



greenredients™

manufactured by SOCRI

AZELACTIVE®

PATENTED PH-RESISTANT,
WATER-SOLUBLE
AZELAIC ACID POLYMER
FOR SKINCARE AND
HAIRCARE

AZELACTIVE®

greengredients™



INCI NAME

POLYGLYCERYL-6 AZELATE

CHINA COMPLIANT PRODUCT NAME: AZELACTIVE - C

TECHNICAL DATA

Appearance at 20°C	Liquid
Colour	Light yellow
Odour	Characteristic
Dry residue (105°C)	97 - 99 %
pH at 25°C 5% in water	2.5 - 4.5
Acid number	17.5 ÷ 20.5 mgKOH/g
Saponification number	145 ÷ 165 mgKOH/g
Heavy Metals	Max. 10 ppm
Total Bacteria	Max. 100 CFU/g
Total Molds	Max. 100 CFU/g



SUGGESTED % OF USE: 2 - 25% (up to 50%)

AZELACTIVE® is a patented functional ingredient obtained through esterification of azelaic acid (40% w/w) with polyglyceryl-6, ensuring full water solubility, high stability, and superior skin compatibility.

Its **low acid number** compared to pure azelaic acid (20 vs 600 mgKOH/g), minimizes irritation while maintaining efficacy allowing for a wider cosmetic application range.

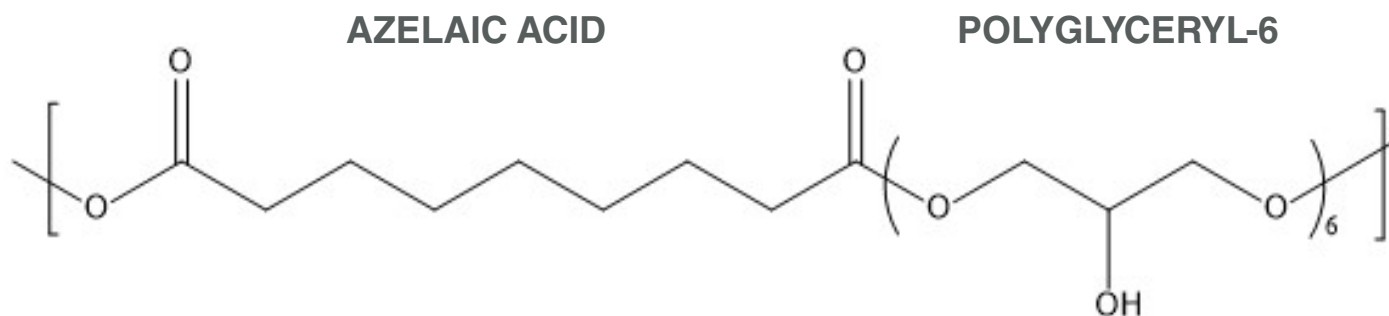
Thanks to its biomimetic and versatile nature, AZELACTIVE® is ideal for both skincare and haircare formulations, offering a multifunctional, stable, and solvent-free alternative to traditional azelaic acid solutions.

✓ **Sebum regulation:** Effectively balancing oil production for healthier skin.

✓ **Skin tone improvement:** Reducing hyperpigmentation and promoting an even complexion.

✓ **Scalp health support:** Limiting excess sebum and soothing inflammation.

✓ **Hair follicle protection:** By inhibiting 5-alpha reductase, it significantly reduces DHT (Dihydrotestosterone), helping to prevent follicle miniaturization and promote hair vitality.



Chemical structure of AZELACTIVE®

DISCOVERING AZELAIC ACID

Azelaic Acid is a dicarboxylic acid well known in the cosmetic field, primarily used to address oily skin, acne, and dark spots by inhibiting 5-alpha reductase and tyrosinase, enzymes responsible for excessive sebum production and hyperpigmentation; it also shows anti-inflammatory and exfoliating activity.

In addition, Azelaic acid manifests anti-microbial efficacy by inhibiting the synthesis of cellular protein in aerobic and anaerobic bacteria, especially in *Staphylococcus epidermidis* and *Propionibacterium acnes*.



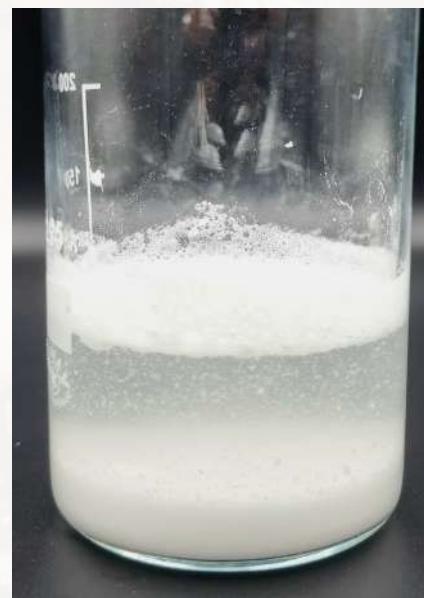
TECHNICAL ADVANTAGES: SOLUBILITY

Azelaic acid, naturally insoluble in water and oil, for its formulation traditionally required either strong solvents, unsuitable for cosmetics, or patented delivery systems like liposomes and microemulsions.

Existing salified versions are unstable over time, often leading to precipitation in formulations.

AZELACTIVE® is stable and easy to formulate in various systems, including water-based and emulsion formulations, without requiring solvents to enhance its solubility.

SOLUBILITY COMPARISON OF AZELAIC ACID IN WATER



**10% AZELAIC ACID
(RAW POWDER) IN
WATER.**

**INSOLUBLE, CLOUDY
SUSPENSION WITH
VISIBLE SEDIMENT.**



**10% AZELAIC ACID
USING 25% AZELACTIVE®
IN WATER.**

**FULLY SOLUBILIZED,
CLEAR AND STABLE
SOLUTION.**

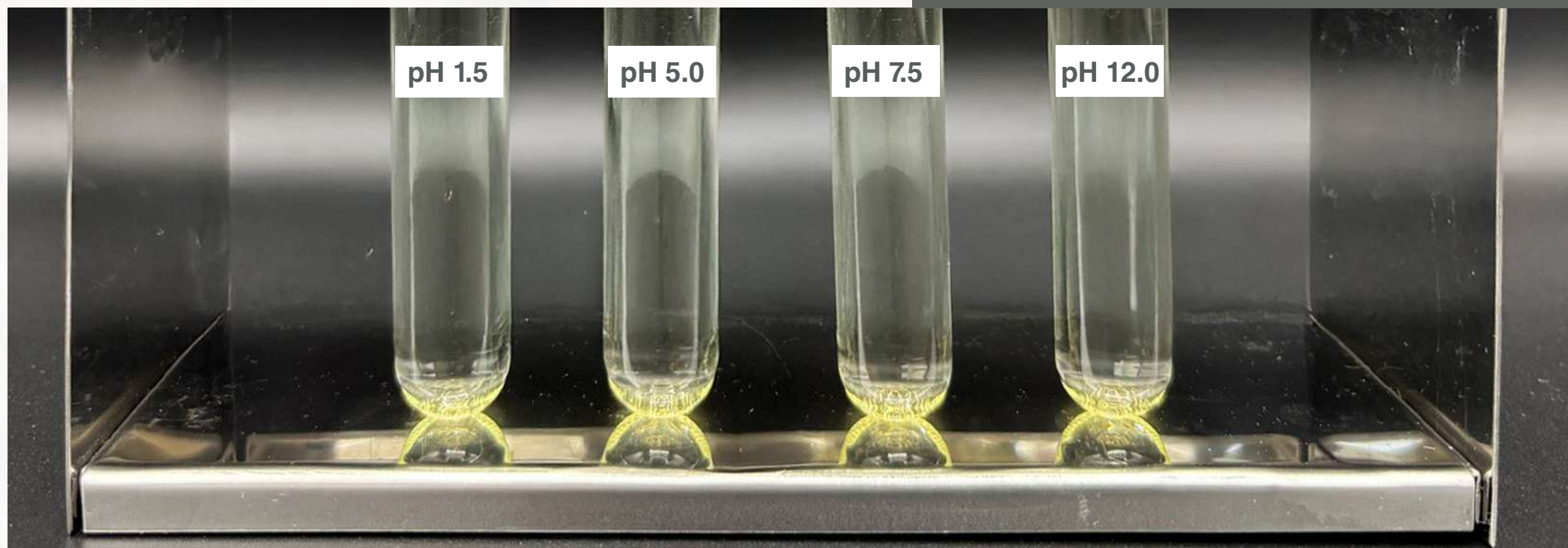
TECHNICAL ADVANTAGES: PH-RESISTANCE

The image shows a 10% Azelaic Acid solution prepared using 25% AZELACTIVE® in water across a wide range of pH.

Unlike salified forms that require strict pH control, AZELACTIVE® is pH-independent, ensuring consistent solubility and enhanced skin penetration across a wide pH range—ideal for flexible use in various cosmetic formulations.

The result is a fully solubilized, clear, and stable system, without precipitation or recrystalization.

AZELACTIVE® PH-RESISTANCE



EFFICACY TESTS IN SKINCARE

The skin faces issues like hyperpigmentation, excess sebum, rosacea, and acne, impacting its health and appearance.

Sun exposure, aging, and inflammation can trigger dark spots, while excessive sebum leads to clogged pores, breakouts, and sensitivity.

In a clinical study, a 5% AZELACTIVE® face cream was tested against a placebo, demonstrating significant efficacy in addressing these concerns. Its clinically validated benefits include evening skin tone, regulating sebum production, and soothing sensitive skin.

SKINCARE PROPERTIES

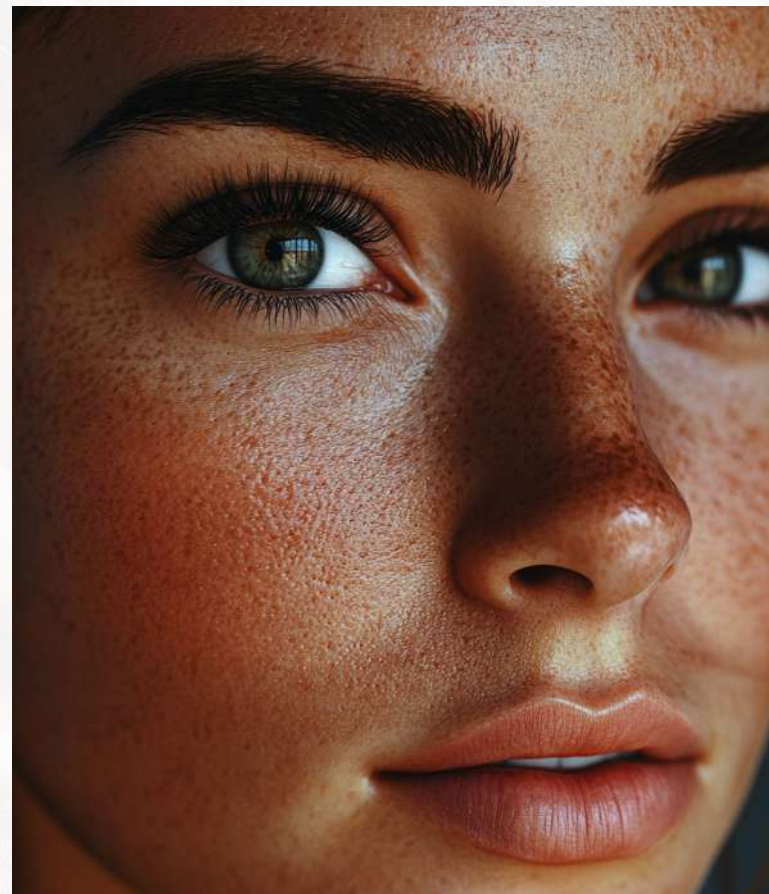
REDUCTION IN DARK SPOT INTENSITY

SEBUM REGULATION FOR OIL CONTROL

IMPROVED SKIN COMPLEXION

REDUCED ROSACEA-RELATED ERYTHEMA

REDUCED ROSACEA-RELATED DEHYDRATION



***AZELACTIVE® face cream:** Water, Caprylic/Capric Triglyceride, **AZELACTIVE® (Polyglyceryl-6 Azelate)**, Polyglyceryl-3 Cetyl Ether (and) Sesamum Indicum (Sesame) Seed Oil (and) Malic Acid, Propanediol, Bentonite, Benzyl Alcohol, Caprylyl Glycol, Xanthan Gum.

****Placebo face cream:** Water, Caprylic/Capric Triglyceride, Polyglyceryl-3 Cetyl Ether (and) Sesamum Indicum (Sesame) Seed Oil (and) Malic Acid, Propanediol, Bentonite, Benzyl Alcohol, Caprylyl Glycol, Xanthan Gum.

IMPROVED SKIN TONE EVENNESS

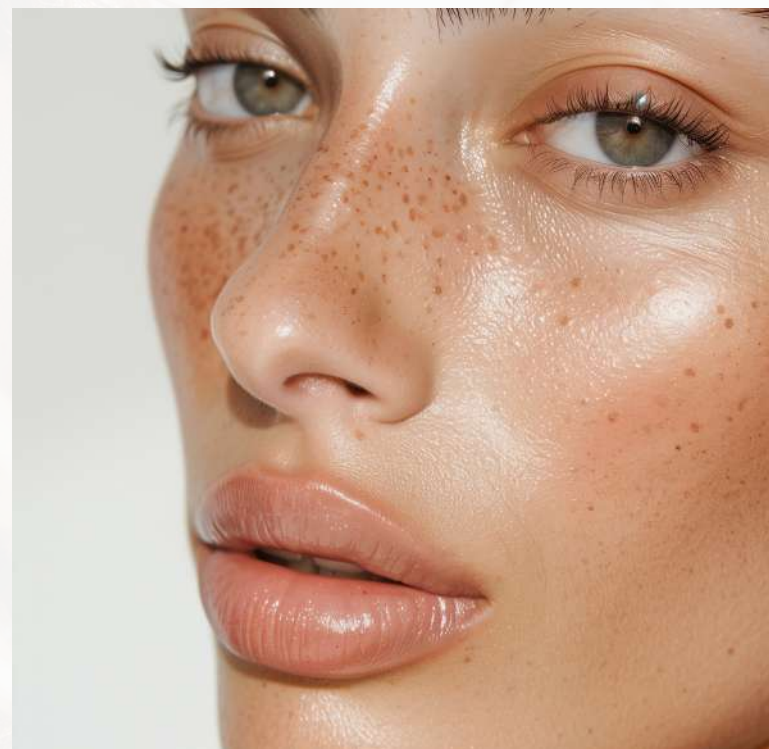
A 5% AZELACTIVE® face cream emulsion was clinically tested against a placebo on 20 healthy **volunteers** (aged 30 to 65) **with oily skin and visible signs of photo- and chrono-aging**, such as dark spots on both sides of the face.

The study employed the “half-face method” for comparative evaluation.

✓ **Dark spot pigmentation** was quantified using the Individual Typological Angle (ITA), measured with a Konica Minolta CM-700d. An increase in ITA indicates a lighter dark spot color and improved skin tone.

✓ **Skin sebum levels** were analyzed using a Courage + Khazaka Sebumeter 815, employing a photometric method.

✓ **Skin complexion evenness** was visually assessed by a board-certified dermatologist to determine the extent of improvement.

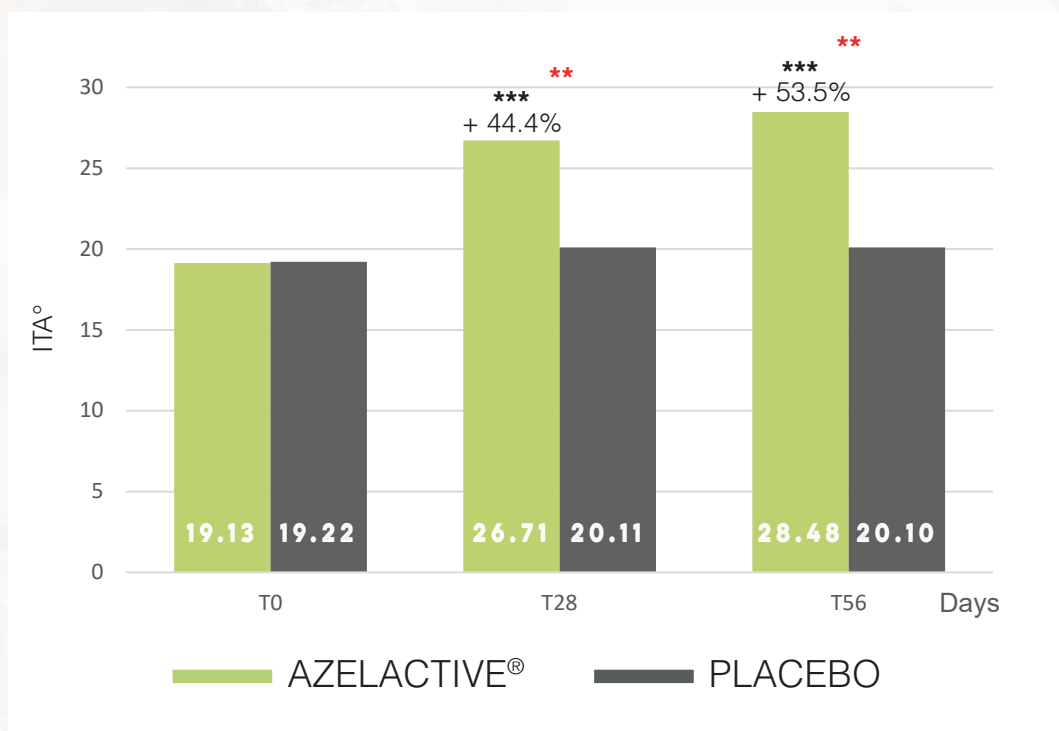


REDUCED DARK SPOT PIGMENTATION

5% AZELACTIVE® significantly increased (**p<0.001) ITA° values by 44.4% at T28 up to 53.5% at T56 compared to T0, indicating a lighter skin tone and a reduction in dark spot intensity, markedly superior to the placebo (**p<0.01), which showed only minimal variation.

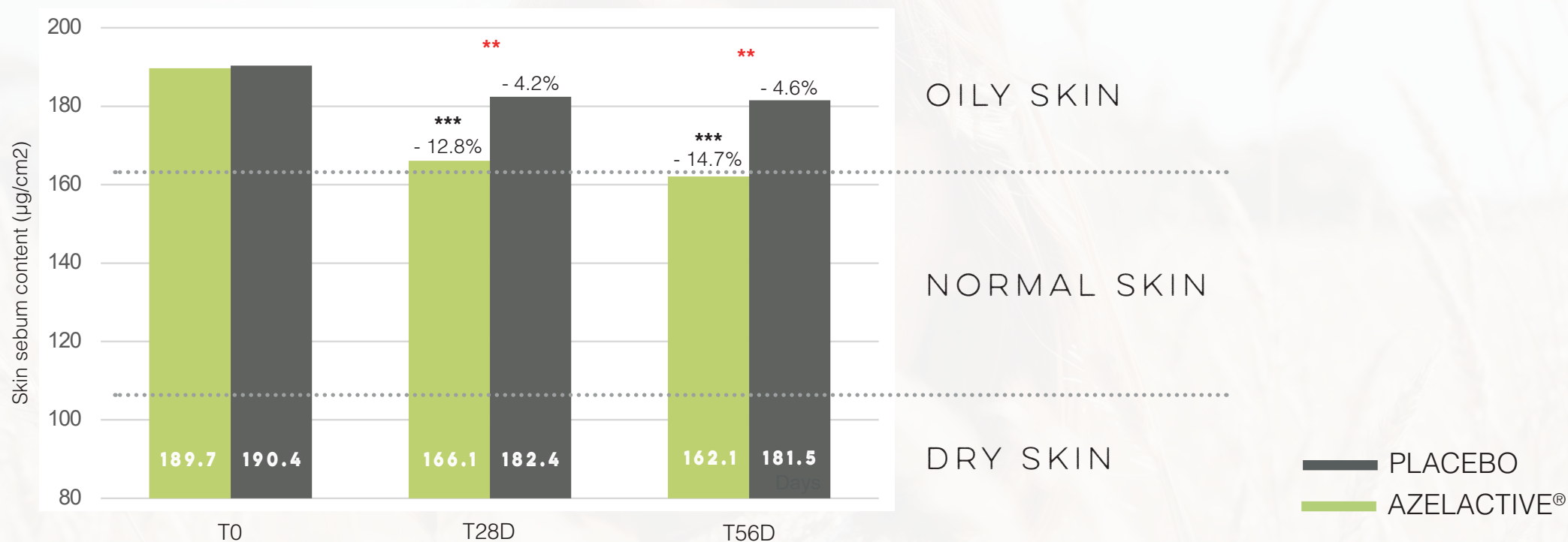
AZELACTIVE® effectively reduces dark spot pigmentation, contributing to a clinically relevant improvement in skin clarity and tone homogeneity.

These findings reinforce AZELACTIVE® role as a targeted skin-brightening ingredient, making it particularly suitable for formulations addressing hyperpigmentation and uneven complexion.



ITA° (Individual Typological Angle):
Higher values indicate a lighter skin tone and reduced dark spot intensity

NORMALIZED SEBUM CONTENT



5% AZELACTIVE® face cream significantly decreased (** $p < 0.001$) skin sebum content by -12.8% at T28 and -14.7% at T56 compared to T0, showing long-term efficacy, greatly outperforming the placebo (** $p < 0.01$), which showed only minimal variation.

By effectively normalizing sebum levels, AZELACTIVE® helps create a healthier, more balanced skin environment, particularly benefiting oily and acne-prone skin.

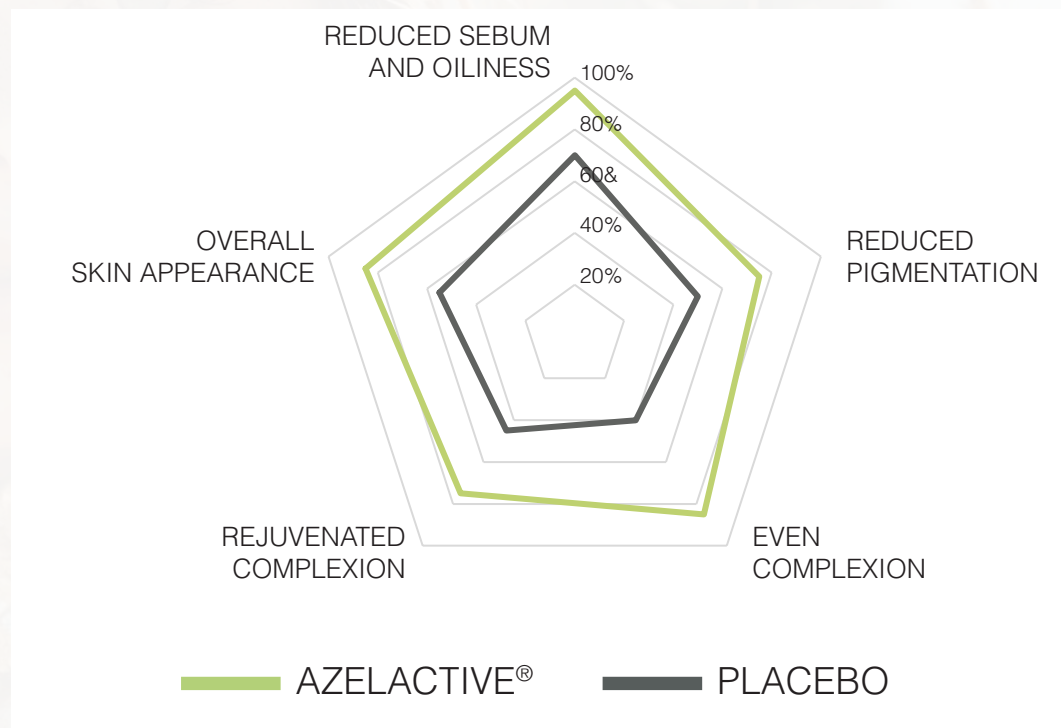
These findings position AZELACTIVE® as a powerful sebum-regulating ingredient, supporting its role in formulations aimed at improving skin texture, reducing shine, and preventing clogged pores.

IMPROVED SKIN COMPLEXION EVENNESS

After 56 days of treatment, volunteers reported that AZELACTIVE® significantly improved skin clarity, uniformity, and overall appearance by effectively regulating sebum, reducing pigmentation, and enhancing complexion.

By the end of the study, 75% of participants observed visible improvements in skin brightness and tone uniformity, further confirming AZELACTIVE® ability to refine skin texture and correct discoloration.

These findings highlight AZELACTIVE® as a multifunctional ingredient, making it particularly effective for oily, uneven, and dull skin, where excess sebum and pigmentation concerns are prevalent.



REDUCED DARK SPOT INTENSITY

T0



T56 DAYS



Comparing the images of the volunteer at T0 and T56, a visible reduction in melanin intensity can be observed. The skin appears noticeably brighter, with a smoother and more even tone.

REDUCED ROSACEA-RELATED ISSUES

5% AZELACTIVE® face cream has been tested against a Placebo on 20 healthy volunteers, aged from 30 to 68, with slight and mild erythema due to rosacea type II (couperose), a chronic skin condition characterized by redness, visible blood vessels, and sensitivity often associated with acne.

The subjects are split into 2 groups: 10 subjects received AZELACTIVE®, 10 subjects used the Placebo.

Skin moisturization (by Corneometer) and Erythema Index (by Mexameter 18) have been evaluated.

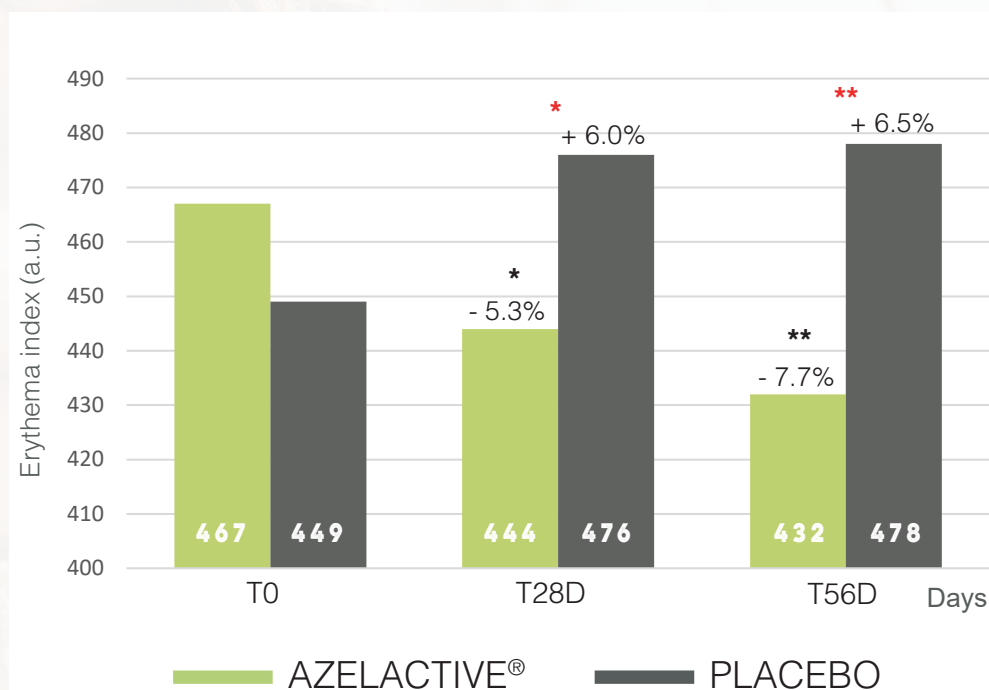


REDUCED ROSACEA-RELATED ERYTHEMA

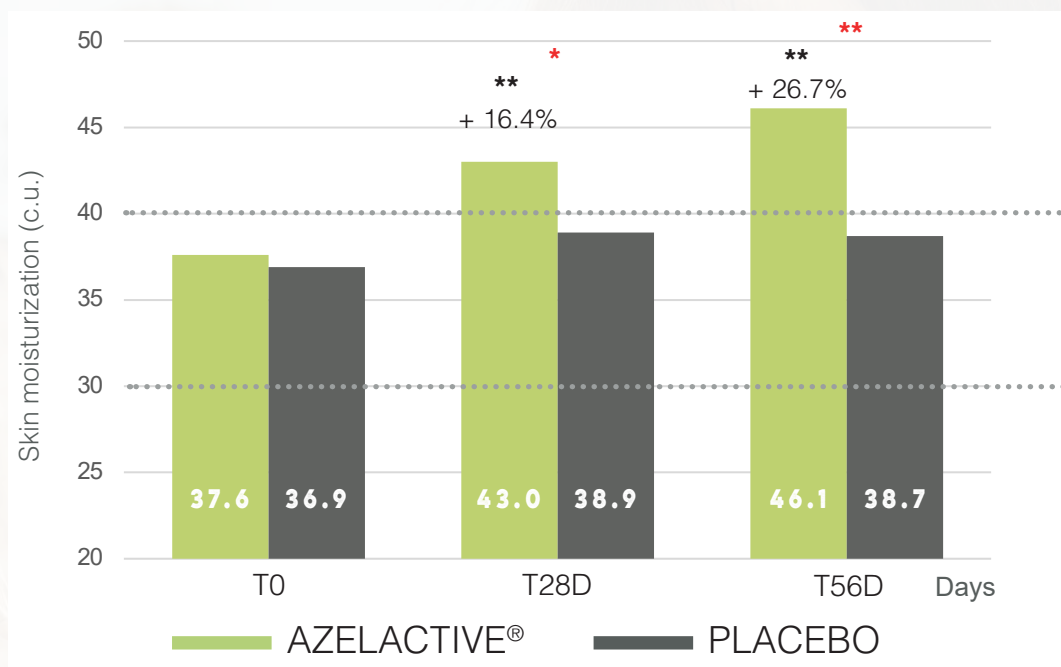
5% AZELACTIVE® face cream significantly reduced (* $p < 0.05$ and ** $p < 0.01$) the erythema (redness) index by -5.3% at T28 and -7.7% at T56 compared to T0, demonstrating a strong soothing effect and mitigating the placebo irritating effect (* $p < 0.05$ and ** $p < 0.01$).

These findings highlight AZELACTIVE® ability to actively calm skin inflammation and redness, making it particularly beneficial for reactive and rosacea-prone skin.

By reducing irritation over time, AZELACTIVE® helps improve skin comfort and resilience, reinforcing its role as a dermocosmetic solution for sensitive skin care.



REDUCED ROSACEA-RELATED DEHYDRATION



HYDRATED SKIN

DEHYDRATED SKIN

VERY DEHYDRATED SKIN

5% AZELACTIVE® face cream significantly increased (**p<0.01) skin hydration over time, with a +16.4% increase at T28 and +26.7% at T56 compared to T0, demonstrating a significantly greater performance than placebo (*p<0.05 and **p<0.01).

By reinforcing the skin barrier and preventing moisture loss, AZELACTIVE® helps counteract rosacea-related dehydration, reducing the likelihood of flare-ups, promoting long-lasting hydration and skin suppleness, and effectively restoring the skin to a well-hydrated state by shifting it from a dehydrated condition back to an optimal moisture level.

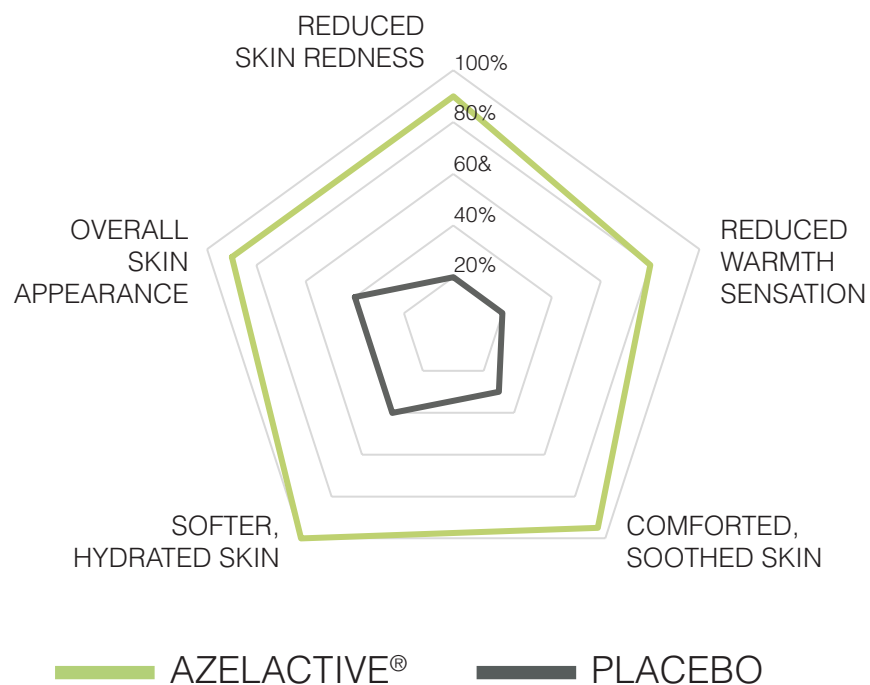
This benefit is essential for maintaining a balanced and resilient skin structure, particularly in sensitive and compromised skin conditions, where barrier dysfunction can exacerbate irritation and redness.

REDUCED ROSACEA-RELATED ISSUES

After 56 days of treatment, volunteers reported that AZELACTIVE® significantly outperformed the placebo across all evaluated parameters.

Its efficacy in reducing redness and warmth sensation, while providing a calming and hydrating effect, highlights its strong dermocosmetic benefits.

These results position AZELACTIVE® as an ideal solution for sensitive and rosacea-prone skin, helping to improve overall skin appearance and comfort.



REDUCED ROSACEA-RELATED REDNESS

T0



T56 DAYS



Comparing the images of the volunteer at T0 and T56, a visible reduction in redness can be observed. The skin appears more uniform in tone, with a noticeable decrease in localized discoloration.

EFFICACY TESTS ON SCALP

Dihydrotestosterone (DHT) causes hair follicle miniaturization, weakening, and scalp inflammation.

Azelaic acid inhibits 5-alpha reductase, reducing DHT levels, soothing scalp irritation, and preventing microbial imbalances linked to hair thinning.

AZELACTIVE® has been tested, proving its efficacy in scalp care by reducing hair loss and supporting follicle vitality.

HAIRCARE PROPERTIES

ANTI HAIR-LOSS EFFICACY

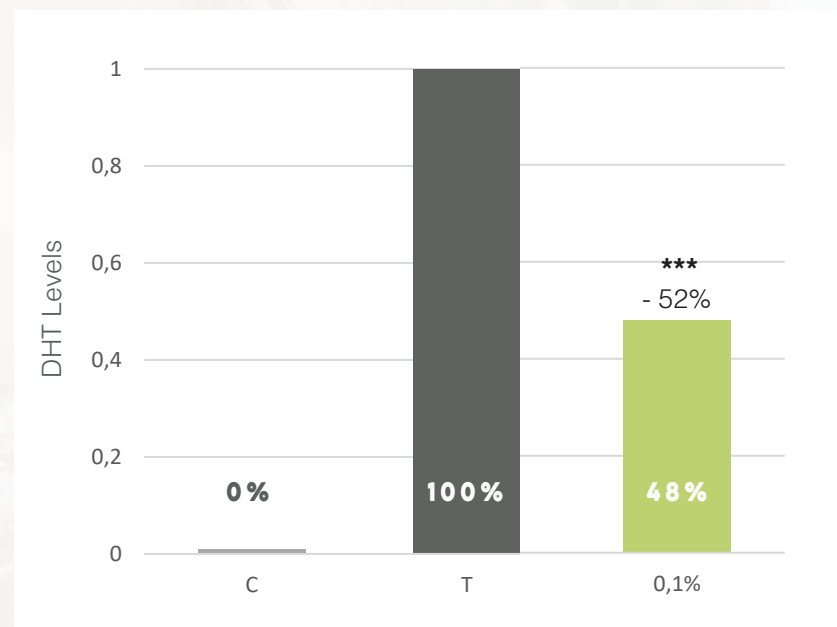
HUMAN FOLLICLE CELL PROLIFERATION



ANTI-HAIR LOSS EFFICACY

In human follicle dermal papilla cells stimulated with Testosterone, 0.1% AZELACTIVE® significantly reduced (**p<0.001) DHT levels by 52%, a key factor in hair thinning, helping to maintain a healthier scalp environment.

By limiting excessive DHT accumulation, it helps preserve hair follicle vitality, contributing to stronger and healthier-looking hair.



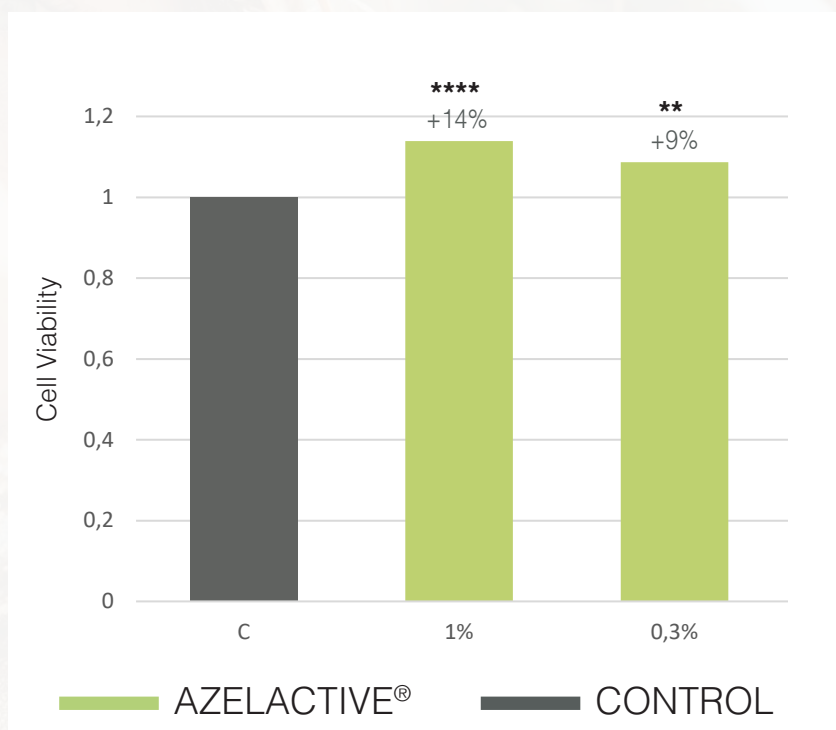
- Testosterone stimulated
- Testosterone stimulated and AZELACTIVE® treated

HEALTHY AND REGENERATED SCALP

AZELACTIVE® promotes human follicle dermal papilla cells proliferation (**** $p < 0.0001$) at the tested concentrations, further supporting its role in maintaining a healthy scalp environment.

Beyond reducing hair loss, AZELACTIVE® actively supports scalp renewal by promoting dermal papilla cell proliferation.

This enhances follicle vitality, creating the ideal conditions for stronger, healthier hair growth.



EFFICACY TESTS SUMMARY

IMPROVED SKIN TONE & BRIGHTNESS

ITA°: +44.4% at T28, +53.5% at T56

SEBUM REGULATION & ACNE PREVENTION

Sebum content: -12.8% at T28, -14.7% at T56

REDNESS & SENSITIVITY REDUCTION

Erythema index: -5.3% at T28, -7.7% at T56

Hydration: +16.4% at T28, +26.7% at T56

ANTI HAIR LOSS EFFICACY

DHT level: -52% at 0.1% concentration

FOLLICLE DERMAL PAPILLA CELL PROLIFERATION

Cell Viability: +14% at 1% and +9% at 0.3% concentration

TECHNICAL ADVANTAGES

100% WATER-SOLUBLE & STABLE

No solvents required, no precipitation issues

EFFECTIVE AT ANY PH

Unlike salified azelaic acid, penetration is not pH-dependent

BIOMIMETIC & MULTIFUNCTIONAL

Inspired by nature, acts on both skin & scalp

SAFE, BIODEGRADABLE & EASY TO FORMULATE

Non-irritating, versatile in multiple systems

AZELACTIVE®

TREND INSIGHTS

AZELACTIVE®: A BIOMIMETIC INGREDIENT

Biomimicry is driven by the desire to create beauty products inspiring by and emulating nature's patterns and strategies.

Azelaic acid, commonly found in wheat and barley, is also naturally produced by the fungus *Malassezia furfur*, a normal component of the skin microbiota.

This fungus, typically harmless, can sometimes cause tinea versicolor, a condition characterized by scaly patches of varying colors.

The hypopigmentation observed in this condition is due to the inhibition of tyrosinase by the azelaic acid produced by the fungus.

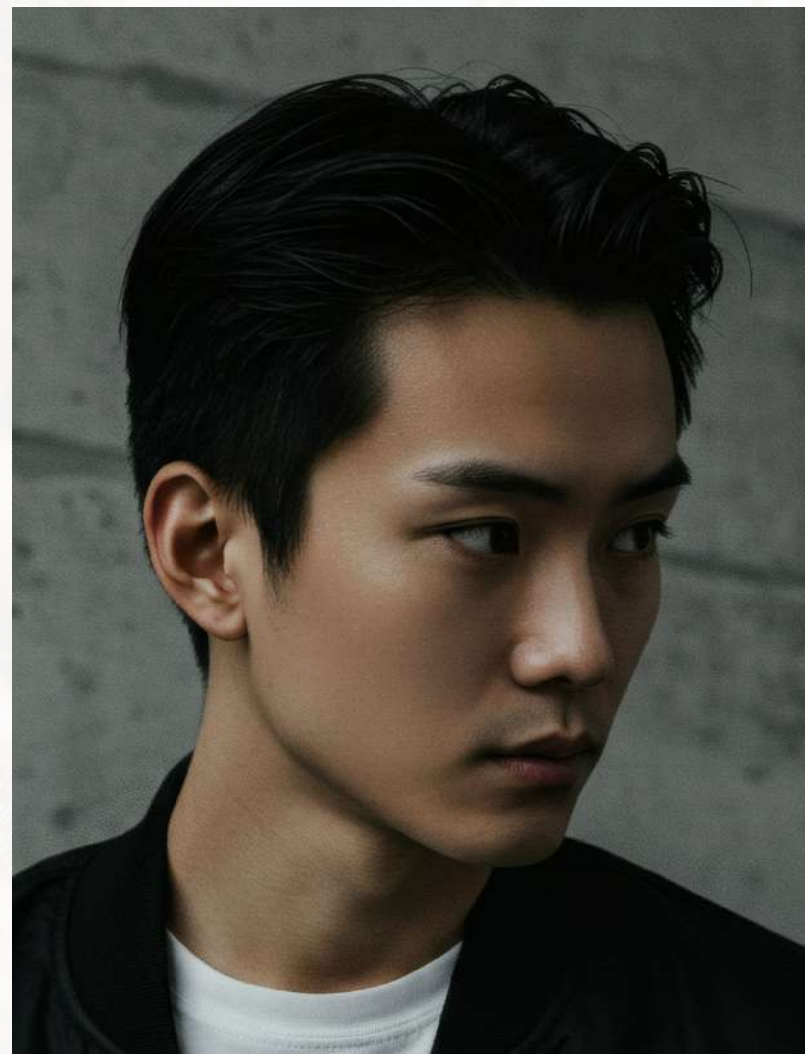
This natural mechanism has inspired the use of azelaic acid as a biomimetic skin-brightening agent in cosmetics, demonstrating how biomimicry can transform our understanding of microbes, from something to get rid of to a source of innovative skincare solutions.

SKINIFICATION OF AZELACTIVE®

The concept of skinification is transforming haircare, treating the scalp as an extension of the skin and applying advanced skincare actives to improve its health and balance as the foundation for strong, vibrant hair.

Key Benefits of AZELACTIVE® for the Scalp:

- ✓ **DHT Inhibition:** Benefits in reducing hair loss by limiting the effects of dihydrotestosterone (DHT).
- ✓ **Sebum Regulation:** Helps control excess oil, ideal for oily scalp conditions.
- ✓ **Anti-Inflammatory Action:** Soothes irritation on sensitive scalp.



SAFE, EASY TO USE & CLEAN

	AZELACTIVE®	AZELAIC ACID
EYE IRRITATION	NOT IRRITANT	MILD IRRITANT
SKIN IRRITATION	NOT IRRITANT	MILD IRRITANT
SOLUBILITY	WATER, ETHANOL, GLYCERIN, PROPYLENE GLYCOL	LIMITED SOLUBILITY; PRONE TO CRYSTALLIZATION IN FORMULATION
PH SENSITIVITY	NO	YES
BIODEGRADABILITY	READILY BIODEGRADABLE	READILY BIODEGRADABLE
TOXICITY	SAFE	SAFE



HEADQUARTER

VIA MAJOCCHI 13B - TORRE D'ISOLA (PV) 27020 - ITALY
TEL. +39 0382 408159 - INFO@SOCRI.IT - WWW.SOCRI.IT

GREENGREDIENTS TECHNICAL CENTER

BORGIO GARIBALDI 14 - MONTEFALCO (PG) 06036 - ITALY
INFO@GREENGREDIENTS.IT - WWW.GREENGREDIENTS.IT