Development of novel, genetics-based control methods for blocking transmission of mosquito-borne pathogens

Anthony A. James, Nijole Jasinskiene, Zachary Adelman, and Nirmala Xavier. Department of Molecular Biology and Biochemistry, University of California, Irvine, CA 92697-3900 USA; aajames@uci.edu

Transgenic mosquitoes resistant to viral and protozoan pathogens are being developed to test the hypothesis that genetically-engineered vectors can be used to block transmission of diseases. We are focused on *Aedes aegypti* and the avian malaria parasite, *Plasmodium gallinaceum*, as a model to develop and test the basic approaches for malaria control, while *Ae. aegypti* also is the focus for dengue control strategies. In addition, we are working with *Anopheles gambiae* and the human malaria parasite, *P. falciparum*. We have characterized mosquito genes whose promoter sequences are candidates for controlling the expression of antipathogen effector genes, and developed stable transformation technology that will allow the integration of antipathogen genes into the vector germline. Single-chain antibodies and RNAi strategies are being pursued to produce antimalarial and antidengue effector molecules. Progress in these and other areas of genetic control will be discussed.