

DNA and Protein Synthesis

Objectives

1. Know the scientists who contributed to our current understanding of DNA and protein synthesis.
2. Distinguish among the types of DNA and RNA.
3. Outline the steps of DNA replication.
4. Describe the controlling mechanism of DNA replication.
5. Outline the steps of transcription and translation.
6. Discuss the effects of types of mutations on replication, transcription, and translation.
7. Diagram the operon model of genetic control in prokaryotes.
8. Diagram the model of genetic control in eukaryotes.
9. Compare and contrast prokaryotic and eukaryotic genomes.
10. Describe mechanisms by which gene expression is regulated.
11. Describe methods of inserting DNA into cells.
12. Describe practical applications and potential legal or ethical problems that may arise from DNA technology.

Key Terms

Chapter 16

DNA ligase
double helix
excision repair
Frederick Griffith
helicase
Hershey-Chase
lagging strand
leading strand
mismatch repair
Okazaki fragments
phages
primase
primer
semi-conservative model
transformation
Watson and Crick

Chapter 17

one gene-one polypeptide hypothesis
Beadle and Tatum
deoxyribose
ribose
transcription
translation
messenger RNA
triplet code
codons
RNA polymerase
transfer RNA
anticodon
aminoacyl-tRNA synthetase
ribosomal RNA
P site
A site
point mutations
base-pair substitutions
frameshift mutation