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AC ExoRoot

Hair Longevity Supports Hairspan Scalp Pro-Aging

Active Concepts

VEGAN

SEPHORA CLEAN

CREDO CLEAN

COSMOS COMPLIANT

ISO 16128

PRODUCT PASSPORT

THE FEATURES.

AC ExoRoot defines hair longevity by targeting Hairspan—the biological foundation that supports the time hair stays healthy, resilient, and visibly vital. By reframing hair care as a wellness ritual, hair has become a visible biomarker of internal balance and long-term health rather than a surface-level concern. Minoxidil opened the door to growth claims, but AC ExoRoot finally gives brands something meaningful to say beyond them. AC ExoRoot delivers hair longevity by supplementing scalp biology – the next frontier.

***INCI**: Water & Chlorella Vulgaris Extracellular Vesicles & Phospholipids & Lactobacillus Ferment*

TECHNICAL DATA SHEET.

AC ExoRoot

THE STORY.

We're no longer chasing youth—we're investing in longevity. Beauty and wellness are no longer separate pursuits; they're merging into a single philosophy of care that honors the body's internal systems as much as its visible surfaces.[1,2] Wellness lives in the small, everyday choices that shape our rituals, and haircare is increasingly one of them. When reframed as a wellness ritual rather than a surface-level concern, hair emerges as a visible, non-invasive biomarker of internal balance and long-term health, reflecting cumulative biological stress through oxidative stress, microinflammation, structural decline, and shifting growth signals that influence how hair grows, sheds, and renews over time.[1,2] Because hair is a rapidly renewing, energy-intensive system, it is uniquely sensitive to changes in internal physiology and environmental stress, often responding before other visible tissues—making it an early signal of vitality.[1] Yet defining hair longevity requires addressing a deeper question: how do we preserve vitality, not just appearance?

AC ExoRoot answers this by delivering hair longevity through the supplementation of scalp biology—the next frontier. While minoxidil opened the door to growth claims, AC ExoRoot enables a more meaningful conversation, one rooted in biology rather than stimulation alone.[3,4] Using advanced cell culture and Bio Authentic Exosome delivery, AC ExoRoot delivers bioactives derived from *Chlorella vulgaris* that help strengthen and protect the scalp at its foundation. By targeting Hairspan—the biological foundation that determines how long hair remains healthy, resilient, and visibly vital, AC ExoRoot defines a new standard for hair longevity.

THE SCIENCE.

AC ExoRoot is designed to support hair longevity by addressing the biological systems that sustain prolonged, healthy hair growth over time. Unlike minoxidil, which stimulates a single growth signaling pathway, AC ExoRoot supports the metabolic, inflammatory, and structural balance of the scalp required for growth signals to be effectively maintained and expressed.[3,4] When this balance is disrupted, the hair follicle becomes less capable of sustaining the anagen (growth) phase, shortening the time available for hair fiber production and reducing length retention.[2]

Hair growth during anagen depends on amino acids, as follicle cells assemble keratin peptide chains that form the hair fiber. Sulfur-rich peptides are particularly critical, creating disulfide cross-links that give the hair shaft its strength and resilience.[5] Beyond fiber formation, amino acids also support the surrounding scalp tissue, including fibroblast activity, collagen synthesis, and extracellular matrix integrity, which physically support the follicle and regulate its growth potential.[5] As the scalp ages, fibroblasts may enter a senescent state, while low-grade inflammation and oxidative stress accumulate within the follicular environment, weakening the extracellular matrix and interfering with growth signaling pathways such as IGF-1.[6] When signaling efficiency declines, follicles are more likely to exit the growth phase prematurely, contributing to shedding, thinning, and delayed regrowth.[6]

To support these systems, AC ExoRoot, these amino acid–rich, peptide-dense biomolecules are packaged inside BioAuthentic exosomes to preserve biological activity and enable targeted interaction with the scalp microenvironment.[7] Our BioAuthentic exosomes advance exosome-based delivery by preserving the full biological network, naturally derived, protein-stabilized vesicles enriched with RNA that skin and scalp inherently recognize. Exosome concentration was determined using a Horiba LA-300 by generating a volume-based particle size distribution. Light scattering measurements were converted from particle volume to estimated particle number by applying spherical geometry and density corrections appropriate for lipid-based vesicles, enabling calculation of exosome concentration 3.74×10^{12} exosomes per milliliter. AC ExoRoot defines Hairspan, targeting the root drivers of hair longevity through the power of *Chlorella vulgaris* and BioAuthentic exosome delivery.

THE TECHNICAL DETAILS.

INCI. Water & Chlorella Vulgaris Extracellular Vesicles & Phospholipids & Lactobacillus Ferment

CAS. 7732-18-5 & 91079-57-1 (or) 223749-83-5 & 123465-35-0 (or) 8002-43-5 & 68333-16-4 (or) 1686112-36-6 (or) 9015-54-7

EINECS. 3 231-791-2 & 293-445-7 (or) N/A & N/A (or) 232-307-2 & N/A (or) N/A (or) 295-635-

Origin. Botanical, Bacteria

Natural Antimicrobial. Lactobacillus Ferment

Preservatives. None

Solvents Used. Water

Appearance. Liquid Exosomal Dispersion, Light Beige to Tan

EUROPE. Compliant

USA. Compliant

CHINA. Contact Us

THE FORMULATION TIPS.

pH Stability. 4 - 7

Temperature Stability. Lower temperatures reduces browning. Product may darken if temperature is maintained over 50 °C for an extended period of time.

Use Level. 1 - 5%

Ionic State. Anionic

Alcohol Compatibility. Compatible with up to 50% alcohol at 5%

Solubility. Water Dispersible

Pro Tips. It is recommended that this product is added to the batch in cooldown to maintain appearance

THE BENEFITS OVERVIEW.

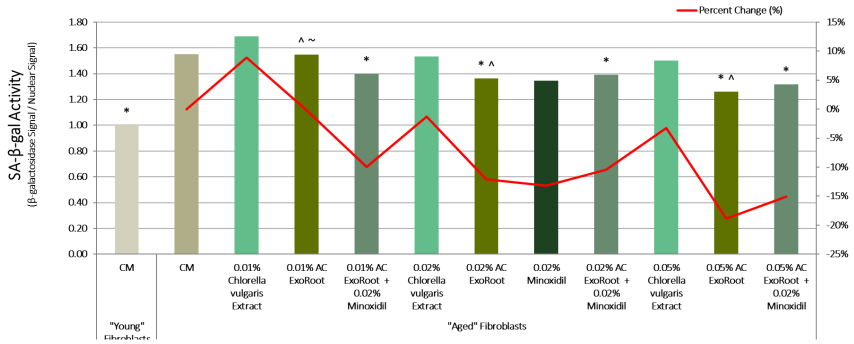
Cellular Senescnese	*SA-β-Gal Assay (vs and with Minoxidil)*
Anti-inflammatory	*IL-6 ELISA Assay (vs and with Minoxidil)*
Antioxidant Protection	*Reactive Oxygen Species (ROS) Scavenging Assay (vs and with Minoxidil)*
Fibroblast Activation	*Sirius Red/Fast Green Collagen Analysis (vs and with Minoxidil)*
Hair Growth Signaling	*IGF-1 Assay (vs and with Minoxidil)*
Scalp Homeostasis	*Scalp Care Study (vs and with Minoxidil)*
Hair Elongation	*Hair Shaft Elongation Assay (vs and with Minoxidil)*

THE EFFICACY.

Cellular Senescense

A senescence-associated β-galactosidase (SA-β-gal) assay was performed in a fibroblast cellular aging model (young P4 vs aged P8) to evaluate AC ExoRoot's ability to reduce senescence in "aged" cells. Aged fibroblasts showed 55% higher SA-β-gal activity than young controls, confirming elevated senescence. AC ExoRoot significantly reduced SA-β-gal activity in aged fibroblasts in a dose-dependent manner (–12% at 0.02% and –19% at 0.05%), and was significantly more effective than Chlorella vulgaris Extract at equivalent use levels, supporting the enhanced performance of bioauthentic exosome delivery. Minoxidil also reduced SA-β-gal activity (–13% at 0.02%), and combining AC ExoRoot with minoxidil maintained anti-senescence benefits (with an additive effect observed at 0.01% blend) without negatively impacting AC ExoRoot's activity.

Cellular Senescence

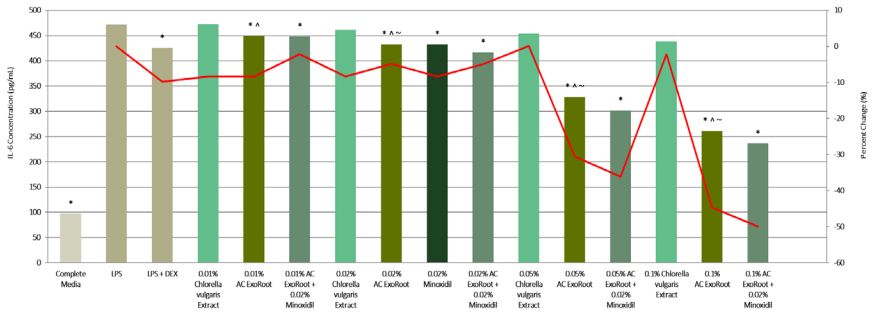


Reduces Cellular Senescense by -12%

Anti- inflammatory

An IL-6 ELISA was performed in human dermal papilla cells to evaluate AC ExoRoot's ability to reduce inflammation under LPS-induced inflammatory conditions. LPS increased IL-6 production by 79%, confirming a robust inflammatory model. AC ExoRoot significantly reduced IL-6 levels in a dose-dependent manner (–5% to –45% at 0.01–0.1%), and was significantly more effective than Chlorella vulgaris Extract alone at all concentrations, demonstrating the enhanced efficacy of bioauthentic exosome delivery. Minoxidil alone reduced IL-6 by 8%, while AC ExoRoot combined with minoxidil showed synergistic anti-inflammatory effects at ≥0.02%, achieving up to 50% IL-6 reduction. Collectively, these data indicate AC ExoRoot effectively attenuates inflammatory signaling associated with follicular stress and aging, supporting a healthier scalp environment.

IL-6 ELISA

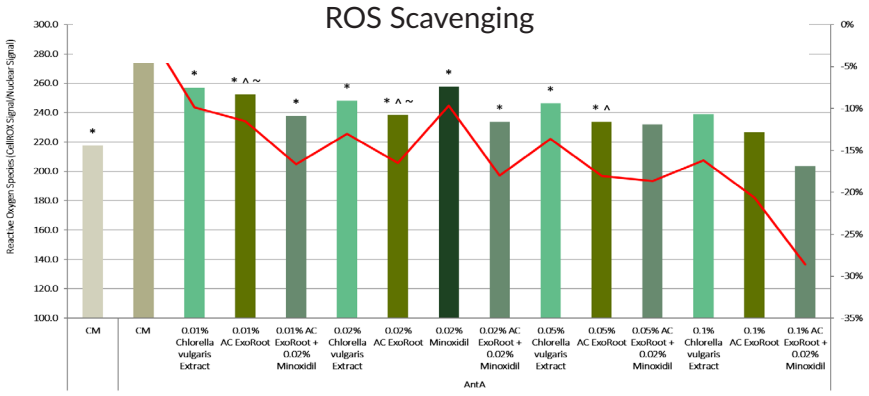


Reduces IL-6 levels by -30%

THE EFFICACY CONTINUED.

Antioxidant Protection

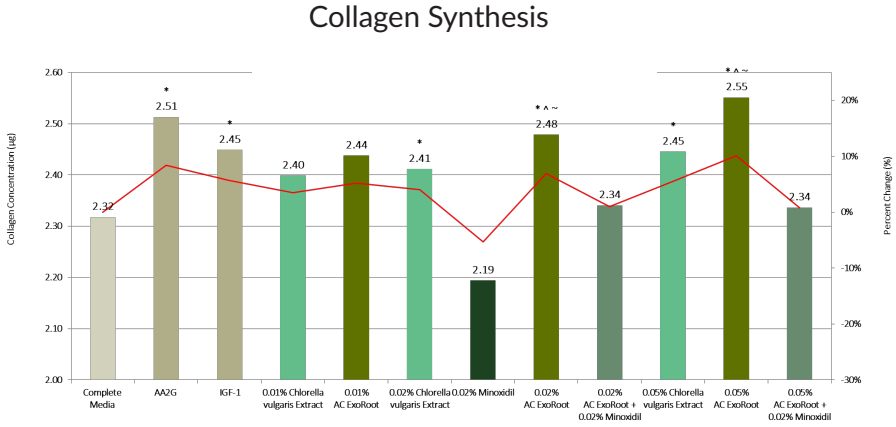
An in vitro Reactive Oxygen Species (ROS) Scavenging Assay was conducted to evaluate the ability of AC ExoRoot to attenuate oxidative stress in human hair follicle dermal papilla cells. Excessive ROS, induced via Antimycin A, is a known contributor to cellular aging and hair follicle dysfunction. AC ExoRoot significantly reduced intracellular ROS levels in a dose-dependent manner (up to −21%), outperforming Chlorella vulgaris Extract alone at all tested concentrations, demonstrating the enhanced efficacy of bioauthentic exosome delivery. While minoxidil alone modestly reduced ROS, combinations of AC ExoRoot with minoxidil produced additive and, at select concentrations, synergistic reductions in oxidative stress (up to −29%). Collectively, these results indicate that AC ExoRoot effectively scavenges excess ROS, supporting cellular homeostasis and helping protect hair follicle cells from oxidative stress–associated aging.



Reduces ROS by -16%

Fibroblast Activation

An in vitro Sirius Red/Fast Green Collagen Assay was conducted to evaluate the ability of AC ExoRoot to stimulate collagen synthesis in normal human dermal fibroblasts. This assay selectively quantifies collagen versus non-collagenous proteins, providing insight into extracellular matrix support relevant to scalp and hair follicle integrity. AC ExoRoot significantly increased collagen production in a dose-dependent manner (up to +10%), outperforming Chlorella vulgaris Extract alone at equivalent concentrations, demonstrating the enhanced delivery efficiency of BioAuthentic exosomes. While minoxidil alone reduced collagen synthesis, AC ExoRoot mitigated this negative effect when combined, maintaining collagen levels comparable to untreated controls. Collectively, these results indicate that AC ExoRoot supports collagen synthesis and may help reinforce dermal structure and hair follicle integrity.



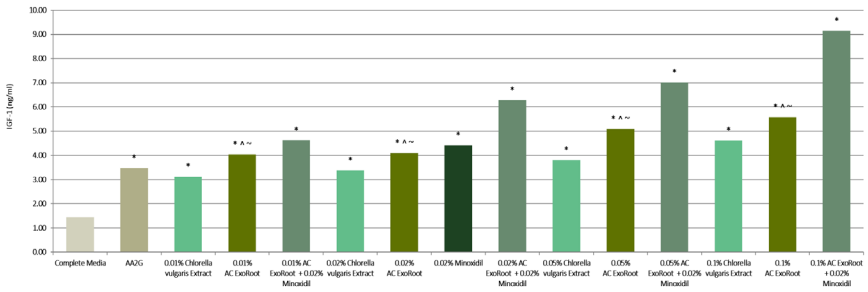
Boosts collagen synthesis by +7%

THE EFFICACY CONTINUED.

Hair Growth Signaling

An in vitro IGF-1 ELISA was conducted in human dermal papilla cells to assess AC ExoRoot's ability to stimulate IGF-1, a key growth factor associated with follicle elongation, anagen maintenance, and delayed catagen. The positive control (AA2G, 34 µg/mL) increased IGF-1 by 141%, confirming assay responsiveness. AC ExoRoot significantly increased IGF-1 in a dose-dependent manner (+180% to +287% at 0.01–0.1%) and was significantly more effective than *Chlorella vulgaris* Extract alone (+117% to +221%), supporting the superior performance of bioauthentic exosome delivery. Minoxidil (0.02%) increased IGF-1 by 207%, and the AC ExoRoot + minoxidil blend produced synergistic gains at all concentrations, reaching up to +536% IGF-1 at 0.1%. Collectively, these data indicate AC ExoRoot enhances a pro-growth dermal papilla signaling environment supportive of healthier, longer-lasting anagen and improved hair growth potential.

IGF-1 Concentrations

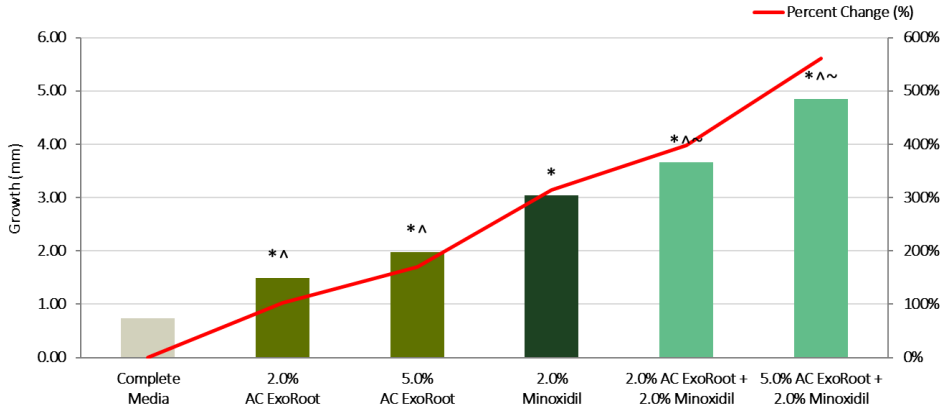


Increases IGF-1 synthesis by +185%

Hair Elongation

An ex vivo hair shaft elongation assay demonstrated that AC ExoRoot significantly augments hair follicle growth by increasing the length of the keratinized hair shaft during the anagen phase. Plucked hair follicles treated with 2.0% and 5.0% AC ExoRoot demonstrated hair shaft growths of 1.48 mm and 1.98 mm resulting in 102% and 170% increases in hair shaft length compared to untreated hair follicles, respectively. Similarly, 2.0% 5.0% AC ExoRoot with 2.0% minoxidil produced hair shaft growths of 3.66 mm and 4.85 mm resulting in 398% and 560% increases in hair shaft length compared to untreated hair follicles, respectively. These data indicate AC ExoRoot increases hair shaft length, which may promote existing hair growth in vivo when added to personal care products at the recommended use-levels. Moreover, combining AC ExoRoot with minoxidil elicits a synergistic effect that produces greater hair follicle growth than either ingredient alone.

Hair Shaft Elongation

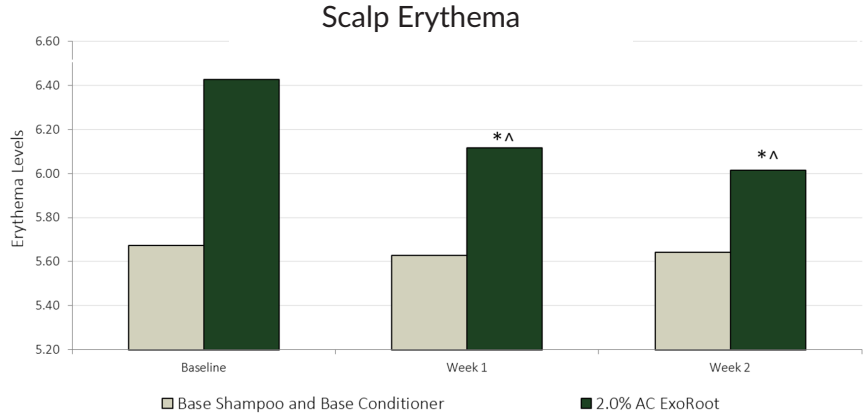


Increases hair shaft length by +560% with Minoxidil

THE EFFICACY CONTINUED.

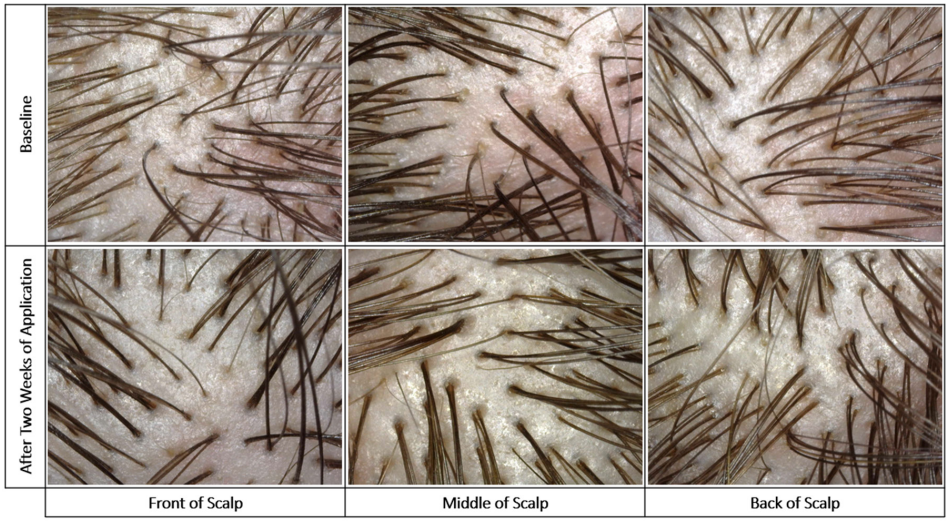
Scalp Homeostasis

In a two-week, randomized, blinded scalp care study, shampoo and conditioner formulated with 2.0% AC ExoRoot significantly reduced scalp erythema while simultaneously improving hydration and barrier function compared to baseline and base formulations alone. AC ExoRoot achieved a 6% reduction in scalp erythema versus a 1% reduction with the base shampoo and conditioner, demonstrating clear anti-redness benefits. In parallel, AC ExoRoot increased scalp hydration by 13% and improved barrier function by 6%, outperforming the base formulations, which showed minimal changes. These objective improvements were supported by participant-reported benefits, including reduced itchiness and flakiness, improved scalp comfort, and enhanced overall scalp condition, as well as visible reductions in redness. Collectively, these findings indicate AC ExoRoot effectively calms scalp irritation while supporting moisture retention and barrier integrity, leading to improved scalp appearance, comfort, and consumer-perceived scalp health.



Reduces erythema by +560%

Two Weeks of AC ExoRoot Application



Increases Homeostasis

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Active Concepts LLC
Lincolnton, NC - USA
Tel +1 704-276-7100
info@activeconceptsllc.com

Active Concepts SRL
Bareggio, (Milano) ITALY
Tel +39 02 90360719
info@activeconcepts.it

Active Concepts LLC, Asia
Kaohsiung, Taiwan
Tel + 886 73599900
info-asia@activeconceptsllc.com.tw

Website
www.activeconceptsllc.com

Social Media
@activeconceptsglobal