

WIU CENTENNIAL HONORS COLLEGE
Thomas E. Helm Undergraduate Research Day 2022

Abstract

Poster

Major Biology

Faculty Mentor: Jeffery Engel

Documenting the development of a wings-down phenotype in *Drosophila* fruit flies that carry potassium channel mutations

Cali Wilson

Potassium ion channels in the membranes of neurons and muscle cells are crucial for moderating excitability in cells. Mutations of K⁺ channels in *Drosophila melanogaster* let us see how hyperexcitability in the nervous system alters behavior. In fly stocks mutant for two K⁺-channel genes, *Eag*¹ and *Sh*¹²⁰, a subset of adults carry their wings bent downward. This wings-down phenotype is presumed to result from hyperexcitability of the neurons and muscles of the mutant flies. The development of the wings-down phenotype has never been described. I will study how the wings-down phenotype manifests in K⁺-channel-mutant *Drosophila*. My hypothesis is that the DLM (dorsal longitudinal flight muscles, or wing depressor muscles) contracts too much which pulls the wings down, as the cuticle hardens during tanning. If the hypothesis is supported, the activity level including wing movements is significantly correlated to acquiring wings-down in individual mutant *Drosophila*. An absence of correlation between the activities and the acquisition of the phenotype, would contradict the hypothesis. I will watch to see when and how the wings down phenotype occurs in newly emerged adults and characterize their level and kind of activity. I will compare wings-down and normal winged mutant flies, and also compare mutant flies of both phenotypes with non-mutant flies (which never acquire wings-down).