increasing its protection against UV radiation and also by improving skin conditions. Thus, the aim of this study was the assessment of protective effects of cosmetic formulations containing UV-filters, vitamins, *Ginkgo biloba* and red alga *Porphyra umbilicalis* extracts by biophysical and skin image techniques. For this purpose, an emulsion was supplemented or not (F) with *Ginkgo biloba* extract (FG), or red alga *Porphyra umbilicalis* extract (FA), or the combination of these extracts and vitamins A, E and C (FGAV). These formulations were submitted to preliminary studies for the evaluation of Sun Protection Factor (SPF), which were carried out on a group of human volunteers according to the COLIPA methodology After that, the formulations were applied on 10 human volunteers' forearm skin, followed by the analysis of their effects using biophysical and skin image techniques. This evaluation was done in terms of transepidermal water loss (TEWL) (Tewameter® TM 210), water content of the stratum corneum (Corneometer® CM 825), viscoelastic properties (Cutometer® SEM575), skin microrelief (Visioscan® VC 98) and the dermal thickness (Dermascan C®). The measurements were done before and after a 30 day-period of daily applications.

J. Descoubes, C. Faucheux, A. Bernois, C. Heusèle, J.C. Pittet, S. Schnebert, **Evaluation of in vivo Keratinocyte size with confocal Laser Scanning Microscopy at 830 and 445 nm,** ISBS 2010 Buenos Aires, Argentina

Confocal Laser Scanning Microscopy (CLSM) allows visualization of the keratinocytes of the different layers of the epidermis rapidly and non invasively. The aim of this study was to quantify in vivo the size of the keratinocytes of the granular and spinous layers with the new VivaScope® 1500 Multilaser to investigate the age effect on the forehead and the ventral forearm. A panel of 98 healthy Caucasian women aged 18 - 70 was recruited for the study. Photoageing was scored according to the Larnier scale. Biomechanical properties of the skin were measured with Cutometer SEM 575 (Courage & Khazaka) with a 2 mm probe and a 500 mBar suction on the cheek and the ventral forearm. Image acquisitions were taken with the VivaScope® 1500 Multilaser (Lucid - Mavig GmbH) on the forehead and the ventral forearm with 2 wavelengths: 445 nm and 830 nm. Three stacks, separated by 5 mm, with a 2 µm step were performed from the skin surface to 150 µm depth. Mosaics of images (3 x 3 mm) were acquired at the center of this region of interest at granular layer and spinous layer levels. Images were analyzed with ConfoScan V 02 (Orion Concept).

A. Elkhyat, Y. Afifi, B. Hassam, P. Humbert; **Human skin wettability cartography;** Skin Research Technology 2010, 16: p. 481

For decades the surface hydrophobicity has been reported to play an important role in many biological processes, such as cellular adhesion, contact inhibition, elasticity, functionality of tissue membranes, functioning of intracellular structures, and adhesion of infectious microorganisms. The skin affinity with water is estimated by measuring of its water contact angle. To establish a cartography of skin's wettability by Ow measuring at nine sites. The hydration and lipidic index (HI, LI) and the skin pH are measured. Volunteers: Ten females volunteers took part in this study.

M.J. Koehler, M. Kaatz, **Intrinsic, solar and sunbed-induced skin aging measured in vivo by multiphoton laser tomography,** Skin Research and Technology 2010; 16, p. 501

Skin aging is accelerated by extrinsic factors, particularly actinic damage. Over the last decades, both clinical and pathological differences between intrinsic and actinic aging have been characterized. In one work, we aimed at quanti-fying skin aging by non-invasive in vivo methods. Young healthy volun teers using indoor tanningg facilities and aged people were compared with appropriate conrols by measurements of skin elasticity with the Cutometer and the Reviscometer and by semi-quantitative evaluation of the dermal matrix composition by the multiphoton laser tomograph dermaInspect. We found differences between the sun-protected volar forearm and the dorsal side as well as between youn g and old test persons with all three methods.

A. Castro, J. Cordero, M. Josmelith, **Use of Tetradecyl Aminobutyrolylvalylaminobutryric Urea Triflouroacetate as Firming in Cosmetic Products and Measurement of its Effectiveness in the Enhancement of Skin Firming,** IFSCC 2010 Buenos Aires, Argentina

The skin aging is due, among other causes moisture loss and reduced strength of the collagen fibers. In this study 60 volunteers were taken with visible signs of sagging skin on face (chin) and chests, between 55 and 70 years old; 30 of them were told daily applied twice a day at the site indicated a formulation with 2.5 % of tetradecyl aminobutyroylvalylaminobutyric urea trifluoroacetate (labeled Firming "A") for a period of 90 days, and 30 other placebo (labeled Firming "B"). We measured the elasticity and hydration of the skin before and after study, using a Multi Dermascope MDS 800. Elasticity measures showed a maximum increase of elasticity in the chest at 18% and this value for the younger person. And the neck (chin) was observed a maximum increase of elasticity with the active (Firming A) in a 28.89%, yielding an average increase of 25%. There was not a significant increase of % elasticity with the placebo (Firming B). For hydration, It was observed in the neck (chin) a maximum increase of moisturizing with the active (Firming A) in a 42,31%, yielding an average increase of 39%.

E. Kim, G. Cho, S. Yu, H. Rho, D. Min, D. Kim, H. Kim, **The elasticity, depth of wrinkles, and skin color on the neck determine your neck age and shape,** IFSCC 2010 Buenos Aires, Argentina

There are many reports on regional variations in skin properties, but few physiological studies have been performed on the neck. The neck is sun-exposed and we stretch or shrink our neck constantly, so the neck skin can be more apt to be aged. The purpose of this study was to find out the biomechanical and physiological parameter on the neck to change age-dependently and make the photographic scale for the neck age or neck shape. The skin properties on the neck of 56 Korean female volunteers in good health (25-64 years old, 43.1±10.5yr) were assessed non-invasively with the skin measuring devices. And we analyzed the correlation of skin physiological parameters with age. The neck skin was changed age-dependently. The elasticity, skin lightness was reduced. The depth of wrinkles and TEWL were increased. Based on the correlation parameter to age, we chose the skin color, winkles and elasticity for the key parameters to determine the neck age or neck shape. As the elasticity was reduced, the sagging of the neck skin increased. The neck wrinkles increased age-dependently and changed to "U" shape because the neck skin was sagged.

S.M. Bertucci, L.S. Freitas, L.R. Gaspar, D.G. Mercurio, M.D. Gianeti, P.M. Maia Campos, **Efficacy of Cosmetic Formulations Containing Green Tea and Ginkgo Biloba Extracts-Pre-Clincal and Clinical Studies,** IFSCC 2010 Buenos Aires, Argentina

This research aims to evaluate the effects of cosmetic formulations containing green tea (*Camellia sinensis*) and/or *Ginkgo biloba* glycolic extracts by histopathological and histometric studies and also to evaluate the immediate and long-term effects on human skin using biophysical techniques and skin image analyses. The pre-clinical efficacy evaluation was performed by the application of the formulations on the dorsum of hairless mice once a day for 5 days. For the clinical studies, formulations under study were applied to the forearm skin of 48 volunteers, which was evaluated by biophysical techniques and skin image analyses according to the following parameters: stratum corneum water content, transepidermal water loss (TEWL), skin elasticity and viscoelastic-to-elastic ratio and skin micro-relief, before (basal values) and after 3 hours (immediate effects), 15 and 30 days (long term effects). The histological analysis showed the formulations containing green tea extract, alone or in

combination with the *Ginkgo biloba* extract, provoked significant enhancement in viable epidermis thickness and in the number of cell layers, suggesting a moisturizing effect and an induction of cell renewal. The clinical efficacy studies showed that the extracts under study had a moisturizing effect and also acted synergistically on skin viscoelastic-to-elastic ratio, related to hydration of deeper epidermal layers.

D.Q.A. Nguyen, T.S. Potokar, P. Price, **An objective long-term evaluation of Integra (a dermal skin substitute) and split thickness skin grafts, in acute burns and reconstructive surgery,** Burns 36/2010; p. 23-28

The field of wound healing and tissue repair has advanced rapidly in the last decade, with this there is an increasing emphasis on the importance of the functional and cosmetic outcomes following injury. Integra artificial skin is the most widely used synthetic skin substitute and is reported to have better outcomes in relation to the appearance and elasticity when compared to split thickness skin grafting (SSG). A review of the literature reveals very few trials that are based on an objective evaluation of Integra treated scars as compared to SSGs. This research aimed to provide objective data on the long-term outcome of Integra.

S. Buchwald-Werner, **Abgrenzung kosmetische und pharmazeutische kosmetische und pharmazeutische Zubereitungen,** Presentation at Interpharm, Frankfurt, October 2010

R. Gopaul, H.E. Knaggs, J.F. Lephart, K.C. Holley, E.M. Gibson, **An evaluation of the effect of a topical product containing salicin on the visible signs of human skin aging**, J Cosmet Dermatol 2010 Sep;9(3): p. 196-201

Background: There are many different visible signs of skin aging. These include wrinkles, hyperpigmentation, lack of firmness, poor texture, enlarged pores, and dryness. While there are many topical agents that claim to deliver wide-spectrum anti-aging benefits, few target all of the signs of skin aging to the same extent. Salicin, an extract from white willow bark, has been researched as a potent anti-inflammatory agent when taken orally. Based on unpublished in-house comprehensive consumer clinical studies, it is believed salicin may have anti-aging capabilities when applied topically to human skin. Aim: This research evaluated the effect of a topical serum formulation containing salicin at 0.5% on the visible signs of skin aging. Materials and methods: This single-center study enrolled 30 female subjects, showing mild to moderate signs of aging, between the ages of 35 and 70 having Fitzpatrick skin types ranging between I and IV. Subjects used the study serum product containing 0.5% salicin on their face twice daily for 12 weeks. Ordinal grading on a nine-point scale (0 = none, 1-3 = mild, 4-6 = moderate, 7- 9 = severe) of facial fine lines, molted pigmentation, uneven skin tone, tactile roughness, global firmness appearance, jaw-line contour, radiance, and overall appearance was performed by investigator at baseline, week 1, week 4, week 8, and week 12. Digital photography, ultrasound, cutometry, and corneometry measurements were also performed at each time point. Background: There are many different visible signs of skin aging. These include wrinkles, hyperpigmentation, lack of firmness, poor texture, enlarged pores, and dryness. While there are many topical agents that claim to deliver wide-spectrum anti-aging benefits, few target all of the signs of skin aging to the same extent. Salicin, an extract from white willow bark, has been researched as a potent anti-inflammatory agent when taken orally. Based on unpublished in-house comprehensive consumer clinical studies, it is believed salicin may have anti-aging capabilities when applied topically to human skin. Aim: This research evaluated the effect of a topical serum formulation containing salicin at 0.5% on the visible signs of skin aging. Materials and methods: This single-center study enrolled 30 female subjects, showing mild to moderate signs of aging, between the ages of 35 and 70 having Fitzpatrick skin types ranging between I and IV. Subjects used the study serum product containing 0.5% salicin on their face twice daily for 12 weeks. Ordinal grading on a nine-point scale (0 = none, 1-3 = mild, 4-6 = moderate, 7- 9 = severe) of facial fine lines, molted pigmentation, uneven skin tone, tactile roughness, global firmness appearance, jaw-line contour, radiance, and overall appearance was performed by investigator at baseline, week 1, week 4, week 8, and week 12. Digital photography, ultrasound, cutometry, and corneometry measurements were also performed at each time point.

J.H. Fitton, V.-A. Gardiner, **Bioactive ingredients from marine macroalgae,** Personal Care September 2010, p. 77-79

Maintaining an organ with direct exposure to the environment is a remarkable achievement. Skin provides a renewable, self-repairing and defensive barrier to externa influences. It is in a continual state of rejuvenation as the new skin cells make their way to the epidermis and also provides immune monitoring and pathogen defence via specialised cells. Seaweed derived products can provide both cosmetic and therapeutic assisistance to this constantly rehabilitated tissue. Brown seaweed contains

a remarkable fucose-rich sulphated polysaccharide called “fucoidan” which has marked biological activities. These include a blocking effect on receptors for viruses in addition to an anti-inflammatory effect.

R. Armengol, B. Martinez-Teipel, E. Rubio, **Combined forces work to restore skin firmness,** Personal Care September 2010, p. 52-55

Due to ageing and external factors, the skin loses its thickness, it produces a reduced amount of structural components and, in general, its biomechanical properties deteriorate. At a facial level, skin expresses these changes with the appearance of wrinkles and flaccidity. This fact is aggravated by the action of gravity, which exerts a constant downward force, altering the shape of the facial oval. To counter these adverse effects, it is essential to recover and maintain the good condition off the skin structural elements; dermal-epidermal junction, epidermal cohesion and dermal extracellular matrix. Union provides strength and firmness. The skin is structured in several tightly bound layers: epidermis, dermis and hypodermis. The epidermis maintains cell cohesion through structures such as desmosomes, which keep adjacent cells firmly together.

C. Jeanmaire, V. Bardey, F. Henry, L. Danoux, L. Bailly, M. Sabadotto, O. Freis, G. Pauly, A. Rathjens, **Mushroom extract recovers youthful skin properties,** Personal Care, September 2010

The organism is daily aggressed by different types of stress. The best known is oxidative stress defined as the toxic effect of chemically reactive oxygen species (ROS) or reactive nitrogen species. Reactive oxygen species can damage cellular components, leading to impaired physiological functions and thus inducing aeing. To counteract ROS, cells have many anti-oxidant enzyme systems. Among these, perroxiredoxins, are key enzymes having a role in cellular detoxification due to theirr reduction potential.

Feasibility and correlation of in vivo measurement of vaginal biomechanical properties using a purpose designed vaginal probe, Joint Annual Meeting of the International Continence Society and the International Urogynecological Association, 23rd – 27th August 2010, Toronto, Canada

In the field of dermatology, non invasive aspiration devices that can measure the biomechanical properties of skin are clinically used. They are presumed to measure properties of the dermal component of the skin, consisting of collagen and elastin fibers. It seems logical that these devices could be applied for similar measurements at the level of the vagianl wall. One such device (DermaLab skin pro be, Cortex Technology, Hadsund, Denmark) has already been used for that purpose. The aspiration device, has a diameter of 2cm and a height of 1.5cm. The probe suctions at a preset vacuum pressure the vaginal wall into an opening of 10 mm diameter (=aperture). During this process it measures the actual pressure (stress) and vaginal wall displacement (strain).

T. Reuther, J. Bayrhammer, M. Kerscher, **Effects of a three-session skin rejuvenation treatment using stabilized hyaluronic acid-based gel of non-animal origin on skin elasticity: a pilot study,** Arch. Dermatol Res (2010) 302: 37-45

The purpose of this study was to evaluate in vivo the effects of micropuncture injections of stabilized hyaluronic acid-based gel of non-animal origin (NASHA, Restylane Vital) on skin elasticity, a major aspect of skin ageing. Patients (n=19) underwent a series of three treatment sessions, spaced 4 weeks apart, with NASHA injected into the lower facial cheeks. Using the suction principle, 12 parameters describing the viscoelastic properties of the skin were assessed, before each treatment session and at follow-up visits 4 and 16 weeks after the last treatment. Treatment with NASHA significantly increased skin firmness and improved its viscoelastic recovery capacities. The most significant differences from baseline were noted at the end of the study. The changes observed in this study may underlie some of the cosmetic improvements noted after treatment with NASHA.

N. Akhtar, M. Waqas, M. Ahmed, T. Saeed, G. Murtaza, A. Rasool, M.N. Aamir, S.A. Khan, N.S. Bhatti, A. Ali, **Effect of Cream Formulation of Fenugreek Seed Extract on Some Mechanical Parameters of Human Skin,** Tropical Journal of Pharmaceutical Research August 2010, 9 (4): 329-337

Skin has good frictional properties, assisting locomotion and manipulation due to its texture. It is elastic and can be stretched and compressed within limits. Elastic fibres within the skin form a fibrous network that is interwoven between the collagen bundles throughout the dermis. As aging occurs, human skin gets more wrinkled, becomes drier and loses its elasticity. Evaluation of skin elasticity is especially important, because it is not as visible as other signs of aging such as wrinkles. Skin mechanical parameters are most sensitive to epidermal hydration. Epidermal hydrating produced by moisturizers influences the mechanical properties of skin. Accumulation of water in the dermis

diminishes friction between fibres and facilitates movement of the interstitial fluid. At the upper level, they are attributed to the softening of the outer layers of the epidermis (mainly stratum corneum).

G. Buchbauer, **Die österreichische Kosmetika- und Parfüm-Industrie,** EURO COSMETICS 7/8-2010 Pressemitteilung von DermaTronnier

Aus Anlass des 20jährigen Bestehens des Instituts für exsperimentelle Dermatologie an der Universität Witten/Herdecke – DERMATRONNIER – fanden am 21.4 und 22.4.2010 die VII. Dermadays in Witten statt. Mit der Veranstaltung Dermadays berichtet das Institut seinen Freunden und Partnern über die Arbeit der letzten Jahre und bedankt sich bei den eingeladenen Gästen gleichzeitig für die Mit- und Zusammenarbeit. Das umfangreiche wissenschaftliche Programm der diesjährigen Dermadys, vorwiegend von Partnern des Instituts gestaltet, zeigt wiederum die breite Themenvielfalt. Sie reichte von der Histologie der Haut über die Neurophysiologie des Juckreizes, die Penetrationsprobleme von Wirkstoffen, Fragen und aktuelle Situation zum in vitro Sonnenschutz, die Logistik für hautphysiologische Messungen der Schwerelosigkeit bis zu Wirkungen und den Nachweis von Stoffen in Nahrungsergänzungsmitteln und zu den Anwendungsmöglichkeiten der Photoakustik in der photodermatologischen Forschung.

M. Choi, J.-W. Choi, S.-Y. Lee, S.-Y. Choi, H.-J. Park, **Low-dose 1064-nm Q-switched Nd: YAG laser for the treatment of melisma,** Volume 21 (4) Informa Healthcare, Jul. 1, 2010

Abstract Background: Melasma is a common acquired pigmentary disorder which is sometimes hard to treat with conventional methods. Various kinds of modalities have been applied for the treatment of melasma but none shows constantly good results. Objectives: In this study, we would like to know the effect of low-dose 1064 -nm Q-switched Nd: YAG laser (QSNYL) on melasma and want to evaluate the changes of skin after laser treatment. Methods: Twenty melasma patients were enrolled. Two regions were evaluated from each patient; a total of 40 sites. The 1064-nm QSNYL at fluences of 2.0–3.5 J/cm 2 was used to treat the whole face, including the melasma lesions. The fluence was adjusted individually and increased until erythema was developed on the laser-treated area. The treatment was performed five times with a 1-week interval. Non-invasive measuring methods, including a chromatometer, mexameter, cutometer, visioscan and a corneometer, were used before and after treatment.

M. Mateu, E. Canadas, J. Cebrian, N. Alminana, **Novel elasticity and tightness enhancing peptide,** Personal Care, June 2010

Wrinkles, lack of firmness or sagginess are the most visible signs of skin ageing. A variety of environmental, hormonal, and genetic factors result in skin elasticity loss. Mature skin becomes less elastic and less able to resist any deformation, leading to many of the visible manifestations of ageing. The synergistic efects of chronological ageing, photoageing environmental factors, and hormonal deficiency, cause skin quality deterioration with age. Hormonal ageing of skin due to oestrogen loss during the menopause is though to include atrophy, elasticity loss and decreased sebaceous secretions, and collagen and water content. Intrinsically, aged skin shows characteristic fine wrinkling and appears smooth. Especially from the age of 40 years, synthesis and turnover of new components by fibroblasts slow, and enzyme action on fibres increases, implying skin elasticity loss and a less supple and more hardened collagen.

S. Mac-Mary, J.M. Sainthillier, A. Jeudy, C. Sladen, C. Williams, M. Bell, P. Humbert, **Assessment of cumulative exposure to UVA through the study of asymmetrical facial skin aging**, Clinical Interventions in aging; Volume 5, 2010 open access

Background: Published studies assessing whether asymmetrical facial ultraviolet light exposure leads to underlying differences in skin physiology and morphology report only clinical observations. The aim of this study was to assess the visual impact oft he skin of repeated ultraviolet-A (UVA) exposure through a window. Methods: Eight women and two men presenting with asymmetrical signs of photoaging due to overexposure of one side of their face tot he sun through a window over a long period of time were enrolled in the study. Split-face biometrologic assessments were performed (clinical scoring, hydration whit Corneometer, mechanical properties with Cutometer, transepidermal water loss with AquaFlux, skin relief with fringe projection, photography, stripping, and then lipid peroxidation analysis).

A. Sadanori, A. Kozo, I. Toshifumi, H. Akiyoshi, **Basic fibroblast growth factor accelerates and improves second-degree burn wound healing,** Wound Repair and Regeneration; Volume 16, Number 5

Second-degree burns are sometimes a concern for shortening patient suffering time as well as the therapeutic choice. Thus, adult second-degree burn patients, mainly with deep dermal burns, were included. Patients receiving topical basic fibroblast growth factor (bFGF) or no bFGF were compared for clinical scar extent, passive scar hardness and elasticity using a Cutometer, direct scar hardness using a durometer, and moisture analysis of the stratum corneum at 1 year after complete wound healing.

L.-C. Gerhardt, V. Strässle, A. Lenz, N.D. Spencer, S. Derler, **Influence of epidermal hydration on the friction of human skin against textiles,** J. R. Soc. Interface (2008) 5, p. 1317–1328

Friction and shear forces, as well as moisture between the human skin and textiles are critical factors in the formation of skin injuries such as blisters, abrasions and decubitus. This study investigated how epidermal hydration affects the friction between skin and textiles. The friction between the inner forearm and a hospital fabric was measured in the natural skin condition and in different hydration states using a force plate. Eleven males and eleven females rubbed their forearm against the textile on the force plate using defined normal loads and friction movements. Skin hydration and viscoelasticity were assessed by corneometry and the suction chamber method, respectively. In each individual, a highly positive linear correlation was found between skin moisture and friction coefficient (COF). No correlation was observed between moisture and elasticity, as well as between elasticity and friction. Skin viscoelasticity was comparable for women and men. The friction of female skin showed significantly higher moisture sensitivity. COFs increased typically by 43% (women) and 26% (men) when skin hydration varied between very dry and normally moist skin. The COFs between skin and completely wet fabric were more than twofold higher than the values for natural skin rubbed on a dry textile surface. Increasing skin hydration seems to cause gender-specific changes in the mechanical properties and/or surface topography of human skin, leading to skin softening and increased real contact area and adhesion.

X. Liang, S.A. Boppart, **Biomechanical Properties of *In Vivo* Human Skin From Dynamic Optical Coherence Elastography**, IEEE Transactions on Biomedical Engineering, Vol. 57, No. 4, April 2010

Dynamic optical coherence elastography is used to determine *in vivo* skin biomechanical properties based on mechanical surface wave propagation. Quantitative Young's moduli are measured on human skin from different sites, orientations, and frequencies. Skin thicknesses, including measurements from different layers, are also measured simultaneously. Experimental results show significant differences among measurements from different skin sites, between directions parallel and orthogonal to Langer's lines, and under different skin hydration states. Results also suggest surface waves with different driving frequencies represent skin biomechanical properties from different layers in depth. With features such as micrometer-scale resolution, noninvasive imaging, and real-time processing from the optical coherence tomography technology, this optical measurement technique has great potentialfor measuring skin biomechanical properties in dermatology

T. Ezure, S. Amano, **The severity of wrinkling at the forehead is related to the degree of ptisos of the upper eyelid,** Skin Research and Technology 2010, 16: p. 202-209

Wrinkling and sagging of the face are well-known features of aging. The mechanism of wrinkle formation has been studied extensively in relation to the deterioration of the dermal condition caused by sun exposure and aging, which enhance the fixation of transiently formed wrinkles. However, little is known about transient wrinkles induced by change of facial expression as putative initiators of fixed wrinkles. The forehead represents a major part of the face, and wrinkles appear there, as well as at the corners of the eyes, around the eyes and around the mouth.

H. Yim, Y.-S. Cho, C.–H. Seo, B.-C. Lee, J.-H. Ko, D. Kim, J. Hur, W. Chun, J.- H. Kim, **The use of AlloDerm on major burn patients: AlloDerm prevents post-burn joint contracture**, BURNS, Vol. 36, Issue 3, p. 322-328

A total of 64 patients received AlloDerm graft selectively on joint areas during the study period from March, 2005 to July, 2007. From January to March, 2008, a total of 31 patients returned to our burn center to examine the functional results by measuring range of motion of joints. Additionally, the quality of grafted skin condition criteria of skin elasticity, scar thickness, trans-epidermal water loss, melanin and erythema level was measured in a total of 11 patients among them. By analyzing the limitation level of 55 joints excluding hand areas, we found that 24 joints (43.6%) showed no limitations, 12 joints (21.8%) showed limitations below 10%, 16 joints (29.1%) showed limitations between 10 and 19% and 3 joints (5.5%) showed limitations over 20%. The scar thickness of non-AlloDerm applied areas was 2.5 ± 0.9 mm and AlloDerm applied areas was 1.8 ± 0.7 mm ($p = 0.396$). Trans-epidermal water loss for non-AlloDerm applied areas was 20.9 ± 7.7 g/h/m^2 and AlloDerm applied areas was 10.8 ± 3.4 g/h/m^2

($p < 0.001$). Erythema value for non-AlloDerm applied areas was 436.1 ± 65.8, whereas AlloDerm applied area was 394.4 ± 61.2 ($p < 0.001$). Acellular dermal matrix is a good option for treating major burns to prevent scar formation after burn and loss of joint function.

J.-M. Sainthillier, S. Mac-Mary, D. Monnier, P. Mermet, C.T. Zarrit, M. Mudry, C. Mudry, P. Humbert, **Exploratory study of the typology of mature skin at different stages,** and Skin Research and Technology 2010; 16

Post-menopausal skin aging has intrinsic and extrinsic origins that induce considerable appearance and feeling disparition within a class of age. The aim of this study was to try and identify different stages of maturity of skin of the face of menopausal women.

K.A. Tadini, **Acetil hexapeptide-3 in a cosmetic formulation acts on skin anisotropy – clinical study,** ISBS Besancon, 2009 and Skin Research and Technology 2010; 16

Acetyl hexapeptide-3 has been used in anti-aging topical formulations since it has demonstrated effects in improving the skin appearance. However, there are few scientific studies about its effects on epidermis and dermis when vehiculated in topical formulations, mainly using objective measurements, which are an important tool in clinical efficacy studies. Thus the aim of this study was to determine the clinical efficacy of the acetyl hexapeptide-3 using biophysical techniques. Formulations with and without acetyl hexapeptide-3 were applied to the ventral forearm and the face area of human volunteers. Skin conditions were evaluated after 2 and 4-week period daily applications, by analyzing the stratum corneum water content (Corneometer SEM 575) and the skin mechanical properties, using two instruments, the cutometer SEM 575 and Reviscometer RV 600 to identify skin changes after the use of the formulations under study.

S. Hibino, U. Hamada, H. Takahashi, M. Watanabe, N. Nozato, Y. Yonei, **Effects of Dried Brewer's Yeast on Skin and QOL: A Single-Blind Placebo-Controlled Clinical Study of 8-Week Treatment**, Anti-Aging Medicine 2010

Objective: Brewer's yeast contains vitamins, minerals, amino acids and other nutrients, and has been reported to control intestinal function as well as to exert anti-ulceration, anti-tumor and anti-allergy effects. The present study evaluated the effects of oral treatment with dried brewer's yeast tablets (study product) on skin in a single-blind placebo-controlled design in humans. Methods: Thirty-two healthy volunteer women (37.0±4.8 years) were allocated as follows: Group E-30 (n=11) were treated with 30 tablets/day of the study product (containing 7,125mg/day of dried brewer's yeast), Group E-9 (n=10) were given 9 tablets/day of the study product, and the control group (n=11) were given 30 placebo tablets/day. The treatment period was 8 weeks. Two patients prematurely discontinued the study (discontinuation rate: 5.9%) and were excluded from the analyses. The study product (Ebios Tablet®) was provided by Asahi Food & Healthcare Co., Ltd. Before and at 4 and 8 weeks after the study, subjective symptoms were evaluated using the Anti-Aging QOL Common Questionnaire (AAQol) and checking skin symptoms, skin images were analyzed with SK Info (SKI, Integral Co.) and Aphrodite-III (PSI), and skin color (CM-700d, Konica Minolta Sensing, Inc.) and elasticity (Cutometer MPA580, Courage & Khazaka electronic GmbH) were measured. Results: In Group E-30, the AAQol physical symptom "cold skin" score was significantly improved at 8 weeks ($p<0.05$). The skin symptoms "make-up runs easily" and "desiccated and gritty skin," as well as the physical symptom "menstruation-related troubles" were improved in a significant and dose-dependent way from the control group ($p<0.01$). On skin analysis, SKI demonstrated an increase in moisture content (15.4%, $p=0.010$), decrease in erythema (– 18.3%, $p<0.001$) and increase in elasticity (13.3%, $p=0.003$), while PSI revealed an increase in hydration (Total: 14.5%, T zone: 13.7%, U zone: 18.2%, $p<0.01$) and decrease in pores (–32.7%, $p=0.022$). Cutometer analysis showed a dose-dependent increase in skin elasticity, while analysis of skin color showed a decrease in hemoglobin (–9.5%, $p=0.016$), improved lightness (–0.7%, $p=0.045$) and decrease in redness (–8.3%, $p=0.013$). During the study period, no serious adverse events were noted. Conclusion: These results suggest that treatment with dried brewer's yeast is useful in improving skin condition, *e.g.* moisture content and elasticity, and also QOL.

A.O. Barel, R. Clysen, P. Clarys, **Evaluation of the elastic properties of the skin using the suction method (Cutometer®). Which parameters to use for claims in anti-aging treatments?** ISBS Besancon, 2009 and Skin Research and Technology 2010; 16; p. 471

In cosmetic claims concerning the efficacy of anti-aging products and treatments, general terms such as elasticity, firmness, tonus etc. are used. Based on the suction method, the Cutometer (Courage-Khazaka, Germany) evaluates quantitavely the elastic and viscoelastic properties of the skin. In the Strain versus Time mode (which is mostly used) the vertical deformation of the skin due to vacuum, is measured in function of time and various linear skin deformation parameters are recorded.

T. Brennan Steele, **A Double blind comparative study to determine the efficacy of a 25% urea cream vs. a 10% urea cream, in treating anhydrosis,** Thesis of the Glasgow Caledonian University

The terms anhydrosis and xerosis are used interchangeably to describe a skin condition which presents as dry, rough and scaly with possible presence of reddening, cracking or itching (Flynn et al, 2001). For the purpose of this project, the term anhydrosis will be applied. Anhydrosis can affect all age groups and features regularly within the podiatrist's clinical environment. The skin may also present as less flexible than normal, contributing to the irregular feel which is usually rough and uneven to touch (Flynn et al 2001, M.Loden, 2003).

A.-L. Rodrigues, O. Freis, L. Danoux, C. Jeanmaire, P. Moussou, M. Sabadotto, A. Rathjens, **Functional moisturiser raises skin barrier function,** Personal Care, January 2010, p. 40-43

One of the skin's primary functions is to protect our body from external aggressions such as allergens, dirt, irritants, chemicals, as well as from water loss from the inside. Stressful environmental conditions, including weather (cold, wind, sun) and pollution in addition to daily-used products, such as soap and surfactants, may alter the skin's natural water balance and affect its protective functions. If the skin's protective barrier is compromised, skin becomes dry and flaky and more sensitive to external stress factors, such as pollution, air-conditioning and frequent cleansing.

R. Armengol, A. Benaiges, J. Bosch, **Cellular senescence inhibition halts skin ageing,** Personal Care, January 2010, p. 29-33

Over time, cells show a decrease in their replicative and metabolic capacity, resulting in a reduction in their number of duplications achieving a state of proliferation arrest. This phenomenon off loss of replicative capacity is known as cellular senescence. The existence of a molecular clock is suggested, marking the moment when the capacity of cell replication stops and senescence starts. This marker is place on the DNA molecules located at the ends of chromosomes, called telomeres, a term which comes from the Greek word "telos" (end) and "meros" (part). Each time, a cell deivides, its telomeres are shortened, thus reducing their subsequent cellular replicative capacity.

K. Kajiya, E. Kawai, J. Kshimoto, M. Detmar, **A Novel Mechanism of Cutaneous Photo-Aging Mediated by the Impairment of Lymphatic Function and the Protective Role of a Lymphatic-promoting Compound,** IFSCC Magazine, Vol. 12, No. 4 / 2009; p. 417

The lymphatic system plays an important role in the maintenance of tissue fluid homeostasis and the afferent phase of immune response. However, the role of the lymphatic system in mediation of aging and its molecular mechanism have been totally unknown. Here we have identified, for the first time, the importance of the cutaneous lymphatic system in the process of ultraviolet (UV) B-induced skin-damage. UVB induced the prominent enlargement of lymphatic vessels wich were leaky and hyperpermeable, suggesting that the function of enlarged lymphatic vessels induced by UVB was impaired.

G. Boyer, L. Laquièze, A. Le Bot, S. Laquièze, H. Zahouani, **Dynamic indentation on human skin in vivo: ageing effects,** Skin Research and Technology 2009; 15, p. 55-67

Knowledge of the mechanical properties of the human skin is very important for cosmetic and clinical research. Objective and quantitative measurements are essential to compare studies performed by different experimenters in different centres. The aim of this paper is to present a method to measure the viscoelastic properties of human skin in vivo dynamic indentation. A complete device to assess the stiffness and damping of skin has been developed.

K. Miyamoto, O. Kuwanzuru, N. Yoshikawa, **Sudden skin appearance change in skin aging, skin elasticity tipping model as a key indicator of the skin aging progression,** Journal of Investigative Dermatology (2009), Volume 129

Understanding bio-elasticity of human tissues is important to maintain human health and wellness including skin substrates against aging. It has been considered signs of skin aging are appeared gradually, while we discovered sudden skin condition change occurred in the aging process. A new skin elastic model was proposed as a new skin aging progression, by characterizing multilayered skin physical properties.

M.J. Koehler, A. Preller, N. Kindler, P. Elsner, K. König, R. Bückle, M. Kaatz, **Intrinsic, solar and sunbed-induced skin aging measured in vivo by multiphoton laser tomography and biophysical methods,** Skin Research and Technology 2009; 15; p. 357-363

In aging skin, the decreasing dermal collagen content due to diminished collagen synthesis is responsible for some of the clinically most evident signs of intrinsic aging skin such as thinning, loss of elasticity and fine wrinkling. Extrinsic skin aging is mainly a consequence of cumulative ultraviolet (UV) exposure of the skin, but can be accelerated my nicotine abuse and environmental hazardous compounds.

G. Sliwinski, A. Schneider, M. Schulz, M. Wolf, A. Fiolka, M. Meyer, H. Feussner, Z. Sliwinski, R. Poll, C. Thiele, **Physical Organ Phantoms for Training in Minimal Invasive Surgery (MIS),** IFMBE Proceedings 25/VI, WC 2009, p. 120-123, 2009;

In surgical training realistic phantoms of organs are necessary. Today's system only meet the requirements of a simulation of a medical intervention very limited. As of now it is only possible to learn the basis skills on such systems. Complicated and complex procedures have to be practised in experiments on animls or under supervision on the patient. As of now the physical organ phantoms do not display the requested features.

N. Krueger, S. Luebberding, M. Oltmer, M. Streker, M. Kerscher, **Age Realted Changes in Skin Mechanical Properties – Quantitative Evaluation Of 120 Female Sugjects In A Trial With A Strict Design,** University of Hamburg, Department of Chemistry, Devision of Cosmetic Science

One of the most important functions of the skin is the protection against mechanical exposure. The mechanical properties of the skin depend on the thickness and qualitative characteristics of the epidermis, dermis and subcutis. During the aging process the tree layered skin system changes strongly accompanied by changes in its mechanical properties, resulting in higher vulnerability and other skin diseases.

N. Waranuch, M. Sirada, K. Ingkaninan, W. Wisuitiprot, **The correlation between Cutometer's parameters of skin elasticity and ages of Thai female volunteers,** ISBS Besancon, 2009

Skin elasticity is one of aging signs that can be measured using several equipments. Cutometer is one among those used to quantify skin elasticity. Skin property can be demonstrated in term of Cutometer's parameters; Ua/Uf: gross elasticity, Ur/Ue: net elasticity, Uv/Ue: ration of viscoelastic to elastic distension and Ur/Uf: relative elastic parameters. However, the correlations of its parameters with skin properties reported in many publications are often in disagreement. Besides, a report on Asian population is limited.

W. Pratchyapruit, **Grading of improvement and relapse in melasma of Thai females after 8 weeks-treatment with a combined cream of hydroquinone, steoid and tretinoin,** ISBS Besancon, 2009

Melasma is a common skin problem in any races including Asians. It commonly occurs in Thai females, age 30-40 years and females outnumber males about 13:1. In addition to multiple etiologic factors, the environmental factor of Thailand as a tropical and sunny climate country constitutes a definite factor responsible for improvement and relapse of pigmentation after any treatments. At present, the topical treatment consisting of hydroquinone (HQ), steroid and tretinoin together with sunlight protection is a standard treatment for melasma.

N. Krueger, S. Luebberding, M. Oltmer, M. Streker, M. Kerscher, **Age-related changes in skin mechanical properties. Quantitative evaluation of 120 female subjects in a trial with a strict design,** ISBS Besancon, 2009

The most commonly used method to determine the mechanical ability of skin is the creep test using suction chamber devices. Until now there is no scientific consensus upon which skin deformation parameters are particularly suitable to describe age related changes in human skin mechanics The aim of this study was to examine common mechanical skin parameters to find those best representing the influence of aging.

M. Lanctin, A. Nkengne, G. Stamtas, F. Le Goff, A. Papillon, C. Bertin, **Changes on body skin as a function of age,** ISBS Besancon, 2009

Facial skin aging has been a great concern in cosmetodermatology and many publications have documented the age-related transformations of skin. However to our knowledge, few studies have been conducted to systematically investigate the changes of skin attributes in different body sites. This study was designed to assess the link between age and skin body attributes such as hydration, firmness, color, stretch marks and cellulite. The study involved 150 healthy women Caucasian volunteers aged between 18 and 70 years of age and with a Body Mass index (BMI) between 20 and 26 kg/m^2.

J.W. Wiechers, S. Mac-Mary, S. Vacheron, J.M. Sainthillier, E. Garcia, G. Khazaka, P. Humbert, B. Gabard; **How to measure exactly the same location on the face as a function of time with digital photography;** ISBS Besancon, 2009

The fight against skin aging is truly international, although the symptoms may differ throughout the world. Whereas Caucasians notice wrinkles as one of the first signs of their passing years, Asians observe skin discolourations. All of us want to have a skin with a perfect colour (a uniform complexion without any discolouration) and a perfect smooth surface (without any wrinkles or other signs of roughness). Hence, there must be products to achieve these effects as well as ways to measure whether these products are successful.

K.P. Wilhelm, G. Springmann, S. Bielfedt, **Functional food, food supplements and the skin,** ISBS Besancon, 2009

Functional food and food supplements are foods or dietary products that should provide a health benefit beyond basic nutrition. The worldwide market for these products is estimated to be in excess of $ 100 billion. Such products are regulated in Europe under the food (supplement) legislation. However there is a potential distinction and separation between food supplements and drugs. While initially functional food and food supplements were mainly provided as a “soft alternative” to pharmaceutical drugs to improve health parameters that could be early linked to nutrition i.e. lower cholersterol levels, prevent osteoporosis, induce natural sleep etc.

S.E. Dal Belo, L.R. Gaspar, P.M. Maia Campos, J.P. Marty, **Skin Penetration of Epigallocatechin-3-Callate and Quercetin from Green Tea and Gingko biloba Extracts Vehiculated in Cosmetic Formulation,** NCBI 2009

Green tea (Camellia sinensis) and Ginkgo biloba extracts in cosmetic formulations have been suggested to protect the skin against UV-induced damage and skin ageing. Thus, it is very important to assess the human skin penetration of their major flavonoids to verify if they penetrage and remain in the skin to exert their proposed effects. The aim of this study was to evaluate the human skin penetration of epigallocatechin-3-gallate (EGCG) and quercetin from green tea and G. biloba extracts vehiculated in cosmetic formulations. This study was conducted with fresh dermatomed human Caucasian skin from abdominal surgery mounted on static Franz diffusion cells.

L.R. Gaspar, F.B. Camargo Jr., M.D. Gianeti, P.M. Maia Campos, **Evaluation of dermatological effects of cosmetic formulations containing Saccharomyces cerevisiae extract and vitamins,** NCBI 2009

Saccharomyces cerevisiae extract (SCE) is used in cosmetics since it can act in oxidative stress and improve skin conditions. This study investigated dermatological effects of cosmetic formulations containing SCE and/or vitamins A, C and E. The formulation studied was supplemented or not (F1: vehicle) with vitamins A, C and E esters (F2) or with SCE (F3) or with the combination of vitamins and SCE (F4). Formulations were patch tested on back skin of volunteers. For efficacy studies, formulations were applied on volunteers and transepidermal water loss (TEWL), skin moisture (SM), skin microrelief (SMR) and free radicals protection wre analysed after 3h, 15 and 30 days of application.

C. Schrammek-Drusio, **Fachfrau in Sachen Haut – die Kosmetikerin als Hautpflegetherapeutin,** natur & kosmetik, service, p. 39

Die Kosmetikerin von heute muss sich in Theorie und Praxis rund um das Thema Haut auskennen. Dafür spielt die fundierte und theorie- sowie fachorientierte Ausbildung und eine stetige Weiterbildung die größte Rolle. Ohne berufliche Fortbildung ist es auf Dauer unmöglich, zeitgerecht und marktorientiert zu arbeiten. Um die Haut der Kundinnen und Kunden für die kosmetische Kabinenbehandlung spezifisch zu bestimmen, liegt ein Schwerpunkt im richtigen erkennen der Hautgrundbilder und Hautzustände – die so genannte Profi-Hautanalyse. Noch immer werden Hauttypen und Hautgrundbilder häufig verwechselt.

P. Wendling, **Skin Changes Help Identify Scleroderma Mimics,** www.skinandallergynews,com, July 2009

Few physicians would be fooled nowadays by gadolinium-induced nephrogenic systemic fibrosis, but there are other diseases that can masquerade as scleroderma. The precise diagnosis of sclerodermalike illnesses is important because even though many of them are called scleroderma, they are different from systemic sclerosis in their treatments and outcomes, Dr. Virginia Steen said at a symposium sponsored by the American College of Rheumatology. The diagnosis is most often based on the distribution and clinical characteristics of skin findings, as biopsies don’t always differentiate types of scleroderma. She recommended watching for the following conditions: Lipodermatosclerosis is one

condition that physicians often fail to think of as a scleroderma mimic. Also known as hypodermatitis sclerodermaformis, it refers to localized chronic inflammation and fibrosis of the skin and subcutaneous tissues of the lower leg. In the acute stage, the leg is inflamed and warm, the skin is very tight, and cellulitis may be present. The ankle and toes are not involved.

K. Bazela, A. Dzwigalowska, E. Kazmierczak, R. Debowska, K. Rogiewicz, I. Eris, **Corrective make-up cosmetics – the study of efficacy and camouflage effect,** 18th EADV Congress, Berlin, 2009

Corrective make-up can be applied to hide the skin imperfections accompanying numerous skin diseases. The aim of this study was to evaluate the efficacy and camouflage effect of corrective make-up in patients with pigmentary disorders, acne and pre-rosacea. Corrective fluid foundation efficacy was tested on 20 subjects and applied once a day for 4 weeks. The skin moisturization, oil content and elasticity were measured using Multiprobe Adapter System MPA 5 probes.

C. Catala-Pétavy, L. Machet, G. Georgescdo, F. Pétavy, A. Maruani, L. Vaillant, **Contribution of skin biometrology to the diagnosis of the Ehlers-Danlos syndrome in a prospective series of 41 patients,** Skin Research and Technology 2009; 15, p. 412-417

The diagnosis of the Ehlers-Danlos syndrome (EDS) is primarly clinical. Clinical signs result from modifications of the rheological properties of the skin: thickness, extensibility and hydration. Our main objective was to demonstrate what skin biometry can contribute to the diagnosis and evaluation of the different types of EDS. Forty-one patients clinically diagnosed with EDS were paired by age and sex to 41 healthy subjects with no known dermatologic disease, in particular connective tissue diseases.

T. Ezure, J. Hosoi, S. Amano, T. Tsuchiya, **Sagging of the cheek is related to skin elasticity, fat mass and mimetic muscle function,** Skin Research and Technology 2009, 15: p.299-305

Facfial sagging is associated with aging, although the mechanism remains unclear. The aim of this study was to investigate the mechanism of facial sagging by examining the relationship of sagging severity to changes of skin elasticity, fat mass and facial muscle function at the cheek. Faces of 108 healthy Japanese female volunteers, aged 20-60 years were photographed at an angle of 45° Standard scores of sagging severity were established by analyzing the photographs. We examined the correlations of scored sagging levels with skin elasticity measured with a Cutometer MPA 580, fat content estimated by bioelectrical impedance analysis and facial muscle function (lip sealing force and occlusal force) in middle-aged female volunteers (30-40 years) with a wide range of sagging scores.

H. Dobrev, **How do cosmetic products improve the skin mechanical properties?,** Congress of EADV, 2009, Berlin

Objective: to study the mechanisms for improving skin mechanical properties after short-term and long-term application of cosmetic products containing different active ingredients. Skin mechanical properties were determined using a non-invasive suction device (Cutometer). A total of 52 healthy female volunteers (aged 18-64 years) divided into 3 groups were studied. The first group was measured before and 120 min after single application on volar forearm of two emulsions containing urea and complex of alpha hydroxyacids, respectively.

D. Boudier, C. Lenaers, C. Sabbadini, D. Creel, B. Closs, **Certified Organic Actives for Cosmetic Formulations,** HAPPI, May 2009, p. 70-77

With more consumers interested in following a healthy and eco-conscous lifestyle, demand for natural and organic beauty care products has grown tremendously in the past couple of years. Indeed, it is more than a trend, consumers today expect their cosmetics to be natural. Silab has more than 20 years of experience in the field of natural active ingredients. Most recently, we have developed a range of certified organic active ingredients that respond to the main cosmetic claims: anti-aging, anti-free radicals, moisturizing and soothing.

G. Oberto, K. Cucumel, Y. Guerif, R. Chabert, A. Berghi, C. Dal Farra, N. Domloge, **Catch them young,** SPC April 2009

The epidermal basement membrane is an essential and highly specialised zone of the skin that links the dermis to the epidermis. Aside from its structural role, the basement membrane participates in the selective flow of communication between the epidermis and the dermis, which is essential for skin homeostasis. The basement membrane contains specialised structures, called the anchoring complex, which ensures the quality and stability of the connection and communication between the dermis and the epidermis.

L.-C. Gerhardt, A. Lenz, N.D. Spencer, T. Münzer, S. Derler, **Skin-textile friction and skin elasticity**

in young and aged persons, Skin Research and Technology 2009; 15, p. 288-298

The mechanical properties of human skin are known to change with ageing, rendering skin less resistant to friction and shear forces, as well as more vulnerable to wounds. Until now, only few and contradictory results on the age-dependent friction properties of skin have been reported. This study has investigated in detail the influence of age on the friction of human skin against textiles. In vivo skin-friction measurements on a force plate were combined with skin analyses concerning elasticity, hydration, pH valule and sebum content.

C. Oresajo, M. Yatskayer, R. Rizer, S. Raab, Z. Draelos, **A multicenter, controlled clinical study to evaluate the efficacy and tolerance of an antioxidant composition containing vitamin C, ferulic acid, and phloretin on photodamaged skin,** JAAD, March 2009, San Francisco

The purpose of this study was to evaluate the effectiveness of an antioxidant composition containing vitamin C, ferulic acid, and phloretin in improving the visible signs of photodamaged skin. A 24-week, multicenter, clinical study of 55 females 35 to 65 years of age with self-perceived sensitive skin, mild to moderate periocular fine and coarse wrinkles, and mild to moderate hyperpigmentation on the face and back of the hands were enrolled.

R. Wanitphakdeedecha, S. Eimpunth, W. Manuskiatti, **The effects of tetrahydrocurcumin in curmin cream on the hydration, elasticity, and color of human skin,** JAAD, March 2009, San Francisco

An antioxidant used in cosmetic applications should have the capability to efficiently quench free radicals on the surfact of the skin. Tetrahydrocurcumin (THC) plays an important role in the antioxidant mechanism resulting in the significant neutralization of free radicals in a dose-dependent manner. Recent studies revealed the superior free radical scavenging ability of THC.

N. Trookman, E. Ho, R. Ford, V. Gotz, **Clinical efficacy and tolerance of a novel treatment serum for photodamaged facial skin,** JAAD, March 2009, San Francisco

Oxidative damage induced by environmental factors, such as chronic ultraviolet exposure, cotributes to the process of photoaging and results in the formation of biochemical events which leads to increased collagen degradation and the suppression of collagen synthesis. Clinical manifestations of photodamage include a loss of skin elasticity and firmness, fine lines and wrinkles, and uneven skin tone

M. Murakami, O. Tanno, H. Kurokawa, **Evaluation of skin mechanical properties by determining of resonant frequency and loss resistance with tactile sensor,** Skin Research and Technology, No. 1, Feb. 2009, p. 125-126

To clarify the characteristics of resonance frequency change and loss resistance by determining the mechanical properties of skin with a tactile sensor (Venustron Axiom Incl, Japan), which is a device used to elucidate the mechanical characteristics of skin based on implementation of a resonance circuit and piezoelectric oscillator. Thwo different experiments were performed with 30 healthy Japanese males as subjects.

D. Khazaka, C. Uhl, **More than 2 decades of bioengineering for efficacy testing and product recommendation,** Household and Personal Care TODAY, No. 1/2009

Due to high competition in the cosmetic and growing customer expectations, in the past two decades there has been a continuousdevelopment of new cosmetic products with more efficient ingredients covering new effects on the skin. Simultaneously to this, there was an increasing demand for new measuring techniques to substantiate the new product claims. The field of skin bioengineering has consequently been immensely enriched in the last years by inventing new physical and optical measurement methods for all kind of skin parameters.

H. Tronnier, M. Wiebusch, U. Heinrich, **Skin-Physiological Test in Weightlessness in the ISS Space Station,** IFSCC Magazine Vol. 11, No. 3/2008

A prolonged stay in weightlessness includes several medical alterations of the human body and also results in impairment of the skin. The stratum corneum, epidermal barrier as welle as other skin compartments are affected in terms of their susceptibility to dryness, desquamation and pruritus. This can lead, for example, to wound healing disorders. Skin physiological tests were performed on the skin of an astronaut during and after the the ASTROLAB-Mission within the Skin Care program initiated by the ESA.

L. Rigano, M. Pleardo, E. Pini, R. Stradi, M. Meloni, A. Bertelli, A. Benedusi, G. Guiliani, **Novel Retinol-like Actives from Parrot Feathers,** IFSCC magazine, Vol. 11, No. 4 / 2008

Several classes of pigments are responsible for coloration in birds. Melanin pigments most commonly appear in bird feathers and bare parts. They impart black, brown and chestnut hues. Carotenoids are a second group of coloring biochemicals in birds. These two types of pigment-based coloration are found in nearly every order of extant birds. In contrast, parrots harbor bright-colored pigments in their feathers, which have different structures.

T. Krieg, M. Worm, J. Wenzel, T. Gambichler, A. Kuhn, E. Aberer, K. Scharffetter-Kochanek, **Diagnostik und Therapie der zirkumskripten Sklerodermie,** AWMF online; AWMF-Leitlinien-Register Nr. 013/066; 11/2008

Bei der zirkumskripten Sklerodermie handelt es sich um ein Spektrum von sklerotischen Erkrankungen der Haut mit je nach Subtyp und Lokalisation möglicher Beteiligung von hautnahen Strukturen wie Fettgewebe, Muskulatur, Gelenke und Knochen. Ein Befall innerer Organe wie z.B. Herz, Lunge, Niere oder Gastrointestinaltrakt tritt bei der zirkumskripten Sklerodermie ebenso wenig wie Übergänge in eine systemische Sklerodermie auf. Die Inzidenz der zirkumskripten Sklerodermie wird mit ca. 27 pro 1 Mio. Einwohner (Silman et al. 1988; Peterson et al. 1997) angegeben. Die zirkumskripte Sklerodermie tritt mit einer Häufigkeit von 2,6 - 6 zu 1 häufiger bei Frauen als bei Männern auf (Silman et al. 1988). Das breite klinische Spektrum der zirkumskripten Sklerodermie führte zur Entwicklung einer Reihe verschiedener Klassifikationen (Jablonska 1975b; Peterson et al., 1995). Für diese Leitlinie wird eine Klassifikation vorgeschlagen, die das Ausmaß, die Ausbreitung und die Tiefe des fibrotischen Prozesses berücksichtigt. Hieraus resultiert eine Einteilung in die vier Hauptformen "limitiert, generalisiert, linear und tief" (Abbildung 1). Vorteil dieser einfachen Klassifikation ist der eindeutige Bezug zu
den therapeutischen Empfehlungen dieser Leitlinie. Diese Einteilung reflektiert teilweise auch den unterschiedlichen klinischen Verlauf der einzelnen Untergruppen. So wird für die limitierte Variante eine Rückbildung bei ca. 50 % der Patienten nach ca. 2,5 Jahren beschrieben (Christianson et al. 1956, Peterson et al. 1997). Hingegen wird für die generalisierte, lineare und tiefe Form eine längere durchschnittliche Erkrankungsdauer mit ca. 5,5 Jahren beschrieben. Hierbei handelt es sich allerdings nur um Durchschnittswerte. Sekundäre Veränderungen wie Hyper-, Depigmentierung, Kontrakturen und atrophische Veränderungen zeigen in der Regel nur eine sehr geringe und langsame Rückbildungstendenz. Die Häufigkeitsmuster für die verschiedenen Subtypen sind altersabhängig. So tritt die lineare Form im Kindesalter deutlich häufiger auf (Zulian et al, 2006). Vorwiegend im Kindesalter wird im Verlauf oder sogar gleichzeitig ein Auftreten mehrerer Formen beobachtet, z.B. einer linearen Form in Kombination mit einer limitierten Form. Dies sollte entsprechend bei Beschreibung der Diagnose angegeben werden.

G. Pauly, J.-L. Contet-Andonneau, P. Moussou, L. Danoux, V. Bardey, O. Freis, M. Sabadotto, Y. Wegrowski, F.-X. Marquart, A. Ratjens, **Small Proteoglycans in the skin: New Targets in the fight against skin aging,** IFSCC Magazine*,* 11 (2008) (1) 21–29

Proteoglycans take an important part in tissue homeostasis. In the skin, Proteoglycans are present in the extracellular matrix of dermis, particularly with lumican which plays an importna role in dermal homeaostasis. In the epidermis, several small proteoglycans such as the syndecans are synthesised and play an important role in keratinocyte activation.

C. Oresajo, M. Yatskayer, A. Galdi, N.S. Trookman, R.L. Rizer, Z. Draelos, I. Hansenne, **Multi-Center, Clinical Evaluation of a Broad Spectrum Sunscreen Moisturizer Containing a new Photostable UVA/UVB Complex for Treatment of Photodamaged Facial Skin**, www.lorealusa.com; Poster

Photoaging is the result of chronic cumulative exposure to UV radiation. UVB radiation changes throughout the year and according to location, whreas UVA radiation is less variable. UVA rays are lower in energy than UVB, however they are twenty times more abundant. Efficient and stable broad spectrum protection is therefore needed year round for adequate protection against photoaging.

J. Staton, **Tools for anti-ageing claim support;** Personal Care, Nov. 2008; S.19-22

Anti-ageing covers a substantially broad area of claims associated with both the prevention and the treatment of chronological and environmental effects on the condition of human skin. A large number of instrumentally based clinical methods are available for the substantiation of claims related to anti-ageing. This article describes the most common of these and considers only those which are essentially non-invasive.

R.M. Debowska, A. Dzwigalowska, M. Szubert, K. Rogiewicz, I. Eris, B. Pander, **Efficacy evaluation of re-modelling face care product,** Abstract, EADV Paris 09/2008

Background: Skin ageing is an important and interesting topic of study. It results from the

combination of intrinsic ageing and photoageing, which is due to the environmental influence. The cosmetic industry creates and develops for the ageing population constantly improving products. Objectives: The aim of this study was to evaluate the in vivo efficacy and beneficial effects of application of the re-modelling face cream containing an anti-wrinkle peptide, vitamin E, proteins from sweet almonds and peach oil.

R.M. Debowska, B. Tyszczuk, J. Zielinska, K. Rogiewicz, I. Eris, B. Pander, **The effect of an anti-ageing body care product containing anti-wrinkle peptide, repairing enzymes and palnt waxes,** Abstract, EADV Paris 09/2008

Background: Aging is an inevitable process which concerns every organ of our body, including the skin. Every day our skin is exposed to external factors. They influence the skin's condition and its appearance. Many women concern themselves mainly with the skin on the face and neck. However, they forget about the rest of their body skin, which undergoes aging as well and thus also needs suitable care. Objectives: The aim of this study was to evaluate the in vivo efficacy and beneficial effects of application of the body cream containing an anti-wrinkle peptide, repair enzymes, and olive, bee, cocoa and mango wax.

J. Vokurkova, H. Buckova, P. Sin, **Treatment of giant congenital melanocytic nevi and cutometric measurement of the skin elasticity after repeated expansions and surgery,** Abstract; EADV Paris 09/2008

Introduction: All types of surgical procedures _ neonatal dermabrasion, parcial excisions, expansion and reexpansion of skin flaps etc. are used in children with diagnosis a Giant Congenital Melanocytic Nevi. Scar maturation after a surgery and especially after a transfer of expanded flap has its biological rules. However, it differs in individual patients in as much as one year. For objective examination of scar maturity and evaluation of its elasticity, it is possible to apply measurement with the Cutometer device. According to the measurement results, an algorithm may be evaluated for individual surgical procedures and especially for the best timing of re-expansion or if to continue in dermabrasion method.

C. Huh, M. Choi, S. Lee, S. Kim, Y. Park, B. Kim, H. Park, S. Choi, S. Youn,K. Park, **Low dose 1064nm Q-switched Nd:YAG laser for the treatment of melisma,** Abstract; EADV Paris 09/2008

Background: Melasma is a common acquired pigmentary disorder that is known for its recalcitrance to the conventional treatment. Although Q-switched Nd: YAG laser (QSNYL) is widely used for the treatmemt of melasma, little has been published regarding its effect. Objectives: In this study, we would like to know the effect of low dose 1064nm QSNYL (MedLite C6, HOYA Conbio, CA) on the treatment of melasma objectively.

H. Tronnier, M. Wiebusch, U. Heinrich, **Skin physiological parmeters in space – results of the European long-term mission in the ISS (ASTROLAB,** Abstract, EADV Paris 09/2008

Background: Since in weightlessness many astronauts report skin problems like dryness, itching, tendency to get injured, impaired wound healing etc., a "Skin Care" program was initiated for the ASTROLAB Mission of ESA (European Space Agency). It was carried out by a consortium with different tasks.

A. Fourtanier, B. Ladan, C. Camus, N. Dami, V. Delvigne, R. Bazin, M. Hughes, A. Green, **Comparison of facial skin parameters in Caucasian Australian and European women,** Abstract, EADV Paris 09/2008

The aim of this study was to compare two Caucasian female populations aged 40 to 69 years with very different lifestyles and cosmetic habits: one (n= 67) living in a temperate climate in Europe (Paris 55° N); the other (n= 80), living in subtropical Australia (Nambour, 26° S). Using a patented proprietary skin evaluation tool (Diagnôs Expert®) in each location, we compared the skin properties of women classified into three age groups: 40 to 49, 50 to 59, 60 to 69. This tool combines several techniques including a capacitance method (Corneometer®) for hydration and a suction method (Cutometer®) for assessment of mechanical properties. The greatest wrinkle-depth, the intensity of the darkest pigmented spot (selected clinically) and sebaceous activity were measured on images acquired by camera with an adapted magnification (x10 and x60) and analyzed by a specific software.

C. Camus, M. Isono, G. Yang, M. Daveno, D. Amar, B. Lavaud, C. Hoang Van Chu, V. Delvigne, R. Bazin, **Comparison of skin properties in various populations using a new multi-criteria measuring device,** Abstract, EADV Paris 09/2008

Purpose of the study: To assess a new testing battery device for evaluating skin condition in relation to age and skin ethnicity and skin type. Methods: Facial skin data have been recorded in female volunteers by the same operator in 5 different countries from December 2003 to April 2004. Study volunteers included various ethnic skin types i.e. Caucasian (Paris, France), Hispanic (Mexico City, Mexico), Asian (Tokyo, Japan and Hong-Kong, China) and African American (Chicago, USA). At least one hundred women per city were involved and split into 4 natures of skin (normal, dry , oily and combined) and 5 age groups (20- 29 years, 30 - 39 years, 40 -49 years, 50 -59 years and over 60 years).

U. Heinrich, B. Garbe, H. Tronnier, W. Stahl, C. Moore, M.J. Arnaud, **Supplementation with green tea extract improves skin physiological parameters,** Abstract, EADV Paris 09/2008

Background: The objective of the study was to determine changes in skin parameters during the intake of a beverage rich in green tea extract. The detection of hydration properties, transepidermal water loss (TEWL), changes of skin surface (SELS), skin elasticity, skin thickness and density as well as serum analyses were determined during the study. Methods: Hydration measurements were carried out with the Corneometer CM 825 prior to and during the study. Transepidermal water loss (barrier function of the skin) was measured with the Tewameter, skin surface (SELS) with the Visioscan and skin elasticity with the Cutometer (Courage & Khazaka Electronics, Cologne, Germany).

Lys'lastine, the face designer, Advertisement of BASF Beauty Care Solutions, Cosmetics & Toiletries 9/2008, Vol. 123, No. 9

Major discoveries about elastin. Elastin naturally brings to mind the skin's youthful appearance and level of elasticity, both of which are symbolic values that make this molecule a choice ingredient in anti-age strategies. Nevertheless, the real scientific aspects of elastin are surprisingly not very well known including information about its structure, its function, and aging process.

C. Orlandi, R. Loubies, S. Baeza, C. Reyes, X. Worstman, **Clinical Experience of the Treatment with Pro-Xylane TM, Isobioline TM and Phytocomplex TM on Chilean Women with Hormonal Aging,** 21st World Congress of Dermatology, Buenos Aires, Argentina, 2008

An open and prospective study was performed in order to evaluate the action of a formulation with pro-xylane, isobioline and phyto-Complex in 59 patients with hormonal aging during a period of twelve weeks. An open and prospective study was peformed in 59 patients, between 50 and 65 years of age (average 55 years old), with hormonal aging in order to evaluate the action of a formulation with –xylane, isobioline and phyto-complex.

P. Msika, S. Bredif, S. Garnier, J. Legrand, **Oligosaccharidic and Peptidic Extract from Maca Root: A new Cell Energizer With Clinical Anti-Aging Properties,** 21st World Congress of Dermatology, Buenos Aires, Argentina, 2008

Purpose of the study: Maca (Lepidium meyenii) was an integral part of the diet and commerce of residents of Andes region. The Incas found maca root so potent that they restricted Maca use to their Royalty. Now days, maca powder is used worldwide as nutraceutical ingredient. We have developed and patented an oligosaccharidic and peptidic extract obtained by a biotechnological process from maca flour.

C. Oresajo, M. Yatskayer, H. Fares, T. Stephens, I. Hansenne, **A Twelve-Week, Clinical Evaluation of the Skin Firming Benefits of a Topical Product Containing Hyaluronic Acid and Oligo Peptides on the Face, Neck, Upper Chest and Hands,** 21st World Congress of Dermatology, Buenos Aires, Argentina, 2008

Purpose of the study: The objective of this study was to assess the efficacy and safety of a test product on subjects with mild to moderate photodamage on the face, neck, upper chest and hands. Methods: 69 female volunteers between the ages 35 to 65 years with mild to moderate photodamage on the face and hands (scores 3-8 on a 10cm scale) were enrolled in 12-week single-center study.

H.S. Ryu, Y.H. Joo, S.O. Kim, K.C. Park, S.W. Youn, **Influence of age and regional differences on skin elasticity as measured by the Cutometer®,** Skin Research and Technology, Vol. 14 / 2008

The medical properties of the skin are due to the thickness and quantative properties of the epidermis, dermis and subcutis. During aging, quantitative and qualitative changes occur in the skin. Loss of elasticity, reduction in the epidermal thickness and collagen content, increased wrinkling and pigment lesions

L.B. Epstein, C.A Graham, M.H. Heit, **Systemic and vaginal biomechanical properties of women with normal vaginal support and pelvic or-gan prolapse**, Am J Obstet Gynecol, 2007 Aug;197(2):165, p.1-6.

Objective: The objective of the study was to compare the biomechanical properties of vaginal and systemic skin in women with and without pelvic organ prolapse. Study design: In this cross-sectional study, 25 women with pelvic organ prolapse and 23 agematched women with normal pelvic support were recruited from an office setting. A Cutometer MPA 580 and DermaLab skin probe were used to measure systemic biomechanical parameters and a 1.5 mm offset DermaLab skin probe was used for vaginal biomechanical measurements. Results: There were no significant differences in the baseline demographic, obstetrical, or gynecologic information between the 2 groups. There were no significant differences in the systemic biomechanical parameters between the 2 groups. Women with pelvic organ prolapse had significantly more extensible vaginal skin than women with normal pelvic support (initial stiffness index 7.3 vs 10.9 kpa, final stiffness index 5.9 vs 10.7 kpa; all P values less than .01). Furthermore, vaginal extensibility was related to pelvic organ prolapse quantification stage in a linear fashion. Conclusion: Our findings suggest that local, rather than systemic, alterations in biomechanical skin properties are associated with pelvic organ prolapse.

S. Ahn, S. Kim, H. Lee, S. Moon, I. Chang, **Correlation between a Cutometer and quantitative evaluation using Moire topography in age-related skin elasticity**, Skin Res Technol., 2007 Aug;13(3): p. 280-4

Background/Purpose: As aging occurs, our skin gets more wrinkles, becomes drier and loses its elasticity. Validating the evaluation of skin elasticity is especially important, because it is not as visible as other signs of aging such as wrinkles. So it is needed that the method for measuring skin elasticity is able to reflect perception about the change of the skin state. Methods: Here, the correlation between age and the parameters given by a Cutometer is identified and the main parameters that reflect the decreases in skin elasticity in terms of ages are presented. Also, Moire's system, an evaluation method to quantify the sensory value of viewing, is developed. A five-grade standard of Moire topographic photo scale on the face is used to evaluate the state of skin elasticity and lifting 20- to 61-year-old women. Based on this photo standard, scoring is performed using a five-grade system by three specialists to obtain the consensus score. The score is compared with the result of a Cutometer. Results: Significant negative correlations between age and results of a Cutometer (r=-0.687-0.725), Moire's topography scores (r=-938), were found. Some Cutometer parameters and the decreases in skin elasticity in terms of ages were highly correlated (r=-0.687-0.725). The results from Moire system and flexibility as sensory evaluation also had a very high correlation with age (r=-0.765-0.932). Finally, we have shown the significance of the correlation between the result of a Cutometer and the score of Moire topography (r=0.711). Conclusions: It is considered that Cutometer parameters R7 and R2 are used as main parameters to assess skin elasticity and aging. And our studies using Moire topography on the face have confirmed that instrumental measurements reflect the decrease in skin elasticity, which is perceived visually.

Was können Kosmetika leisten?, Beautyforum 05 / 2008
Messung der Hautelastizität; Ein wichtiges Kapitel sind Problemhäute, die aus Barriere- und Verhornungsstörungen resultieren. In diesen Fällen bitet hinsichtlich der Wirkstoffe und Transportsysteme die Korneotherapie von Prof. A Klingman gute Ansatzpunkte (s. auch Ästhetische Dermatologie 2007 (3), 8-16)

C. Barba, S. Mendez, A.Roddick-Lanzilotta, R. Kelly, J.L. Parra, L. Coderch, **Cosmetic effectiveness of topically applied hydrolysed keratin peptides and lipidis derived from wool,** Skin and Research Technology Vol. 14, No. 2, May 2008

Wool is primarily (ca. 85%-95%) composed of keratin proteins that combine to give it desirable properties such as strength, insolubility and moisture regain. Different classes of keratin proteins are respresented in the complex macromolecular stucture, each of which has specific functions and characteristics. Protein hydrolysates from various sources have long been used in skin and hair personal care products and are known to confer improved campatitbility, feel moisturisation and help maintain the natural structure…

D. Qu, J. Leverett, O. Freis, M. Sabadotto, G.P. Seehra, J. Scimeca, B. Luke, G. Pauly, A. Rathjens, **Correlating Age and Quantifying Product Efficacy on Human Skin Using Noval Viscoelastic Parameters**

Biological age and anti-aging product effiacacy were evaluated in human skin in vivo using noval viscoelasticparameters. The Cutometer SEM 575 (CK Electronics) was employd to collect the

mechanical responses of the skin. Measurments were conducted on the inner forearm skin of sixty-nine healthy female volunteers age 18 to 60 years. Cutometer data were then analyzed using an automated technique of inflection point and area analysis to obtain novel viscoelastic parameteters termed total viscoelastic recovery (R/R), elastic recovery (R/R), and "viscous"recovery (R/R). Our results showed strong correlation of age with two skin viscoelastic parameters – viscoelastic and elastic recovery . Age did not seem to affect the viscous component although a sligh declining trend was observed. Standard curves were constructed based on those parameters to provide linear age – elasticity functions for quantification of product efficacy.A6 week anti-aging product efficacy trial was then conducted on 30 volunteers to evaluate the biomechanical properties of skin . At the end of the trial , significant improve- meter in viscoelastic and elastic parameters were observed when comparend to baseline. Average elastic improvement at 6 weeks corresponded to approximately a 15-year shift using our previously characterized standard curves relating skin viscoelasticity and age.

A. Delalleau, G.Josse, J.-M. Lagarde, H. Zahouani, J.-M. Bergheau, **A nonlinear elastic behavior to identify the mechanical Parameters of Human skin *in vivo,*** Skin Research and Technology 2008, 14

Background/purpose: Various nalyses have been performed to identify the mechanical properties of the human skin tissue *in vivo* . They generally usse different approaches and hypotheses (behavior laws as well as mechanical testes)and the obtained results are consequently difficult to analyze and compare.
In this paper , an inverse methods that can be adapted to any kind of mechanical testes and behavior laws is presented.

D.B.L. Terci, D. Terci, D. Terci, A. Pinheiro, **Use of Cutometer to Asses Skin Water Content,** IFSCC Barcelona 2008

Assessing the skin water content (skin hydration) is one of the first and most important measurements to test the efficacy of cosmetics on the skin surface. The quantity of literature worldwide dealing with this subject indicates the significance of this measurement.

T.H. Jeong, K.Y. Jeong, S.K. Han, S.J. Lee, S.H. Kang, S.G. Oh, **Development of Thermotropic Gel Patch Technology improving skin moisture and resilience physiochemically: An innovative skin shielding and drug-delivering challenger,** IFSCC Barcelona 2008

Sol-Gel transition has been vigorously investigated in various chemical synthesis to manufacture powders, polymers, and encapsulating materials. Starting from pharmaceutical industries, Sol-Gel transition and its applications have been focused to enhance the time-releasing patterns of drugs such as insulin and to maintain their effective periods much longer than conventional methods. Therefore, many researchers in pharmaceutical fields have paid their attention to develop bio-compatible polymers which show Sol-Gel transitions to be transformed nearby human's bodytemperature, as well as bio-degradable ones.

*S.-J. Kim, T.-H. Jeong, E.-A. Ko, S.-H. Kang, K.-Y. Jeong, S.-K. Han, S.- J. Lee, S.-G. Oh***, Development of a noble solid lipid emulsion technology using silicone-based waxes and its cosmetic applications improving instant skin resilience and skin protection,** IFSCC Barcelona 2008

Recently, women make more effort for their beauty. Because the entry of women in public affairs have been extended. And their appearances can affect to their social images. Moreover, many of skin problems are caused by the stress of social activities and the environmental problems. Especially, the problems with skin aging are appeared a lot by the increase in UV exposure. In these situations, many cosmetics for anti-aging are gaining popularity. The wax formulations of cosmetic are effective on skin protection and moisturization.

*U. Heinrich, B. Garbe, H. Tronnier***, In Vivo Assessment Of Ectoin: A Randomized, Placebo-Controlled Clinical Trial,** IFSCC Barcelona 2008

The objective of this study was to determine the anti-aging properties of Ectoin with special regard to its compatibility and efficacy. For this purpose 104 voluntary female participants were included in a monocentric, randomized, double-blind application test. Moisturizing properties, skin surface structure and skin elasticity were tested, comparing Ectoin (2 %: Treatment B) to a reference emulsion (Treatment A) versus an untreated control. None of all treated participants showed side effects during the study.The gained results of this study display that the natural cell protection concept of Ectoin is transferable to skin care.

A. Tada, A. Kanamaru, M. Oyobikawa, T. Maeda, H. Oshima, **Advanced Glycation End Products Crosslinks Breaker: A New Approach for Improvement of Aged Skin,** IFSCC Barcelona 2008

The reaction between proteins and glucose was first reported by Maillard [1], who observed, while cooking food, glucose and other reducing sugars reacting with protein amino acids to form adducts that after dehydration and rearrangement became stable brown pigments. This reaction between reducing sugar and proteins has been named non-enzymatic glycation. These glycation products undergo further complex reactions to become irreversibly cross-linked, forming a broad range of heterogeneous fluorescent and yellow-brown products called advanced glycation end products (AGEs).

L. Couturier, F. Yvergnaux, **Biotechnological Process For The Synthesis Of Omega 9 Compound For Enhancement Of Anti-elastase Activity With Firmness And Restructuring Efficacy,** IFSCC Barcelona 2008

Inhibition of human neutrophile elastase is an important target due to the enzyme's involvement in tissue destruction of a number of skin disease states [1]. Elastase itself cleaves collagens, as well as elastin and other proteins with important biological functions. A variety of different types of inhibitors and inhibitor formulations have been devised for treatment of these targets [2,3]. Oleic acid is a highly selective non-toxic inhibitor of elastase. To enhance the vectorization of Omega 9 into the skin, especially in the dermis where elastase acts, Omega 9 type compound has been synthesised through a biotechnological process, miming a structural lipid analogue of the skin.

S.H. Pérez Damonte, C.L. Selem, C. Groisman, **Bi-Functional Study of Ion Calcium in the Skin,** IFSCC Barcelona 2008

The Calcium ion has an important function in the skin. Its gradient plays a role in regulating epidermal growth and differentiation *in-vivo*. In the intact epidermis, the extra cellular calcium content is low in both, malpighi and spinosum strata, but increases from the inner to the outer layer of the stratum granulosum [1]. Also, the calcium ion participates in the formation of the epidermal desmosomes, fibroblasts and keratinocytes, which provide the integrity and firmness of the skin [2]. All of these factors are important for the correct function of the epidermal barrier.

A. del Pozo, M. Solans, C. Fernandez, M. Dolz, F. Corrias, M. Herráez, O. Diez-Sales, **Efficacy evaluation and characterization of chitosan nanoemulsions with Spirulina hydro-glycolic extract,** IFSCC Barcelona 2008 (Poster)

Nanoemulsions represent an interesting prospect for use as vehicles in the development of formulations to deliver active ingredients to the human body. Particularly, nanoemulsion formulations have been shown to be superior for transdermal and dermal delivery of hydrophilic and lipophlic compounds, compared to conventional vehicles, such as hydrogels and emulsions [1]. Lecithins (phosphatidylcholines) have been used in several studies as surfactants for topical nanoemulsion vehicles. These surfactants are able to form nanoemulsions without co-surfactants.

B. Nedelec, J.A. Correa, G. Rachelska, A. Armour, L. LaSalle, **Quantitative Measurement of Hypertrophic Scar: Intrarater Reliability, Sensitivity, and Specificity,** Journal of Burn Care & Research May/June 2008

The comparison of scar evaluation over time requires measurement tools with acceptable intrarater reliability and the ability to discriminate skin characteristics of interest. The objective of this study was to evaluate the intrarater reliability and sensitivity and specificity of the Cutometer, the Mexameter and the DermaScan C relative to the modified Vancouver Scar Scale (mVSS) in patient-matched normal skin, normal scar (donor sites), and hypertrophic scar.

B. Nedelec, J.A. Correa, G. Rachelska, A. Armour, L. LaSalle, **Quantitative Measurement of Hypertrophic Scar: Intrarater Reliability and Concurrent Validity,** Journal of Burn Care & Research May/June 2008

Research into the pathophysiology and treatment of hypertrophic scar (HSc) remains limited by the heterogeneity of scar and the imprecision with which its severity is measured. The objective of this study was to test the interrater reliability and concurrent validity of the Cutometer measurement of elasticity, the Mexameter measurement of erythema and pigmentation, and total thickness measure of the DermaScan C relative to the modified Vancouver Scar Scale (mVSS) in patient-matched normal skin, normal scar, and HSc.

H. Tronnier, M. Wiebusch, U. Heinrich, **Change in Skin Physiological Parameters in Space - Report on and Results of the First Study on Man,** Skin Pharmacol Physiol 2008;21: p. 283-292

Astronauts often show skin reactions in space. Systematic tests, e.g. with noninvasive skin physiological test methods, have not yet been done. In an interdisciplinary cooperation, a test series with skin physiological measurements was carried out before, during and after a long-term mission in the International Space Station. The hydration of the stratum corneum (Corneometer), transepidermal water loss (Tewameter), and the surface structure of the skin (SkinVisiometer) were measured. In order to record cutaneous states, the suction elasticity was measured (Cutometer), and an ultrasound measurement with 20 MHz (DermaScan) was also made. In addition, one measuring field of the two inner forearms was treated with a skin care emulsion. There were indications of a delayed epidermal proliferation of the cells, which would correspond to the clinical symptoms. Hydration and TEWL values are improved by respective skin care. On the cutaneous level, the elasticity measurements and the ultrasound picture showed results which correspond to a significant loss of elasticity of the skin. Further examinations are necessary to validate these preliminary results.

B. Sommer, **Regenerationsergebnisse nach Nervenverletzungen an der oberen Extremität – Einflussfaktoren und die Optimierung klinischer Untersuchungsmethoden**, Dissertation aus der Klinik für Plastische Chirurgieder Universität zu Lübeck, Lübeck 2008

Klinik der Nervenverletzungen: In der Handchirurgie nimmt die Verletzung peripherer Nerven der oberen Extremität mit 10% aller zu versorgenden Fälle einen wesentlichen Stellenwert ein. Durch motorische und sensible Ausfälle im entsprechenden Versorgungsgebiet des Nerven kommt es zum Verlust von sensomotorischen Fertigkeiten, die zu Bewältigung von Situationen im Berufsleben als auch im häuslichen Lebensumfeld von zentraler Bedeutung sind. Der hohe Anteil der postoperativen Arbeitslosigkeit [51] hat in den letzten Jahren den wirtschaftlichen Einfluss auf das Gesundheitssystem nach Verletzungen der oberen Extremität immer mehr in den Fokus neuer Studien gerückt [34,94]. Insbesondere Nervenverletzungen haben einen nachhaltigen Einfluss auf den sozioökologischen Status des Patienten und können zu erhöhten Behandlungskosten vor allem im Bereich Rehabilitation und sekundärer Rekonstruktion führen [34]. Trotz der hohen klinischen Relevanz können Nervenverletzungen im Rahmen vermeintlicher Bagatellverletzungen leicht übersehen werden (Abb. 1).

D. Qu, Chris J. Masotti, G.P. Seehra, **Novel Cutometer Analysis for Evaluation of Skin Viscoelastic Properties/ Nouveaux Paramètres pour l'Evaluation des Propriétés Viscoélastiques de la Peau,** SFIC 2008 Monaco (Poster, Engllish + French)

Quantitative evaluation of biomechanical properties of human skin *in vivo* is the subject of continuous investigation. The Cutometer (*Courage & Khazaka*) has been frequently used to measure the mechanical properties of skin. Conventionally with this instrument, skin viscoelastic properties are defined by many linear parameters (Uf, Ue, Uv, Ur, and Ua) from a typical mode 1 measurement of the Cutometer. The ratios of those U values, particularly Ue/Uf (overall elasticity), Ur/Uf (pure elasticity), and Ur/Ue (elastic-viscous ratio), are frequently reported. In our extensive studies using the Cutometer we have noticed significant variability of those U parameters leading to inconsistent results.

Efficacy evaluation of a skin treatment product, Report Essex Testing Clinic 2008

The objective of the study was to determine if the use of a skin treatment product: reduces the appearance of fine lines and wrinkles at the crow's feet area; improves skin texture; improves skin firmness/elasticity; improves the moisture content of the skin; and diminishes the appearance under-eye puffiness in a panel of 30 subjects, aged 35-69 years, 2 minutes after application and after 4 weeks of product use.

Viele Blender – Gesichtscremes mit UV-Schutz, test 1/2008, S. 28 - 31

Auf den Lichtschutz in Gesichtscremes kann man sich oft nicht verlassen. Sieben Produkte sind deshalb „mangelhaft" und nur drei insgesamt „gut". Eine gute Gesichtscreme soll die Haut in erster Linie mit zusätzlicher Feuchtigkeit versorgen, damit sie frisch, glatt und gesund bleibt. Der Trend geht allerdings dahin, diese Cremes mit Lichtschutzfiltern anzureichern, um die Haut vor vorzeitiger Alterung und Fältchenbildung zu schützen. Ein Ansatz, den viele Hautärzte unterstützen.

A. Rougier, S. Seite, **Clinical efficacy of topically applied vitamin C associated with madecassoside on skin aging,** AB28 J. Am. Acad. Dermatol.

Cutaneous aging is a complex biological process that affects the different compartments of the skin. In sun-exposed areas, skin aging is caused by two distinct processes: chronological aging and sun-induced actinic damage, called photoaging. We have previously demonstrated in vivo, the beneficial effect of topically applied vitamin C in the treatment of skin aging.

J. Crowther, P. Matts, J. Jarvis, **Quantification of body skin aging requires measuring multiple parameters,** AB29 J. Am. Acad. Dermatol.

Background: Changes in skin with increasing age result in alteration of its physical and chemical characteristics. In areas of the body where skin is subjected to mechanical stress from repeated bending (knees, elbows) or to environmental stressors, such as repeated exposure to UV radiation (hands, décolletage), these differences may become more obviously expressed.

T. Reuther, A. Atwan, M. Kerscher, **Evaluation of skin elasticity using an approach with repeated deformation of the skin,** AB15 J. Am. Acad. Dermatol.

One prominent feature of aged skin is the decreased capability of relaxation in particular after repeated deformation. Measuring of this phenomenon appears to be an interesting approach for assessing skin aging. However, comparatively little data dealing with this topic is available. Therefore the aim of the present study is to evaluate skin elasticity after repeated deformation as a measure of skin aging with respect to age and skin thickness.

R. Wanitphakdeedecha, W. Manuskiatti, S. Eimpunth, S. Hunnangkul, **The effects of single application of mucopolysaccharide polysulphate (MPS),** AB96 J. Am. Acad. Dermatol.

To study the efficacy on the skin hydration of mucopolysaccharide polysulphate (MPS) 0,1% after single application. Twenty female volunteers aged 30 to 45 years with dry skin, defined by the corneometer, were recruited to the study. All subjects were asked to apply 2 g of MPS cream on a selected forearm.

R. Wanitphakdeedecha, W. Manuskiatti, S. Eimpunth, S. Hunnangkul, **The effects of mucopolysaccharide polysulphate (MPS) on the hydration and elasticity of human skin),** AB95 J. Am. Acad. Dermatol.

To study the efficacy of mucopolysaccharide polysulphate (MPS) in hydration and elasticity of human skin. Methods: Sixty female volunteers aged 30 to 45 years with dry skin, defined by the corneometer, were recruited to the study. The volunteers were randomly treated with MPS and placebo.

T. Miller, S. Batra, J. Ramirez, **Evaluation of the effect of a Novel Bi-Mineral Complex on photoexposed periorbital skin**, AB32 J. Am. Acad. Dermatol.

The elasticity of the skin is attributable to elastic fibers that can stretch and then recoil. The elastic fibers contain elastin – a large protein synthesized by dermal fibroblasts that forms spiral filaments comparable to springs. The spiral filaments are crosslinked together and, when the skin is stretched, this crosslinking enables the spiral filaments to spring back to their original positions.

T. Reuther, J. Bayrhammer, M. Kerscher, **Einsatz biophysikalischer Messverfahren zur Untersuchung der hautphysiologischen Wikung injizierbarer Hyaluronsäure,** Hautarzt 2007, 58: 1046-1050

Hyaluronsäure (Glukoronsäure-ß-1-3-N-Acetyl-Glycosamin; HS) ist ein wichtiger physiologischer Bestandteil der extrazellulären Matrix gesunder Haut. Bis zu 50% des Gesamtkörpergehaltes humaner HS befinden sich in der Haut. Es handelt sich um ein großes anionisches Glukosaminoglykan (GAG), das aus Doppelzhuckergrundbausteinen (D-Glukoronsäure + N-Acetylglucosamin) aufgebaut ist und ein lineares Polymer mit bis zu > 10.000 Monomeren bildet. HS hat verschiedene wichtige Funktionen in der Haut. So kann das Molekül große Mengen Wasser binden und ist essenziell für die kutane Hydratationshomöostase. Außerdem ist HS wichtig für die Zelldifferenzierung, den Zellgerüstaufbau, die Zellmigration und –mobilität, für die selektive Diffusion verschiedener Stoffe im Gewebe (z.B. Elektrolyte und diverse Nähr- und Abfallstoffe), die Mediation von Immunprozessen sowie den Aufbau der extrazellulären Matrix.

K. Tsukahara, M. Hotta, T. Fujimura, K. Haketa, T. Kitahara, **Effect of room humidity on the formation of fine wrinkles in the facial skin of Japanese**, Skin Research and Technology 2007, 13, p. 184 – 188

Changes in humidity are commonly known to influence the condition of the skin. Previous studies of the skin dealt with variations in relative humidity (RH) either through statistical analysis or by maintaining room humidity at a constant level; however, the range of humidity and the length of acclimation varied in each study.

L. Ambroisine, K. Ezzedine, A. Elfakir, S. Gardinier, J. Latreille, E. Mauger, M. Tenenhaus, C. Guinot, **Relationships between visual and tactile features and biophysical parameters in human facial skin,** Skin Research and Technology 2007; 13: p. 176 – 183

Skin properties, such as colour, hydration and texture, can be studied on a qualitative basis by a clinical assessment or on a quantitative basis using techniques that measure biophysical properties of the skin. The aim of this study was to explore the links between facial skin features and a range of skin biophysical parameters using multivariate methods.

I. Wontroba, **Der Einfluss von linear polarisiertem Licht auf Hauttemperatur, Hautwasserabgabe und sudomotorische Aktivität**, Digitale Dissertation FU Berlin, p. 1-37

Zur Untersuchung, welche Auswirkungen inkohärentes polarisiertes Licht (VIP = visible incoherent polarized light) auf die menschliche Haut zeigt, sind in unterschiedlichen Messreihen an insgesamt 48 Probanden Veränderungen von Evaporation und Temperatur über der Haut des Unterschenkels in einem Messzylinder (Tewameter) untersucht worden. Verwendet wurde eine im Rahmen der VIP-Lichttherapie eingesetzte Lichtquelle der Firma Bioptron.

F. Hashmi, J. Malone-Lee, **Measurement of skin elasticity on the foot,** Skin Research and Technology 2007; 13, p. 252-258

The Cutometer 580 MPA is a device that is designed to measure the viscoelastic properties of skin in response to the application of negative pressure. The aim of this study was to test the Cutometer 580 MPA for the repeatable, quantitative measurement of the specific indices of elasticity of pedal skin.

S. Cho, D.H. Lee, C.H Won, S. Lee, M.J Lee, J.H Chung, **A Rondomized, Double-Blind Clinical Trial on the Clinical Efficacy of Oral Supplementation with Chlorophyll Extracts on Skin Aging,** 21st World Congress of Dermatology, Buenos Aires, Argentina, 2007

Chlorophyll, a polyene photoreceptor of plants, is known to have anti-inflammatory effects. Though its beneficial roles on aged skin were reported, there have been few systematic studies. The aim of this study is to evaluate the efficacy and tolerability of dietary chlorophyll extract supplementation on aging skin. Thirty healthy females (aged more than 45) were randomised to take low-dose or high-dose dietary supplementation containing chlorophyll extracts for 12 weeks.

U. Eich, **Thermische Verletzungen im Kindes- und Jugendalter,** Dissertation Universität zu Lübeck 06.06.2007

Einführung**:** Jedes Jahr verunglücken circa 7100 Kinder im Alter von 0 bis 20 Jahren durch thermische Unfälle, sodass sie stationär in einem der 44 Betten für Kinder in einem Schwerbrandverletztenzentrum in Deutschland behandelt werden müssen. Thermische Verletzungen entstehen im Kleinkind- und Vorschulalter vorwiegend (etwa 85%) in Form von Verbrühungen, d.h. bei Kontakt mit heißen Flüssigkeiten. Der Inhalt einer Tasse mit heißem Wasser genügt, um bis zu 30% der Körperoberfläche eines Säuglings- oder Kleinkindes zu verbrühen. Verbrennungen treten hingegen häufiger bei Schulkindern auf und werden vornehmlich durch Hausbrände, Grillunfälle und Experimentieren mit dem Feuer hervorgerufen. Bei circa 3000 Kindern verbleiben nach der Therapie einschränkende Narben. Diese sind häufig hypertroph, verursachen Schmerzen und Juckreiz und können zu funktionellen Einschränkungen führen. Gut sichtbare Narben, insbesondere an Gesicht und Händen, können zudem auch psychosoziale Probleme im Leben der Kinder nach dem Unfall hervorrufen.

H. Dobrev, **In vivo study of skin mechanical properties in Raynaud's phenomenon**, Skin Research and Technology 2007, p. 91-94 and Vol. 9, Nr. 2, May 2003, Abstract No. P76 and 14th International Congress for Bioengineering and the Skin, May 21-24, 2003

Mechanical properties of the skin in patients with suspected secondary Raynaud's phenomenon significantly differ from these in patients with primary Raynaud's phenomenon and resemble those in patients with edematous phase of scleroderma. Our findings suggest that the non-invasive measurements of skin elasticity could be helpful in identifying patients with Raynaud's phenomenon at risk of developing systemic sclerosis.Raynaud's phenomenon (RP) is usually the first symptom in patients with systemic sclerosis (SS) and may precede skin changes by several months or years. Non-invasive measurements of skin elasticity are very sensitive and appropriate for objective and quantitative evaluation of sclerodermatous skin. Diagnosis of systemic slerosis (SSc) at very early stage could allow starting an appropriate therapy and improving the patient outcome. Skin involvement is often the first non-Raynaud's phenomenon (RP) symptom. Ist uncovering may play an important role for the initial diagnosis. Objective: To introduce a simplified method for non-invasive evaluation of skin mechanical properties in patients with clinically evident or suspected SSc. Material and Methods: A total of 94 patients and 162 healthy subjects were studied. According to clinical and nailfold videocapillaroscopy findings the patients were divided into four groups: 20 with edematous phase of SSc (group 1), 28 with

indurative phase of SSc (group 2), 26 with suspected secondary RP (group 3), and 20 with primary RP (group 4).

A. Puig, J.M. García Antón, M. Mangues, **A new Decorin-like Tetrapeptide for Optimal Organization of Collagen Fibers**, IFSCC Magazine, Vol. 10, No. 4/2007

Decorin interacts with collagen via its protein core and influences collagen fibrillogenesis, thus regulating excessive bundle-like aggregation of collagen. As skin ages, there is a lack of functional decorin which results in disrupted collagen fibers and a reduction in the tensile stregth of the skin. Therefore, a substitute for decorin would make up for the non-functional decorin that is present as we age.

G. Betz, **In Vivo Comparison of Various Liposomal Formulations for Cosmetic Application**, IcoS, June 2007, Istanbul Türkiye, p. 14-16

Liposomal formulations have been used for skin moisturization, due to the occlusive effect of a phospholipid film deposited on the skin surface. Furthermore, interactions between liposoal lipids and Stratum corneum lipids may affect positively the structure of the Stratum corneum. Phospholipids themselves are hygroscopic and bind water.

K. Shimada, K. Awai, H. Irie, **Ceramide Polymer improves skin texture**, Personal Care, May 2007, p. 47-50

Anti-ageing cosmetics are increasingly demanded today. Many consumers, especially women, care about keeping their skin young by controlling wrinkles and freckles and keeping their skin soft, firm, smooth and beautifully white. Ingredients for controlling the ageing of the skin are demanded and are actively studied.

H. Frank, E. Schubert, H. Konrad, A. Eggert, **Biokybernetik - ein sanfter Weg zur Gewebestraffung und Körperformung,** Ästhetische Dermatologie 2/2007, p. 44 – 47

Dysformien, Alterungsprozesse, Schönheit und ewige Jugend. Die Angst des Menschen vor dem Altern ist sicherlich der wichtigste Beweggrund, „forever young“ zu sein. Daran hat sich über die Jahrhunderte nichts geändert. Das heute vorherrschende gesteigerte Körperbewußtsein in Verbindung mit einer erfreulich gesteigerten Lebenserwartung und einer bis ins hohe Alter erhaltenen körperlichen und geistigen Fitness lassen diesen Wunsch jedoch immer mächtiger werden.

R. Muggli, **Systemic Evening Primrose Oil for Irritated Skin Care,** Cosmetics & Toiletries magazine, Vol. 122, No. 2/February 2007

Dry skin is a common complaint from men and women alike and its incidence and severity increase with age. This condition is the result of an impaired barrier function, increased transepidermal water loss (TEWL) and a significantly lower level of ceramides in the horny layer that causes the skin to lose an excessive amount of water.

M. Paye, S. Mac-Mary, A. Elkhyat, C. Tarrit, P. Mermet, P.H. Humbert, **Use of the Reviscometer for measuring cosmetics-induced skin surface effects,** Skin Research and Technology 2007; 13; p. 343-349

The Reviscometer® RVM 600 that measures resonance running time (RRT) has been shown to be inversely related to the skin stiffness. However, very few publications describe the use of this instrument for testing the effect of cosmetic products. Slight xerotic skin condition was induced by usind an alkaline soap for 1 week. Skin has then been rehydrated with a lotion or further dehydrated and dried with sodium lauryl sulfate.

L. K. Smalls, R. R. Wickett, M. O. Visscher, **Effect of dermal thickness, tissue composition, and body site on skin biomechanical properties**, Skin Research & Technology 2006, 12, p. 43-49

The epidermis, the fibrous collagen and elastin network of the dermis, and the hypodermis give rise to the biomechanical properties of the skin. Measurements of these properties have been used extensively to evaluate treatments for the repair of facial actinic damage and the effects of aging and to assess the effectiveness of facial resurfacing treatments (1-3).

F. Khatyr, C. Imberdis, D. Varchon, J.-M. Lagarde, G. Josse, **Measurement of the mechanical properties of the skin using the suction test**, Skin Research & Technology 2006, 12, p. 24-31

The mechanical behaviour of skin in vivo is both viscoelastic (1,2) and anisotropic (3-5). Currently, the suction test is the only real test that is in use in both research laboratories and dermatology departments. This is mainly because of the availability on the market of perfectly operational

apparatuses such as the Dermaflex A (Cortex Technology, Hadsund, Denmark) (6) and in particular the Cutometer SEM575 (Courage Khazaka, Köln, Germany) (7).

Beurteilung von frühkindlichen Verbrennungen – Objektivität optimiert Therapie; aesthetic Tribune, Ausgabe 8, Dezember 2006

Die Beurteilung von Narben erfolgt im Allgemeinen visuell und palpatorisch durch den Arzt. Darin liegt allerdings auch ein grosses Fehlerpotential begraben, da jeder Untersucher die Narbe subjektiv eurteilt. Was leistet die objektive Einschätzung mittels Apparaten? Zur Beurteilung von Narben hat sich die Vancouver Scar Scale (VSS) etabliert. Mit ihr werden Hautrötung, Pigmentierung, Erhabenheit und Elastizität beurteilt. Allerdings spielen hier zahlreiche subjektive Einflussfakoren durch den Untersucher mit, sodass diese Methode insbesondere den wissenschaftlichen Ansprüchen nicht genügt. Dr. Jörn Lohmeyer von der Plastischen, Hand- und Wiederherstellungschriurgie und Intensivstation für Schwerbrandverletzte in Lübeck stellte Methoden vor, Narben nach frühkindlichen Verbrennungsunfällen mit objektiven Kriterien zu beurteilen.

Y.J. Kim, M.Y. Kim, P.K. Lee, H.O. Kim, Y.M. Park, **Evaluation of natural change of skin function in split-thickness skin grafts by noninvasive bioengineering methods**, Dermatol Surg. 2006 Nov;32(11):1358-63

Background: Autologous split-thickness skin grafts (STSGs) are considered the mainstay for the treatment of large full-thickness wounds. There have been few studies reporting the natural change of the skin function in STSGs after procedure, however. Objective: The objective was to evaluate the natural change of the skin function in STSG usingnoninvasive bioengineering methods. Methods: Eighteen patients were eligible for the study. The skin functions of the graft and the controlsite were evaluated by an evaporimeter, corneometer, mexameter, and cutometer at Postoperation Days 0.5, 1, 2, 3, 6, 9, and 12 months. Results: Transepidermal water loss (TEWL) of the graft was maintained around that of the normal skin. The values of the skin hydration testing generally decreased during the follow-up period. Erythema was highly maintained for the whole period. For the pigmentation, the ratio tended to increase after 6 months. The skin pliability of the graft was abruptly decreased at 0.5 month, and it recovered from 3 to12 months. The value did not reach that of the normal skin, however. Conclusion: Our results showed that the STSGs had changed within the frame of the skin function, including the TEWL, epidermal hydration, color, and pliability, throughout 1 year after surgery. The authors have indicated no significant interest with commercial supporters.

C. Lenaers, D. Boudier, C. Chauprade, D. Rondeau, B. Closs, **Wrinkle Reduction by Stimulation of the Skin's Mechanical Resistance**, Cosmetics & Toiletries, Vol. 121, No. 11/Nov. 2006, p. 47-56

Wrinkles are a symptom of structural failure in the dermis. They indicate that the skin is losing its ability to support its own weight, and that fibroblasts in the dermis are losing their capacity to attach to collagen fibers and transmit mechanical information.

L. Rigano, C. Andolfatto, *F. Rastrelli,* **Antiaging Effects of a Skin Repair Active Principle**, Cosmetics & Toiletries, Vol. 121, No. 11/Nov. 2006, p. 57-64

Sodium DNA is an ingredient with activity at the cellular level. This fact has led to its incorporation in numerous high-end antiaging skin care products. An explanation of that activity and results of several tests of one sodium DNA material are presented in this article.

C. Lenaers, M. Dana, M. Pinel, B. Closs, **Immediate and long-lasting skin tightening**, Personal Care, Sept. 2006, p. 65-67

The use of tensor active ingredients in anti-age care products is well-known to provide the users with immediate and visible effects. Nevertheless, these tensor active ingredients provide only mechanical effects on the skin surface that are also short-term effects.

F. Distante, V. Pagani, A. Bonifigli, L. Rigano, J. Fluhr, **Objective evaluation of the placebo effect in cosmetic treatments. A randomized controlled study,** Presentation on the IFSCC in Florence 2005 and IFSCC Magazine, Vol. 9, No. 3/2006

A product's packaging and claimed efficacy may stimulate pleasant emotions during the use of cosmetics, thus enhancing their perceived benefits. The aim of this study was to evaluate if smart packaging and strongly claimed efficacy attributes can influence the objectively measured efficacy, allowing a true placebo effect to be associated with a given cosmetic treatment.

D. Khazaka, **Objective Measurement at all Stages of the treatment**, 5th Asia Pacific Conference on Antiaging Medicine, Bali, September 2006

The days are over when a dermatologist only looked at the skin to make a diagnosis and to decide about the following treatments and to recommend skin care products to use. For almost 20 years now there is scientific equipment available to measure different parameters on the skin, such as hydration and sebum level, pH, elasticity, pigmentation skin texture and wrinkles and many more.

D. Schmid, C. Schürch, F. Zülli, **Mycosporine-like Amino Acids from Red Algae Protect against Premature Skin-Aging,** Euro Cosmetics 9-2006, p. 18-22

Normal skin aging is accompanied by slow and continuous structural, functional, and metabolic changes in the skin. Such changes are greatly accelerated when the skin is exposed to solar UV radiation. The solar UV spectrum which reaches the earth's surface has been divided into UVB (290 – 320 nm) and UVA (320 – 400nm).

U. Heinrich, K. Neukam, H. Sies, W. Stahl, **Long-Term Ingestion of High Flavanol Cocoa Provides Photoprotection against UV-Induced Erythema and Improves Skin Condition in Women**, Journal of Nutrition 136: p. 1565–1569, July 2006

Dietary antioxidants contribute to endogenous photoprotection and are important for the maintenance of skin health. In the present study, 2 groups of women consumed either a high flavanol (326 mg/d) or low flavanol (27 mg/d) cocoa powder dissolved in 100 mL water for 12 wk. Epicatechin (61 mg/d) and catechin (20 mg/d) were the major flavanol monomers in the high flavanol drink, whereas the low flavanol drink contained 6.6 mg epicatechin and 1.6 mg catechin as the daily dose. Photoprotection and indicators of skin condition were assayed before and during the intervention. Following exposure of selected skin areas to 1.25 3 minimal erythemal dose (MED) of radiation from a solar simulator, UV-induced erythema was significantly decreased in the high flavanol group, by 15 and 25%, after 6 and 12 wk of treatment, respectively, whereas no change occurred in the low flavanol group. The ingestion of high flavanol cocoa led to increases in blood flow of cutaneous and subcutaneous tissues, and to increases in skin density and skin hydration. Skin thickness was elevated from 1.11 6 0.11 mm at wk 0 to 1.24 6 0.13 mm at wk 12; transepidermal water loss was diminished from 8.7 6 3.7 to 6.3 6 2.2 g/(h m2) within the same time frame. Neither of these variables was affected in the low flavanol cocoa group. Evaluation of the skin surface showed a significant decrease of skin roughness and scaling in the high flavanol cocoa group compared with those at wk 12. Dietary flavanols from cocoa contribute to endogenous photoprotection, improve dermal blood circulation, and affect cosmetically relevant skin surface and hydration variables.

H.O. Rennekampff, J. Rabbels, V. Reinhard, S.T. Becker, H.E. Schaller, **Comparing the Vancouver Scar Scale with the cutometer in the assessment of donor site wounds treated with various dressings in a randomized trial,** J. Burn Care Res. May 2006

Cutaneous scarring observed in wounds is, to a significant degree, dependent upon the time it takes for the wounds to heal. Various topical dressings are proposed to influence healing time in donor sites. In this prospective randomized study, we examined the effect of Vaseline gauze (VD; Branolind, Paul Hartmann AG, Germany), Biobrane (BD; Bertek Pharmaceuticals, Inc., Morgantown, WV), an occlusive film dressing Barrier Flex (OD; Moelnlycke Health Care GmbH, Germany), and an equine collagen foil, Tissu Foil E (CD; Baxter, Heidelberg, Germany), on re-epithelialization and scarring in standardized donor site wounds. At 6 months after surgery, donor site scars and normal uninjured mirror sided skin were evaluated in 33 patients using both the Vancouver Scar Scale (VSS) and the cutometer SEM 575 (Courage and Khazaka). The median healing time for OD was 14 days, BD 16 days, CD 19 days, and VD 19 days. The single parameter pliability of the VSS was not significantly different from uninjured skin when all donor site scars were pooled. No difference was found between the four groups. Viscoelastic analysis of all pooled patient data showed a significant difference for Uf (total deformation), Ua (total recovery), Ur (immediate retraction), Ue (immediate distension), Ur/Ue, and Ur/Uf, indicating that donor sites significantly differed from normal uninjured skin.

F. Guillaumie, B. M. Malle, K. Schwach-Abdellaoui, T. C. Beck, **A New Sodium Hyaluronte for Skin Moisturization and Antiaging**, Cosmetics & Toiletries Vol. 121, No. 4, April 2006, p. 51-58

In response to growing concerns about animal-derived sources for hyaluronic acid, some researchers have turned to biotech methods to produce this skin moisturizing agent.

S. Tamburic, **Effects of Polymer Entrapment of Prunus Spinosa Fruit extract on its cosmetic efficacy**, Journal of Applied Cosmetology, vol. 24, number 2, April/June 2006, p. 1-14.

The aim of this paper was to find out whether the entrapment of herbal extract into polymeric "reservoir" systems affects its skin efficacy.

E. Berardesca, N. Cameli, G. Primavera, M. Carrera, **Clinical and Instrumental Evaluation of Skin Improvement after Treatment with a New 50% Pyruvic Acid Peel,** Dermatol Surg 2006

Pyruvic acid is an a-keto acid that presents keratolytic, antimicrobial, and sebostatic properties as well as the ability to stimulate new collagen production and elastic fibers formation. Because of its low *p*Ka and its small dimension, it penetrates rapidly and deeply through the skin, so far as to be considered a potent chemical peel agent. It has proven its efficacy for the treatment of many dermatological conditions such as acne, superficial scarring, photodamage, and pigmentary disorders. Pyruvic acid application usually induces intense burning, and the postpeeling period is characterized by erythema, desquamation, and, sometimes, crusting.

G. Varju, G. Garay, **Surface Evaluation of Living Skin (SELS) during Microdermabrasion Treatment Course**, Poster Presentation, Dr. Derm Laser Center of Dermatology, Budapest Hungary, 2005

Microdermabrasion has become a popular method of skin rejuvenation for treating photodamage, fine rhytides, age spots, dyschromia, enlarged pores and mild ache. This procedure is one of the newest skin rejuvenating techniques employed to help improve the texture and appearance of the skin.

W. Rungsima, S. Apichati, T.Papapit, **Transepidermal water loss, hydration, pH and elasticity of skin in atopic dermatitis and normal Thai subjects**, Siriraj Medical Journal, 2005 Nov; 57(11): p. 486-490

In order to obtain objective data on skin functions in patients with atopic dermatitis (AD), we studied, by means of measurement of transepidermal water loss (TEWL), skin surface hydration, pH, and elasticity of dry and normal skin at the dorsum and volar aspects of the forearms in patients with atopic dermatitis compared with normal subjects. Transepidermal water loss (TEWL), skin surface hydration, pH, and elasticity function were measured using Tewameter TM 210, Corneometer CM 820, Skin-pH-meter pH 900, and Cutometer SEM 575, respectively. Forty-one subjects, twenty-five atopic dermatitis patients with dry skin, sixteen atopic dermatitis patients without dry skin, and twenty normal subjects, were recruited in the study. Considering all skin sites together, no significant differences were found between the mean values of TEWL in the same sites, the dorsum and volar forearms, of subjects in each group of patients ($p = 0.717$, and $p = 0.981$, respectively). Statistically, there were significant differences between the mean values of skin surface hydration at the dorsum and volar forearms ($p = 0.019$ and $p = 0.019$, respectively) and skin pH at the dorsum and volar forearms ($p = 0.036$ and $p = 0.043$, respectively). Regarding the elasticity function of the dorsum, immediate recovery and biological elasticity were significant differences in each group of the patients ($p = 0.048$ and $p = 0.019$, respectively), meanwhile, the elasticity function of the volar forearms, immediate recovery, elasticity index, elastic recovery index, viscoelastic ratio and relative elastic recovery were significant differences ($p = 0.014$, $p = 0.029$, $p < 0.001$, $p < 0.001$ and $p < 0.001$, respectively). Therefore, further wellcontrolled studies, investigating the skin morphology of patients with atopic dermatitis, should be pursued to provide more targeted therapies and establish an optimal standard of care for all patients with atopic dermatitis.

M. Szubert, C. Vincent, K. Rogiewicz, I. Eris, Z. Jakolska, M. Stroinski, M. Wieczorowski, J. Chajda, **Efficacy of Dr. Irena Eris Anti-Cellulite Body Cream,** Poster Presentation, Centre for Science and Research Dr. Irena Eris, 2005

Cellulite is a skin problem which characterizes non-inflammatory lesions of subcutaneous tissue (lipodystrophy), leading to changes in smoothness of skin surface. Epidemiological data indicates that cellulite is problem for 80-95% of women population. The pathogenesis of cellulite covers complex of different factors: genetics, hormonal and life style.

Dermokosmetik, Beratung in der Apotheke, PTA Nr. 11, Oktober 2005

Eine gute Unterstützung bei Promotionaktionen zum Thema „Hautpflege“ sind Hautanalysegeräte. Sie erleichtern den Einstieg in die Beratung, individuell auf den Hauttyp und Hautzustand der Kundin oder des Kunden abegestimmt.

D. Schmid, F. Suter, F. Zülli, **Soothing Factor from Opuntia Cactus for Sensitive Skin,** SÖFW-Journal 131/11-2005, p. 2-5

Sensitive skin tends to be more susceptible to some environmental factors. People with sensitive skin report exaggerated reactions such as redness, itching or rashes when their skin is in contact with certain cosmetics, plants or fabrics, hot or cold, or insect bites. Normally, people with sensitive skin show quicker an erythemal reaction against ultraviolet irradiation. Skin that is sensitive to

sun, typically shows allergic reactions, induced by ultraviolet radiation alone or in combination with chemical ingredients in skin care products.

A. O. Barel, K. Henau, P. Clarys, **In vitro calibration and validation of the reviscometer using silicone polymers as simple skin model systems,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstracts)

In vitro determination of the mechanical properties and isotropy of various polymers used as skin model systems can be determined using the shear wave propagation method. The Reviscometer (Courage-Khazaka, Cologen, Germany) measures the resonance running time (RTT) between 2 sensors which are placed with constant pressure on the surface of the material. The RTT times are expressed in arbitrary units related to time.

P. Clarys, K. Henau, A.O. Barel, **Investigation of intrinsic and photoaging of human skin using the reviscometer and the cutometer,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstracts)

In vivo and mechanical isotropy/ anisotropy properties of the skin can be determined using the shear wave propagation method (Reviscometer, Courage-Khazaka). The wave travelling time from transmitter to receiver (Resonance Running Time, RTT), expressed in arbitrary time units, is inversely proportional to the stiffness of the skin.

M. Jouandeaud, C. Lenaers, S. Mazalrey, J. Dorotyn, B. Closs, **Synthesis capacities of human fibroblasts compared to those of fibroblasts from striae,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstracts)

The deterioation of the fibril network of the skin is due mainly to aging and other types of modifications such as hormonal modifications. One of the problems often encountered as a result of a modification of the skin fibrous network is striation.

D. Kowatzki, C. Machold, K. Krull, P. Elsner, J.W. Fluhr, **Regeneration kinetic of sweating, Stratum Corneum hydration, Surface pH, Sebum production and mechanical properties is not altered by regular sauna bathing,** Presentation on the ISBS Meeting 2005 in Philadelphia and Skin Research and Technology 2005, 11 (abstracts)

Wellness and especially sauna bathing are of growing interest in modern health care. The positive effect of sauna for general health is well documented. However, to our knowledge no controlled studies have been published on the effect of sauna on skin physiology.

K. Lintner, C. Mas Chamberlin, P. Mondon, O. Peschard, **IgG fragments regulate IL6 production in keratinocytes: potential use in anti-age treatments,** Sederma S.A.S., Le Perray, 78612 France, Presentation at the IFSCC in Florence 2005

Cytokines play a fundamental role in inter-cellular communication. Their secretion rate and cellular concentrations are well regulated and in an equilibrium state (“homeostasis”) in healthy, young skin. Ageing leads to changes in these equilibriums. DHEA clearly controls IL6: the age-related decrease in DHEA (by a factor of >2 after age 50) is accompanied by increased IL6 levels. Cytokine IL6 is also known to be strongly induced in skin by UV rays.

P.M.B.G. Maia Campos, M.D. Gianeti, G.M.S. Gonçalves, L.R. Gaspar, **Assessment of *in vitro* antioxidant and *in vivo* anti-ageing effects of cosmetic products containing vitamin C and its derivatives on human skin,** Presentation at the IFSCC in Florence 2005

The objective of this study was to determine the *in vitro* antioxidant activity of vitamin C (AA) and its derivatives, magnesium ascorbyl phosphate (MAP), ascorbyl tetra-isopalmitate (ATIP) as well as their *in vivo* anti-ageing effects by using Cutaneous Bioengineering Techniques on human skin. The study of antioxidant activity *in vitro* was made with an aqueous and a lipid system, the luminol-chemiluminescence, and malondialdehyde assay, respectively.

S. Ahn, S. Kim, H. Lee, S. Moon, I. Chang, O. Lee, **Correlation between a Cutometer® and quantitative evaluation using Moire topography in age-related skin elasticity,** Presentation at the IFSCC in Florence 2005

As aging occurs, our skin gets more wrinkles, becomes drier and loses its elasticity. Validating the evaluation of skin elasticity is especially important, because it is not as visible as other signs of aging such as wrinkles. Here, we identified the correlation between age and the parameters given by Cutometer®, and we present the parameters of that reflect the decreases in skin elasticity in terms of

ages. (U_r/U_f, U_a/U_f, U_r/U_e, U_a, r = -0.687~-0.725). Also we developed an evaluation method to quantify the sensory value of viewing. A five-grade standard of Moire topographic photo scale on face was prepared using sensory evaluation of 20 to 61 year-old women.

P. Granata, R. Maffei Facino, A. Ghirardini, E. Berardesca, G. Primavera, M. Carrera, **Tyrosyl-Histidine Dipeptide: A New Approach Against Premature Aging,** Presentation at the IFSCC in Florence 2005

Oxidative fragmentation of polyunsaturated fatty acids in the skin generates cytotoxic aldehydes, mainly 4-hydroxy-*trans*-2-nonenal (HNE), involved in premature skin aging and photo-aging, due to the formation of collagen and elastin cross-links, skin enzymes inactivation, accumulation of lipid peroxidation products. Since histidine-containing dipeptides have been recently shown to possess carbonyl quenching activity, we developed a series of different dipeptides with the aid of combinatorial chemistry and each of them was subjected to antioxidant and anti-carbonyl assays, in a cell-free model using the ORAC assay (Oxygen Reactive Antioxidant Capacity) for anti-lipoperoxidant activity, HPLC analysis for the evaluation of the HNE quenching ability and LC-MS/MS for the characterization of the site and of the mechanism of adduction.

K. Yagi, K. Ogawa, T. Kanemaru, K. Joichi, N. Kunizawa, R. Takano, **Optical Rejuvenation MakeUp Using an Innovative Shapecontrolled Hybrid Powder,** Presentation on the IFSCC in Florence 2005

For women, the sagging on the face skin that is noticed with aging is one of the important problems that should be solved. Although conventional cosmetics that can prevent sagging are only skin-care products, no makeup cosmetics that can correct the appearance of sagging have been developed. The vital factors of an optical rejuvenating makeup were found to recover the skin tension and to lighten up the face shadow appeared on the sagging skin. Therefore, the hybrid powder consisting platy barium sulfate on the surface of titanium dioxide coated mica having red interference light was developed. The panel test resulted that almost all panels could realize the rejuvenating effect of the foundation containing the powder. The image analysis showed that the finishing of the foundation was 12-years-younger than no makeup face.

J.-H. Kim, G.-S. Sim, J.-H. Kim, D.-H. Lee, Y.-H. Cho, B.-C. Lee, H.-B. Pyo, **Effects of *Draconis sanguis* on antioxidant and MMP-1 expression in human dermal fibroblast,** Presentation on the IFSCC in Florence 2005

UV irradiation stimulates the production of free radicals and reactive oxygen species (ROS) and overexpression of matrix metalloproteinases (MMPs) in the human skin. These cause various types of cell damages and destruction of connective proteins such as collagen in the skin. In order to develop new anti-photoaging agents, we examined the antioxidant activity and the inhibitory effect of MMP-1 (collagenase) with the extracts of oriental herbs.

D. Bissett, J.E. Oblong, C.A. Berge, **Niacinamide: A B vitamin that improves aging facial skin appearance**, Dermatol Surg., 2005 Jul;31(7 Pt 2): p. 860-865

Background: In multiple chronic clinical studies, topical niacinamide (vitamin B3) has been observed to be well tolerated by skin and to provide a broad array of improvements in the appearance of aging facial skin (eg, reduction in the appearance of hyperpigmentated spots and red blotchiness). Objective: To clinically determine the effect of topical niacinamide on additional skin appearance and property end points (wrinkles, yellowing, and elasticity). Methods: Female white subjects (N = 50) with clinical signs of facial photoaging (fine lines and wrinkles, poor texture, and hyperpigmented spots) applied 5% niacinamide to half of the face and its vehicle control to the other half twice daily for 12 weeks (double blind, left-right randomized). Facial images and instrumental measures were obtained at baseline and at 4-week intervals. Results: Analyses of the data revealed a variety of significant skin appearance improvement effects for topical niacinamide: reductions in fine lines and wrinkles, hyperpigmented spots, red blotchiness, and skin sallowness (yellowing). In addition, elasticity (as measured via cutometry) was improved. Corresponding mechanistic information is presented. Conclusion: In addition to previously observed benefits for topical niacinamide, additional effects were identified (improved appearance of skin wrinkles and yellowing and improved elasticity).

H. Dobrev, **Evaluation of the efficacy of a Rooibos Extract containing anti-wrinkle cream**, EADV, May 2005, Sofia, Bulgaria (abstract and poster)

Background: Rooibos plant possesses scientifically proven anti-oxidative, anti-allergic, anti-microbial and anti-inflammatory features. Aim: To evaluate the efficacy of a Rooibos extract containing cream on aged facial skin using in vivo skin bioengineering techniques.

H. Dobrev, **The Effects of topically applied Matrixyl, natural grape seed and avocado oils on skin surface, hydration and elasticity**, EADV, May 2005, Sofia, Bulgaria (abstract/poster)

Background: Matrixyl is a lipophilic pentapeptide that stimulates the collagen synthesis by fibroblasts in the skin. The grape seed extract is rich in flavonoids which are powerful antioxidants. Avocado oil consists predominantly of unsaturated fatty acid glycerides, vitamins and minerals, and has good emollient properties.

H. Dobrev, **Application of Cutometer area parameters for the study of human skin fatigue**, Skin Research and Technology 2005-11, May, p. 120-122

The hallmark of age-related changes of skin mechanical properties is the decrease in its elastic properties. This results in larger fatigue of adult skin than young skin after applying multiple stress at one and the same anatomic region.

R. Debowska, K. Rogiewicz, T. Iwanenko, M. Kruszewski, I. Eris, **Folic Acid (Folacin) – New Application of a Cosmetic Ingredient**, Kosmetische Medizin 3/2005, p. 16-22

Many years of trials and research tests proved that a lot of well-known vitamins could be successfully used in cosmetology. The available data indicate that one of them – folic acid plays an important role in life process of mitotically active tissues and its deficiency increases background level of DNA damage.

P. Humbert, P. Creidi, A. Richard, A. Rougier, **Efficacy of a 5% ascorbic acid cream on skin aging induced by UVA**, JAAD Case Reports, 2005

The aim of this study was to assess the tolerance and the effect of a cream combining ascorbic acid and sunscreen on women with facial heliodermatitis, after receiving UVA and repeated application of the cream for 3 months. A 3-month, open study (daily application of the active on the face) was conducted in 20 women with heliodermatitis (age range, 50-65 years). At each visit (day 0, day 30, day 61, day 94), volunteers had a clinical examination on several items, and biometric measurements were performed: corneometry (CM825; Courage et Khazaka), cutometry (SM810; Courage et Khazaka), and wrinkles evaluation analyzed with fringe projection (prototype). These volunteers were irradiated with UVA 3 times per week over 3 months, with increasing doses (10 J/cm2 the first week, 15 J/cm2 the second week, 20 J/cm2 until the end of the study). Clinical scoring showed a significant increase in hydration, slackness, softness, bright complexion and a significant decrease in roughness and wrinkles. Skin hydration (SH) as determined by corneometry as well as skin elasticity (Ur/Ue) of the face were significantly increased by the cream (SH = 54.3 ± 9.3 at day 0 and SH = 63.5 ± 7.9 at day 94; Ur/Ue = 0.454 ± 0.113 at day 0 and Ur/Ue = 0.549 ± 0.084 at day 94). The wrinkles were significantly decreased as shown by the volume (V) assessed by fringe projection *in vivo { P =* .0361) and the depth of the wrinkles *(P =* .0024). One of the main causes of skin aging induced by the environment is UV radiation from the sun. Previous studies have shown that UV radiation decreases basal ascorbic acid levels. This study has shown the benefit of using a cream combining ascorbic acid and sunscreen in terms of protection and efficacy against photoaging, by improving wrinkles, skin elasticity, and skin hydration, even after 3 months of repeated UVA irradiation.

T. Kawakita, Y. Takano, N. Asano-Kato, M. Tanaka, M. Dogru, E. Goto, K. Tsubota, S. Takahashi, K. Fukagawa, H. Fujishima, **Quantitative Evaluation of Eyelid Elasticity Using the Cutometer SEM575 and Its Clinical Application in Assessing the Efficacy of Tacrolimus Ointment Treatment in Eyelid Atopic Dermatitis,** Cornea, 2004 Jul;23(5): p. 468-471

Purpose: To study the clinical efficacy of a noninvasive suction device that measures eyelid skin elasticity in the treatment of eyelid atopic dermatitis using tacrolimus (FK-506) ointment. Methods: Ten patients with eyelid atopic dermatitis treated with tacrolimus ointment and 10 normal volunteers participated in this study. The cutometer SEM575 was used to quantitatively evaluate eyelid skin elasticity. Severity of the eyelid atopic dermatitis was scored, and comparisons were made before and after treatment. Results: Skin elasticity of patients with eyelid atopic dermatitis was significantly lower than that of normal volunteers (31.3 ± 5.2% vs 40.2 ± 7.8%, respectively). Skin elasticity of patients with eyelid atopic dermatitis improved significantly to 37.5 ± 6.3% after treatment with tacrolimus ointment. The total severity score for eyelid atopic dermatitis also improved from 2.77 ± 1.11 to 1.77 ± 1.15. Conclusion: Measurement of skin elasticity using the cutometer SEM575 is a useful and reliable method for objective and quantitative evaluation of eyelid skin condition in patients with eyelid atopic dermatitis. The efficacy of short-term tacrolimus ointment treatment in patients with eyelid atopic dermatitis was confirmed quantitatively using this apparatus.

M. Marcenaro, S. Sacco, S. Pentimalli, L. Berretta, V. Andretta, R. Grasso, R.C. Parodi, M. Guarrera, D. Scarpati, **Measures of late effects in conservative treatment of breast cancer with standard or hypofractionated radiotherapy**, Tumori, Nov-Dec 2004;90(6):586-91

Aims and background: To confirm the equivalence in terms of late effects between two fractionation schedules of radiotherapy in conservative treatment of breast cancer. Methods: Fifty-eight patients treated at our institution from 1999 to 2002, with a median follow-up of 15 months (range, 7-46 months), were evaluated retrospectively. Twenty-nine patients (group A) were treated with standard fractionation: 5000 cGy/25fx/5 weeks, and 29 patients (group B) were treated with a hypofractionated schedule: 4500 cGy/15fx/5 weeks, three fractions per week. Late effects were evaluated using the LENT-SOMA scoring scale. The cosmetic results were assessed on a five-point scale. Skin elasticity was measured using a dedicated device (Cutometer SEM 575). Results: There were no differences in breast volume, age at diagnosis and follow-up between groups. The LENTSOMA toxicity observed in groups A and B, respectively, was as follows: grade 2-3 pain in five patients in each group; grade 2 breast edema in two and three patients; grade 2-3 and grade 2 fibrosis in six and eight patients; grade 2 and grade 2-3 telangiectasia in two and three patients; grade > or = 2 and 2 arm edema in two and one patients; no ulceration or atrophy were observed. Two patients in group A and one patient in group B needed treatment for breast and arm edema and arm edema, respectively. Very good, good-acceptable, and poor cosmetic results were observed in seven and two, fifteen and nineteen, and six and eight patients, respectively. Median skin elasticity loss due to treatment was -4.19% in group A and -6.29% in group B. These results are not statistically different. Conclusions: LENT-SOMA toxicities were minimal and no differences were observed between groups. Few patients in the hypofractionated group had very good cosmetic results, but it is debatable if radiotherapy was the only cause. Skin elasticity was not different between groups. Our results seem to suggest that it is possible to treat patients with both schedules, with similar late toxicity

H. Tagami, **Development of Skin Measurement Instruments**, JMAJ 47(11): p. 495–500, 2004

The observation of skin changes has long been conducted with an emphasis on the visually identifiable and palpable lesions. However, because of the limitation of sensory evaluation, efforts have been made during the last 30 years toward the introduction of various types of instrumental measurement. Skin conditions that have conventionally been categorized as normal can now be classified into various types on the basis of numerical values. Achievements from such studies are widely utilized not only for the treatment of diseases, but also in the field of cosmetics. Of particular importance is the measurement of the barrier function of the stratum corneum in the outermost layer of the skin, as well as its water content. Such measurement enables us to perform numerical assessment of skin irritation and abnormal cornification. It also facilitates the quantitative evaluation of the action of topical drugs in softening and smoothing the skin surface. Skin color, surface topography, and stiffness can also be evaluated numerically. The magnified observation of the skin assists the differential diagnosis of malignant tumors. Recent developments are enabling us to perform in-situ non-invasive observation of the internal structures of the skin, eliminating the need for invasive biopsy and histopathological studies to some extent.

H. Dobrev, **Impact of Three Different Emulsions on Skin Hydration And Elasticity,** Department of Dermatology and Venereology, Med. Uni. Plovdiv, Bulgaria

The well-hydrated skin is smooth, soft and elastic. Therefore, the restoration and maintenance of skin water content is the main goal of skin care products. Currently, two kind of moisturizers are used [1, 2]: Emollients (lipids), which reduce the loss of water from the skin by simple occlusion of its surface and by improvement of water-holding capacity of stratum corneum in result of restoration of the lipid layers around the corneocytes. Humectants (urea, glycerin, lactic acid, pyrrolidone carboxylic acid, hyaluronic acid), which bind or attract water in or to the corneal layer.

*H. Dobrev***, Comparative Study Of The Mechanical Properties In Erysipelas Of The Lower Legs Using Suction Method And Share Wave Propagation Method**, EADV Plovdiv Bulgaria, 13th Congress "The Renaissance Of Dermatology", Florence 2004.

Inflammatory dermal edema in erysipelas alters skin mechanics. The aim of this study was to compare the informativeness of two different methods for evaluation of skin mechanical properties.

H. Dobrev, **Application Of Cutometer Area Parameters For Study Human Skin Fatigue**, Department of Dermatology and Venereology, Med. Uni. Plovdiv, Bulgaria.

The hallmark of age-related changes of skin mechanical properties is the decrease in its elastic properties [1-2]. This results in bigger fatigue of adult skin than young skin after applying multiple stress

at one and the same anatomic region. Skin fatigue can successfully be evaluated with a suction skin elasticity meter (Cutometer) using measurements with several repetitions of the measuring cycle [3].

F. M. Hendriks, D. Brokken, C.W. J. Oomens, F. P. T. Baaijens, **Influence of hydration and experimental length scale on the mechanical response of human skin in vivo, using optical coherence tomography**, Skin Research and Technology 10, p. 231-241, 2004

Human skin is a complex tissue consisting of different layers. To gain better insight into the mechanical response was studied with experiments of various length scales. Also, the influence of (superficial) hydration on the mechanical response is studied.

M. Fröschle, R. Plüss, A. Peter, F. Etzweiler, **Phytosteroids for skin care**, Personal Care, Vol. Sept. 2004

Healthy skin is a largely self-regulating system. In order to keep metabolic processes functioning efficiently, the relevant biological precursors and activators must be available to the skin cells for metabolism. If, due to age-related changes, the body no longer provides a sufficient amount of certain substances, an additional external supplement can proactively support the biological processes and thus counteract the advance of the ageing process.

J. Rabbels, **Klinische und Experimentelle Untersuchungen zur Abheilung von Spalthautentnahmestellen,** Dissertation der Berufsgenossenschaftlichen Unfallklinik Tübingen 2004

Einleitung: Die Wunde: Man versteht unter einer Wunde eine Unterbrechung des Zusammenhangs von Körpergewebe mit oder ohne Substanzverlust. Ursache können unterschiedliche physikalische oder chemische, aber auch entzündliche oder ischämische Einwirkungen sein. Dabei kommt es zur Eröffnung von Blut- und Lymphgefäßen sowie zur Zellschädigung. Unter einer kutanen Wunde wird eine mehr oder minder klaffende Durchtrennung der Haut verstanden. Die oberflächlichste Form einer Hautwunde ist die Hautabschürfung oder Exkoriation. Sie betrifft immer nur die gefäßlose Epidermis. Da die Epidermis zur Regeneration befähigt ist, heilen diese oberflächlichen Wunden narbenlos ab (9). Tiefere Wunden liegen vor, wenn die Verletzungstiefe in der Dermis liegt, wie z.B. bei Spalthautentnahmestellen. Die tiefste Form der Hautwunde ist der Vollhautdefekt, bei dem alle Hautschichten verlustig sind.

G. Guglielmini, M. Cucchiara, **Cosmetic treatment for heavy legs**, Poster Presentation, IFSCC Orlando, 2004

Heavy legs is a really widespread problem. It hits the 50% of the adults of more than 50 years old, with a prevalence for female sex, interested 4 times more than the male one. Subjects perceive some symptoms associated to a sense of tiredness and to a sensation of pain for lower limbs…

M. Kumar, **Biotechnology for Personal Care: A Case Study of Silk-Elastin Protein Polymer**, Biochemistry Department, USA, Poster Presentation, IFSCC Orlando, 2004

Designer Proteins are in need as active ingredients to perform a variety of functions and to impart desired characteristics to personal care product formulations. Advances in genetic engineering offer a unique opportunity to design specific, targeted properties, and production of consistent fermentation based protein polymers with desired properties that are important to provide specific benefits.

J. C. Leverett, J. Gour, J. Mayne, **Immunofluorescent Imaging Of Dermal Proteins Using Laser Scanning Confocal Microscopy**, IFSCC Orlando 2004, Podium Proceedings

More powerful tools are needed in order to develop the next generation of functional cosmetics. Today´s highly evolving field demands a greater understanding of the root causes of actinic and age related damage that until recently were seen as merely surface phenomenon. By understanding these causes, better solutions can be discovered which will produce a more profound effect for the consumer.

H.H. Chan, D.S.Y. Wong, W.S. Ho, L.K. Lam, W. Wei, **The Use of Pulsed Dye Laser for the Prevention and Treatment of Hypertrophic Scars in Chinese Persons,** Dermatologic Surgery, Voulme 30, issue 7, July 2004, p. 987-994

Background. Pulse dye laser has been used with variable degrees of success in the treatment of hypertrophic scars, and although earlier reports suggested a significant degree of improvement, more recent studies have raised concern about its effectiveness. Furthermore, most previous studies examined its use in patients with light skin types, and the use of pulse dye laser in dark-skinned patients for the treatment of hypertrophic scars is not well established.

L.J. Draaijers, Y.A.M Botman, F.R.H. Tempelman, R.W. Kreis, E. Middelkoop, P.P.M. van Zuijlen, **Skin elasticity meter or subjective evaluation in scars: a reliability assessment**, Journal of the International Society for Burns Injuries, Vol. 30, Issue 2, March 2004, p. 109-114

Various methods are available for evaluating the elasticity of scars. However, the reliabilty and validity of these methods have been spersely examined.

H. Tronnier, U. Heinrich, **Beautytek-Studie: Gutachten über einen Wirksamkeitsnachweis einer kosmetischen Behandlung**, Dermatronnier, Institut für experimentelle Dermatologie i. A. für medilab GmbH & Co., Würzburg, Mai 2004

Unter Bezugnahme auf unseren Forschungsauftrag 19/2/04 vom 20.02.2004 sowie unter Bezugnahme auf Ihr Schreiben vom 29.09.2003 erstatten wir Ihnen nachfolgend ein Gutachten über einen Wirksamkeitsnachweis einer kosmetischen Behandlung. *

C. Brandi, C.D. Aniello, L. Grimaldi, E. Caiazzo, E. Stanghellini, **Carbon Dioxide Therapy: Effects on Skin Irregularity and Its Use as a Complement to Liposuction,** Aesthetic Plastic Surgery 2004

For a successful conventional or superficial liposuction, it is necessary to consider the competence of the surgeon who is to administer the procedure necessary for this type of surgery as well as the physical and psychological evaluation of the determined patient. A poor result often is related to the persistence of adipose tissue irregularity in the form of fatty tissue accumulation. This complication, common to this type of surgery, has called for research to determine methods for its treatment. Carbon dioxide (CO_2) therapy refers to the transcutaneous and subcutaneous administration of CO_2 for therapeutic purposes. This treatment originated at the Royal Spas of France in 1932 with the treatment of patients affected by obliteration of arteriopathies. Recent studies have demonstrated the effect of subcutaneous CO_2 therapy performed to improve local parameters of circulation (performed by Doppler, laser–Doppler, and trans-cutaneous partial pressure of oxygen determination), and to reduce localized adiposities (verified reporting variations in maximum circumference and performing histologic studies). With these results, the absence of toxicity, and the relevant side effects related to this treatment taken into consideration, the Plastic Surgery Unit of Siena has been committed to researching the role that CO2 therapy can play in the treatment of skin irregularity and as a complement to liposuction. The authors report their experience using CDT therapy apparatus and 30GA1/2 0,3X13 microlance needles for the treatment of patients with adipose tissue accumulations located on the thighs and knees. In their study, 42 patients were divided into three groups: A, B, and C. In Group A, only liposuction was performed. In group B 3 weeks after liposuction CO_2 therapy was administered in two weekly subcutaneous applications of CO_2 for 10 consecutive weeks. In group C, CO_2 therapy alone was administered with the same contingencies used for group B (two weekly subcutaneous applications of CO_2 for 10 consecutive weeks). The objective was to assess the effectiveness of CO_2 therapy for skin irregularity and as a complement to liposuction for adipose tissue accumulation by reporting variations in circumference and skin elasticity monitored by the Cutometer SEM 474 in all treated areas. The data obtained were analyzed statistically. Values of *p* less than 0.05 were considered significant. The authors report their experience and the results achieved from the study.

E. Hernandez, **Bioengineering in Dermatology and Cosmetology: Methods, Studies and Prospects**, SÖFW-Journal, 129. Jahrgang, 11-2003

One of the trends in modern dermatology and its perspectives for the near future are skin bioengineering and imaging. The 1st joint meeting of two scientific societies focusing on measurements and visualisation of skin function, structure and physiology – the International Society for Skin Imaging (ISSI) – took place in Hamburg, May 21-24, 2003. Before that, the meetings and conferences organised by these societies had been held separately.

P-A. Wendling, G. Dell'Acqua, **Skin biophysical properties of a population living in Valais, Switzerland,** Skin Research and Technology 2003, 9, 306-311

On average we observed low values of skin capacitance that identify subjects with dry skin. Measures of skin visco-elasticity ratios were also particulary low, while skin pH and sebum content were in the normal range. Age was correlated with a decrease of skin elasticity and sebum content, but there was no correlation with hydration or pH.

L.P.L. van de Vijver, E. Boelsma, R.A. Bausch-Goldbohm, L. Roza, **Subjective skin condition and its association with objective skin measurements**, Cosmetics & Toiletries, Vol. 118, No. 7, July 2003

From a group of 302 volunteers, the authors obtained both selfreported subjective evaluations of skin condition and objective measurements of skin conditions, and then looked for correlations between the subjective and objective kin measures.

M. Jouandeaud, M. Dana, B. Closs, **A new generation of tensor actives**, Household and Personal Products Industry, June 2003

After age 50, or thereabouts, women experience a slackening of the skin and a loss of elasticity and tone. Cutaneous aging results primarily in the appearance of more or less marked wrinkles, which are accentuated on the photo-exposed body areas such as the face, the neck or hands. In order to "erase"the effects of age, consumers are eager to test an entire range of anti-wrinkle substances, or take more drastic measures such as undergoing plastic surgery.

H.K. Lee, S.Y. Bae, S.J. Moon, I.S. Chang, **Comparisons of skin characteristics between men and women using non-invasive methods in young healthy Asians**, Skin Research and Technology, Vol. 9, No. 2, May 2003

Skin has different properties depending on intrinsic effects such as inherent factors, race, gender and so on. Besides, it has been known that skin may change because of the environmental stress such as UV, climate and life style. We would like to know the differences of skin characteristics between male and female. The results of this study might be applicate the depart of dermatology and cosmetology.

D. Brokken, L.J.M. Schlangen, P.M. van Kemenade, **A mechanical model for the skin suction experiment**, Skin Research and Technology, Vol. 9, Nr. 2, May 2003, Abstract No. P72

The skin suction experiment is one of the most widely used methods in dermatology and cosmetology to evaluate the mechanical properties of the skin. Usually, the skin is sucked into an aperture repeatedly by applying an intermittent partial vacuum (P).

I. Sadiq, T. Stoudemayer, A. Kligman, **Blue light visualizes the degree of solar elastosis in photodamaged human facial skin**, Skin Research and Technology, Vol. 9, Nr. 2, May 2003, Abstract No. P74

We have utilized the short wavelength visible light (blue light) to visualize the fluorophores and chromophores of photo-aged facial skin. Topographic details of the surface can also be seen with great clarity.

L.J.M. Schlangen, D. Brokken, P.M. van Kemenade, **Correlation between small aperture skin suction parameters: statistical analysis and mechanical model,** Skin Research and Technology, Vol. 9, No. 2, May. 2003

Skin suction experiments are widely used in order to evaluate the effects of skin treatments, both for cosmetic and for dermatological purposes. Classically, the elevation of the skin is measured at different discrete time instances after the pressure has been changed. Relations between the classical parameters-Uv, Ur, Ue and Uf-have been investigated and used in order to develop a new model for interpreting the mechanical properties of the skin.

M. I. Nogueira de Camargo Harris, **Propriedades biomecânicas da pele,** Pele: estrutura, propriedades e envelhecimento, Editora Senac, Sao Paulo, 2003

A biometrologia cutânea, ramo da ciência que avalia quantitativamente as propriedades biomecânicas da pele, tem encontrado na cosmetologia um importante aliado, pois o apelo mercadologico dos produtos destinados aos cuidados com a pele e com os cabelos tem-se baseado cada vez mais em evidências cientificas e tecnicas sensiveis, precisas e validadas, ao inves de serem fundamentadas em especulacoes.

P.M. van Zuijlen, **Perspectives On Burn Scar Evaluation and Artificial Skin**, Dissertation 2002

H. Zahouani, J. Asserin, P. Humbert, **Mechanical Properties of the Skin During Friction Assessment**, CRC Press 2002, p. 49-58

Previous studies on the tribology of human skin have attempted to demonstrate a correlation between certain certain tactile sensations and the friction between the skin surface and variety of probes. In addition, friction measurements have been used to provide in vivo information about the effects of age, hydration, dermatitis, and cosmetic products on both the interfacial and bulk properties of skin.

M. Hara, T. Ma, A.S. Verkman, **Selectively Reduced Glycerol in Skin of Aquaporin-3-deficient Mice May Account for Impaired Skin Hydration, Elasticity, and Barrier Recovery**, The Journal of Biological Chemistry, Vol. 277, No. 48, Issue of November 29, p. 46616–46621, 2002

Deletion of the epidermal water/glycerol transporter aquaporin-3 (AQP3) in mice reduced superficial skin conductance by ~2-fold (Ma, T., Hara, M., Sougrat, R., Verbavatz, J. M., and Verkman, A. S. (2002) J. Biol. Chem. 277, 17147–17153), suggesting defective stratum corneum (SC) hydration. Here, we demonstrate significant impairment of skin hydration, elasticity, barrier recovery, and wound healing in AQP3 null mice in a hairless (SKH1) genetic background and investigate the cause of the functional defects by analysis of SC morphology and composition. Utilizing a novel 3H2O distribution method, SC water content was reduced by ~50% in AQP3 null mice. Skin elasticity measured by cutometry was
significantly reduced in AQP3 null mice with ~50% reductions in elasticity parameters Uf, Ue, and Ur. Although basal skin barrier function was not impaired, AQP3 deletion produced an ~2-fold delay in recovery of barrier function as measured by transepidermal water loss after tape stripping. Another biosynthetic skin function, wound healing, was also ~2-fold delayed by AQP3 deletion. By electron microscopy AQP3 deletion did not affect the structure of the unperturbed SC. The SC content of ions (Na^+, K^+, Ca^{2+}, Mg^{2+}) and small solutes (urea, lactic acid, glucose) was not affected by AQP3 deletion nor was the absolute amount or profile of lipids and free amino acids. However, AQP3 deletion produced significant reductions in glycerol content in SC and epidermis (in nmol/µg protein: 5.5 ±0.4 versus 2.3 ± 0.7 in SC; 0.037 ± 0.007 versus 0.022 ± 0.005 in epidermis) but not in dermis or blood. These results establish hydration, mechanical, and biosynthetic defects in skin of AQP3-deficient mice. The selective reduction in epidermal and SC glycerol content in AQP3 null mice may account for these defects, providing the first functional evidence for physiologically important glycerol transport by an aquaporin.

H.S. Yoon, S.H. Baik, C.H. Oh, **Quantitative measurement of desquamation and skin elasticity in diabetic patients,** Skin Research and Technology, Vol. 8, No. 4, Nov. 2002

Diabetes mellitus is responsible for many cutaneous alterations. Xerosis and sclerotic change of the skin are the most common findings. Recently non-invasive computerized devices have been developed and used for determining the desquamation rate and measuring the mechanical properties of the skin. Using these devices, the necessity to characterize the conditions of the skin in the healthy as well as the diseased state is increasing.

P. Humbert, P. Creidi, B. Chadoutaud, J.C. Choulot, P. Msika, **Photoageing: clinical and biometrological results of a double-blind randomized trial evaluating a new cosmetic product containing avocadofurane plus pentapeptides and retinol (abstract),** 11th Congress of the European Academy of Dermatology and Venereology, Prag 2002

The role of metallo matricial proteinases (MMPs) in cutaneous ageing is now well established. Moreover the decrease of TGF-beta has been more recently discovered. Two new molecules have been developed in this field: pentapeptides which inhibit the production of MMP1, -3, -9 by UV exposure on fibroblast cultures and pure heptadecadienylfurane (Avocadofuranea) which increases the collagen synthesis via a specific stimulation of TGF beta.

J-H. Park, S-W. Son, Y-M. Yoon, M-H. Lee, Y-S. Lee, H-C. Kim, H-S. Oh, C-H. Oh, **Objective evaluation for xerosis by morphological study in atopic dermatitis,** Symposium of the International Society for Bioengineering and the Skin, Baltimore Oct. 24-26, 2002

It is essential to be able to measure and record the severity of atopic dermatitis for routine clinical practice and research. Many clinical severity scales have been proposed, but not yet objective. Of severity scoring systems currently available for atopic dermatitis, the SCORAD index has been the most extensively tested.

H. Dobrev, **Study of Human Skin Fatigue**, Medicine and Stomatology Session, 18 October, 2002 House of Scientists, Plodiv, Bulgaria
The aim of this study was to determine age-related changes in human fatigue.

L.M. Rodrigues, P.C. Pinto, P. Lamarao, **After-sun claims substantiation: experimental criteria to assess the in vivo effects of sun care products under controlled-using conditions,** Cosmetics & Toiletries, Vol. 117, No. 10, October 2002

The authors describe a practical method of substantiating claims of “after-sun” products. Ten healthy women 35-65 years old were irradiated on both legs (antero-lateral) in a laboratory for six sequential days using an indoor solarium-type UV source. Efficacy assessment endpoints were defined from the product’s typical claims.

A. Oba, T. Gomi, Y. Nishimori, C. Graves, A. Pearse, C. Edwards, **A Non-invasive Method for Measuring Invisible Subcutaneous UV Damage,** 22nd IFSCC Congress, Edinburgh, 25.09.2002

Repeated exposure to UV radiation can induce subcutaneous damage leading to permanent structural degradation and formation of visible wrinkles. In the early stages when damage is slight, the body is capable of repairing itself, and intervention with certain drugs or treatment products may slow or even reverse the process of photoaging. This is not possible, however, when damage is severe and extensive.

H. Zahouani, C. Pailler-Mattei, R. Vargiolu, M.A. Abellan, **Assessment of the elasticity and tactile properties of the human skin surface by tribological tests,** 22nd IFSCC Congress, Edinburgh, 25.09.2002

The current paper describes the assessment of the visco-elasticity and tactile properties during a static and frictional contact of a spherical indentor on an inner human forearm. The current techniques that simultaneously measure the normal load F_z between the contacting surfaces and the friction force F_x, can be used to determine the normal and lateral stiffness, the Young modulus, static and dynamic friction forces F_z, F_d and respective friction coefficients: μ_s, μ_d.

P. Msika, F. Perin, P. Beau, et. al., **AvocadoFurane, Pentapeptides and Soy Isoflavones: A Clinical Study against Hormonal Aging, Bioengineering and The Skin**, International Congress 27-28th June 2002, Paris

A patented association containing a new inducer of collagen synthesis via TGF-beta (Avocadofurane), an MMP's inhibitor (Pentapeptides) and soy isoflavores was evealuated in postmenopausal skin aging. 30 women were engaged in two clinical studies (age < 50, no hormonal replacement theraphy) and have applied twice daily the product for 1 year.

H. Dobrev, **Mechanical Properties in Other Dermatological Diseases,** In P. Elsner, et al. (Edts): Bioengineering of the Skin, CRC Press, 2002, Chapter 19

Human Skin, as a complex multi-layered organ, has three major mechanical properties: Stiffness, i.e., resistance to change of shape; elasticity, i.e., ability to recover the initial shape after deformation; Viscoelasticity, i.e., time-dependent deformation with a "creep" phenomenon and nonlinear stress-strain properties with "hysteresis".These properties are altered in dermatological diseases, which are accompanied with pathological induration or softening of the skin. Noninvasive bioengineering measurements allow quantifying the alterations of skin mechanics *in vivo.*

R.R. Wickett, **Standardization of Skin Biomechanical Measurements,** In P. Elsner, et al. (Edts): Bioengineering of the Skin, CRC Press, 2002, Chapter 15

Standardization of measurement methods has been a goal of many researchers working on noninvasive measurement of skin function. For example, Pierard stated, "optimization of noninvasive biophysical measurements should benefit from strict standardization of measurements and frequent calibration of devices." While no absolute standards for skin measurements have been published, helpful guidelines have been published for measurement of transepidermal water loss (TEWL) and the electrical properties of skin for assessment of skin hydration.

U. Berndt, P. Elsner, **Hardware and Measuring Principle: The Cutometer®**, In P. Elsner, et al. (Edts): Bioengineering of the Skin, CRC Press, 2002, Chapter 7

The biomechanical properties of human skin are a complex combination of elastic and viscous components. Elasticity correlates with the function of elastin fibers; viscosity is controlled by the collagen fibers and the surrounding intercellular ground substance, which consists primarily of water and proteoglycans. The cutometer allows the measurement of the viscoelastic properties of the skin in vivo, which provides valuable information on physiological and pathological changes of human dermis as well as on the efficacy of topical treatments. It is recognized as a standard tool in dermatological and cosmetic research.

A. O. Barel, **Product Testing: Moisturizers**, In P. Elsner, et al. (Edts): Bioengineering of the Skin, CRC Press, 2002, Chapter 21

The presence of an adequate amount of water in the stratum corneum is important for maintaining the following properties of the skin: general appearance of a soft, smooth, flexible, and healthy-looking skin; and an intact barrier function allowing a slow rate of transepidermal water loss (TEWL) under dry external conditions, which are frequently encountered

L.A. Young, J.C. Dodge, K.J. Guest, J.L. Cline, W.W. Kerr, **Age, Breed, Sex and Period Effects on Skin Biophysical Parameters for Dogs Fed Canned Dog Food**, American Society for Nutritional Sciences, J. Nutr. 132: 1695S–1697S, 2002

Noninvasive skin biophysical methods have been used in clinical and experimental dermatology for humans (1). The application of some of these methods has also been investigated for companion animals (2–9). Skin biophysical measurements have been reported to be affected by age, breed, sex, site of measurement, animal excitement, evaluation (time) period or season, gonadal status and even coat color (9). The objective of this study was to look at the effect of age, breed, sex and time period on skin biophysical parameters for dogs fed a nutritionally complete and balanced canned food for adult dogs.

T. Gambichler, P. Altmeyer, S. Rotterdam, M. Herde, M. Stücker, K. Hoffmann, **Bioengineering der Haut,** Kosmetische Medizin, 4/2002, 23. Jahrgang

Nicht-invasive Untersuchungstechniken (Bioengineering) am Hautorgan werden in der Dermatologie und Kosmetologie zunehmend eingesetzt. Gegenüber der bloßen klinischen Untersuchung bietet der Einsatz von Bioengineering-Methoden viele Vorteile. Es lassen sich morphologische und funktionelle Parameter der Haut objektiv darstellen und standardisiert messen, die der bloßen klinischen Untersuchung bzw. sensorischen Wahrnehmung oft unzugänglich sind.

G. Maramldi, M.A. Esposito, **Potassium Azeloyl Diglycinate: A Multifunctional Skin Lightener,** Cosmetics & Toiletries, March 2002, Vol. 117, Nr. 3

Skin lightening and sebum normalization are among the useful cosmetic functions of potassium azeloyl diglycinate, a soluble derivative of azelaic acid.

H. Dobrev, **A Study of Human Skin Mechanical Properties by Means of Cutometer**, Folia Medica, XLIV 3/2002

Cutometer is a commercially available non-invasive suction skin elasticity meter. The present study discusses some aspects of the biological informativeness and interpretation of the results obtained in studying skin mechanical properties with cutometer. We analyze the results of previously published studies on the mechanical properties of healthy and diseased skins and their changes after external influences. Studying human skin using cutometer gives objective and biologically meaningful information about the mechanical properties of healthy and diseased human skin.

M. Egawa, M. Oguri, T. Hirao, M. Takahashi, M. Miyakawa, **The evaluation of skin friction using a frictional feel analyzer,** Skin Research & Technology, 2002 Feb;8(1): p. 41-51

Background/Aims: Sensory evaluation is an important factor for cosmetic products. Several devices for the measurement of sensory properties have been developed in recent years. The objective here is to measure skin surface friction using these devices and examine the correlation with other physiological parameters in order to evaluate the potential of physical measurement of tactile sensation. Methods: A KES-SE Frictional Analyzer, a commercial device for measurement of surface frictional characteristics, was used in this study. An arm holder was added to this device for measurement on the human forearm. The frictional coefficient (MIU) and its mean deviation (MMD) were used as the parameter to indicate surface friction. The moisture content in the stratum corneum was measured with a Corneometer CM825, the transepidermal water loss with a Tewameter TM210, the viscoelastic properties of the skin with a Cutometer SEM575 and the skin surface pattern by observing the negative replica using silicon rubber. Results: The MIU was not influenced by load; however, it was increased due to water application on the skin. The relationship between MIU and the moisture content in the stratum comeum, between MMD and skin surface pattern and between MMD and viscosity of both normal human forearm skin and SDS (sodium dodecyl sulfate)-induced dry skin were confirmed by statistical analysis in a test on human subjects. There was also a correlation between either MIU or MMD and sensory evaluation in the morning after the application of moisturizing products. Human skin surface friction was measured by using a KES-SE Frictional Analyzer. Conclusion: Judging from the correlation between either MIU or MMD and sensory evaluation, we considered this instrumental analysis to be useful for evaluating the tactile impression of human skin.

H.O. Rennekampff, J. Rabbels, M. Pfau, H.E. Schaller, **Evaluating scar development with objective com-puterassisted viscoelastic measurement**, Kongressbd Dtsch Ges Chir Kongr, (Article in German), 2002:119: p. 749-755

In a prospective study we compared the subjective scar assessment by the Vancouver Scar Scale with an objective viscoelastic measurement. Donor sites from the thigh primarily dressed with vaseline gauze (F), biobrane or occlusive dressing(O) were evaluated 0.5 years postoperatively by VSS and with the Cutometer (Courage and Khazaka). VSS of donor sites was 2.74 +/- 0.91 (F), 4.25 +/- 0.77 (B) and 2.57 +/- 0.72(O) (mean +/- sem). All ratings were significant compared to normal mirror-sided

skin. Viscoelastic measurements by the Cutometer were near normal compared to uninjured skin. No correlation was found between subscale VSS pliabilty rating and Cutometer readings.

M. Aalberts, **Functional changes in the bovine cervix during preganancy**, Thesis 2001-2002, Utrecht University, Faculty of Veterinary Medicine

M. Egawa, T.Hirao, M. Takahashi, **The measurement of skin friction using a frictional feel analyser**, Congress Stratum Corneum III, Basel, September 2001

Sensory evaluation is an important factor for cosmetic products. Several devices for the measurement of sensory properties have been developed in the recent years.

*H. Lambers, H. Pronk***, Biophysical Methods for Stratum Corneum Characterization**, in T. Förster (Editor): Cosmetic Lipids and the Skin Barrier, 2001 by Marcel Dekker

There is no doubt that the application of cosmetic lipids has many positive effects on the structure and function of the skin. These effects are pleiotropic, caused either by direct interaction with the epidermis, particularly the stratum corneum, or indirectly, by influencing the physiologic, homeostatic condition of the skin.

H.M. Ribeiro, J. Morais, L. Rodrigues, **Long-term Influence of Polymers on the Biological Properties of the In Vivo Normal Human Skin**, IFSCC Conference, Stockholm/Sweden, May 7-9, 2001

Cosmetic formulations are actually included into the normal skin care daily habits and often aim to contribute to the normal skin physiology.

H. Song, **The Effects of Inositol Extracted from Rice on the Skin**. Personal Care Ingredients Asia, March 2001

A.O. Barel, R. Lambrecht, P. Clarys, **Mechanical Function of the Skin: State of the Art**, Skin Bioengineering. Vol. 26, March 2001

The in vivo mechanical properties of the human skin have been studied extenively. The skin is a complex five-layered structure organ, which as many other biological materials presents the typical properties of elastic solids and various liquids in a combined way known as viscoelastic properties. Typical mechanical properties of viscoelastic material are nonlinear stress-strain properties with hysteresis (the stress-strain curve obtained during loading will not be superposed by the curve obtained during unloading).

D. Iliev, U. Hinnen, P. Elsner, **Skin Bioengineering Methods in Occupational Dermatology**, Skin Bioengineering Vol. 26, March 2001

Measruing biophysical properties of the skin is not only useful to study cutaneous physiology and pathology but may also be of value for the prediction of eczema risk, for the detection of subclinical eczema and for therapy control in occupational dermatology.

R.R. Wickett, **Stretching the Skin Surface:** Skin Elasticity, Cosmetics &Toiletries, March 2001

This contribution to the series “From Test to Claim” deals with the instrumental measurement of skin elasticity, discussing measuring conditions, relevant parameters to record, data analysis and the type of conclusions that could be drawn from such measurements. In particular, this paper will review the use of the Dermal Torque Meter (DTM) and the Cutometer to measure the elasticity of the stratum corneum.

D. Khazaka, **News in the Field of Elasticity Measurement**, Cosmetic Science Conference 2001

Dermatology and cosmetic industry have been investigating skin parameters for decades to defeat skin diseases and to test the efficacy of cosmetics and pharmaceuticals on the skin.

H. Dobrev, **Evaluation of the inhibitory activity of topical indomethacin, betamethasone valerate and emollients on UVL-induced inflammation of means of non-invasive measurements of the skin elasticity,** Photodermatology, Photoimmunology & Photomedicine, January 2001

Topical indomethacin has been reported to inhibit ultraviolet light-induced erythema. The objective of this study was to verify this assertion and to compare indomethacin 10% ointment to betamethasone valerate 0.1% ointment, water-in-oil emulsion and oil-in-water emulsion by means of non-invasive skin elasticity measurements.

K. Tsukahara, Y. Takema, S. Moriwaki, T. Fujimura, S. Mayama, G. Imokawa, **Carbon dioxide laser treatment promotes repair of the three-dimensional network of elastic fibres in rat skin**, British Journal of Dermatology, Vol. 143, 2001

We have previously reported that ultraviolet (UV) B irradiation induces a loss of linearity in the three-dimensional structure of dermal elastic fibres, which results in the reduction of elastic properties of the skin and leads to wrinkle formation. We further reported that repair of wrinkles by all-trans retinoic acid is accompanied by recovery of the linearity of elastic fibres. Carbon dixide lasers are widely used for treating wrinkles in cosmetic surgery.

S. Sustmann, **Body care for dry skin**, Scientific Study Eubos Med, 2001

Dry skin is a widespread phenomenon of our time and is characterized by a deficiency of fat and moisture.

S. Sustmann, **Face care for sensitive and particularly dry skin**, Scientific Study Eubos Med, 2001

Daily influences, such as stress and the effects of weather, attack our skin and cause damage that is initially slow and scarcely detectable.

R. Fournier, G.E. Piérard, **Skin tensile strength modulation by compressivegarments in burn patients. A pilot study**, Journal of Medical Engineering & Technology, Volume 24, Number 6, (November/December 2000), pages 277 – 280

Compression therapy is frequently used to prevent hypertrophy of post-burn scars. This pilot study was performed in 6 patients to assess non-invasive changes induced in the tensile strength of the skin before any clinical improvement can be perceived. Assessments were performed using a computerized suction device delivering three 5 s cycles of 500 mbar depression. Measurements were made at one-month intervals for three months after initiating the garment compression therapy. Comparisons were made between the intact skin, the ungrafted and grafted post-burn scars and the graft donor sites. Data show that garment compression therapy alters the tensile strength in the skin of all test sites. The most reliable variations consist of an increase in both the extensibility and elasticity of the tissues submitted to traction.

H. Dobrev, **In vivo Study of Skin Mechanical Properties in Psoriasis Vulgaris,** Acta Derm. Venerol., 2000; 80, p. 1-5

The aim of this study was to investigate the mechanical properties of the skin in psoriatic plaques before and after treatment with dithranol in clinically uninvolved psoriatic skin in comparison with skin of healthy controls.

P.P.M. van Zuijlen, A.J.M van Tier, J.F.P.M. Vloemans, F. Groenevelt, R.W. Kreis, E. Middlekoop, **Graft Survival and Effectiveness of Dermal Substitution in Burns and Reconstructive Surgery in a One-Stage Grafting Model,** Plastic and Reconstructive Surgery, September 2000, p. 615-623

Survival of autograft and subjective parameters for scar elasticity were evaluated after dermal substitution for acute burns and reconstructive surgery.

J. Habig, E. Vocks, F. Kautzky, J. Ring, **Biophysical characteristics of healthy skin and non-lesional skin in atopic dermatitis: short-term effects of ultraviolet A and B irradiation**, Skin Pharmacol Appl Skin Physiol, 2000 May-Aug;13(3-4): p. 174-181

The present study was designed to evaluate basic differences in surface structure and viscoelastic properties of nonatopic versus atopic skin and facultative acute changes following ultraviolet irradiation. Therefore, biophysical measurements by means of profilometry and cutometry were carried out on sun-protected unaffected gluteal skin areas in both groups before and 24 h after single UVA and UVB irradiations. The results indicate that the clinically unaffected skin of patients with atopic eczema differs from normal skin in terms of increased roughness parameters, but not concerning depth of furrows or viscoelastic properties (viscosity and biological elasticity, cutometrically calculated). Single UVA irradiation with 50 J/cm(2) induced neither measurable changes in the skin's surface structure nor in its viscoelastic properties in both groups after 24 h. However, irradiation with a single erythemogenic dose of 1 MED UVB was followed by a short-term significant increase in the depths of furrows and decrease in biological elasticity in normal and atopic skin, accompanied by an increase in viscosity in normal skin.

L.F. Gouveia, J. Tavares, L. Rodrigues, **Mathematical Modelation of Cutometer Acquired Signals**, 13th ISBS Jerusalem, March 2000 and Skin Research and Technology, Vol. 6, No. 3, August 2000

The biomechanical 'descriptors' obtained from systems such as the Cutometer™, a well known device used to assess the biomechanical properties of the in vivo skin using forces perpendicular to skin's surface, have been extremely useful to address such a complex characteristic of human skin.

S. Diridollou, A. Pavy-Le Traon, A. Maillet, F. Bellossi, D. Black, F. Patat, J.M. Lagarde, M. Beron, Y. Gall, **Characterisation of Gravity-Induced Facial Skin Oedema Using Biophysical Measurement Techniques**, Skin Research and Technology, Vol. 6, No. 3, August 2000

In humans, the microgravity environment can be expected to induce swelling of facial tissues and shrinking of the tissues in the lower limbs, together with a loss in body weight. To evaluate fluid shifts in skin, the head-down bed-rest model was used. the aim of the present study was to evaluate the appearance of facial oedema in subjects undergoing antiorthostatic bed-rest at an angle of –10°.

S. Sakai, S. Sasai, Y. Endo, K. Matue, H. Tagami, S. Inoue, **Characterization of the Physical Properties of the Stratum Corneum by a New Tactile Sensor**, Skin Research and Technology, Vol. 6, No. 3, August 2000

The physical properties of the stratum corneum (SC) change with its water content which is regulated by the presence of water solutes (natural moisturizing factors) and lipids in the SC, and are considered to be responsible for the induction of desquamation, skin surface roughness and fine wrinkles.

A. Morita, K. Kobayashi, I. Isomura, T. Tsuji, J. Krutmann, **Ultraviolet A1 (340-400nm) Phototherapy for Scleroderma in Systemic Sclerosis**, AAD 2000

The presence of an inflammatory infiltrate consisting of helper T cells and a dysregulated matrix metabolism leading to excessive deposition of collagen are two pathogenetic factors responsible for the developments of fibrosis and sclerosis in patients with systemic sclerosis. In previous studies, ultraviolet A1 (UVA1) radiation phototherapy was shown to deplete skin-infilltrating T cells through the induction of T-cell apoptosis and to up-regulate the expression of matrixmetalloproteinase-1 (collagenase-1) in dermal fibroblasts.

D. Schmid, A. Lang, T. Allgäuer, C. Bayerl, E.G. Jung, **Beurteilung der Veränderung der Hautbeschaffenheit durch die Heilpflanzensäfte Brennnessel und Löwenzahn**, Akt. Dermatol. 2000

Wir führten eine Anwendungsbeobachtung über die Beeinflussung von objektiven und subjektiven Parametern der Hautbeschaffenheit durch die Kombination der Heilpflanzensäfte Brennnessel und Löwenzahn bei gesunden Probandinnen durch. Zehn Probandinnen (Versuchsgruppe) nahmen über 6 Wochen die Kombination der Heilpflanzensäfte oral ein, gleichzeitig erhielten sie eine standardisierte Körperpflege mit Basiscreme DAC, weitere 10 Probandinnen (Kontrollgruppe) benutzten lediglich die standardisierte Körperpflege mit Basiscreme DAC.

J. Grudeva-Popova, H. Dobrev, **Biomechanical measurement of skin distensibility in scleredema of Buschke associated with multiple myeloma**, Clinical and Experimental Dermatology, 25, 2000, p. 247-249

We report a case of scleredema of Buschke associated with IgG kappa monoclonal hypergammaglobulinaemia.

H. Dobrev, **Evaluation of the photoprotective activity of topical indomethacin, betamethasone valerate and emollients by means of non-invasive measurements of the skin elasticity,** Department of Dermatology, Plodiv, Bulgaria

Topical indomethacin has been reported to inhibit ultraviolet light-induced erythema.

H. Dobrev, **Photoaging and Skin Elasticity**, National Session of Young Scientists, May 2000

The aim of the present study was to determine the effect of chronic sun exposure on the skin mechanical properties.

H. Dobrev, **Changes in Skin Elasticity after an Application of Emulsions containing urea and alphahydroxy acids**, 7th National Congress of Dermatology and Venereology, May 2000

The aim of the present study was to compare the effect of 3 different emulsions on skin mechanical properties-

H. Dobrev, **Influence of telegammatherapy on the skin physiology,** 7th National Congress of Dermatology and Venereology, May 2000

We investigated a female patient who after left mammectomy was treated by means of telegammatherapy with a total dose of 50 Gy (two cycles of 13 and 12 days, pause of 10 days, daily dose of 2 Gy).

H. Dobrev, **Treatment of psoriasis vulgaris with hydrocolloid occlusive dressins in combination with betamethasone dipropionate 0.05% cream**, 7th National Congress of Dermatology and Venereology, May 2000
In the present preliminary study we report comparative results regarding a new method, used for the first time in Bulgaria.

H. Dobrev, **Photoaging and Skin Elasticity**, Research Reports of the Union of scientists in Bulgaria, 19. May 2000
The aim of the present study was to determine the effect of chronic sun exposure on the skin mechanical properties.

H. Fadhli, C. Edwards, S. Gaskell, R. Marks, **Differences between normal skin and Unaffected Psoriatic Skin are Demonstrated by Cutometer and Uniaxial Extensometry, and Confirmed by Measurement of Elastic Fibre Content,** 13th ISBS Jerusalem, March 2000
Unaffected skin in psoriasis looks normal, but past work in our group hinted at subtle differences between skin from a normal individual and normal looking skin from an individual with psoriasis.

F. Henry, O. Martalo, G.E. Piérard, **Liminar Perception Threshold of Cutaneous Distension**, 13th ISBS Jerusalem, March 2000
Cutaneous sensorial perception is complex and proves to be difficult to quantify.

H.E. Packham, C.L. Packham, **Skin Bioengineering as a Contribution to Product Performance and Safety**, Cosmetics & Toiletries 03/2000
With today's increasing consumers sophistication and the demand both for products that work and are safe for the user, there is a need for greater objectivity and accuracy in both formulations and claims made by the manuafcturer.

H. Dobrev, **Use of Cutometer to assess epidermal hydration**. Skin Reserach and Technology 2000, 6, P. 239-244
The Cutometer equipped with a 2 mm diameter suction probe is a device suitable for the assessment of epodermal mechanics.

L. Vaillant, L. Declerq, D. Malvy. J.C. Béani, J Bazex, D. Maes, S. Hercberg, **Topical Antioxidant treatment provides long term pretective benefits against skin aging,** Poster Arbois 1999
Most photoniological effects (from sunburn to immunosuppressin, photoaging and photocarcinogenesis) are attributed to ultraviolet raditation and are believed to be essentially mediated by reactive oxigene species.

R. Jermann, R. Voegeli, J. Meier, **Wirkstoffe und Marktsystem der Pflegekosmetik – Rückblick, Veränderungen und zukünftige Trends**, SÖFW-Journal-Jubiläumsausgabe 1999
Die Pflegekosmetik weist eine eher junge Geschichte auf, die weniger als 100 Jahre zurück geht. Pentapharm ist seit über 20 Jahren Hersteller von Pflegewirkstofen für die Kosmetikindustrie. Vor allem in dieser Zeit hat sich sowohl bei den Produkten der Pflegekosmetik wie auch bei den Wirkstoffen viel verändert. dieser Artikel zeigt im ersten Teil die Entwicklungen des ganzen Marktsystems der Pflegekosmetik mit all den Einflüssen von außen.

U. Heinrich, B. Meick, H. Tronnier, **Neue Wege bei Behandlung von Cellulite**. Pharmazeutische Zeitung Sonderdruck 45/94, 139. Jahrgang, 1999
Das Körperbewußtsein der Verbraucher ist in den vergangenen Jahren deutlich gestiegen. Dabei werden neben reinigenden und pflegenden Anwendungen auch zunehmend Maßnahmen ergriffen, um die Körpersilhouette zu verbessern. Die Cellulite – ein weit verbreitetes Phänomen – nimmt dabei eine zentrale Stellung ein. Das sichtbare Bild der Cellulite beruht auf einer Zunahme von Fettpolstern in der Subcutis (Unterhautfettgewebe), einer Bindegewebesschwäche sowie einer Minderung der Durchströmungsverhältnisse in en Blut- und Lymphbahnen. Die Ursache ist somit eine zum Teil anlagebedingte Schwächung des Bindegewebes mit gleichzeitigen Auftreten von vergrößerten Fettzellkammern infolge von Übergewicht, unausgewogener Ernährung, Bewegungsmangel, etc.

L.M. Harnisch, M.K. Raheja, L.K. Lockhart, A. Pagnoni, A. Lopez, A. Gabbianelli, **Substantiating Antiaging Product Claims**, Cosmetics & Toiletries, Vol. 114, No. 10, October 1999

Areas of the body most battered by the damaging effects of UV raditation, such as face and hands, are also the most visible in our social life.

R.J. Koch, E.T. Cheng, **Quantification of Skin Elasticity Changes Associated With Pulsed Carbon Dioxide Laser Skin Resurfacing,** Arch Facial Plasr Surg/Vol 1, Oct.-Dec. 1999

While Skin resurfacing using pulsed carbon dioxide lasers appears to have a skin-tightening effect clinically, the debate continues over its actual effects on dermal collagen. There have been multiple histological evaluations of its effects, but it is unclear how this translates into substantive changes in skin elasticity. Objective measures of results obtained from facial plastic surgery procedures are desirable. Uniform photographic documentation has improved, but there are still inconsistencies in patient position and lighting, which may lead to skepticism over viewing the presented results. Also, physician-based grading systems have inherent elements of subjectivity no matter how good the intentions. Quantification of results in a purely objective manner would be of great benefit for all facial plastic procedures. This need has been recognized with the use of cephalometric radiographs to monitor orthognathic procedures and grid systems to assess browlift results.

L.M. Rodirigues, **EEMCO Guidance to the in vivo assessment of tensile functional properties of the skin,** EEMCO Group, Part 2: Instruments and Test Modes

Tensile functions of the skin and subcutaneous tissues contribute to the appearance of the aged and photodamaged skin and to the effects of various other pathophysiological processes.

H. Dobrev, **Non-invasive Monitoring of the Mechanical Properties of Keloids during Cryosurgery,** Acta Derm. Venereol., 1999; 79, p. 1

Non-invasive bioengineering techniques are successful in monitoring the progres and response to treatment of various skin diseases.

M. Förschle, I. Frei, **Elastisch und geschmeidig – Tests zur Messung der Hautstraffung,** Kosmetik International 6/99

Der Hauptnutzen vieler Produkte ist es, die Haut der jüngeren Konsumentin elastisch und geschmeidig zu erhalten, bzw. die der älteren Verwenderin wieder straffer aussehen zu lassen.

*W. Voss, G. Schlippe, M. Breuer***, Tests on Cosmetics Scientific Standards**, SÖFW-Journal 4/99

In general, body care articles and cosmetics have only a low allergy potential. The probability that toxic-irritative reactions will arise after proper use is even lower.But especially with patients with sensitive skin, unclear skin reactions, which can frequently be confused with allergies, can arise. The cosmetics manufacturers, however, would like to produce safer products and naturally want to avoid that type of problem from the start.

M. Puschmann, A. Melzer, H.P. Nissen, **Hautglätende, hautelastische und hautschützende Wirkung einer Urea-Ceramid-Kombination,** Kosmetische Medizin Nr. 4, 1999-11-22

Sebostase ist ein häufiges dermatologisches Krankheitsbild. Sie wird durchexogene Faktoren, (Klima, Waschgewohnheiten) und/oder konstitutionelle Faktoren wie Alter und atopische Hautdiathese hervorgerufen. Eine auffällige Häufung derartiger Symptome findet sich in der kalten Jahreszeit. Hier ist das Klima (Temperatur, Luftfeuchtigkeit) sowohl im Freien als auch in den Gebäuden als wichtiger Kofaktor anzusehen. Zur Therapie trockener Haut werden traditionell Salben/Fettsalben, Ölbäder sowie harnstoffhaltige Zubereitungen eingesetzt.

C. Greif, W. Wigger-Alberti, M. Arens-Corell, P. Elsner, **Beurteilung einer Körperlotion für trockene und empfindliche Haut,** Poster – 5. Tagung der ABD, Aachen 03/99 und Allergologie 3, 03/1999

Durch häufige Reinigungsmaßnahmen kann es zu einer starken Entfettung des Stratum corneum und zu Störungen der epidermalen Permeabilitätsbarriere kommen.

S. Gütt, **Rheologische in vivo-Untersuchung an der menschlichen Haut mit nicht-invasiven Verfahren**, Dissertation aus dem Institut für Gewerblich Technische Wissenschaften - Fachrichtung Körperpflege - der Universität Hamburg, 1998 (German language)

Changes in the regulatory guidelines for cosmetics as well as consumer interest have led to increased efforts in assessment of product efficacy and claim substantiation. Within the framework of the development of modern emulsion systems with improved percutaneous absorption, it is important to be able to detect even slight alterations in skin conditions. This requires a selection of suitable

measurement procedures with high reproducibility. This dissertation focuses on the evaluation of methods for the noninvasive measurement of biomechanical skin parameters, particularly in conjunction with application of cosmetic skin care products.

J.S. Koh, K.S. Chae, H.O. Kim, **Skin Characteristics of Normal Korean Subjects According to Sex and Site using Non-Invasive Bioengineering Methods**, Korean J Dermatol., 1998 Oct; 36(5): p. 855-864

Background: During the last few years, the in vivo study of the physiological parameters of the skin by non-invasive methods has been considerably developed. So far, there have been some reports on the skin characteristics only in parts, but there has not been any criteria to classify those of normal subjects. Objective: The aim of the present study was to investigate the skin characteristics of healthy Korean subjects according to sex and sites using non-invasive methods. Methods: To determine normal levels of sebum, skin hydration, transepidermal water loss (TEWL), skin elasticity and skin color according to sex, 163 subjects (male; 124, female; 39) were used to investigate 5 different anatomical sites. 6 different instruments were used: The Sebummeter SM 410, Corneometer CM 820, Evaporimeter EP1, Cutometer SEM 474, Chromameter CR-121, and Mexameter MX 16, for evaluating sebum excretion rate, capacitance, TEWL, mechanical property and skin color respectively. Results: Differences were noticed depending on the anatomical sites and sex. Most of the measuring parameters were significantly different according to sites and sex. The values of sebum levels, capacitance and TEWL were higher in the males on the cheek, forehead and crows foot, whereas in the females, higher values were observed on the dorsum of the hand. The skin elasticity varied considerably among the nine-parameters but, for the elastic ratio (R2, R5), the females showed significantly higher values than the males in all sites except the forehead. Skin lightness (L* value) was higher in the females, whereas the males showed lugher values in the category of redness (a* value) and yellowness (b* value). The values of the eqrthema index (EI) and melanin index (MI) were also higher in the males on all sites. Correlations between the skin parameters mentioned above were calculated. A negative, correlation between capacitance and TEWL was observed only on the cheek (male/female, r =-0.2/ r =-0.4, p<0.05). The L* value correlated negatively with MI. Mioreover the values between a* and EI also showed sipificant correlations in the male (cheek and dorsum of hand, y =0.2, forehead and crows foot, r =0.3, p<0.05). There were considerably significant correlations between the visual pigmentation score and instrumental skin parameters in the males (visual pigmentation score vs. L* value measured by Chromameter ; cheek/crows foot, r = -0.3/y =-0.4, visual pigmentation score vs. MI by Mexameter ; cheek/crows foot, r =0.2/ r =0.4, viisual winkle score vs. sebum excretion rate measured by Sebumeter ; cheek, r=0.2, visual winkle score vs. elasticity parameters measured by Cutometer ; cheek, R2/R5/R7, r =-0.3/ r =-0.2/ r =-0.3, p<0.05). Conclusion: Skin physiological parameters can be evaluated by non-invasive skin bioengineering methods which show quantitative modifications in physiological conditions in relation to sites and sex.

Y. Yazan, M. Seiller, S. Avcier, M. Demirel, **Comparison of Glycolic, Lactic and Glycolic + Lactic Acids in Multiple Emulsion Systems,** 20th IFSCC Congress Cannes, 09/1998

Y. Nishimori, H. Tsuruoka, K. Matsumoto, M. Kawai, A. Pearse, C. Edwards, R. Marks, **A new Approach for the Improvement of Photoagend Skin Through Collagen Fiber Bundle Reconstruction Mechanism,** 20th IFSCC Congress Cannes, 09/1998

Many anti-wrinkle and anti-photoaging cosmetics contain retinoic acid (RA) or RA-derived chemicals to induce the production of connective tissue components. However, this approach does not always produce longlasting or satisfactory results. Investigations of injured skin reveal that the ultrastructural condition of dermal connective tissue, especially dermal collagen fiber bundles, is an extremely important factor affecting both the mechanical properties and surface profiles. Photoaging is skin injury caused by solar radiation. Our research indicates that restoration of the ultrastructural changes of ther dermal collagen fiber bundles is more important than simple promotion of the production of cnnective tissue components.

D. Black, A. Del Pozo, S. Diridollou, J.M. Lagarde, Y. Gall, **Assessment of Emollient Effects on the Stratum Corneum of Wingter Dry Skin Using A Multiple Measurement Approach**, Stratum Corneum II Symposium, Cardiff, 09/98

A randomised single-blind study was carried out on 13 female volunteer subjects aged 21-43, (mean 35 yrs), with the aim of assessing the effects of a glycerine/vaseline based emollient cream on the stratum corneum of winter dry skin.

A. Benaiges, P. Marcet, R. Armengol, C. Betes, E. Gironés, **Study of the refirming effect of a plant complex**, Int J Cosmet Sci, 1998 Aug;20(4): p. 223-33

Loss of skin elasticity is one of the main problems of ageing. This is a mechanical property influenced by elastin, a protein in the dermis which, together with collagen and glycosaminoglycans, makes up the connective tissue. This tissue is affected by a large number of events (such as cutaneous ageing, pregnancy, slimming processes and cellulitis) which eventually cause it to change. At the same time, the metabolism of the proteins of the connective tissue decreases and there is an ever greater presence of enzymes, principally elastases and collagenases, which are responsible for breaking down the elastin and the collagen. One way to prevent such a loss of elasticity is to use active ingredients that are able to inhibit elastase enzymes. A plant complex was prepared using the following plants: lady's thistle (Silybum marianum GAERTN), alchemilla or yarrow (Alchemilla vulgaris L.), horsetail (Equisetum arvense L.) as well as germinated seeds (Glycine soja Siebold and Zucc., Triticum vulgare Vilars, Medicago sativa L., Raphanus sativus L.). The complex was standardized to give the corresponding active principles, silybin, tannins, silicon and peptides, respectively, and in vitro enzymatic tests were carried out to establish its ability to inhibit elastase. The study of enzymatic inhibition was carried out using two enzymes: (1) porcine pancreatic elastase (PPE), and (2) human leukocyte elastase (HLE). The results showed that the plant complex presents non-competitive inhibition in the order of 41.0% against PPE and 50.0% against HLE. An in vivo test was made alongside the in vitro test using an SEM 474 Cutometer (Courage & Khazaka) to study the elasticity of the skin, and positive effects were obtained when applying a cosmetic formulation containing 5% of the plant complex. Image analysis of duplicates of the cutaneous surface, before and after treatment began with a product containing 5% of plant complex and showed that wrinkles were decreased by 36.7%.

W. John Kitzmiller, L. Singer, D. Page, M. Visscher, R.R. Wickett, **Use of Noninvasive Biophysical Techniques to Compare Effects of Laser Resurfacing and Dermabrasion on Perioral Skin**, 12th ISBS, Boston, 06/98

Direct comparison of two common techniques, dermabrasion and CO_2 laser resurfacing used for restoring facial skin condition from the effects of solar damage and acne scarring are absent from literature.

R. Lambrecht, P. Clarys, B. Gabard, A.O. Barel, **Relation Between Capacitance Measurements and Biomechanical Skin Properties Under Different Hydration Conditions,** 12th ISBS, Boston, 06/98

The biomechanical characteristics of the stratum corneum are influenced by the water content of this layer.

P. Humbert, H. Zahouani, N. Bizouard, J. Asserin, J. Arnaud-Battandier, **Evaluation of Efficacy of an Anti-Aging CreamContaining Anti-Glycation Agents and Vitamins Using a Non-Invasive Method,** 12th ISBS, Boston, 06/98

The aim of the study was to evaluate the efficacy of an anti-aging cream containing antiglycation agents and vitamins.

P.Y. Rizvi, St. Kaplan, B.M. Morrison, **Seasonal Skin Changes as Measured by Biophysical Instruments,** 12th ISBS, Boston, 06/98

The work presented here examines the changes in the biophysical properties of the skin as a function of seasonality.

C. Greif, W. Wigger-Alberti, M. Arens-Corell, P. Elsner, **Beurteilung einer Körperlotion für trockene und empflindliche Haut**, Kosmetische Medizin Nr. 5, 1998

In einer offenen kontrollierten Anwendungstudie über 3 Wochen wurde an 30 Probanden eine Body Milk auf Hautverträglichkeit und Wirksamkeit getestet. Dazu wurden folgende hautphysiologische Parameter erfaßt: Hautfeuchtigkeit, transepidermaler Wasserverlust, Hautelastizität, pH-Wert sowie Hauttemperatur.

T. Fischer, C. Greif, W. Wigger-Alberti, P. Elsner, **Instrumentelle Methoden zur Bewerbung der Sicherheit und Wirksamkeit von Kosmetika**, Kursprogramm Sicherheitsaspekte in der Kosmetik, Basel, Mai 1998

Durch die Erfordernisse eines Wirksamkeits- und Sicherheitsnachweises für Kosmetika gewinnen nichtinvasive biophysikalische Meßmethoden zunehmend an Bedeutung. Neben der Bestimmung des transepidermalen Wasserverlustes und der Messung der Hautfeuchtigkeit, des Oberflächenfettes, des pH-Werts, und der Elastizität kommen der Bestimmung des Oberflächenreliefs, der Farbe und der Hautdurchblutung große Bedeutung zu. Mit diesen Methoden können u.a. die

hautfeuchtigkeitsfördernden, glättenden und straffenden Wirkungen von Topika sowie der Grad der Irritation durch Externa valuiert werden. Zur Messung der Vergleichbarkeit dieser unterschiedlichen Funktionsparameter sind standardisierte Meßbedingungen erforderlich.

S.A. Barkovic, Y. Appa, G. Payonk, **A Clinical Evaluation of a Glycolic Acid Hand Treatment with Retinyl Palmitate and an SPF 15 on Photoaged Hands**, AAD, Orlando, March 1998

Treatments for improving the appearance of photo-damaged skin have primarily focussed on facial tissue, despite the neccessity of similar treatment for the hands.

J. Hart, C. Polla, **Oat Fractions.** Cosmetics & Toiletries March 1998

Clinical and in vitro studies demonstrate the ability os specific topically applied oat fractions (oat ß-glucan, hydrolyzed oat protein and oat extract) to provide targeted benefits in the skin care and hair care.

H. Tronnier, **Neuere Wirkstoffe in der Kosmetik – Teil 2**, Kosmetische Medizin Nr. 2, 1998

Eine Reihe neu oder wieder entdeckter Wirkstoffe für die Kosmetik wird vorgestellt und kritisch beleuchtet. Manches ist an Wirkungen an der Haut nachgewiesen, anderes bisher nur in Modellen und dann einfach auf die Haut übertragen worden. Für den Wirkungsnachweis bedeutet das aber speziell in der Kosmetik, daß dieser zur Bewertung prophylaktischer Maßnahmen, die ja erst nach Jahrzehnten zum Tragen kommen, natürlich kaum geführt werden kann, und hier ein Rückgriff auf eine Beeinflussung von Mechanismen, die zu einer Alterung, vor allem einer vorzeitigen führen, erfolgen muß.

H. Dobrev, **Value of the Non-Invasive Skin Bioengineering Investigations of the Skin Mechanical Properties In Vivo,** 5th National Congress of Rheumatology, November 1997

During recent years several modern non-invasive bioengineering methods and devices for evaluation of the skin mechanical properties have been introduced.

H. Dobrev, **In Vivo Study of Skin Mechanical Properties in Patients with Systemic Sclerosis,** 5th Nat.Congress of Theumatology in Sofia, November 1997

Background: Measurements of skin elasticity are more sensitive than the skin severity score and very appropriate for an evaluation of sclerodermatous skin.

M. Kläsgen-Radez, **Putting Claims to the Test**, SPC Oktober 1997

The pressure is on to substantiate your product claims or drop them altogether. Michael Kläsgen-Radez of Courage + Khazaka explains how high-tech equipment is making this possible in skin care.

H. Drobrev, **In Vivo Study of Skin Mechanical Properties in Scleredema of Buschke.** Derma 1029. October 1997

A non-invasive, in vivo suction device was used to investigate the mechanical properties of the skin in a patient with scleredema of Buschke. Clinical scoring of skin induration and measurements of skin elasticity were performed over 9 anatomic regions on admission and after 3 (on discharge), 17 and 28 months. Immediate distension, final distension and immediate retraction were significantly decreased, while the viscoeleastic to elastic ratio was significantly increased in the patient as compared to the healthy controls. Delayed distension and biological elasticity were preserved. Low value of skin distensibility correlated with a severe skin induration ($p<<0.001$). The changes were more expressive with the 8 mm-diameter measuring probe than the 2 mm-diameter probe. The method applied can be used for objective and quantitative assessment of skin involvement in scleredema of Buschke.

H. Dobrev, **Changes of Skin Mechanical Properties after Single Application of Different Moisturizers,** 1st Balkan Congress of Medicine, October 1997

In this study we investigated the influence of single application of different moisturizers on skin mechanics and the relationship between the mechanical parameters and capacitance of the skin.

H. Dobrev, **Use of Cutometer to Assess Dermal Oedema in Erysipeals of the Lower Legs,** 1st Balkan Congress of Medicine, October 1997

Inflammatory dermal oedema in erysipelas alters skin meachanics.

H. Dobrev, **In Vivo Study of Skin Mechanical Properties in Erysipelas of the Lower Legs,** 1st Balkan Congress of Medicine, October 1997

Using a non-invasive, in vivo suction skin elasticity meter (Cutometer®), we studied the mechanical properties of the skin in 17 patients with erysipelas of the lower leg.

B.K. Sun, H.K. Lee, J.C. Cho, J.I. Kim, **Clinical Improvement of Skin Aging by Retinol Containing Products: With Non-Invasive Methods,** IFSCC Conference Mexico 25-27 September 1997

Retinol as well as RA (retinoic acid) is well known to have many benificial effects on (photo)aged skin. But the skin irritation potential and unstable condition of the products containing them have been some problems in their cosmetic uses. So, retinol containing gel product (MDC gel) was developed for less skin irritancy and more stability in cosmetic products. To examine the clinical effects of retinol containing product, we used clinical non-invasive assessment techniques on 40 volunteers for 6 months maintaining double-blind test conditions. According to our results, the use of retinol containing product improved skin color and hydration level slightly. But there was no statistical difference. There was no erythema reaction compared to the use of RA. Especially, the skin elasticity increased above 20% and skin wrinkles od crows`feet region decreased more than 10%. Besides the instrumental analysis, a large majority of volunteers felt that their skin was improved in the case of wrinkles, elasticity, hydration and color.

H.Blitz, M.Schidelko, H.P.Nissen, H.Driller, **Skin mechanics measured in vivo: A new and accurate model more sensitive to age and moisturising treatment,** Australian Journal of Dermatology: Abstracts 19th World Congress of Dermatology, Sydney, June 1997

Measurements of skin mechanics are required to better understand the condition of human skin and loss of elasticity in the epidermis. The study presents a new method which shows that cosmetic products are capable to induce significant changes in the mechanical properties of human skin after an application twice a day for one week.

B.C. Murray, R.R. Wicket, **Correlations between Dermal Torque Meter®, Cutometer®, and Dermal Phase Meter® measurements of human skin,** Skin Research and Technology 1997-3

The Dermal Torque Meter® (DTM) and the Cutometer® are instruments that measure mechanical properties of skin. The NOVATMDermal Phase Meter® (DPM) measures the stratum corneum (SC) hydration level. The objectives of this study were to determine which parameters of the DTM data curves were most sensitive to changes in SC hydration level, which of the two instruments (Cutometer or DTM) was most sensitive, and what correlations existed between the Cutometer and DTM data.

K.P. Wilhelm, **Client-Server based On-Line Data Acquisition for Skin Bioinstrumentation Devices;** *proDERM* institut for applied Dermatological Research GmbH. Schenfeld, Germany

During dermatological safety and efficacy studies, huge amounts of data- both instrumental data as well as evaluator scores may accumulate. We have developed an integrational data with on-line data acquisition capability. The program runs in a Macintosh network. A graphical interface facilitates data entry. A multilevel password system secures unauthorised use. In order to comply with GCP/GLP requirements all data entries and any possible changes relating to experimental studies- both scores and instrumental values -are secured in a log file together with date, time, and initials of the person entering the data. The program can at present acquire data from: Chromameter(Minolta), Tewameter, Corneometer, pH-Meter, Sebumeter, Mexameter, (all Courage and Khazaka). However, the open architecture would easily allow to incorporate more instruments with a serial interface. Data can be exported in DOS, windows or Macintosh format for easy import into any spreadsheet or statistics programs. The program has been completely validated and successfully used in a contract research organisation for over 12 months. Automatic data acquisition has proven to be very useful tool to facilitate and speed up data analysis and to enhance the quality and reliability of test results.

F. Henry, G.E. Pierard, **Biomechanical Properties of Striae Distensaie of Pregnancy,** Skin Research and Technology, Vol.2 No. 4 Nov.1996

Backround and Objective**:** Striae Distensae of pregnancy is a common finding. There is currently a lack of information about the rheological properties of such lesions. The purpose of this study was to compare the mechanical properties of striae distensae before and after delivery. Patients and methods: A total of 79 primigravid entered the study. Rheological properties of the skin were evaluated in vivo using a CUTOMETER equipped with a 2-mm probe. Results: Mechanical properties of striae distensae developing during pregnancy resembled those of the surrounding skin. By contrast, significant differences were yielded during post-partum. Extensibility of striae distensae was increased although parameters of elasticity remained normal. Conclusion: Rheological properties of striae

distancae of pregnancy vary in time. This might reflect the changes in hormones and in the mechanical stresses normally setting the skin under tension.

A.O. Barel, **Mechanical Function of the Skin: State of the Art,** Skin Research and Technology, Vol. 2 , No. 4, Nov 1996.

In vivo assessment of the mechanical properties of the skin is considered a valuable non-invasive tool for the investigation of normal and diseased skin as well as for evaluating the efficiency of various cosmetic treatments.

A. Teglia, A. Mondelli, **Influence of cosmetic treatments on the intercorrelations of skin elasticity, hydration and microrelief,** 19th IFSCC Congress Sydney, October 1996 and Experimental Dermatology Vol 6 No 5, ISICD and ISBS Meeting Rome 2-4 October 1997

Skin Hydration, elasticity and surface microtopography are important cutaneous parameters reflecting sensory/aesthetic qualities of the skin and have been largely adopted as indicators of the effectiveness of cosmetic treatments. Several studies have been made about the influence of environmental and biological factors on them, while little is known about their correlation. Aim of our study was to investigate their intercorrelation and possible influence of cosmetic applicartions on their relationship. 30 healthy volunteers were subject to the study over a period of one year. 7 skin sites for each longitudinal half of the body were taken as test areas: volar aspect of the forearm (3sites), upperarm, breast cheek, forehead. The subjects divided into two groups were properly instructed to apply twice a day a W/O emulsion (1st group) and an O/W emulsion (2nd group) on the test sites of a half of the body; contolateral untreated sites were used as controls. Biophysical measurements of skin hydration, mechanical properties and surface geometry were made at regular intervals over the test period for each volunteer. The data collected were submitted to statistical analyses for cross-correlation and differences of the means. The following variables were considered: electric capacitance EC as measure of the hydration of the horny layer; the viscoelastic to elastic ratio Uv/Ue and the biological elasticity Ur/Uf as mechanical properties of the skin; mean roughness depth Rz and coefficient of skin estensibility LD as parameters of the skin surface microtopography. Age of the subjects was considered as biological variable. On untreated skin were observed: significant correlation of topographycal and mechanical parameters with age; correlation of Rz with Uv/Ue (direct) and with Ur/Uf (inverse); correlation of LD with EC (inverse) and with Ur/Uf (direct). Correlation of mechanical properties with hydration was not significant. Treatment with W/O emulsion increases significantly hydration, elasticity and skin smoothness; intercorrelation of biophysical variables does not show important variations. The baseline correlation of microrelief parameters with age was reduced. Treatment with O/W emulsion increases moderately hydration and smoothness but does not effect the elastic properties of the skin; correlation of Rz with biological elasticity and viscoelastic component loses significance. Exposure of the skin to different type of emulsions ca effect selectively the cutaneous biophysical parameters and vary their intercorrelation.

H. Dobrev, **Age-Related Changes in Skin Mechanical Properties,** 5th National Conference of Gerontology and Geriatry, October 1996

J. Woodruff, **Testing time,** Cosmetics, June 1996

In his continuing series on impending EC cosmetics-legislation, John Woodruff looks at the requirements for proof of efficacy, and takes a trawl around available testing facilities.

J. Habig, E. Vocks, F. Kautzky, M. Dahm, S. Borelli, **Influence of single UVA and UVB irradiation on surface structure and viscoelastic properties of the skin in vivo,** Umweltdermatologie (ABD), Göttingen März 1996

The present study was designed to evaluate the effects of single irradiation either with UVA (dosage: 50J/cm²), or UVB (dosage IMED) on surface structure and viscoelastic properties of the skin. Biophysical measurements by means of profilometry and cutometry were carried out on normally sun-protected skin areas directly before and 24 hours after irradiation. UVA induced neither immeasurable changes in skin surface structure (expressd by the profilometrically calculated parameters of roughness Ra and RxDIN and the parameter Wt reflecting depths of furrows) nor in its viscoelastic properties (expressed by the cutometrically calculated ratio Uv/Ue reflecting viscosity and the ratio Ur/Uf reflecting biological elasticity). However, a single dry-thermogenic dose of UVB radiation was followed by significant increase in the depths of furrows, increase in viscosity and decrease in biological elasticity. (Article in German)

J.Habig, E.Vocks, F.Kautzky, M.Dahm, S.Borelli, **Einfluß einmaliger UVA- und UVB-Bestrahlung auf Oberflächenbeschaffenheit und viskoelastische Eigenschaften der Haut in vivo,** Hautarzt 47, 1996

The present study was designed to evaluate the effects of single irradiation either with UVA (dosage: 50J/cm2) or UVB (dosage: 1 MED) on surface structure and viscoelastic properties of human skin. Biophysical measurements by means of profilometry and cutometry were carried out on normally sun protected skin areas directly before and 24 hours after irradiation. UVA induced neither measurable changes in skin surface structure (expressed by the profilometrically calculated parameters of roughness Ra and RzDIN and the parameter Wt reflecting depths of furrows) nor in its viscoelastic properties (expressed by the cutometrically calculated ratio Uv/Ue reflecting viscosity and the ratio Ur/Uf reflecting biological elasticity). However, a dry themogenic dose of UVB radiation was followed by significant increase in the depth of furrows, increase in viscosity and decrease in biological elasticity.

J. Habig, E. Vocks F. Kautzky, J. Ring, **Biophysikalische Charakterististika der Haut von Patienten mit Atopischem Ekzem und Beeinflussing durch einmalige UV-Applikation**, Hautartzt 47, 1996

Zur quantitativen Erfassung biophysikalischer Eigenschaften klinisch befallener Haut von Patienten mit atopischem Ekzem gegenüber einem Kollektiv hautgesunder Patienten wurden die Methoden der Profilometrie (Hommeltester T 20000, Hommelwerke, Schwennigen) zur Messung der Oberflächenstruktur und der Cutometrie (Cutometer SEM 474, Courage und Khazakaa, Köln) zur Messung der viskoelastischen Hauteigenschaften angewandt.

J.R. Mekkes, D.N.H. Enomoto, R. Hoekzema, J.D. Bos, C.de Borgie P.M.M. Bossuyt, **Quantification of cutaneous sclerosis in patients with generalized scleroderma with a skin elasticity meter,** American Academy of Dermatology, 55th Annual Meeting March 1997 and J. Am. Acad. Dermatol. 1996;35: p. 381-387

A skin score, a subjective assessment of skin elasticity, is widely used in patients with systemic sclerosis. Although this scoring method is regarded as validated and accepted tool, the interobsever and intraobserver reproducibility are relatively poor. Aim of the study: To investigate whether the recently developed SEM 474 cutometer, which exerts a controlled vacuum force to the skin, can measure skin elasticity more objectively.

D.H.N Enomoto, J.R. Mekkes, P.M.M. Bossuyt, R. Hoekzema, J.D. Bos, **Quantification of cutaneous sclerosis with a skin elasticity meter in patients with generalized scleroderma**, J Am Acad Dermatol 1996; 35: p. 381-387

Background: The skin score, a subjective assessment of skin elasticity, is widely used in patients with systemic sclerosis. Although this scoring method is regarded as a validated and accepted tool, the interobserver and intra-observer reproducibility is relatively poor. Objective: Our purpose was to investigate wheter the recently developed SEM 474 cutometer, which exerts a controlled vacuum force to the skin, can measure skin elasticity more objectively than the skin score.

H. Gerny, **IV. Medizinische und Kosmetische Behandlungen**, Kosmetik+Dermatologie, 1. Ausgabe 1996

Die Langzeitwirkung einer Pflege kann nur dann einigermaßen objektiv beurteilt werden, wenn ein klar definierter Ausgangspunkt bezüglich des aktuellen Hautzustandes und Hauttypes gegeben ist. Die Bestimmung des Hauttypes ist ein sehr komplexer Vorgang, da viele äußerliche Einflüsse auf unser Hautbild einwirken. Auch ist die Haut hormonell empfindlich und stellt ein Bild unseres Innenlebens dar.

G.E. Piérard, **Relevance, Comparison, and Validation of Techniques,** Handbook of Non-Invasive Methods and the Skin, J. Serup, G.B.E.Jemec, 1995

Measuring in an objective way is always in need of additional breakthrough. Dermometrology and bioengineering have been and remain closely associated in the search for improvements of quantitative noninvasive assessments. The pre-bioengineering times and the descriptive phase of dermometrology are behind us. Ingenious researches pioneered methods that may now look crude, time-consuming, and sometimes lacking in reproducibility.

A.O. Barel, W. Courage, P. Clarys, **Suction Method for Measurement of Skin Mechanical Properties: The Cutometer®,** Handbook of Non-Invasive Methods and the Skin, J. Serup G.B.E. Jemec, 1995

The mechanichal properties of the human skin have been extensively studied in the past most in vitro and less in vivo. Skin is a complex organ which as many other biologicals, presents in a combined way the typical properties of elastic solids and viscous liquids. As a consequence the mechanical

properties of the skin are called viscoelastic. Typical properties of viscoelastic materials are nonlinear stress-strain properties with hysteresis (the stress-strain curves obtained on loading will not be superposed on the curves obtained by unloading). Furthermore the deformation of the skin is time-dependent with a typical phenomenon of creep. The creep is characterized as an increasing deformation of the skin in function of time when a constant stress is applied on this material. The viscoelastic properties of the skin are due to the components of the skin: collagen fibers and elastin fibers impregnated in a ground substance of proteoglycans.

A.O. Barel, W. Courage, P. Clarys, **Suction chamber method for measurement of skin mechanics: the new digital version of the Cutometer**

The mechanical properties of the human skin have been extensively studied in the past most In Vitro and less In Vivo, (1). Skin is a complex organ which as many other biologicals, presents in a combined way the typical properties of elastic solids and viscous liquids, (2). As a consequence the mechanical properties of the skin are called viscoelastic. Typical properties of viscoelastic materials are non linear stress - strain properties with hysteresis (the stress - strain curves obtained on loading will not be superposed on the curves obtained by unloading), (2-5). Furthermore the deformation of the skin is time-dependent with a typical phenomenon of creep. The creep is characterised as an increasing deformation of the skin in function of time when a constant stress is applied on this material. The viscoelastic properties of the skin are due to the components of the skin: collagen fibers, elastin fibers and cells impregnated in a ground substance of various proteoglycans and glycoproteins, (6).

I. Diepenbrock, U. Heinrich, H. Tronnier, **Der Einfluß von Nikotin auf die Haut,** Parfümerie und Kosmetik 12/95

Die Beschaffenheit der Haut als größtes menschliches Organ ist wie keine zweite ein Gradmesser für das Alter des gesamten Organismus. Nicht selten lassen sich durch ihren Zustand Rückschlüsse auf vorhandene Erkrankungen schließen. Der Einfluß des Rauchens nun auf die Hautelastizität bestätigt um ein weiteres die oben genannte Feststellung. Aufgrund des Vergleichs von quantitativen Messungen der Hautelastizität bei Rauchern und Nichtrauchern über verschiedene Altersgruppen ließ sich eindeutig feststellen, daß die Elastin- und Kollagenfasern eine längere Zeit benötigen, um wieder in ihre ursprüngliche Ausgangslage zurückzukehren. Weiterführende Untersuchungen ergaben sogar einen verstärkten Abbau der elastischen Fasern. Auf jeden Fall läßt sich fesstellen, daß die Haut bei Rauchern um durchschnittlich 11 Jahre älter ist als bei Nichtrauchern vergleichbaren Alters.

P. Elsner, **Skin Elasticity,** Bioengineering of the Skin: Methods and Instrumentation, CRC Press 1995

Mechanical properties of human skin have interested dermatologists and bioengineers for a considerable time, as differences between biomechanical skin parameters at various skin sites and changes with age and disease are obvious. Objective functional assessment of skin mechanics was necessary in order to correlate mechanical properties with anatomical and biochemical findings.

G.E. Piérard, N. Nikkels-Tassoudji, C. Piérard-Franchimont, **Influence of the Test Area on the Mechanical Properties of Skin,** Dermatology 1995, 191: p. 9-15

New advances in bioengineering have provided commercially available devices for measuring the mechanical properties of skin in vivo. Reproducibility of data and methodological approaches have not yet been thoroughly studies. Objective: To study the reproducibility and the influence of the area of the test site on the values of biomechanical variable yielded in a normal population. Method: A 500-mbar suction was transmitted to the skin through Cutometer probes equipped with a 2- or 8-mm opening. Results: The best reproducibility was obtained for the maximum distension of skin and for the biological elasticity. The values of the standard biomechanical ratios were almost the same for both probes. Linear correlations were found between parameters of elasticity.

N. Nikkels-Tassoudji, F. Henry, C. Letawe, C. Piérard-Franchimont, P. Lefèbre, G.E. Piérard, **Mechanical Properties of the Diabetic Waxy Skin,** S. Karger, Basel, 1995

Background: In some diabetic patients, the skin of the hands has a waxy appearance. Objective: To study subclinical skin stiffening in diabetic patients using a noninvasive, in vivo suction device measuring skin extensibility and elasticity. Skin thickness was also measured by high-resolution ultrasonography. Methods: Evaluations were made on the dorsum of the hands and on the volar aspect of the forearms. Results: In type 1 diabetic patients, the extensibility of skin was decreased while values of thickness and elasticity were increased. These alterations were most prominent on the hands. Similar modifications, although less pronounced, were also found in type 2 diabetic subjects. Conclusion: The reported biomechanical changes indicate the presence of subclinical skin stiffening in many patients

with diabetes mellitus. Such noninvasive biometrological evaluations could be used for monitoring, rating and correlating some diabetes-associated disorders.

G.E. Piérard, R. Kort, C. Latawe, C. Olemans, C. Piérard-Franchimont, **Biomechanical Assessment of Photodamage,** Skin Research and Technology 1995

Background/Aims: Intrinsic ageing and photoaging may present different biomechanical properties. Dorsal and volar forearm skin is differently exposed to UV-light. The object was to derive a cutaneous extrinsic ageing score (SEAS) representative of UV ageing, i.e. the global photoageing corrected for intrinsic ageing.

G.E. Piérard, C. Letawe, A. Dowlati, C. Piérard-Franchimont, **Effect of Hormone Replacement Therapy for Menopause on the Mechanical Properties of Skin,** Jags 43:662-665, 1995.

Objective: To evaluate the effect of hormone replacement therapy (HRT) for menopause on the mechanical properties of the skin in healthy women. Design: A group of 114 women, including 43 nonmenopausal controls, 46 menopausal women with HRT and 25 menopausal women without HRT, participated in the study. Mechanical properties of the skin were measured on the volar forearm using a computerized suction device.

M. Viatour, G.E. Piérard, **A Computerized Analysis of Intrisinc Forces in the Skin, BSL** Clinical Experimental Dermatology Paper, 15/8/1995.

The skin of the volar forearm is a site selected for many biometrological studies. We studied the influence of forearm position when evaluating the surface topography and mechanical properties of the skin in normal young adults. Optical profilometry of skin replicas and the suction biomechanical method (Cutometer, 2 and 8 mm probes) were used in combination with evaluation of the thickness and sliding mobility of the dermis and dermohypodermal tissues.

H. Dobrev, **In Vivo Noninvasive Study of the Elastic and Viscoelastic Properties of Human Skin after a Short Term Appliation of Topical Corticosteroids,** 6th Congress of Dermatology and Venerology, Pleve, Bulgaria, May 11-13, 1995

A noninvasive, in vivo suction device for measuring skin elasticity (Cutometer SEM 474, Courage + Khazaka electronic GmbH, Köln, Germany) was used to determine the alteration in the mechanical properties of the skin after a short term application of 5 commercially available topical corticosteroids as ointments and creams. 25 volunteers (20 female and 5 male, aged 16-54 years) were investigated. The following relative parameters, independent of skin thickness, were caluclated and compared: R2 (Ua/Uf) - gross, R5 (Ur/Ue) - net, R7 (Ur(Uf) - biologic elasticity and R6 (Uv/Ue) - viscoelastic/elastic ratio. Corticosteroid ointments increase the purely elastic parameters R2, R5 /$p<0.05$/, R7 as well as the parameter of viscoelasticity R6 /<0.001/. Corticosteroid creams alter the elastic parameters weakly while increase the viscoelastic parameter R6 significantly /$p<0.05$/. These effects of topical corticosteroid formulations are probably due to the hydration of the stratum corneum and softening of keratin, which imporve the epidermal mechanical properties. On the other hand as a result of dermal oedema and some biochemical effect on the ground substance perhaps, the friction between the fibres is reduced and interstitial fluid movement is facilitated through the fibrous network. The applied noninvasive method can be useful for an evaluation and comparison of local effects of the different dermatologic topicals on the elastic and viscoelastic properties of human skin.

W.I. Worret, T. Krusche, **Objektive Nachweismethoden zur Überprüfung von Narbentherapeutika,** 38. Tagung der Deutschen Dermatologen Gesellschaft, Berlin, 29. April - 03. Mai 1995

Es gibt mehrere Methoden, um hypertrophe Narben und Keloide der Hautoberfläche anzugleichen. Intraläsionale Triamcinolon-Injektionen gelten dabei als Standardbehandlung.

T .Krusche, W.-I.Worret, **Änderung der mechanischen Eigenschaften von Keloiden während Behandlung mit intraläsionalem Triamcinolonacetonid,** 38. Tagung der Deutschen Dermatologischen Gesellschaft in Berlin, 29.04.-03.05.1995

K. Stephanek, J.J. Levy, A. Kesckés, **The Local Reaction Followed Topical Application of Leukotriene B4 on Healthy Human Skin**, Skin Pharmacology Society: 12th Annual Meeting 1995

The archidonic acid-derived metabolite leukotriene B4 (LTB4) seems to play an important role in the pathogenesis of several skin diseases like psoriasis, leukocytoclastic vasculitis and atopic dermatitis.

K. Matsuzaki, N. Kumagai, S. Fukushi, O. Ohshima, M. Tanabe, H. Ishida, **Cultured Epithelial Autografting on Meshed Skin Graft Scars: Evaluation of Skin Elasticity,** Burn Science Publishers, Inc. 1995

Many patients with meshed skin graft scars compalin of the scars unsightly appearance and hardness. Since 1989 we have shaved away meshed skin graft scars and then resurfaced the area with autologous cultured epithelium in nine patients. This method improved the disfigurement of meshed skin graft scars, with minimal sacrifice of normal donor skin. Furthermore, autologous cultured epithelium grafted areas had high skin elasticity compared with meshed skin graft scars, as measured with a noninvasive suction device.

T. Krusche, W. Worret, **Mechanical properties of keloids in vivo during treatment with intralesional triamcinolone acetonide,** Arch. Dermatol Res 287-293, 1995

The mechanical properties of 17 keloids in 9 patients before and during treatment with intralesional triamcinolone acetonide were studies using a recently developed noninvasive suction device for measuring skin elasticity in vivo. Each keloid was treated with intralesional injections of 10 mg/ml triamcinolone acetonide without local anaesthetic at intervals of 3 weeks. A total of four measurements per keloid were performed, before treatment and 3 weeks after the first, second and third treatments. The parameters used were: immediate distension (Ue), delayed distension (Uv), immediate retraction (Ur) and final distension (Uf). Relative parameters independent of skin thickness were calculated: Uv/Ue, the ration between the viscous and the elastic deformation of the skin, and Ur/Uf, representing the ability of the skin to return to its initial position after deformation (biological elasticity). After three injections of triamcinolone acetonide a marked decrease in Uv/Ue and a less-pronounced increase in Ur/Uf compared with baseline values was observed. These findings indicate that the main effect of intralesional steroids on the connective tissue of keloids is a decrease in viscosity due to a loss of ground substance. This method provides a noninvasive quantitative assessment of the mechanical properties of scars and is well suited to comparative studies on the efficacy of various scar therapies.

T. Krusche, **Keloidbehandlung - Neues Gerät objektiviert den Therapieerfolg,** Medical Tribune Nr. 5, 03.02.1995

Dick, derb und manchmal hässlich verfärbt sind Keloide. Manchmal stören sie ihren Besitzer empfindlich.

G.E. Piérard, R. Kort, C. Letawe, C. Olemans, C. Piérard-Franchimont, **Biomechanical assessment of photodamage,** Skin Research and Technology 1:17-20, 1995

Background/Aims: Intrinsic aging and photoaging may present different biomechanical properties. Dorsal and volar forearm skin is differently exposed to UV-light. The object was to derive a cutaneous extrinsic aging score (SEAS) representative of UV aging, i.e. the global photoaging corrected for intrinsic aging.

V. Couturaud, J. Coutable, A. Khaiat, **Skin biomechanical properties: in vivo evaluation of influence of age and body site by a non-invasive method,** Skin Research and Technology 1:68-73, 1995

The stratum corneum is covered by a network of microdepressions which have been classified by Hashimoto (1). Escande (2) introduced the concept of microdepressionary network, mDN, representing Hashimoto's primpary [I] and secondary [II] lines. The primary lines are visible, and represent the deepest furrows delimiting 3- to 4-sided polygons. Their anatomic base is at the level of the dermal-epidermal junction, the furrows surrounding a group of papilla (3). The secondary lines are inside these figures and cross all or parts of their surface. Their presence is noticeable only from the stratum granulosum.

J. Ennen, S. Jaspers, G. Sauermann, U. Hoppe, **Measurement of Biomechanical Properties of Human Skin,** Cosmetic and Toiletries Manufacture Worldwide, Jan. 95

The biomechanics of skin comprises a complex interrelashionship and interaction of three layers - epidermis, dermis, and subcutaneous tissue. Assessment of the mechanical properties of the skin by noninvasive techniques has turned out to be a difficult task. The intimitate interconnection of the different tissue compartments of the skin, the anisotrophy, and time dependance of the mechanical properties, as well as the regional variations in skin make biomechanical measurements more difficult than other types of skin measurement. Measurement of those parameters of skin that describe the biomechanical properties of the skin are currently performed mainly by two different mechanical modes. Firstly, the test mode of torsion is represented by a rotating disc and guard ring torque measurement. Secondly, the mechanical test mode of elongation is represented by the instrumentation of a suction device. The mechanical parameters of extensibility and elastic recovery, both represented in a biological elastic

modulus of skin, can be measured by both approaches. In this paper the characteristics, the similarities, and the differences of both bioengeneering techniques of characterizing the biomechanical properties of skin are described.

C. Trullas, J. Coll, C. Pelejero, J. Vilaplana, S. Sirigu, C. Dederen, **Cosmetological Activity of Glycolic Acid Incorporated in a New Topical Delivery System (W/O/W Emulsion),** 18th International IFSCC-Congress, Venice, October 1994

The cosmetological potential of alpha hydroxyacids (AHA'S) is still evolving. The powerful research in physicochemistry has provided a promising new delivery system, the multiple emulsion W/O/W which could permit a controlled and sustained release of AHA'S , modifying their efficiency and safety. The cosmetological activity and safety of a W/O/W multiple emulsion containing 3% of glycolic acid has been assessed by bioengineering methods using several tests. A six-hour test and 30-days study for comparison of the effects of 3% glycolic acid in two delivery systems W/O/W multiple emulsion and O/W emulsion were conducted. The cutaneous biophysical variables evaluated were electrical capacitance of stratum corneum, skin surface lipids, transepidermal water loss, biomechanical properties, blood flow and skin surface topography. The safety of 3% glycolic acid in the two delivery systems was determined using patch testing and assessment of cutaneous responses by visual scoring and biophysical non-invasive methods (evaporimetry, laser doppler flowmetry, reflectance spectophotometry).

P. Masson, P. Blin, R. Urbaniak, F. Mérot, **Influence of Operative Procedures on Cutaneous Deformations following Measurement of Skin Elasticity by Vertical Stretching,** 18th International IFSCC-Congress, Venice, October 1994

Numerous systems are available for experimenters in order to evaluate the biomechanical properties of the skin and especially its elasticity. The principle of the cycle vertical stretching-relaxing process under partial vacuum is operated by different equipment using probes of different sizes and especially 2.8 and 13 mm providing various (cutometer 0-500 millibars) or fixed tensile strengths. Each inventor praises the merits of his own equipment and its specificity without the support of any objective and comparative analysis able to provide the possibility of justification and evaluation of the comparative advantages.

B. Seybold, K. Seidel, K. Beck-Devalle, F. Hevert, K. Klein, T.L. Diepgen, **Distribution and Variation of Basic Physiological Characteristics of Uninvolved Skin in the General Population - a Bioengineering Study,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

The aim of the study was to data about the distribution and variation of bioengineering parameters in the general population (GP).

O.A. Barel, P. Clarys, R. Lambrecht, **In Vivo Study of the Mechanical Properties of the Human Skin with the Suction Method (Cutometer®),** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

The Cutometer SEM 474® based on the suction method, measures the vertical deformation of the skin surface when the skin is pulled in the circular aperture of the measuring probe after application of a vacuum. With this instrument experimental deformation (strain)-time and stress-strain curves are obtained.

F. Panisset, D. Varchon, P. Agache, P.. Humbert, **Assessment of Human Stratum Corneum Tangent Modulus in Vivo,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

The elastic modulus (E) is a major parameter of the skin mechanical behavior.

P. Elsner, H.I. Maibach, **Biophysical Properties of Human Male Genital Skin,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

Since many skin diseases, especially sexually transmitted may be localized in genital skin, information about the physiological properties of this specilized skin is of importance for the dermatologist.

J. Asserin, P. Agache, P. Humbert, **Checking the Mechanical Performance of a Skin Suction Meter: the Cutometer®,** The 10th International Symposium on Bioengineering & the Skin, Cincinnati, Ohio, June 13-15, 1994

Presently skin mechanical testing has gained increasing acceptance in Dermatology, while it is currently used in Cosmetology. Accordingly checking the mechanical reliability of the devices is mandatory.

F. Deleixhe-Mauhin, C. Piérard-Franchiomont, G. Rorive, G.E. Piérard, **Influence of Chronic Haemodialysis on the Mechanical Properties of Skin,** Clinical and Experimental Dermatology 1994; 19: p. 130-133

Certain features of the skin of patients undergoing chronic haemodialysis suggest an ageing process. Seventy-two haemodialysed patients were studied by a non-invasive technique using the Cutometer SM 474 to determine biomechanical properties of the skin. Patients undergoing chronic haemodialysis showed some impairment of changes in viscous properties of skin similar

Y. Takema, Y. Yorimoto, M. Kawai and G. Imokawa, **Age-related Changes in the Elastic Properties of Human Facial Skin,** British Journal of Dermatology, 1994.

Using recently designed, commercially available, non-invasive instruments, we measured the thickness and elasticity of the skin of the face and ventral forearm in 170 women, and evaluated the effects of age and exposure to sunlight. Skin thickness decreased with age in ventral forearm skin, which has limited exposure to sunlight, but increased significantly in the skin of the forehead, corners of the eyes, and cheeks, which are markedly exposed to sunlight

A. O. Barel, P. Clarys, R. Lambrecht, L. Hemelaers, **In Vivo Non-Invasive Study of the Elastic and Viscoelastic Properties of Human Skin: Determination of Various Skin Deformation Parameters and Modulus of Young,** Poster at the Regional Meeting of the International Society for Bioengineering and the Skin, Liibeck, Germany, April 23-25, 1993

The Skin Elasticity Meter, Cutometer SEM 474 based on the suction method, allowed us to measure in vivo in a simple way the biomechanical properties of the human skin. The influence of various experimental conditions such as load (vacuum), aperture of the probe and pretension of the skin, on the elastic and visoelastic properties of the skin was evaluated. Under well controlled experimental conditions, reproducible and accurate stress - strain and strain - time curves were obtained which gave quantitative data concerning the elastic properties (Ur/Uf, Ur/Ue j and E) and viscoelastic properties (Uv/Ue). The influence of physiological parameters such as anatomical skin sites, ageing and sex on the biomechanical properties of the skin was clearly established using the suction method.

K.P. Wilhelm, A.B. Cua, H.I. Maibach, **In Vivo Study on Age-Related Elastic Properties of Human Skin, Noninvasive Methods for the Quantification of Skin Functions**, 1993;190:203

The pertinent literature on the effect of aging on human skin elasticity is reviewed and various methods to investiagte dkin elasticity in vivo are described.

F. Mérot, J.P. Borthier, P. Denis, P. Masson, **Incidence du diametre de la sonde sur les mesures d'elasticite cutanée,** Congres SFC-ISIPCA, Versailles (France), 16-18 Novembre 1992

Pour chaque catégorie de peau l'étirement maximal moyen augmente en fonction du diamètre de la sonde / selon la classification adoptée, l'étirement maximal moyen est significantivement plus important pour la catégorie "peaux relachées" / la dispartié des résultats individuels obtenus avec les trois sondes suggére l'impliation de structures cutanées différentes.

M. Nishimura, T. Tsuji, **Measurements of Skin Elasticity with a New Suction Device - Relation to Age, Sex, Anatomical Region, Sun-Exposure and Comparison with Deseased Skin,** Jpn J Dermatol: 1111-1117, 1992

Using a recently developed in vivo suction device for measuring skin elasticity, we evaluated age, sex, and regional differences in the elastic properties. Skin elasticity decreased with aging at all anatomical regions. Differences between the anatomical regions in the same age groups were significant, but no significant differences were noted between the sexes. The measurements in patients with skin deseases (PSS and Ehlers-Danlos syndrome) showed interesting results. This procedure allows assessment of skin elasticity, and its application to deseased skin, particularily connective tissue disorders may be helpful for diagnosing, deciding progression and evaluating therapeutic effects. (Article in Japanese)

A. Barel, P. Clarys, **In Vivo Evaluation of Skin Ageing: Relations between Viscoelastic Properties and Skin Surface Roughness Parameters,** 9th ISBS Meeting, Japan, October 19 +20, 1992

Ageing of the skin is clearly characterized by changes in a variety of physical parameters related to the dermis. We have studied the influence of age on the mechanical properties of the skin and on

skin roughness. Both physical properties are correlated with modifications in the structure of the papillary and reticular dermis.

P.G. Agache, D. Varchon, P. Humbert, A. Rochfort, **Non-Invasive Assessment of Biaxial Young's Modulus of Man in Vivo,** 9th ISBS Meeting, Japan, October 19 +20, 1992

The elastic modulus (E) is a major parameter of the skin mechanical behaviour. Unfortunately up to now only its variation could be currently estimated in vivo, and without access to absolute differences.

P. Busch, *K. Schumann*, *H. Verbeek*, **Die Entwicklung der Hautkosmetik in den letzten 25 Jahren,** Parfümerie + Kosmetik 02/92

Die gegenwärtige Wissensexplosion übersteigt bei weitem unsere Vorstellungskraft.Experten jaben herausgefunden, daß sich das Menschheitswissen alle 5 Jahre etwa verdoppelt.

E.H. Braue, C.R Bangledorf, R.C. Rieder, J.J. Guzman, **Assessment of Skin Injury from Sulfur Mustard using Bioengineering Techniques,** US Army Medical Research Institute of Chemical Defense, Aberdeen, MD, USA

In the past, noninvasive methods for evaluating the severity of sufur mustard (HD) skin lesions have relied on subjective visual scoring by trained observers.

S.S. Curri, A. Gezzi, A.M.G Longhi, M.N.G. Longhi, **Una nuova tecnica strumentale per la determinazione della elasticità cutanea,** Gruppo di studio per la Dermacosmetica Funzionale, Milano-Bologna

La scopo prefisso era quello di realizzare in dispositivo che permettesse di determinare un valore numerico in qualche modo legato all elasticità cutanea dell'uomo.

P. Zuijlen, J. Vloemans, A. van Trier, M. Suijker, E. van Unen, F. Groenvalt, R.W. Kreis, E. Middlekoop, **Dermal Substitution in Acute Burns and Reconstructive Surgery: A Subjective and Objective Long-Term Follow-Up**, Plastic and Reconstructive Surgery Vol. 108, No. 7, December 1991

Tissue engineering and dermal substitution are currently prominent subjects of wound-healing research.

V. Parison, **Validation d´une nouvelle méthode de mesure de l´élasticité cutanée: le Cutometer. Application à l´étude de l´effet de l´hydratation sur les propriétés biomécaniques de la peau,** Thèse pour le diplôme de docteur en Pharmacie, 29.11.1991

Check-up Cosmetologique et Biometrologie Cutanee, Actualités Pharmaceutiques, Jul. 1991, Special Dermo-cosmétologie, No. 289

La notion de "Check-Up" cutane a toujours exprime un souci de rigueur pour definir des besoins cutanes et des reponses performantes. Une logique, aujourd'hui scientifique, qui s'assuie sur des connaissances precises de la physiologie cutanee pour interpreter les differents etats de la peau et proposer de veritables methodes de correction; c'est l'avenement d'une cosmetologie de soins, rigoureuse.

P. Elsner, *H.I. Maibach*, **AT-based Data Aquisition and Analysis System for the Skin Bioengineering Laboratory**, Dermatosen 39, Heft 4 1991

In recent years, bioengineering instruments have found wide application for the non-invasive evaluation of functional properties of human skin. These devices measure transepidermal water loss (evaporimetry), skin hydration (methods based on conduction, impedance, and capacitance), skin blood flow (laser Doppler velocimetry, photoplethysmography), friction (friction meter), and mechanical properties (e.g. twistometer, suction devices), and allow the investigator to generate considerable data which requires documentation and analysis. Although some instruments meanwhile offer interfaces for the transfer of data into personal computers, integrated data acquisition systems supporting the whole spectrum of instruments used in the laboratory are lacking. We have developed an inexpensive data acquisition and analysis system for our skin bioengineering laboratory which allows the acquisition of data from several instruments simultaneously or in sequence. The data are fed into a spreadsheet on a personal computer and conversions and basic statistics are computed automatically. The system consists of an AT-compatible PC with two serial interfaces and an analog-digital conversion board. The software is an industry-standard spreadsheet (Lotus 1-2-3) with an instrument set (Lotus Measure). Using this system, we considerably improved the precision of our measurements and the scientific productivity in our skin bioengineering laboratory.

A.B. Cua, *H.I. Maibach*, *K.P. Wilhelm*, **Elastic properties of human skin: relation to age, sex and anatomical region**, Dermatologica Research, 1990

Using a recently developed noninvasive, in vivo suction device for measuring skin elasticity, we evaluated age, sex, and regional differences in the visco-elastic properties of skin. A total of 33 volunteers participated in the study consisting of (a) 8 young females, (b) 9 old females, (c) 8 young males and (d) 8 old males. Measurements were performed on 11 anatomical regions; three different loads were applied: 100, 200, and 500mbar. The parameters used were: immediate distension (Ue); delayed distension (Uv); immediate retraction (Ur) ; and, final deformation (Uf). To compare between subjects and anatomical regions, relative parameters independent of skin thickness were calculated: Uv/Ue, the ratio between the viscoelastic properties of skin and immediate distension, and Ur/Uf, which measures the ability of the skin to regain its initial position after deformation. Generally, Uv/Ue increased while Ur/Uf decreased with aging. Responses were variable with respect to load applied. Variability, within anatomical regions was also noted. However, differences between the sexes were not statistically significant for most regions. These findings are in congruence with earlier studies suggesting the differences are mainly attributable to alterations in the elastic fiber network. This procedure provides a simple, quantitative assessment of elastic properties of the skin. Its application may help in future investigations of other connective tissue disorders.

P. Elsner, **Mechanical properties of human vulvar skin,** 8th international symposium "Bioengineering and the skin", Stresa / Italia, June 1990

Using a newly developed suction device, the mechanical properties of forearm and vulvar skin were studied in 22 healthy women, 12 before and 10 after the menopause. The ratio between viscous deformation (Uv) and elastic deformation (Ue) and the biological elasticity, i.e. the ratio between immediate recovery (Ur) and total deformation (Uf), were both significantly lower in vulvar than in foream skin. Ur/Uf decreased significantly with load in vulvar, but not in foream skin, whereas Uv/Ue was not load-dependent in either site. Uv/Ue remained constant with age in both test sites, whereas Ur/Uf was significantly lower in post-menopausal women in both foream and vulvar skin. In vulvar, but not in forearm skin, Uv/Ue was significantly correlated with body height which may be an indicator of mechanical connective tissue properties. Viscous deformation plays a lesser role and biological elasticity is decreased in vulvar compared to foream skin. Despite differences in mechanical parameters at both sites, age-related changes seem to be similar.

T. Anfossi, **Influence of environment factors on skin elastometric patterns**, 8th international symposium "Bioengineering and the skin", Stresa / Italia, June 1990

S. Bonazzi, *Gazzaniga*, **Skin plastoelasticity modifications due to application of a reconstructed moisturizing compound,** 3rd international congress on cosmetic dermatology, Wien, 27.-29.10.1989

D. Bosio, *T. Anfossi*, *S. Audi Grivetta*, **Indici biofisici della cute in rapporto all`età determinati in elastometria cutanea,** Incontri di cosmetologia, 06/89

L'indagine è condotta mediante l'impiego del CUTOMETER SEM 474; il pricipio di funzionamento dello strumento si basa sulla possibilità di misurare, mediante uno speciale sensore optoelettronico, l'altezza della cute aspirata all'interno di una sonda da una depressione di 250 mBar (2,3). I risultati di ogni singola determinazione vengono presentati sotto forma di grafico delle deformazioni cutanee dove in ordinata è indicata l'altezza in mm della cute aspirata nella sonda ed in ascissa sono indicati i tempi a cui il parametro altezza viene rilevato. Si osserva di norma il seguente comportamento: rapido e lineare incremento del parametro altezza seguito da una fase di crescita lenta fino al ragiungimento del valore della massima deformazione cutanea indotta dalla forza applicata.