



# CALIFORNIA STATE SCIENCE FAIR

## 2010 PROJECT SUMMARY

Name(s) <b>Jeannie Tran; Van Tran; Katerina Trinh</b>	Project Number <b>S2412</b>
<b>Project Title</b> <b>Identifying Trends of Wolbachia pipiensis Infection in Various Species of Arthropods</b>	
<b>Objectives/Goals</b> The purpose of our experiment is to identify the infection patterns of the Wolbachia bacteria in arthropods through DNA analysis in order to better understand the proliferation of the Wolbachia gene and its effect on arthropod populations.	<b>Abstract</b> After identifying the sample arthropods, which were either store-bought or collected in nature, we used polymerase chain reactions (PCR) in order to replicate segments of the DNA strands of each sample. Through the use of agarose electrophoresis, we separated the DNA fragments by size and then stained the gels with ethidium bromide. The banding pattern on the gels indicated the presence or absence of Wolbachia in our samples.
<b>Methods/Materials</b> Though research is still being conducted, 132 arthropods have been tested thus far. The DNA of 50 samples were inconclusive and of the remaining 82 that tested positive for cytochrome c oxidase (the internal positive control for insect DNA), 34.1% were also positive for Wolbachia. Approximately 54.5% of commercially-bred arthropods tested positive for Wolbachia, compared to approximately 20.4% of the collected arthropods.	<b>Results</b> From our data, we may conjecture that the Wolbachia bacterium is ubiquitous, as even though all infected samples had similar backgrounds, they were not all collected from similar locations. This could either indicate that the bacterium is proliferating or that the bacterium is simply being discovered in an increasing number of species. Our data demonstrates that the presence of Wolbachia in store-bought, or commercially-raised, arthropods is higher than that in arthropods caught in nature. We may also conjecture that the bacterium is potentially communicable between different species rather than solely genetically transferred as previously thought. Our data indicates that the bacteria may exist in parts of the arthropod's physiology other than its reproductive organs, as the infected species are unlikely to have mated with one another and the ancestors of the infected arthropods are likely to have fed on the decaying matter of infected organisms.
<b>Conclusions/Discussion</b> We are identifying the presence of the Wolbachia bacterium in various arthropod species through DNA extraction, PCR, and electrophoresis in order to better understand the proliferation of Wolbachia and its effect on arthropod populations.	
<b>Summary Statement</b> We are identifying the presence of the Wolbachia bacterium in various arthropod species through DNA extraction, PCR, and electrophoresis in order to better understand the proliferation of Wolbachia and its effect on arthropod populations.	
<b>Help Received</b> BABEC Wolbachia workshop provided procedure guidelines; Borrowed equipment from SCCBEP; Mr. Allen handled ethidium bromide; Mr. Lyter identified arthropod species	