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Abstract

Live Poster Session

Major: Biological Sciences

Faculty Mentor: Jeffrey Engel

Developmental Timing of a Novel Wing Phenotype in K⁺-channel Mutant *Drosophila*

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The conduction of action potentials in neural and muscle cells is initiated by ion channels. In the fruit fly, *Drosophila melanogaster*, two potassium channel gene mutations, *eag1* and *Sh120*, increase excitability of flight muscles and motor neurons. Some double mutants express an abnormal “wings-down” phenotype angling the wings downward instead of folded across the back, which cannot be used for flight. An environmental condition, an increase in rearing temperature, increases the proportion of *eag1Sh120* flies displaying this phenotype (Engel and Wu 1992). Our goal is to understand how environmental conditions interact with the influence of ion channel mutations on behavioral effects such as the abnormal wing-position phenotype. The objective is to determine if there is a critical period in fly development when *eag1Sh120* double mutants are most susceptible to high temperature inducing the wings-down phenotype. Flies will be placed into four groups. Groups 1 and 2 will be controls placed at 18°C and 25°C respectively for the duration of development. Groups 3 and 4 will be experimental groups: one will be placed at 18°C during embryonic and larval stages, then switched to 25°C for pupal and adult stages, while the other group will start at 25°C and be switched to 18°C for pupal and adult stages. By assessing wing phenotypes of the adult flies, we can determine if there is a critical period in development increasing susceptibility to the wings-down phenotype pre- or post-pupation, which can lead to further experiments to isolate the timeframe when wing position state is determined.