



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title Evolution of Species through Protein Electrophoresis	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project is to analyze evolutionary links among fish, birds, reptiles, amphibians, and mammals through protein fingerprinting.</p> <p>Methods/Materials The main technique used in this project was protein electrophoresis, which includes extracting the proteins from the various samples and separating the proteins of the different samples on polyacrylamide gels. Materials that were used include: Electrophoresis Chamber and its power supply, micropipeter, screwtop and flip top tubes, water bath, running buffer, and sample buffer.</p> <p>Results The amphibians had the most common proteins with the fish, the birds had the most common proteins with reptiles, and the mammals shared only a few proteins with the birds.</p> <p>Conclusions/Discussion The results show that fish and amphibians are closely related, and the birds and reptiles are closely related. These results coincide with the theory of evolution because according to the theory of evolution, amphibians evolved directly from fish, which explains why they are closely related and even though reptiles evolved from amphibians, according to the theory of evolution, birds are, in essence, "flying reptiles," which also shows why the reptiles and birds were found to be most closely related to reptiles. The mammals, however, only shared a few proteins with the birds, which shows how mammals evolved later than the rest of the animals. By analyzing the common proteins of the various animals, we are actually analyzing the DNA of the organism because proteins are reflections DNA. Thus, the similarities found among the various animals were actually similarities in their genetic material: DNA, which is the basis of evolution.</p>	
Summary Statement The goal of this project is to establish and record evolutionary links among fish, birds, reptiles, mammals, and amphibians through the use of protein fingerprinting and analyze what animals are closely related.	
Help Received This project was conducted at the Ribet Academy Biology lab.	