APOENA

MORE THAN NATURAL, SUSTAINABLE

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Integrity Ingredients Corporation

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APOBIO FILM

Moisturizing postbiotic for skin and hairs

Biofilm Former | **Increased Hydration** | **Reduced Water Loss** | **Oil control**

Produced sustainably through the fermentation of probiotic bacteria, this product is abundant in polysaccharides and fructooligosaccharides, helping prevent transepidermal water loss, which, in turn, enhances skin and hair hydration, among other benefits.

Perfect for formulations:
- **Skin:** Hydrating and soothing cream for facial and body skin;
- **Hair:** Styling cream, hydrating mask, leave-in product.

Recommended dose: 4%
INCI: AQUA, BACILLUSFERMENT, FRUCTOOLIGOSACCHARIDE BENZYLALCOHOL, ETHYLHEXYLGLYCERIN.

In vitro efficacy tests

Oil Control

APOBIO FILM reduces the expression of oil-related markers:

- 66,7% the expression of 5-a-reductase

Dermocalming property

APOBIO FILM reduces the expression of inflammation-related markers:

- 76,7% of IL-6 expression
- 77,5% of IL-8 expression

Clinical test

Hydration

Instrumental evaluation and sensory analysis demonstrate the product's effectiveness in increasing immediate and continuous skin hydration:

- 58% skin hydration by Corneometry®

Reduced water loss

Instrumental evaluation demonstrated the product's effectiveness in reducing transepidermal water loss:

- 15% water loss by TWL®

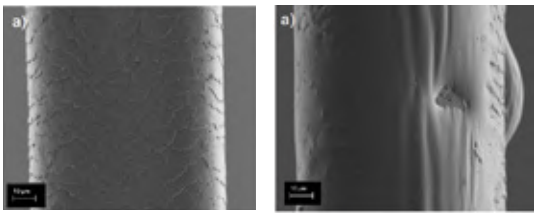
Tests performed with hair locks

Biofilm formation

This active ingredient adheres to the hair fiber to form a protective film, as seen in the SEM-FEG images.

Water content and water retention of treated hair locks

The biofilm formation traps water within the hair fiber, preventing dryness, as evidenced by DSC measurements indicating a shift in the peak vaporization temperature of water from 64.80 to 84.30 °C after product application.



Control **APOBIO FILM**

APOBIO SKIN

Postbiotic with anti-aging effect

Increases hyaluronic acid (HA) production | **Protection against UV light damage** | **Skin protection**

APOBIO Skin is a postbiotic derived from **biotechnological processes** which contains substances produced by beneficial microorganisms with numerous positive effects on the skin. It effectively **prevents and treats** signs of aging by stimulating the endogenous **synthesis of hyaluronic acid,** a vital component of the extracellular matrix.

Perfect for formulations:
Moisturizers, facial creams, eye creams, serums, and treatment products.

Recommended dose: 1 to 3%

INCI: AQUA, ASTRAGALUS MEMBRANACEUS EXTRACT, BACILLUS FERMENT, BENZYL ALCOHOL, ETHYLHEXYLGLYCERIN.

In vitro efficacy tests

Astragalus effect enhancement – hyaluronic acid production

Boosts the stimulation of hyaluronic acid production through the fermentation of Astragalus with probiotic microorganisms:

Astragalus only (no fermenting): 29% HA production

APOBIO SKIN: 53% HA production

Stimulates the expression of skin barrier markers

Marked increase in the expression of key genes responsible for protecting and maintaining the skin barrier:

- 217% Aquaporin-3
- 366% Involucrine
- 226% Filgarine

Ex vivo efficacy tests

Increases Hyaluronic Acid production

Induces hyaluronic acid production at the same levels as retinoic acid. Since APOBIO Skin is a biotechnological solution that lacks the side effects caused by retinoic acid:

APOBIO SKIN: 33% HA production

Retinoic acid: 30% HA production

Protection against UV damage

The active ingredient in APOBIO Skin prevents the decrease in hyaluronic acid synthesis when the treatment is applied before or after exposure to UV radiation.

While maintaining hyaluronic acid production at levels comparable to skin not stressed by UV light.

APOBIO SLIM

Postbiotic agent with anti-cellulite action

Cellulite reduction | **Reduction of body measures** | **Inhibition of adipogenesis** | **Lipolytic efficacy**

Probiotic microorganisms like Lactobacillus naturally produce beneficial molecules known as **postbiotics,** which have various positive effects on the skin. Furthermore, **APOBIO Slim** acts particularly against cellulite. It enhances skin texture and reduces the appearance of cellulite through its lipolytic effect, promoting softer, more hydrated skin.

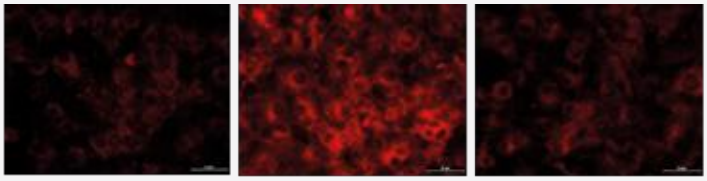
Perfect for formulations:
Perfect for use in massage gels, anti-cellulite creams and size reduction cream formulations.

Recommended dose: 3%
INCI: AQUA, LACTOBACILLUS FERMENT, BENZYL ALCOHOL, ETHYLHEXYLGLYCERIN.

In vitro efficacy tests

Inhibition of adipogenesis

APOBIO Slim inhibits cell differentiation in the adipogenesis process. To demonstrate the formation of adipocytes, triglycerides were labeled with red dye.



Baseline control
No adipogenesis induction

Adipogenesis induction

Adipogenesis induction + APOBIO Slim

Lipolytic efficacy

Increased lipase expression, demonstrating lipolytic efficacy and action in inducing lipolysis, and promoting cell fat burning:

- 45,4% expression of triglyceride lipase

Clinical test

Celluvision thermographic plate evaluation

Sixty percent (60%) of participants showed significant improvement in cellulite after APOBIO Slim application.

Self-evaluation

The product improved several skin aspects, including: reduced swelling, improved texture, more hydrated skin and visual improvement in the cellulite appearance.

Anthropometric assessment

Reduction in body measurements in centimeters: average of 1.35 in 80% of the group

Fat reduction: average 1.53 mm

RAMNOCARE

Multifunctional anionic biosurfactant

Sulfate-free | **Antioxidant** | **Gentle cleaning** | **Skin protection**

You no longer need to compromise between a **high-performance product and a sustainable one — now you can have both!** RamnoCare is produced by microorganisms and can provide users with not only surfactant properties, but also **antioxidant benefits** and **enhanced skin protection.**

Perfect for formulations:
Perfect for formulating “sulfate free” soaps, shampoos, and makeup removers”.

Recommended dose: 2 to 6%
INCI: AQUA,RHAMNOLIPIDS,BENZYLALCOHOL,ETHYLHEXYLGLYCERIN.

In vitro efficacy tests

Antioxidant effect

oneThe evaluation of the antioxidant effect was determined by the reduced free radicals. RamnoCare showed activity equal to vitamin E:

RamnoCare: ↓ 91% production of free radicals

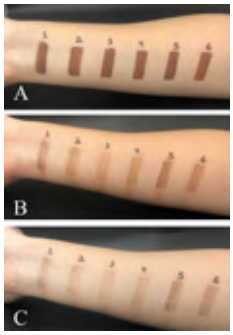
Vitamina E: ↓ 92% production of free radicals

Skin Barrier Markers

Marked increase in the expression of key genes responsible for protecting and maintaining the skin barrier:

- ↑ 647% Aquaporin-3
- ↑ 226% Involucrin
- ↑ 142% Figarine

Make-up removal effectiveness



1-RamnoCare (2%), 2-RamnoCare (4%), 3-Sodium lauryl sulfate (12.5%), 4-Lauryl polyglucoside (7.5%), 5-Placebo, 6-Commercial makeup remover.

(A)Application of skin base;

(B)Remaining base after applying makeup remover;

(C)Remaining base after two applications of makeup remover.

Ex vivo efficacy tests

Inflammatory potential

Evaluation of IL-1α production, an interleukin associated with inflammatory processes, demonstrates that RamnoCare does not induce skin irritation, unlike the surfactant Sodium Lauryl Sulfate, which promotes a 29% increase in the production of this interleukin.

Foam test

5 minutes after shaking

Foaming Comparison of Ramnocare (RC), Lauryl Glycoside (LG) and Sodium Lauryl Sulfate (LS).

Ramnocare demonstrated foaming power similar to lauryl glucoside. LS had a greater volume of foam, but a less dense one.

At **Apoena Biotech,** a pioneering Brazilian company, we draw inspiration from nature's abundance and scientific advancements to develop sustainable, high-performance solutions. In 2022, our bioprospecting endeavors were initiated in Brazil, a country harboring 20% of the world's biodiversity.

The inaugural **"Blue Amazon"** and **"Green Amazon"** expeditions sought to uncover microorganisms across diverse biomes, with the potential to revolutionize the biotechnology sector, while aiming to create innovative biotechnological products that defy conventional standards and reduce reliance on environmentally harmful chemicals.

We dedicate ourselves to achieving high performance with minimal environmental impact. Our solutions derive from meticulous processes, ranging from minimalistic sample collection (less than 5 g) to delivering sustainable biological assets that drive innovation and efficiency.

Through bioprospecting, we are establishing a microorganism bank capable of producing novel products for various industries worldwide. This initiative underscores our commitment to democratizing biotechnology.

Join us on this journey and witness the harmony between science, technology, and nature.

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GET IN TOUCH WITH US

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