



StarGenetics

## Fruit Fly Exercise 6

### Description of StarGenetics

In this exercise you will use StarGenetics, a software tool that simulates mating experiments, to analyze the nature and mode of inheritance of specific genetic traits.

### Getting started with StarGenetics

- To get to StarGenetics, please navigate to: <http://web.mit.edu/star/genetics/>.
- Click on the **Start** button to launch the application.
- Click **Trust** when a prompt appears asking if you trust the certificate.
- Click on **File -> New** on the main menu.
- Click on the **Fruit Fly Exercise 6** file.

You are studying the synthesis of a pigment that determines eye color in a species of the common housefly. Synthesis of this pigment involves a multi-step pathway. Each step of the pathway is catalyzed by a specific enzyme and each enzyme is encoded by one gene.

Wild type flies have red eyes. A fly that is missing the function of any of the enzymes in this pathway has different eye color. You identify the genes encoding the enzymes involved in the eye pigment pathway through a mutant hunt. You collect eight mutants. For answering the questions below, you may assume that the enzymes controlling eye color act in a linear pathway and that the genes that code for them act independently.

**1** *Based on the information provided, arrange the mutants into different complementation groups.*

**Answer**

**2** *Mate the mutant flies to determine the order of the enzymes and the respective eye-color intermediates of this multi-step pathway.*

- You can set up a cross by dragging the specific parent flies to the **Mating site** and by clicking on the **Mate** button.
- Mating results can be seen on the **Summary** tab and each resulting offspring can be viewed by clicking on the **Individual** tab.
- To add additional progeny, click on the **Mate** button until you obtain the desired number of progeny.
- To keep track of your experiments, you can click on the **Save experiment** button in the main menu and rename your experiment.



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**Answer**

**3** Describe the key crosses that you did to determine the order of the mutant flies within the pathway, their outcomes, and the conclusion that you drew from each of these crosses.

**Answer**