LABORATORY 5, EXERCISE 1. CHROMOSOME MAPPING

Purpose

The purpose of this Laboratory is to increase your understanding of linkage and how gene loci locations can be used to map genetic information to individual chromosomes. You will be using the Fly Lab program again to perform mating experiments to examine linkage between three assigned genes. Your TA will walk you through the protocol for this exercise.

Exercise Protocol

1. Launch the Fly Lab Colony (https://cws.auburn.edu/FlyLab) and open a LINKAGE cross.

2. Select the MALE parental fly and enter the mutant traits provided by your TA.:

Body Color:

Eye Color:

Wing Shape:

3. Select the number of offspring you wish to produce and MATE the parental flies.

4. Select the F1 MALE offspring (move your cursor over the fly and make sure it is highlighted in blue).

5. Select the same number of offspring you chose above. The corresponding PARENTAL fly (FEMALE in this case) is automatically selected to mate with the F1 offspring in a BACKCROSS.

6. Cross the flies to produce an F2 Generation and record all the data below.

7. Follow the instructions provided in the Background and Significance document to determine the order of the genes (if possible).

8. Calculate the Recombination Frequencies between the provided loci and record your conclusions on the data sheets.

9. Determine Interference for your double crossovers and answer the questions following this exercise.

GENETIC CROSS

LAB 5 EXERCISE 1 - DATA SHEET

NAME: [ ]

	Category	Trait
TRAIT 1:	[ ]	[ ]
TRAIT 2:	[ ]	[ ]
TRAIT 3:	[ ]	[ ]

Parentals

	Male		Female
Phenotype	[ ]	x	[ ]
Genotype	[ ]	x	[ ]

F1 Generation

	Male		Female
Phenotype	[ ]	x	[ ]
Genotype	[ ]		[ ]

F2 Generation

Observed	Phenotype	Genotype
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]
[ ]	[ ]	[ ]

	Gene 1	Gene 2	Gene 3
Gene Order:	[ ]	[ ]	[ ]

Gene 1 : Gene 2 Recombination Frequency [ ]

Calculations: (list all crossover progeny along with their phenotype and show your work for the RF calculation)

[ ]

Gene 2 : Gene 3 Recombination Frequency [   ]

Calculations: (list all crossover progeny along with their phenotype and show your work for the RF calculation)

[   ]

Gene 1 : Gene 3 Recombination Frequency [   ]

Calculations: (list all crossover progeny along with their phenotype and show your work for the RF calculation)

[   ]

Interference : [   ]

Calculations:

[   ]

What does the Interference calculation tell you about the linkage of these three genes?

[   ]