# EPIDERMIST 4.0 NEW SKIN BUILDER

# EPIDERMIST 4.0: Marine ExoPolySaccharide Biotechnological active ingredient

#### ORIGIN

Epidermist 4.0 is a Marine Exopolysaccharide secreted by a planktonic micro-organism from Aber Benoit (France – Brittany).

The Aber-Benoît is a coastal river of the country of Leon, Brittany (northwestern France). A Aber (Celtic word meaning estuary) is a river valley flooded by the sea. The Abers represent a rich and diverse ecosystem in which organisms and micro-organisms live in both salt water from the sea and fresh water.





#### BENEFITS

Epidermist 4.0 is produced by culture in biorecator to obtain a pure, natural and characterized molecule (<u>GALACTOSE ET N-ACETYL-GLUCOSAMIN</u>), that has no land-based equivalent.

N-acetyl-glucosamin is involved in the synthesis of GlycosAminoGlycans (GAGs) which represent the main water storage of dermis.

Galactose

N-acetyl-glucosamin

### Ideal skin: consumers expectancies

Results of a worlwide study realized on 485 women, 19 to 70 years old.

# A new expectancy: flawless skin quality linked to its deep health.

Genuine concern for the behavior of the skin in depth.

« I need to know that I can count on my skin to react and adapt to all situations, protect, regenerate by itself »

« There was only when my skin behaves well in depth, when it is healthy, that it is likely to be perfect on the surface: smooth, uniform, without a shadow of a ride »

Source:

Cosmetic Ressources by Laurence Bacilieri Beauty Update January 2012





## Ideal Skin: a comprehensive strategy

Perfect skin is the result of a multifactorial approach: color, shine, surface condition of the skin, texture ...

To answer effectively, we must adopt a comprehensive strategy.

#### To renew the skin

Action to reboot the 3 main functions of the skin to restore health, homogeneity, hydration and radiance:

- PHYSICAL BARRIER FUNCTION
- CHEMICAL BARRIER FUNCTION
- HYDRA MEMORY FUNCTION

As a specialist of the epidermis, Epidermist 4.0 reboots these 3 vital functions

### Healthy skin

This reboot involves a readjustment of four parameters o "good" skin health:

- innate immunity
- epidermal renewal
- chronic inflammation
- rehydration

PHYSICAL BARRIER CHEMICAL BARRIER HYDRA MEMORY

INNATE IMMUNITY RENEWAL INFLAMMATION REHYDRATION



# 1- The physical barrier function

Desorganisation of physical barrier =

- Dehydration
- Increase in skin roughness
- Loss of brightness
- Increase in allergen contacts
- Development of unwanted bacterial flora

<u>Keratinocytes Differentiation</u>, and <u>Epidermis Renewal</u> are the 2 main mechanisms involved in the physical barrier quality. DEHYDRATION

ROUGHNESS

BRIGHTNESS

ALLERGENS CONTACT



### 1- Rebooting the Physical Barrier Function Epidermal differentiation

The primary function of the epidermis is to produce the stratum corneum. It is formed through the differentiation of the keratinocytes from the basal layer to the skin's surface layer. Many proteins are involved at each stage of this differentiation process.

#### **Differentiation proteins:**

INVOLUCRIN (INV) : involved in forming the cornified envelop

TRANSGLUTAMINASE 1 (TGM1): ensures assembling of proteins that make up the cornified envelop

SMALL PROLINE RICH PROTEIN (SPRP): precursor proteins in the formation of the cornified envelop

LATE CORNIFIED ENVELOP (LCE): precursor proteins in the formation of the cornified envelop

CORNEODESMOSINE (CDSN): major role in cohesion of the cornified layer

NICE 1: involved in terminal differentiation of keratinocytes

# Chronology of differentiation protein expression



## 1- Rebooting the Physical Barrier Function IN-VITRO TEST : 1% Epidermist 4.0 increases the synthesis of differentiation proteins



Protocol: assessment of gene expression on human reconstituted epidermis treated with 1% Epidermist 4.0 applied topically.



The increase in differentiation proteins will contribute to the formation of a higher quality physical barrier, and activation of stratum corneum renewal.

#### 1- Rebooting the Physical Barrier Function

CLINICAL TEST : 1% Epidermist 4.0 improves skin renewal



Protocol:

- 17 volunteers aged between 18 and 59
- Application of a coloured cream containing 5% DHA, 1 day before start of treatment.

- From Day 0, lotion containing 1% Epidermist 4.0 applied twice a day for 2 weeks.

Skin pigmentation by the DHA enables monitoring of cell renewal; pigmentation will be eliminated faster if cell renewal activated.

Cell renewal rate is doubled in just 1 week. By improving the skin's natural renewal process, Epidermist 4.0 will help to eliminate dead cells on the skin's surface and avoid the formation of a too thick and rough stratum corneum.

# Benefits associated with rebooting the physical barrier function

Epidermist 4.0 increases the synthesis of proteins involved in keratinocytes differentiation and activates cellular renewal.

Both action will promote better epidermal cohesion and better elimination of dead skin cells and skin roughness.

Rebooting the skin's physical barrier provides a smoothing and softening effect on skin texture, appreciated by the volunteers. MORE COHESION LESS DIED CELLS LESS ROUGHNESS = SMOOTHER SKIN SOFTER SKIN



## 2- The chemical barrier function

The chemical barrier function brings 2 defence modules into play:

- innate immunity made up of proteins and antimicrobial peptides
- inflammatory reaction.

Innate immunity, unlike acquired immunity, is already present within a child when it is born. It is the first line of defence against the infectious agents and pathogens which surround us. Innate immunity is activated immediately and works for 4 days.

Inflammatory reaction is triggered by the release of proinflammatory molecules by keratinocytes under attack; it causes the appearance of redness, tingling, inflammation, etc.

#### **INNATE IMMUNITY**

#### INFLAMMATION

#### ACNE



#### 2- Rebooting the chemical barrier function

## Innate immunity and inflammatory reaction



#### Peptides of innate immunity:

Defensin beta (DEFB103) : deconstructs the membrane of exogenous bacteria ; known for its efficacy against *Staphylococcus aureus* Secretory Leucocyte Peptidase Inhibitor (SLPI): inhibits proteases, mainly elastases activated by bacteria to better penetrate the tissues Ribonuclease Rnase 7 (RB RNASE 7): destroys bacterial and viral RNA

S100 Calcium Binding Protein A10 (S100A10): inhibits bacterial growth by interacting with their cellular cycle

#### Mediators of inflammation:

S100 Calcium Binding Protein A7 (S100A7): also called psoriasin, promotes the activity of collagenases and elastases during inflammation
 Toll-like Receptor 2 (TLR2) recognizes bacterial LipoPolySaccharides (high allergen potential) and activates TNFa
 TNFa: activates the chemokins CXCL5 and CXCL10
 CXC Ligand 5 et 10 (CXCL5 et CXCL10): chemokins involved in the migration of neutrophils

# 2- Rebooting the chemical barrier function IN-VITRO TEST: 1% Epidermist 4.0 reinforces innate immunity while decreasing pro-inflammatory mediators

Protocol: assessment of gene expression by human reconstituted epidermis treated with 1% Epidermist 4.0 applied topically.



By acting on both innate immunity and inflammatory mediators, Epidermist 4.0 improves skin health while decreasing its reactivity.

## 2- Rebooting the chemical barrier function *CLINICAL TEST*: 1% Epidermist 4.0 decreases bacterial growth at the surface of the skin

Porphyrins are bacterial excretions (among others, characteristics of P. acnes) that lodge in the pores and can cause acne. It is possible to visualize and quantify the amount of porphyrin on the surface of the skin since this molecule is fluorescent under UV light.

#### Protocol:

- 20 volunteers aged 35 to 45
- lotion with 1% Epidermist 4.0, twice daily for 4 weeks
- Effect on bacterial growth is evaluated by quantification of porphyrin thanks to UV light

#### After 28 days treatment:







# 2- Rebooting the chemical barrier function CLINICAL TEST : 1% Epidermist 4.0 decreases skin reactivity

<u>Principle of stinging test:</u> the test consists in applying lactic acid on a nasogenian fold, and physiologic serum on the other one. The stinging sensation triggered by lactic acid is evaluated by volunteers themselves, on a scale from 0 to 3 (no severe sensation to severe sensation). The soothing effect of a product is assessed according to the variation of stinging sensation generated by lactic acid before and after treatment.





• 30 volunteers aged 30 +/- 2

• Application of a gel containing 1% Epidermist 4.0, twice daily for 1 week.

After 1 week treatment only, 76% of volunteers observed a decrease in their skin's reactivity.

# Benefits associated with rebooting the chemical barrier function

Epidermist 4.0 reinforces skin's innate immunity and reduces inflammation.

Bacterial growth is curbed, thereby reducing acne characteristics. Skin is less reactive and less sensitive.

Epidermist 4.0 improves skin health by rebooting the skin's chemical barrier in this way.

MORE ANTI-BACTERIAL DEFENSES LESS INFLAMMATION = LESS ACNEIC TENDANCY LESS REACTIVITY HEALTHIER SKIN



### 3- Hydra-memory

Environmental attacks, chemical products, friction... all play a daily role in drying out skin. Applying moisturising products helps to rehydrate damaged skin, but not all skin types recover their optimal hydration levels in the same way.

This ability to recover optimal hydration levels can be called: « HYDRA MEMORY ».

SKIN DRYNESS

REACTIVITY

#### AUTONOMOUS REHYDRATION CAPACITY

This Hydra Memory involved a mechanism of pumping water into the dermis to rehydrate the upper layers: epidermis and stratum corneum.

The skin's water memory will be all the more effective if the physical and chemical barrier functions perform well. This memory can also be improved by reinforcing the skin's ability to retain moisture, as does hyaluronic acid.



#### 3- Rebooting Hydra Memory

### Dermis, water storage and hydra memory

#### Water reservoir of the dermis

Within skin, in the dermis, the proteins of the extracellular matrix synthesised by fibroblasts create "a sort of water reservoir".

Hyaluronic acid, the main component, acts like a water magnet to trap hydration molecules and gradually disseminate them to the skin's outer layers.

During intense dehydrating stress, skin pumps the water contained in the reservoir of the dermis to broadcasts in the upper layers and to rehydrate the dehydrated areas.

It is thanks to this water reservoir that the skin is able to rehydrate autonomously after dehydrating stress.



## 3- Rebooting Hydra Memory IN-VITRO TEST: 0.02% Epidermist 4.0 stimulates the synthesis of hyaluronic acid



Protocol: human dermis fibroblasts cultivated with or without Epidermist 4.0 present. Dosage of the amount of hyaluronic acid synthesized, in culture environment.



The increase in hyaluronic acid synthesis by fibroblasts promotes an increase in dermis hydration levels, which represent the main water reservoir and are essential to good skin hydration.

## 3- Rebooting Hydra Memory EX-VIVO TEST: 1% Epidermist 4.0 improves the autonomous rehydration of the skin.

#### Protocol:

We tested the ability of a skin explant pre-treated with 1% Epidermist 4.0 to autonomously regain (without added moisturiser) its optimal level of hydration after severely dehydrating stress (use of salt crystals). Hydration levels are measured using corneometry.



# 3- Rebooting Hydra Memory EX-VIVO TEST: 1% Epidermist 4.0 improves the autonomous rehydration of the skin.



The explants were subjected to severe dehydration: approx. -40% hydration. Only the explant treated with Epidermist 4.0 was able to regain its initial hydration levels: 96%, 1 hour after the dehydration process and 99% after 24 hours.

## Conclusion on rebooting the 3 main functions of the skin

With its multi-faceted approach, Epidermist 4.0 provides skin with an overall perfecting action

- Keratinocytes differentiation is improved
- Cell renewal is optimised
- Skin's natural defences are reactivated
- Pro-acne bacteria growth is inhibited
- Pro-inflammatory mediators are inhibited
- Skin reactivity is reduced
- Skin's intrinsic ability to rehydrate itself is strengthened



# New skin builder CLINICAL TEST: overall perfecting action of Epidermist 4.0

Skin renewal is about regaining soft, brighter skin with smoothed skin texture and less visible pores – skin that looks renewed and in good health.

Protocol:

- 20 volunteers aged between 35 and 45
- Lotion containing 1% Epidermist 4.0 applied twice a day for 28 days
- Use of the VISIA tool to visualise skin texture smoothing effect and visibility of pores
- self assessment by volunteers



# CLINICAL TEST: overall perfecting action of 1% Epidermist 4.0 SMOOTHING EFFECT

Roughness variation after 28 days



Rebooting the physical barrier function, improvement of skin renewal and reactivation of water memory help to obtain smoother skin texture, less rough and softer skin.





# CLINICAL TEST: overall perfecting action of 1% Epidermist 4.0 PORES LESS VISIBLE

Variation of number and total surface area of visible pores after 28 days.



Rebooting the chemical barrier function, reduction of bacterial growth and improved skin renewal help to obtain a reduction in the number of pores and total surface area of pores visible. Astringent effect on pores







# CLINICAL TEST: overall perfecting action of Epidermist 4.0 Overall view on one volunteer



Porphyrine: -54%

Roughness: -39%

Number of pores: -24%

After 4 weeks using Epidermist 4.0, this woman founds her skin smoother, softer and healthier.

# CLINICAL TEST: overall perfecting action of Epidermist 4.0 Overall view on one volunteer



Porphyrine: -56%

Roughness: -38%

Number of pores: -22%

After 4 weeks using Epidermist 4.0, this woman founds her skin smoother, softer, healthier, as regenerated.

### New Skin Builder CLINICAL TEST: Volunteers self assessment



#### Self assessment using analogic scale



# EPIDERMIST 4.0 NEW SKIN BUILDER

Thanks to its multifactorial approach, Epidermist 4.0 provides the skin with an <u>overall perfecting action</u>:

#### *After a single application:*

• Improvement of the autonomous rehydration capacity: +17%

#### After 1 week of use:

- Improvement of cellular renewal: +31%
- Decrease in skin reactivity: -37%

#### After 4 weeks of use:

- Decrease in bacterial growth: -10% of porphyrine
- Skin smoothing effect: -19% of roughness
- Pores are less visible: -7% of pores and -11% of the total area of visible pores
- Skin is brighter: observed by 64% of volunteers
- Skin is softer: observed by 82% of the volunteers
- Skin is healthier: observed by 73% of the volunteers

# EPIDERMIST 4.0 NEW SKIN BUILDER

INCI name:

EPIDERMIST 4.0 P: Water (and) Plankton extract (and) Phenoxyethanol EPIDERMIST 4.0 PA: Water (and) Plankton extract (and) Phenethyl alcohol



Recomended % of use: EPIDERMIST 4.0 P: 1% EPIDERMIST 4.0 PA: 1%

#### Examples of use:

In a B.B Cream Associated with Hydrasalinol and EPS Seamat

In an antiaging regenerative cream Associated with Matrigenics.14 G and Phormiskin Bioprotech G

In a whitening cream for injured skins Associated with 3M3.Whiteris G and Neurolight.61G