



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> Sierra G. Nichols	<b>Project Number</b> <b>S0418</b>
<b>Project Title</b> <b>How Does Topically Applied Protein Affect Human Hair?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My project is based on the hypothesis which states that if I apply a topical protein to hair, it will thicken, strengthen and increase the heat resistance more than untreated hair under the same conditions. The experiments I chose were used to test the thickness, strength and heat resistance of each hair.</p> <p><b>Methods/Materials</b> For the thickness, I compared a topically applied protein hair to a non treated hair under a microscope. Doing this I found their widths in micrometers. For the second experiment in which I was testing the strength of each hair, I placed the hairs (all individually) into a device that was used to determine how much strength it had. This was determined by how many increments of rotation it could withhold before it broke. Lastly, I tested the heat resistance of the hairs. I used a heat gun to apply heat to each individual hair. I timed how many seconds it took before each hair singed with constant heat.</p> <p><b>Results</b> My results from each experiment showed that each experiment did not increase the strength and heat resistance of the hairs when the topical protein solution was applied, opposite from what my hypothesis had predicted. Generally topically applied protein solution doesn't affect the hairs' strength or heat resistance. It only moderately affects the hairs' width / thickness.</p> <p><b>Conclusions/Discussion</b> The experiments proved that the topically applied protein didn't increase the hair's strength and resistance to heat, only in minor and maybe even ineffective ways. It did increase the thickness. My hypothesis wasn't correct and wasn't supported by any of my results, except experiment number 1. I had stated that the protein treated hair would be wider than the untreated hair, while in fact its average thickness increased by 18 micrometers. Next, I had guessed that the protein treated hair would be stronger than the untreated hair. The results from experiment two showed that the hair's strength wasn't affected by the protein solution, and the same with experiment three. Statistical data shows no correlation between the hairs' strength and heat resistance due to topically applied proteins.</p>	
<b>Summary Statement</b> The affects of topically applied protein on human hair.	
<b>Help Received</b> My parents, My Teacher Mr. Robinson	