

Skills Worksheet

Active Reading

Section: Genome Interactions

Read the passage below. Then answer the questions that follow.

Gene regulation plays an important role in the developmental process of cell differentiation in multicellular organisms.

Homeotic genes are a group of regulatory genes that control differentiation. Scientists first discovered these genes in fruit flies. Mutations in these genes called homeotic mutations can cause strange traits, such as one body part developing in place of another body part; for example, a leg in place of an antenna.

Homeotic genes are common throughout many genomes. And these genes always seem to control similar developmental processes by similar mechanisms. All homeotic genes code for transcription factors that control the expression of other genes. Many homeotic genes contain a similar sequence of 180 bases called a *homeobox*. The homeobox codes for a protein with a DNA-binding domain.

In general, the genetic regulation of development seems to be similar in all animals. A specific set of homeotic genes, called *hox*, is found in all animals that have a head end and a tail end. Hox genes affect the body plan of an organism.

READING EFFECTIVELY

Read each question, and write your answer in the space provided.

1. What does the last sentence in the first paragraph describe?

2. Reword in your own terms the difference between a homeotic gene and a homeobox.

Active Reading *continued*

3. What is *hox*?

4. What can you infer from the second paragraph about transcription factors and how homeotic genes work?

In the space provided, write the letter of the phrase that best completes the statement.

- _____ 5. Homeotic mutations can lead to
- a. changes in development.
 - b. changes in body plan layout.
 - c. legs growing on the head of a fly
 - d. All of the above