

Active Beauty
Unirepair[®] T-43
The skin DNA fortifier

Crafted by synthesis



Focus on the product

The fight against UV radiation is a global matter of concern...

Being exposed to sun light is necessary for good health, but with the increasing number of skin cancers and skin diseases, a global warning message for the prevention against UV rays has been launched and shows no sign of stopping. Sunscreens, which are known for their activity in the protection against UV-induced erythema are not sufficient when the skin has existing UV damages, because sunscreens do not have repairing functions.

... which has to be solved inside the skin, at the molecular level

Skin directly exposed to UV rays gets damaged at multiple levels. At the visible level this leads to signs of ageing, such as wrinkles or increased skin redness. At the molecular level, these aggressions have a very unhealthy effect on the DNA of our skin cells.

The cumulative effect of repeated damages strongly contributes to the development of DNA mutations and down-regulates the synthesis of proteins which are essential to maintain normal skin turnover and avoid ageing. Also, this DNA attack is responsible for cell death (apoptosis), and a higher level of energy is needed to counteract these phenomena.

A major lesion induced by UV (particularly UVB) on the DNA is the formation of cyclobutane pyrimidine dimers (CPD) also called "DNA dimers". They are known to play a vital role in the alteration of the biological functions of DNA.

Unirepair[®] T-43 acts as a cellular DNA fortifier...

Unirepair[®] T-43 is a rich complex of amino acids (acetyl tyrosine, proline, and hydrolysed vegetable proteins) and adenosine triphosphate.

It acts directly at the DNA level to help repair the skin.

- ▶ Acetyl tyrosine, known to show a strong redox property, also demonstrated its capacity to repair oxidised guanine¹, which is a typical product of UVB radiation, and also to help accelerate the DNA repair mechanisms².
- ▶ Proline is a survival factor³ with strong redox properties, and is a precursor of proteins targeted for phosphorylation in DNA repair¹.
- ▶ Hydrolysed vegetable proteins and adenosine triphosphate play the role of energy boosters (that the cells need after a UV radiation) to accelerate the skin DNA repair reactions, and stimulate the activity of antioxidant enzymes.

... which answers cells' needs to accelerate DNA repair (Mode of action)

Unirepair[®] T-43 shows essential properties which are directly involved in the skin repair after a UV exposure, at the molecular level, and also at the visible level:

- ▶ A preventive treatment which helps decrease redness and CPD's production
- ▶ A curative treatment which accelerates the CPD's disappearance

A clinical study on 25 volunteers results in visible and significant decrease of skin redness, as a result of skin DNA repair.

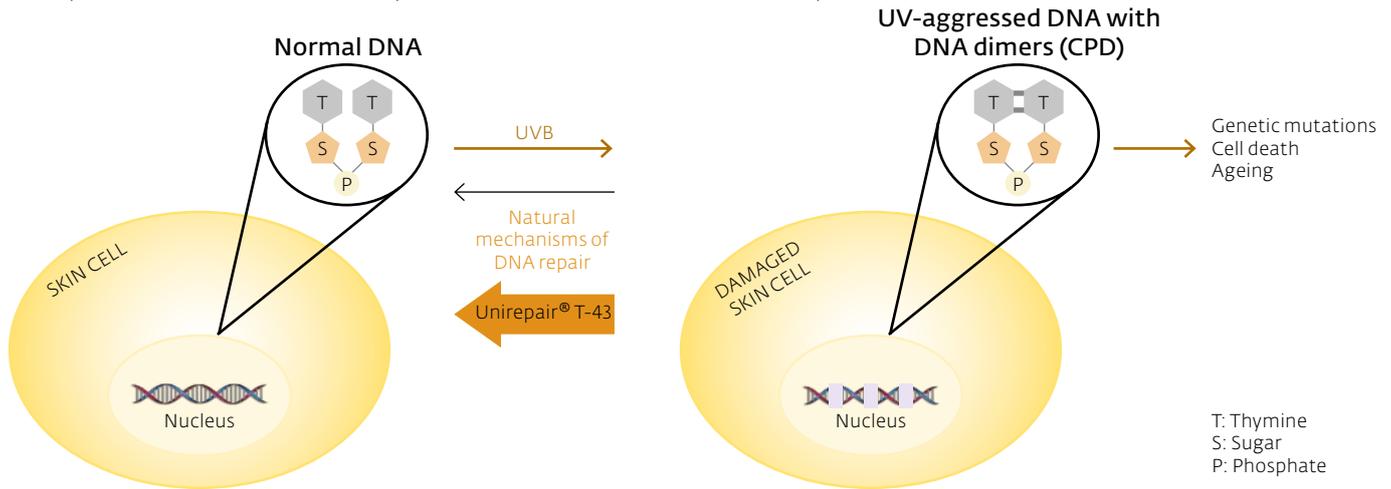
¹ Nucleic Acid Res., 31(21), 6258-63

² J. Photochem. Photobiol. B., 37 (1-2), 1-17

³ Proc. Natl. Acad. Sci. USA, 102 (9), 3459-64

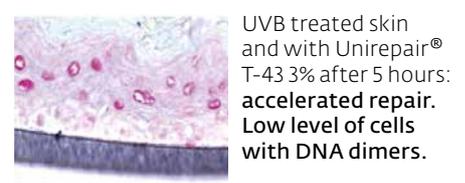
Biological activity

Unirepair® T-43 accelerates and improves natural mechanisms of DNA repair

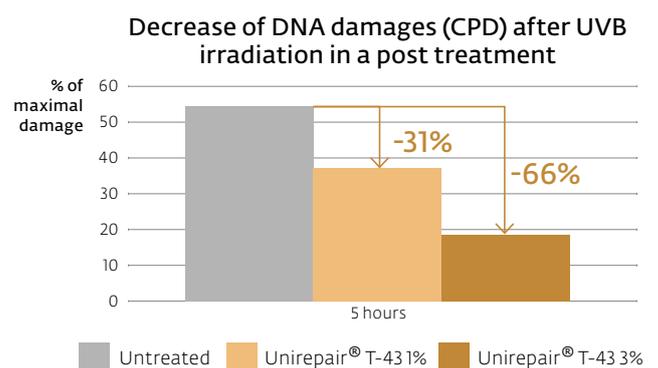


Sun post-treatment use of the product (*ex vivo* tests)

Unirepair® T-43 was tested for its ability to reduce Cyclobutane Pyrimidine Dimers (CPD), a major DNA lesion after UVB-irradiation. Reconstituted human skin (SkinEthic®) were first UVB irradiated (300 mJ/cm²). After 1h, cells were treated with 1 or 3% of the product for 5h. CPD were investigated in the epidermal cell nuclei with an immunostaining. The 100% corresponds to the number of CPD just after UVB-irradiation on the untreated skin explant.



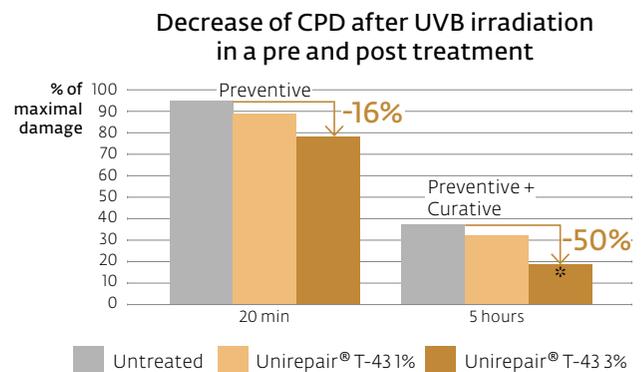
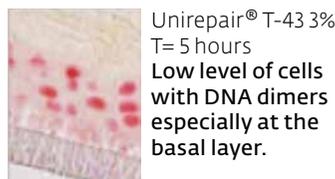
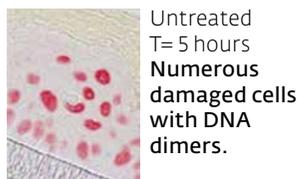
Results: A post-treatment with Unirepair® T-43 at 3% decreases CPD (DNA dimers) after UVB irradiation by -66%, and accelerates DNA repair by more than two times in 5 hours.



Efficacy

Combined use of the product: pre/post sun-treatment (*ex vivo* tests)

A test with Unirepair® T-43 was run to confirm its ability to reduce CPD, a major DNA lesion after UVB irradiation. Reconstituted human skin was first treated with 1 or 3% of the product. After 20 min, the epidermis was UVB irradiated (300 mJ/cm²) and reincubated with the product (5h). CPD were investigated in the epidermal cell nuclei with an immunostaining (red/pink color). The 100% corresponds to the number of CPD just after UVB-irradiation on the untreated skin explant.



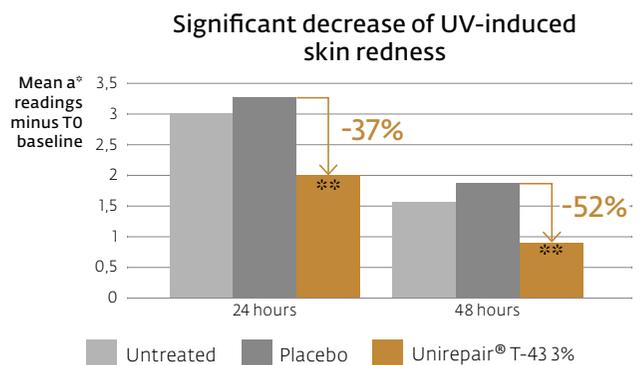
*p<0.05 compared to Untreated, Student's t Test

Results: A pre-treatment with Unirepair® T-43 at 3% improves skin repair capacities instantly by 16% and a post-treatment with Unirepair® T-43 at 3% decreases DNA damages after UVB irradiation by -50% after 5 hours, reaching the maximal level of skin repair.

DNA repair leads to visible reduction of skin erythema (Clinical efficacy)

The efficiency of Unirepair® T-43, versus a placebo, was evaluated during a clinical trial on 25 volunteers (aged between 27-58). The application of either the cream containing 3% Unirepair® T-43, or the placebo was done on the innersides of the forearms. After 20 min, the skin was UV irradiated (Solar Light Model 601-300 Multiport adjusted to 125% of Minimum Erythema Dose) and skin redness was evaluated with Chromameter CR400 after 24 and 48h.

Results: Treatment with Unirepair® T-43 at 3% significantly reduces skin redness by 37% after only 24h, and -52% after 48h. It protects and repairs skin and shows a perfect efficiency for sun care products.



**p<0.01 compared to Placebo, Student's t Test

Summary



Technical information

INCI:	Water (and) Butylene Glycol (and) Acetyl Tyrosine (and) Proline (and) Hydrolysed Vegetable Protein (and) Adenosine Triphosphate
Origin:	Organic synthesis
Preservation:	Preservative free
Appearance:	Clear to slightly opalescent, yellow-brown liquid
Solubility:	Water-soluble
Dosage:	1-3%
Processing:	Can be incorporated in any formula under liquid form at pH between 5.0 and 8.0 and temperature below 50°C

Claims

Claims:	Repairs skin DNA, accelerates skin DNA repair, boosts cellular energy, reverses UV-induced damages, anti-redness, reduces erythema
Applications:	After-sun, sun care products, protective care, day and night care, anti-ageing products, sensitive skin

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