BE DyNAmic Repair & Prevent™ Complex

Delays aging of skin structural proteins

Peptide born from preventive cosmetics

Promotes the DNA repair system capacity

Preserves skin from photoaging

Description

Tetrapeptide that prevents the damage caused directly or indirectly by UV radiation to DNA and proteins, preventing skin from photoaging.

Changes that occur in the skin with aging are easily noticeable with the apparition of wrinkles and loss of elasticity. These macroscopic defects are the outcome of microscopic molecular processes, such as glycation and cross-linking of proteins, which generally arise after 35 years.

Advanced Glycation Endproduct (AGE) deposits, as a result of the Maillard reaction, have been observed in long-lived proteins such as - bronectin, laminin, collagen and elastin, however , vimentin is a maj or target. This susceptibility of vimentin glycation is based on its structural properties and the Lysine (Lys) residues of the linker region. A comparable susceptibility exists in collagen glycation, due to the resemblance in the Lys residues of the two proteins and they are both long structural łamentous amino acid chains.

BE DR&P™ is a new combination of active ingredients developed to slow down skin aging due to glycation of proteins. The Lys coating of the delivery system has the double role of inhibiting the Maillard reaction and binding the liposomes to the skin, thus helping to release the active peptide providing elasticity and suppleness.

Appearance

Translucent solution containing 0.05% Diaminopropionoyl Tripeptide-33.

INCI

Water (Aqua), Diaminopropionoyl Tripeptide-33, Caprylyl Glycol Lysine HCl, Lecithin, Caprylyl Glycol, Tripeptide-10 Citrulline, Carbomer , S odium Hydro xide.

Paraben free.
Preservative free.

Properties

Fights the detrimental effects of UV radiation in human skin, protecting and repairing DNA, thus av oiding the appearance of premature aging signs.

Applic ations

The BE DR&P™ can be incorporated in daily cosmetic formulations where a photoprotecti ve effect is desired. Also recommended for sun care products.

Science

UVA and UVB cause different biological effects on the skin. UV A radiation penetrates the epidermis resulting in damage to the dermis. Furthermore, UVA is mainly responsible for indirect DNA damage. Meanwhile, UVB is mostly absorbed in the epidermis and its main mec hanism of action is the direct inter-action with DNA via induction of DNA damage. In the aging process, the various DNA repair systems decrease their ability, as a result of the accumulation of mutagenic DNA photoproducts.

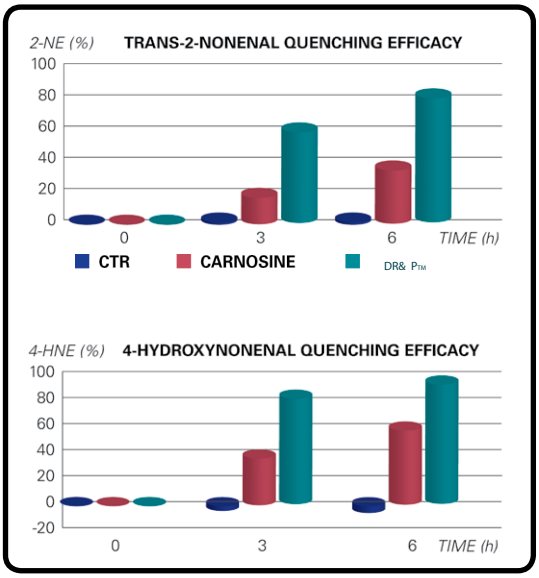
Reacti ve Carbon yl Species (RCS) are potent media - tor s of cellular carbon yl stress originating from chemical processes. Trans -4-h ydro xy -2-nonenal (4-HNE) is one of the most abundant and cytoto xic of the RCS. HNE reacts with a variety of nucleophilic sites in DNA and proteins, generating various types of adducts. Intracellular RCS are suggested to play an impor tant role in oxidati ve stress through their inhibitory effect on DNA repair mec hanisms as well as on induction of DNA damage through its direct interaction with repair proteins.

The BE DR&P™ is a tetrapeptide born from preventive cosmetics that protects skin cells from UV A-induced DNA damage and is able to promote the DNA repair system capacity , pro viding a complete skin protec - tion of intrinsic and extrinsic aging.

BE DyNAmic Repair & Prevent™

1. QUENCHING ABILITY

study of the quenching activity of the BE DR& P™ towards trans-2-nonenal (2-NE) and 4-hydroxynonenal (4-HNE). For each experiment a 20-fold excess solution of BE DR& P™ respect to the aldehydes was prepared.

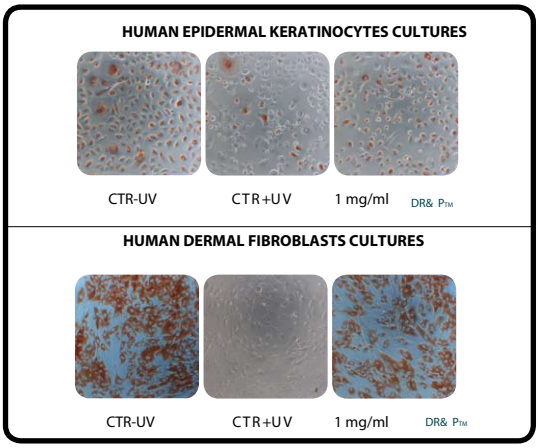


DR &P™ quenched 2-NE by 82.6% and 4-HNE by 95.3% after 6 hours of treatment

The results obtained by DR& P™ were superior to the quenching ability of carnosine.

2. PHOTOPROTECTIVE EFFECT

The protective activity of the BE DR& P™ on human epidermal keratinocytes (HEKa) and human dermal fibroblasts (HDFa) was tested in the presence of a cytotoxic dose of simulated solar light.



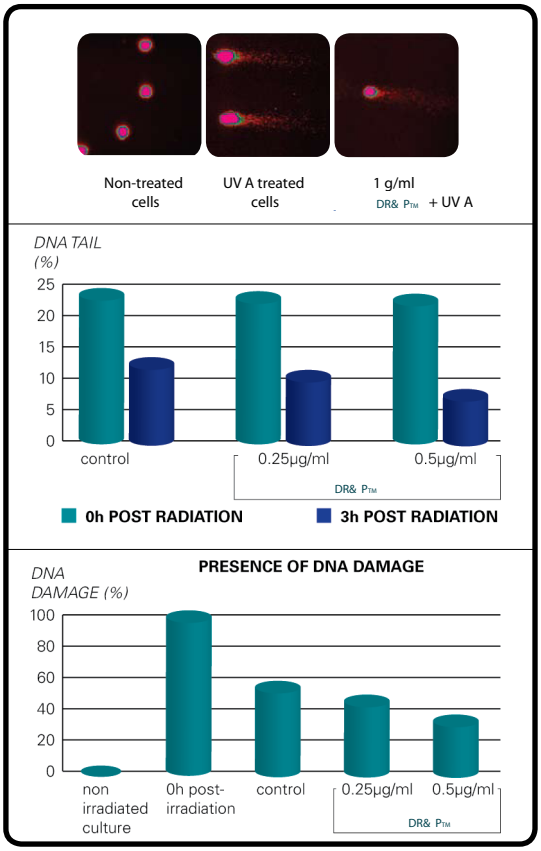
92% Increase in cell viability

BE DR& P™ increased cell viability by more than 13,000% respect to irradiated control cells

3. DNA CARE

Comet assay was used for analysing and quantifying DNA damage in human melanocytes.

Evaluation of complex BE DR& P™ effects in cellular DNA repair systems on human dermal fibroblasts irradiated with UVB. Immediately after irradiation, cells were exposed to different concentrations of BE DR& P™.



BE DR& P™ showed an inherent photoprotection capacity against UVA radiation

DNA tail generated was reduced on BE DR& P™ treated cells

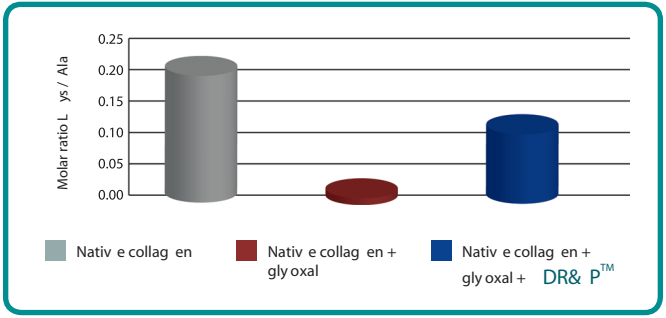
3 hours after irradiation, the DNA repair capacity increased in presence of BE DR& P™

BE DyNAmic Repair & Prevent™

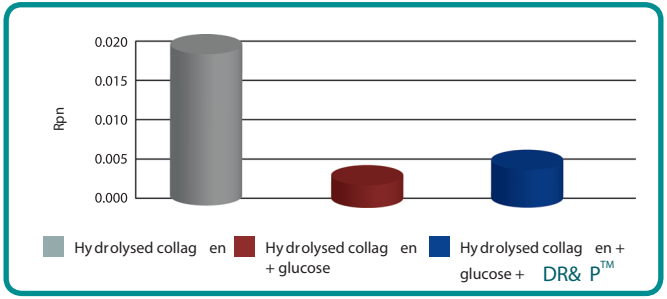
assay conditions due to its chemical structure.

4. Inhibition of glycation

Glycation on Lysine (Lys) residues of proteins was studied with 50 mg of insoluble native collagen. Reactions with 170.5 µl glyoxal (40%) were carried out parallely in presence or absence of 2.74 ml BE DR& P™, reducing conditions (157.1 mg $NaBH_3CN$) and phosphate buffer until reaching a volume of 5 ml. Alanine (Ala) was used as a control as it can be considered inert at the



As 3D-structure is essential for the function of biomolecules, the structural changes of proteins due to glycation were investigated by Circular Dichroism (CD). Rpn value is a measure of collagen purity. Hydrolysed collagen (100 mg) reacted with 270 mg of glucose in the presence or absence of BE DR& P™ (4.3 ml) and phosphate buffer until reaching a volume of 6 ml. According to their structural resemblance, inhibition of vimentin glycation by BE DR& P™ is expected to be at least in the same order of magnitude than in hydrolysed collagen.



BE DR& P™ protects native collagen from glycation. In the light of the excellent efficacy results in the inhibition of collagen glycation, DR& P™ is expected to inhibit vimentin glycation.

BE DR& P™ inhibited denaturation of collagen due to glycation by 66.6%, and it is therefore expected to inhibit vimentin glycation and prevent its denaturation.