

# SIRHAMNOSE®

DERMO-COSMETICS  
ANTI-AGING  
ANTI-AGE SPOTS  
SKIN RESTRUCTURATION  
SCAR HEALING  
IMPROVEMENT OF BARRIER FUNCTION

**EXSYMOL**  
MONACO

# SIRHAMNOSE

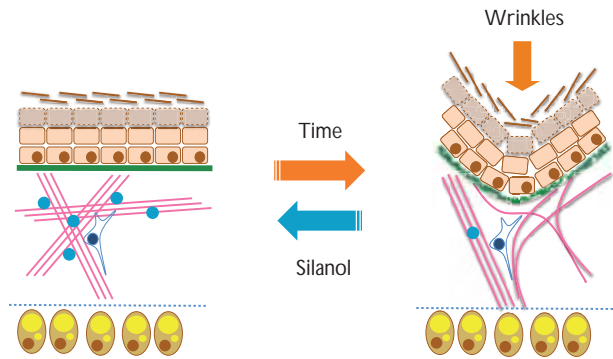
## THE SILANOL TECHNOLOGY

### 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.

**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. Skin will be rejuvenated, better organized and structured. Ultimately, skin will become visibly younger.



## RHAMNOSE AND DEJ

Rhamnose is a natural sugar that has been described to stimulate papillary fibroblasts' activity. As a result, it can play an important role in anti-aging.

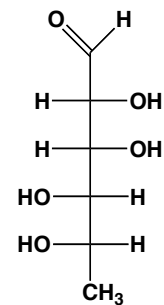
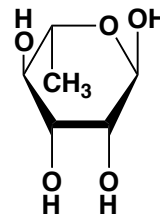
One of the main benefits for this compound is its ability to improve the architecture of the dermal-epidermal junction (DEJ). This compartment is the border between dermis and epidermis and it has numerous roles for a healthy skin:

DEJ ensures skin cohesion.

DEJ ensures cross-communication between cells from the epidermis and from the dermis.

DEJ determines keratinocyte polarity, it is responsible for providing a direction for both proliferation and differentiation processes.

DEJ is used as a support matrix for keratinocyte migration during the scar healing process and the reepithelialisation mechanism

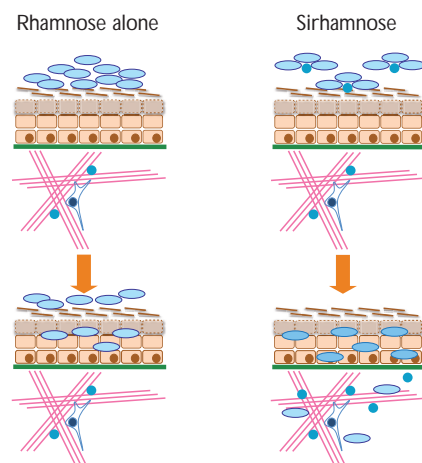


L-Rhamnose is a natural sugar that exists in a cyclic (left) and in a linear form (right).

## 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 dermis where it will stimulate fibroblast activity.

**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.



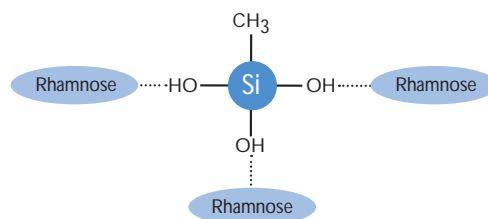
# SIRHAMNOSE

## Applications



INCI name: SILANETRIOL (AND) RHAMNOSE

**SIRHAMNOSE** is a silanol that combines the restructuring benefits of 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



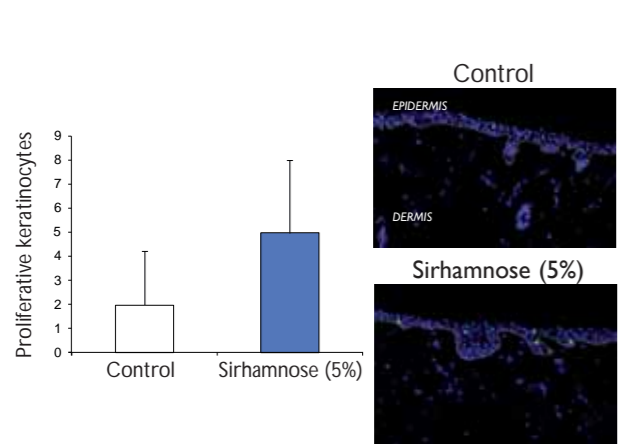
### Cosmetic applications: body and face

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

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### SIRHAMNOSE stimulates keratinocytes



As a silanol, **SIRHAMNOSE** has a core of organic silicium that has been shown to increase keratinocyte proliferation. Treatment of human skin explant with **SIRHAMNOSE** leads to an increase of proliferative keratinocyte (green) number.

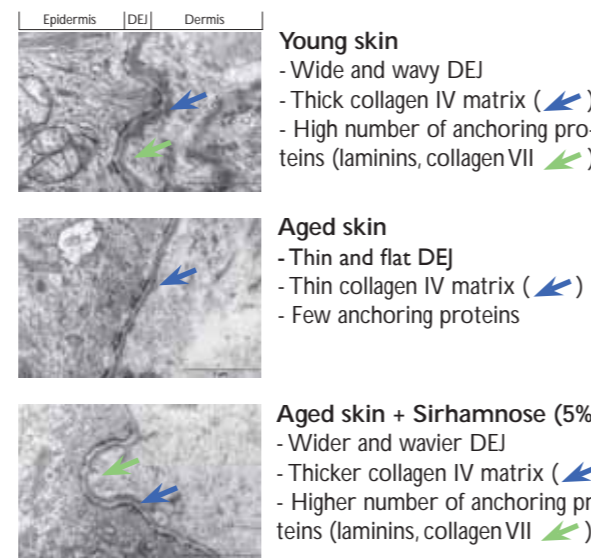
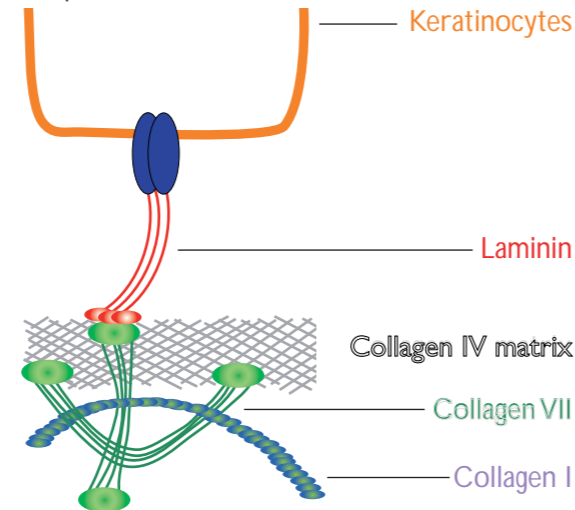
### SIRHAMNOSE improves the DEJ

The dermal-epidermal junction is an interface that insures 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 electronic microscopy pictures (see below), aging leads to a thinning of the DEJ (blue arrows) and a loss of anchoring proteins (green arrows) as shown using electron microscopy. This leads to a loss of cohesion, cell communication is impaired and global skin structure is impacted.

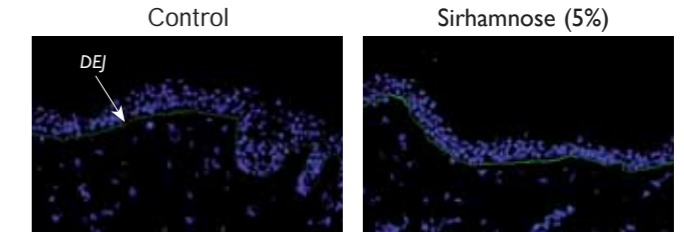
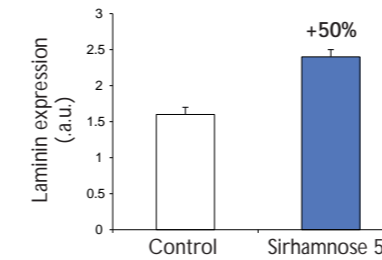
Rhamnose has been described to have a positive effect on the dermal-epidermal junction. However because of its extremely low penetration power, it has virtually no effect when applied on skin.

**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.



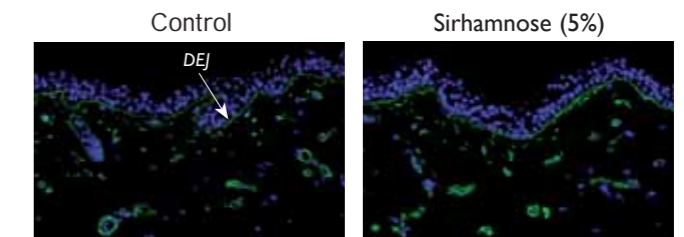
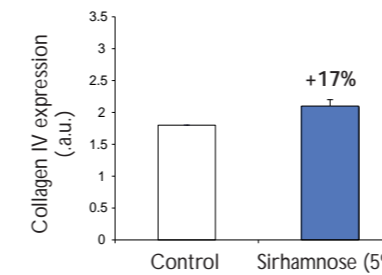
### SIRHAMNOSE improves laminin-5 expression

Laminins are anchoring proteins responsible for the attachment of keratinocytes to the collagen IV matrix of the DEJ. Treatment of human skin explants with **SIRHAMNOSE** strongly increases laminin expression (green).



### SIRHAMNOSE improves collagen IV expression

Collagen IV is the most abundant component of the DEJ as it forms the matrix. Collagen IV is also expressed in blood vessels. Treatment of human skin explants with **SIRHAMNOSE** strongly increases collagen IV (green) expression.



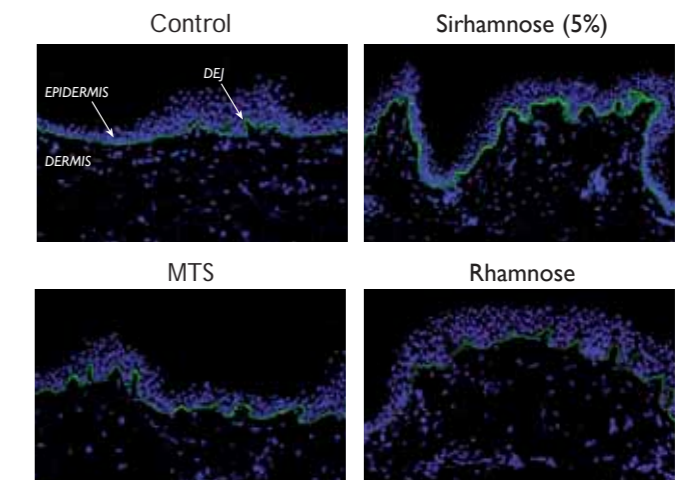
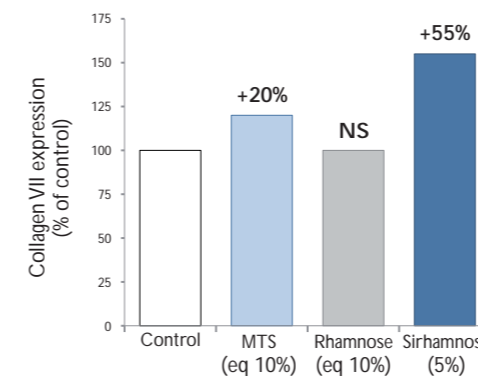
### SIRHAMNOSE improves collagen VII expression because of a synergy between silicium and rhamnose

Collagen VII is a type of collagen synthesized by fibroblast. Its role is to bind collagen I fibers of the dermis to the collagen IV matrix of the DEJ.

Treatment of human skin explants with **SIRHAMNOSE** strongly increases collagen VII (green) expression in the DEJ.

However, treatment with the organic silicium core (MTS) alone leads to an improvement of collagen VII expression because of the silicium ability to increase fibroblast activity, and treatment with rhamnose alone did not have any impact on collagen VII expression because rhamnose was not capable of reaching the dermis compartment to stimulate fibroblasts.

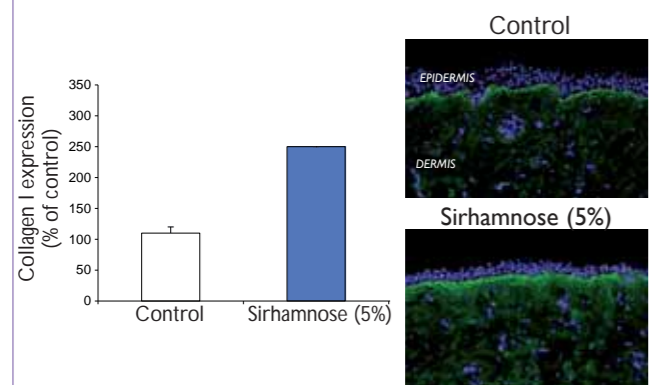
By combining silicium and rhamnose, we dramatically improved rhamnose penetration power and allowed it to reach the dermis to stimulate fibroblast activity. This clearly shows how the silanol technology creates a synergy between the organic silicium core and rhamnose.



### SIRHAMNOSE stimulates collagen I production

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 explant with **SIRHAMNOSE** increases collagen (green) density for a firmer and more elastic skin.



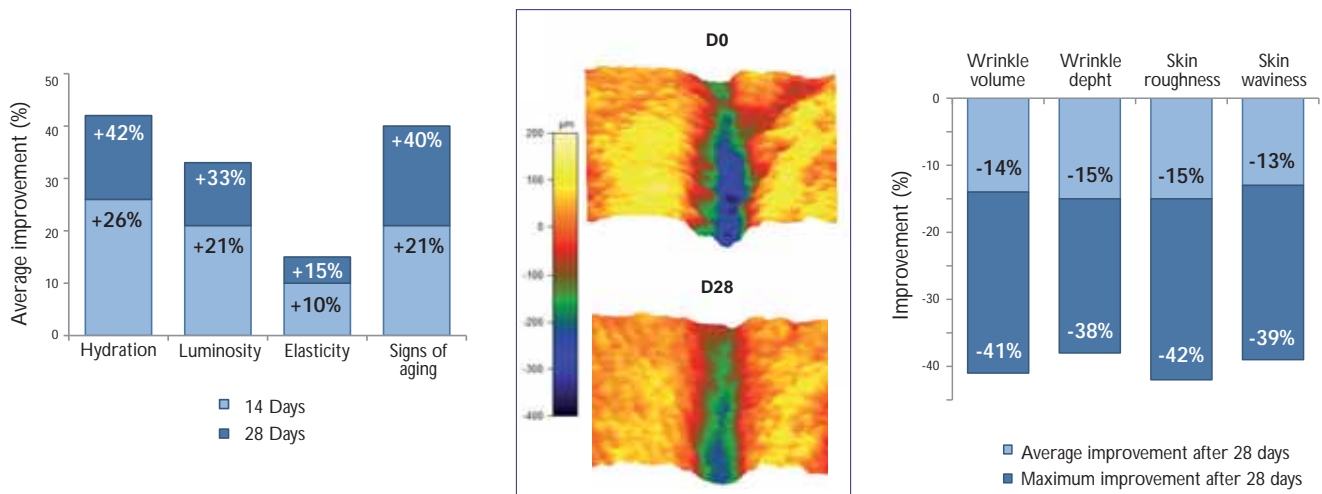
# SIRHAMNOSE

## Clinical test

Realized under dermatological control, a clinical trial was performed on 35 women aged 30 to 60. The volunteers received a treatment with SIRHAMNOSE (5%) 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 results as assessed by a dermatologist (left panel), together with a visible reduction of wrinkles as measured using the PRIMOS technology (right panel).



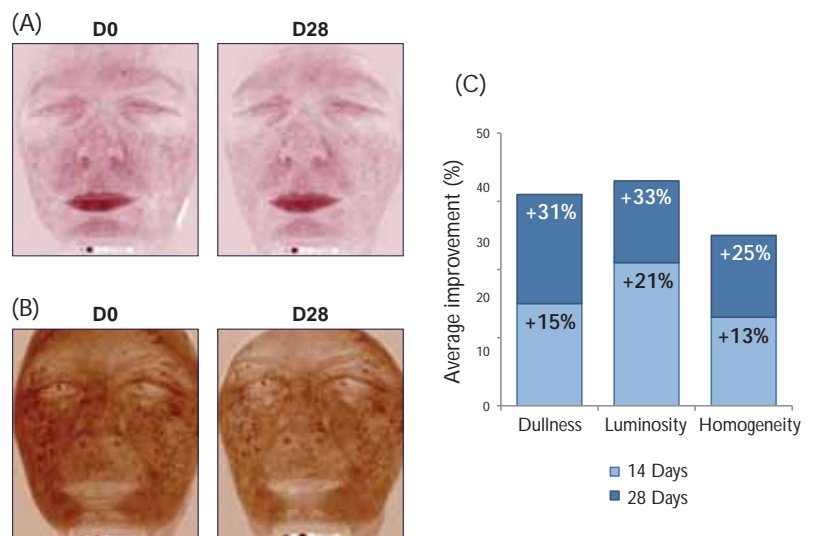
### Sirhamnose for anti-age spots and skin tone uniformity

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 potentialized 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

Methylsilanetriol	0.3%
including organic SILICIUM	0.09%
Rhamnose	2.1%
Methylpropanediol	20%
Citric acid	0.3%
Water (sqf)	100%

### PHYSICO-CHEMICAL CHARACTERISTICS

Limpid to slightly opalescent, colorless to yellowish liquid  
pH  $\approx$  6  
Density at 20°C  $\approx$  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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