

Modeling Gene Drive Systems

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Abstract

A great deal of attention has recently been given to the possibility of genetically modifying mosquitoes to prevent the transmission of malaria. In order to spread such a modified trait through the wild-type population, better than Mendelian inheritance is a necessity. To bring this about, various gene drive systems are being explored. Here, we develop and analyze continuous time and space models for two such systems: homing endonuclease and engineered underdominance. We also consider the use of the sterile insect technique as a tool in spreading modified traits.