

CHAPTER 10 STUDY GUIDE

FROM GENES TO PROTEINS

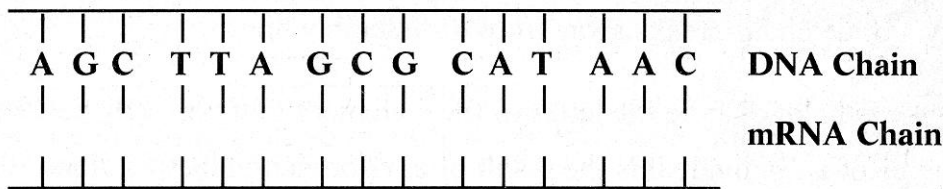
Section 10.1 Polypeptide Synthesis

In your textbook, read about transcription.

Complete the table by checking the correct column for each statement.

Statement	DNA	RNA
1. Contains ribose		
2. Composed of a double chain of nucleotides		
3. Contains deoxyribose		
4. Contains uracil		
5. Contains thymine		
6. Composed of a single chain of nucleotides		

7. Label the diagram by completing the sequence of nitrogen bases in the mRNA. Use these letters: A, U, C, G, T.



Answer the following questions.

8. What is it that acts as a template for making RNA?
9. What is meant by transcription?
10. What are two types of RNA?
11. Which type of RNA is transcribed from DNA and contains the code for polypeptide formation?
12. What is the difference between an intron and an exon?
13. What is mRNA processing?
14. What happens to mRNA after processing is complete?

FROM GENES TO PROTEINS

Section 10.1 Polypeptide Synthesis continued

In your textbook, read about translation, DNA and phenotypes, and composition of eukaryotic chromosomes.

15. Order the steps in translation from 1 to 8.

- _____ The tRNA anticodon recognizes the mRNA codon, and the two molecules join.
- _____ At the end of the mRNA strand there is a codon, for which no tRNA molecules have anticodons to match; therefore, translation stops.
- _____ An mRNA codon attaches to a ribosome.
- _____ Once the first and second amino acids are in place, they bond together; then, the first tRNA is released.
- _____ A tRNA molecule approaches, carrying its amino acid.
- _____ The second mRNA codon is joined by the proper tRNA molecule with its amino acid.
- _____ The process continues as the ribosome moves along the mRNA strand and a polypeptide chain grows.
- _____ The polypeptide chain breaks away from its assembly line.

16. Read the statements below. Circle the letter of the statement that correctly defines phenotype

- a. The phenotype of an individual is the result of environmental factors alone. Thus, phenotype is unrelated to DNA and so, has no chemical basis.
- b. The phenotype of an individual is the result of the particular proteins that are produced as the individual's genes are expressed. Thus, all phenotypes have a chemical basis.
- c. An individual's phenotype results from particular genes that are produced as the individual's proteins are expressed. Thus, all phenotypes have a chemical basis.

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

- 17. Most of the DNA in a eukaryotic chromosome *codes* for polypeptides.
- 18. DNA regions called *pseudogenes* do not code for functional polypeptides.
- 19. The presence of repetitive DNA can be a(n) *disadvantage* to a cell.
- 20. Having multiple sets of genes allows the cell to make RNA molecules quickly, which allows the cell to synthesize *carbohydrates* rapidly.
- 21. An estimate is that only *one percent* of the total DNA in a eukaryotic cell actually codes for polypeptides.