

Abstracts

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Immune System-Driven Human Ageing: Inflammageing

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Ageing, especially human ageing can be explained by the emerging concept of para-inflammation-driven inflammageing, which is a coinage combining inflammation and ageing. Inflammageing explains that ageing, either physiological or pathological, can be driven by a low level of a variety of pro-inflammatory cytokines and substances produced by the innate immune system. Animals must maintain homeostasis during ageing with time against incessant attack from both intrinsic and extrinsic stimuli / antigens. These potentially harmful pro-inflammatory signals at a variety of the later stage of life may act antagonistically to their beneficial role as developmental engines for body system formation at an earlier stage of life. The idea of inflammageing is based on an antagonistic pleiotropy theory programmed during evolution. Clinical trials including caloric restriction, sirtuin activators and p38 MAPK inhibitors against premature ageing models such as metabolic syndrome, rheumatoid arthritis and Werner syndrome have been proposed.

Application of Image Processing Technique for Facial Gloss Evaluation

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A total absence of gloss can make the skin appear dry, while excessive gloss can contribute to an unattractive, "oily-look." Traditionally, skin gloss has been measured by the intensity of surface reflection. The disadvantage of this method is that the gloss is determined by the amount of the surface reflection in small, localized facial areas only, and does not permit evaluation of the overall optical impression of the entire face. In our work, we recognized differences in the optical contribution of facial features such as the nose and cheekbones, and surface characteristics such as pores and wrinkles. Highlights from facial features are usually regarded as normal whereas the highlight from skin texture can accentuate the presence of large pores and wrinkles, contributing to a negative impression. For an accurate evaluation of facial gloss impression, these contributions were taken into consideration in designing our system. In this study, we propose a new method of evaluating facial gloss using an image processing technique. By this method, the surface reflection image is computed from the digital color image, and separated into the facial feature and texture images for quantitative evaluation. The purpose of this work is to explore the possibility of using 2-dimensional parameters of gloss appearance in our system for more accurate and objective evaluation of gloss impression.

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Cosmetic Application of a Novel Technique Preparing Lamellar-Structure-Nano Capsule with POE / POP Dimethyl Ether

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We have developed various kinds of ultrafine emulsifying methods using POE / POP dimethyl ether. Among ultrafine emulsions made by these methods, it was reported that an o / w type emulsion, which had been prepared with POE / POP dimethyl ether, sterol surfactant, and polar oils, was characterized by a lamellar structure on the outside of nano-size emulsified particles (lamellar nano-capsules). The investigation of the use of various kinds of lipophilic active ingredients inside the particles showed that the particles could hold the ingredients stably. The fluidity of emulsified particles was also investigated from the measurements of fluorescent polarization and NMR measurements. On the other hand, panel tests of a cosmetic essence containing the emulsion showed that approximately 80% of panelists confirmed the essence could improve their skin condition including skin-moisture and skin-tension after the treatments, and they felt a clear progress in skin-improvement by continuing use of the essence.

Bactericidal Activities of Several Electrolyzed Waters

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Bactericidal activities of several electrolyzed waters were evaluated by time-kill assay using *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*. Strongly acidic electrolyzed oxidizing water (EOW) showed remarkably high bactericidal activity against all four bacterial strains, including a spore-forming bacterium, *B. subtilis*. Strongly alkaline electrolyzed reducing water (ERW) exhibited high bactericidal

activity against gram-negative bacteria (*E. coli* and *P. aeruginosa*), whereas it showed low or no bactericidal activity against gram-positive bacteria. In contrast, hydrogen water (HW) showed only low bactericidal activity against two (*S. aureus* and *P. aeruginosa*) of the four strains tested, and weak acidic electrolyzed reducing water (WA-ERW) did not show any bactericidal activity. Thus, it was demonstrated that among several electrolyzed waters, EOW possessed high bactericidal activity against all four bacterial strains regardless of gram-negative or gram-positive status and against their spore formation. It was also suggested that some electrolyzed waters might be applicable as disinfectants or antiseptic agents instead of normal purified water in pharmaceutical preparations or cosmetics.

Effect of DNA from Salmon Milt on Human Skin Conditions

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We investigated the effect of rubbing the DNA-Na from salmon milt on human skin condition. A 3% DNA-Na cream or the control cream was rubbed onto the male subjects (ten / group) for 12 weeks. The results showed that the DNA cream improved skin-elasticity more than the control cream after the fourth week. The change in skin-elasticity was improved significantly. Rubbing of the DNA cream tended to decrease transepithelial water loss (TEWL) and to increase water content in the face skin at 12 weeks. In addition, according to the results of a questionnaire, more than 90 percent of the subjects who used the DNA cream felt improving roughness of the skin.

In conclusion, these results showed that their skin conditions were improved by rubbing on the DNA-Na. We evaluated the promoting effect of the DNA-Na on the production of hyaluronic acid using human normal dermal fibroblasts. The results showed that the DNA-Na has the promoting effect of hyaluronic acid production on the fibroblasts. This data suggested that the DNA-Na would improve skin conditions.

Effect of Disulfide Bonds in Human Hair Fibers on the Melting Behavior of Their Crystalline Structure

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In order to reveal the role of disulfide (S-S) bonds in the fine structure of human hair fibers, especially in the complex between intermediate filaments (IFs) and intermediate filament-associated proteins (IFAP), we investigated the relationship between melting behavior of α -crystallites on thermal analysis and structural orientation of the fibers when S-S bonds were oxidized using 1.5 wt% peracetic acid (PAA) solution. It was revealed that oxidative treatment of human hair fibers immersed in PAA solution made cystine residues dissociate to cysteic acids and that the α -crystalline structure of the oxidized hair fibers was maintained despite the fission of S-S bonds. Their thermographs in water on high pressure differential scanning calorimetry (HPDSC) showed that the endothermic peak assigned as the melting of α -crystallites became separated into two endothermic peaks with

progression of the treatment time, and the one started melting at a lower temperature while the other had a higher melting temperature than the melting temperature of untreated hair. Furthermore, the sum of the two endothermic peak areas decreased. Polarized light microscopic observation indicated that the orientation of IFAP still existed at the temperature at which the orientation of IFs disappeared. Therefore, these results suggested that some S-S linkages at the interface between IFs and IFAP dissociated with the PAA treatment and that there was not only some region of IFs stabilized by S-S bonds but also another region of IFs stabilized by hydrophobic interaction for their thermostability.

Evaluation of Tactile Sensation of Cosmetics by Tactile Movement –Application Movement of Skin Care Products–

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The correlation between tactile sensation and tactile movement during application of cosmetics is important because tactile sensation is induced only by active handling. The aim of this study is to evaluate application feeling of skin care products objectively using motion analysis of human fingers during application. The effect of the application velocity on the sensory evaluation score was investigated. It was shown that the participants tend to apply the skin care products at the velocity which they feel the most comfortable. Based on this result, change in the application velocity by changing rheological property of the skin care product was studied. From these results, it was shown that motion analysis of application is useful to evaluate tactile feelings of skin care products.

