

Abstracts

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Glutathione as a depigmenting agent: an overview

Clarissa D. Villarama, and Howard I. Maibach

University of the Philippines, College of Medicine, Manila, Philippines

Glutathione is an ubiquitous compound found in our bodies. Aside from its many ascribed biologic functions, it has also been implicated in skin lightening. We review *in vitro* and *in vivo* studies that show evidence of its involvement in the melanogenic pathway and shed light on the its anti-melanogenic effect. Proposed mechanisms of action include a) direct inactivation of the enzyme tyrosinase by binding with the copper-containing active site of the enzyme; b) mediating the switch mechanism from eumelanin to pheomelanin production c) quenching of free radicals and peroxides that contribute to tyrosinase activation and melanin formation; and d) modulation of depigmenting abilities of melanocytotoxic agents. These concepts supported by the various experimental evidence presented form basis for future research in the use of glutathione in the treatment of pigmentary disorders.

An optimized method for intensive screening of molecules that stimulate β -defensin 2 or 3 (hBD2 or hBD3) expression in cultured normal human keratinocytes.

Pernet I, Reymermier C, Guezennec A, Viac J, Guesnet J, Perrier E

COLETICA, Lyon, France

Normal human skin controls the intrusion of microorganisms by the production of peptide antibiotics such as defensins. The aim of our study was to develop a culture model of normal human keratinocytes for optimal β -defensin mRNA detection which allows the screening of molecules able to stimulate hBD2 and hBD3 without inducing pro-inflammatory cytokines. A keratinocyte

culture model in 96-well plates, in high calcium medium (1.7mM) allowed to analyze hBD2 and hBD3 mRNA expression in basal condition and after cell stimulation by products from diverse vegetal extracts. The release of IL-8 and the chemokine MIP-3 α was also evaluated in cell supernatants by ELISA. Among the 184 extracts tested, 75 showed a stimulatory effect on β -defensin expression: 40 on hBD2, 26 on hBD3 and 9 on both defensins. 15 of these substances which also induced the release of proinflammatory cytokines were eliminated. Among the other substances, 4 were selected and were analyzed in a dose-dependent study (n=4) by real-time quantitative RT-PCR and completed by a measure of MIP-3 α , IL-8 and IL-1 α levels. These data underline the important necessity of screening result controls by a quantitative method reproduced at least 3 times. This new method of intensive screening allowed us to exhibit vegetal extracts that were able to stimulate epidermal β -defensin expression without inducing an up-secretion of proinflammatory cytokines.

Sodium Ascorbyl Phosphate shows *in vitro* and *in vivo* efficacy in the prevention and treatment of acne vulgaris

Jochen Klock, Hiroshi Ikeno, Kitaro Ohmori, Takeshi Nishikawa, Jürgen Vollhardt, Volker Schehlmann

R&D Personal Care, DSM Nutritional Products Ltd., Basel, Switzerland

Acne vulgaris is the most common inflammatory skin disorder and jeopardizes seriously the facial impression of a person. Development of acne involves a complex relation among several causes. Treatment and prevention success can be archived by affecting the main contributors positively like Propionibacterium acnes or lipid oxidation leading to inflammatory reactions and follicular keratinization. Vitamin C tends to break down in cosmetic formulations resulting in a brownish discoloration. Sodium Ascorbyl Phosphate represents a stable precursor of vitamin C that ensures a constant delivery of vitamin C into

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the skin. We were able to show that 1% Sodium Ascorbyl Phosphate has a strong anti-microbial effect with a log reduction of 5 after 8 hours on *P. acnes* in a time-kill study. Further on in a human *in vivo* study with 20 subjects a Sodium Ascorbyl Phosphate O/W formulation significantly prevents the UVA-induced sebum oxidation up to 40%. Finally we performed an open *in vivo* study with 60 subjects with a 5% Sodium Ascorbyl Phosphate lotion over 12 weeks. The efficacy ranked as excellent and good of Sodium Ascorbyl Phosphate was 76.9%, which was superior compared with a widely prescribed acne treatment. In conclusion this data shows that Sodium Ascorbyl Phosphate is efficient in the prevention and treatment of acne vulgaris. Sodium Ascorbyl Phosphate can be used in a non-antibiotic and effective treatment or co-treatment of acne with no side effects, which makes it particularly attractive for cosmetic purposes.

Synthesis of mono-dispersed spherical silica particles containing covalently bonded chromophores

Thomas Walenzyk, Christophe Carola, Herwig Buchholz and Burkhard König

Institut für Organische Chemie, Universität Regensburg, Regensburg, Germany

Organic-inorganic UV active hybrid materials have been prepared by a sol-gel process from benzophenone derivatives and tetraethylorthosilicate. The silica particles are spherical in shape and have a narrow size distribution which remains unchanged up to organic chromophore concentrations of 0.2 mmol/g. At higher concentrations the spheres become less regular and fuse. A dependence of the materials absorption properties on the particle size (at the same organic chromophore concentration) and on the concentration of surface grafted chromophores was noted.

The most effective UV filter materials were found in a combination of silica incorporated chromophores and surface grafted chromophores at low overall chromophore concentration. A comparison of the chromophores photostability at standardized UV irradiation revealed an increase in stability for silica incorporated and surface immobilised benzophenone compared to benzophenone in homogeneous solution.

Topical palmitoyl pentapeptide provides improvement in photoaged human facial skin

Larry R. Robinson, Noelle C. Fitzgerald, Darrell G. Doughty, Nancy C. Dawes, Cynthia A. Berge, and Donald L. Bissett

The Procter & Gamble Company, Miami Valley Laboratories, Cincinnati, OH, USA

The palmitoyl pentapeptide palmitoyl-lysine-threonine-threonine-lysine-serine (pal-KTTKS) is a synthetic material that was designed as a topical agent to stimulate collagen production and thus provide a skin anti-wrinkle benefit. To determine if pal-KTTKS is effective, the clinical study reported here was conducted. Caucasian female subjects (n = 93, ages 35-55) participated in a 12-week, double-blind, placebo-controlled, split-face, left-right randomized clinical study assessing two topical products: moisturizer control product vs. the same moisturizer product containing 3 ppm pal-KTTKS. Pal-KTTKS was well tolerated by the skin and provided significant improvement vs. placebo control for reduction in wrinkles/fine lines by both quantitative technical and expert grader image analysis. In self assessments, subjects also reported significant fine line/wrinkle improvements and noted directional effects for other facial improvement parameters.