



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Lauren M. Yen	Project Number J2223
Project Title Blaberus discoidalis Cockroach Mind Control by Artificial Neurosensory Signals	
Abstract Objectives/Goals A cockroach senses their environment with their antennae. The purpose of this experiment is to test the feasibility of stimulating the antennae to change cockroach behavior. The hypothesis for this experiment states that the cockroach will turn left or right no matter how quickly the stimuli are given. Methods/Materials In this experiment, a remote control transmitter and receiver were used to send an electrical signal to the antennae that tricked the cockroach into turning left or right. The receiver was attached to the back of the cockroach and had wires connected to the antennae. When a transmitter sent out infrared light, the receiver detected the light as a command to send a small current to the cockroach antenna. The cockroach then turned left or right depending on the signal. Opposite signals were given 10 seconds apart, 5 seconds apart, 2 seconds apart, and 1 second apart. Results The cockroach responded to signals given 10 seconds, 5 seconds, and 2 seconds apart, but was confused and did not move when signals were given 1 second apart. Conclusions/Discussion The hypothesis was proven false because the cockroach did not turn when signals were given 1 second apart. However, the receiver was able to provide sensory data to the brain that the cockroach responded to. This study can be a model for combining robotics with neurobiology to send sensory signals to the brain. For example, this technology could help restore a patient's touch sensation in a human who lost a hand or arm.	
Summary Statement Cockroaches were stimulated by a remote control to turn left or right at different time intervals.	
Help Received My father purchased a RoboRoach kit from Backyard Brains. He helped me understand the instructions from the RoboRoach kit.	