

# Lipolami® ER

## Multi-functional formulation ingredient for sensory textures and skin protection



### A natural and sustainable ingredient

Obtained from milk thistle, Lipolami® ER takes the form of a dry soft-touch, fluid oil. Milk thistle is cultivated in France close to our manufacturing site by our farming partners.

Lipolami® ER is obtained by transesterifying triglycerides from milk thistle fatty acids. This eco-responsible process produces monoesters, which give the oil its dermocosmetic properties. These natural fatty acid esters are extremely fluid and dry to the touch, which means they can be used to formulate lighter textures than vegetable oils whilst retaining their precious properties.



One of the new trends in cosmetic formulation is the use of multi-functional ingredients. It is particularly appealing for brands which want to streamline their raw materials portfolio and reduce the costly procedures of Reach registration. It deals with “cross-functional” ingredients which are not only functional but also active. Efficacy and sensory textures are now fully consistent one with another. Of course, this trend has to comply with the continuous demand in natural alternatives to synthetics.

Alban Muller International's expertise in natural formulation has enabled to develop Lipolami® ER, the new ingredient for all your beauty products that matches perfectly the market demand. This natural agent offers a double function: a cosmetic activity to protect the skin barrier against aggression and a formulation asset, as a natural alternative to silicones, to create absolutely sensory textures.

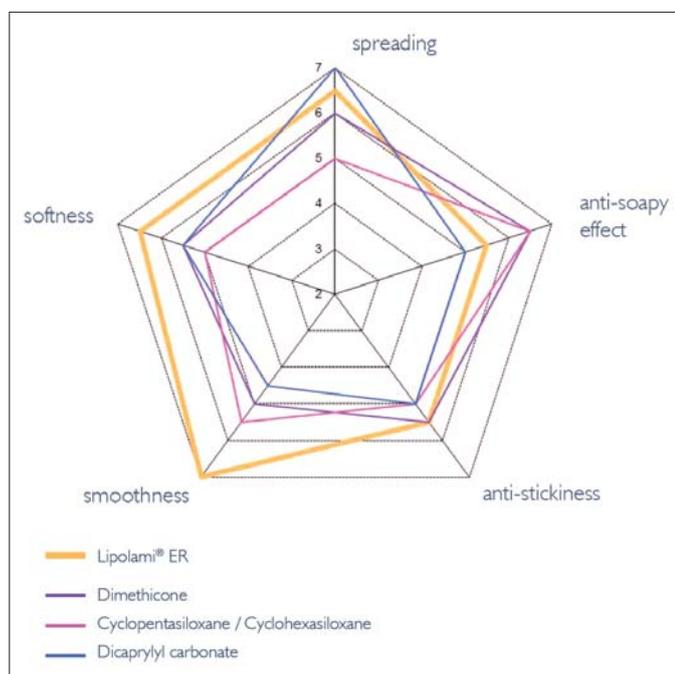
It can be used to formulate finished products with a smooth, silky and non-sticky texture with no silicones. It provides a feeling of extreme softness when applied. Lipolami® ER is also an active ingredient source of omega-6 linoleic fatty acid that contributes to reinforce the skin barrier.

## Lipolami® ER, your new best friend in natural formulation

### 1) Natural sensory textures... with no silicones!

#### A. Soft-touch and melting emulsions

A comparative blind study between 5 separate textures was carried out with 5 volunteers to evaluate the sensorial qualities obtained by adding either 5% of Lipolami® ER, either different kind of silicones to a basic formula. The results were particularly successful for the softness, the velouté and the non-sticky aspect of the textures with Lipolami® ER. An awesome performance for our natural active vs. silicones!



#### B. Mild and translucent foaming products

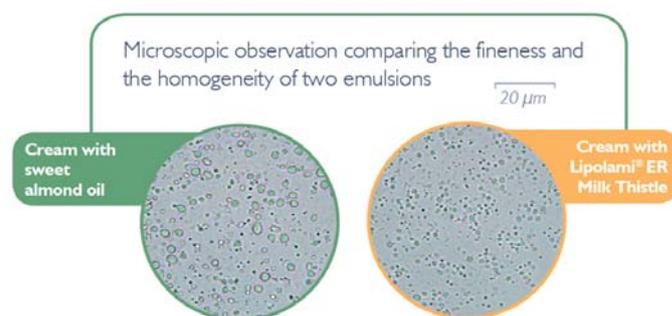
As it efficiently decreases the drying effect of surfactants, Lipolami® ER is amazing in foaming products as well. It offers a concrete feeling of comfort on the skin after shower or on the hair after shampoo, leaving it supple, easy to untangle and easy to style. Besides up to 1.5% (even more depending on formulas), Lipolami® ER can be added to foaming products without using a solubilizer and without affecting their transparency or their foaming power.

### 2) Numerous technical benefits

Lipolami® ER can fulfil several roles as part of cosmetic formulas. According to several tests, it combines its sensory appeal with extremely interesting technical benefits:

- Stability and fineness of emulsions

- Disperses and solubilizes sunscreens
- Disperses pigments and minerals
- Solubilizer for perfumes (perfumed bases and essential oils)
- Effective solubilizer for oily substances



### 3) Protective barrier function

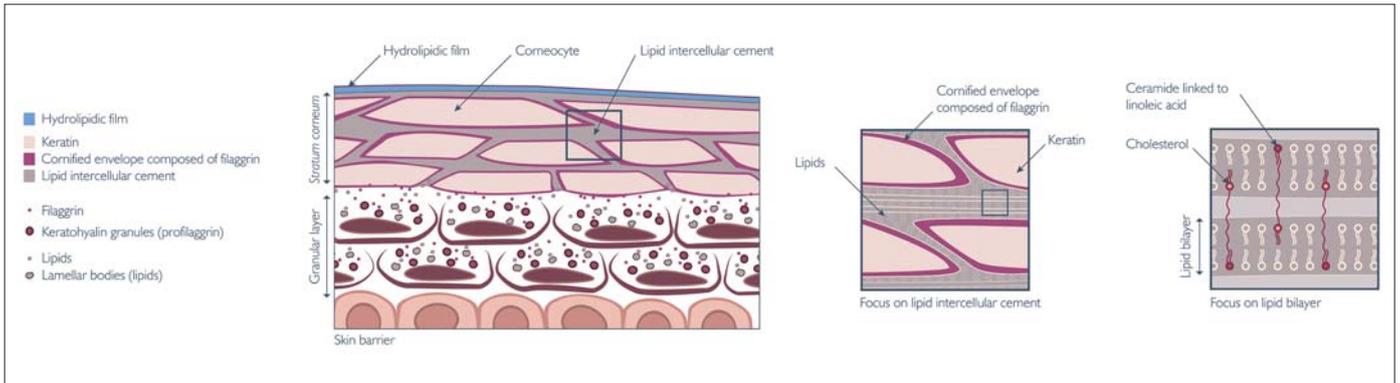
#### Focus on the skin barrier

The epidermis, particularly the horny layer which is directly exposed to the external environment, provides a protective function against mechanical aggressions but also a barrier against pathogens, UV rays, dryness, transepidermal water loss, etc.

The stratum corneum consists mainly of corneocytes, the hydrophilic film and of a lipid cement forming a strength and waterproof barrier.

The intercellular cement between the corneocytes is composed of lipid bilayers, which are themselves composed of free fatty acids, ceramides and cholesterol arranged in a very orderly manner. The latest research has illustrated the importance of linoleic acid in ensuring the intercellular cement strength and that the skin barrier remains effective.

On the other hand, the knowledge of the stratum corneum have evolved from a simple system made of two-compartment (model "brick and cement") to a system with a regulated metabolic activity related to the deeper layers of the skin. Indeed, among the major components involved in the formation of the skin barrier, there is also the protein filaggrin, a marker of the barrier function.



### Focus on filaggrin

Filaggrin is a protein participating in the formation of the horny layer and its barrier function by binding to the keratin of corneocytes. It plays a key role in the hydration of the stratum corneum upon its degradation into free amino acids that form a major part of the NMF (Natural Moisturing Factor). Indeed, the more the skin is dry, the greater the degradation phenomenon is to maintain hydration. Reducing the production of NMF leads to an alteration of the skin barrier repair. Therefore filaggrin is an excellent marker of the skin barrier condition.

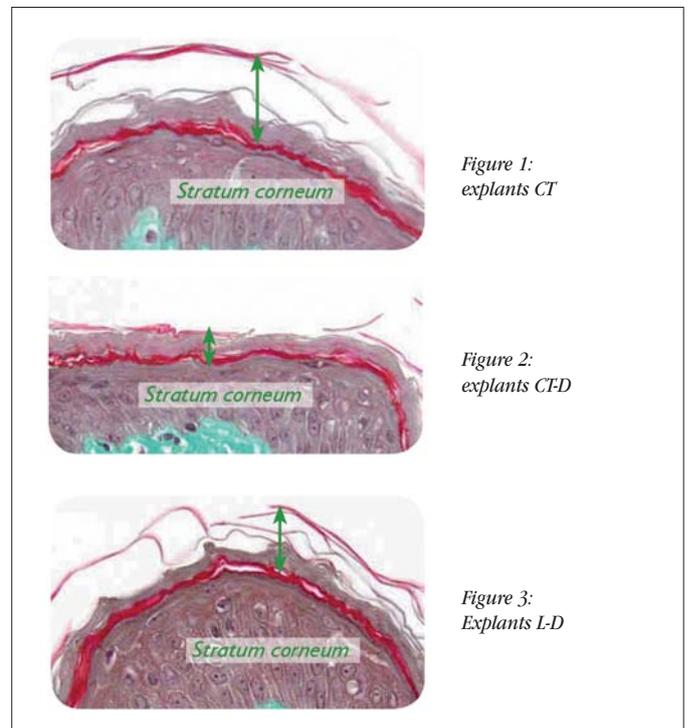
NB: 20-50% of people with atopic dermatitis (extreme drought) have a filaggrin deficiency.

An *ex vivo* demonstration of the activity of Lipolami® ER on human skin explants has enabled us to highlight the protective effect of the barrier function after delipidation of the stratum corneum by a solution of SDS 10%.

The protective activity of the skin barrier is evaluated by the observation of the general morphology of the stratum corneum (A) and by immunostaining of filaggrin (B) on 3 batches of explants treated as follows:

- Control untreated explants (CT)
- Control delipidated explants, after a treatment for 2 hours with a solution of SDS at 10% (CT-D)
- Explants treated with Lipolami® ER and then delipidated three hours after by SDS solution at 10% for 2 hours (L-D)

### A. Morphological study of the effect of Lipolami® ER on the skin barrier

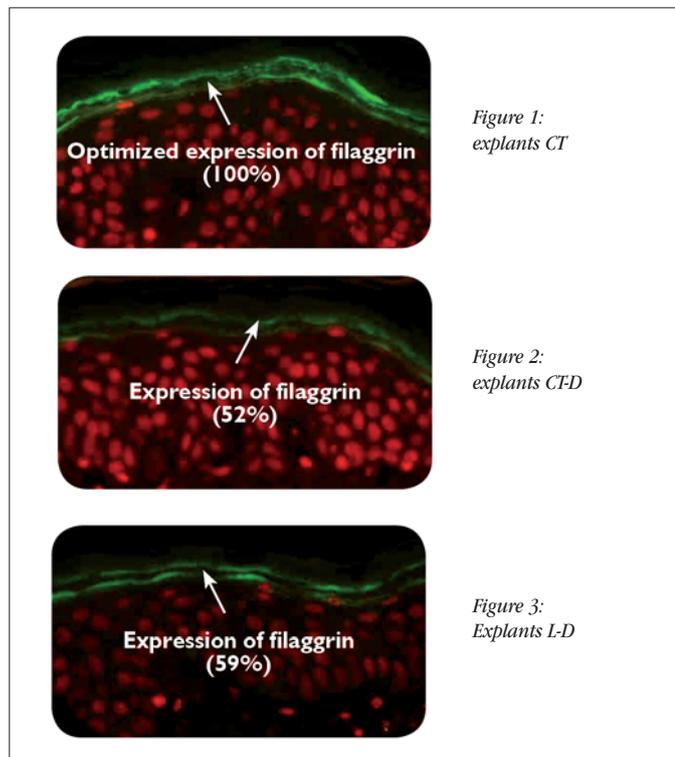


The delipidation by SDS (Figure 2) leads to reduce or suppress the lipid intercellular cement and therefore the cell cohesion which reduce significantly the barrier function. The explants pretreated by Lipolami® ER (Figure 3) have a *stratum corneum* similar to that of control explants CT (Figure 1). Lipolami® ER's composition rich in linoleic acid ester contributes to maintain the strength of the intercellular cement and the barrier function, ensuring flexibility, tightness and elasticity to the skin. Lipolami® ER thus protects the skin from an intense dryness preserving the integrity of the skin barrier.

### B. Immunostaining study of filaggrin

The immunostaining of filaggrin enables to evaluate more precisely the mode of action of Lipolami® ER on the protection of the

skin barrier. Indeed, filaggrin is a marker of the state of the skin barrier and also provides information on the hydration of the skin.



Compared to explants CT (Figure 1), the green fluorescence of explants CT-D (Figure 2) highlights a decrease by half of the filaggrin expression which is degraded to provide compensation for losses caused by the SDS delipidation and therefore provide skin hygroscopic components of the NMF.

The expression of filaggrin in the explants treated beforehand with the Lipolami® ER (Figure 3) represents a significant increase of 13% compared to explants CT-D. Indeed, Lipolami® ER reinforces the lipid cement and thus maintains its seal. By this action, Lipolami® ER reduces the intense dryness of the skin caused by the SDS and reduces the need for NMF. Therefore, filaggrin is less hydrolyzed in explants L-D and its expression remains higher than in explants CT-D.

## Conclusion

Lipolami® ER is the perfect multifunctional ingredient for natural formulation as a texture agent and cosmetic active protecting the skin barrier. Lipolami® ER is a top-of-the-edge innovative solution to replace silicones in any cosmetic products. It also preserves the skin barrier function by protecting it from aggressions. It provides cosmetic formulas with additional activities beneficial to dry, delipidated or atopic skin.

Lipolami® ER is particularly recommended in face, baby, body, lips and eye contours skin care products. But it offers limitless possibilities and will surely become your must-have ingredient to formulate any cosmetic products aiming at offering the best skin-feel ever, and completely naturally!

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