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REGENERYL

An efficient synergy preventing and reducing stretch marks.

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Stretch marks, State of the art

Today, up to 80% of women and 15% of men show stretch marks on some part of their body.

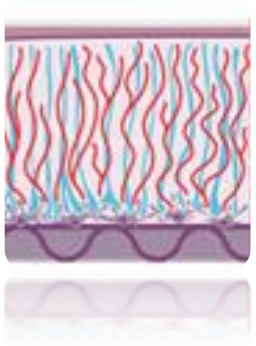
Stretch marks are skin breakdowns caused by a too fast stretch emerging during a pregnancy, a weight intake, or puberty.

From a bluish-purple red at the inflammatory phase, stretch marks are slowly lightened to become white at their maturity.

They result from a weakening and a degradation of the dermis connective tissue and a diminished capacity of fibroblasts synthesis.

Skin is then less soft, elastin fibers and collagen are altered, disorganized, and fragmented.

Healthy skin



Stretch mark's skin

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REGENERYL: An efficient synergy preventing and reducing stretch marks.

An active ingredient serving the tissue engineering

Synergy of a natural biomineral functionalized with Borojo and Ulva Lactula extracts, lead Regeneryl to stimulate effectively the extracellular dermis matrix in order to create an enabling environment for cellular recolonization.

REGENERYL also provides the maintaining of two fundamental parameters, the elasticity and the « youth » of cells.

REGENERYL helps then the repairing and the restructuration of the tissue.

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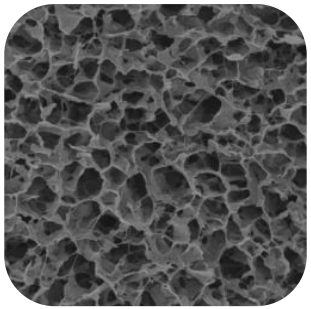
3 active ingredients, 1 Synergy

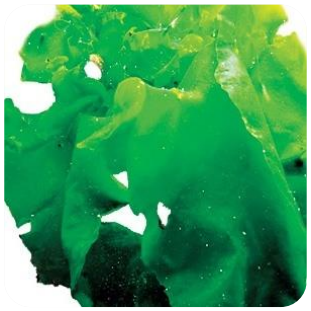


Lamellar biomineral : montmorillonite

Thanks to its structure, it allows to encapsulate the active ingredient, protect it and release it progressively on the skin.
Moreover, this biomineral enhances the wound healing process by helping the regeneration of the extracellular dermis matrix.
It acts as scaffold and create a protecting environment for the cellular migration / restructuration.

Pulp Borojo extract

Rich in minerals and amino acids, the mucopolysaccharide of Borojo pulp stimulates hyaluronique acid synthesis by fibroblasts and maintains cells in a state of « youth » by inhibiting cell senescence.



Ulva lactuca extract

Ulva lactula. L is a green algae vitamins rich. Those glycoproteins stimulate the type 1 collagen synthesis and its anti-elastase activity helping preserving elasticity of the skin.

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A double action for an increase efficiency

Preventing action:

- REGENERYL is able to stimulate the type 1 collagen synthesis and inhibit anti-elastasic activity, contributing to slow down the extracellular matrix degradation of the skin.

- By inhibiting cell senescence, REGENERYL helps other cells to be ultra-functional, maintaining and extending their « youth ».

- Those preventing actions promote a deep moisturizing (hyaluronic acid), a better tonus (collagen fibers), and the skin elasticity (elastin fibers).

Curative action:

- Studies have shown than silanols present in the montmorrilonite, especially exfoliated, contribute to regenerate extracellular matrix's proteins[1].
- Moreover, thanks to its scaffold structure like « second skin », REGENERYL participates to the tissue and wound healing restructuration. This new-made skin reduces color, size and global appearance of stretch marks.

- As a "pivot" molecule in the wound healing process, hyaluronic acid promotes a deeper moisturization and helps the adhesion and cells migration as well.

- Stimulation of type 1 procollagen synthesis consolidates faster the new-made skin.

1)Biomineralization and Biomaterials; Aparicio C, Ginebra MP; Woodhead Publishing, 2015

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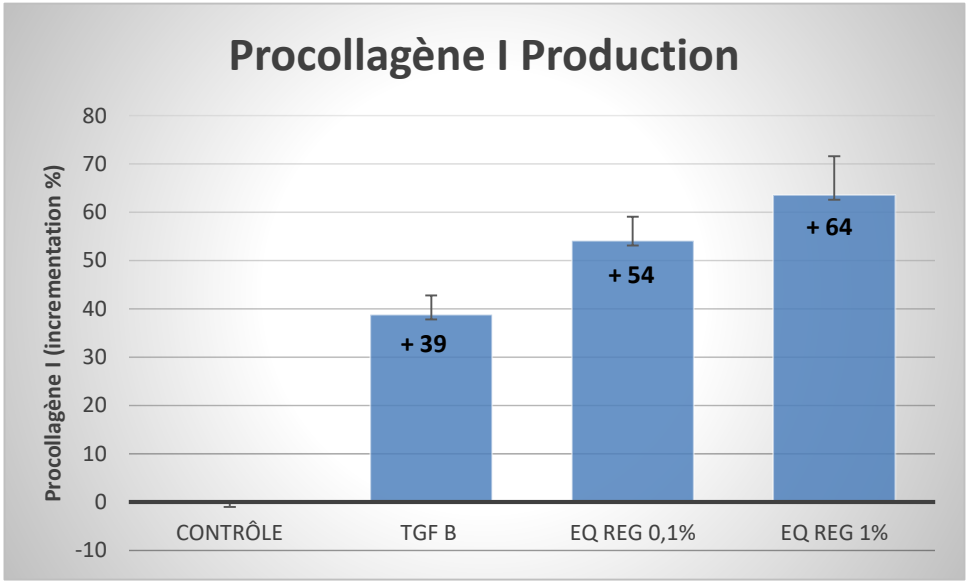
IN VITRO: Stimulation of Procollagen I synthesis

MATERIALS & METHODS :

On a model of a normal dermal monolayers human fibroblasts.

Fibroblasts are incubated at 37°C during 48 hours, under humid atmosphere and 5 % of CO2, with or without the reference product (TGF β 50 ng/ml) or active ingredient at different concentrations.

At the end of the incubation period, procollagen, in the culture mediums, is quantified with a specific and sensitive ELISA kit. Tests evaluated each experimental condition in triplicate.



Average significantly different from Control's one (p<0,05).

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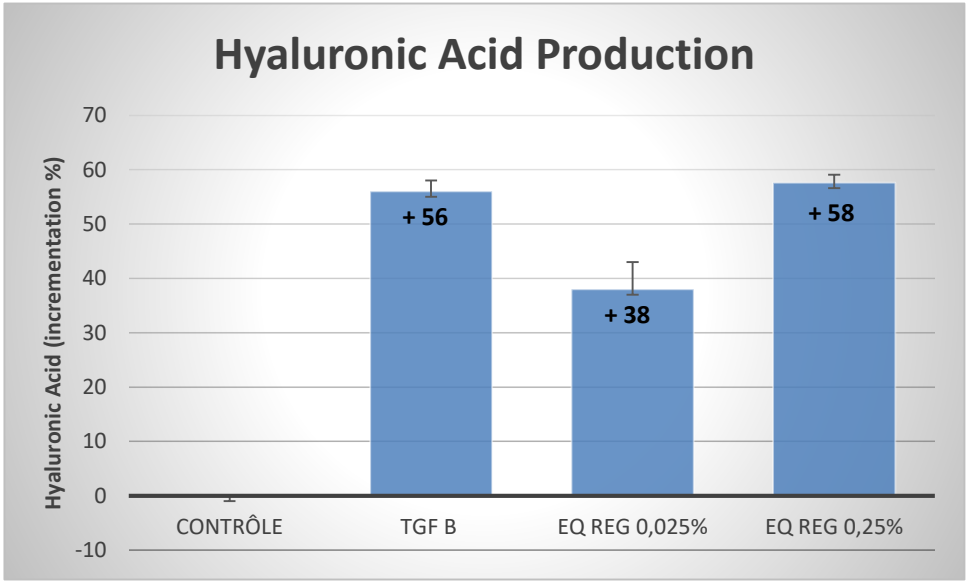
In vitro : Stimulation of HA production

MATERIALS & METHODS :

On a model of a normal dermal monolayers human fibroblasts.

Fibroblasts are incubated at 37°C during 48 hours, under humid atmosphere and 5 % of CO_2, with or without the reference product (TGF β 50 ng/ml) or active ingredient at different concentrations.

At the end of the incubation period, hyaluronic acid in the culture medium is quantified with a specific and sensitive ELISA kit. Tests evaluated each experimental condition in triplicate.



Average significantly different from Control's one ($p<0,05$).

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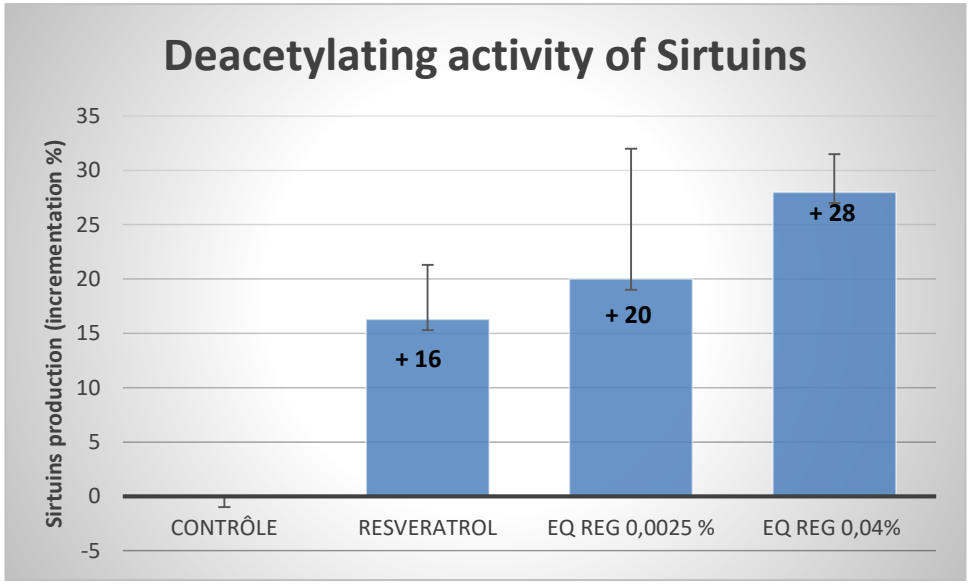
In vitro : Stimulation of the deacetylating activity of Sirtuins

MATERIALS & METHODS :

On a model of a normal dermal monolayers human fibroblasts.

Fibroblasts are incubated at 37°C during 1 hour, under humid atmosphere and 5 % of CO2, with or without the reference product (RESVERATROL 100 µM) or active ingredient at different concentrations.

At the end of the incubation period, a sirtuin specific fluorescent substrate, as well as all the co-factors which are necessary to the enzymatic reaction, are introduced in the culture mediums. Fibroblasts are incubated 60 additional minutes. The enzymatic reaction is stopped, and the deacetylase activity is assessed by reading the fluorescence signal. Tests evaluated each experimental condition in triplicate.



Average significantly different from Control's one (p<0,05).

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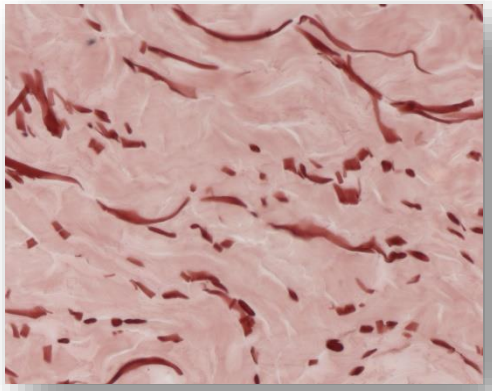
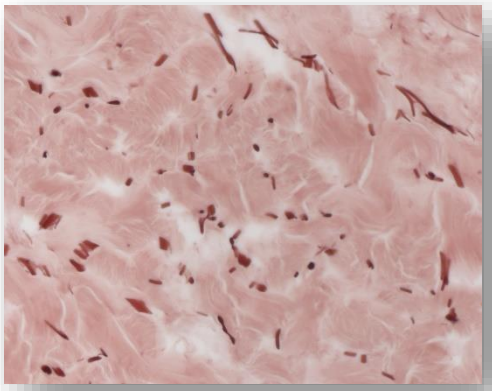
In vitro : Inhibition of elastin degradation

Cryo-sections of human skin are used as reaction substrate. Human skin cryo-sections are incubated at 37 °C during 30 minutes, with or without the active ingredient. After that, human skin cryo-sections are incubated at 37 °C during 3 hours in the same conditions, with or without an elastase.

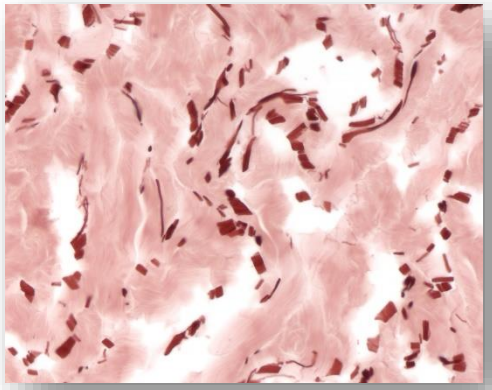
For each experimental condition retained, the elastase activity is measured on the section skins which are colored with orcein, by quantification of the occupied area by elastic fibers.



Normal elastin rate

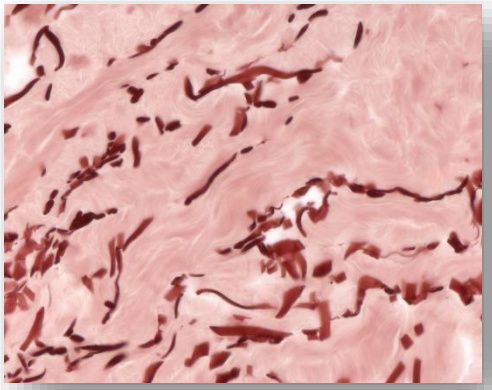


Maximal elastin degradation



Regeneryl at 0,1%

Degradation inhibition - 37%



Regeneryl at 1%

Dégradation inhibition -100%

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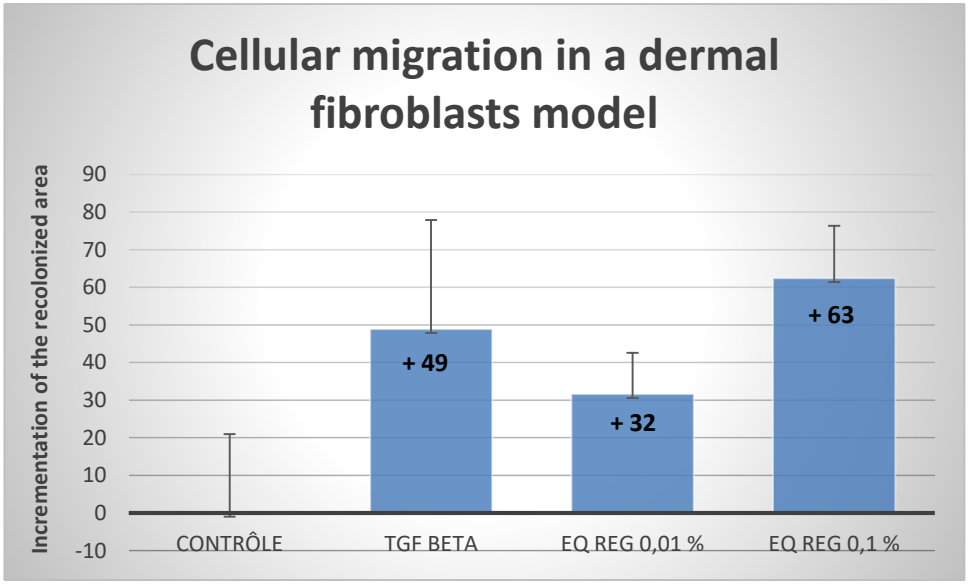
In vitro: Stimulation of cellular migration

MATERIALS & METHODS :

Normal human dermal monolayers fibroblasts are incubated at 37 °C.

Those fibroblasts were subject to a « scratch » on their cell layers, under humid atmosphere and 5% of CO_2, with or without the reference (TGF β) or increasing concentrations of the REGENERYL, for 24 hours.

At the end of the incubation period, the recolonized surfaces are evaluated with an image analysis software.



Average significantly different from Control's one (p<0,05).

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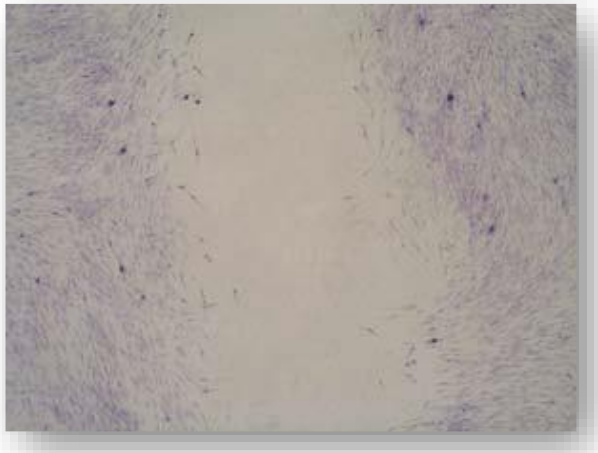
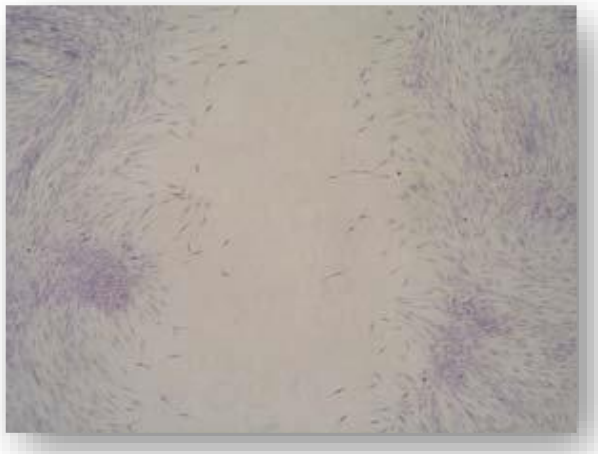
In Vitro: Stimulation of cellular migration

Human dermal fibroblasts were selected from an abdominoplasty made on a 44 year old woman. Once the confluence was achieved, a « scrap » was realized in each culture well by scratching the cell layers. Remaining cells are incubated without (control) or with an increasing concentrations of the active ingredient.

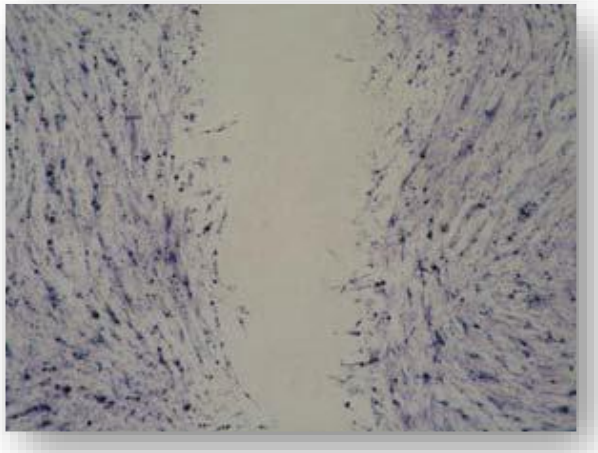


Recolonized surface + 32 %,

with 0,01% of Regeneryl



Control



Recolonized surface + 63%,

with 0,1% of Regeneryl

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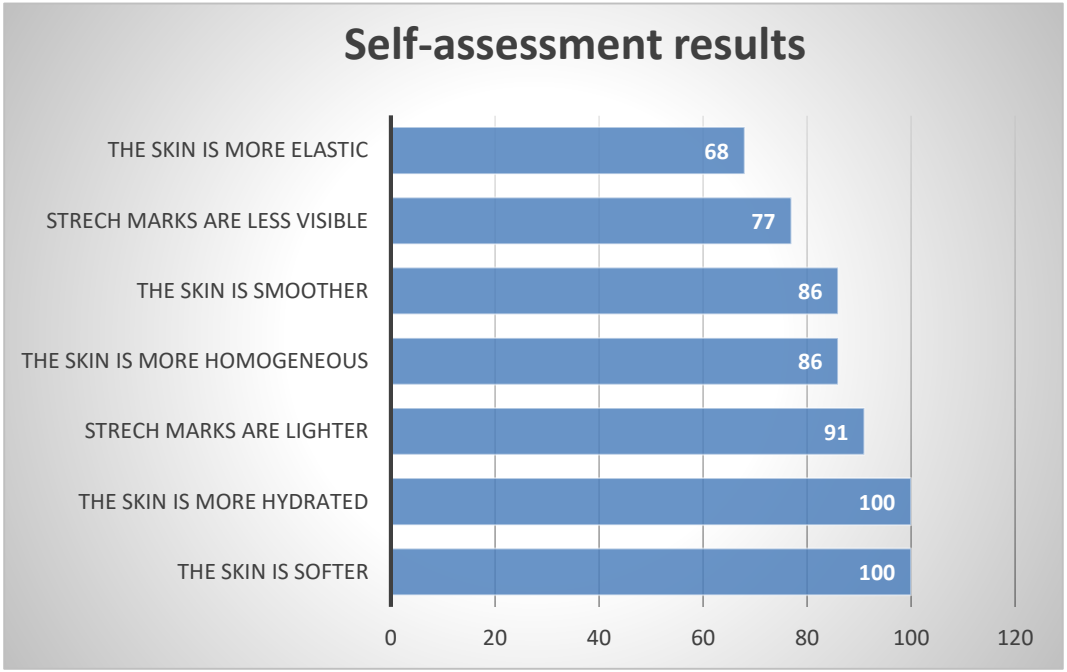
In Vivo: Self-assessment questionnaire

Colorimetric and morphological analysis of stretchmarks on a panel of 20 volunteers during 56 days.

Dosage at 1% of REGENERYL in topic application twice a day.



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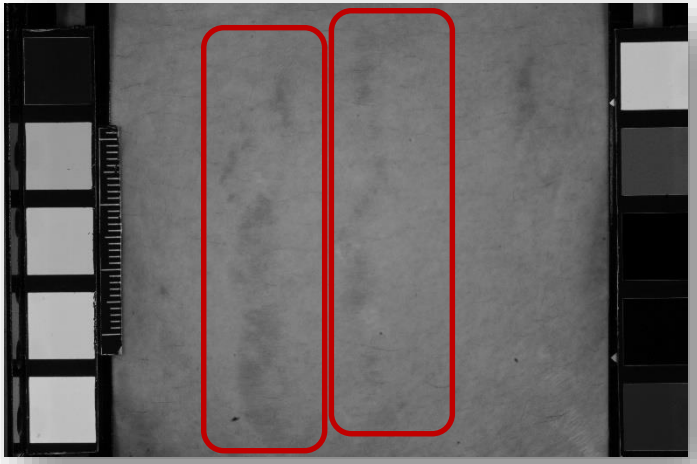
In Vivo: Stretchmarks reduction analysis



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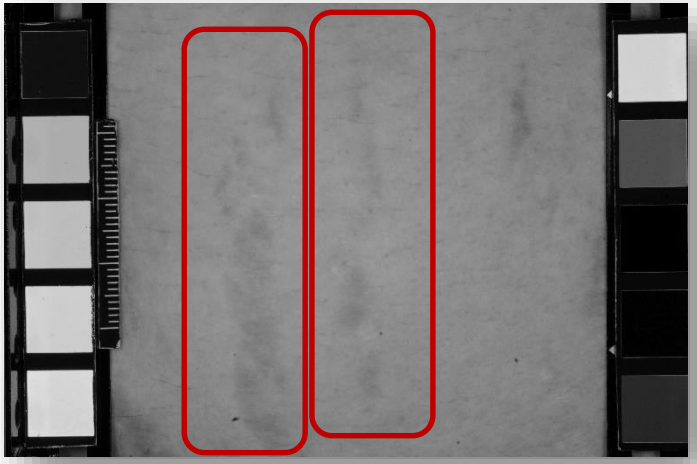

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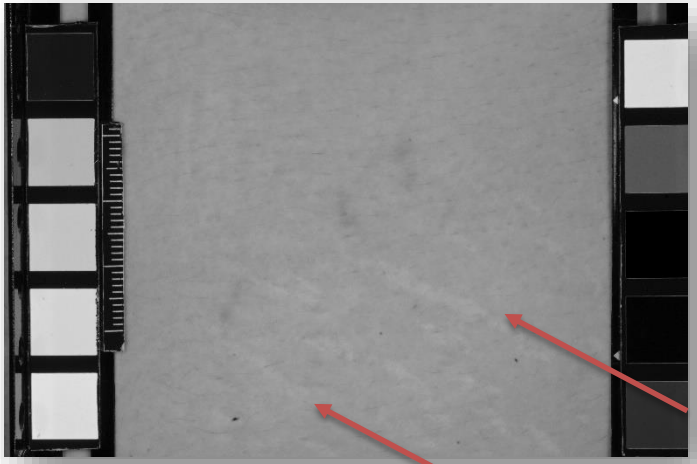

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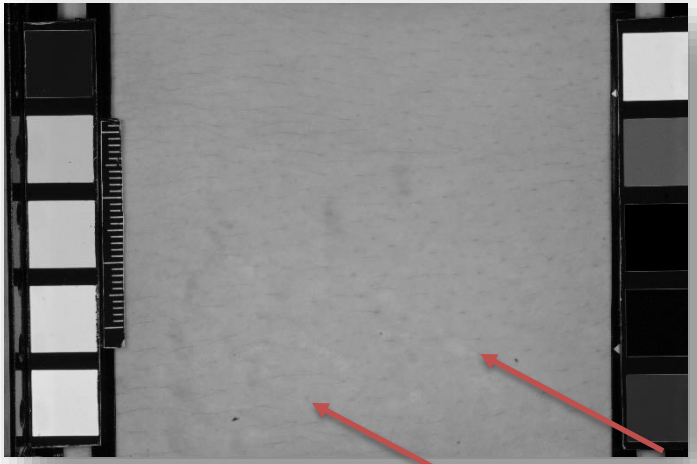

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Stretch mark area reduction: -22 %

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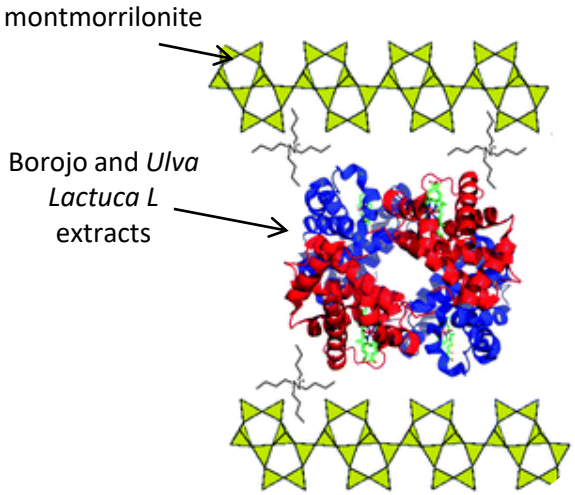
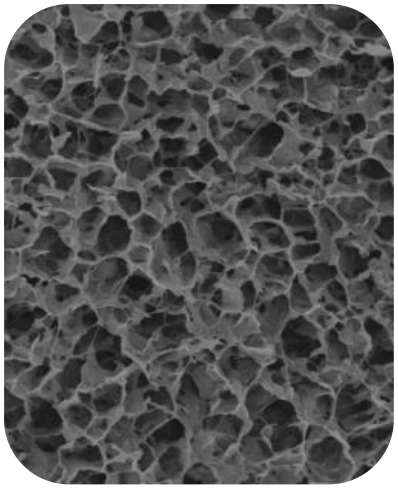
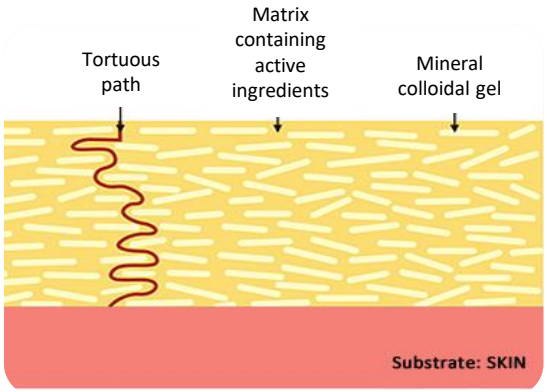
PROTECTION and DRUG RELEASE mechanism

Protection and stability of active ingredients





Drug release mechanism



Active ingredients as raw material in powder from:

Biological active ingredients are integrated in montmorrilonite sheets as a dehydrated form without preservatives.

Active ingredient as finished products:

In aqueous environment, montmorrilonite creates a 3D structure as « honeycomb » able to protect biological active ingredients.

Once on the skin:

Creation of a scaffolding structure type « second skin » able to release biological active ingredients in a controled way.

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Regeneryl, technical specifications

- INCI: Montmorillonite & Borojoa patinoi fruit juice & Ulva lactuca extract
- CAS: 1318-93-0 & ND & 97281-59-9
- EINECS: 215-288-5 & ND & 306-651-0
- COSMOS CERTIFIABLE
- APPEARANCE, beige powder without preservatives.
- FORMULATION: dispersible in aqueous phase
- STORE CONDITIONS: 18 months in a ventilated area
- DOSAGE
  - PREVENTION: 0,5 - 1 %
  - CURATIVE: 1 %
- TOLERANCE:
  - Cutaneous: non-irritant
  - Ocular: moderately irritant
  - Genotoxicity: non-mutagenic
  - Cutaneous skin sensitization test: non-irritant and non-sensitizing
- **Certified estrogen-like endocrine disruptors free**

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Conclusion

1. A preventive action against stretch marks appearance
   - Elastin protection: + 37%
   - Inhibition of senescence cellular: + 28%
   - Stimulation of Type 1-collagen synthesis: +64%
   - Stimulation of Hyaluronic acid synthesis: +58%

2. A curative action which reduces significantly stretch marks size
   - Wound Healing power of REGENERYL :
     - In Vitro, Scrap test: +63% of recolonized surface area
     - In Vivo, anti-stretchmarks test : -22% of stretchmarks area

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