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APOENA

MORE THAN NATURAL, SUSTAINABLE

ABOUT US

Apoena Biotech was founded in 2018 to drive sustainable development through biotechnology. Our work encompasses bioprocess technologies and biotechnological products, developing products for the agriculture and personal care markets.

AGRICULTURE

Solutions for the agricultural market with sustainable biological products.

Currently, with an annual sales volume of 700,000 liters.

PERSONAL CARE

Development of cosmetic ingredients from microorganisms.

Seeking performance, sustainability, and innovation for a new economy.

OUR PURPOSE

- What planet do we want to leave for our children and grandchildren?
- Are natural products also sustainable?

Thinking about these issues, biotechnology is one of the best ways to have high-performance products, controlled in the laboratory and extracting as little as possible from the environment.

We invite you to be part of this journey towards a greener and more responsible world, with products that meet the demands of a market that is constantly evolving.

Our structure

PRODUCTION FACILITY :

- Bioreactors with a capacity of 140,000 liters per month;
- Mixers
- Fillers

LABORATORIES:

Analysis Laboratory
Factory Support Laboratory

R&D Center:

- Molecular Biology Laboratory
- Bioprospecting Laboratory
- Animal Cell Culture Laboratory

Laboratories Team:

A multidisciplinary team composed of masters, doctors, biotechnologists, chemists, biologists, and pharmacists

PRODUCTION PROCESS

Microorganism

Bioprocesses

Purification

APPLICATION TESTING

Partner Companies:

In vitro → ***Ex vivo*** → **Clinical**

núcleo vitro

Grupo kosmo science

MEDCIN PESQUISA

CEDAD CREDIBILIDADE EM PESQUISAS DERMATOCOSMÉTICA

Grupo kosmo science

PERSONAL CARE:

- Postbiotics
- Biosurfactants

Why Apoena Biotech?

- Multifunctional Actives
- Sustainability
- Innovation
- Minimalist Formulation
- High Performance

Biosurfactants:

RamnoCare

Multifunctional anionic biosurfactant

INCI: AQUA, RHAMNOLIPIDS, BENZYL ALCOHOL, ETHYLHEXYLGLYCERIN.

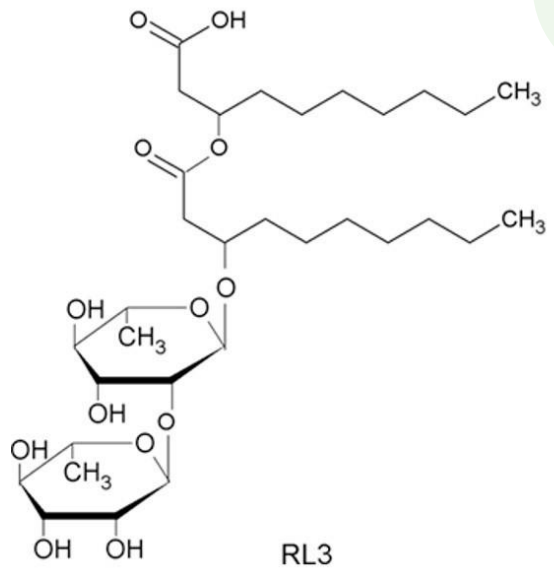
APPLICATION SUGGESTIONS

- Micellar Water
- Sulfate-Free Facial Cleanser
- Liquid Soap for Sensitive Skin
- Baby Soap/Shampoo

Active concentration: 2 a 6%

Claims:

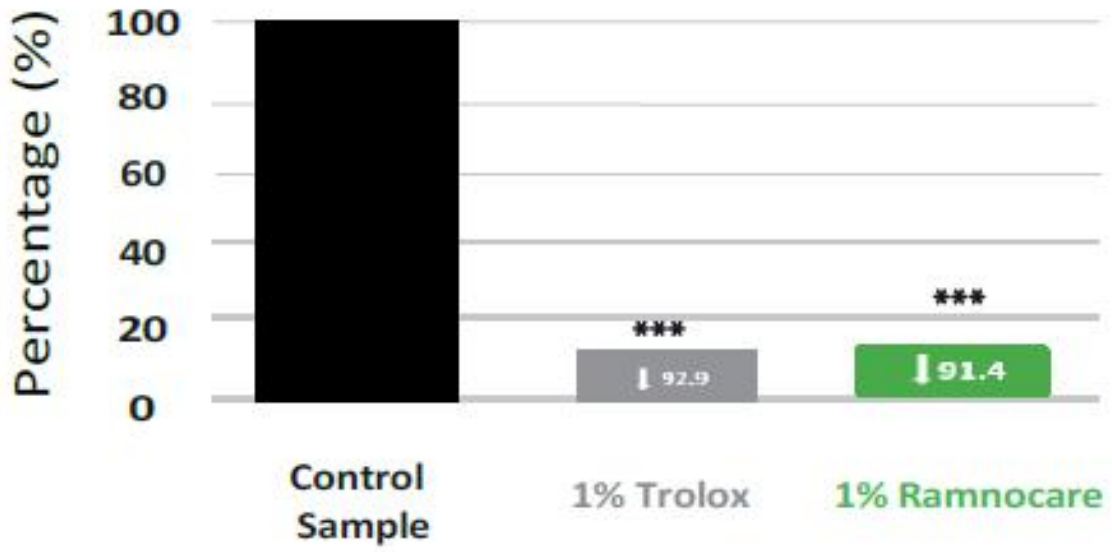
- Alternative to traditional surfactants
- Antioxidant properties
- Low toxicity
- Antimicrobial activity
- Biodegradable
- Skin-compatible



RL3

RamnoCare: Antioxidant Properties (*in vitro*)

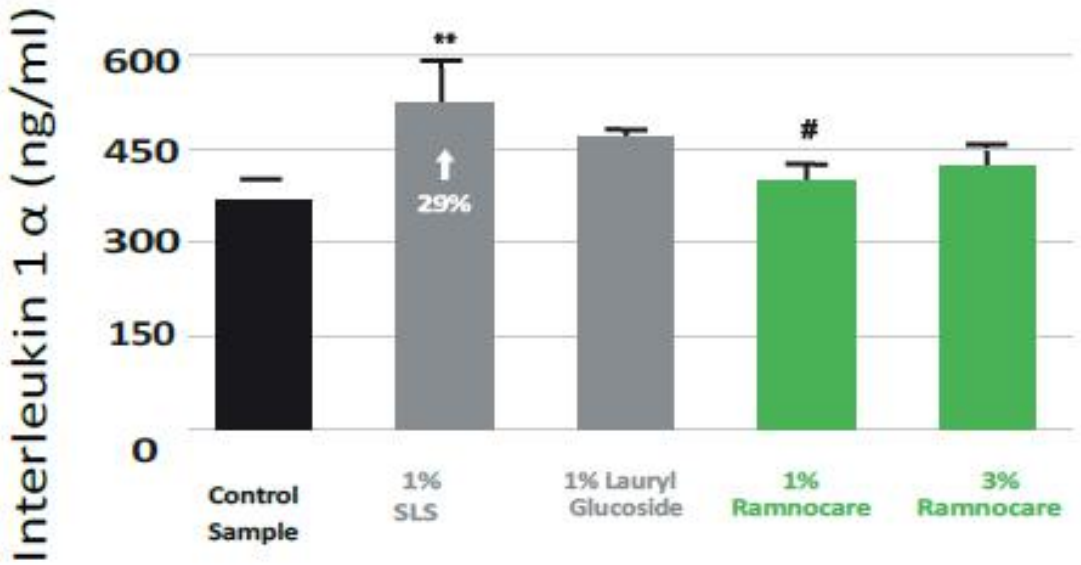
The assessment of the antioxidant effect was determined by the reduction in the amount of free radicals produced by human fibroblast cells, using 1% Trolox (a water-soluble analog of vitamin E) as a positive control.



Percentage of free radical production. The 1% solution of the product exhibited similar effectiveness to 1% Trolox. (***p<0.001)

RamnoCare: Evaluation of inflammatory activity (*ex vivo*)

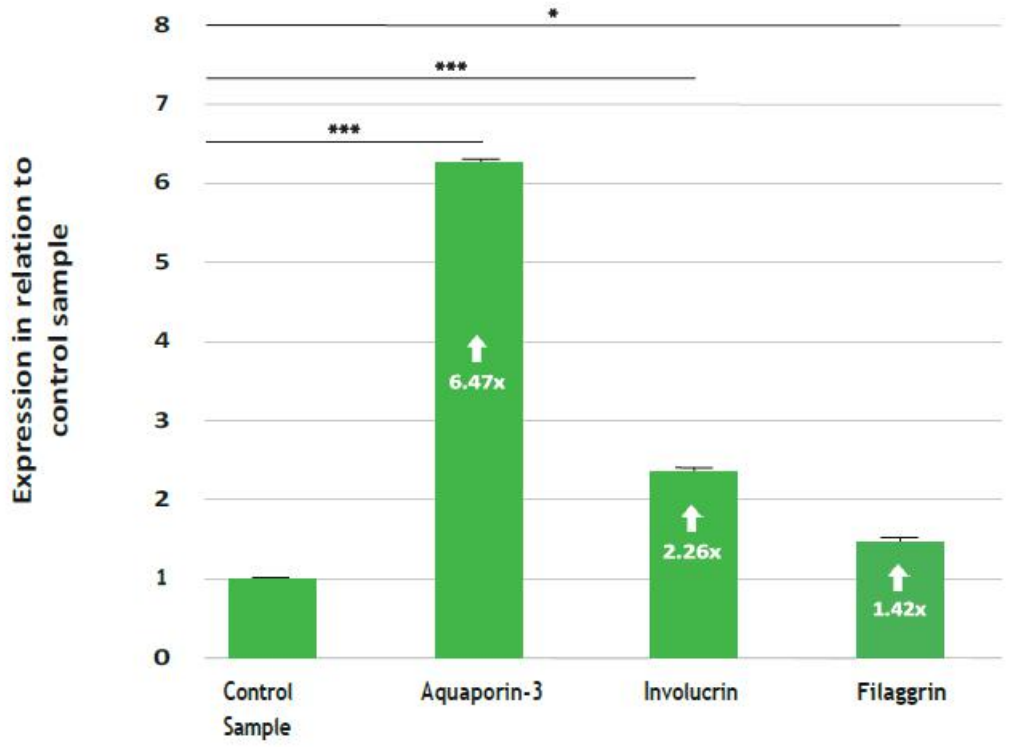
Evaluation of inflammatory cytokine production in supernatants from human skin culture treated with the products



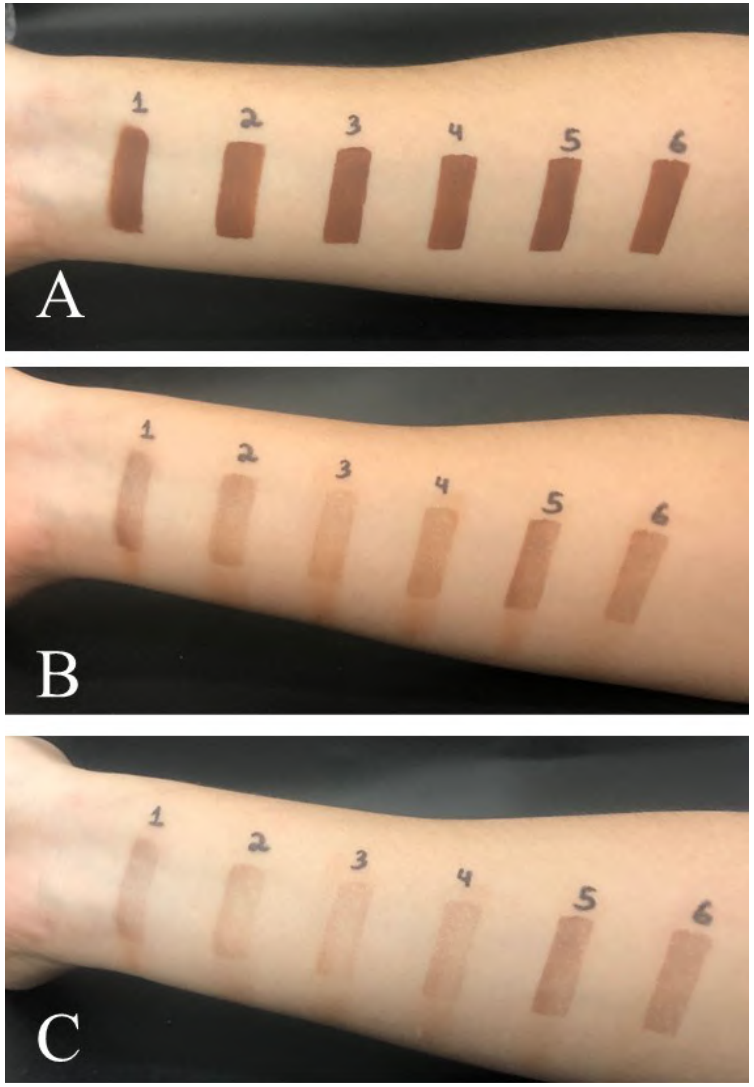
Sodium Lauryl Sulfate 1% increases IL-1α synthesis by 29%. The product Ramnocare at 1% and 3% maintains the IL-1α level statistically equivalent to that observed in the basal group, suggesting that these products do not induce an irritative process in the skin. (**P<0.01 compared to control) (#P<0.05 compared to SLS)

RamnoCare: Skin barrier markers (*in vitro*)

Evaluation of gene expression of skin barrier and skin hydration markers in human epidermal keratinocytes.



Results of the expression analysis compared to the negative control (basal). APOBIO Skin has the potential to maintain skin cell cohesion, reflecting in skin hydration, plumpness, resistance, and improvement in skin barrier formation. (***p<0.001) (*p<0.05)



MAKEUP REMOVER ACTIVE

Figure 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 foundation to the skin;

(B) Remaining foundation after one application of makeup remover formulations;

(C) Remaining foundation after two applications of makeup remover formulations.

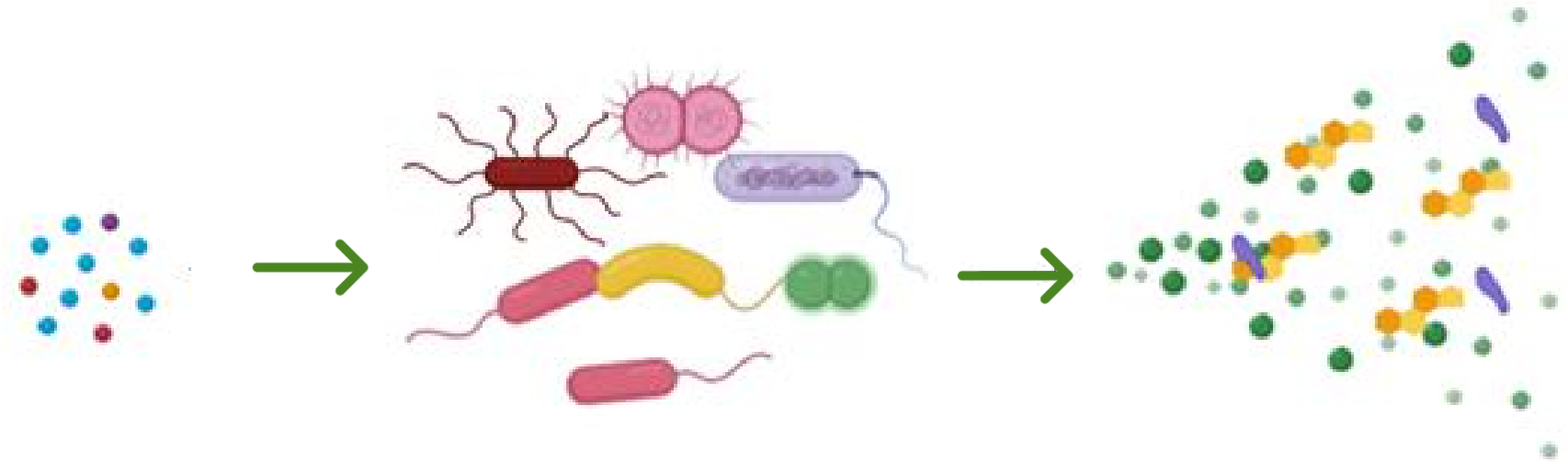
RamnoCare: Evaluation of genotoxic and mutagenic potential

- Ames Test: The sample was not considered mutagenic at any of the concentrations tested.

- Micronucleus test with cytokinesis blockade: The sample showed no genotoxic potential for HepG2/C3A cells under the conditions studied.

POSTBIOTICS:

DEFINITION:



Prebiotics

They stimulate the growth and reproduction of beneficial microorganisms.

Probiotics

Live microorganisms that provide health benefits to the host.

Postbiotics

Probiotic microorganisms produce metabolic byproducts.

PRODUCTS :

APOBIO SKIN:
Post-biotic with pro-aging effect

APOBIO SLIM:
Postbiotic with anti-cellulite action

SOFT LAUNCH

APOBIO FILM:
Post-biotic for skin and hair

APOBIO SKIN:

Post-biotic with pro-aging effect

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

Active concentration: 1 to 3%

Claims: increase in hyaluronic acid synthesis, hydration

APPLICATION SUGGESTIONS

Pro-age products:

- Eye area
- Facial tonic
- Neck and décolleté cream
- Hand cream
- Facial serum
- Face cream
- **Lip treatment:**
- Lip balm
- Hydrating lipstick

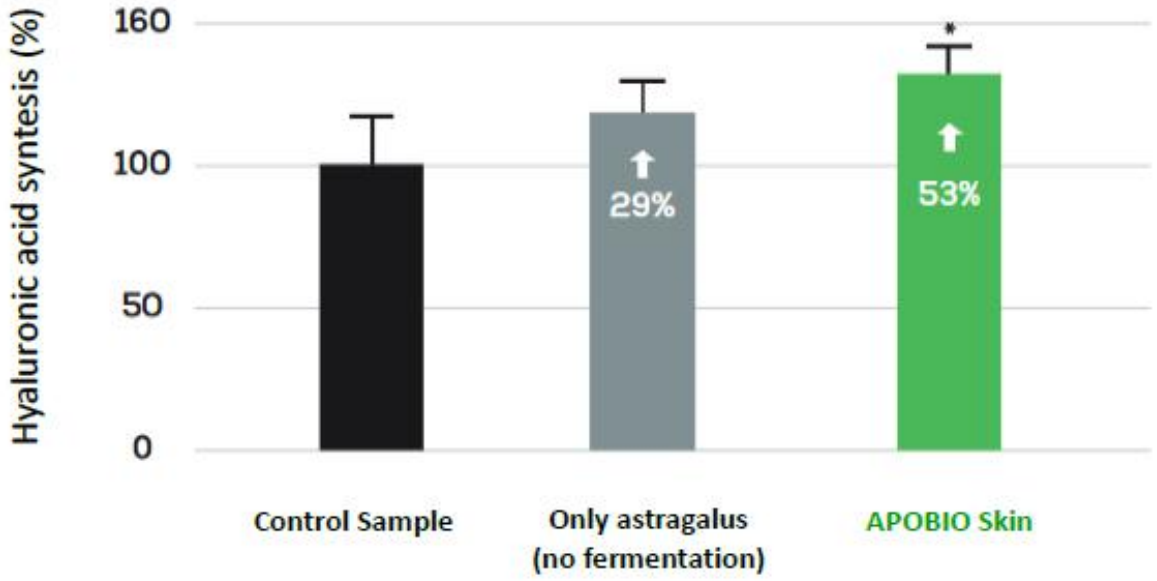
Astragalus

Fermentation with probiotic bacteria

Effects improvement

APOBIO SKIN: production of hyaluronic acid *(in vitro)*

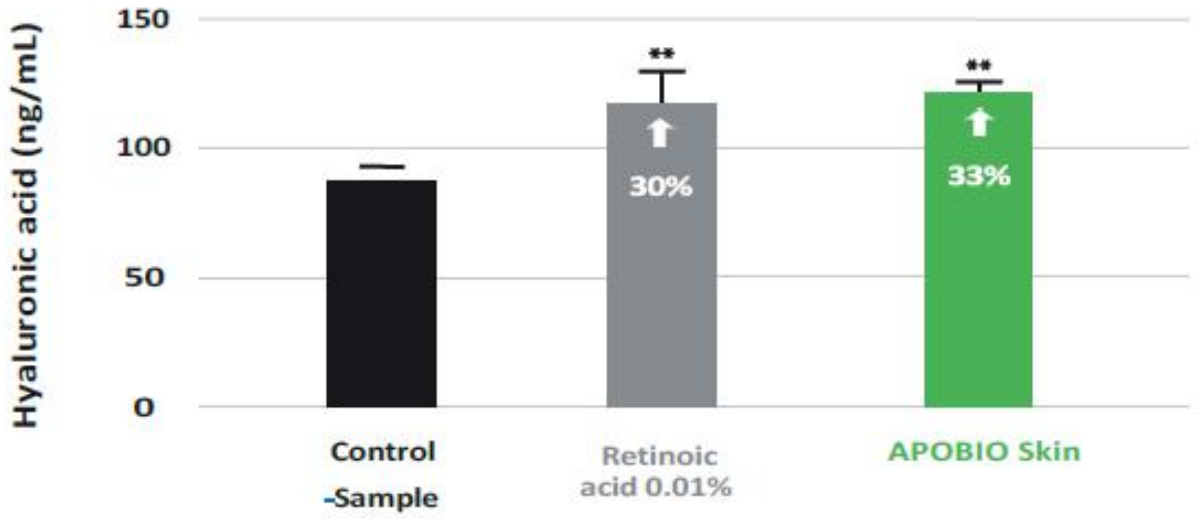
Evaluation of the stimulation of hyaluronic acid synthesis induced by pure Astragalus extract and APOBIO Skin in human fibroblast culture supernatant using an immunoenzymatic assay (Elisa):



APOBIO Skin enhanced the stimulation of hyaluronic acid synthesis through the fermentation of Astragalus with probiotic microorganisms. (*p<0.05 compared to control)

APOBIO SKIN: production of hyaluronic acid *(ex vivo)*

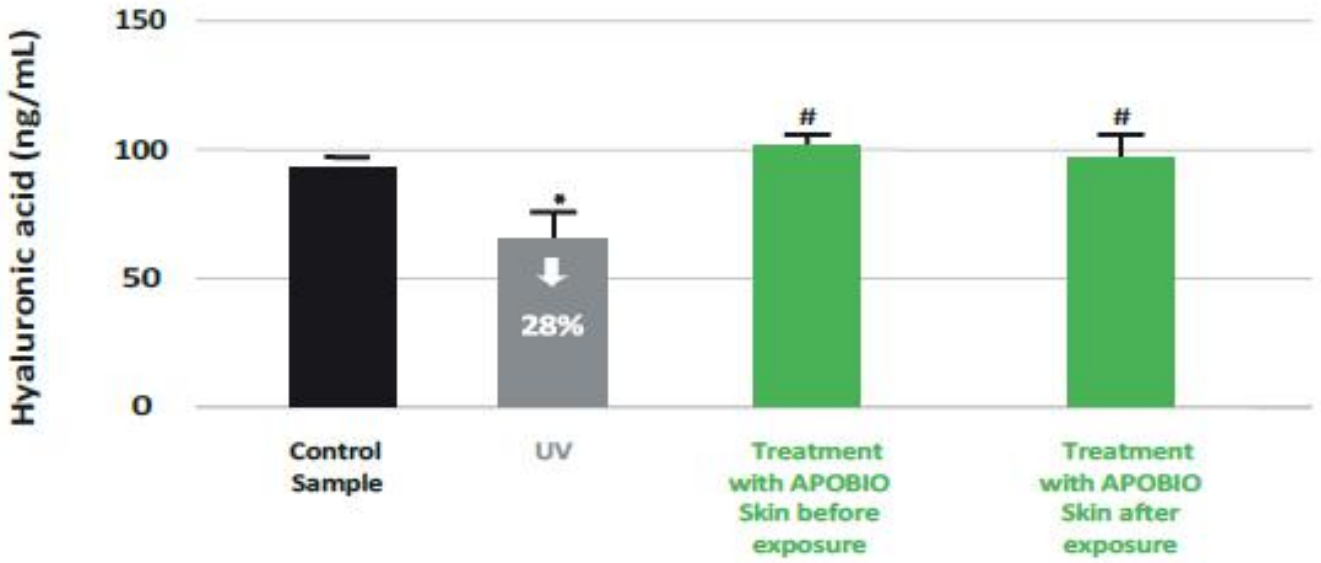
Quantitative determination of hyaluronic acid in human skin using ELISA.



The product APOBIO Skin at 1% induces a 33% increase in hyaluronic acid synthesis compared to the basal group and stimulates hyaluronic acid synthesis at the same levels as 0.01% retinoic acid. APOBIO Skin is a biotechnological solution without the side effects caused by retinoic acid. (**p<0.01 compared to control)

APOBIO SKIN: Exposure to UV (*ex vivo*)

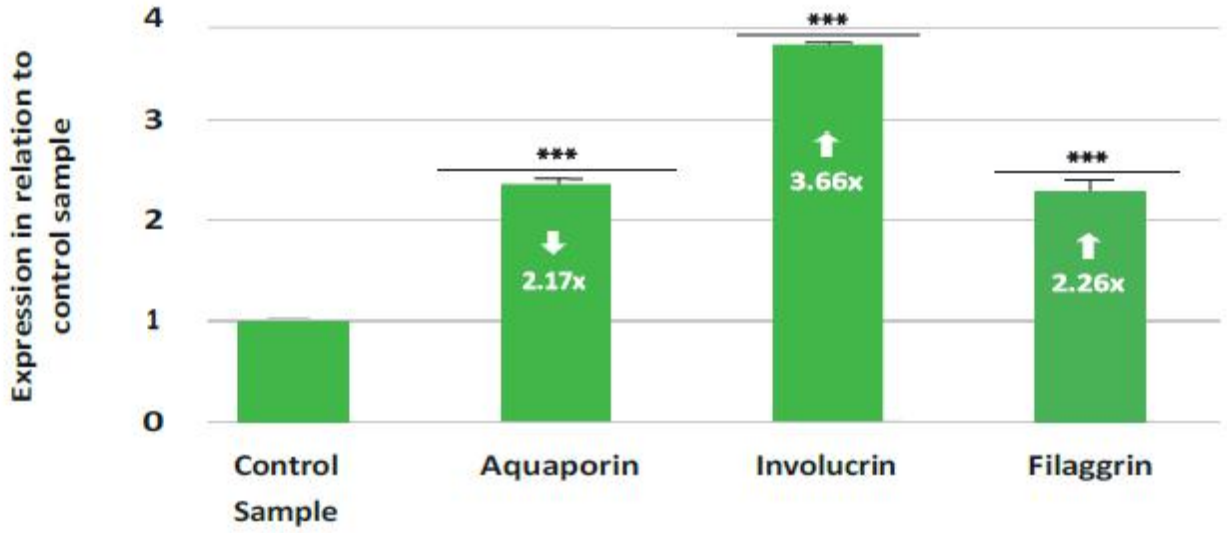
Quantitative determination of hyaluronic acid synthesis in human skin exposed to UV light, with treatment before and after exposure.



The APOBIO Skin active ingredient prevents the reduction of hyaluronic acid synthesis when treatment is conducted before or after exposure to UV radiation. (**p<0.01 compared to basal) (#p<0.001 compared to UV)

APOBIO SKIN: skin barrier markers *(in vitro)*

Solutions containing control and sample groups were applied to keratinocyte cell culture to evaluate the gene expression of aquaporin-3, involucrin, and filaggrin genes, which are essential for maintaining keratinocyte cohesion and, thus, the maintenance of the skin barrier.



Results of the expression analysis compared to the negative control (basal). APOBIO Skin has the potential to maintain skin cell cohesion, resulting in improved skin hydration, plumpness, resistance, and skin barrier enhancement. (***p<0.001 compared to control)

APOBIO SKIN: Evaluation of genotoxic and mutagenic potential

- Ames Test: The sample was not considered mutagenic at any of the tested concentrations.

- Cytokinesis-Blocked Micronucleus Assay: The sample showed no genotoxic potential for HepG2/C3A cells under the studied conditions.

APOBIO SLIM:

Postbiotic with anti-cellulite action

INCI: AQUA, LACTOBACILLUS FERMENT, BENZYL ALCOHOL, ETHYLHEXYLGLYCERIN.

Active concentration: 3%

Claims:

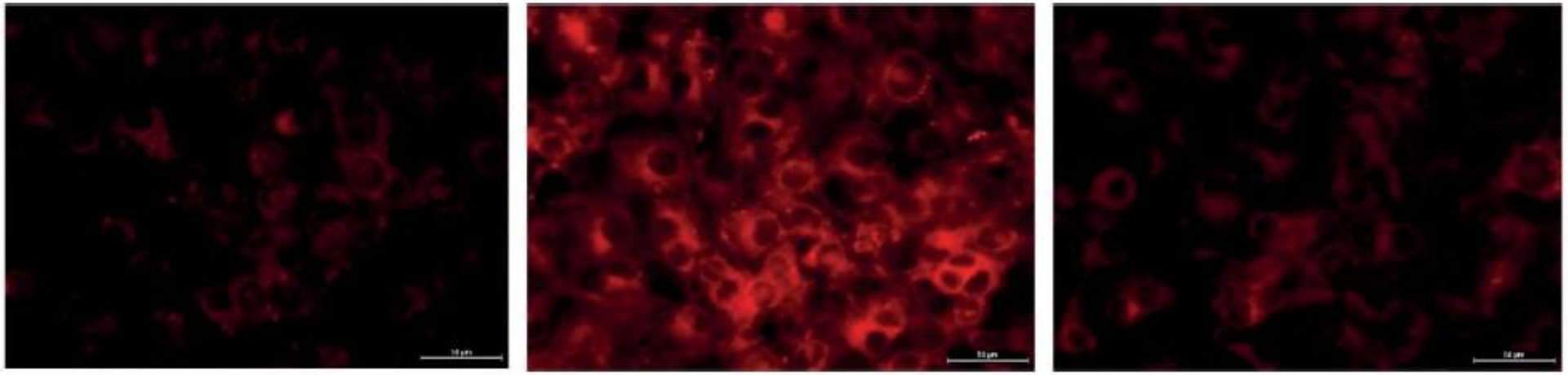
- Improves skin firmness and tonicity
- Enhances the appearance of cellulite
- Aids in reducing fat and localized measurements
- Enhances skin texture
- Hydrates and softens the skin

APPLICATION SUGGESTIONS

- Anti-cellulite gel-cream
- Modeling massage cream
- Anti-cellulite cream
- Exfoliant

APOBIO SLIM: Inhibition of adipogenesis (*in vitro*)

In vitro study where undifferentiated cells underwent the adipogenesis induction process and were then treated with APOBIO Slim to assess the product's interference in the cell differentiation process and adipocyte formation. To highlight adipocyte formation, triglycerides were labeled with a red dye.



Control Sample
Without induction of adipogenesis

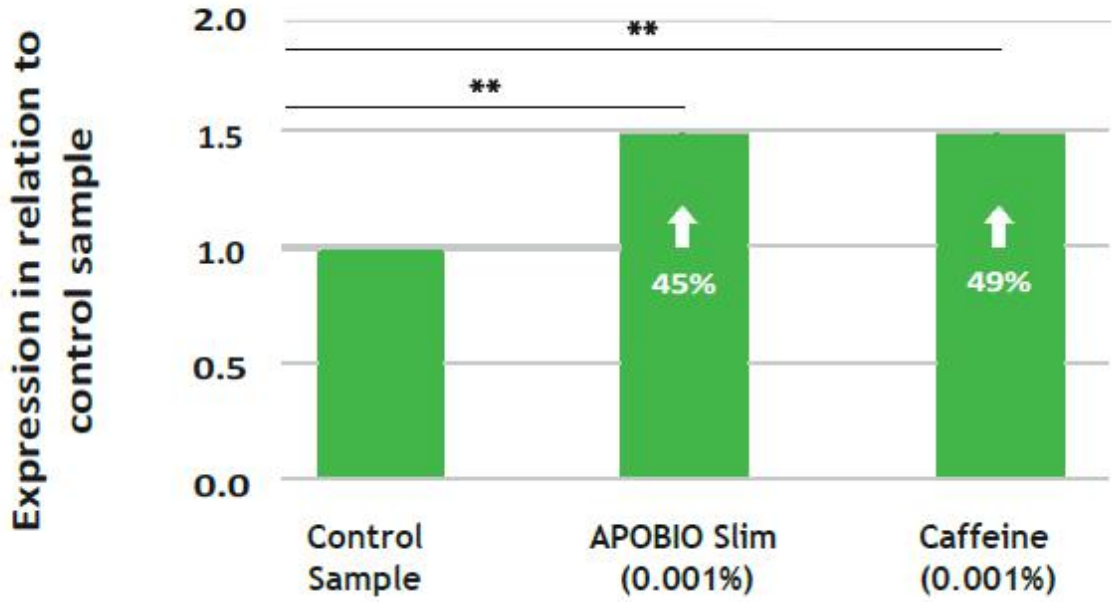
Control Sample
With induction of adipogenesis

Control Sample
With induction of adipogenesis
+ APOBIO Slim

The study demonstrates that the product APOBIO Slim inhibits cell differentiation in the adipogenesis process.

APOBIO SLIM: Lipolytic effectiveness (*in vitro*)

Differentiated adipocytes were exposed to the sample to evaluate the relative expression of adipose triglyceride lipase among the groups through RT-qPCR and to relate it to the sample's potential for increasing lipolysis.



Exposure to APOBIO Slim showed a 45.4% increase in lipase expression compared to the control group, demonstrating its lipolytic efficacy and its action in inducing lipolysis, promoting fat burning in cells, and reducing cellulite. (**p<0.01)

APOBIO SLIM: Clinical test

Clinical trial conducted on fifteen women aged 18 to 65 with cellulite grades ranging from I to V.

Product applied once daily for 40 days.

- The assessment using the Celluvision thermographic plate demonstrated that 60% of the participants showed significant improvement after using APOBIO Slim.

- Self-assessment revealed improvement in various aspects of the skin, including reduced swelling, improved elasticity, enhanced skin texture, increased skin hydration, softer skin, and a better visual appearance of cellulite.

APOBIO SLIM: Contact test (patch test)

- Assessment of the absence of potential for primary dermal irritability, cumulative dermal irritability, and allergenic potential (sensitization) after repeated applications in humans:

No irritations or discomfort were observed in the participants. The product exhibited acceptable skin compatibility after both single and repeated applications

Launch: InCos 2024 & Suppliers Day-NY

APOBIO FILM:

Post-biotic for skin and hair

INCI: AQUA, BACILLUS FERMENT, FRUCTOOLIGOSACCHARIDE BENZYL ALCOHOL, ETHYLHEXYLGLYCERIN

Active concentration: 4%

CLAIMS:

FOR SKIN:

- Hydration
- Prevents water loss
- Anti-inflammatory potential
- Oil control.

FOR HAIR:

- Combats dry hair
- Retains water in the hair
- Thermal protection
- Film formation

APPLICATION SUGGESTIONS

Skin:
moisturizing cream for face and body

Hair:
Finishing cream, moisturizing mask, leave-in, curling hair cream

Efficacy test results: SKIN

- **Clinical test**:
Corneometry® and TEWL® measurements demonstrate the effectiveness of the product with a **58% increase in skin hydration** and a **15% reduction in water loss**, with immediate and continuous hydration.

- **Anti-inflammatory potential (*in vitro*):**
Evaluation of the effect of the product on the expression of markers related to inflammation: APOBIO FILM **reduced IL-6 expression by 76%** and **IL-8 expression by 77%**

Efficacy test results: SKIN

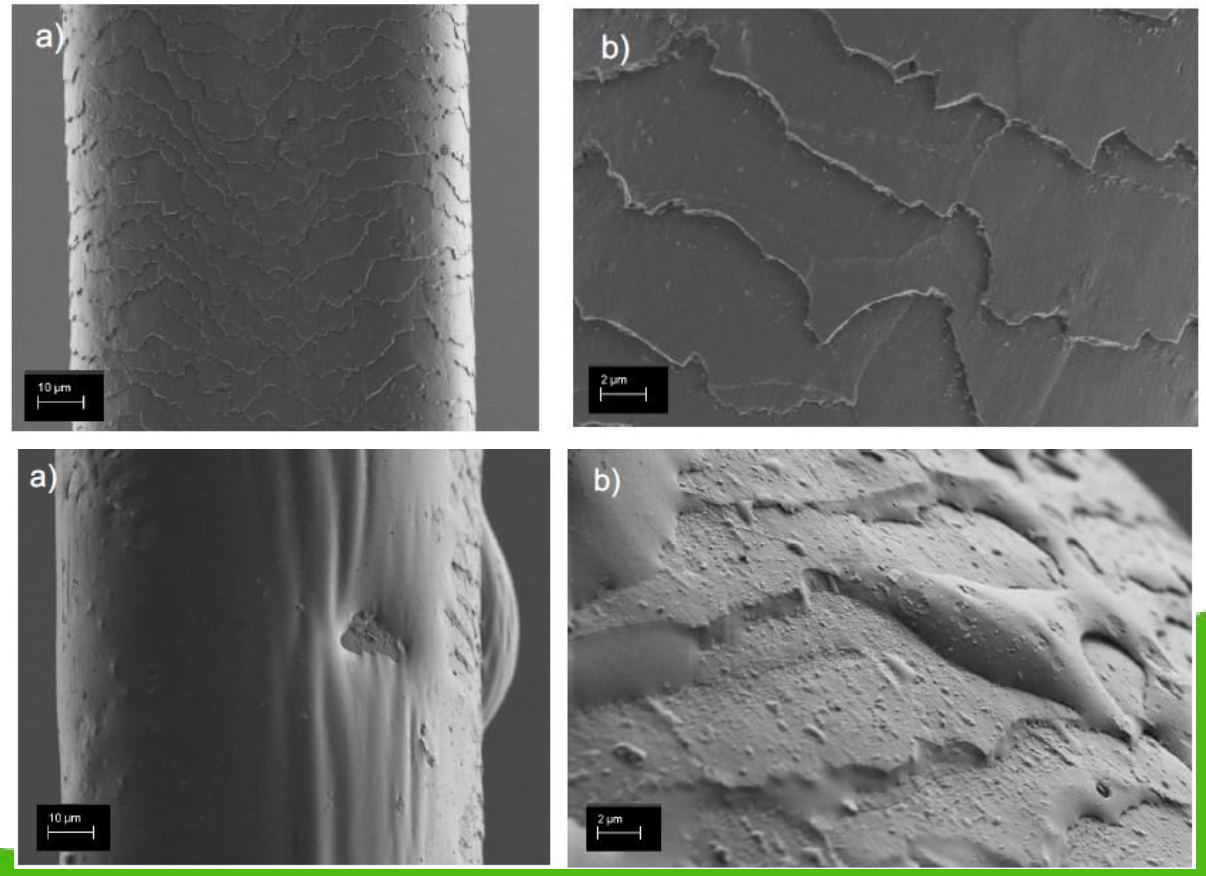
- **Skin oil control (*in vitro*):**

Evaluation of the effect of the product on the expression of oil-related markers (5-a-reductase): APOBIO FILM **reduced enzyme expression by 66%** compared to the control group

Efficacy test results: HAIR

- **Biofilm formation:**

The product adheres to the hair fiber, forming a film and covering it, as seen in the High Resolution Electron Microscopy (SEM-FEG) images:



BIOPROSPECTION:

Blue Amazon Project **Fernando de Noronha**

In July 2022, Apoena Biotech initiated sustainable bioprospecting activities in Fernando de Noronha, an archipelago representative of the Blue Amazon.

This choice highlights and drives the development of Brazilian biotechnology from one of the world's richest ecosystems, enabling the creation of exclusive sustainable products in terms of preservation, and opening up new opportunities for the development of innovative solutions.

PRODUCTS IN DEVELOPMENT: BLUE AMAZON

Skin lightening cream

Tyrosinase inhibition test

inhibition: 97%

Inhibition of melanin production (*in vitro*)

Kojic Acid: ↓ 33,5%

Sample: ↓ 40,0%

Clinical Trial

In progress

FAQ

- **Does the product contain live microorganisms?**

No, all products have the cells removed at the end of the process. The product consists of a mixture of metabolites produced and secreted during fermentation.

- **What is the recommended usage percentage?**

RamnoCare: 2 to 6%
APOBIO Skin: 1%
APOBIO Slim: 3%
APOBIO Film: 4%
For questions about product applications, consult the datasheet and the guide with suggested formulations for the respective product.

- **What percentage was used in the tests?**

The tests were carried out with the recommended percentage of use

- **What are the compatibilities or incompatibility for formulation?**

Consult formulation compatibility report

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