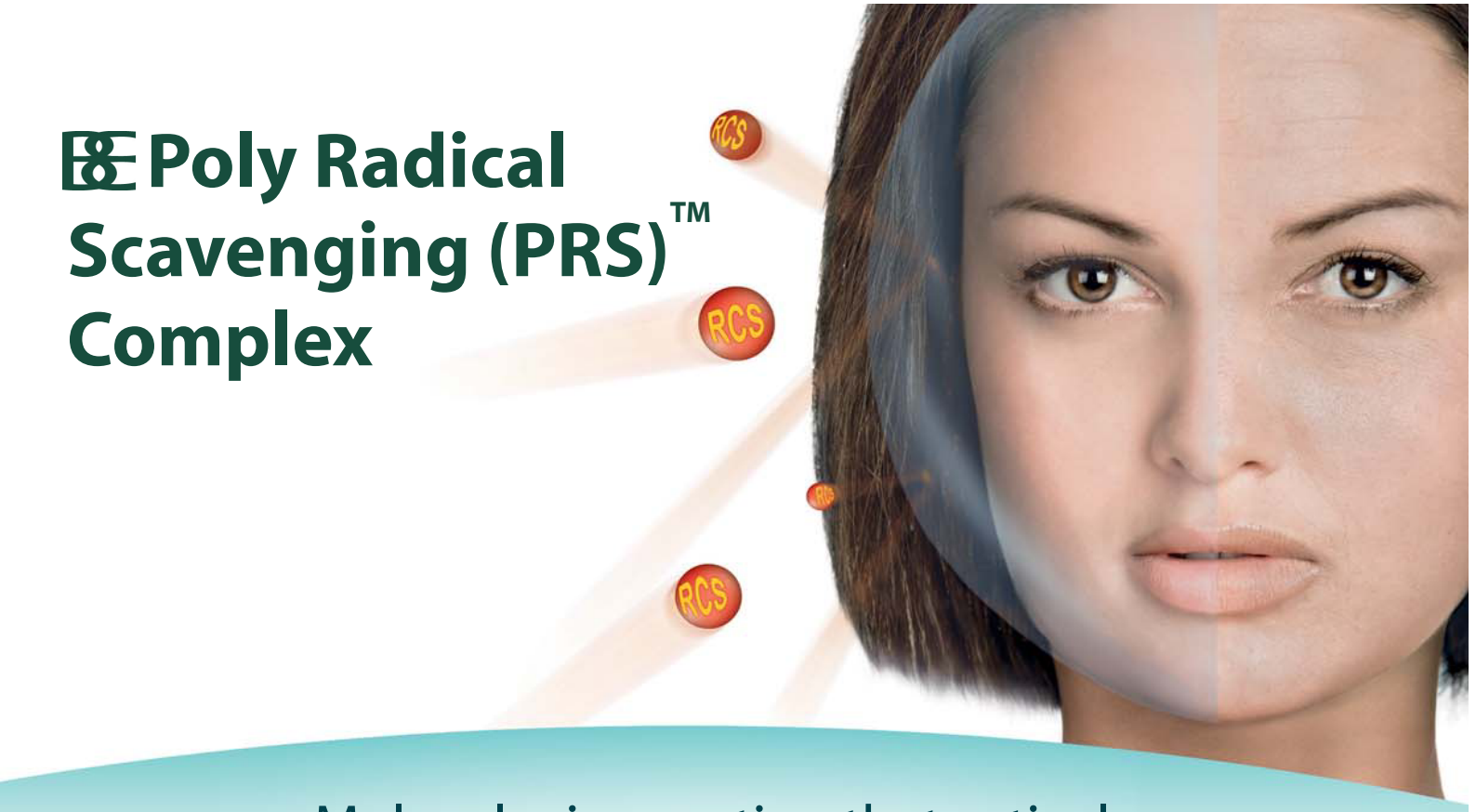
BE Poly Radical Scavenging (PRS)™ Complex



Molecular innovation that actively prevents aging and activily shelters to protect cells

The first Anti-RCS active in cosmetics

Protects DNA from UVA-induced damage

Detoxifies cutaneous cells

Double activity: RNS & ROS radicals scavenger

Prevention of premature aging

restructure

anti-radical

Description

GHK tripeptide stabilised within the tertiary structure of the vegetal protein, is able to detoxify the skin from the noxius Reactive Carbonyl Species (RCS) and protects the skin from photoaging.

Chromane that protects cells from several damages such as structural alteration of proteins, inhibition of enzymatic activity and interferences of the regulatory cellular function.

Appearance

Translucent solution containing bound nano complex.

INCI

Water (Aqua), Hydrolyzed Wheat Protein, Hydrolyzed Soy Protein, Xanthan Gum, Tripeptide-1. (GHK). Dimethylmethoxy chromanol.

Please contact us for information on the preservative system.

Science

BE PRS™ is the first cosmetic active ingredient that is able to capture noxius RCS, avoiding the necrosis of the keratinocytes and the loss of collagen elasticity. At the same time it protects the skin from DNA damage induced by UV radiation.

Radicals and reactive species are responsible for several mechanisms which trigger skin aging. They cause irreversible damages in cells and tissues, affecting organs too, so they are involved in a great number of diseases. Peroxynitrite, a powerful RNS (Reactive Nitrogen Species), exhibits a wide array of tissue harmful effects, ranging from lipid peroxidation and DNA damage to inactivation of enzymes via protein oxidation and nitration. ROS (Reactive Oxygen Species) are free radicals generated from endogenous sources and also from external pro-oxidant stimuli. BE (PRS)™ is designed to capture both types of free radicals, thus avoiding their noxious effects.

Properties

Prevention and protection of the skin from extrinsic and intrinsic agents which cause premature aging.

Protects cells from reactive species, preventing skin from premature aging.

Applications

BE PRS™ can be incorporated in daily cosmetic formulations where prevention of photoaging is desired, improving simultaneously the elasticity and firmness of the skin. Also suitable for sun care products.

BE PRS™ can be incorporated in lipophilic based cosmetic formulations to avoid deterioration of skin.

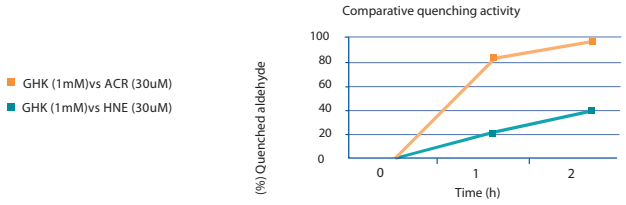
Poly Radical Scavenging (PRS)™

In vitro efficacy

Molecular-level studies

• Relative capture of RCS

Evaluation of the quenching activity of GHK versus 4-Hydroxynonenal (HNE) and Acrolein (ACR)



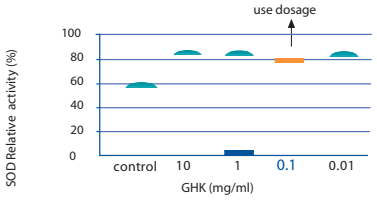
The quenching activity of GHK is dose-dependent.

RCS are captured efficiently by GHK

GHK forms adducts with HNE, the cells are detoxified and remain healthy.

• Glycation inhibitory activity of GHK

Study of the inactivation of Superoxide Dismutase (SOD)



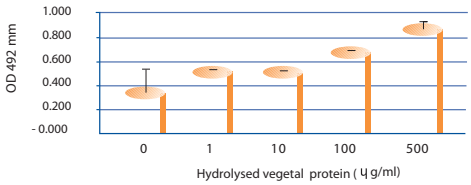
The inactivation of SOD by its reaction with fructose is used as a model of glycation.

Glycation inhibitory effect

Avoids the formation of Advanced Glycation End-products (AGEs), which are effective indicators of protein damage.

• Synthesis of Collagen III

An ELISA test with monoclonal antobodies was tested in Human Dermal Fibroblasts.



The increase in Collagen III can be seen even after 24 hours but a dose dependent result is obtained after 7 days.

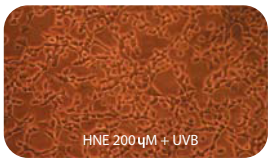
300% Increase of Collagen III synthesis

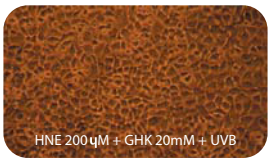
Collagen III is characteristic of youthful skin, and its increase provides a healthy skin.

Cellular-level studies

• Cellular Detoxification

Keratinocytes were irradiated with a low UVB dose (50 mJ/cm^2) in order to evaluate the quenching activity of GHK.





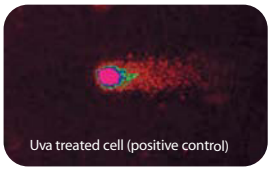
Keratinocytes detoxify endogenously-formed HNE by forming adducts with GSH (glutathione), the skin's natural antioxidant. However, when submitted to UVB, keratinocytes are depleted of GSH, they can no longer detoxify from HNE and they die.

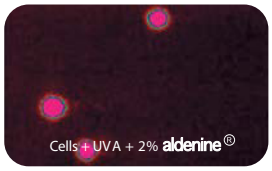
Detoxifies cutaneous cells

When the skin is exposed to the sunlight, the cells need GHK to quench HNE and other noxious RCS.

• DNA Protection

The DNA protection was tested in primary cultures of human melanocytes using the alkaline comet assay.





showed to have an internal photoprotection capacity against UVA light.

97% DNA Protection

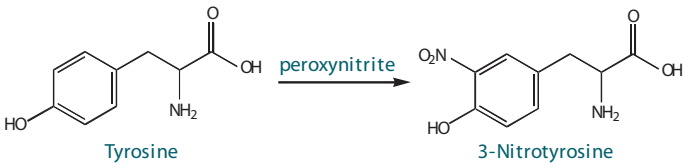
Protects skin cells from UVA-induced DNA damage.

Poly Radical Scavenging (PRS)™

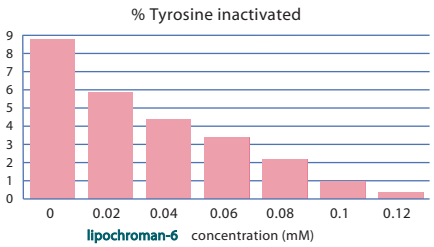
Molecular-level studies

• Efficacy in nitration blocking

The nitration of tyrosine residues of proteins is an irreversible reaction which compromises cyclic interconversion between phosphorylated/non-phosphorylated tyrosine, necessary in activation/deactivation of enzymes and receptors.
Evaluation of reactivity between tyrosine and peroxynitrite at different concentrations of BE (PRS)™, determined by HPLC.



Tyrosine — 3-Nitrotyrosine



• Interlaboratory comparison of the antioxidant potential

Study of the antioxidant activity using the TBA assay (2-thiobarbituric acid), which is based on the prevention of the formation of malondialdehyde, a degradation product of lipid peroxidation. Evaluation performed in six laboratories.

J.Buenger et al. Int. J. Cosmet. Sci. 28:135-146, 2006

RANK	SUBSTANCE	MEAN
1	BE (PRS)™	-0.38
2	BHT	-0.06
3	Trolox	0.23
3	Tocopherol	0.31
3	4-MBC	0.38

BE (PRS)™ protects enzymes from inactivation

Inhibits the reaction between tyrosine and peroxynitrite in a dose-dependent manner.

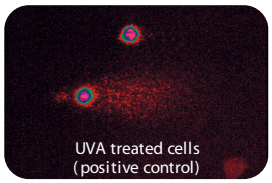
Protection of lipid structures

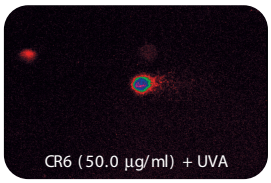
BE (PRS)™ was the best of five anti-oxidants in the interlaboratory comparison.

Cellular-level studies

• Cellular photoprotection

The internal photoprotection capacity of BE (PRS)™ against UVA was evaluated by the Comet assay in primary cultures of human melanocytes.

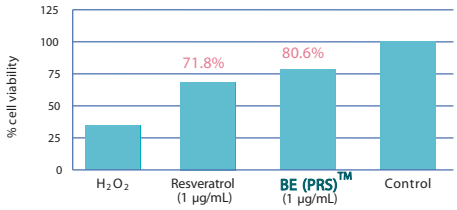




• Inhibition of oxidative stress

Oxidative stress is the imbalance between cellular production of free radical species and the ability of cells to eliminate them employing endogenous antioxidant defence mechanisms. This stress damages cells irreversibly.

In skin cell cultures, oxidative stress was generated by the addition of H_2O_2 to the culture medium. The protecting effects of BE (PRS)™ and Resveratrol were measured by a cell viability assay (Calcein-AM assay).



Prevents skin from photoaging

Protects cellular DNA from ROS oxidation, induced by UVA radiation.

BE (PRS)™ is more effective than Resveratrol against oxidative stress,

when tested at the same concentration (1µ g/ml).