



Identifying genetic background effects for cancer susceptibility

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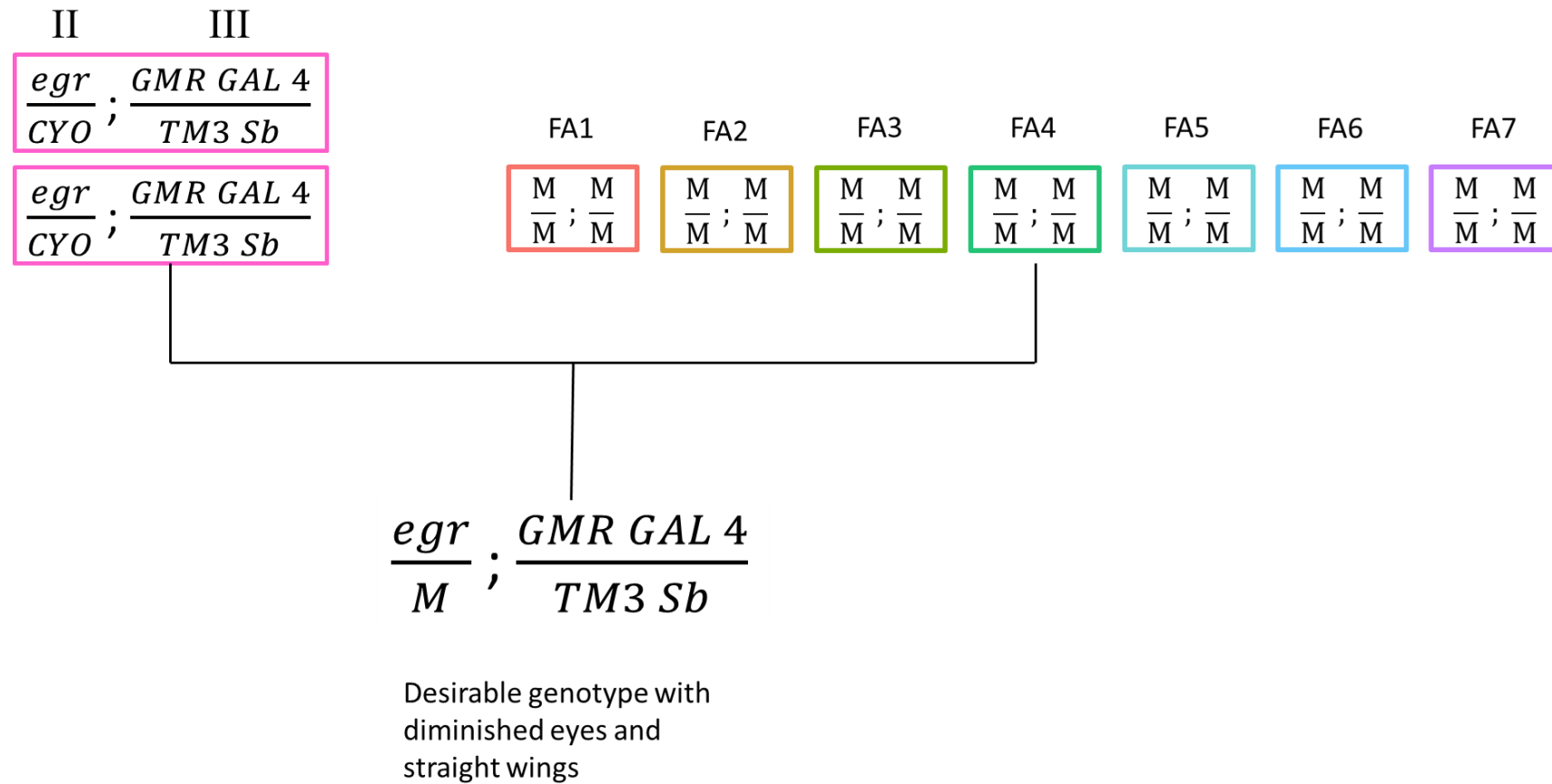
SENIOR BIOLOGICAL SCIENCES

Background

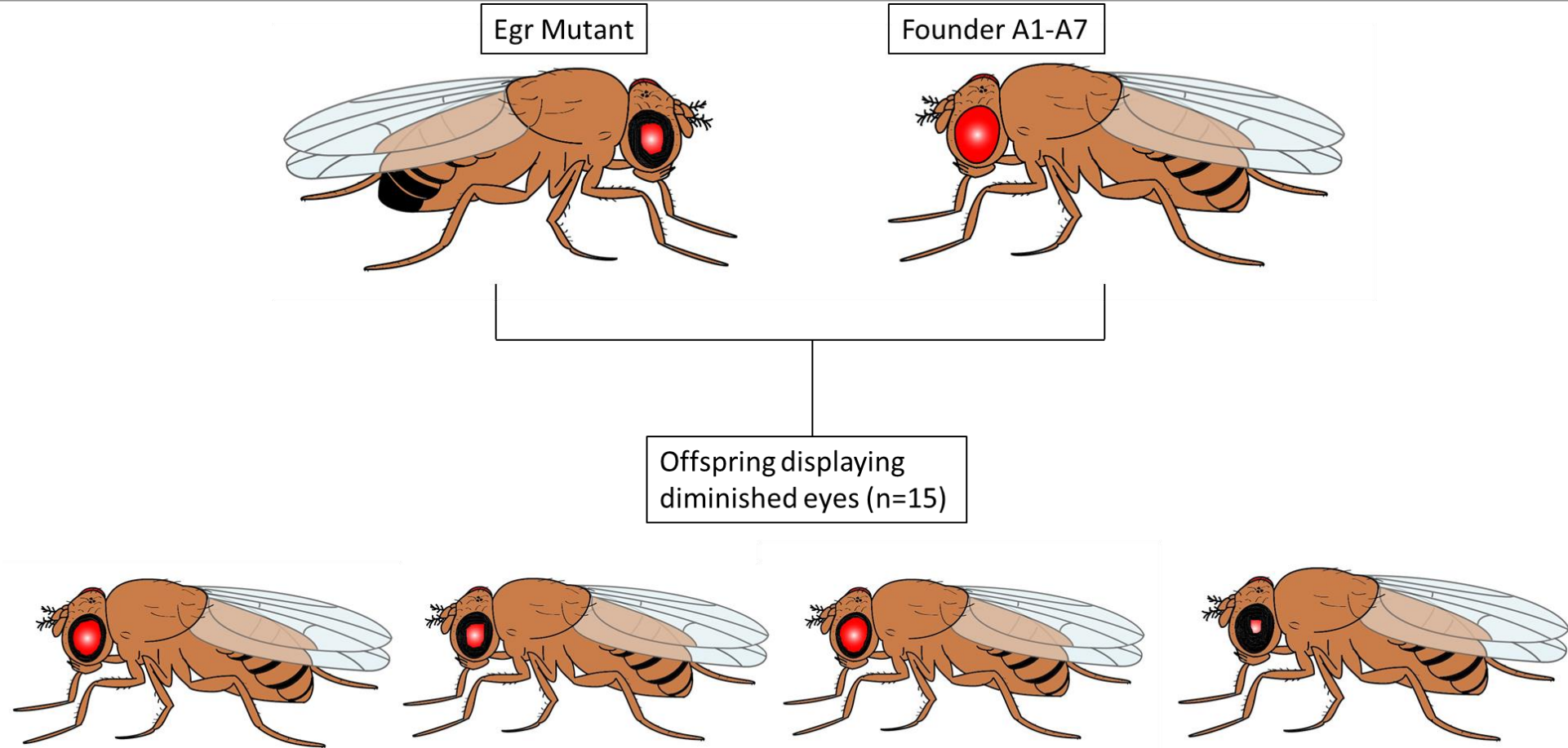
- This project used *Drosophila melanogaster* to identify genetic background effects on the severity of a cJUN NH2-terminal kinase (JNK) mutation.
- JNK is a tumor-suppressor and regulator of cell proliferation. When mutated, the JNK gene loses control of its regulatory capabilities, causing cells to enter premature death cycles.
- One of the noticeable effects of the JNK mutation is that yields a phenotypic variation of decreased eye pigment due to increased cell death.
- Our project aimed to observe the heritability and prevalence of this JNK mutation in crosses with wild-type flies



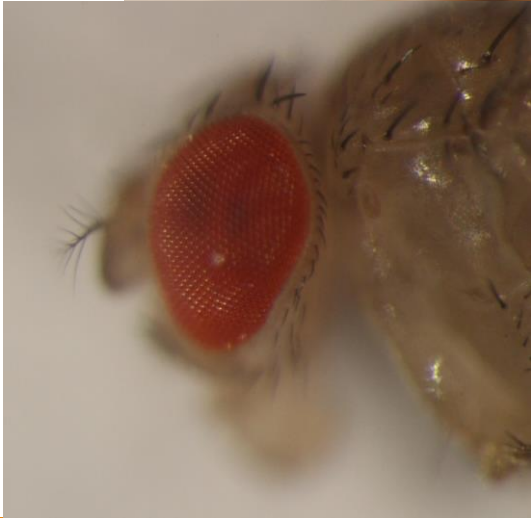
The Mutated *Egr* Gene and genotypes



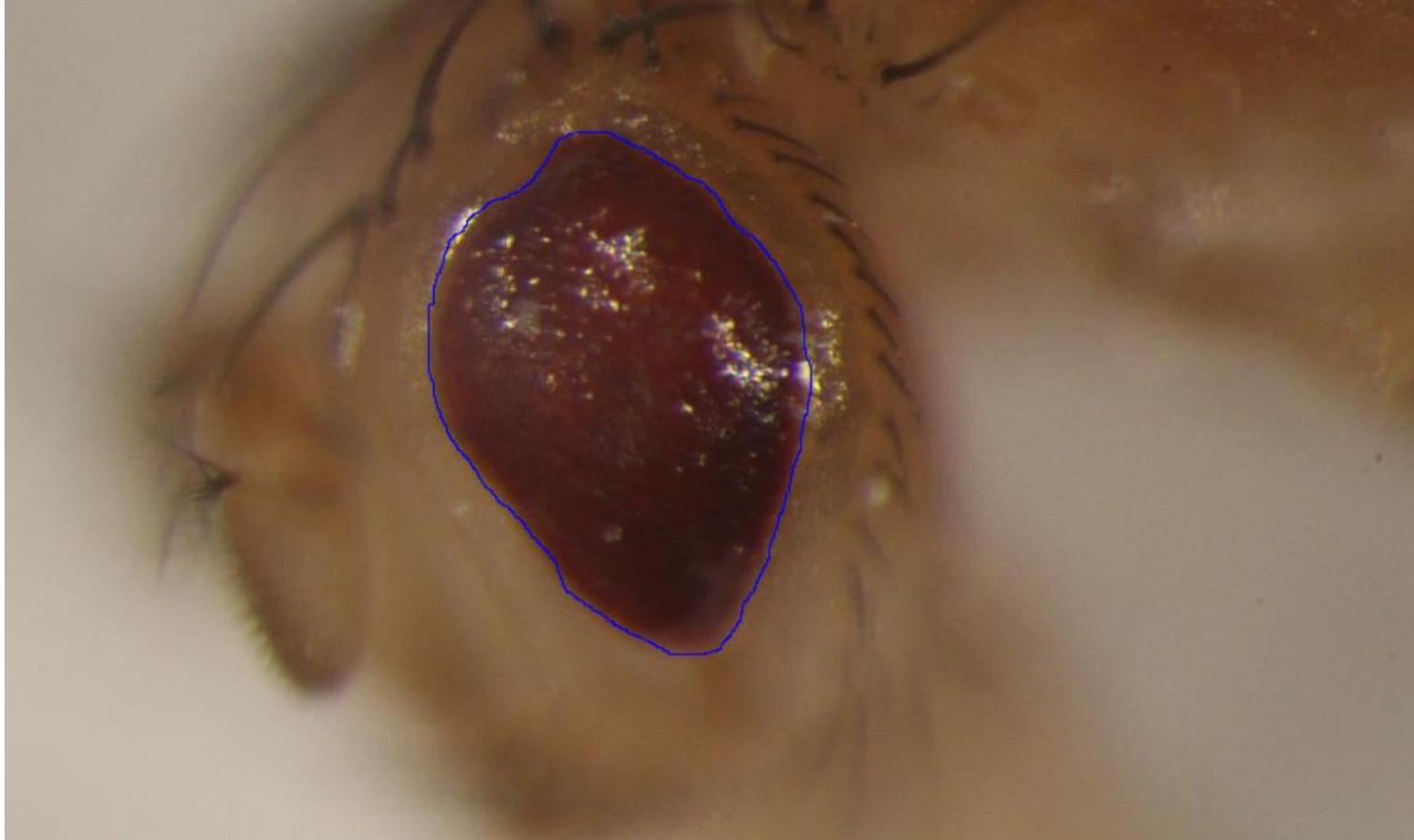
Desired Phenotypes



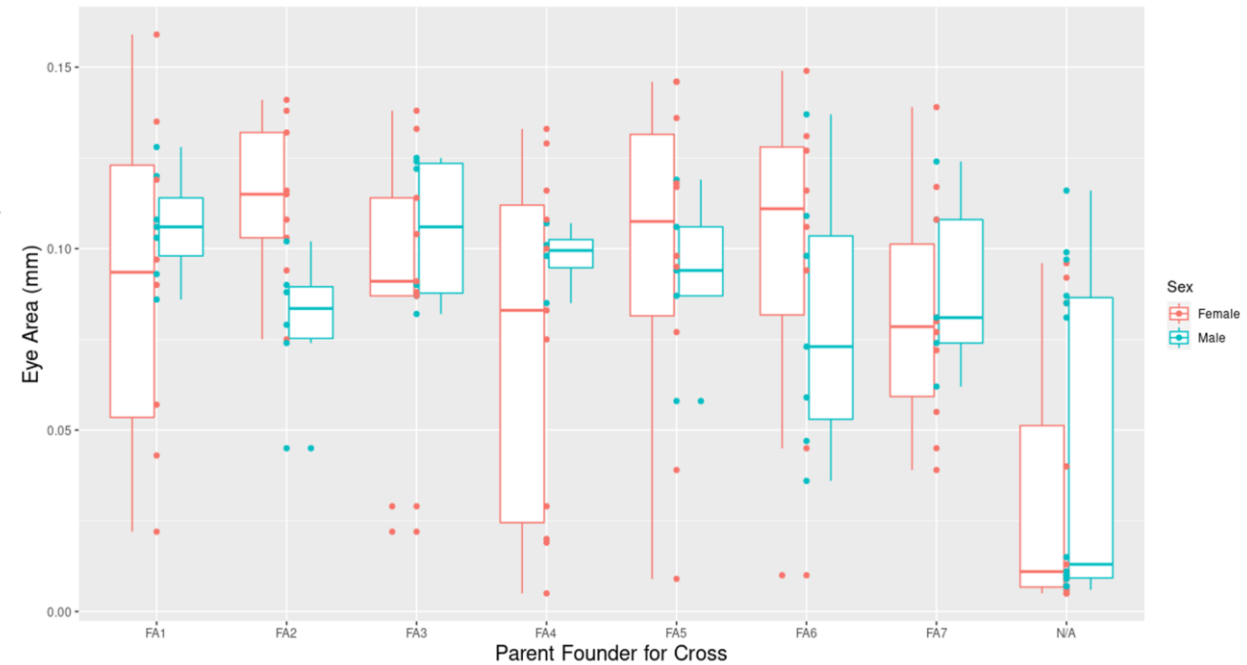
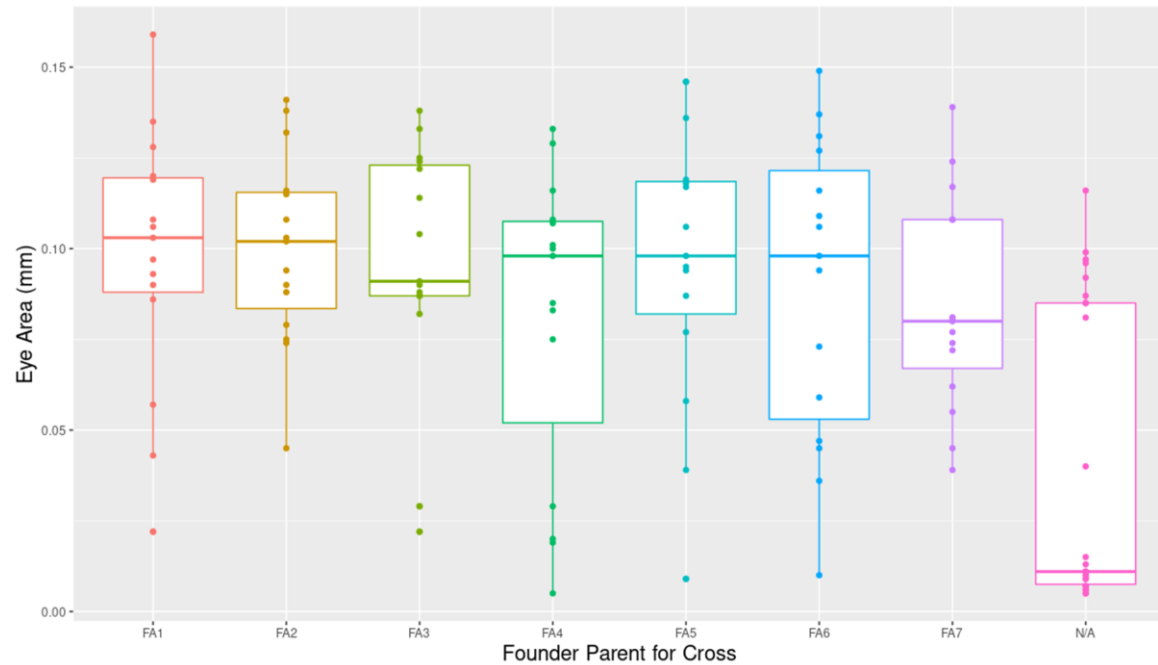
Imaging



Measuring Images



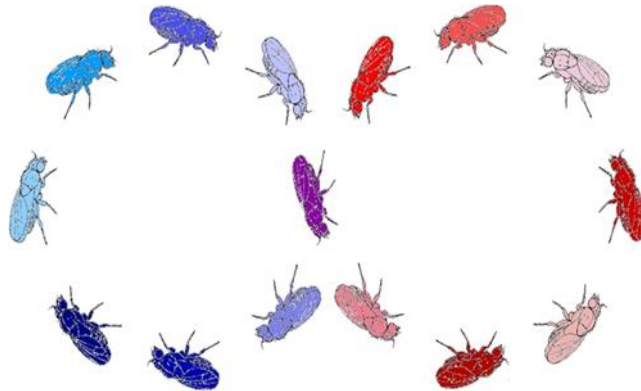
Results and Plots



Pr(>F)
 $1.33\text{e-}06$ ***

Discussion

- We found that there was a significant difference between the eye size of original mutated flies and their crossed offspring
- This signifies that the mutated gene is passed down, but to a diminished extent
- Sex was found to be a significant background effect.
- The observation of the CYO (curly wing) and TM3 Sb (stubby bristle) genes are next steps

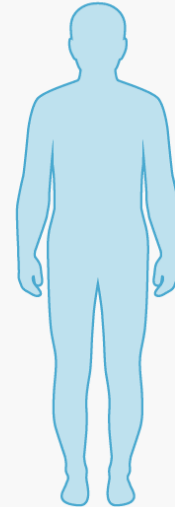


Significance

- Important first step in identifying background effects of cancer susceptibility
- Large variation of founder lines is ideal for detecting novel effects
- Around 60% of human DNA is conserved in flies so this could be similar in our genes
- Could lead to a better understand of the variables involved in cancer susceptibility

The genetic similarity
between a human
and a fruit fly is:

61%



Thank You

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