



Scanning Electron Microscopy

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Tradename: ProCutiGen® Hold

Code: 20831

CAS #: 999999-99-4 & 1686112-10-6 (or) 9015-54-7

Test Request Form #: 3152

Lot #: NC170117-M

Test Performed:

Scanning Electron Microscopy (SEM)

Background

Everyday stressors come in all forms whether environmental, chemical, or thermal. Rather than focusing on repairing broken bonds that occur during physical and chemical stress, **ProCutiGen® Hold** consists of bivalent cationic peptides that create a *de novo* cuticle on the hair to prevent damage from happening in the first place.

This study was conducted to determine if **ProCutiGen® Hold** is capable of modifying hair shape while protecting it from styling damage.

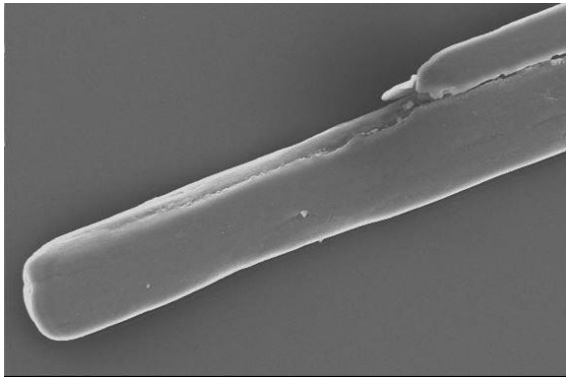
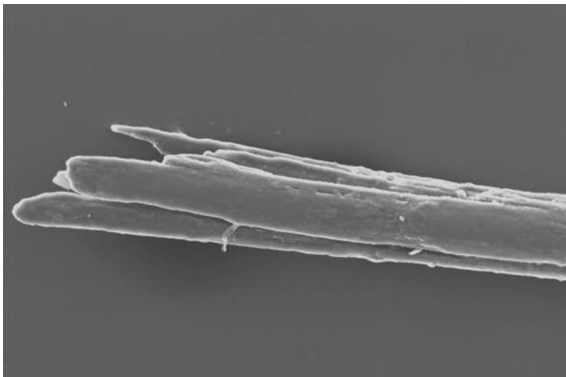
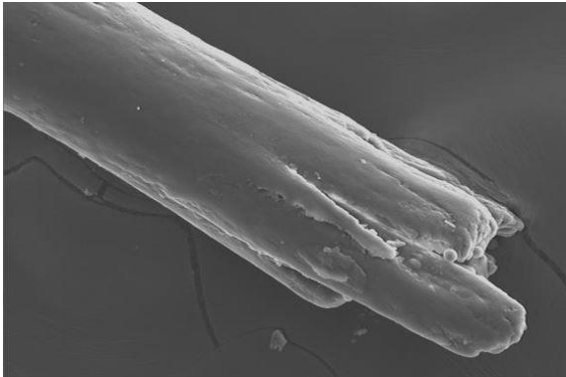
Methods & Materials

This study was conducted by salon professionals using Sensationnel Bare & Natural Brazilian 100% Virgin Remi Unprocessed Human Hair (Hair Zone Moonachie, NJ). One swatch, left unaltered, was analyzed as the control. Two test swatches were treated and submitted for testing. One swatch was treated, spritzed with water, allowed to dry, curled holding for 10 seconds and released. The other test swatch was treated, spritzed with a 2.0% **ProCutiGen® Hold** solution and water, allowed to dry, curled holding for 10 seconds and released. The swatch treatment was designed to mimic everyday effects of curling the hair. It is important to note no additives or fixatives were used in the test solution. This was done intentionally in order to visually see clear results.

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

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Results

Swatch Description	SEM Image
Untreated Virgin Hair	
Water Treated & Curled	
Water + 20831 ProCutigen® Hold & Curled	



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Discussion

Standard Electron Microscopy (SEM) imaging shows high resolution images of the hair cuticles of each hair swatch. The SEM images depict how the outermost layer of the hair, the cuticle, is effected by stressors, in this case styling stressors. The SEM imaging demonstrates that, Untreated Virgin hair is clearly already prone to damage from everyday aggressors, showing characteristic signs of breakdown. The imagery results of the water treated, curled sample depict an extensively damaged, split cuticle. This type of damage leads to irregular growth, breakages, and overall unhealthy, dead appearance. At a singular level, one cuticle may not seem important, but these strand to strand imperfections contribute to a much bigger picture of unhealthy and unprotected hair. When the untreated images are compared to the **ProCutiGen® Hold** treated swatches, a significant decrease in damage of the cuticle is exhibited. Better yet, the **ProCutiGen® Hold** treated SEM images depict the creation of a *de-novo* cuticle on the damaged cuticle. The cuticle corrects and acts as a protective layer to the fiber. The cuticle formation **ProCutiGen® Hold** employs also exhibits properties such as moisturization, pH balance, barrier protection, and additionally, protection from hair weakening after exposure to styling rendering **ProCutiGen® Hold** the ideal addition to everyday treatment to repair and protect against everyday stressors as well as styling stressors.