SIRHAMNOSE®

Dermo-cosmetics
Anti-aging
Anti-age spots
Skin restructuration
Scar healing
Improvement of barrier function

NEW DATA

EXSYMOL
MONACO
Rhamnose is a natural sugar that has been described to stimulate papillary fibroblast's and keratinocyte's ability to improve the dermal-epidermal junction (DEJ) structure and architecture. DEJ is responsible for epidermis to dermis attachment and thus warrants cohesion and mechanical resistance of the skin. It also behaves as a selective permeability barrier controlling cell migration (immune cells, for example), and molecular exchanges (growth factors and nutrients, stress signals, ...). Epidermal cells interaction with the DEJ regulates their proliferation, differentiation and migration, which is critical for epidermal renewal, barrier function setup, and wound healing. Furthermore, DEJ was reported to be involved in the apparition of age spots. Rhamnose can therefore play an important role in anti-aging.

SIRHAMNOSE is part of the silanol family. It is a compound that possesses an organic silicium core. A topic application of SIRHAMNOSE 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.

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. SIRHAMNOSE is part of the silanol family. It is a compound that possesses an organic silicium core. A topical application of SIRHAMNOSE 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.

Rhamnose and DEJ

Rhamnose is a natural sugar that has been described to stimulate papillary fibroblast's and keratinocyte's ability to improve the dermal-epidermal junction (DEJ) structure and architecture. DEJ is responsible for epidermis to dermis attachment and thus warrants cohesion and mechanical resistance of the skin. It also behaves as a selective permeability barrier controlling cell migration (immune cells, for example), and molecular exchanges (growth factors and nutrients, stress signals, ...). Epidermal cells interaction with the DEJ regulates their proliferation, differentiation and migration, which is critical for epidermal renewal, barrier function setup, and wound healing. Furthermore, DEJ was reported to be involved in the apparition of age spots. Rhamnose can therefore play an important role in anti-aging.

L-Rhamnose is a natural sugar that is responsible for improving DEJ structure.

Sirhamnose : the silanol technology applied to rhamnose

Rhamnose has very low penetration power. As a result, when applied topically on the skin, only a small fraction (if any) of it is capable of effectively reaching the basal layer of the epidermis, and the dermis. SIRHAMNOSE is the combination of rhamnose and organic silicium. Because of its high affinity for the dermis, silicium will home there very efficiently. Because silicium is bound to rhamnose, it will drag it to the deepest layers of the skin, hence improving rhamnose penetration, bioavailability and therefore activity.

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SIRHAMNOSE is a silanol that combines the restructuring benefits of the organic silicium and rhamnose for specific benefits to the dermal-epidermal junction.

**Skin benefits**

- Increases keratinocyte proliferation
- Stimulates collagen production
- Restores the dermal-epidermal junction

**Cosmetic applications: Body and Face**

- Dermo-cosmetics
- Anti-aging
- Scar healing
- Improvement of barrier function
- Skin restructuring
- Anti-age spots
The dermal-epidermal junction is an interface that ensures good cohesion to the skin. It is formed of a collagen IV matrix to which keratinocytes from the epidermis are bound via anchoring proteins known as laminins, and collagen I fibers from the dermis are bound via collagen VII fibrils.

As seen on electron microscopy pictures (see below), aging leads to a thinning of DEJ (blue arrows) and a loss of anchoring proteins (green arrows). This leads to a loss of cohesion, cell communication is impaired and global skin structure is impacted.

SIRHAMNOSE is the combination of rhamnose and silicium. Silicium is capable of stimulating skin cell activity and proliferation rate, and it is also capable to improve rhamnose penetration. As a result, SIRHAMNOSE is capable of restoring DEJ optimal thickness by improving the expression of all its constituents.

Treatment of human skin explants with SIRHAMNOSE strongly increases collagen VII (green) expression in the DEJ. Similar results were observed for other constituents of the DEJ (laminin and collagen IV).

By combining silicium and rhamnose, we dramatically improved rhamnose penetration power and allowed it to reach the dermis to stimulate fibroblast activity. This clearly shows how the silanol technology creates a synergy between the organic silicium core (MTS) and rhamnose.

As a silanol, SIRHAMNOSE has a core of organic silicium that has been shown to stimulate fibroblast ability to synthesize collagen. Treatment of human skin explants with SIRHAMNOSE increases collagen (green) density for a firmer and more elastic skin.
**Age spots are the results of a damaged DEJ**

Perlecan (✓) is a proteoglycan located in the DEJ that is capable of binding KGF (●) (keratinocyte growth factor). This KGF is secreted by fibroblasts and is responsible for stimulating melanogenesis.

When the DEJ is damaged, KGF is released and melanocytes locally produce more melanin which eventually turn into age spots.

**SIRHAMNOSE ensures perlecan expression and prevents age spots**

UV exposure and/or aging lead to KGF overexpression and to a DEJ degradation.

High amounts of KGF will reach melanocytes and cause age spots due to melanin overproduction.

**SIRHAMNOSE** is capable of regulating KGF trafficking by increasing perlecan expression while also normalizing KGF production.

As a result, **SIRHAMNOSE** prevents melanin overproduction and therefore protects the skin from age spots.

**SIRHAMNOSE ensures the DEJ integrity with biomechanical benefits**

Using electron microscopy and atomic force microscopy, it was shown that **SIRHAMNOSE** restores age-impaired DEJ.

Electron microscopy (top line) shows that aging causes a thinning of the DEJ that may lead to a decreased skin cohesion, to an impaired cell communication, and to a loss of physical resistance.

Atomic force microscopy (bottom line) provides data on the DEJ tomography (✓), the skin elasticity and the 3D organization of the ECM hence illustrating skin biomechanics. Aging causes a heavy loss of skin resilience.

**SIRHAMNOSE** is capable of restoring the DEJ and therefore to ensure a good physical resistance to the skin.
Realized under dermatological control, a clinical trial was performed on 35 women aged 40 to 60. The volunteers received a treatment with SIRHAMNOSE (5%) or a placebo applied twice a day on the face for 14 and 28 days.

**SIRHAMNOSE for global anti-aging benefits**

SIRHAMNOSE is a silanol which organic silicium core is responsible for improving skin architecture. A treatment with SIRHAMNOSE will therefore provide global anti-aging result as assessed by a dermatologist (left panel), together with a visible reduction of wrinkles as measured using PRIMOS technology (right panel).

**SIRHAMNOSE for anti-age spots and skin tone uniformity**

SIRHAMNOSE has specific benefits on the dermal-epidermal junction (DEJ) which has been described to have an impact on skin tone uniformity.

Using the VISIA technology, we measured the improvement of skin redness (A) and age spot (B) after 28 days of treatment with SIRHAMNOSE (5%).

By the end of the treatment, skin redness was reduced by an average of 22.4%, while age spot surface was reduced by an average of 12%, and up to 42%.

By combining benefits provided by organic silicium and potentialyzed rhamnose, SIRHAMNOSE improves skin tone uniformity as we observed an improvement of skin dullness, luminosity and homogeneity after 14 and 28 days of treatment with SIRHAMNOSE (5%) (C).
SIRHAMNOSE
Technical characteristics

ANALYTICAL COMPOSITION

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylsilanetriol</td>
<td>0.3%</td>
</tr>
<tr>
<td>including organic SILICIUM</td>
<td>0.09%</td>
</tr>
<tr>
<td>Rhamnose</td>
<td>2.35%</td>
</tr>
<tr>
<td>Methylpropanediol</td>
<td>20%</td>
</tr>
<tr>
<td>Citric acid</td>
<td>0.3%</td>
</tr>
<tr>
<td>Water (sqf)</td>
<td>100%</td>
</tr>
</tbody>
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PHYSICO-CHEMICAL CHARACTERISTICS

- Limpid to slightly opalescent, colorless to yellowish liquid
- pH ≈ 6
- Density at 20°C ≈ 1.0
- Miscible with water, alcohol and glycol.

PRESERVATIVES

No preservatives.

TOLERANCE AND TOXICITY STUDIES

According to tolerance studies, SIRHAMNOSE is perfectly tolerated. SIRHAMNOSE does not show any toxicity.

FORMULATION

Advised doses: 3 to 6%
No major restriction of formulation.

AVAILABILITIES

SIRHAMNOSE is available in 5, 30kg drums.

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