

# AC Alfalfa Boost

INCI: Medicago Sativa (Alfalfa) Callus Culture Conditioned Media Extract & Lactobacillus Ferment Lysate



# Available Efficacy Studies



## In Vitro .

- Hair Shaft Elongation Assay
- IGF-1 ELISA
- ROS

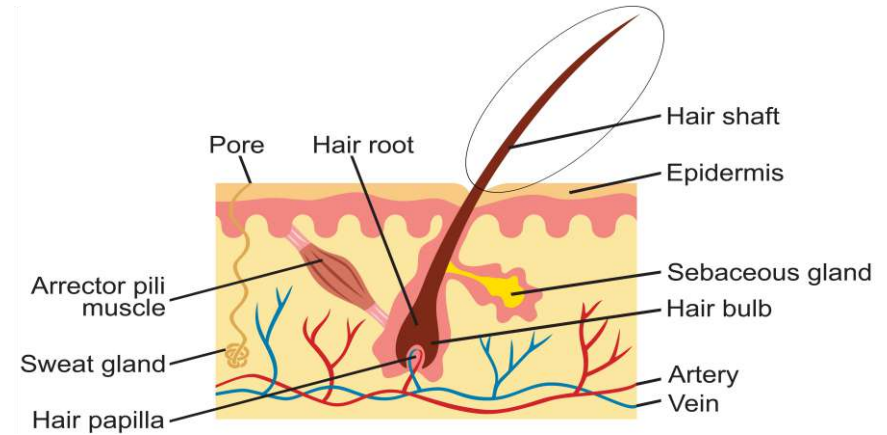
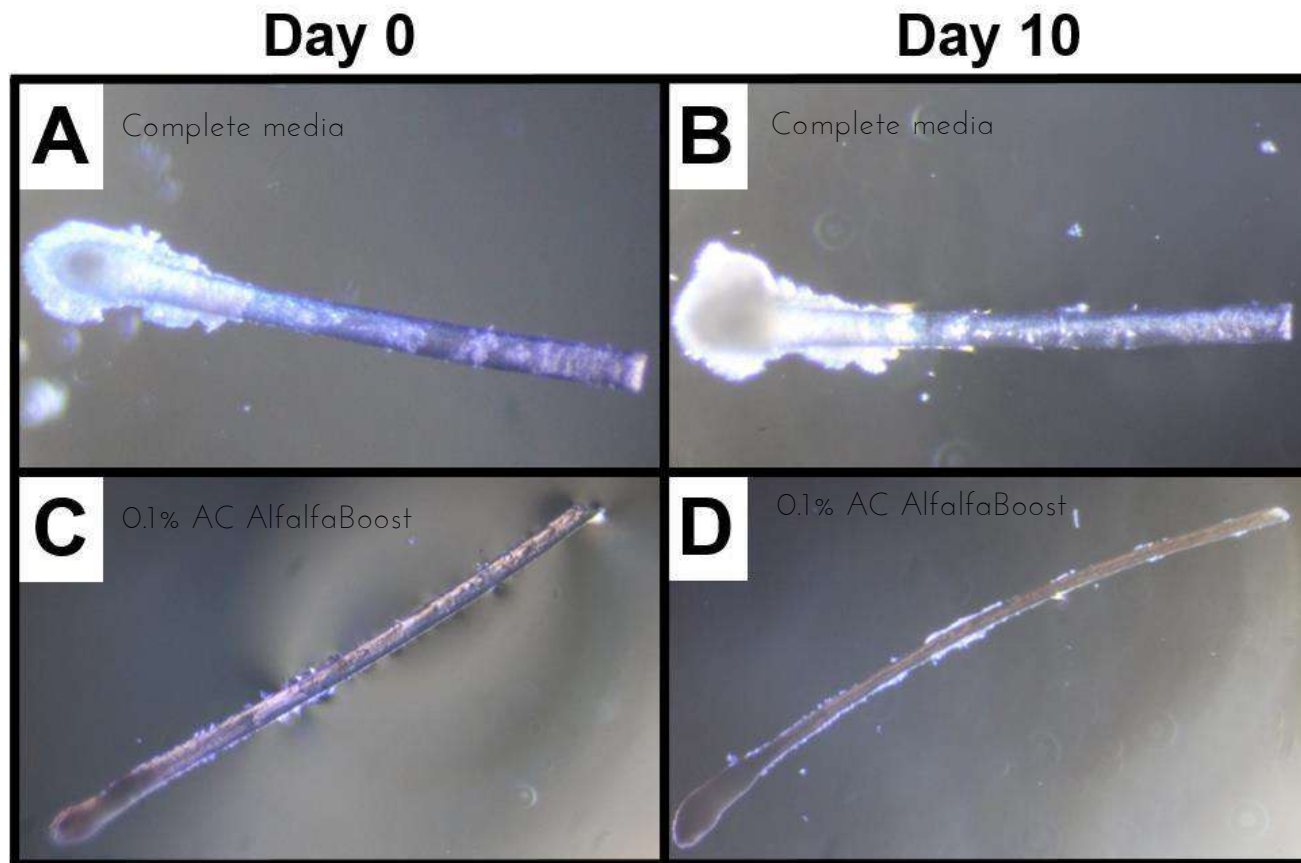
## In Vivo .

- Eyelash Characteristics
- Scalp Care Study

## Tox & Safety

- AMES
- Cellular Viability
- Dermal & Ocular Irritation
- Phototoxicity Assay
- OECD 201 Fresh Water Algae Growth Inhibition
- OECD 301B Ready Biodegradability Assay
- OECD TG 442C - Direct Peptide Reactivity Assay
- OECD TG 442D - In Vitro Skin Sensitization Report

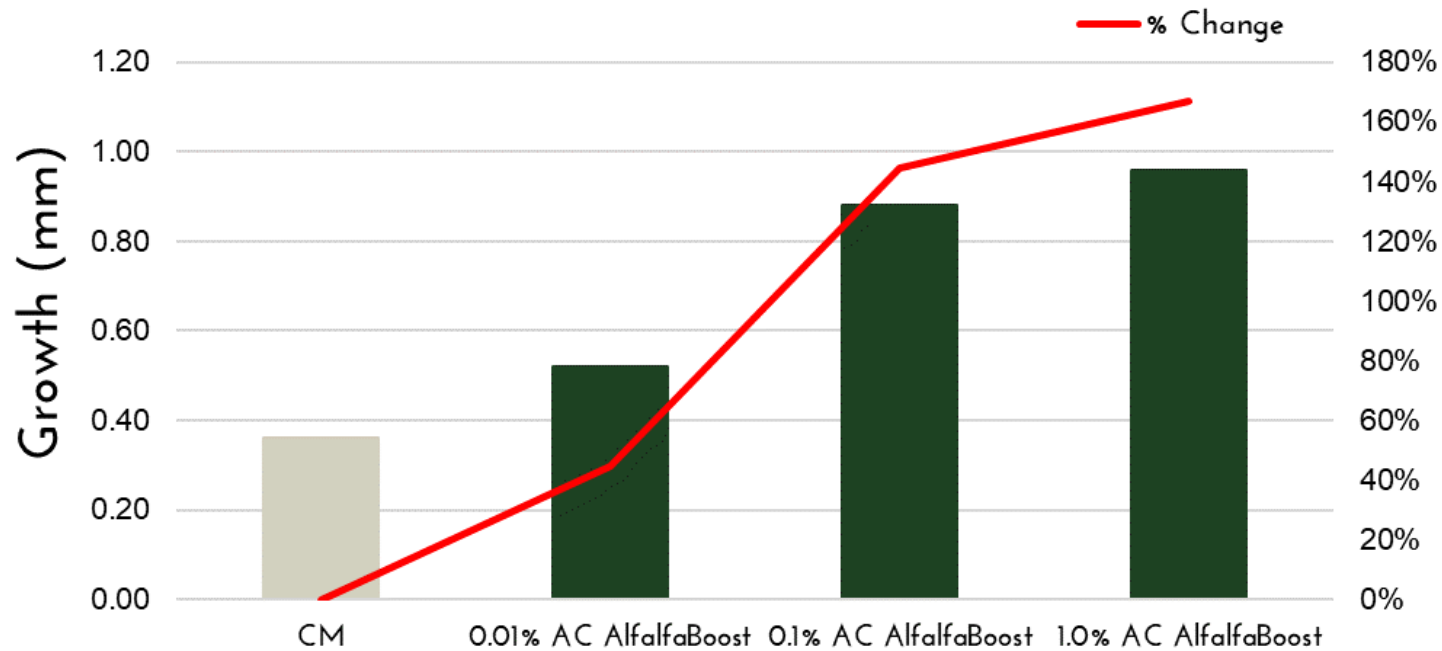
# Hair Shaft Elongation Assay



Hair consists of a visible structure (the hair shaft) and a component underneath the skin surface (the hair follicle). Hair shafts are thin, keratinized epithelial cells comprising of a central medulla, cortex, and cuticle cells that determine hair's aesthetics and mechanical properties.

Fig 1. Representative images of plucked hair follicles incubated with complete media (A, B) and 0.1% AC AlfalfaBoost (C, D) on Day 0 (A, C) and Day 10 (B, D).

# Hair Shaft Elongation Assay Cont.



Plucked scalp hair was obtained from 5 healthy males. The hairs were isolated with watchmaker's forceps in the anagen phase and were required to have the bulb intact. The plucked hairs cultured for 10 days and were placed into complete media or 0.01%, 0.1%, or 1.0% concentrations of AC AlfaBoost.

Figure 2. The effect of AC AlfaBoost on plucked hair follicle growth after 10 days. Complete media (CM) contains 2 mM L-glutamine, 10 ng/mL Hydrocortisone Hemisuccinate, 10 µg/mL rh Insulin, 100 Units/mL Penicillin, 100 µg/mL Streptomycin, and 250 ng/mL Amphotericin B.

At 0.1%, AC AlfalfaBoost was able to increase hair shaft length of plucked hair follicles *in-vitro* by

144%

This is an indicator that since AC AlfalfaBoost increases hair shaft length *in-vitro*, it may promote existing hair length *in-vivo*.

# Benefits

# Mechanism: IGF-1 ELISA

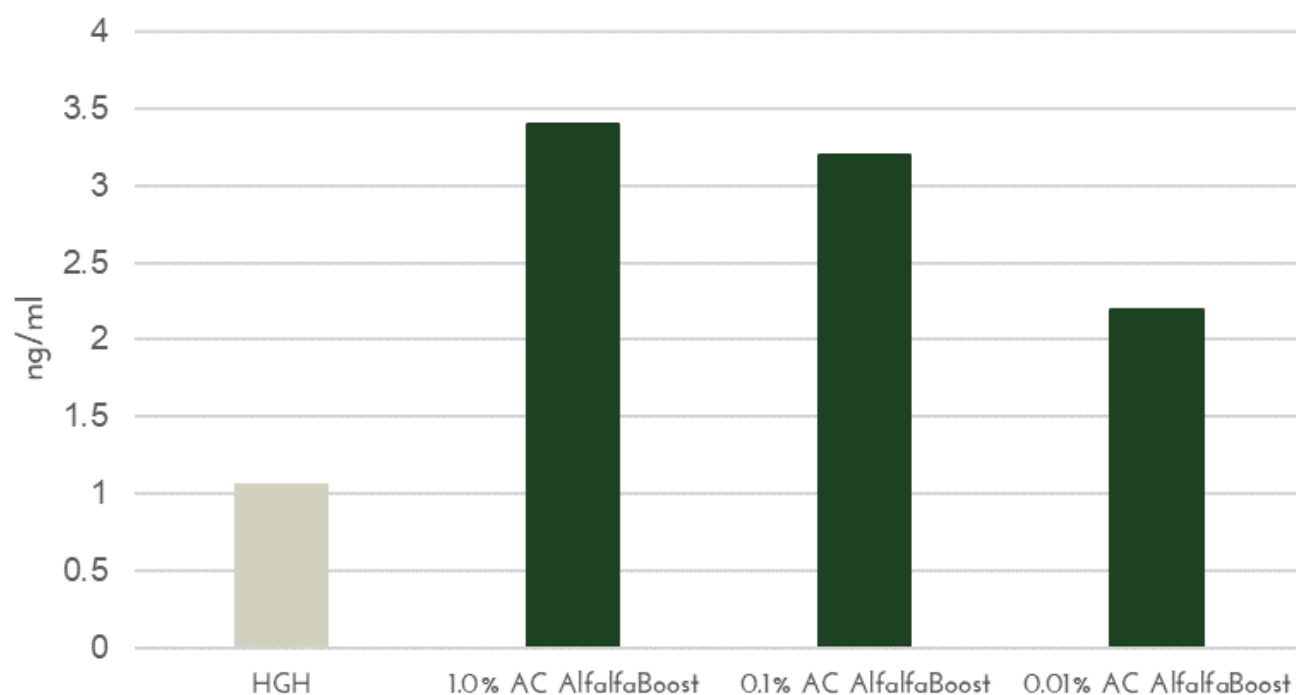
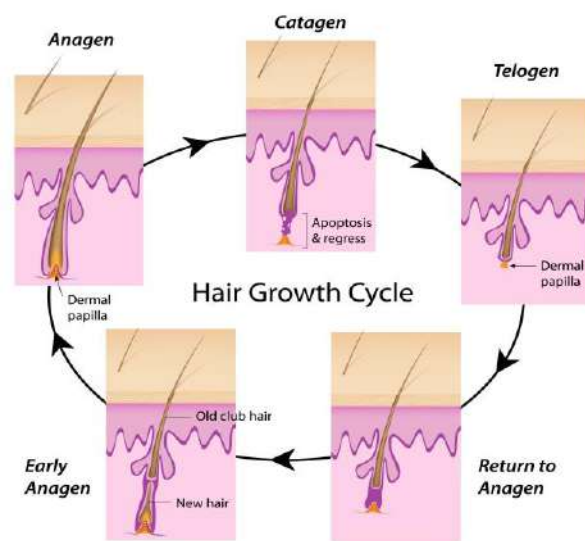


Fig 3. AC AlfalfaBoost - treated dermal papilla cells IGF-1 concentrations and percent change. Human Growth Hormone (HGH) serves as the positive control.



Insulin-Like Growth Factor-1 (IGF-1) is a 70 amino acid polypeptide that plays a large role in mediating the actions of growth hormones. Increasing the concentration of IGF-1 is believed to stimulate the dermal papilla cells and the hair follicle, resulting in follicle elongation.

At 0.1%, AC AlfalfaBoost was able to increase IGF-1 production compared to the positive control by

# Benefits

190%

AC AlfalfaBoost creates an environment conducive for hair length and thickness, follicle stimulation, and maintenance of the anagen phase.

# ROS Assay

## Oxidative Stress

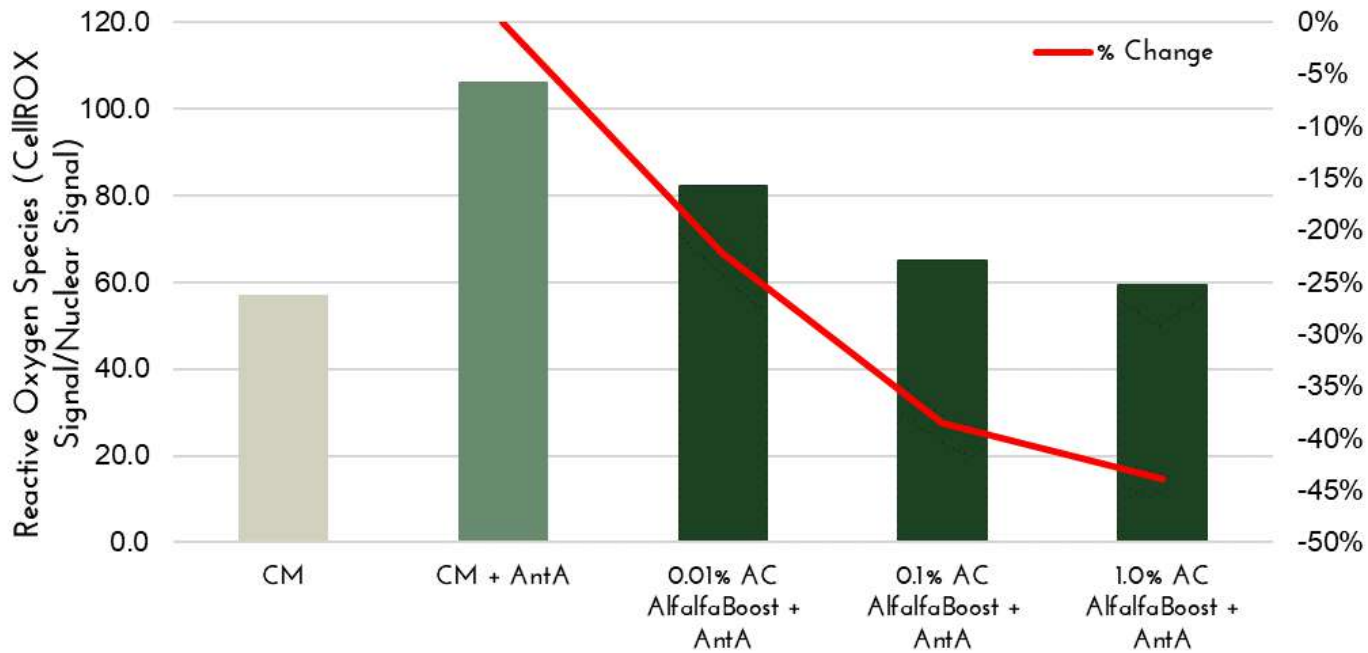
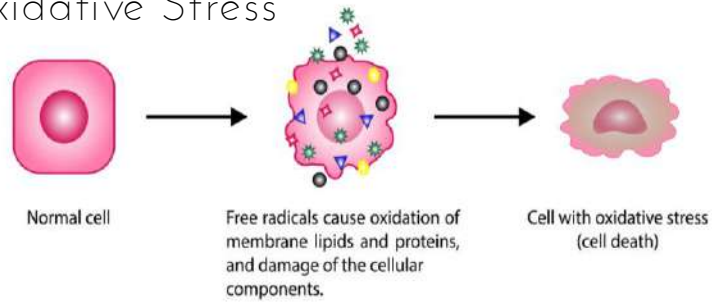


Fig 4. The effect of AC AlfalfaBoost on ROS scavenging.

Just like our skin, our scalp needs antioxidant protection. UV irradiation, pollutants, foreign substances, and aging elicit unrestricted increases in reactive oxygen species (ROS). Antioxidant benefits would provide scalp cells protection in the blood vessels to promote healthy hair.



At 0.1%, AC AlfalfaBoost, compared to fibroblasts treated with AntA (a known inducer of oxidative stress) was able to decrease ROS levels by

# Benefits

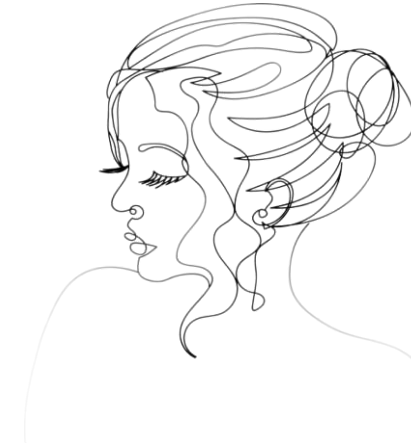
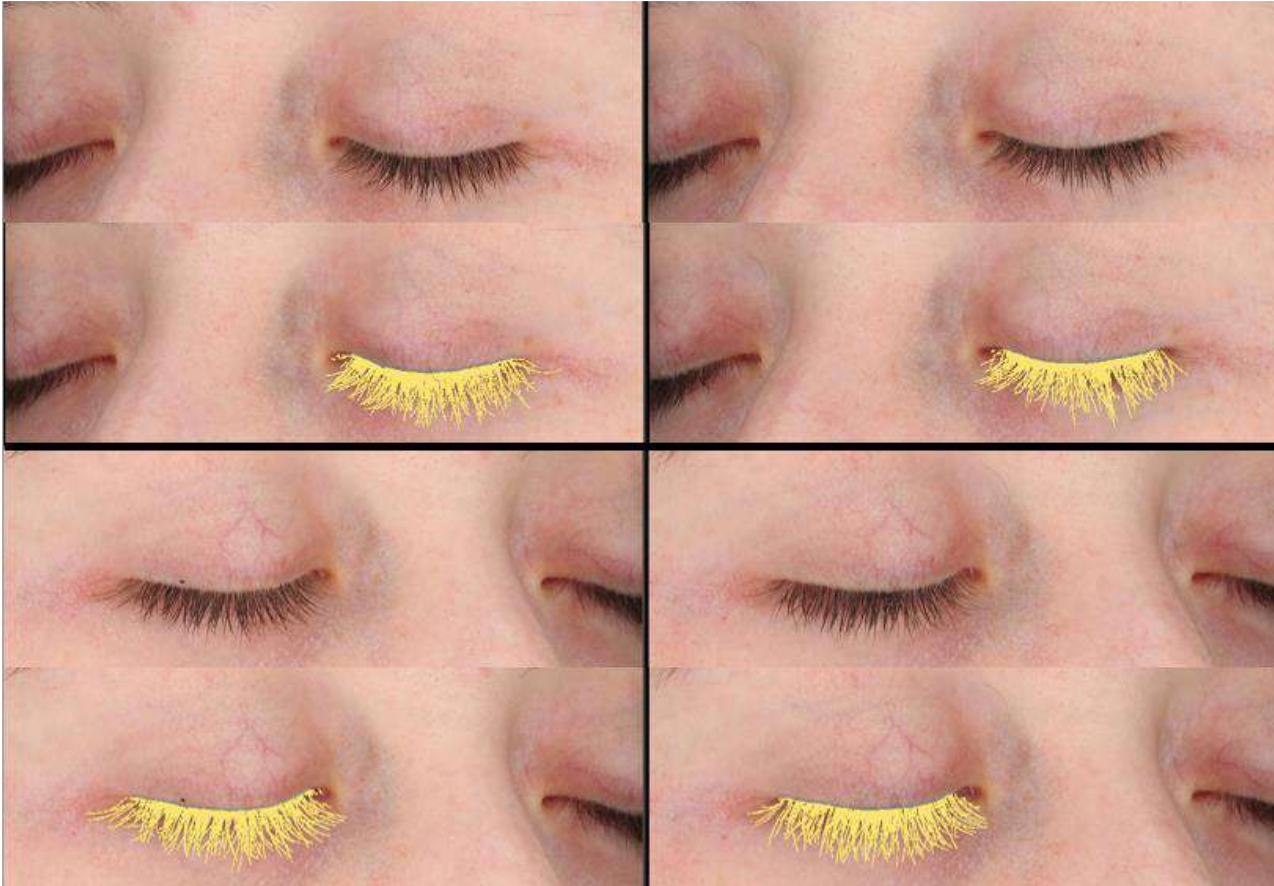
39%

This indicates AC AlfalfaBoost scavenges unnecessary ROS, which may contribute to healthier scalp conditions ideal for healthy hair.

# Eyelash Characteristics

Before Treatment/Baseline

8 Weeks, 5.0% AC AlfalfaBoost



Eyelashes also have a growth cycle consisting of the same 3 phases of the hair growth cycle: anagen, catagen, and telogen. However, the anagen phase of eyelashes is a lot shorter than hair. The natural eyelash cycle is 8 weeks.

Image 1: Images of Participant Treated with 5.0% AC AlfalfaBoost in Base Serum with and without VISIA Image Enhancement. Left = Initial, Right = 8 weeks.

# Eyelash Characteristics

## Overall Average Length (mm)

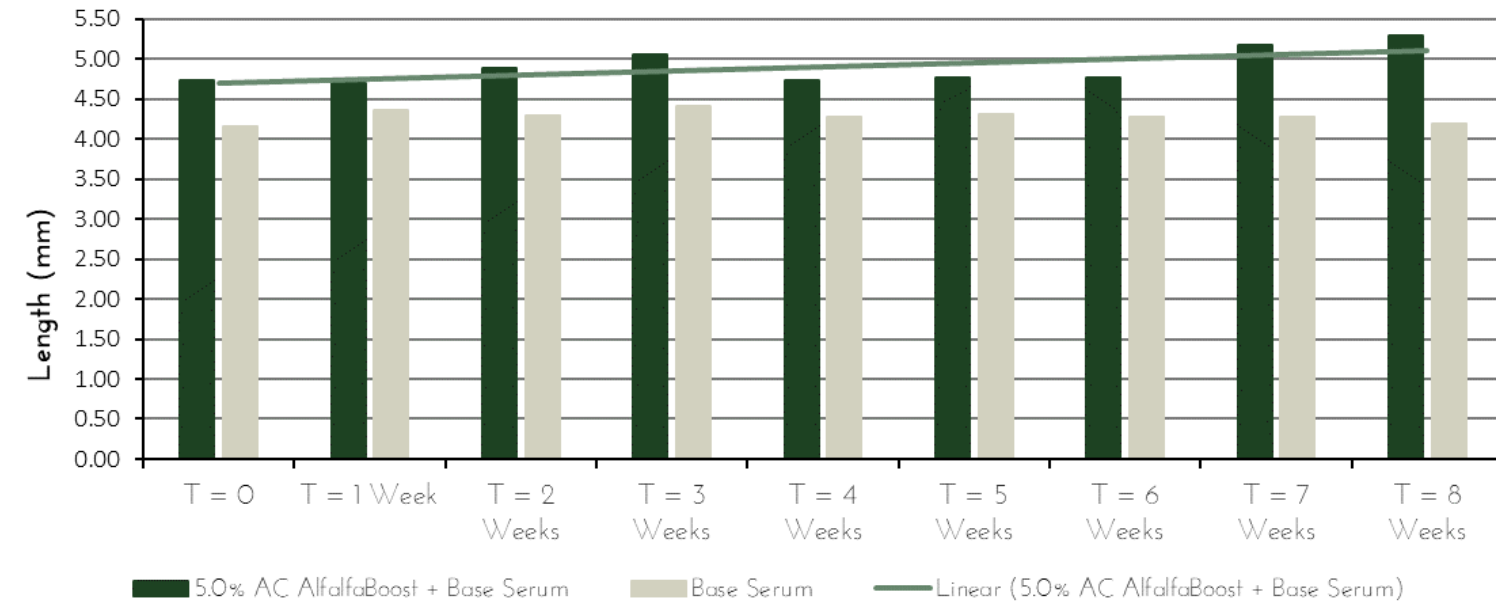


Fig 5. Average Overall Eyelash Length Over Time with Linear Trendline.

10 female participants were instructed to apply a provided eyelash serum to the upper lash-line of both eyes once nightly for an eight-week period. Participants were instructed to not start any new products during the duration of the study. Half used 5.0% AC AlfalfaBoost in a base serum while the other half used the base serum alone as a control.

At 5.0%, AC AlfalfaBoost increased eyelash fullness compared to baseline readings by

# Benefits

23%

This confirms AC AlfalfaBoost is capable of improving eyelash characteristics such as eyelash thickness.

# Scalp Care Study

## Scalp Moisturization Averages

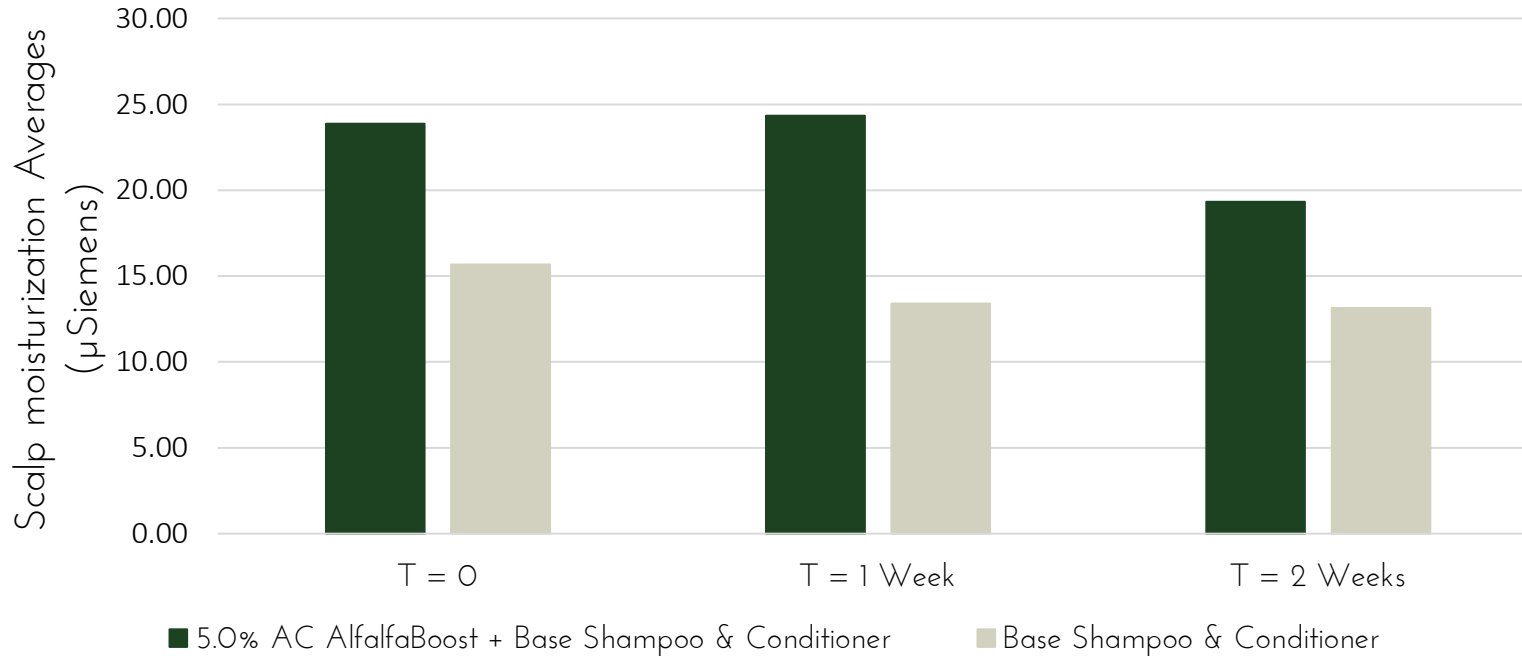


Fig 6. Overall (Front, Middle, Back) Scalp Moisturization Averages at Each Time Point.

An *in vivo* salon study was conducted to determine the scalp care benefits of 5.0% AC AlfalfaBoost in a shampoo and conditioner vs. the control. The study had 20 M/F panelists with pictures taken of the front, middle, and back of their scalps. A DermaLab Corneometer was used to measure the moisture levels of the scalp and the pigmentation measurement of the DermaLab Combo was performed using a handheld probe.

# Scalp Care Study

Front

Middle

Back

Initial



2 Weeks, 5.0%  
AC AlfalfaBoost



Fig 7. Initial and T=2 Week Images of Participant 4 Using Experimental Product Containing 5.0% AC AlfalfaBoost. Note the redness reduction from the top row pictures to the bottom row pictures.

AC AlfalfaBoost used at 5.0% was able to increase scalp moisturization and reduce scalp erythema compared to the base controls by

# Benefits

19%  
& 18%

AC AlfalfaBoost is able to provide the scalp with benefits such as moisturization and redness reduction.

# Summary



## WHAT .

Topical application of natural sulfur-rich peptides derived from alfalfa stimulates an environment primed for enhanced hair thickness and scalp protection.

## WHY .

AC AlfalfaBoost increases the amount of IGF-1, a polypeptide that plays a large role in mediating the actions of growth hormones and has the power to scavenge unnecessary ROS levels.

## MADE OF

AC AlfalfaBoost is extracted from alfalfa cell culture and is comprised of sulfur-rich peptides and amino acids.

## ACTION .

AC AlfalfaBoost is a botanically derived ingredient that encourages hair density, scalp care, and antioxidant protection.





# AC AlfalfaBoost



Code: 20988, 20988CHI\*

INCI: Medicago Sativa (Alfalfa) Callus Culture Conditioned Media Extract & Lactobacillus Ferment Lysate

Appearance: Clear to Slightly Hazy Liquid, Colorless to Pale Amber

Suggested Use Level: 1-10%

Suggested Applications: Hair Growth, Scalp Care, Antioxidant

Standardization: Sulfur: 3.5 - 3.7% | Peptides: present



In Vitro



In Vivo



ISO 16128  
NI & NOI



Vegan  
Compliant



COSMOS  
Compliant



Product  
Passport

\*China subcode available

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# References

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