Collrepair™ DG – Anti-Ageing Active Ingredient
Reverses 20 Years of Skin Glycation

The Phenomenon of Sensitive Skin

Efficacy of a Hyaluronic Acid Gel
to Improve the Skin Properties

An Integral Approach
for a Bright and Even Skin Tone

The Use of Ultramarine Pigments
in Cosmetics

Wetting Agents – Multifunctional Ingredients
in Color Cosmetics

Odour Measurement for Improved
Scent Performance in Consumer Goods

New Data of the Cosmeceutical and Tripeptide GHK
COSMETICS

S. Léoty-Dkoumbi, F. Trombini, C. Bonnual-Rosaye, V. André-Frei
Colrepair™ DG – Anti-Ageing Active Ingredient
Reverses 20 Years of Skin Glycation ........................................... 2

A. Kleinert, F. Dourdot, F. Debaene, C. Ringenbach, O. Peschard, P. Mondon
The Phenomenon of Sensitive Skin ............................................. 8

H. Haeseler
Efficacy of a Hyaluronic Acid Gel
to Improve the Skin Properties .............................................. 16

A. Giménez, C. Davì, E. Cañadas, A. Soley, R. Delgado
An Integral Approach for a Bright and Even Skin Tone .......... 20

E. Bartholomew
The Use of Ultramarine Pigments in Cosmetics ....................... 26

A. Thiemann, S. Gröne, M. Salmina-Petersen, J. Janichen
Wetting Agents – Multifunctional Ingredients
in Color Cosmetics .............................................................. 34

N. Nibbed, H. Gygax, B. Moxter
Odour Measurement for Improved Scent Performance in Consumer Goods .... 42

SPECIALTIES

I. Piccart, S. Schagen
New Data of the Cosmeceutical and Tripeptide GHK ........ 48

PRODUCT NEWS

Corum Inc.
Pioneer Whitening Peptide Technology Targeting
4 Levels of Skin Pigmentation ............................................... 54

FORMULATIONS

Dry Skin Recover & Care Face Cream, MM 285/3 ............ 56

In-Shower Body Lotion, SG 41/13-4. ......................... 56

Mattifying Make-Up Foundation, SZ 24/13-1 ............... 58

COMPANY NEWS

Evonik Advances RSPO Certifications ......................... 58

The New Miraval® Cosmic Pigment Range from Merck .... 59

Latest SCCS Opinion on Alpha-Arbutin Confirms it is Safe for Cosmetic Use .......... 60

2M Holdings in the 2015 ICIS Top 100 Chemical Distributors .................. 60

Subject: The Latest Launch from Vantage Specialty Ingredients-Lipomulse Eco Series .................. 60

Rich Pickings in Asia for Natural and Organic Brands ... 62

Chemtec Chemical Company Adds New Suppliers to Portfolio .................................................. 62

Evonik Globalizes Research & Development for the Cosmetic Industry .................. 63

Imprint / Index of Advertisers ............................................ 64
New Data of the Cosmeceutical and Tripeptide GHK

Introduction

The term «cosmeceutical» refers to the combination of cosmetics and pharmaceuticals and is used to describe cosmetic products with ingredients that are biologically active and have medicinal benefits. The quality of these derma-cosmetics has to be ensured by scientifically well-documented in vivo and in vitro tests that provide proof of efficacy and proven desirable effects. The products are applied topically.

The strong trend in the cosmetic and pharmaceutical industries to cosmetically-medically oriented products – there is for example an almost endless variety of cosmetics for skin ageing – requires a closer look. A guideline of the Society of Dermopharmacy in Germany, «derma-cosmetics against skin ageing», divides anti-ageing ingredients into categories, making the availability of scientific test data a major factor. Categories are formed by determining the presence of in vivo, in vitro or no scientific evidence. In the latter category it is at least required to have documentation that no adverse effects may occur.

The tripeptide H-glycyl-L-histidyl-L-lysine-OH (GHK) is one of the small protein fragments that occur naturally in the human body and has a high affinity for copper ions. This tripeptide complex is a natural constituent of human plasma, saliva and urine.

In plasma of a 20-year-old human about 200 μg/ml Cu-GHK are measured. With age, this percentage drops. In a 60-year-old person about 80 μg/ml are measured (1). Recent studies show that Cu-GHK influences the expression of a number of human genes. Cu-GHK regulated at least 4000 genes in the human genome. In essence, a higher Cu-GHK concentration results in DNA regeneration and thus a healthier state (2, 3). Recent studies shed new light on the activation of the regeneration of the skin by the Cu-GHK peptide.

Cu-GHK was discovered in 1973 by Dr. Loren Pickart. In 1977 the results of his research were confirmed by David Schlesinger (Harvard University Chemistry Department). It has been demonstrated that the growth stimulatory peptide isolated by Pickart is glycyl-L-histidyl-L-lysine peptide (3).

Further research showed that the peptide GHK has a strong affinity for copper and exists in two forms, Cu-GHK and GHK. It is known that after damage to body tissues and the naturally following skin renewal process, the Cu-GHK peptide is released by proteolysis. The high affinity of the tripeptide to copper ions makes it possible to dissolve them from carrier molecules such as albumin to form a copper complex.

Abstract

New research data suggests that the cosmeceutical GHK regulates 4,000 genes in the human genome. It increases the Cu-GHK concentration in the body and results in a DNA regeneration. Medically, this drug can show confirmed effects against inflammation, COPD and cancer. Moreover GHK supports wound healing and nerve regeneration. Cosmetic use includes healing, rejuvenating and preventative effects. Cu-GHK stimulates cellular regulatory molecules and regenerates and heals the skin. It seems that GHK is able to reset genetic patterns to a healthier state.
obstructive pulmonary disease (COPD), and metastatic colon cancer (6, 7, 8). McCormack et al. showed that Cu-GHK increases vitality and regeneration of fibroblasts in patients undergoing anticancer radiotherapy, reducing the damaging effects of the therapy (5). Pickart et al. describe that GHK expresses numerous caspases and stimulates DNA repair genes and growth factors. A combination of ascorbic acid and Cu-GHK strongly inhibits the growth of sarcoma-180 in mice (6). (Fig.1)

Controlled Dermatological Studies

Experiments have shown in vitro that Cu-GHK increases and stimulates the synthesis of collagen, glycosaminoglycans, and other extracellular matrix molecules. A number of placebo-controlled clinical trials have confirmed the observed effects (2).

A study of healthy skin demonstrated that a topically applied cream with Cu-GHK stimulates the dermal skin procollagen synthesis. For proof, skin biopsies were taken and examined with immunohistochemical techniques. The synthesis induced by the copper tripeptide was significantly more pronounced than for the comparative active ingredients Vitamin C, Tretinoin and Melatonin (8).

Leyden et al. confirmed in two different studies the clinically beneficial effects of Cu-GHK formulations on both aged and sun damaged skin. The Cu-GHK face cream and an eye cream reduced the visible signs of skin ageing. The team observed improved skin elasticity, improved skin humidity, significant smoothing of the skin by stimulating the synthesis of collagen, a significant improvement of the skin contrast and diminished wrinkles. Ultrasonography results showed an increase in skin density and thickness (7, 8).

In another study of Finkley et al. Cu-GHK cream was applied twice a day for twelve weeks on 67 women. The Cu-GHK cream improved the appearance of aged skin. By histological analyses of biopsies it could be re-confirmed that the use of topically applied Cu-GHK products intensified skin thickness in the range of the epidermis and dermis and that keratinocyte proliferation of the skin was greatly stimulated (9).

Krüger et al. confirmed with their pilot study for topical application of copper tripeptide complexes in aged skin an increase in skin thickness in the range of the epidermis and dermis, improved skin humidity, a significant smoothing of the

Fig. 1 Tissue remodeling copper peptides induce regeneration of diverse organs. (Source: Loren Pickart)
skin by stimulating collagen synthesis, increased skin elasticity, a significant improvement in skin contrast and an increased production of collagen I. Simeon et al. demonstrated that glycosaminoglycan and decorin are upregulated in damaged skin. The copper glycy-histidy-l-ysine complex modulated in different ways the expression of the extracellular matrix of macromolecules during wound repair process (10, 11, 12). Study data from Jose et al. show that in conjunction with a biodegradable support GHK significantly increased the potential for the repair and healing of the proangiogenic mesenchymal stem/stromal cells (13). Cu-GHK is able to stimulate hair growth. The copper tripeptide complex ensures follicular enlargement and helps covering the follicle with a downy hair; the effect is comparable with that of Minoxidil (13). The results of a hair transplant show significant improvement (14) following the application with a copper tripeptide product. Topical Cu-GHK products stimulate collagen synthesis on the scalp, strengthen existing hair and encourage hair growth (15).

Summary/Discussion

Cu-GHK stimulates cellular regulatory molecules and regenerates and heals skin and other tissues. New research findings complement the existing knowledge. Stem cells treated with GHK regenerated and expressed more stem cell markers. GHK and Gly-gly-His (GGH) reduce TNF-alpha induced cytokines IL-6 (22), thus ensuring better wound healing. Pickart et al. describe that GHK significantly increased the expression of DNA repair genes, while 47 genes are stimulated and 5 genes suppressed (3). GHK is involved with different mechanisms of action and can apparently promote regeneration, healing, repair and also achieve good effects against ageing processes. GHK can be formulated for medical and cosmetic use in gels, creams, liposomes, skin patches etc. Future GHK research is needed to assess the efficacy, dosing and other medical/cosmetic possibilities better and in a more targeted manner.

References


