

Developing natural skin care formulations to target sensitive and dry skin conditions is a challenge. But with AAK functional tools such as the lipophilic actives and emulsifiers, derived from natural sources, you can now formulate safe and elegant natural treatment products.

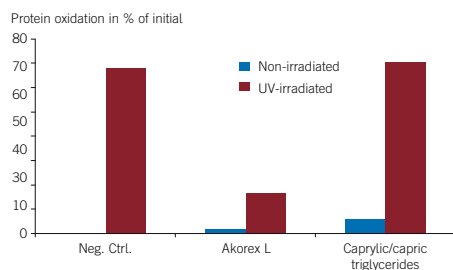
The natural way to create advanced skin care products

Skin caring formulations for delicate skin require well formulated products and a good awareness of skin functionality. The key to success is a careful selection of emollients, emulsifiers, humectants and actives. AAK offer a complete range of naturally derived and safe ingredients for your formulations, including high quality vegetable oils, lipophilic actives and naturally derived emulsifiers. Thanks to their mild character and skin moisturising, caring and protecting properties, they are well suited for treatment formulations.

Natural Lipophilic Actives

Akorex L (high stability canola oil) and Lipex® Collect (Phytosteryl Canola Glycerides) are innovative vegetable emollients with enriched high

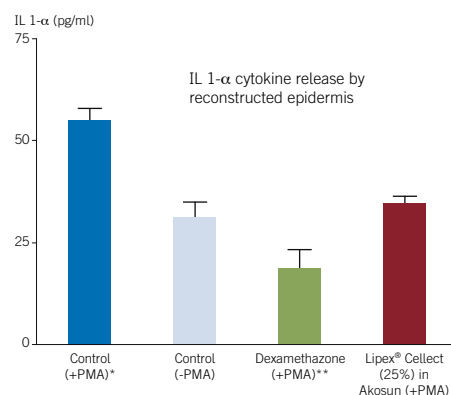
Figure 1. Akorex L efficiently protects UV-irradiated human skin cells.



The protective effect was studied in normal human epidermal keratinocytes irradiated with simulated solar UV radiation for 60 minutes at room temperature.

content of natural tocopherols (Vitamin E) and sterolesters. Tocopherols are well known potent natural antioxidants and sterols are known for good membrane stabilising properties. Both tocopherols and sterols are also shown to be efficient anti-inflammatory agents due to their leucotriene inhibiting capacity, properties supported by literature data.

Figure 2. Lipex® Collect significantly reduces inflammatory reaction in human skin cells.



* Phorbol myristate acetate, pro-inflammatory agent, (5 µg/ml) added to culture medium
 ** reference compound (0,1 µM)

Epidermis cultures were topically treated with 3 µl of each test compound.

The protective effect was studied in normal human epidermal keratinocyte cultures exposed to a pro-inflammatory agent (PMA) by measuring cytokine release.

The good content of actives in Akorex L and Lipex® Collect have demonstrated both photo-protecting capacity and anti-inflammatory properties, confirming their capacity to provide protection against environmental aggressions (See Figures 1 and 2).

Accordingly, dermal application of the lipophilic actives has the potential of strengthening the skin barrier, reducing damage of oxidative and environmental stress conditions and soothing the skin in a natural way.

Improved Skin Penetration

The composition of the formulation has an important effect on the penetration of hydrophilic as well as lipophilic actives through the stratum corneum (SC). However, the mode of actions are complex and not yet fully understood.

Lipophilic actives such as natural tocopherols and sterolesters have the potential of penetrating the upper skin surface by diffusion within the lamellar structures in the intercellular region of the SC. Thanks to structural similarities, they have a good affinity to the lipid matrix and this will further facilitate diffusion and favour the permeation of the actives in epidermis. The facilitated bioavailability of topically applied lipids may result in interactions with skin metabolic processes such as reduction of inflammatory mediators. The natural tocopherols may also supplement the skin's natural antioxidant system, already containing tocopherols as the most important lipophilic antioxidants.



**Bioactive natural
oils bring valuable
skin benefits.**



Examples of natural sources, shea and canola.

Natural emulsifiers with humectant properties

The naturally derived emulsifiers, Akoline GC (Hydrogenated Vegetable Glycerides Citrate) and Akoline SL (Sodium Stearoyl Lactylate), offer additional skin caring properties for treatment formulations. They efficiently stabilise liquid crystalline structures formed by non-ionic surfactants, stabilising the emulsion and also contributing to good skin moisture retention. Likewise combinations of Akoline GC and Akoline SL have been shown in clinical tests to significantly improve skin firmness, elasticity and smoothness.

Thanks to a slow release of the alpha hydroxy acids in contact with the skin, these emulsifiers are well suited for mild treatment formulations, offering moisturising properties and an elegant skin after-feel.

Functional treatment formulations

Sensitive and dry skin conditions are correlated with a defective skin barrier, high water evaporation and enhanced sensitivity to environmental stress conditions. Selected functional ingredients offer a natural protection, soothing properties and good skin moisturisation – new tools for formulating safe and elegant natural treatment products.

Compositional and stability data (typical values).

Product and INCI name	Akorex L (Canola oil)	Lipex® Collect (Phytosteryl Canola Glycerides)
Tocopherols (ppm)	1000	700
Sterols (%)	0,7	45 (sterol esters)
OSI (hours @110°C)	100	80



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