

# Exercise 4

## Genetics

### Learning Objectives

After completing this exercise, you should be able to do the following:

1. Predict the results of crosses involving one or two autosomally linked traits.
2. Predict the results of crosses involving single X-linked traits.
3. Perform crosses using the classical genetic organism, *Drosophila melanogaster*.
4. Analyze data using a simple statistical test.
5. Describe the principles of segregation and independent assortment and use these principles in solving problems involving monohybrid, dihybrid, and X-linked crosses.

### Prelaboratory Quiz

Study this week's laboratory exercise and then complete the following quiz to assess your preparation for the laboratory.

1. Two chromosomes containing genes coding for the same group of traits are called
  - a. allelic chromosomes.
  - b. homologous chromosomes.
  - c. homozygous chromosomes.
  - d. heterozygous chromosomes.
2. A gene that, when present, is always expressed is said to be
  - a. dominant.
  - b. recessive.
  - c. homozygous.
  - d. heterozygous.
3. The genes that code for alternate expressions of a trait are called
  - a. alleles.
  - b. homologous genes.
  - c. homozygous genes.
  - d. recessive genes.
4. Use the word "alleles" or "genes" to fill in the following blanks.
  - a. The two \_\_\_\_\_ for body color studied in this week's laboratory are ebony and wild.
  - b. Diploid organisms possess two sets of chromosomes containing \_\_\_\_\_ that code for the same traits, but not necessarily the same expression of those traits.
  - c. When a fly has the recessive ebony phenotype, both \_\_\_\_\_ coding for the body color trait must be the same.
5. True/False A fruit fly that has sex combs on its prothoracic legs; a genital plate; and a dark, wide band at the tip of the abdomen is a female.
6. True/False Fruit flies have four larval instar stages and a pupal stage.