

## **Abstract**

Beneficial insect-microbial symbioses (mutualisms) are often essential for normal growth and development of the insect. The bacterial partners in these symbioses may provide novel targets for the development of new insecticides and transgenic crops, in light of rising incidences of insecticide resistance to conventional insecticides. Greater understanding of the bases and mechanisms underlying insect-bacterial mutualisms is needed to advance the development of these new strategies. In this regard, the proposed project aims to investigate the association between the Asian Longhorned beetle (ALB) (*Anoplophora glabripennis*), a wood boring cerambycid pest, and nitrogen fixing bacteria, which aid in nitrogen provisioning. My studies so far show the presence of nitrogen fixing bacteria in ALB larvae and the gene cluster that codes for the enzyme complex necessary for nitrogen fixation in bacteria extracted from the larval gut. I propose to use radio-labeled atmospheric nitrogen to determine if nitrogen fixed by gut bacteria is subsequently incorporated into proteins utilized by the insect. This step is necessary to confirm that the relationship between ALB and nitrogen fixing bacteria represents a true mutualism.