

EPIDERMOSIL®

**SKIN RESTRUCTURATION
ANTI-DEEP AND SUPERFICIAL WRINKLE
MOISTURIZER
SKIN PROTECTION
BIOLOGICAL PEELING
ALTERNATIVE TO SURGERY**

EXSYMOL
MONACO

EPIDERMOSIL: A SILANOL OF HYALURONIC ACID

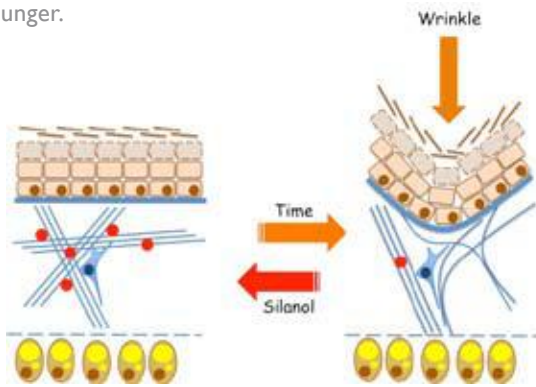
THE SILANOL TECHNOLOGY SKIN RESTRUCTURATION

Silicium is an essential component of the skin. Indeed, by interacting with structure and elastic proteins within the dermis such as collagen fibers, elastin and proteoglycans, the silicium insures optimal skin organization and architecture.

However, with age the amount of silicium naturally present in the skin tends to decrease. As a result, an overall collapse of the skin architecture will happen, which will in turn induce skin metabolism slow down, inevitably leading to wrinkles.

EPIDERMOSIL is part of the silanol family. It is a compound that possesses an organic silicium core.

A topic application of **EPIDERMOSIL** on the skin will therefore replenish the skin natural pool of organic silicium. The skin will be rejuvenated, better organized and structured. Ultimately, the skin will become visibly younger.



Please refer to **ALGISIUM C** leaflet for any further details about the **SILANOL** technology.

HYALURONIC ACID AND SKIN

Hyaluronic acid (HA) is the most abundant glycosaminoglycan (GAG) within the skin. Because of its hydrophilic structure, HA's role is to maintain an optimal hydration level in skin. Native HA is naturally produced by skin cells, mainly as high (>2,000kDa) and low (150-600kDa) molecular weight biopolymers. The size of the polymer dictates its biological role on skin cells.

In **EPIDERMOSIL**, we chose to use low molecular weight HA which will trigger a virtuous circle leading to epidermis thickening.

By binding its receptor CD44 at the surface of the keratinocytes of the germinal layer, low molecular weight HA induces 3 reactions:

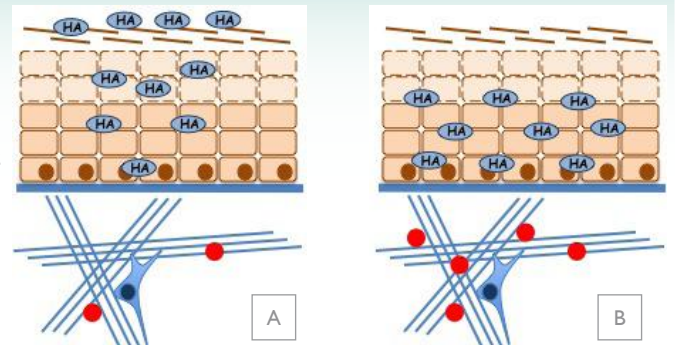
- Production of native HA by the keratinocytes
- Overexpression of CD44, the HA receptor, at the surface of these keratinocytes
- Proliferation of these keratinocytes

More keratinocytes that produce more HA and that express more of its receptor will further proliferate for yet a stronger production of HA. This is a virtuous circle that will lead to a quick thickening of the epidermis and a reduction of visible signs of aging.

SILANOLS AS SMART CARRIERS FOR SYNERGETIC BENEFITS

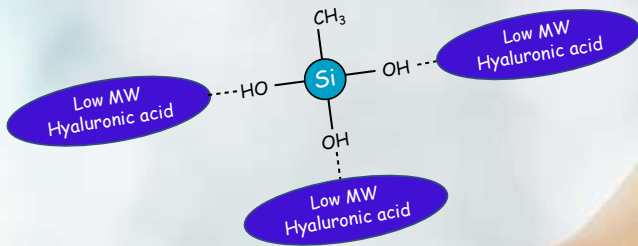
In order to be effective, the organic silicium core needs to be maintained in its monomeric active form. We therefore stabilized it using low molecular weight hyaluronic acid (HA), hence preventing its polymerization into inactive silicone.

While HA is stabilizing the organic silicium core, hence ensuring its activity, the organic silicium will in turn improve HA's activity. Because of its high affinity for the dermis tissue, the organic silicium will quickly go toward this skin compartment and, because it is bound to HA, it will drag it in the skin deepest layers hence improving its penetration. As a result, there will be an optimal repartition of HA throughout the skin and more of it will reach the basal layer of the epidermis where it will bind its receptor CD44 for an improved activity.



Silanols as smart carriers.

A. By itself, HA has a mild penetration and therefore activity.
B. With **EPIDERMOSIL**, HA is capable of reaching the basal layer of the epidermis and the skin is replenished with organic silicium.



INCI name : SILANETRIOL (AND) HYALURONIC ACID

EPIDERMOSIL is a silanol that combines the restructuring benefits of the organic silicium and low molecular weight hyaluronic acid which is capable of stimulating keratinocyte proliferation within the epidermis.

SKIN BENEFITS

*Stimulates collagen production
Increases skin cell proliferation
Increases skin cell survival
Preserves skin hydration*

COSMETIC APPLICATIONS: BODY & FACE

BEAUTY CARE

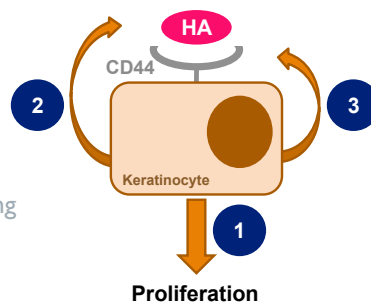
- Anti-aging
- Anti-wrinkle
- Biological peeling
- Body firming

DERMO COSMETIC

- Alternative to botox and/or HA injections
- Anti-dehydration
- Skin protection

STRUCTURAL IMPROVEMENT

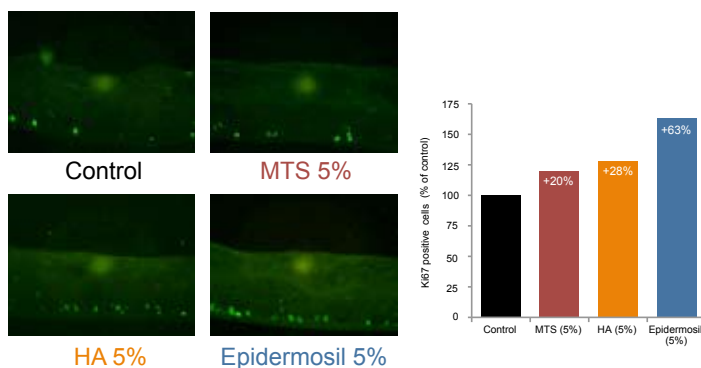
EPIDERMOSIL is capable of stimulating keratinocyte proliferation. By enhancing low molecular weight hyaluronic acid penetration and bioavailability, a higher amount of HA is capable of binding its receptor CD44 at the surface of keratinocytes hence triggering three reactions:



- 1 Keratinocyte proliferation that will lead to epidermis thickening
- 2 Keratinocyte production of HA
- 3 Overexpression of hyaluronic acid receptor CD44

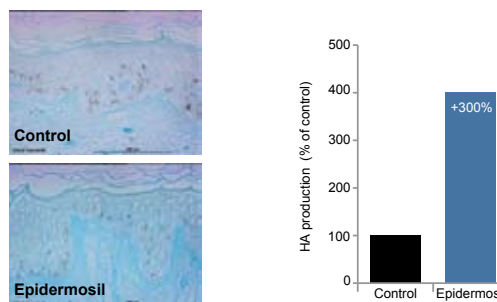
1 Keratinocyte proliferation that will lead to epidermis thickening

HRE were treated with silicium alone, with HA alone or with **EPIDERMOSIL** at the same concentration and the number of proliferating keratinocytes (Ki67 positive cells marked in green) was assessed. Both silicium and HA alone stimulate keratinocyte proliferation. **EPIDERMOSIL** has a stronger cyto stimulating effect than both HA and silicium pooled together, hence showing the synergy created by this compound.



2 Keratinocyte production of HA

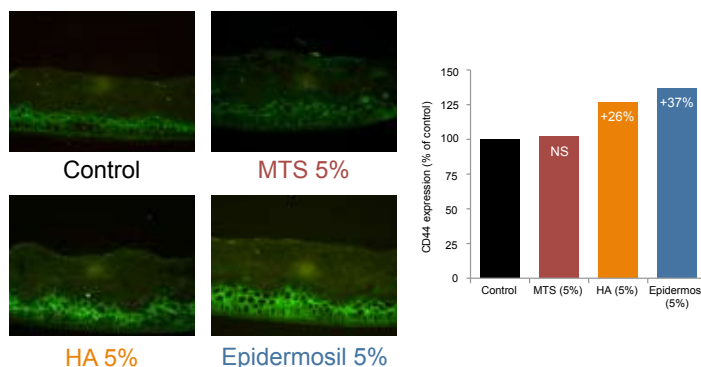
Human skin explants were treated with **EPIDERMOSIL** (5%) for 9 days. By the end of the treatment, the amount of HA (stained in blue) present in the skin was improved, suggesting a strong HA-induced HA production by the keratinocytes from the epidermis.



3 Overexpression of hyaluronic acid receptor CD44

Human reconstructed epidermis (HRE) were topically treated with silicium alone (MTS), HA alone or **EPIDERMOSIL** at the same concentration.

A stronger overexpression of CD44 (marked in green) was observed in the **EPIDERMOSIL** treated HRE.



The benefits provided by EPIDERMOSIL are higher than the combination of organic silicium and HA together. This synergy is responsible for a strong cyto stimulation of the keratinocytes, leading to a thickening of the epidermis for an improved protection and hydration of the skin.

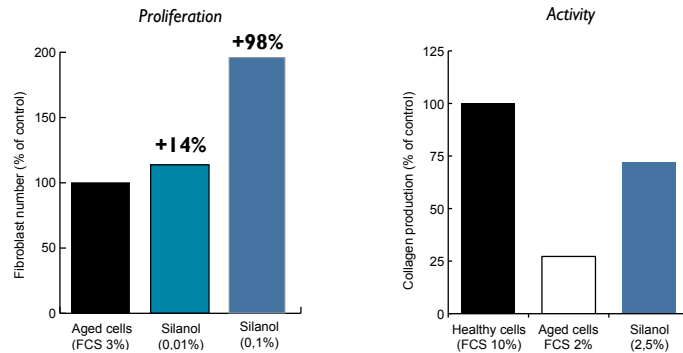
STRUCTURAL IMPROVEMENT

Organic silicium has been described as an important structural element for the dermis. Indeed it is capable of stimulating the production of structure proteins (such as collagen fibers) and GAGs.

EPIDERMOSIL stimulates collagen production

Collagen fibers are structure proteins synthesized by fibroblasts in the dermis. They ensure skin firmness, elasticity, flexibility and resistance.

Treatment with organic silicium leads to a recovery from aged-induced drop of proliferation and activity.

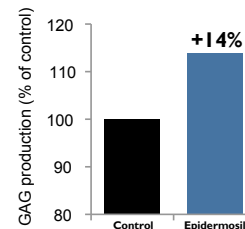
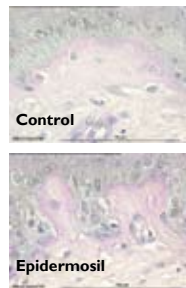


Within the dermis, there are more fibroblasts and each one of them produces more collagen. The skin is therefore redensified and plumped in depth.

EPIDERMOSIL stimulates GAG production

Glycosaminoglycans (GAGs) are very hydrophilic proteins. They ensure skin hydration and resistance in the dermis.

Treatment of human skin explants with **EPIDERMOSIL** (5%) leads to a stimulation of GAG (stained in purple) production within the dermis.

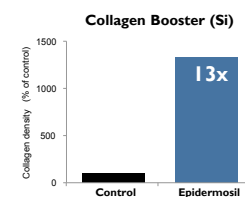
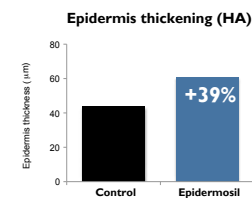
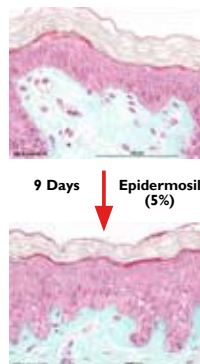


Treatment with **EPIDERMOSIL** improves the amount of GAGs within the skin. The skin is better hydrated and resilient.

EPIDERMOSIL: Synergetic effect for global skin benefits

As a result of all the benefits provided by **EPIDERMOSIL**, a treatment with this compound provides the skin with global improvements at all levels:

- The epidermis is thicker for higher skin protection and a reduced transepidermal water loss (TEWL).
- The dermis is denser for a more resistant, flexible and elastic skin.



PROTECTION & HYDRATION

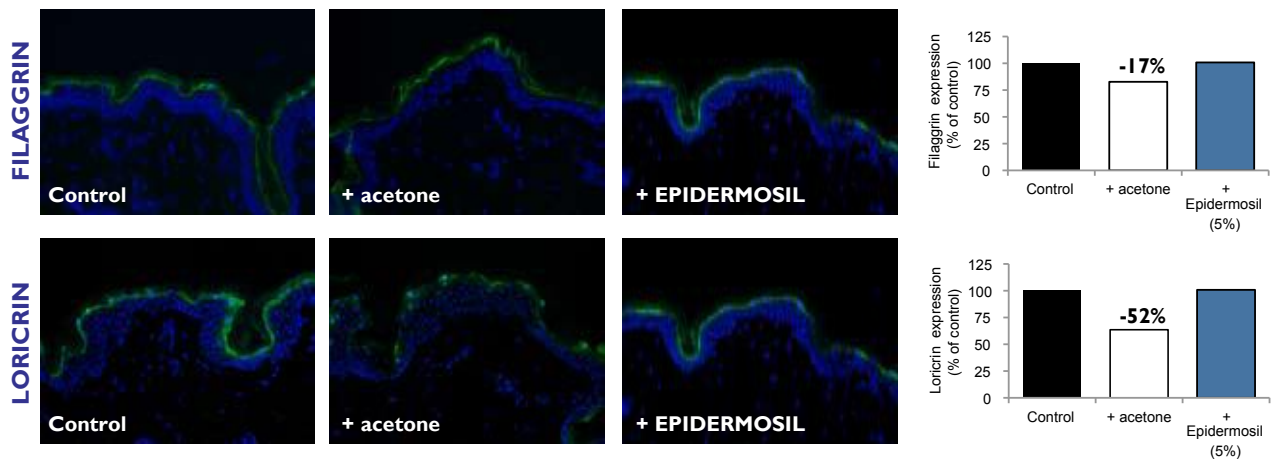
In order to assess **EPIDERMOSIL**'s ability to protect the skin from dehydration and to help it recovering from a severe stress, we exposed human skin explants to acetone.

When applied at the surface of the skin, acetone is responsible for corneocyte removal and surface lipid disorganization, hence leading to severe trans-epidermal water loss (TEWL) and to several adaptive responses such as the blockage of water fluxes within the skin.

EPIDERMOSIL ensures optimal protection for the skin

Filaggrin plays a very important role in the maintenance of optimal levels of natural moisturizing factors (NMF) in the *stratum corneum* and in the skin resistance to environmental stress as it maintains the cohesion between corneocytes within the epidermis.

Loricrin works together with filaggrin to provide the skin with physical, chemical and biological protection.



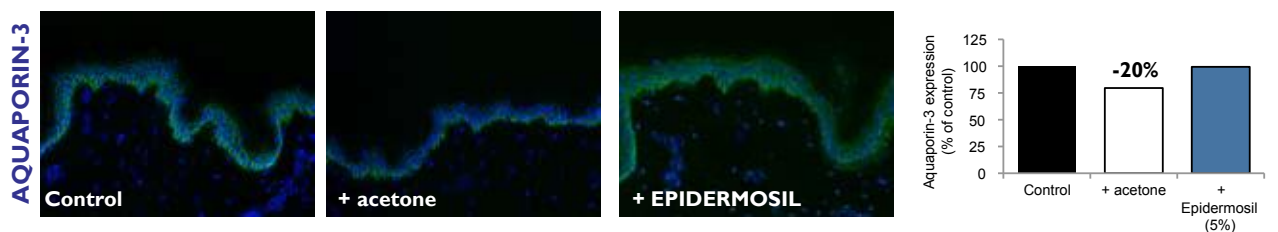
Three hours after acetone exposure, human skin explants show a 17% decrease in filaggrin (marked in green) expression and a 52% decrease in loricrin (marked in green) expression.

Treatment with **EPIDERMOSIL (5%)** leads to a complete recovery of filaggrin expression and thus provides the skin with optimal protection and hydration levels.

EPIDERMOSIL ensures optimal skin hydration

Aquaporin-3 is a protein responsible for the creation of transmembrane pores which allow water transport across cell membranes. As a result, aquaporin-3 ensures optimal moisturization in the epidermis.

Three hours after acetone exposure, human skin explants show a 20% drop in aquaporin-3 (marked in green) expression.



Treatment with **EPIDERMOSIL (5%)** leads to a complete recovery of aquaporin-3 expression and thus provides the skin with optimal hydration.

EPIDERMOSIL is capable of protecting and of maintaining an optimal hydration level in the skin, even in the most extreme conditions.

EPIDERMOSIL contributes to maintaining a young, smooth and healthy skin

TECHNICAL CHARACTERISTICS

EPIDERMOSIL®

ANALYTICAL COMPOSITION

Methylsilanetriol	0.3%
including silicium	0.09%
Low molecular weight hyaluronic acid	0.35%
Water (sq)	100%

PHYSICO-CHEMICAL CHARACTERISTICS

Limpid to slightly opalescent, colorless to yellowish liquid
pH ≈ 5.5
Density at 20°C ≈ 1.0
Miscible with water, opalescent in alcohols
Not miscible in oils.

PRESERVATIVES

Different preservative systems are available in order to fit with your requirements. Please contact us for additional details about the available versions.

TOLERANCE AND TOXICITY STUDIES

EPIDERMOSIL is perfectly tolerated. Tolerance and toxicity studies were performed using both *in vitro* (cell culture and reconstructed epidermis) and *in vivo* (human volunteers) methods.

FORMULATION

Advised doses: 3 to 6%.
Incompatibilities: No particular formulation restriction.

AVAILABILITIES

EPIDERMOSIL is available in 5 and 30 kg drums.

EXSYMOL
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