



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Hippolyte Goux	Project Number S1311
Project Title Cutaneous Microbial Antibiosis in the Salamander <i>Ensatina e. klauberi</i>	
Abstract Objectives/Goals The objective is to determine if bacteria on the skin of the salamander <i>Ensatina eschscholtzii klauberi</i> produce compounds (antibiotics) that inhibit the growth of microbes from the soil and leaf litter found in the salamander's terrestrial habitat. Methods/Materials Bacterial flora was sampled from 4 wild <i>Ensatina</i> found at two sites on Mt. Palomar (San Diego Co Calif.). Three of the samples came from specimens found at Cedar Creek. The fourth sample came from a specimen found in Doane Valley. The leaf and soil sample was also taken from Doane Valley. The resulting mixed samples were grown in sterilized Petri Dishes. Morphologically distinct bacteria colonies were then isolated so that pure cultures were obtained. Using a microscope, the cellular morphology of each isolate was noted. <i>Ensatina</i> skin bacteria were tested for inhibitory activity against soil bacteria in Inhibition Trials. Inhibition was measured as a zone of unobservable growth adjacent to the bacterial streak. Results The inhibition trials did not demonstrate the presence of bacteria from the skin of <i>Ensatina</i> capable of inhibiting microbial growth from the soil and leaf litter. Unexpectedly, one of the soil bacteria from Doane Valley produced antibiotics that killed off 79% of the bacteria isolated from Cedar Creek <i>Ensatina</i> . However, 100% of the "native" <i>Ensatina</i> bacteria from Doane Valley were unaffected when exposed. Conclusions/Discussion More work is necessary to understand the relation of bacteria to the salamander <i>Ensatina e. klauberi</i> . The study neither refutes nor confirms the presence of cutaneous microbial antibiosis in the salamander <i>Ensatina e. klauberi</i> . Work in the area is vitally and rapidly important because if the role of symbiotic bacteria is found to be significant, removal of them due to pollution may account for many of the current amphibian declines. An "error" in sampling of soil and <i>Ensatina</i> bacteria between two sites on Mount Palomar led to the discovery that the microbial communities of the mountain have evolved a "finely tuned system" of relative stasis. In each case, bacteria have evolved a resistance to antibiotics produced by forms in their native area.	
Summary Statement The project is concerned with the symbiotic relationship between bacteria and the salamander <i>Ensatina e. klauberi</i> , in the form cutaneous microbial antibiosis.	
Help Received I used laboratory equipment at John W. High School under the supervision of Dr. K. Atkinson, who also provided assistance during microscope analysis.	