



Name

Period

Date

SECTION

7.1

CHROMOSOMES AND PHENOTYPE

Reinforcement

KEY CONCEPT The chromosomes on which genes are located can affect the expression of traits.

There are two types of chromosomes: autosomes and sex chromosomes. Genes on the sex chromosomes determine an organism's sex. Autosomes are all of the other chromosomes, and they do not directly affect sex determination. Gene expression can differ depending on the type of chromosome on which a gene is located.

- **Autosomal genes:** There are two copies of each autosome, which means that there are two copies of each autosomal gene. However, the two copies of a gene may be different alleles. Both copies of a gene can affect phenotype. Much of what has been learned about human genes comes from studies of genetic disorders. Many genetic disorders are caused by recessive alleles on autosomes. People who have one dominant allele and one recessive, disorder-causing allele, do not have the disorder, but can pass it on because they are **carriers** of the disorder.
- **Sex-linked genes:** Genes on the sex-chromosomes (the X and Y chromosomes in many species) are **sex-linked genes**. In mammals, including humans, and some other animals, XX individuals are female and XY individuals are male. Because males have only one copy of each sex chromosome, all of the genes on each chromosome will be expressed. Expression of sex-linked genes in females is similar to the expression of autosomal genes: two copies of each gene can affect phenotype. However, one X chromosome in each cell is randomly turned off by a process called **X chromosome inactivation**.

CHAPTER 7
Extending Mendelian Genetics

1. What is the pattern of expression for autosomal genes?

2. What is a carrier?

3. What are sex-linked genes?

4. What are the patterns of expression for sex-linked genes?

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