

II. Abstract

In recent years, several new methods of mosquito control have been developed. One of the most exciting of these is paratransgenesis, or the alteration of host biology through the use of a symbiont such as *Wolbachia*. In *Aedes aegypti*, infection with *Wolbachia* produces mosquitoes that are refractory for Dengue virus. However, no known *Wolbachia* strains are able to stably infect the malaria vector *Anopheles gambiae*. Genetically altered *An. gambiae* specific Densovirus (AgDNV) has been proposed as an alternative paratransgenic agent yet little has been done to develop such a tool. I have created an AgDNV construct capable of expressing small genetic segments such as miRNAs or miRNA sponges that bind to and deplete complementary miRNAs. This construct will be used to alter the levels of three host miRNAs and change mosquito gene expression. Manipulation of the selected miRNAs is known to reduce egg production and impede proper blood digestion, producing an easily detected change in phenotype. The experiments conducted will demonstrate the effectiveness of AgDNV as a paratransgenic agent capable of manipulating miRNA levels within *An. gambiae*. Once tested, this tool could be used for *An. gambiae* control or to determine the purpose of previously unstudied miRNAs. All requested funding will be used to conduct the assays necessary to validate this technique.