

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

**Abstract**

Poster

Major Biology

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**Developmental timing of a novel wing phenotype in K<sup>+</sup>-channel mutant *Drosophila***

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The conduction of action potentials in nerve and muscle cells is initiated by ion channels in the membrane of those cells. In the fruit fly, *Drosophila melanogaster*, I have studied three potassium channel genes, *eag1*, *Sh120*, and *Hk1*, that increase the excitability of flight muscles and motor neurons. *Eag1Sh120* and *Hk1eag1* double mutants can express an abnormal “wings-down” morphological phenotype.

In *eag1Sh120*, it was known that increasing rearing temperature increases the frequency of flies that are wings-down (Engel and Wu 1992). Our objective here was to determine the time in development when the wings-down phenotype is determined by seeing when it is most susceptible to an increase in rearing temperature. Two treatment groups were reared at high temperature up until the start of pupation or from pupation onward. High temperature from pupation onward produced a significantly larger number of wings-down flies.

For the *Hk1eag1* flies, our goal was to see if wings-down penetrance in these flies is also affected by an increase in rearing temperature. Three groups of flies were set at different rearing temperatures and wings-down penetrance was evaluated. This genotype also showed an increase in wings-down percentage with increasing rearing temperature. This supports the hypothesis that wings-down arises by the same process in both of these genotypes, and is most likely due to hyperexcitability of neurons and muscle cells as a result of their potassium channel gene mutations.