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Abstracts

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Caffeine Microspheres – An Attractive Carrier for Optimum Skin Penetration

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Caffeine is an effective slimming agent used for topical administration or in cosmetic products. The formulation must be such that caffeine reaches the adipocytes in the hypodermis. Biodegradable caffeine-loaded microspheres were evaluated for the transport of caffeine to its site of action for 24 h and up to 72 h. The mean diameter of the microspheres was 2.8 µm and their caffeine loading was 2.3 mg/g of particles. The permeation of caffeine from microspheres applied in aqueous suspension or from solution was evaluated through in vitro diffusion measurements with static Franz cells (n=6) over 24 h or 72 h. The first experiments carried out on full-thickness skin without hypodermis showed that after 24 h the total amount of caffeine was twice as high from microspheres as from aqueous solution (22.6% versus 9.99%). The results suggested that microspheres could easily penetrate through the skin and accumulate in the receptor compartment, ensuring continuous caffeine release. When the hypodermis was retained, microsphere penetration was only slightly decreased. After 72 hours' exposure the receptor fluid contained 15.3% free caffeine and 27.8% encapsulated fraction. The hypodermis hindered solution permeation, and therefore the free caffeine content was lower. Permeation of microspheres was not stopped by the presence of hypodermis.

Optoacoustics – Its Application in Photodermatology

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Optoacoustics is a new method to study the optical properties of human skin in vivo. We measured the absorption spectra of human skin in a study in twenty subjects belonging to skin phototypes I-IV. Absorption coefficients were determined in the range from 290 nm to 341 nm (3 nm steps) on the inner and outer side of the forearm and the ball of the thumb. Comparison of these new data with known action spectra of photobiologic effects and natural solar irradiation spectra indicates that the small wavelength range from ca. 300 nm to 320 nm may be responsible for significant detrimental and beneficial effects. Consequently, the skin is very sensitive to changes in irradiation in this spectral region.

Development of a New Cosmetic Active for Safe Skin Brightening

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In Asia, lighter skin is a desirable feature considered to be a symbol of beauty and femininity, and the use of skin brighteners is widespread due to traditional beliefs. In

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Western countries, skin brightening agents are applied for the treatment of irregular pigmentation such as age spots and to produce a more even skin tone. Most current skin brightening agents show numerous adverse effects such as high irritant and sensitizing potential, melanocyte cytotoxicity and instability in formulations. Moreover, their lightening activity appears to be quite limited when it is tested in vivo on human volunteers. Dimethylmethoxy chromanyl palmitate (INCI name) is a novel skin brightener that has been tested for efficacy and safety with satisfactory results. The new active does not have any of the side effects that are normally associated with depigmenting agents, presents good efficacy in vitro and in vivo and is unique in that, unlike all other skin brighteners, it has a photoprotective effect.

Elucidation of the Anti-Aging Effects of Ectoine Using cDNA Microarray Analysis and Signaling Pathway Evaluation

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A human three-dimensional skin model was treated with ectoine in two different concentrations for four days. Gene expression profiling was performed using cDNA microarray analysis. A network analysis of the deregulated genes yields hypotheses regarding potential molecular mechanisms leading to anti-aging effects of ectoine.

Sun & Skin, Not Always Good Friends – How Cosmetics Improve Their Relationship

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This review explores the difficult relationship between sun and skin. The various significant factors in this substantial problem include in particular the gene pool, the cells' physiological conditions, biochemical reactions (e.g. reactive oxygen species), biophysical modifications of aging (e.g. skin slackness) and social behavior. Facts regarding the risks related to sun exposure need constant updating and clearly dermatological recommendations should be mindful to include all populations, particularly the high-risk groups (due to their low skin phototype or their location on the globe). It is obvious to most researchers that far too much misleading information and incorrect extrapolations are being continuously disseminated. There currently exists an overwhelming need for public debate and a global agreement put in place to advise individuals on the correct methods and products to efficiently protect themselves from the harmful effects of sunbeams. These recommendations should also take into account other global health concerns like Vitamin D deficiencies. Possible goals are to develop international homogeneity in the evaluation of broad-spectrum sunscreen products and to target efficient campaigns for communication when necessary. These measures need to be coordinated in such a way that the problems with sun protection will be solved in order to avoid any dramas existing in current paradigms.

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