

## Models for species-specific regulated transposition in mosquitoes

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The long-term objective of our research is to develop strains of vector mosquitoes that are genetically refractory to the transmission of pathogens such as those that cause malaria and dengue fever. These insects will be used to test the hypothesis that an increase in the frequency of a gene or allele that confers decreased vector competence to a population of mosquitoes will lead to a reduction in the incidence and prevalence of that disease. Following the successful efforts demonstrating the possibilities for engineering synthetic effector genes that produce pathogen-refractory phenotypes in mosquitoes, we propose now to investigate specific drive mechanisms that would facilitate the safe and efficient spread of such genes in vector mosquito populations. We plan to take advantage of the progress made with mosquito transgenesis and the fundamental nature of embryonic development in insects to meet the need to research gene drive mechanisms. Toward these ends we are identifying the *cis*-acting DNA and promoter elements responsible for the specific expression patterns of the *nanos* (*nos*) orthologous genes in *Anopheles gambiae*, *An. stephensi* and *Aedes aegypti*. We plan to construct and test synthetic transposable elements composed of mosquito *nos* genes and selected transposons. The rationale and progress in these experiments will be presented.