COURSE: BIOL3001 GENETICS LAB NAME:

LABORATORY EXERCISE 1. FLY COLONY EXERCISE

Purpose

The purpose of this exercise is to acquaint you with the Electronic Fly Colony program and increase your understanding of basic Mendelian principles.

Exercise Protocol

Your assignment is:
1. Determine for your trait, which phenotype is dominant (Wild or your mutant).
2. Using Chi-squared analysis, demonstrate that the F_2 offspring fit a **3:1** expected ratio.

Steps for this Exercise:

1. Choose one of the following **TRAITS** to examine:

Black Body	**Stubble Bristle**	**Brown Eye**
Sepia Eye	**Lobe Eye**	**Curled Wing**

2. Launch the **FLY COLONY** program on Canvas and select MENDELIAN CROSS.
3. For the MALE parent, use the drop boxes to find your desired trait.
4. Select your phenotype chosen above.
5. Mate the parents, selecting any number of offspring that you prefer.
6. Record the results on the data sheet for LABORATORY EXERCISE 1. Take a moment to think about your results.
   a. *Do the offspring look like either parent?*
   b. *Are the numbers of males and females equal for each phenotype?*
   c. *Are both the mutant and Wild phenotypes present?*
   d. *Did any new phenotypes appear?*
7. Mate the F_1 offspring to produce F_2 offspring and record the results on the LABORATORY EXERCISE 1 data sheet.
8. Using the Chi-Squared Test at the bottom of the F2 Generation page, calculate the Chi-Squared for your results and enter that data on your data sheet as well.
9. Answer the <u>Exercise 1 questions</u> on the following pages.

GENETIC CROSS

DATA SHEET (Exercise 1)

NAME:

TRAIT: **PHENOTYPES CROSSED:** **Male** X **Female**

CROSS DIAGRAM

Parentals	**Male**		**Female**
Phenotype		**x**	
Genotype		**x**	

F1 Results	**Male**	**Female**
Phenotype		
Genotype		

Parents for F2	**Male**		**Female**
Phenotype		**x**	
Genotype		**x**	

F2 Results ***Predicted Segregation Ratio*** **=** **phenotype** **ratio** : **phenotype** **ratio**

Gender	**Phenotype**	**Genotype**	**Exp Number**	**Obs Number**

Chi-Squared Test (enter values from F2 Generation Page, combine sexes to one phenotype)

Phenotype	Observed	Expected	O - E	$(O – E)^2$	$(O – E)^2 / E$
TOTAL					

Observed Chi – Squared Value =

Degrees of Freedom (*df*) =

Table Value (0.05) =

Overall Conclusion = --

CONCLUSIONS:

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A. Which phenotype (Wild or your mutant) is **Dominant**?

B. Defend your answer by listing at least two pieces of evidence from your data.

C. Why is your initial predicted segregation ratio 3:1?