

Directed Reading**Section: Gene Regulation and Structure**

Complete each statement by writing the correct term or phrase in the space provided.

1. To break down lactose, *Escherichia coli* need three different _____, each of which is coded for by a different gene.
2. The three genes are located next to each other, and all are controlled by the same _____ site.
3. The piece of DNA that overlaps the promoter site and serves as the on-off switch is called a(n) _____.
4. The group of genes that codes for enzymes involved in the same function, their promoter site, and the operator all function together as a(n) _____.
5. The operon that controls the metabolism of lactose is called the _____.

6. A(n) _____ is a protein that binds to an operator and physically blocks RNA polymerase from binding to a promoter site.

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

7. What are enhancers?

8. Why is there more opportunity for gene regulation in eukaryotic cells than in prokaryotic cells?

9. Why have no operons been found in eukaryotic cells?

Directed Reading continued

10. When can gene regulation occur in eukaryotic cells?

11. What are introns and exons?

12. What happens to mRNA that includes introns?

13. What might be the evolutionary advantage of genes being interrupted by introns?

Complete each statement by underlining the correct term or phrase in the brackets.

14. Mutations can only be passed on to offspring if they occur in [gametes / body cells].
15. Mutations that change one or just a few nucleotides in a gene on a chromosome are called [random / point] mutations.
16. If a mutation causes a gene containing the nucleotide sequence ACA to become ACT, the mutation is called a [substitution / deletion] mutation.
17. If a mutation causes a sequence of nucleotides to change from ACGAGA to ACGGA, the mutation is called a(n) [insertion / deletion] mutation.
18. If a mutation causes a sequence of nucleotides to change from ACGAGA to ACGAGGA, the mutation is called a(n) [insertion / deletion] mutation.