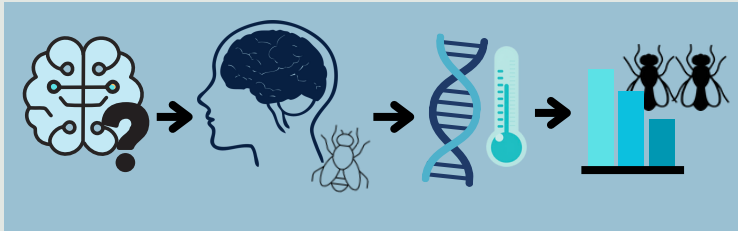


Analyzing the Developmental Effect of AKH Suppression on Drosophila Memory

Madison Lee, 85 Prescott St. Worcester, MA

Research Question: Does AKH suppression in Drosophila larvae have significant effects in cognition as the larvae mature into adults?

Hypothesis: Suppressing AKH signaling during larval development will result in impaired odor habituation and reduced cognitive performance in adult Drosophila.



Olfactory habituation is a reliable way to test Drosophila memory.

Data Analysis & Results

Short Term Olfactory Habituation

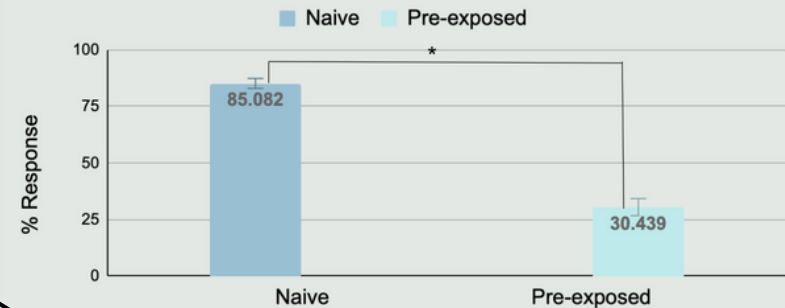
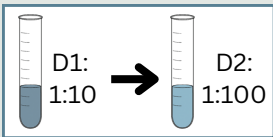


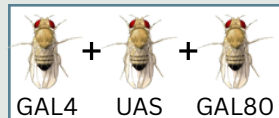
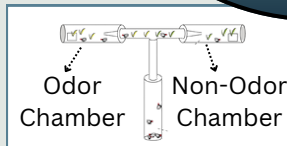
Figure 1. Naïve flies show significantly higher avoidance responses than odor pre-exposed flies. Bars represent mean \pm SEM. A two-sample t-test indicates a significant difference ($t = 12.513$, $p = 0.01125$) *--(p -value <0.05).

Methodology



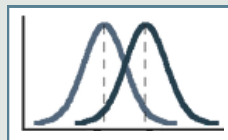
Isoamyl acetate diluted to 1:100 in mineral oil for odor

Naïve and pre-exposed adults tested in odor T-maze. Performance Index (PI) and 2 sample T-test calculated



AKH suppressed using and crossing GAL4/UAS with GAL80

Naïve and pre-exposed AKH-manipulated adults tested. Mean PI compared to wild-type with 2 sample T-test



Conclusions & Interpretation

Odor pre-exposure caused a **significant reduction in avoidance behavior**, indicating successful short-term olfactory habituation in wild-type Drosophila.

- Naïve flies showed ~85% avoidance, while pre-exposed flies showed only ~30%, producing a large behavioral shift.
- A two-sample t-test confirmed this difference was **statistically significant**