



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

Literature List

Quantirides®/Visioline®

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 accelerate skin 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.

A.M. Juncan, C. Morgovan, L.-L. Rus, F. Loghin, Development and Evaluation of a Novel Anti-Ageing Cream Based on Hyaluronic Acid and Other Innovative Cosmetic Actives, *Polymers* 2023, 15

Abstract: The importance of incorporating hyaluronic acid (HA) as a cosmetic ingredient in skin care formulations emerged lately because the amount of HA naturally found in the epidermis decreases with age, and when applied to the skin through cosmetic products, it confers hydration and reduces the appearance of wrinkles. Currently, the diversity of cosmetic products for mature skin and the use of various and innovative active ingredients supporting their anti-ageing effect represent ample proof that the cosmetic industry is currently relying on these actives. The main objective of this study was the development of an anti-ageing formulation, incorporating HA and different other active ingredients. The developed formulation contains a novel complex of natural waxes, with an essential role in the restoration of the skin's hydro-lipid barrier, in combination with innovative active ingredients—like low-molecular hyaluronic acid (LMW-HA), sodium hyaluronate (NaHA), ectoin, gold, and an anti-ageing botanical complex—contributing to optimal skin hydration specifically designed to reduce the visible signs of ageing. An important objective was represented by the skin compatibility and topography assessment after 28 days (D28) of regular application of the developed cream. Stability testing, physicochemical characteristics, and microbiological control, including efficacy testing of the used preservative (challenge test) were performed for the cosmetic formulation. In silico approaches were applied to demonstrate the safety of cosmetic-related substances and the risk assessment of the cosmetic formulation. Safety and instrumental evaluation were performed to demonstrate the skin tolerance—the compatibility and the efficacy, respectively—of the developed anti-ageing cream. As result, quality control of the developed cosmetic formulation evidenced an appropriate cosmetic preparation with desirable aspect and adequate physicochemical characteristics. The concentrations of restricted ingredients like preservatives and UV filters were in accordance with those recommended by the Regulation (EC) No. 1223/2009 and so were considered to be safe. Additionally, according to the margin of safety (MoS) calculation, cosmetic ingredients incorporated in the developed formulation could be considered safe. The developed formulation was very welltolerated, and wrinkle depth and length in the periorbital area were significantly reduced after 28-daycosmetic treatment. Subjects' assessment questionnaires revealed self-perceived benefits referring to the cosmetic qualities and efficacy of the anti-ageing cream. This study confirmed the skin tolerance and efficacy of the new complex anti-ageing

cream incorporating HA, microencapsulated sodium hyaluronate, ectoin, and a botanical extract. The formulated cosmetic product could serve as a daily care for mature skin to alleviate the effects of skin ageing.

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 1000 μ m 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.

M.J. Gu, H.-W. Lee, G. Yoo, D. Kim, I.-W. Choi, Y. Kim, S.K. Ha, Protective effect of Schizonepeta tenuifolia Briq. ethanolic extract against UVB-induced skin aging and photodamage in hairless mice, Frontiers in Pharmacology 2023

The purpose of this study was to illuminate the mechanism by which *Schizonepeta tenuifolia* Briq. (ST) ethanolic extract prevents skin photoaging in HR-1 hairless mice (HR-1). The ST ethanolic extract alleviated wrinkle formation, epidermal skin thickness, and collagen degradation in skin tissues of ultraviolet B (UVB)-irradiated HR-1 mice. Expression of matrix metalloproteinases (a wrinkle-related marker) was reduced, and tissue inhibitor of metalloproteinase 1 expression was upregulated following application of ST ethanolic extract. Furthermore, skin dehydration and levels of hyaluronidase-1 and -2 (enzymes that break hyaluronic acid) were decreased. Moreover, protein expression of hyaluronan synthases (markers of skin hydration) and hyaluronic acid levels increased following ST ethanolic extract treatment in UVB-induced photoaging HR-1 mice. In addition, the phosphorylation of mitogen-activated protein kinases (MAPKs), including p38, extracellular signal-regulated kinase, and Jun N-terminal kinase was suppressed, and expression of nuclear factor-kappa was reduced. Treatment with ST ethanolic extract also reduced advanced glycation end product (AGE) accumulation and expression of the receptor for AGE (RAGE) in skin tissue. These results suggest that ST ethanolic extract moderates skin damage caused by UVB irradiation via regulating the expression of wrinkle- and hydration-related proteins, MAPKs, and RAGE.

J.-M. Kim, K.-S. Chung, Y.-S. Yoon, S.-Y. Jang, S.-W. Heo, G. Park, Y.-P. Jang, H.-S. Ahn, Y.-K. Shin, S.-H. Lee, K.-T. Lee, Dieckol Isolated from Eisenia bicyclis Ameliorates Wrinkling and Improves Skin Hydration via MAPK/AP-1 and TGF- β /Smad Signaling Pathways in UVB-Irradiated Hairless Mice, Mar. Drugs 2022, 20, 779

Repetitive exposure to ultraviolet B (UVB) is one of the main causes of skin photoaging. We previously reported that dieckol isolated from *Eisenia bicyclis* extract has potential anti-photoaging effects in UVB-irradiated Hs68 cells. Here, we aimed to evaluate the anti-photoaging activity of dieckol in a UVB-irradiated hairless mouse model. In this study, hairless mice were exposed to UVB for eight weeks. At the same time, dieckol at two doses (5 or 10 mg/kg) was administered orally three times a week. We found that dieckol suppressed UVB-induced collagen degradation and matrix metalloproteinases (MMPs)-1, -3, and -9 expression by regulating transforming growth factor beta (TGF- β)/Smad2/3 and mitogen-activated protein kinases (MAPKs)/activator protein-1 (AP-1) signaling. In addition, dieckol rescued the production of hyaluronic acid (HA) and effectively restored the mRNA expression of hyaluronan synthase (HAS)-1/-2 and hyaluronidase (HYAL)-1/-2 in UVB-irradiated

hairless mice. We observed a significant reduction in transepidermal water loss (TEWL), epidermal/dermal thickness, and wrinkle formation in hairless mice administered dieckol. Based on these results, we suggest that dieckol, due to its anti-photoaging role, may be used as a nutricosmetic ingredient for improving skin health.

*S.M. Savic, N.D. Cekic, S.R. Savic, T.M. Ilic, S.D. Savic, 'All-natural' anti-wrinkle emulsion serum with *Acmella oleracea* extract: A design of experiments (DoE) formulation approach, rheology and *in vivo* skin performance/efficacy evaluation, Int J Cosmet Sci. 2021*

Objective: The growing consumers' preferences and concerns regarding healthy ageing, youthful skin appearance, environmental protection and sustainability have triggered an ever-increasing trend towards natural, eco-friendly and ethically sourced anti-ageing products. Accordingly, this paper describes design and evaluation of novel, safe, effective and high-quality emulsion serums, completely based on ingredients of natural origin, intended for improving facial fine lines and wrinkles. Methods: Model formulations, stabilized by an innovative glycolipid mixed emulsifier (lauryl glucoside/myristyl glucoside/polyglyceryl-6 laurate) and containing *Acmella oleracea* extract as a model anti-ageing active, were prepared by cold process and fully assessed regarding their rheological behaviour (continuous rotational and oscillatory tests) and physical stability (dynamic-mechanical thermoanalysis – DMTA test). To study and optimize the simultaneous influence of varied formulation factors (emollients and emulsifier concentrations) on critical rheological attributes of the developed serums, a central composite design within 'design of experiments' approach was employed. The general skin performance – preliminary safety and anti-wrinkle efficacy of selected model serum, was evaluated in human volunteers, by employing several objective, non-invasive bioengineering techniques. Results: Rheological characterization revealed favourable shear-thinning flow behaviour with yield point, and dominating elastic character (storage modulus $G' > \text{loss modulus } G''$) in both amplitude and frequency sweeps, which together with relatively small structural change obtained in DMTA test indicated overall satisfying rheological and stability properties of formulated serums. From the established design space, and taking into account formulation cost and carbon footprint, promising model serum (desired/optimal apparent viscosity, yield point and loss factor, rather small and constant structural change), containing 15% of emollients and 1% of emulsifier, was chosen for *in vivo* evaluations. Screening of skin irritation effects revealed the absence of potential irritancy of investigated serum, suggesting overall satisfying skin tolerability/preliminary safety. Silicone skin replica image analysis demonstrated noticeable reduction/improvement in all measured skin wrinkle parameters after only 2 weeks of test serum application in periorbital and perioral areas, indicating its rapid and beneficial effects on the facial expression lines and wrinkles. Conclusion: Altogether, the results corroborate the promising potential of the developed *Acmella oleracea* extract-loaded emulsion serum as safe, effective and non-invasive natural anti-wrinkle product.

M. Dąbrowska, I. Nowak, Lipid Nanoparticles Loaded with Selected Iridoid Glycosides as Effective Components of Hydrogel Formulations, Materials 2021, 14, 4090

One possibility of improving active ingredient penetration into deeper skin layers to enhance the cosmetic product effectiveness, is the application of lipid nanoparticles. The aim of the study presented in this paper was to evaluate the potential of hydrogel formulations enriched with iridoid glycosides-loaded lipid nanoparticles. Lipid nanocarriers were produced using an emulsification-ultrasonication method based on multiple emulsions. The encapsulation efficiency was determined at the level of 89% and 77% for aucubin and catalpol, respectively. The next stage was the incorporation of the obtained dispersions of lipid nanoparticles into hydrogel formulations, followed by determination of their physicochemical properties, shelf-life stability, and application properties (*in vivo* tests). The introduction of lipid nanoparticles increased the stabilization of the consistency of the obtained hydrogel formulations, and was confirmed by viscosity measurements. No effect of lipid nanoparticle incorporation on shelf-life stability of the hydrogels was detected. *In vivo* studies showed improvements in moisture content of the epidermis, transepidermal water loss, skin topography, and macrorelief parameters. In particular, a synergistic effect of the active ingredients and lipid nanoparticles on the anti-wrinkle effect, moisturizing effect, and regeneration of the protective barrier of the stratum corneum was evidenced. The attractiveness of aucubin and catalpol as cosmetic raw materials in hydrogel formulations was evidenced, especially when the iridoid glycosides were applied in the form of lipid nanoparticles.

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 addition 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.

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 fizycznie i umysłowo – i wyglądają młodziej – niż kiedyś?

M.G. Suh, G. Y. Bae, K. Jo, J.M. Kim, K.-B. Hong, H.J. Suh, Photoprotective Effect of Dietary Galacto-Oligosaccharide (GOS) in Hairless Mice via Regulation of the MAPK Signaling Pathway, Molecules 2020, 25, 1679

This study investigated the suppression of photoaging by galacto-oligosaccharide (GOS) ingestion following exposure to ultraviolet (UV) radiation. To investigate its photoprotective effects, GOS along with collagen tripeptide (CTP) as a positive control was orally administered to hairless mice under UVB exposure for 8 weeks. The water holding capacity, transepidermal water loss (TEWL), and wrinkle parameters were measured. Additionally, quantitative reverse-transcription polymerase chain reaction and Western blotting were used to determine mRNA expression and protein levels, respectively. The GOS or CTP orally-administered group showed a decreased water holding capacity and increased TEWL compared to those of the control group, which was exposed to UVB (CON) only. In addition, the wrinkle area and mean wrinkle length in the GOS and CTP groups significantly decreased. Skin aging-related genes, matrix metalloproteinase, had significantly different expression levels in the CTP and GOS groups. Additionally, the tissue inhibitor of metalloproteinases and collagen type I gene expression in the CTP and GOS groups significantly increased. Oral administration of GOS and CTP significantly lowered the tissue cytokine (interleukin-6 and -12, and tumor necrosis factor- α) levels. There was a significant difference in UVB-induced phosphorylation of JNK, p38, and ERK between the GOS group and the CON group. Our findings indicate that GOS intake can suppress skin damage caused by UV light and has a UV photoprotective effect.

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.

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-to-moderate 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.

M. Merlini, M. Lumin, **Pro-ageing: when ageing becomes trendy**, PERSONAL CARE ASIA PACIFIC, September 2019

„Age-defy“, „slow-age“, „well-ageing“ are increasingly replacing the term „anti-age“ on packaging and in advertising campaigns for cosmetic products. In the press, young women are also making a little more room for their elders (fifty and above). This is the pro-age trend, which consists of moving away from the beauty ideal defined by eternal youth.

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.

P. Rouaud-Tinguely, R. Vyumvuhore, J. Corvo, D. Boudier, M. Le Guillon, B. Closs, **Quantificação de como Envelhecer Bem**, Cosmetics & Toiletries Brasil, Vol. 31, Mai-June, 2019, p. 40-48

Não há evidencia biológica que explique por que alguns indivíduos parecem mais novos ou mais velhos do que realmente são.

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 contaminants, 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 periorcular 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.

P. Rouaud-Tinguely, R. Vyumvuhore, J. Corvo, D. Boudier, M. Le Guillou, B. Closs, **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. Clairet, V. Bardin, S Trevisan, M. Jomier, **Horse chestnut flower extract redesigns eye contour**, PERSONAL CARE EUROPE, April 2018, p. 145-148*

With time, the fragility of the skin around the eyes and its permanent motion favour the formation of wrinkles. These lines change how our expression is read, in particular under-eye wrinkles and the tear trough or valley of tears which give the face an impression of tiredness and sadness. By reconnecting the epidermis to the dermis and enhancing the communication pathway, Gatuline® Link n Lift restores the features of a young skin and visibly reduces crow's feet, under-eye and tear trough wrinkles. The face regains a rested expression of authentic positive emotions.

*M. Dąbrowska, A. Mielcarek, I. Nowak, **Evaluation of sex-related changes in skin topography and structure using innovative skin testing equipment**, Skin Research & Technology, April, 2018*

Background: Evaluation of skin condition on the basis of parametrization and objective measurements of the parameters has become obligatory. The aim of this study was to assess sex-related changes in skin topography and structure using the skin testing equipment. Materials and Methods: The study was carried out on the group of 40 volunteers (20 females and 20 males) of the mean age 24±3years. The skin parameters were measured using 3 devices: Visioscan® VC 98 (skin topography), Visioline® VL 650 (skin macro relief) and Ultrascan UC22 (ultrasound imaging of the skin). All measurements were performed on the inner part of the left forearm. Results: The skin parameters measured revealed significant differences in skin surface and structure between females and males. The skin of all women subjects was more homogenous in its structure with the presence of more abundant superficial skin lines and wrinkles in comparison to male skin. The higher number of skin furrows in the skin of women is in agreement with literature reports claiming that men's skin has lower number of wrinkles which are deeper and more pronounced. Ultrasound imaging of the skin indicated greater thickness and lower density of the dermis of men subjects compared to those of females. Conclusion: Non-invasive methods of skin testing using new and advanced equipment have provided a possibility of objective parametrization and evaluation of sex-related changes in skin topography and structure.

*M. Dąbrowska, A. Mielcarek, I. Nowak, **Evaluation of sex-related changes in skin topography and structure using innovative skin testing equipment**, Skin Res Technol. 2018; 24, p. 614-620*

Background: Evaluation of skin condition on the basis of parametrization and objective measurements of the parameters has become obligatory. The aim of this study was to assess sex-related changes in skin topography and structure using the skin testing equipment. Materials and Methods: The study was carried out on the group of 40 volunteers (20 females and 20 males) of the mean age 24 ± 3 years. The skin parameters were measured using 3 devices: Visioscan® VC 98 (skin topography), Visioline® VL 650 (skin macro relief) and Ultrascan UC22 (ultrasound imaging of the skin). All measurements were performed on the inner part of the left forearm. Results: The skin parameters measured revealed significant differences in skin surface and structure between females and males. The skin of all women subjects was more homogenous in its structure with the presence of more abundant superficial skin lines and wrinkles in comparison to male skin. The higher number of skin furrows in the skin of women is in agreement with literature reports claiming that men's skin has lower number of wrinkles which are deeper and more pronounced. Ultrasound imaging of the skin indicated greater thickness and lower density of the dermis of men subjects compared to those of females. Conclusion: Non-invasive methods of skin testing using new and advanced equipment have provided a possibility of objective parametrization and evaluation of sex-related changes in skin topography and structure.

*H. Aoshima, **Fullerenes improve fine wrinkles around eyes**, PERSONAL CARE ASIA, May 2017, p. 58-61 and PERSONAL CARE EUROPE, September 2017, p. 37-40*

Formation of fine wrinkles during the photo-ageing of skin is caused by reactive oxygen species (ROS) generated by exposure of the skin to ultraviolet (UV) light. Therefore, it is very important to quickly scavenge the ROS generated in skin. Applying a radical scavenger such as an antioxidant to skin is effective for the prevention of wrinkles. However, most antioxidants are unstable in the presence of light

and heat, and easily deteriorate under exposure to UV light. However, fullerene (C60) is an antioxidant that is stable even in the presence of light and heat. Hence, fullerene was hypothesised to be effective in preventing the formation of fine wrinkles. A clinical trial demonstrated that, compared to a placebo cream, a cream containing fullerene significantly reduced the area of wrinkled skin, without any adverse effects; the wrinkle-improving effect may result from the regulation of gene expression involved in wrinkle formation and skin barrier function via ROS scavenging by fullerene.

B. Onišak, L. Sardinšek, J. Jelenc, K. Žmitek, HIFU for skin tightening, Poster for the AMWC Monaco 2017

HIFU is a new method of skin rejuvenation that uses ultrasound. High intensity focused ultrasound (HIFU) has recently expanded from high-precision surgical procedures into the field of non-invasive cosmetic medicine. HIFU is an energy modality that can propagate through tissues, resulting in selective thermal coagulative changes within the focal region of the beam while leaving the remaining regions unaffected. Where applied, the temperature at the focal point (discrete thermal injury zones – TIZs) rapidly rises while tissue above and below the TIZs are unaffected. The heating induced shortening of collagen fibers causes immediate lifting of the skin and consequently reduction in wrinkles. Application of HIFU causes collagen fibers to denature, contract and stimulates de novo synthesis of new collagen (neocollagenesis). By targeting the facial superficial musculoaponeurotic system (SMAS), noninvasive tightening and lifting of sagging facial and neck skin and improvements in the appearance of wrinkle can be achieved. During the period of several months after the treatment the appearance of the skin continues to improve and remodeling of the skin structure lifts the skin and makes it more youthful, tightened and toned.

T. Houser, C. Zerweck, G. Grove, R. Wickett, Shadow analysis via the C+K Visioline: A technical note, Skin Research and Technology, 2017;00: p. 1–5

The development of facial wrinkles, especially in the crow's foot region, is generally considered a benchmark sign of aging. Wrinkling of the skin is aesthetically undesirable and is often the target symptom that a consumer is trying to treat with anti-aging products. Thus, it is not surprising that the assessment of wrinkles is considered an important and valid means of measuring the pace of the skin's aging as well as its retardation or potential reversal via a given treatment. There are currently a number of accepted methods for analyzing skin surface wrinkling which range from simple visual assessments of the degree of wrinkling by an Expert Grader to computerized measurements with highly sophisticated 3D Cameras. These alternative methods have varying levels of difficulty and expense; One of the most popular methods, Shadow Analysis, offers accurate analysis of skin relief at a fraction of the cost compared with that of other instrumentation. In this approach, silicon rubber is used to obtain a skin surface impression (SSI) which is then illuminated in such a fashion as to create a pattern of shadows that is representative of the topography of the degree of wrinkling.

T. Houser, C. Zerweck, G. Grove, R. Wickett, Shadow analysis via the C+K Visioline: A technical note, Skin Research and Technology 2017; 23: p. 447-451

Background/purpose: This research investigated the ability of shadow analysis (via the Courage + Khazaka Visioline and Image Pro Premiere 9.0 software) to accurately assess the differences in skin topography associated with photo aging. **Methods:** Analyses were performed on impressions collected from a microfinish comparator scale (GAR Electroforming) as well as a series of impressions collected from the crow's feet region of 9 women who represent each point on the Zerweck Crow's Feet classification scale. Analyses were performed using a Courage + Khazaka Visioline VL 650 as well as Image Pro Premiere 9.0 software. **Results:** Shadow analysis showed an ability to accurately measure the groove depth when measuring impressions collected from grooves of known depth. Several shadow analysis parameters showed a correlation with the expert grader ratings of crow's feet when averaging measurements taken from the North and South directions. The Max Depth parameter in particular showed a strong correlation with the expert grader's ratings which improved when a more sophisticated analysis was performed using Image Pro Premiere. **Conclusion:** When used properly, shadow analysis is effective at accurately measuring skin surface impressions for differences in skin topography. Shadow analysis is shown to accurately assess the differences across a range of crow's feet severity correlating to a 0-8 grader scale. The Visioline VL 650 is a good tool for this measurement, with room for improvement in analysis which can be achieved through third party image analysis software.

H.-J. Kim, D. Kim, H.-J. Kim, H. Kim, J.-S. Kim, H.-S. Chae, A. Jang, Anti-Wrinkle Effect of Leg Bone Hydrolysates and Oil from Jesu Crossbred Horses, 62nd International Congress of Meat Science and Technology, 14-19th August 2016, Bangkok, Thailand

This study investigated the antiwrinkle activity of horse leg bone hydrolysates less than 3 kDa (HL) and horse oil (HO) on ultraviolet-induced photoaging in hairless mice (Skh-1). Skin wrinkles were

induced by UVB-irradiation for 10 weeks on the back of Skh-1 hairless mice three times a week. Total 70 mice were divided into 7 groups: -NC (normal group), +UC (UV control), +HLL (dietary HL, 500 mg/kg/d BW), +HLH (dietary HL, 1000 mg/kg/d BW), +HO (spreading HO), +HOHLL (spreading HO and dietary HL, 500 mg/kg/d BW), +HOHLH (spreading HO and dietary HL, 1000 mg/kg/d BW). Wrinkle formation, skin moisture, transepidermal water loss (TEWL), wrinkle depth and epidermal thickness were analyzed. +UC induced epidermal barrier dysfunction including a decrease in skin moisture, an increase in TEWL, skin wrinkle depth and epidermal thickness. The skin moisture of +HOHLH (63.32%) was higher than in +UC (52.26%). TEWL was decreased in HL and HO. In +HLH (17.52 μ m), the wrinkle depth significantly lower than in +UC (24.74 μ m). The epidermis thickness in +UC was higher than that in +HLL, +HLH, +HO, +HOHLL and +HOHLH. These results indicate that HL and HO exerts anti-photoaging activities by improving wrinkle formation and dryness.

M.A. Amirkhani, A. Shoaie-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, BiolImpacts, 2016, 6(3), 149-154

Introduction: The rejuvenation characteristics of fat 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 were interested 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 2.0×10^7 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.

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.

P. Barlier, V. Couturaud, Évaluation de l'effet antirides et des propriétés biomécaniques, in: A.-M. Péne-Lhéritier (Editor): Évaluation des produits cosmétiques, 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.

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.

*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: 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 environment. 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.

*G.W. Nam, E.J. Kim, Y.C.I 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.

*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.

*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, 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 high molecular weight that belongs to the family 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.

*L.J. Cruz, C. Gutierrez, C. Caniego, I.M. Ramos, **Intelligent targeting devices; Target delivery of cosmetic actives to specific skin cells**, Household and Personal 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 bioavailability, 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.

*J. Woodruff, **Testing - backing up the claims**, Cosmetic Business, August 2010*

Instrumental methods for efficacy testing of cosmetic products have long been of interest. The first Journal of the Society of Cosmetic Chemists published in 1947 contained an article on cosmetic efficacy testing although the only instrumental method quoted was the use of a spectrophotometer to measure UV absorbance of sunscreen agents. It is interesting to note that the need to determine if these were subject to photodegradation was mentioned. Papers on efficacy testing have appeared in almost every issue of the journal since that first edition but most methods are subjective. Instrumental methods other than those to measure physical parameters or analytical ones to measure ingredient concentrations of the cosmetic composition were sadly lacking until 1956 when a paper describing the measurements of percutaneous absorption using radioisotopes to measure absorption journal during 1956 was an in-vitro method using radioisotopes to measure absorption by hair.

*Y. Lee, S.K. Choi, Y.J. Kim, Y.J. Park, J.M. Heo, **Anti-Wrinkle Effect of Ligustrum japonicum Fruits Extract**, IFSCC 2010 Buenos Aires, Argentina*

To develop wrinkle care cosmetic ingredient with plant extracts, ten species of plant extracts were investigated. Accordingly, *Ligustrum japonicum* (LJ) was selected as candidates for developing cosmetic ingredient. By high performance liquid chromatography, 7.93% of ursolic acid and 30.33% of oleanolic acid which are well-known for anti-wrinkle effect were analyzed. To investigate the effect of *Ligustrum japonicum* fruits extract (LJE) on the procollagen type I (COL1A1) expression, human fibroblast CCD-986Sk was used. In this study the expression of COL1A1 gene and elastase inhibition were significantly increased. As the results, LJE is applicable for potential cosmetic ingredient focused on anti-wrinkle effect. Aging of the skin by natural or environmental processes may result in the formation of deep-set wrinkles on the forehead and around the eye area. There are a number of factors that contribute to the formation of these wrinkles, both intrinsic factors such as loss of connective tissue, excessive contraction of the facial muscles and, general aging of the skin and also extrinsic factors caused by environmental factors such as UV radiation, glucosides, and phenolic compounds from this plant, and constituents such as phenylethanoids, monoterpenes, and secoiridoid glucosides from other species of the genus *Ligustrum* [1], [2]. Screening studies in our laboratory have found that the ethanol extract of the fruits of LJ showed significant anti-aging effects.

M.D. Gianeti, P.M.B.G Maia Campos. Effects in tactile sensitivity and in skin moisturizing of cosmetic formulations containing vitamins and botanical extracts, IFSCC 2010 Buenos Aires, Argentina

Skin is a sense organ with sensory nerve endings and receptors, which behaves like a body wrap with its protection and regulation functions. Sensorial informations are originated at the sensory receptors and it makes possible body representation, mediating physical world exploration. Experimental studies have shown that many factors may affect tactile sensations. For this purpose it was measured the current perception threshold (CPT) sensory nerve fibers by using an electric current sine wave stimulator (Neurometer™) in 20 healthy women volunteers, aged from 25 to 35 years, before and after 2 hours of a single application of a formulation containing an association of vitamins A, C, E, *Ginkgo biloba* and *Phorphyra umbilicalis* extracts. The CPT for 5Hz, 250Hz and 2000Hz frequency current are reported to enable a selective quantification of the sensory thresholds of C, Ad, and Ab fibers respectively. In parallel, the stratum corneum hydration, the sebum content and the TEWL were measured using Corneometer™ CM285, Sebumeter™ SM810 and Tewameter™ TM210, respectively. Skin water and sebum content were significantly increased after 2 hours of the formulation application. The test group showed significantly decreased in the TEWL and in the CPT of 2000Hz, while the control group did not demonstrate any change on those parameters.

D. Boudier, M. Magnol, N. Solingéas, M. Pinel, B. Closs, Stress-related cutaneous disorders treated, Personal Care, January 2010, p. 51-55

The plague of a generation, stress is everywhere in our hectic lives. We have all used the term "stress" to define what we feel (acceleration of the heartbeat, increased perspiration, etc.) in unsettling or unexpected situations. We have Hans Selye to thank for popularising the ideas of physiological stress and showing that stress could have an impact on health. In the 1920's, he studied the body's reaction or common response, subsequently known as the general adaptation syndrome or stress response to varied stimuli. Although stress often has a negative connotation, it was originally a gift of nature. It is an evolutionary adaptation mechanism enabling individuals to adapt to any changes in their environment, whether physical, social and/or psychological.

L. Sousselier, C. Camuzat, White biotechnology new source of ingredients, Personal Care, September 2009, p. 49-51

White biotechnology has been used for millennia for the preparation of bread and alcoholic drinks. Sumerians had mastered alcoholic fermentation, for the manufacture of beer, 4,000 years AD. Nowadays, white biotechnology is used for several applications. In the pharmaceutical sector it is used for the production of antibiotics such as famous Penicillin, and it is used for energy in bioethanol production.

J.-M. Sainthillier, S. Mac, M. Pfulg, V. Gribinski, V. Guillou, J. de Rigal, C. Montastier, P. Humbert, Comparative instrumental study of aesthetic dermatology acts and cosmetic protocols, ISBS Besancon, 2009

Mesotherapy and chemical peels are commonly performed in dermatological practice. However few data are available to compare their cutaneous effects on the face with those resulting from the repeated application of cosmetic products. A mesotherapy study (meso study) and a chemical-peel study (peel study) devised according to criteria defined by LaClinic of Montreux were compared with two different cosmetic protocols combining a serum, a day cream and an eye contour cream for the meso study and a cream for the peel study.

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 continuous development 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.

C. Heusèle, C. Derome, D. Kanchankoti, R. Mohile, A. Bernois, S. Schnebert, Clinical and Instrumental Evaluation of the Facial Photoageing on Indian Women, IFSCC Barcelona 2008

Daily exposure to the sun leads to skin photodamage. Clinical signs of photoageing due to biological and structural alteration of the epidermis and dermis will be function of level of UV exposure and individual protection capacities. The influence of ethnic origin on skin structure and function is more and more investigated but few instrumental or clinical studies describe the characteristics of healthy skin and their evolution with age on Indian women living in India [1]. Previous clinical, instrumental or biological studies were carried on Indian subjects living in South Africa or England.

D. Boudier, C. Lenaers, C. Sabbadini, D. Creel, B. Closs, Development of “certified” organic actives, Personal Care, September 2008; p. 35-37

Nowadays, consumers are more conscious than ever before of what they put on their skin. They demand authenticity from natural/organic brands, scrutinising product labels and favouring products that meet certification standards. For over 20 years, independent company Silab has introduced natural active ingredients to the cosmetic industry. In order to meet market expectations and by applying its expertise in the “natural” area, Silab now has launched three “certified” organic active ingredients covering the main aspects of anti-ageing products: an immediate tensor, a hydrating ingredient and an anti-wrinkle active ingredient.

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.

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. Distanto, V. Pagani, A. Bonifigli, L. Rigano, J. Fluhr, Objective evaluation of the placebo effect in cosmetic treatments. A randomized controlled study, 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

C. Lenaers, N. Guichard, S. Mazalrey, B. Closs, A biological desquamation strategy for skin resurfacing, Personal Care Magazine, January 2006, p. 31-37

The stacking of corneocytes constitutes the horny layer of the skin, or stratum corneum (SC) and enables the epidermis to fulfil two of its principal functions. On the one hand, the SC ensures a barrier and protection function between the organism and its environment by limiting both water losses and the penetration of exogenous molecules.

A. Berghi, E. Bauza, G. Oberto, C. Del Farra, D. Pyronel, N. Domloge, Date Palm Kernel extract exhibits anti-aging properties and significantly improves skin wrinkles, 20th World Congress of Dermatology, Paris, July 2002

It is well established that body hormones play a central role in skin appearance and are implicated in skin aging. Studies have shown that the decrease of these hormones plays an important role in skin endogenous aging, the decrease of skin thickness, and the disturbance of normal collagen turnover which, in turn, results in a decrease in collagen I and III synthesis.

E. Bauza, A. Berghi, G. Oberto, N. Domloge, Ederline, an anti aging active ingredient In vivo studies on wrinkles, Society of Cosmetic Chemists, Dec. 2000

Skin aspect and texture is largely influenced by steroid hormones which are stored in the subcutaneous tissue and act on skin cells as they stimulate the regeneration of the extra cellular matrix. Studies have shown that the decrease of these hormones plays an important role in skin endogenous aging.

P. Corcuff, J. de Rigal, S. Makki, J.-L. Lévêque, P. Agache, Skin relief and aging, J Soc Cosmet Chem, 1983, 34, 177-190

Synopsis: An analysis using a Quantimct 720 IR| of skin surface negative replicas made of silicone rubber (SILFLO)[®] shows several modifications with age (from 2 to 98 years old) of forearm skin surface patterns of males and females. These changes of skin relief involve the principal and secondary directions of furrows, their densities and average depths, and the coefficient of developed skin surface (a measure of true versus apparent surface area). In children and adults, two main pattern directions of furrows are found. The first direction persists all through the life span, whereas the second one progressively disappears after the age of sixty and is very rarely detected beyond the age of seventy. With aging, the principal pattern direction gets closer to the forearm axis at an angle of 65° in children, 50° in adults, and 30° in the aged group. The skin furrow density is clearly decreased after age sixty-five, and their depths continuously increase after age fifty (children: 33 ± 1 ; adults: $41 \mu\text{m} \pm 2$; aged people: $60 \mu\text{m} \pm 3$). No difference in results was found in relation to sex.