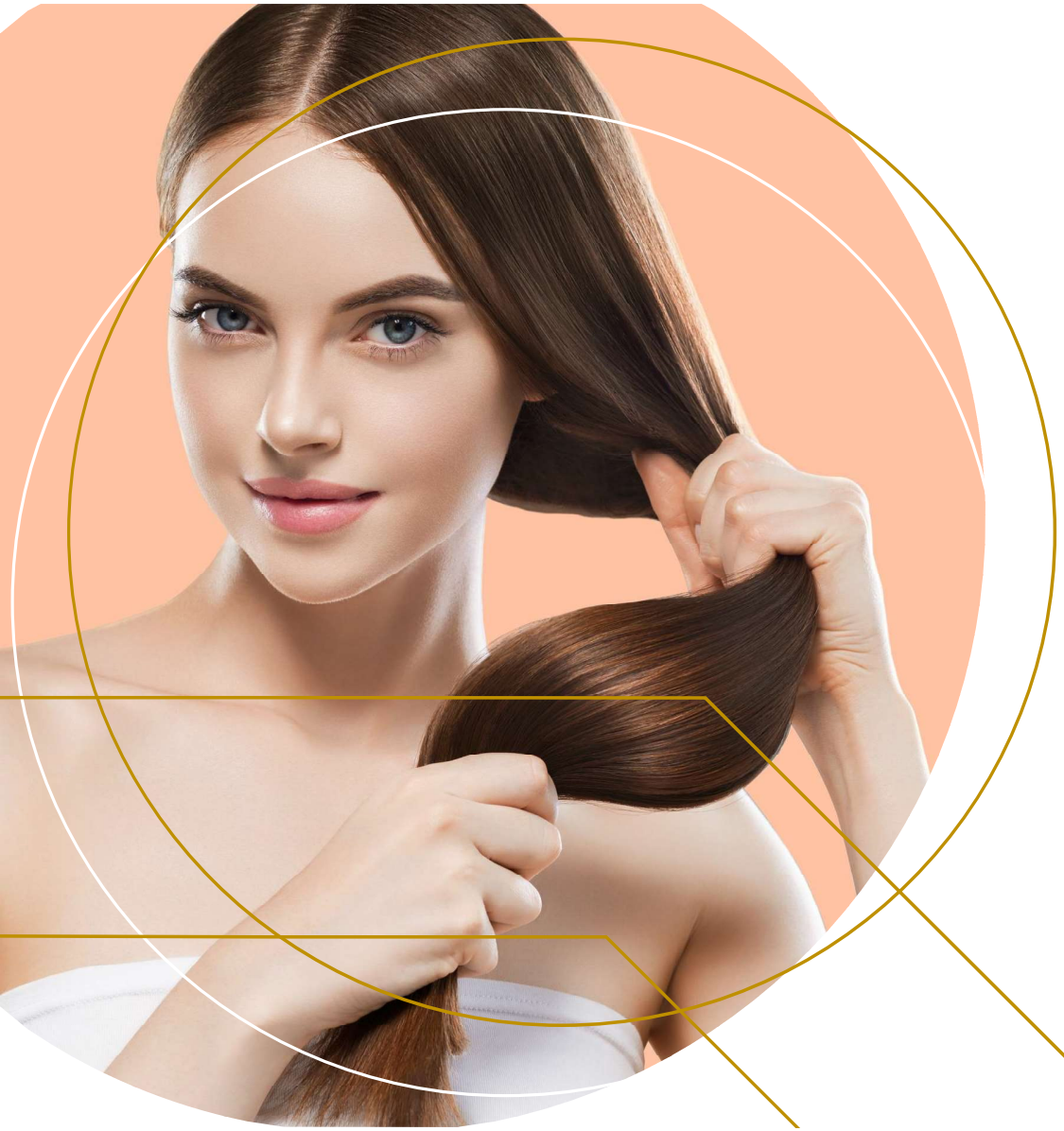


HAIRCARE
SCALPCARE

Epinutrix

Biomimetic Lipid repair from the scalp to the hair tip!

AQiA
QUÍMICA INOVATIVA



ÍNDICE

Inspiration and Market

Origin and Composition

Mode of action

Tests

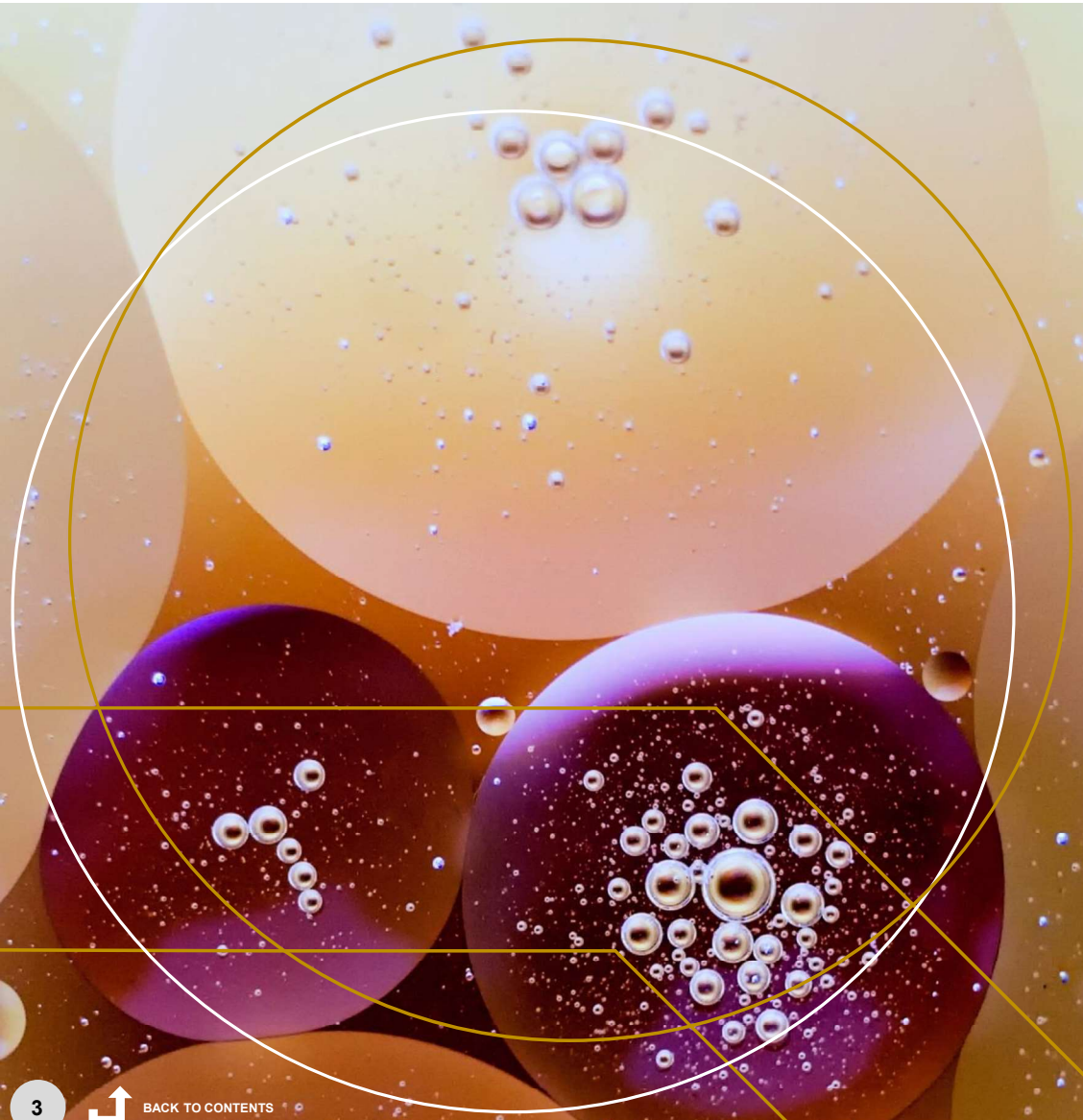
Benefits

Formulation and uses

Claims

Dashboard

AQIA
QUÍMICA INOVATIVA

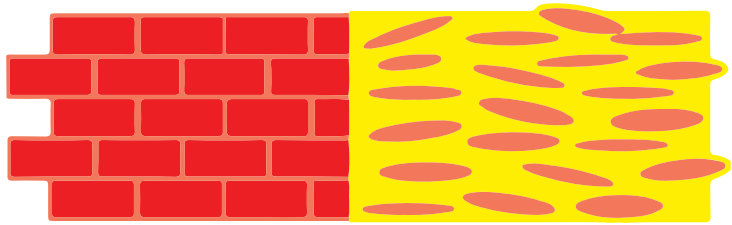


Inspiration & Market



Lipid Profile of the scalp (skin)

- Skin is the human body's largest organ, working as a protection barrier, impeding the entrance of noxious organisms, besides protecting against solar radiation.
- On the epidermis there is a rich matrix of lipids, thus: ceramides, cholesterol and free fatty acids
- The lipids act as "cement" between the corneocytes and keratinocytes and present the following functions:
- They contribute to the maintenance of the skin's structural integrity
- They are essential to the formation of the skin barrier
- They provide protection against environmental factors
- They contribute to the conservation of the dermal microbiome
- They avoid transepidermal water loss (TEWL)



Corneocytes: "Bricks" **Epidermal Lipids: "Cement"**

Brick & Mortar pattern of the stratum corneum (skin barrier)
Source: Michaels AS et al.

Kendall, Alexandra C., *et al.* "Lipid functions in skin: Differential effects of n-3 polyunsaturated fatty acids on cutaneous ceramides, in a human skin organ culture model." *Biochimica et Biophysica Acta (BBA)-Biomembranes* 1859.9 (2017): 1679-1689.

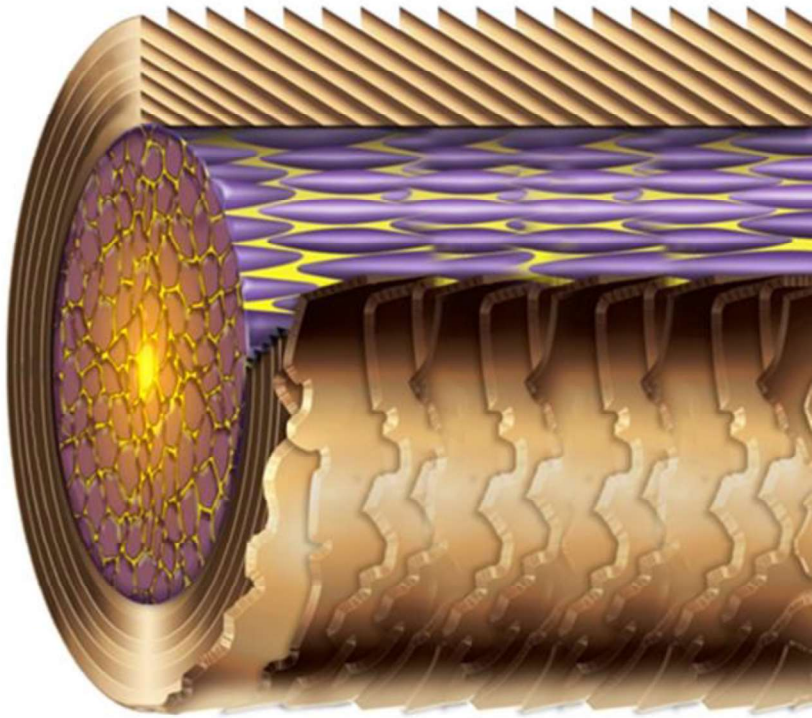


Lipid profile of the hair fiber

- The lipids are produced by the sebaceous glands and correspond to about 1 to 9% of the hair mass
- Constituted by sebaceous fat with 16 to 18 carbon chains, ceramides and cholesterol
- They are distributed along the strand of hair

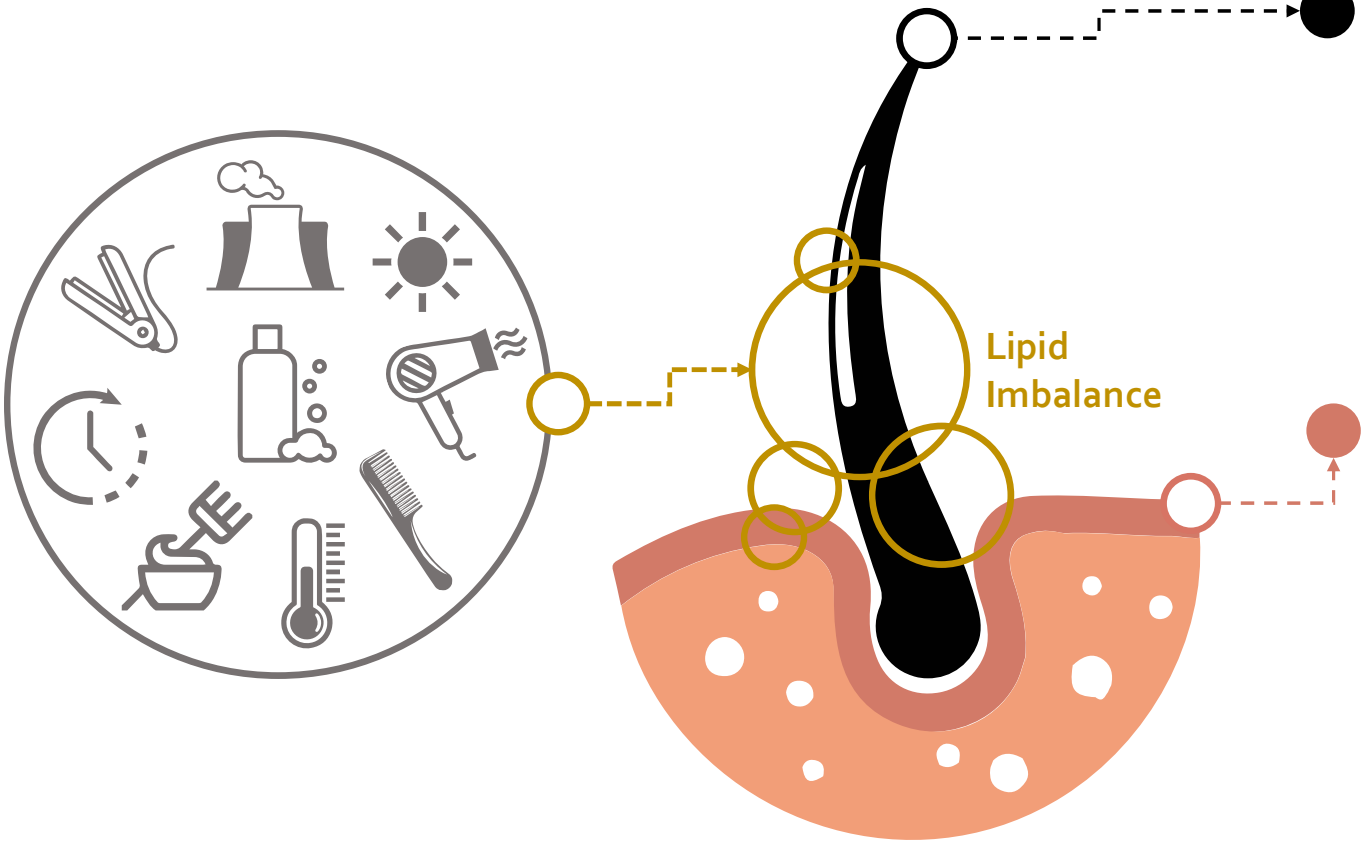
They are essential to:

- Keep the structural integrity of the hair
- Maintain the hair hydration
- Keep the hair soft
- Preserve the shine
- Maintain the hair emollient
- Protect the hair against external damages and water loss



*Lee, Won-Soo. "Integral hair lipid in human hair follicle." *Journal of dermatological science* 64.3 (2011): 153-158.

Lipid Imbalance



HAIR

- Poor Lipid Matrix
- Dryness
- Weakening of the hair strands
- Irregular hair cuticles
- Roughness

SCALP

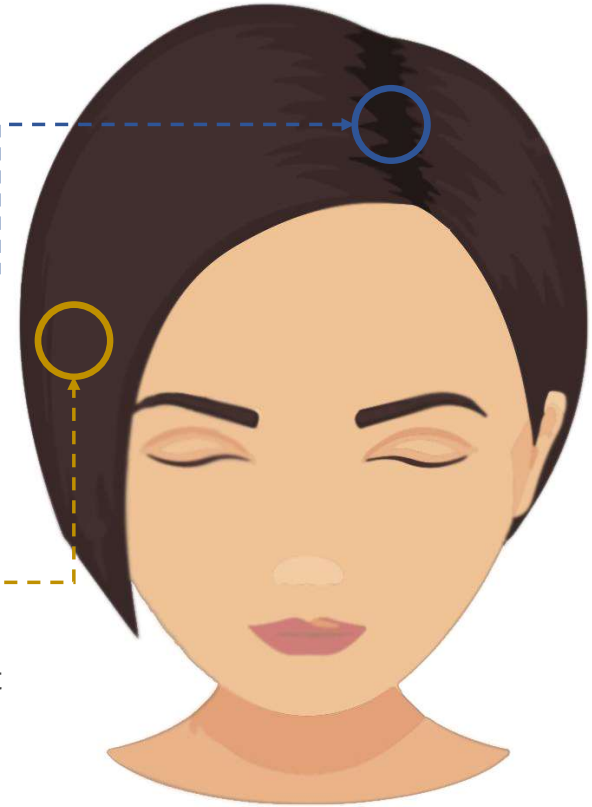
- Damaged barrier function
- Increase of TEWL
- Dryness
- Scalp flaking
- Greater susceptibility to inflammations and diseases such as psoriasis and dermatitis

Market: Scalp and Strengthening of the strands are promising appeals

54% of the interviewed, according to the Mintel research, reported that they have already suffered trouble on the hair or scalp.

Besides the concern with the greasiness, the consumers also expressed interest in strengthening the hair and such benefit could also be announced in products of scalp care.

62% of the interviewed also mentioned this positioning as being important for their choice of product for the hair care.



Skinspiration to diversify the care with the hair.

The trend of scalp care is more and more spread among Skin Care and Hair Care, having more brands emphasizing that the scalp is an extension of the face skin.

Mintel, Cuidados com o cabelo Brasil, 2022
Mintel, Um ano de inovação em cuidados capilares, estilo e coloração, 2022

Market Showcase



Kérastase Spécifique Kit leaves the scalp invigorated and with a refreshing sensation, deeply treats and controls sebum production. It also nourishes the sensitized areas of the hair and dry tips.



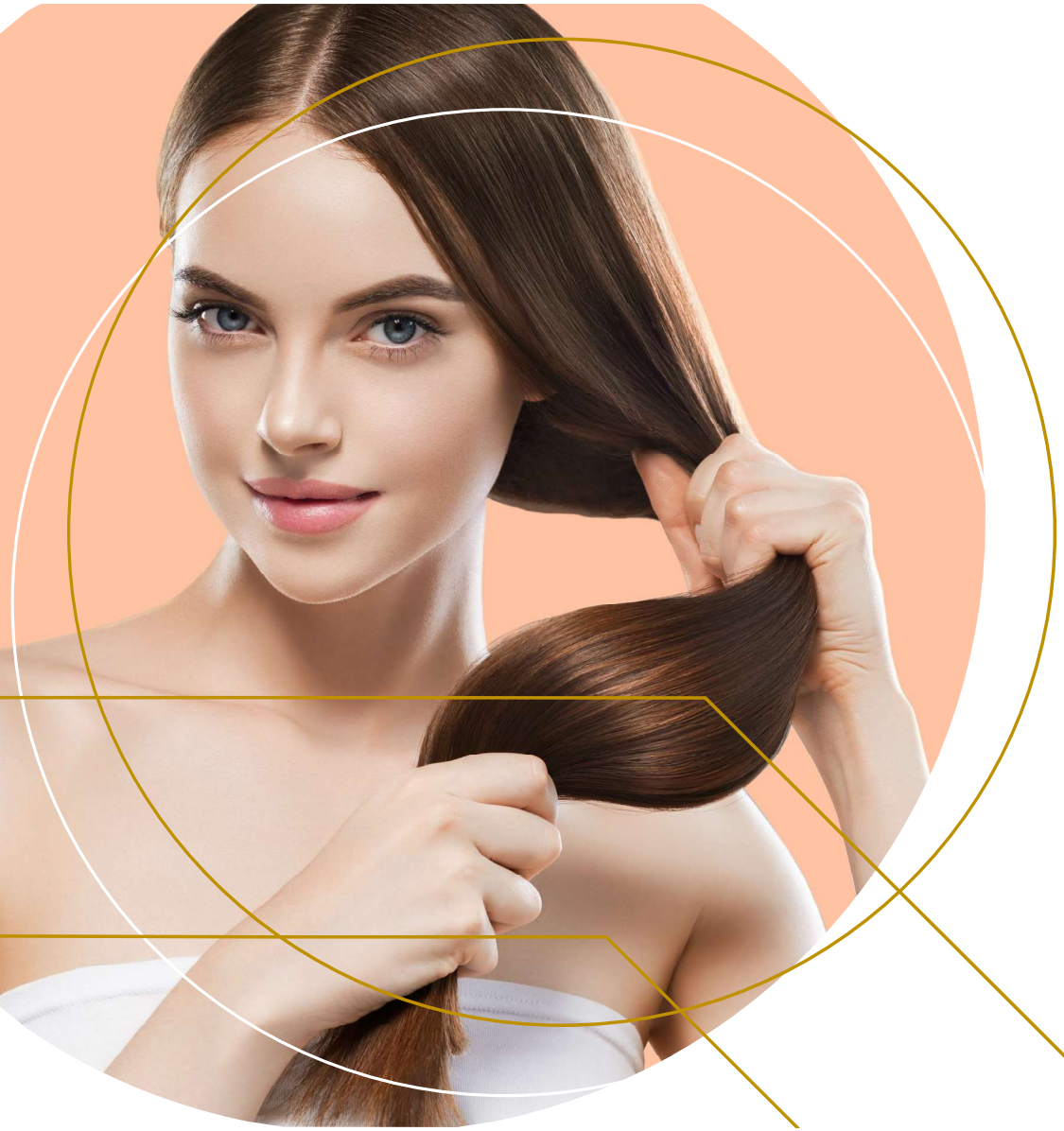
New line driven by the growing *skinification* of hair care, Neutrogena Healthy Scalp promises a new scalp for your best hair.



Deep cleansing shampoo with soothing and moisturizing properties that nourish the wires deeply and rebalance the scalp

Balancing shampoo for the scalp and hair strands, for the protection and reinforcement of the hydrolipidic mantle, strengthening the scalp and maintaining the hydration of the hair strands.





HAIRCARE
SCALPCARE

Epinutrix

Biomimetic Lipid repair from the scalp to the hair tip!

AQiA
QUÍMICA INOVATIVA



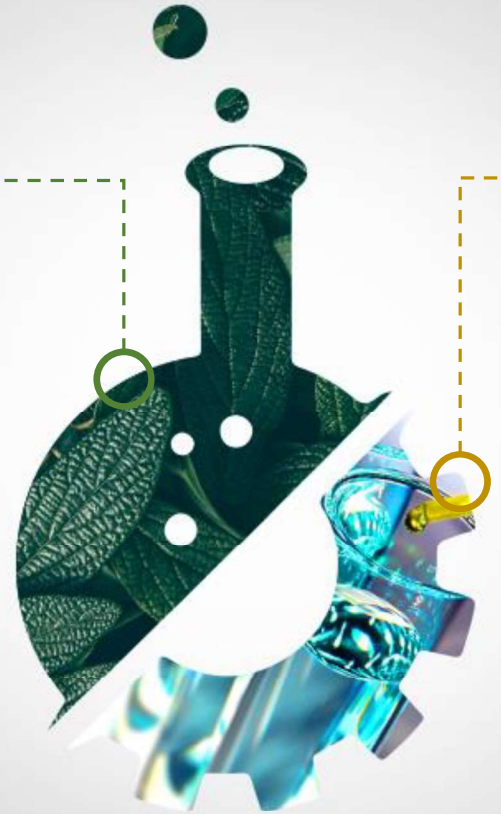
Origin and Composition

Origin and composition

Fatty Acids From Plant Origin

Oleic acid (Omega-9) + Behenic Acid

Supply ideal characteristics for the lipid biomimetism and to keep the synthesis process clean



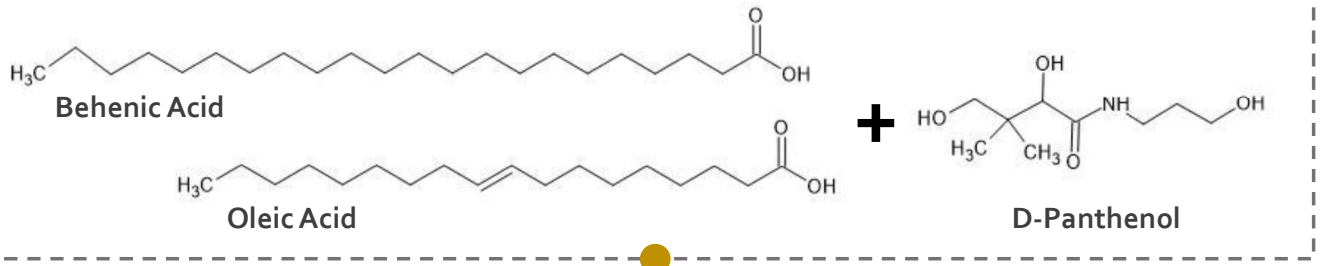
D-Panthenol

Contains affinity and several benefits for the skin and hair

For the synthesis, it supplies the “base” of active's structure and it facilitates the reaction with fatty acids.

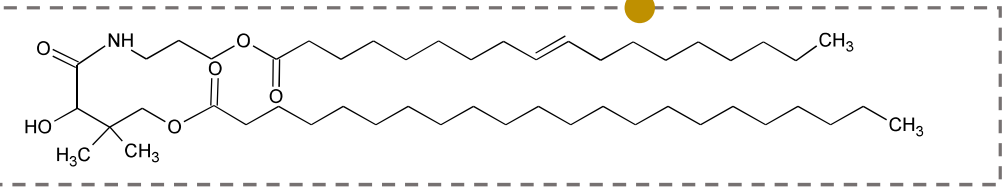
*Cardoso e cols., 2011); **Shahriyar e cols., 2021; Gaur e cols., 2016)

Obtention Process by Enzymatic Catalysis



Synthesis by Enzymatic Catalysis

- ✓ Enzyme recovered at the end of synthesis, allowing the reuse
- ✓ Water as the only byproduct



EPINUTRIX
Patented Biomimetic Lipidic compound

PROCESSO ECO FRIENDLY

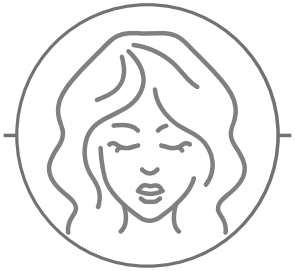
- ✓ Clean process
- ✓ Mild conditions of processing
- ✓ Enzymes catalyze the process
- ✓ No solvent use

TECNOLOGIA PATENTEADA EXCLUSIVA

BR 10 2022 017344 3

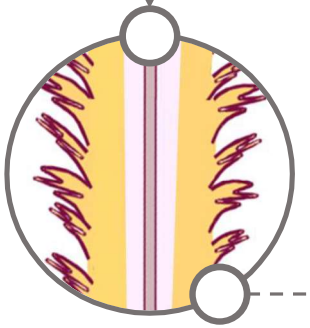
AQIA QUÍMICA INOVATIVA

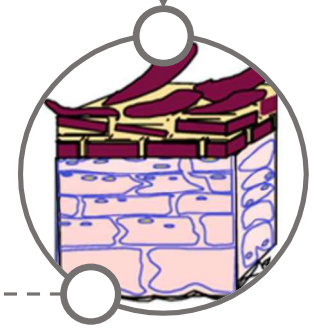
Mode of Action



Daily, chemical and environmental aggressions

Damaged hair in the lipid matrix, irregular cuticules, dehydration



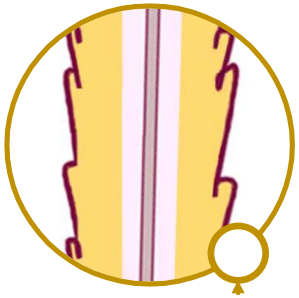


Scalp and skin with altered lipid characteristic: barrier function harmed, dryness, flaking, increase of TEWL



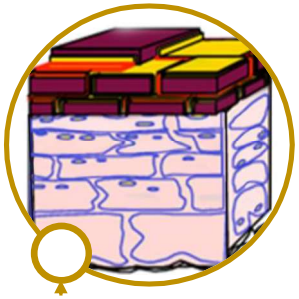
Lipid Imbalance

Healthy hair, soft, aligned cuticules, replenished lipid matrix



EPINUTRIX

Biomimetic lipid repair



Scalp and skin presenting unharmed lipid characteristic, protection, hydration and comfort

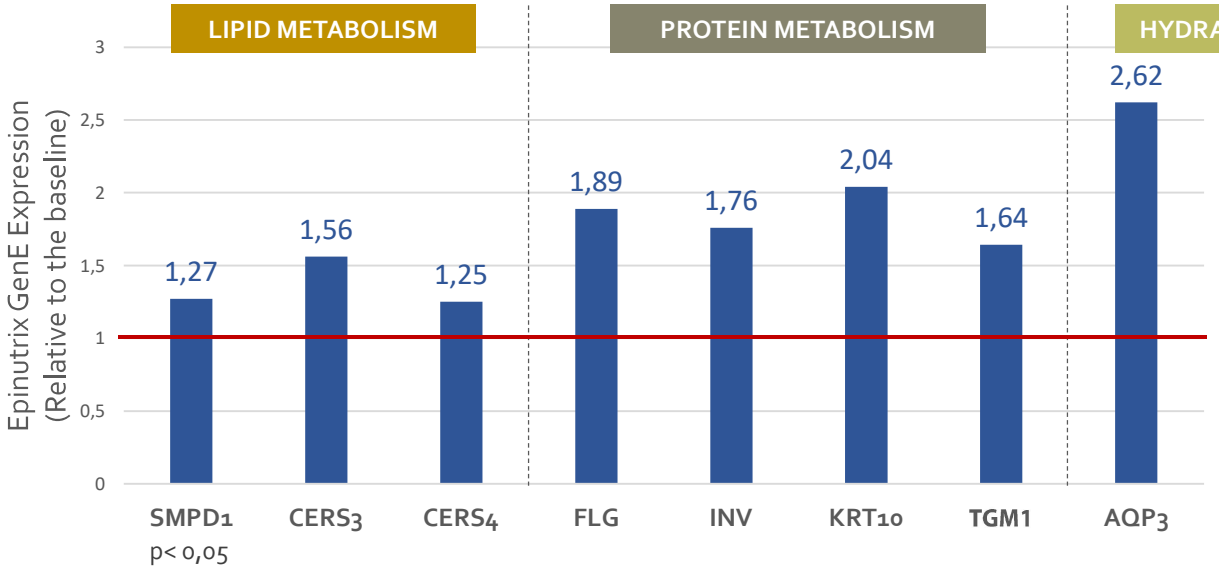


Scalp Tests

AQiA
QUÍMICA INOVATIVA

Barrier Function – Unharmed | Gene Expression Tests

Reconstructed human skin was used (SkinEthic, Episkin; L'Oreal, Brazil) treated exclusively with mineral oil (control – red line N.1) vs mineral oil + Epinutrix at 0.1% for 48 hours. The samples were evaluated by RT-PCR.



SMPD1	- Sphingomyelin phosphodiesterase 1
CERS3	- Ceramide Synthase -3
CERS4	- Ceramide Synthase -4
FLG	- Filaggrin
INV	- Involucrine
KRT10	- Keratin 10
TGM1	- Transglutaminase-1
AQP3	- Aquaporin-3
ACER 2	- Alkaline Ceramidase 2

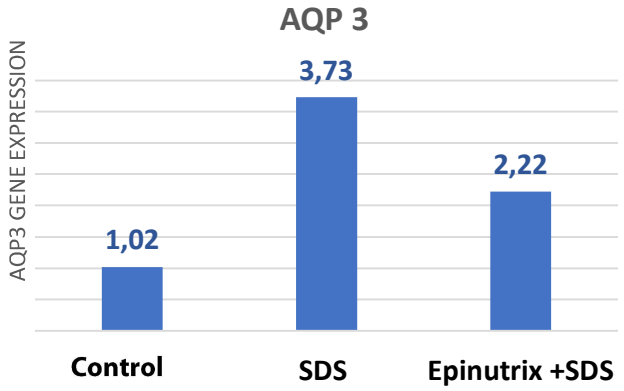
Epinutrix induces the gene expression related to the protein and lipid metabolism and the skin hydration

Barrier Function – Damaged – Gene Expression Tests

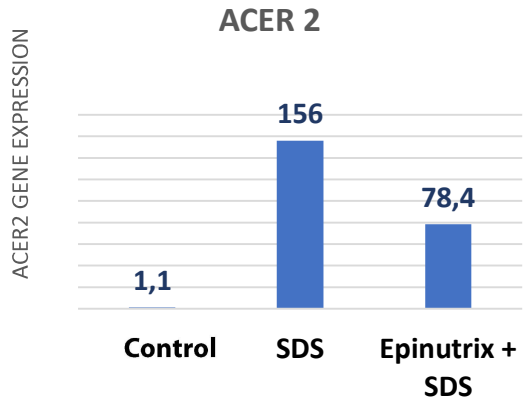
Reconstructed human skin was used (SkinEthic, Episkin; L'Oreal, Brazil) damaged with 1% of SDS (Sodium dodecyl sulfate) for 30 minutes and treated with mineral oil (Control) vs mineral oil + Epinutrix at 0.1% for 48 hours. The samples were evaluated by PT-PCR.

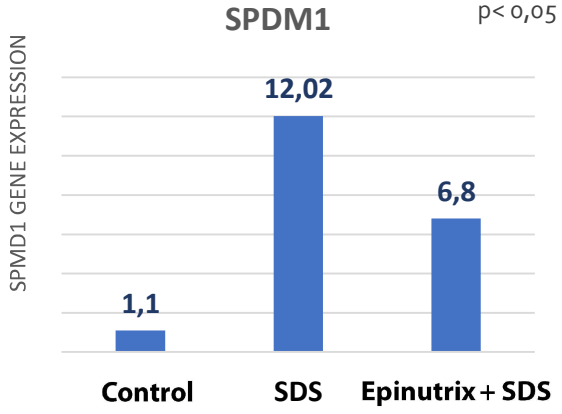
*SDS is a surfactant that interferes skin lipid metabolism removing lipids from the stratum corneum

HYDRATION



LIPID METABOLISM





The SDS exacerbates the gene expression, over-stimulating the metabolism for the replenishment of lipid content, for the hydration and formation of stratum corneum. Epinutrix decreases this exacerbated response, demonstrating protection to the harm and skin recovery



Gene Expression | Results

PROTEIN METABOLISM/HYDRATION

FLG – FILAGGRIN INV – INVOLUCRINE KRT10 - KERATIN 10	TGM1 - TRANSGLUTAMINASE -1	AQP3 - AQUAPORIN- 3
Keratinocyte differentiation, keratinization and NMF formation	Formation of the stratum corneum	Hydration e water retention

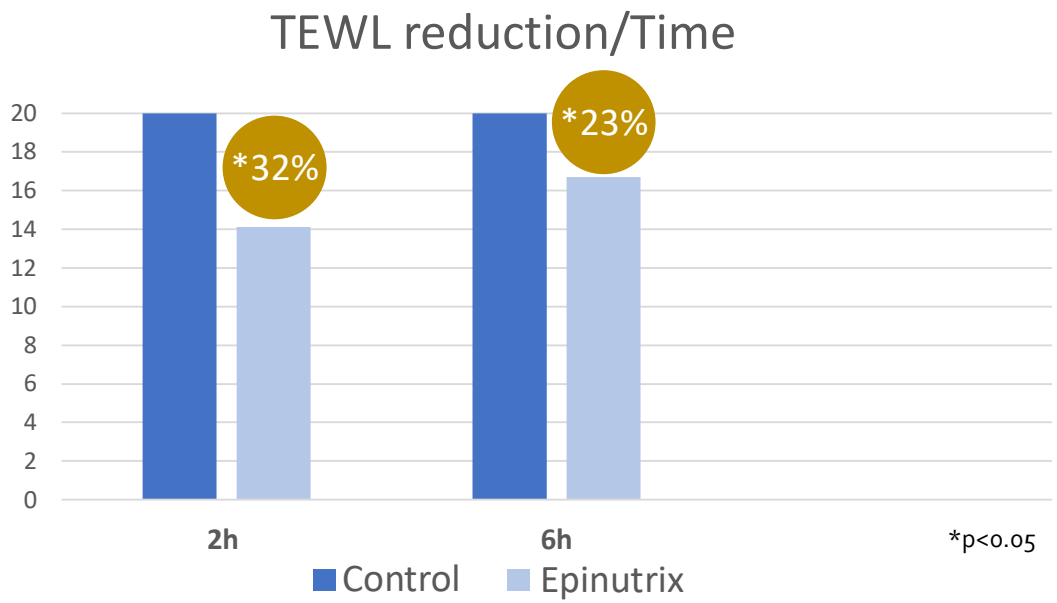
LIPID METABOLISM

CER3 e CER4 - CERAMIDE SYNTHASE 3 E 4 SMPD1 - SPHINGOMYELINE PHOSPHODIESTERASE 1	ACER 2 – ALKALIN CERAMIDASE 2
Formation of neoceramides and the lipid mantle	Cell injury marker and repair via sphingosines



Instrumental evaluation of the efficacy of the skin protection barrier (TEWL)

20 volunteers were selected from both genders, raging from 19 to 48 years old. Two measures of TEWL were conducted after 2 and 6 hours (T2h and T6h) treated with control cream vs treated with Epinutrix 1%. The analysis was conducted by Tewameter probe.



Epinutrix is efficient in the skin barrier protection, it reduces the TEWL in up to 6 hours



Efficacy Study by Cosmetic Assessment

Methodology:

An initial medical evaluation was conducted for the inclusion of participants. 30 volunteers were selected (ranging from 18 to 65 years old), who presented dry scalp, itching, discomfort and sensibility due to daily agressions provoked by surfactants.

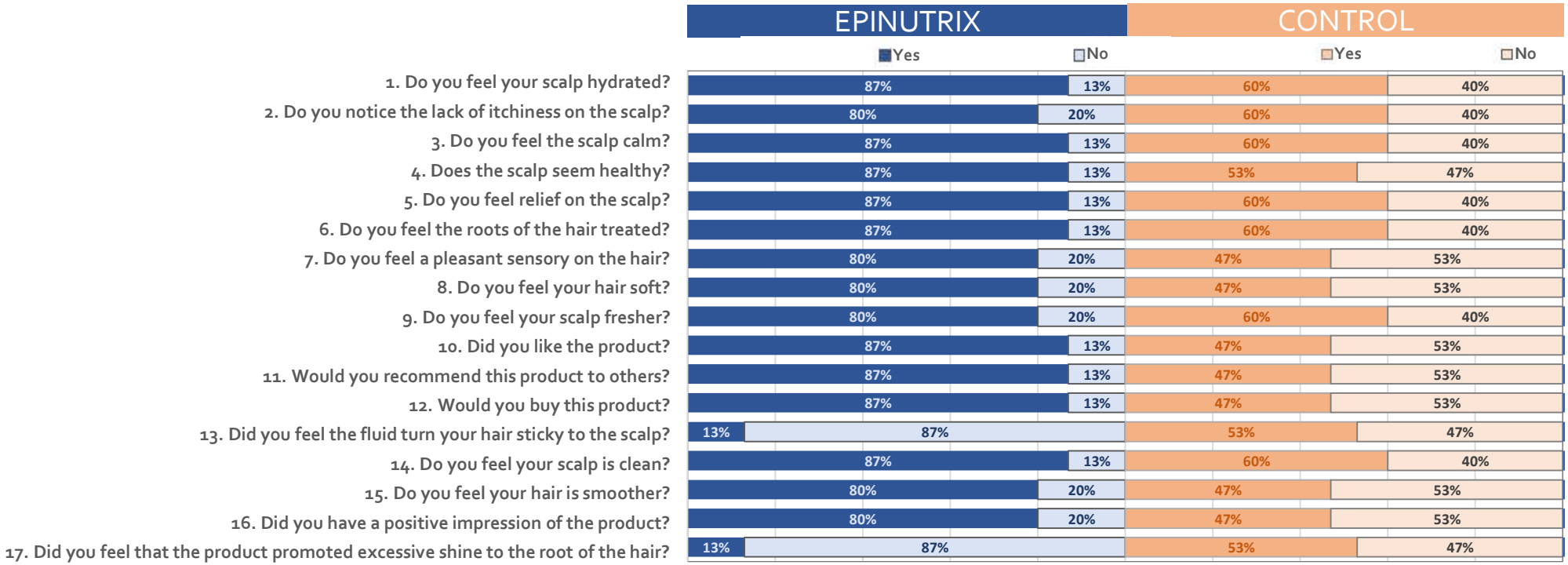
Half of the participants made use of a lotion without Epinutrix and the other half with Epinutrix at 1%. After the application a final medical evaluation was also conducted.

The participants were instructed to answer an evaluation questionnaire after 1 and 5 hours.





Epinutrix vs placebo after 1 hour – Volunteers' Evaluation



Epinutrix showed better results in all aspects evaluated after 1 hour

DERMATOLOGICALLY TESTED

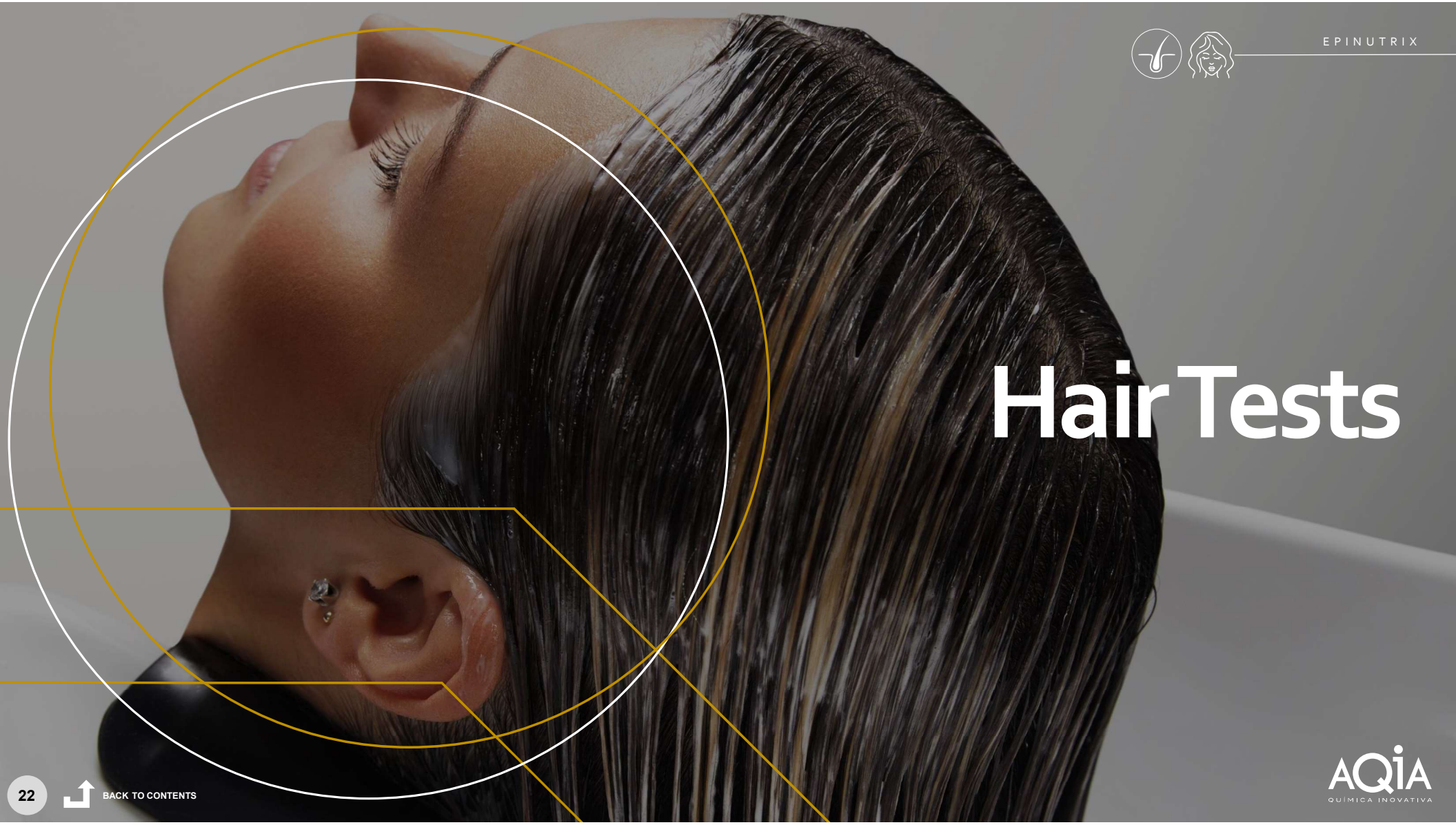


Epinutrix vs placebo after 5 hours – Volunteers' Evaluation

	EPINUTRIX		CONTROL	
	Yes	No	Yes	No
1. Do you feel your scalp hydrated?	73%	27%	47%	53%
2. Do you notice the lack of itchiness on the scalp?	73%	27%	47%	53%
3. Do you feel the scalp calm?	80%	20%	47%	53%
4. Does the scalp seem healthy?	80%	20%	40%	60%
5. Do you feel relief on the scalp?	80%	20%	47%	53%
6. Do you feel the roots of the hair treated?	80%	20%	47%	53%
7. Do you feel a pleasant sensory on the hair?	73%	27%	40%	60%
8. Do you feel your hair soft?	73%	27%	40%	60%
9. Do you feel your scalp fresher?	80%	20%	47%	53%
10. Did you like the product?	80%	20%	40%	60%
11. Would you recommend this product to others?	80%	20%	40%	60%
12. Would you buy this product?	80%	20%	40%	60%
13. Do you feel your scalp is clean?	80%	20%	47%	53%
14. Did you feel the fluid turn your hair sticky to the scalp?	20%	80%	60%	40%
15. Do you feel your hair is smoother?	73%	27%	40%	60%
16. Did you have a positive impression of the product?	80%	20%	40%	60%
17. Did you feel that the product promoted excessive shine to the root of the hair?	20%	80%	60%	40%

Epinutrix showed better results in all aspects after 5 hours

DERMATOLOGICALLY TESTED



Hair Tests

Application Test: Epinutrix vs control

Pairs of different kinds of hair strands were previously cleaned. One of strands of each pair was washed with control shampoo and conditioner, while the other pairs of strands were washed with shampoo and conditioner containing 0.5% of Epinutrix. After 24 hours, the pairs were compared through images.





Epinutrix showed a superior performance in all the evaluated strands, including the bleached strands

Application Test – Epinutrix vs Reference

Pairs of different kinds of hair strands were previously cleaned. One of strands of each pair was washed with shampoo and conditioner containing 0.1% of reference active, while the other pairs of strands were washed with shampoo and conditioner containing 0.5% of Epinutrix. After 24 hours, the pairs were compared through images.



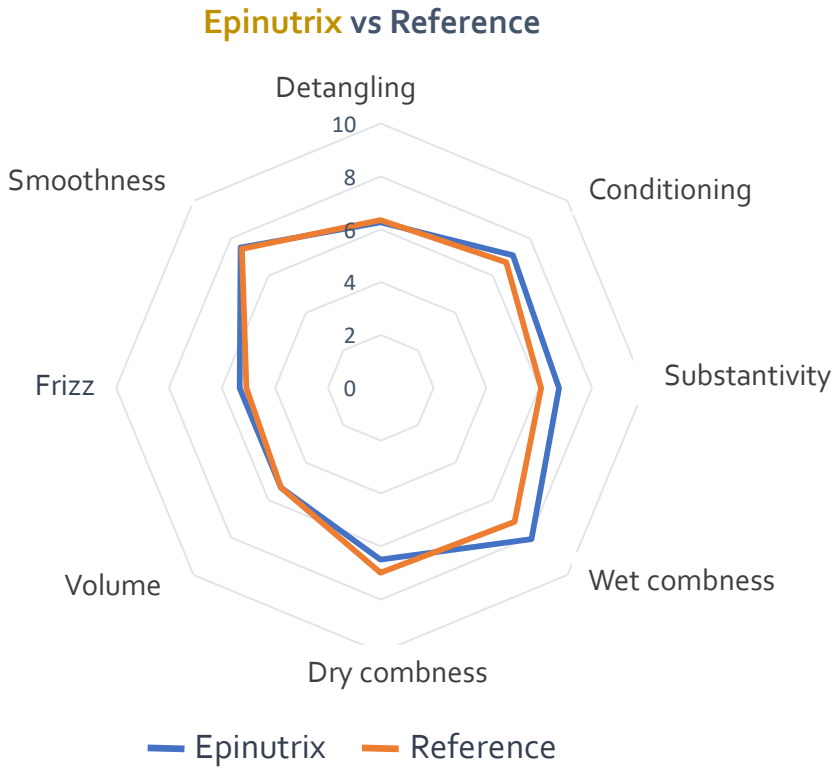
Epinutrix showed similar or superior performance compared to the reference in all evaluated strands

The cost of formulation with the reference active is more than double the cost of the formulation with Epinutrix.
*Subject to market variations



Assessment Test

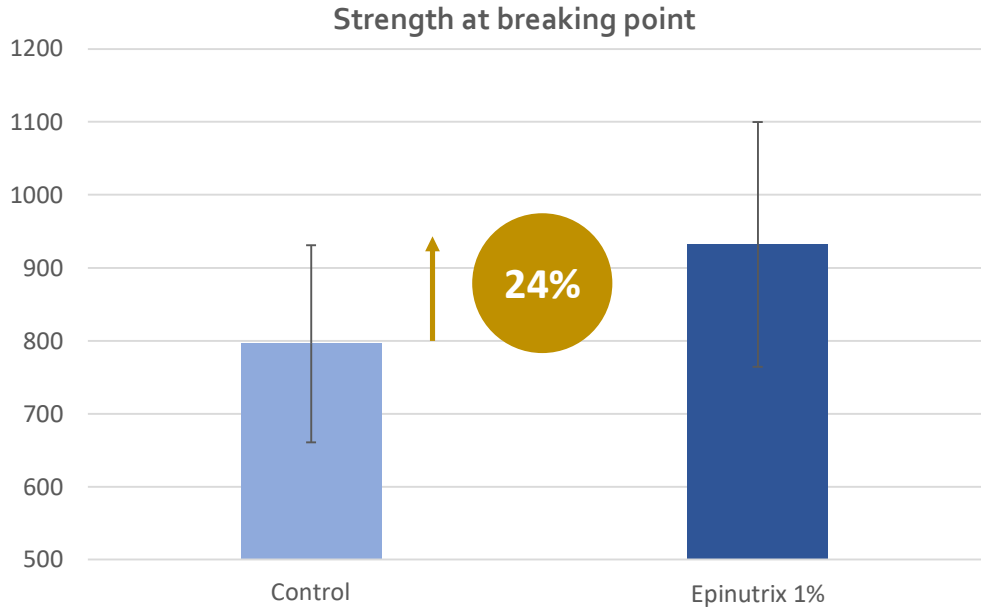
12 volunteers with wavy and curly hair were selected for the half-head tests. Half of the hair was treated with shampoo and conditioner containing 0.5% of Epinutrix and the other half with shampoo and conditioner containing 0.1% of reference product. The parameters were evaluated through a perception questionnaire.



Epinutrix showed similar performance to the market reference lipid in all aspects evaluated

Resistance Increase (Strength)

Standard strands of double bleached hair were submerged for 10 minutes in 10% sodium lauryl ether sulphate then rinsed; this procedure was repeated twice. After washing, one of the strands was treated with a control placebo shampoo and the other one was treated with a 1% Epinutrix shampoo and conditioner. The analysis was conducted through the Dia-Stron UV1000 Control Unit device.



Epinutrix showed 24% more resistance (strength) to rupture

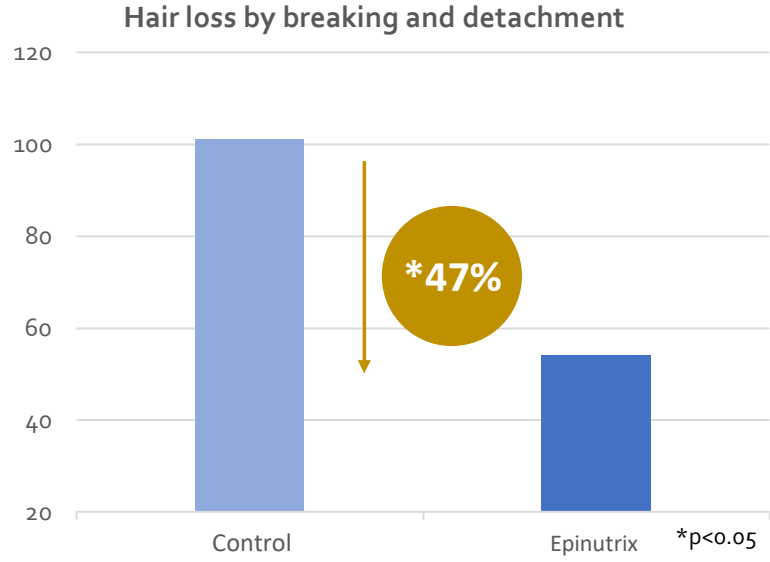
Efficacy evaluation in the reduction of loss by hair breakage conducted with thermal cycles

Strands of straight virgin hair were selected and split in two groups: control (treated with control shampoo and conditioner) vs Epinutrix (treated with 1% Epinutrix shampoo and conditioner). After the treatment, the strands were dry naturally and submitted to brushing within a thermal cycle machine. 1500 repetitions were made with an automatic brush and a hot dryer. For the comparative analysis: were considered the broken and broken loose strands after the brushing process.





Equipment of termal cycle to evaluate the hair breaking



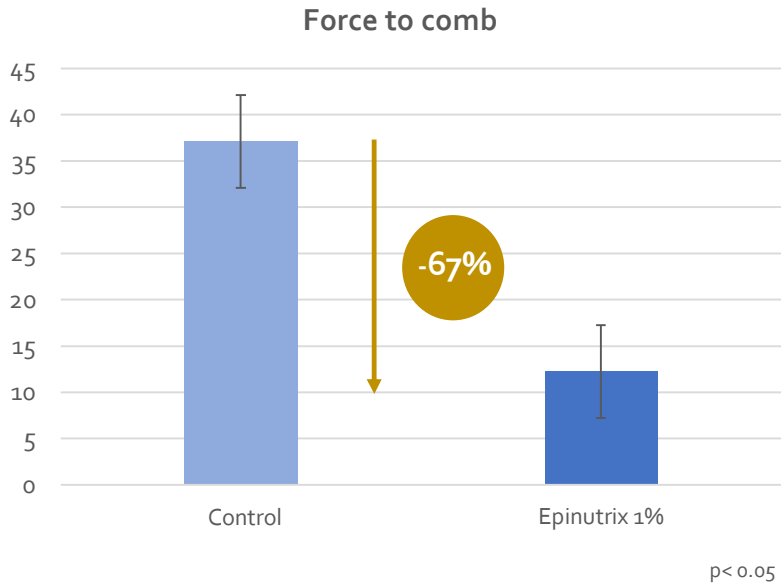
Epinutrix reduced by 47% the loss by breaking



NEW TEST

Wet combing

Patterned hair strands **doble bleached** were treated with placebo shampoo and conditioner (without Epinutrix) and with **1% Epinutrix**. Analysis was performed thought Dia-Stron UV 1000 Control Unit.

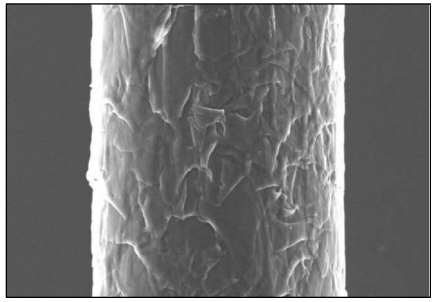


Epinutrix has a 67 % force to comb reduction

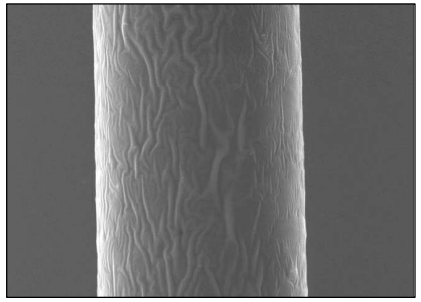
AQIA QUÍMICA INOVATIVA

Efficacy evaluation in the morphologic restoration of hair fiber – EMS

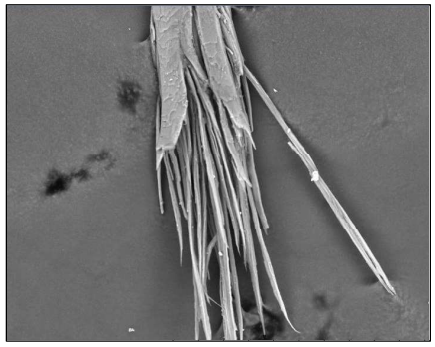
Strands from straight, bleached, caucasian hair were divided into 2 groups: treated with control (shampoo and conditioner) vs Epinutrix (shampoo and conditioner at 1%). The strands were let to dry naturally and placed in a controlled environment. The analyses were evaluated through Electronic Microscopic Scan.

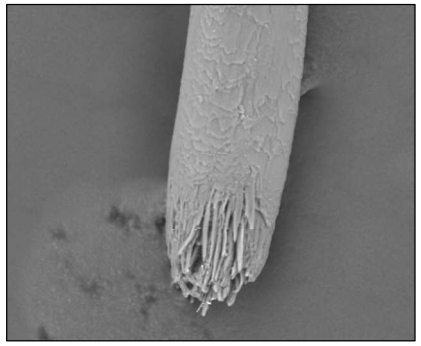


CONTROL



EPINUTRIX





Epinutrix reduced the cuticules damages, promoted the restoration of the hair surface and sealed the tips of the strands



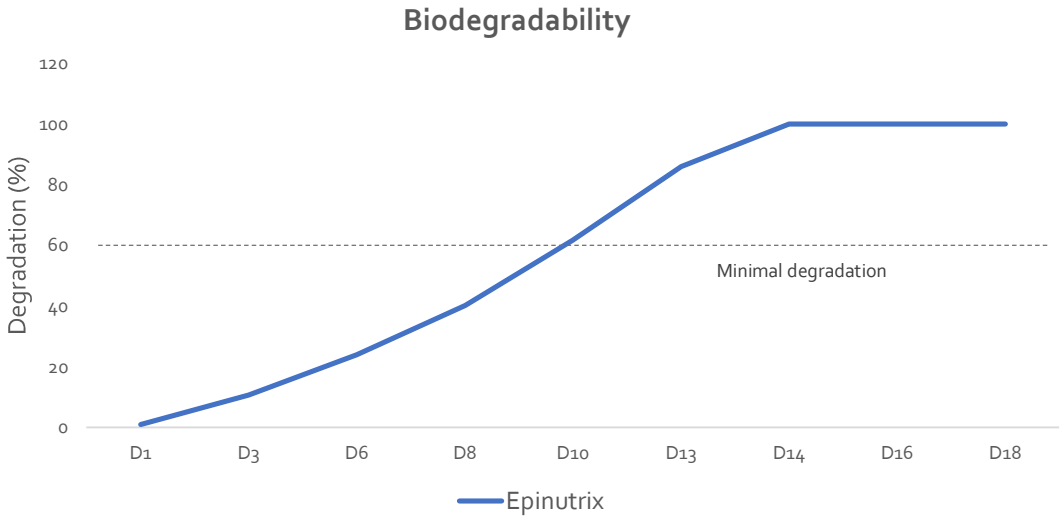
NEW TEST

Imediate Biodegradability

Test performed to evaluate Epinutrix ready biodegrability thought OECD 301 B* method, determining the percentage of CO_2 release during 28 days by microbial effect.

*Readily biodegradable substance: minimum of 60% must be reached in 10 days.





Epinutrix is biodegradable

Benefits

Maintenance of the barrier function

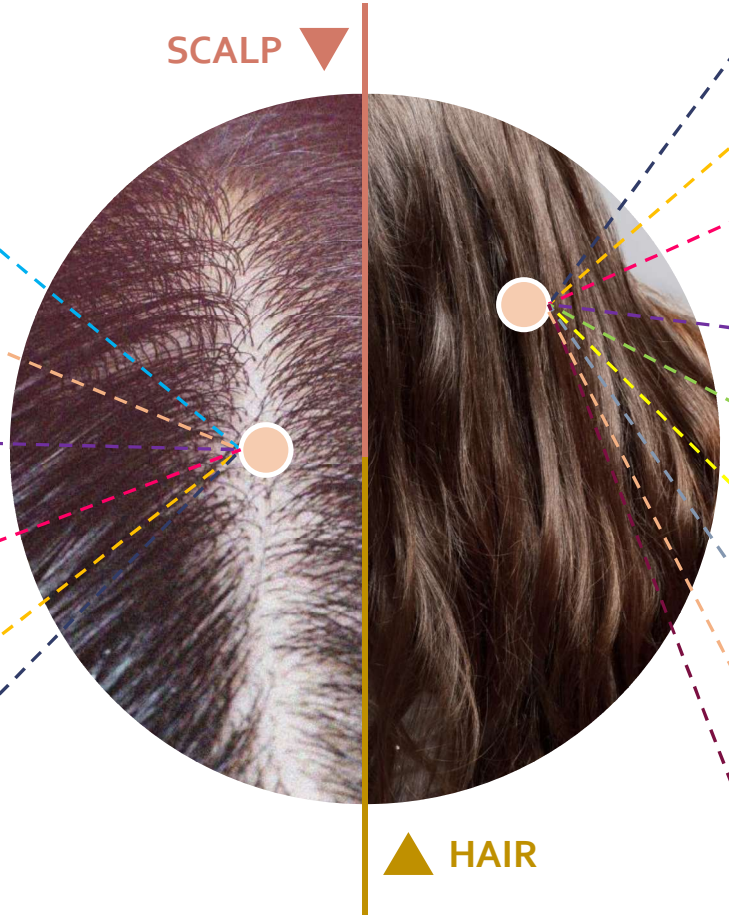
Improves hydration and reduces TEWL

Stimulates the formation of a natural lipid cover

Induces the production of neo-ceramides

Protects from damages caused by surfactant agents

Promotes the sensation of freshness, comfort and cleanliness



Reconstruction, lipid replenishment

Resistance to breakage by brushing

Strengthening of the strands

Easiness to comb, softness, conditioning and detangle

No buildup effect, light sensorial

Cuticule alignment

Tip sealing

Stable in extreme pH, 1.5-13

Similar performance to market reference with better cost x benefit



Formulation and uses

Product Identity

- *INCI*: *Panthenyl Dibehenate/Oleate*
- Appearence (25°C): pasty solid
- Stable at 1.5 to 13 pH
- NOI (ISO 16.128): 0.74
- Use level: 0.5 - 1.0 %

Applications | Hair Care

- Shampoo
- Conditioner
- Hair mask
- Leave-in
- Hair shot treatment
- Post dyeing
- Scalp care

Formulation Guide

In shampoos, heat Epinutrix up to 70 – 75°C with the surfactants and then add all or part of the water heated to 70 – 75°C.

In emulsions, heat Epinutrix to 70 – 75°C in the oil phase.



Serum Hair Bio.Resist

PJ002617-03

Phase	Item name	*INCI Name*	Quantity
A	DEMINERALIZED WATER	*Aqua*	QSP100
A	SUNQUART CAP 50	*Palmitamidopropyltrimonium Chloride*	2.0000
A	SUNQUART DHE	*Behentrimonium Chloride*	1.0000
B	POLYGREEN® COCONUT OIL	*Cocos Nucifera Oil*	1.5000
B	**EPINUTRIX**	***Panthenyl Dibehenate/Oleate***	**1.0000**
B	ALCOHOL C 1618-S	*Cetearyl Alcohol*	1.0000
C	PRESERVATIVE	See technical literature	0.4000
C	ESSENCE	*Parfum*	0.5000

Manufacturing Procedure:
In the main vessel, heat phase A to 70 - 75°C and mix.
In a side vessel, heat phase B to 70 - 75°C and mix.
While stirring, add B to A and mix for 5 minutes.
While stirring, cool to 40 - 45°C and add phase C.
Homogenize.

Specifications:
- Aspect: Fluid lotion
- Color: Slightly yellow
- pH: 4.0 – 5.0

Observations:
Essence Scentec: Essence Coconut 2 - SCE 668443

Key words / Claims

- Biomimetic lipid repair
- From the scalp to the tips
- Following the *Skinspiration* trend
- Scalp care
- Patented active
- Natural byproduct
- Reconstructed and solid hair scalp
- Health of the hair strands
- Balanced lipid profile
- More resistant and stronger strands
- Protection of the barrier function
- Comfort
- Hydration
- Excellent sensorial properties: smoothness, combability and detangling



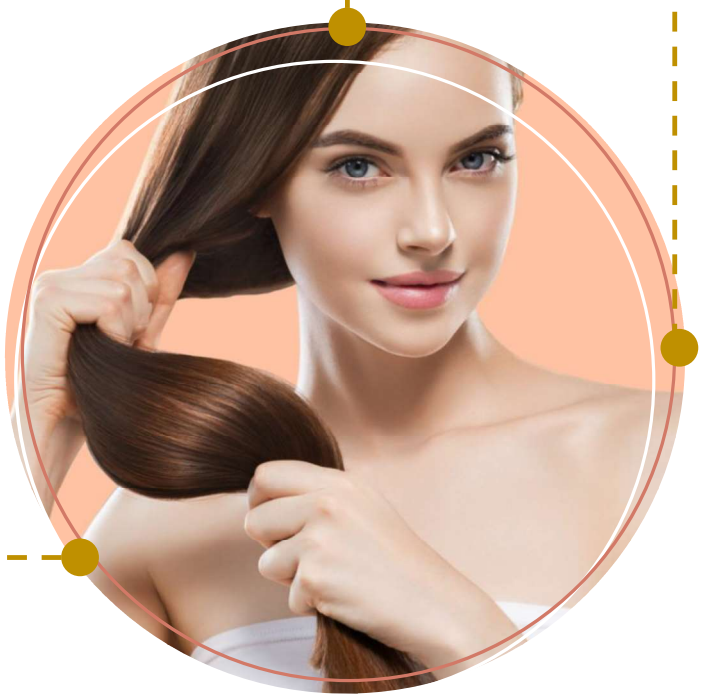
Epinutrix

Properties:

- Expression of genes related to lipid, protein metabolism and of the skin hydration
- Protection against harm and skin recovery
- Improved wet combability, frizz and conditioning
- Increases resistance to breakage
- Sealing of split ends

Composition:

Biomimetic lipid compound obtained from vegetable origin fatty acids and D-Pantenol through synthesis via enzymatic catalysis, Eco-friendly process.



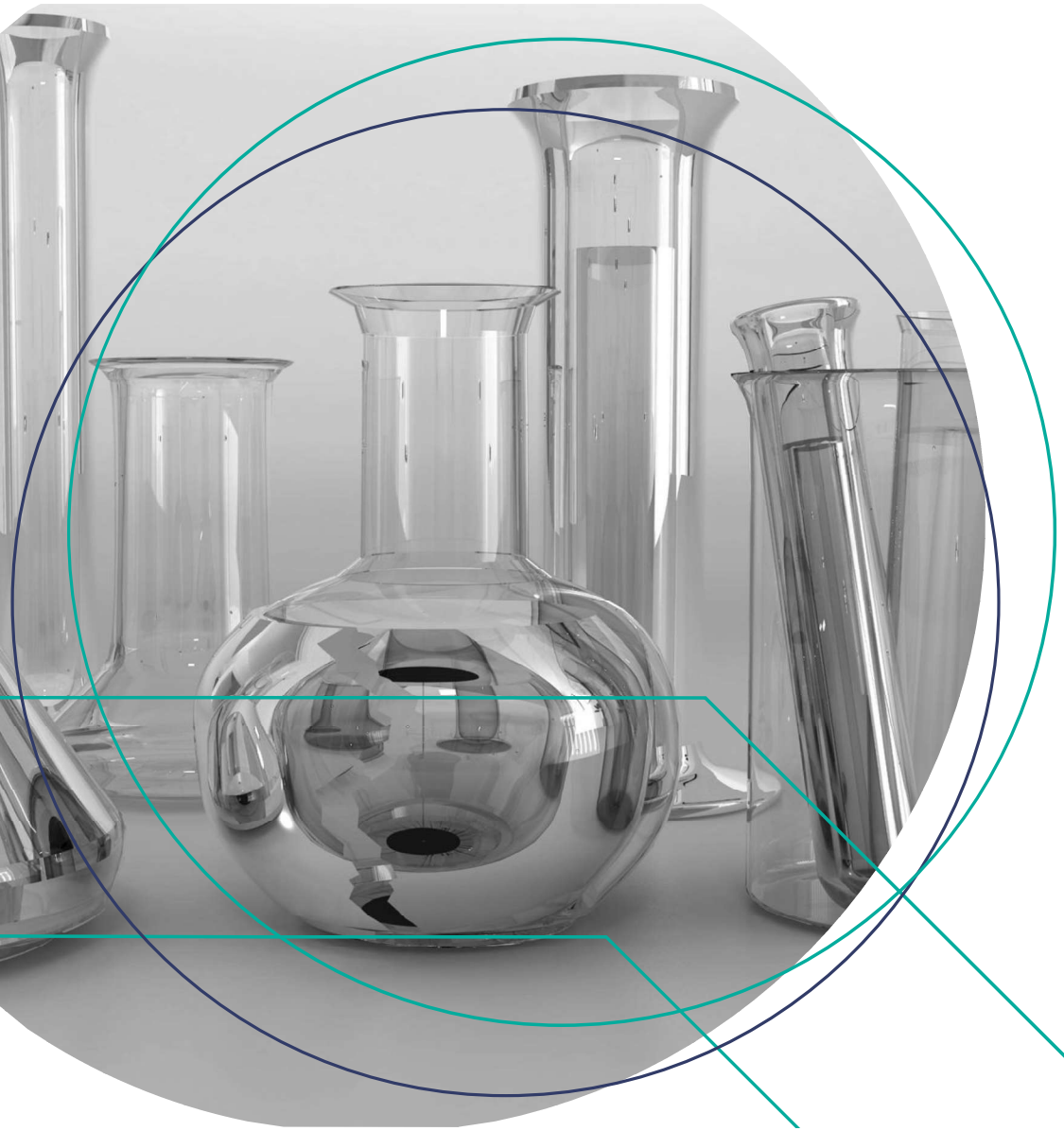
Benefits:

HAIR

- Reconstruction, lipid replenishment
- Strengthening
- Improved sensorial features: combability, softness, conditioning and detangling
- Light sensorial, without build-up effect
- Sealing of split ends
- Resistance to breakage by combing
- Alignment of cuticules

SCALP

- Maintenance of the barrier function
- Favors hydration
- Stimulus to the natural formation of the lipid cover
- Induction of neoceramides production
- Protection against the harms caused by surfactant agents



AQiA
QUÍMICA INOVATIVA

ACESS OUR SOCIAL MEDIA!

WWW.AQIA.NET

Empresa B Certificada