Scanning Electron Microscopy

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Tradename: AC Hair and Scalp Complex PF

Code: 11301PF

CAS #: 7732-18-5 & 91722-22-4 & 84929-31-7 & 107-43-7 & 107-41-5 & 85251-63-4 & 84650-60-2 & 84775-94-0 (or) 1686112-10-6 & 100684-36-4

Test Request Form #: 5609

Lot #: N191017-J

Test Performed: Scanning Electron Microscopy (SEM)

Background

The hair follicle, the section of the hair that lies below the scalp, is the living portion of the hair system. This bulb is full of cellular activity and is key for producing healthy, thick and full hair. The aging of the hair follicle can create loss of hair yielding unhealthy and thinning locks.

This study was conducted to determine if **AC Hair and Scalp Complex PF** is capable of improving the integrity of the hair follicle thus leading to fuller, thicker hair.

Methods & Materials

This blind study was conducted by salon professionals on 10 healthy individuals aged 25-45. All participants had hair at least 12 inches long. Each participant was asked to use the control shampoo/conditioner duo for three days prior to the study to remove all residue from the hair and scalp. For the following five days the participants were shampooed and conditioned once a day at the salon. The whole head was shampooed with the control shampoo. Half of the head was conditioned with the control conditioner and the other half was treated with the control conditioner which contained 5.0% **AC Hair and Scalp Complex PF**. The conditioner was allowed to sit on the hair and scalp for 5 minutes. After, the participant had a cape placed over their shoulders in order to collect any hairs that may fall. The wet hair was then combed and blown dry for 5 minutes. During this time period, all hairs were collected, especially those which still had the bulb intact, collecting happened at Day 0 and Day 5 of treatment. The number of hair fibers collected from each side of the head were retained for data purposes. Participants were also asked to comment on their hair condition on Day 5 in a questionnaire to determine changes in strength and feel.

Gaston College Textile Technology Center located in Belmont, North Carolina was asked to perform Scanning Electron Microscopy Imaging (SEM) on the swatches provided by Active Concepts, LLC. Gaston College used a Zeiss DSM 962 to perform the test at 20.0kV using a magnification range from 50x-300x.

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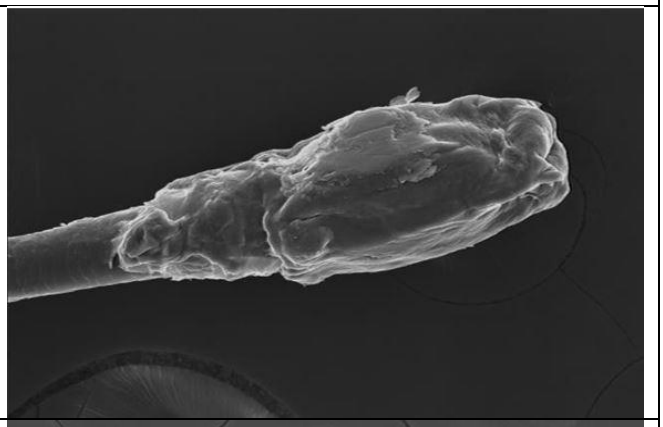
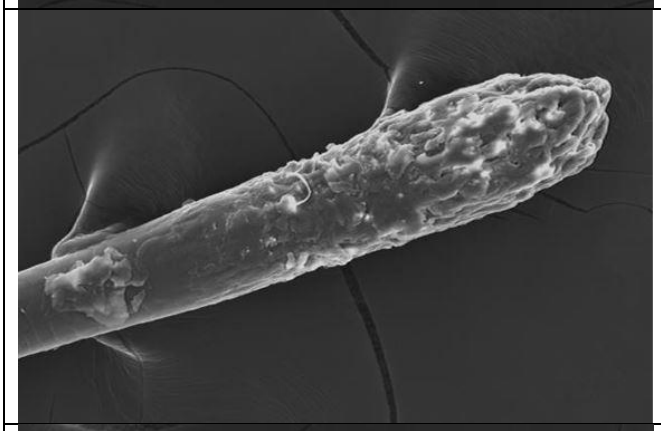
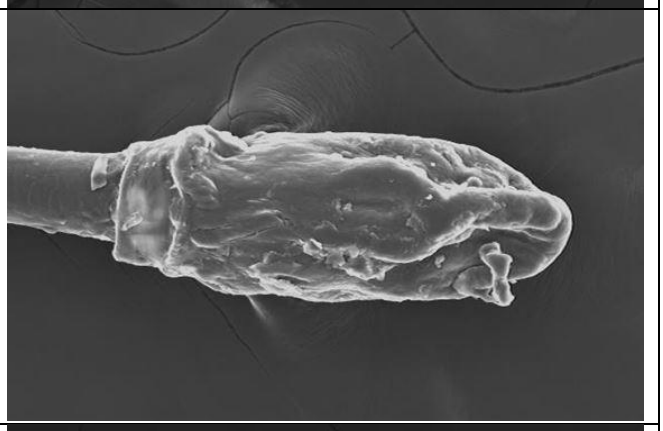
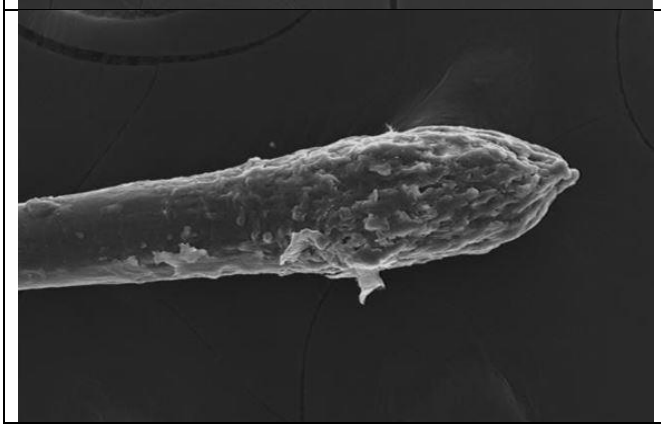
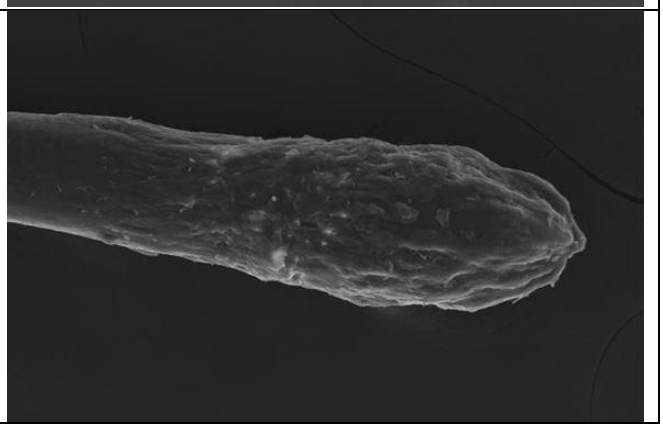
This method utilizes an electron microscope that produces images of the treated hair by scanning the hair with a focused beam of electrons. These electrons interact with the atoms on the hair sample to provide images of the hairs surface topography and surface composition.

Results

Control Treated Hair Follicle	5.0% AC Hair and Scalp Complex PF Treated Hair Follicle
	
	
	

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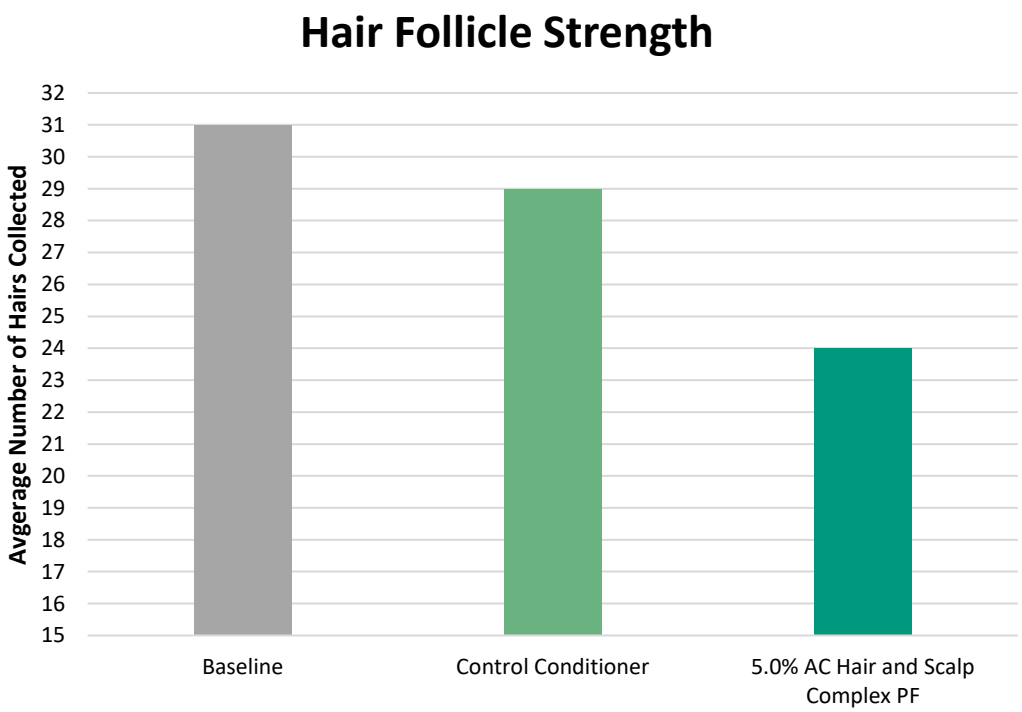

Graph 1. Results of a 5 day in-vivo efficacy study evaluating hair follicle strength.

Discussion

Standard Electron Microscopy (SEM) imaging shows high resolution images of the hair bulb itself. The SEM images depict how the bulb is positively affected when treated with 5.0% **AC Hair and Scalp Complex PF**. The imagery clearly demonstrates that the treated bulb exhibits a 'younger' appearance which includes a healthier, intact bulb which is noticeably larger and smoother. The untreated bulbs elicit rigid, small, less uniform forms. At a singular level, one bulb may not seem important, but these bulb to bulb imperfections contribute to a much bigger picture of unhealthy, thinning and aging hair. In just 5 days, a significant improvement is visible deeming **AC Hair and Scalp Complex PF** ideal for inhibiting loss of hair through strengthening of the hair follicle.

When the combing data was compared, the treated vs. untreated vs. baseline strand count can be seen in Graph 1. A 22% improvement can be seen on the side which was treated with **AC Hair and Scalp Complex PF**. A reduction in hair collected in just five days' time was exhibited.

Lastly, participants, when answering their questionnaire on Day 5, reported softer, smoother hair. Also, participants felt the treated side was easier to comb. This was a blind study yet participants still identified the treated side as more desirable.

This data set makes it evident that **AC Hair and Scalp Complex PF** improves the overall health of the hair follicle which can lead to a reduction in loss of hair and an increase in the penetration potential of actives into this living portion of the hair.