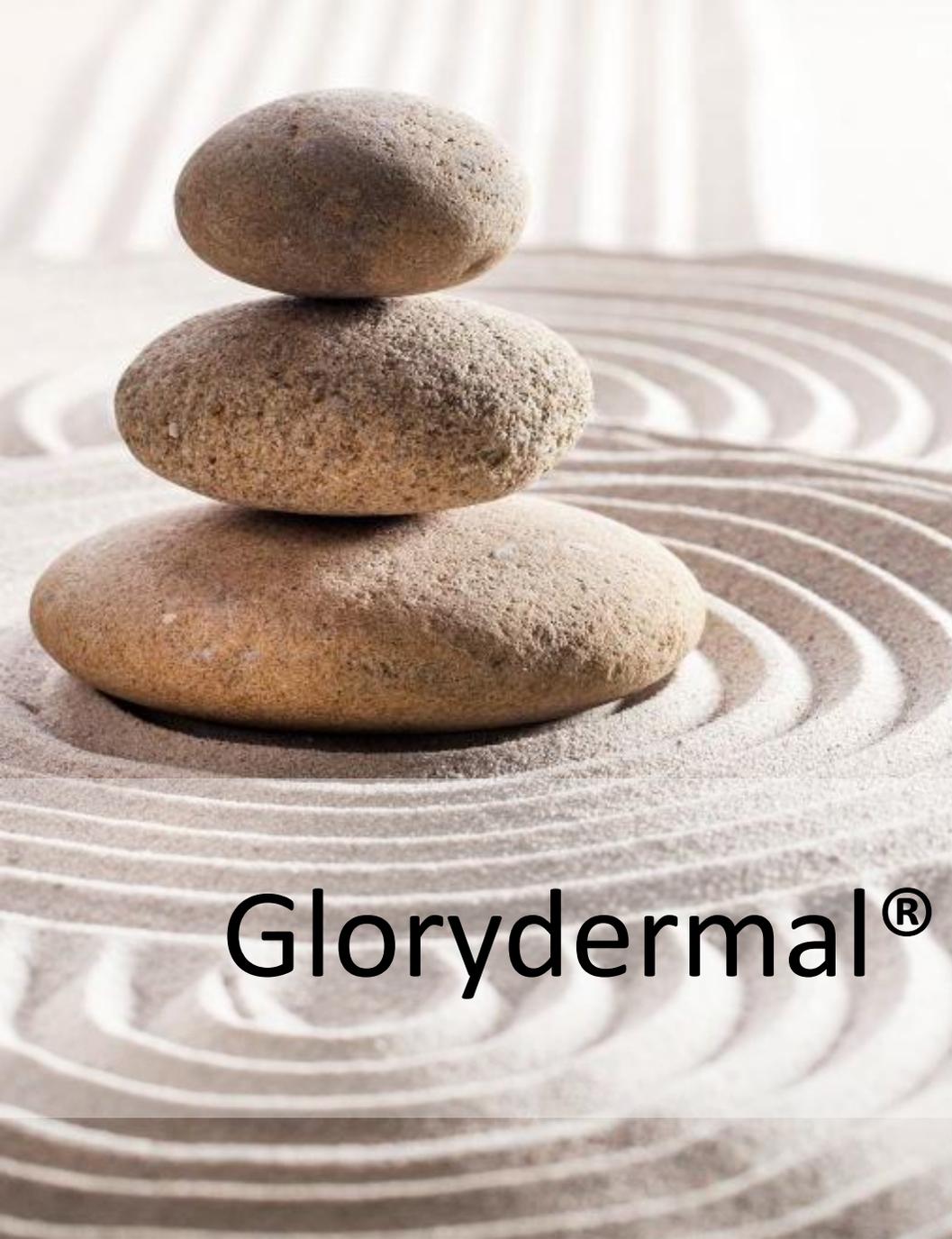




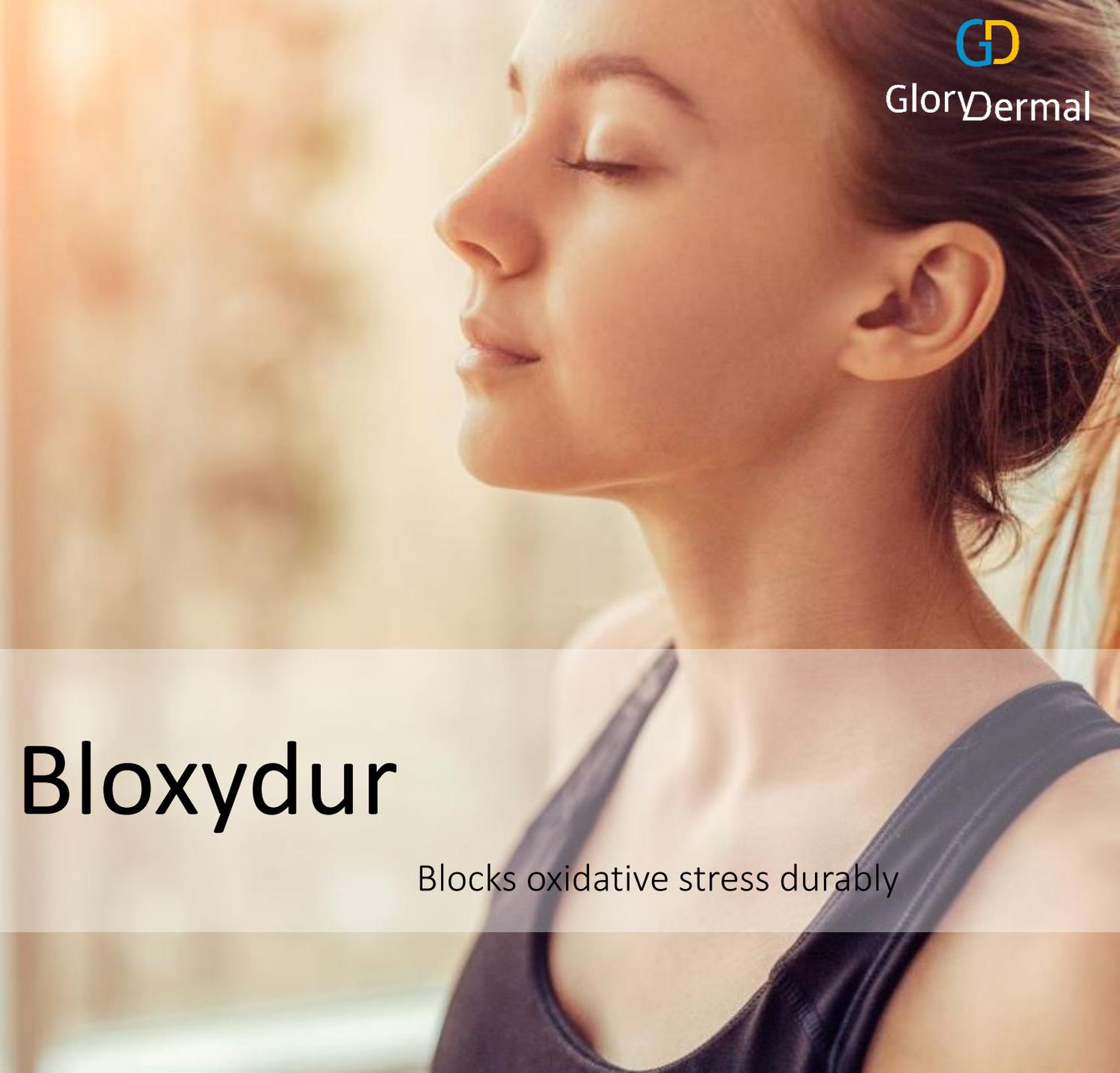
GloryDermal



Glorydermal®

Bloxydur

Blocks oxidative stress durably





Relaxation for the skin

In order to counteract premature skin ageing and the negative consequences of free radicals, it is important that **free radicals in excess** are **sustainably neutralised** and the skin is thus **permanently rebalanced**.

Ideally, the free radicals should be **neutralised** for a **long time** and thus **continuously** before they can have an effect on the skin.





Active description – Enzymes and enzyme-like actives



Free radicals are very well-known natural influences of **ancient origin**.

Since the beginning of life, organisms are depended on using effective **protective mechanisms** to counteract these influences to survive.

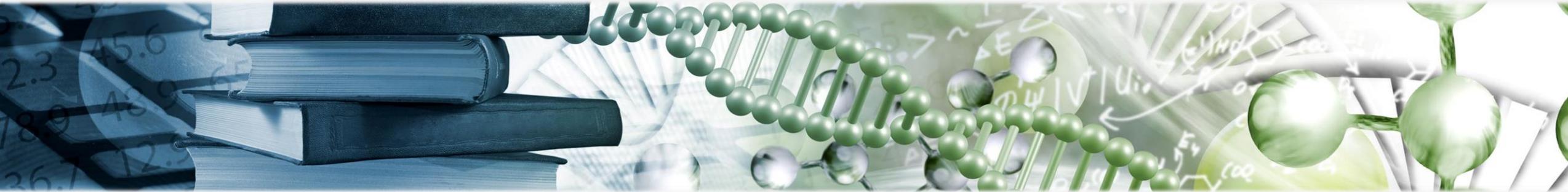
Enzymes play an essential role in these processes. They **enhance and accelerate** many biochemical reactions and they have **important functions in the metabolism of organisms**.

They are **not used up** over many reaction cycles and therefore they offer a **long-term powerful efficacy**.

Enzymes could be called the “conductors of life”.



Active description – Learning from nature



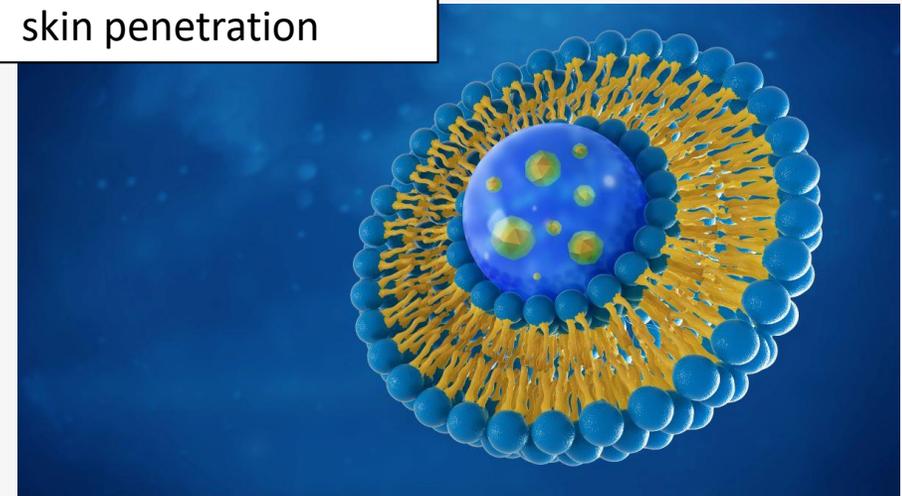
Antioxidant enzyme

Iron peptide

**Neutralisation of
free radicals**



Encapsulated in liposomes
for improved
skin penetration





Active description – Antioxidant enzyme



Antioxidant enzyme (iron peptide):

Reactive Oxygen Species (**ROS**), which include free radicals, are **continuously neutralised**.

This long-term antioxidant acts like an enzyme. It is **not used up** and **regenerates itself**.

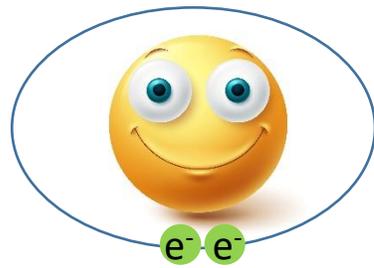


Long-term radical protection



Free radicals – **Action**, neutralisation, long-term radical protection

Action of free radicals **without antioxidants**



Molecule with paired electrons



Free radical without paired electrons



Molecule without paired electrons

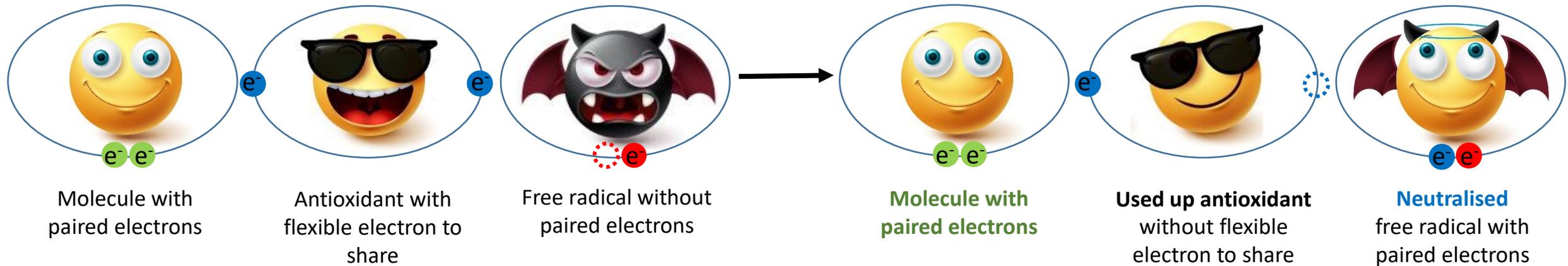


Free radical with paired electrons



Free radicals – Action, **neutralisation**, long-term radical protection

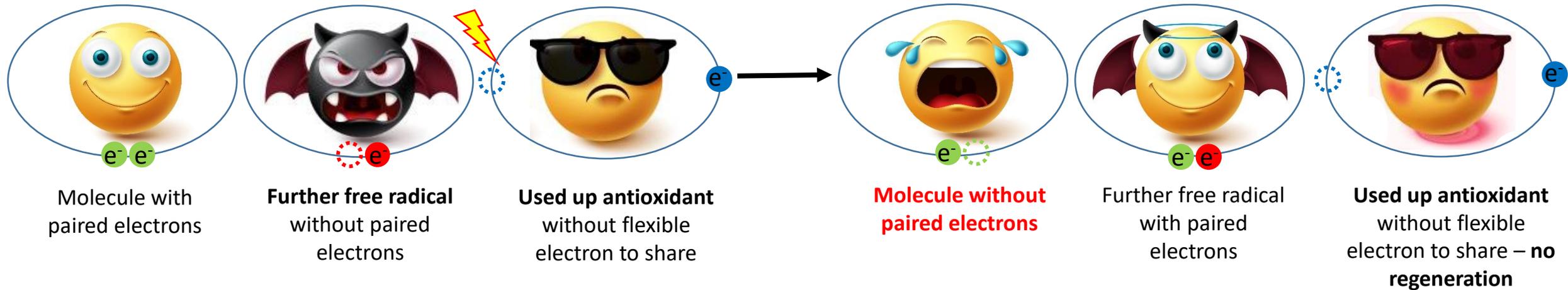
Neutralisation of free radicals **with common antioxidants**





Free radicals – Action, neutralisation, long-term radical protection

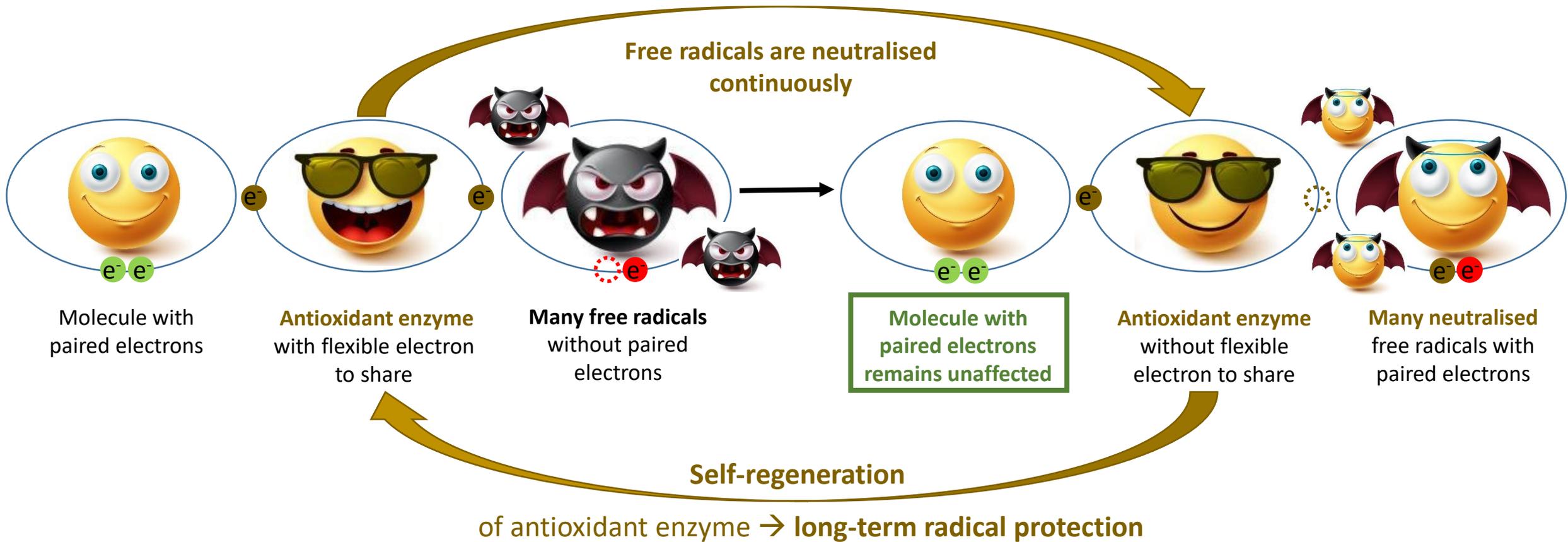
Limits of neutralisation of free radicals with common antioxidants





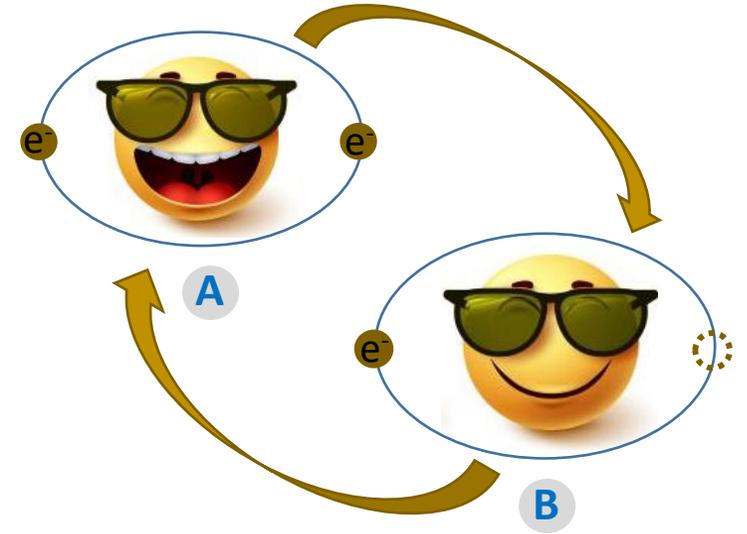
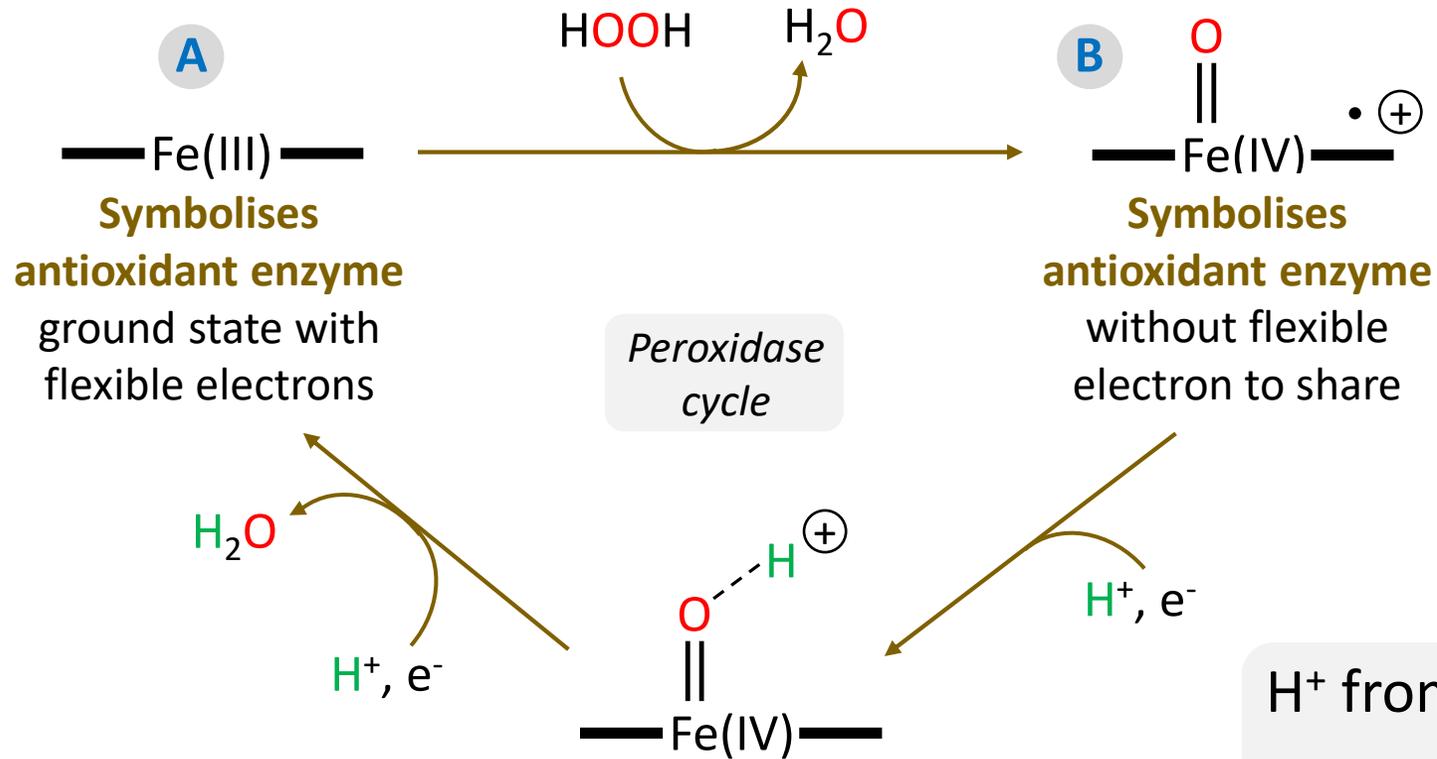
Free radicals – Action, neutralisation, **long-term radical protection**

Neutralisation of free radicals with antioxidant enzyme in Glorydermal® Bloxydur





Self-regeneration of the antioxidant enzyme



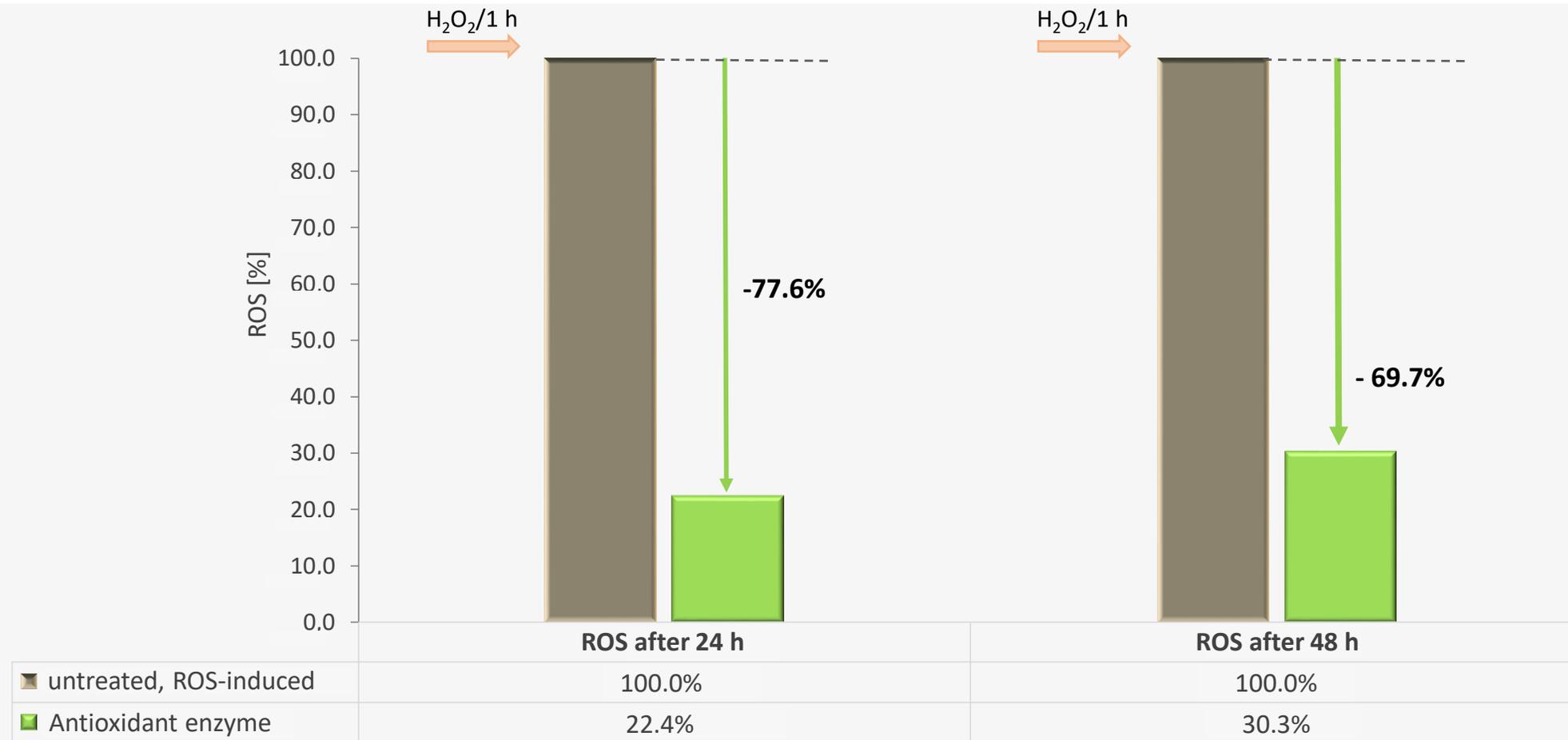
H⁺ from autoprotolysis of water:

$$2 \text{H}_2\text{O} \rightleftharpoons 2 \text{H}^+ + 2 \text{OH}^-$$

Adapted from the peroxidase cycle of horseradish peroxidase (Berglund, G., Carlsson, G., Smith, A. *et al.* The catalytic pathway of horseradish peroxidase at high resolution. *Nature* **417**, 463–468 (2002).)



Efficacy study – Long-term radical protection

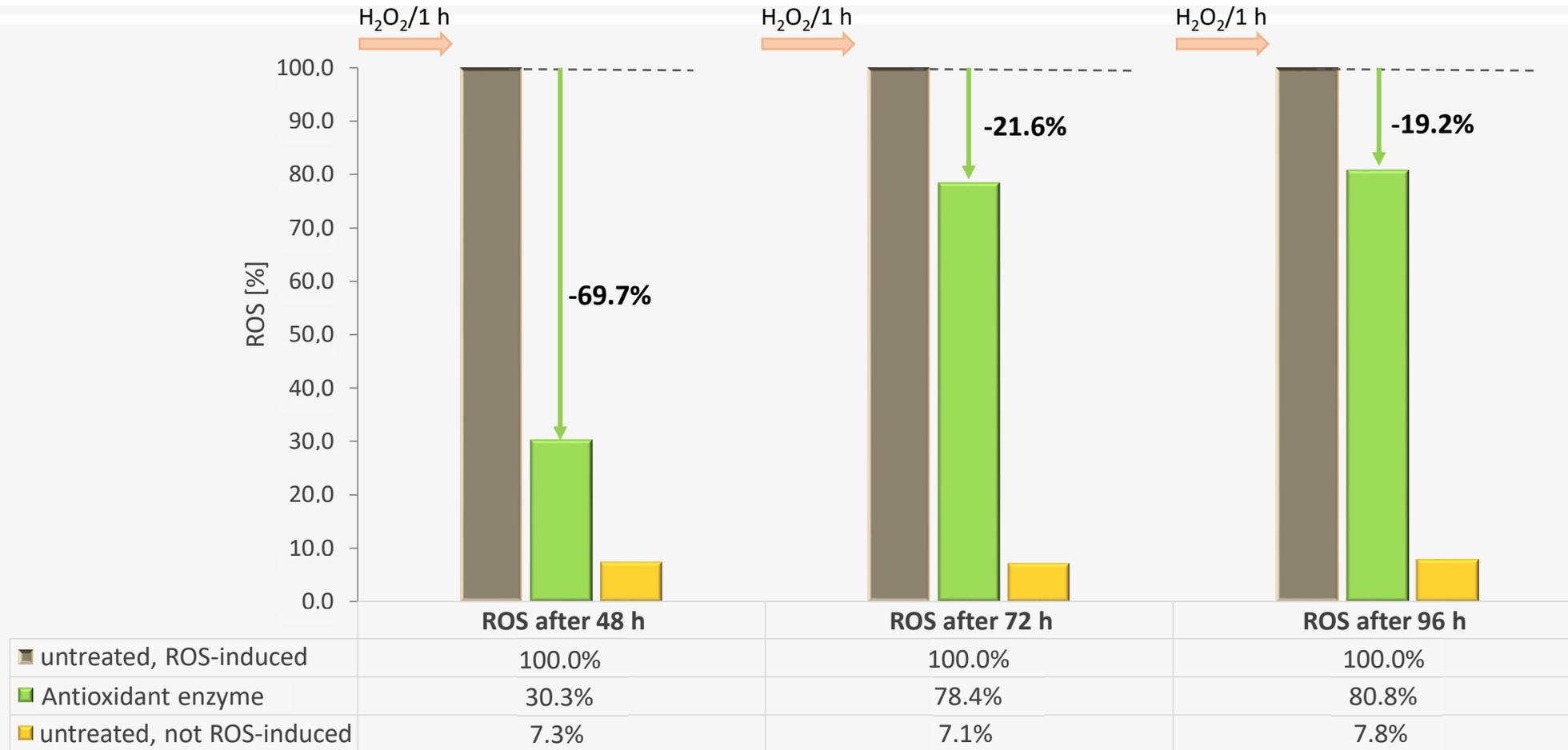


The antioxidant enzyme regenerates itself and provides long-lasting protection against free radicals.

Study design: Human keratinocytes, used formulation: aqueous solution of active ingredient with 0.3% antioxidant enzyme mixture according to Glorydermal® Bloxydur. ROS were induced by H₂O₂ treatment (treatment duration: 1 h). Untreated, ROS-induced = positive control (normalised to 100%, maximum stress). Results in relation to positive control (p<0.0001).



Efficacy study – Long-term radical protection



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Glorydermal® Bloxydur

INCI EU (CTFA/PCPC):

AQUA (WATER), GLYCERIN, LECITHIN, XANTHAN GUM, GLYCINE, GLUTATHIONE, FERRIC GLYCERO-PHOSPHATE, HISTIDINE.

ADDITIVES, PRESERVATIVES:

PENTYLENE GLYCOL, SODIUM PHYTATE.

Appearance: yellow to light brown, turbid liquid

Solubility: dispensable in water

Recommended dosage: 0.3%

Formulation: at the end of the production process at a temperature < 40°C



VEGAN



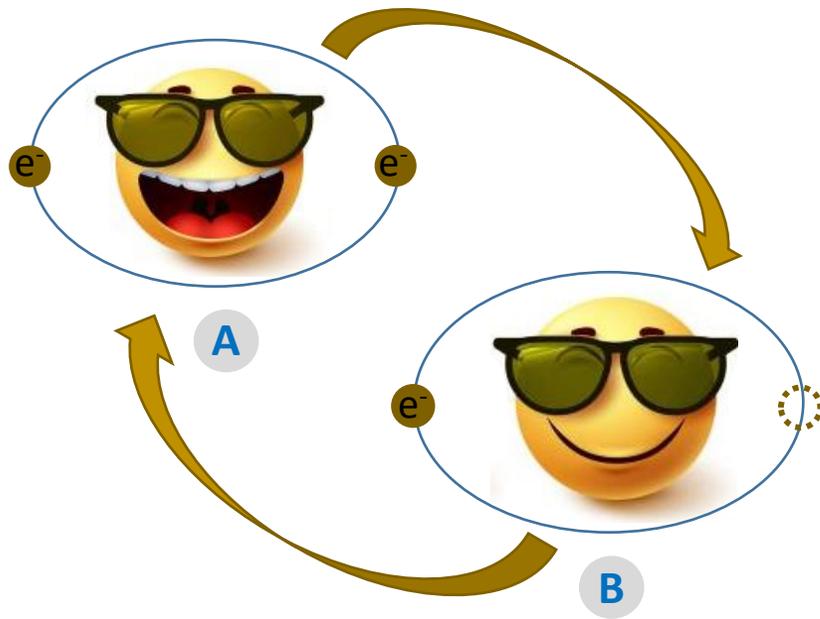
ISO 16128



ISO 16128



Summary – PROTECTIVE BEAUTY

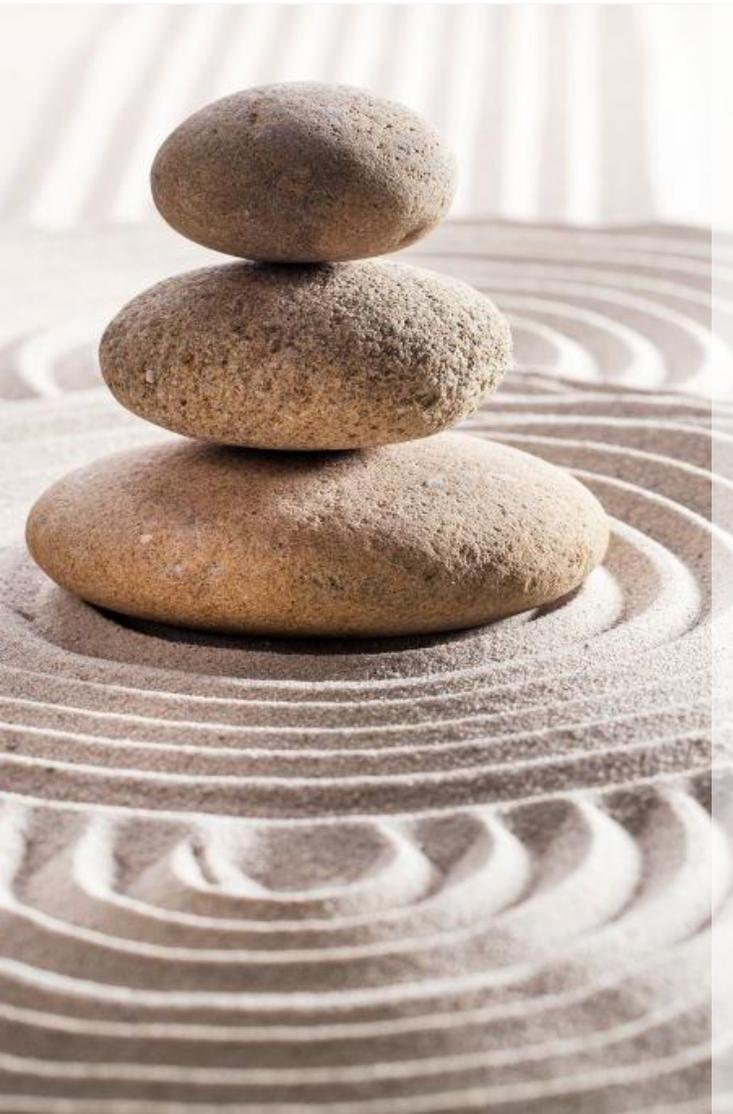


- **Oxidative stress** caused by **free radicals** leads to **premature skin ageing**.
- **Common antioxidants** are **limited** in terms of long-lasting effect.
- The **antioxidant enzyme** (iron peptide) enables a **long-lasting, continuous neutralisation** of free radicals.
- **Easy handling** in the production of cosmetic products (addition at the end of the production process, cooled bulk).
- Recommended for **daily care** (serum, cream, etc.), **body care, sunscreen** and **after sun products**.

Against oxidative stress - for a relaxed skin in balance



Glorydermal® Bloxydur



GloryDermal

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