1035-92-400 **Genevieve Y. Toutain*** (genevieve.toutain@asu.edu), 2430 S Mill Avenue #122, Tempe, AZ 85282, and **Pamela Reitsma** and **Sharon Crook**. *A Mathematical Model of the Drosophila Heart.*

The heart of *Drosophila melanogaster* is a tubular organ that contains two types of excitable cells which work together to pump hemolymph through the body. At the cellular level, specific ion channels involved in the heartbeat of *Drosophila* have been identified and studied using genetic mutations and pharmacological agents. In this work the *Drosophila* heart is modeled as a network of excitable cells in order to explore the biophysical mechanisms underlying the generation of the heartbeat. The model cells are arranged in a tubular shape to form a network connected by gap junctions. Pacemaker cells with an intrinsic rhythm are added at one end of the network model and generate a wave of contraction down the heart. Using the model, channel kinetics are manipulated to explore the effects of different channels on *Drosophila* heartbeat. Model results are compared to experimental data. (Received September 05, 2007)