COURSE: BIOL3001 GENETICS NAME:

LABORATORY 5, EXERCISE 2. CHROMOSOME MAPPING

Purpose

The purpose of this Laboratory is to give you practice in performing linkage experiments and a better understanding of how genetics laboratories use these same exercises to map genes for different organisms. You will essentially be performing the same type of experiment that Morgan Hunt's Cal Tech Fly Lab performed only you will not have to wait for flies to make. You will be using the Auburn Fly Lab computer program to speed all those steps up.

You will also be working as a group for this assignment (the entire lab section will be working toward the goal of mapping the Drosophila genes you are provided). Some of this information you may already have from last week's Chromosome Location lab. The rest of it you will deduce during today's lab session. Use what you know and what you are given to map all the unknown genes to their specific chromosomes and provide their mad distances. You MUST provide the CORRECT LOCATION for each gene and put the genes in the CORRECT ORDER. Distribution of labor and a good plan of action, should let everyone in the lab complete the exercise, but it will take everyone working together.

Exercise Protocol

1. Launch the Fly Lab Colony (https://cws.auburn.edu/FlyLab) and open a LINKAGE cross.
2. Select the MALE parental fly to use for your mutant traits. Choose the traits you wish to map from the list in Exercise 3 and assign to the male.
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 in the data sheets provided. You probably have more data sheets than you will need so don't feel that you need to use all of them but they are there for you use if you need them. If you need more, open the file again and just keep going!
7. Fill in the CHROMOSOME MAPPING SHEET in Exercise 3 of this module as you complete your mapping. You will need to place the genes in the correct order and you will need to provide the map distances on the mapping sheet. You really only need one mapping sheet for the entire lab.

HINT – Develop a plan and a division of labor to make the best use of your time. There is no need for everyone to map each and every gene. BE SMART about how you set this exercise up!!

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 1

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 2

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 3

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 4

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 5

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 6

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 7

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 8

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 9

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)

GENETIC CROSS

LAB 5 EXERCISE 2 - DATA SHEET 10

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)