



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Cameron B. Seebach	Project Number J0414
Project Title Do Snakes Have Legs? Electrophoresis of Leg Muscles in Lizards and Possible Leg Muscle Regions in Snakes	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my experiment is to determine whether snakes have detectable leg muscle regions still existent from past legged ancestors.</p> <p>Methods/Materials I took tissue samples from four dead snakes and two dead lizards. From the two lizards, I took front and back leg and jaw tissue samples. From the snakes, I took tissue from where front legs and back legs would be on a snake and from the jaws. Then I prepared the samples to be used in Tris-HCL (protein) Electrophoresis gels. I loaded my gels and ran them.</p> <p>Results Once the gels had been run and stained, the banding patterns were very similar between the front and back leg gels of both the snakes and the lizards, but were completely different from the jaw gels.</p> <p>Conclusions/Discussion Protein electrophoresis can never establish a genetic relationship between two species because proteins, unlike DNA have multiple configurations. For example, a protein could have an Amino acid sequence of UAG, but could also be UAU. Thus, proteins can never be used to prove directly that the snakes are related to the lizards. However, protein allows us to infer things about the muscles in a a designated sample. The banding patterns of the leg regions on the snakes being very similar to the banding patterns of the legs on the reptiles proves that there is still some muscle left over from past legs in an area that needs no more muscle than areas on other parts of the snake, but that area has more anyway. I believe this can be attributed to the previous bone structure of a leg that may have been there in an ancestor.</p>	
Summary Statement Have snakes evolved from a past legged ancestor?	
Help Received Used equipment at school lab under supervision of Mr. Mark Michail.	