

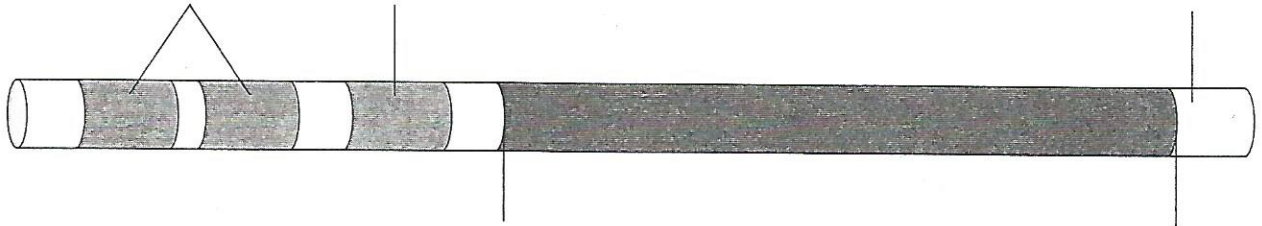
Section 12-5 Gene Regulation (pages 309–312)

Key Concepts

- How are *lac* genes turned off and on?
- How are most eukaryotic genes controlled?

Introduction (page 309)

1. Label the parts of a typical gene in the diagram below.



2. Where does RNA polymerase bind? _____
3. Is the following sentence true or false? The actions of DNA-binding proteins help to determine whether a gene is turned on or turned off. _____

Gene Regulation: An Example (pages 309–310)

4. What is an operon? _____

5. What is the function of the genes in the *lac* operon? _____

6. Circle the letter of each sentence that is true about lactose.
 - a. Lactose is a simple sugar.
 - b. To use lactose for food, *E. coli* must take lactose across its cell membrane.
 - c. The bond between glucose and galactose must be broken in order for *E. coli* to use lactose for food.
 - d. Proteins encoded by the genes of the *lac* operon are needed only when *E. coli* is grown on a medium containing glucose.
7. What turns the *lac* operon off and on? _____
