

Protein Synthesis

Questionnaire pre and post activity

Objectives of the activity

■ State the steps involved in protein synthesis

o Describe the events of transcription; use the terms:

- *Template strand*
- *Base pairing*
- *mRNA*
- *mRNA splicing*

o Describe the events of translation and protein synthesis:
use the terms

- *initiation*
- *tRNA*
- *codon*

- *start codon*
- *anticodon*
- *ribosome*
- *amino acid*
- *elongation of the polypeptide*
- *termination*
- *protein folding*

■ State where transcription and translation occur in the cell

o Describe how proteins are transported and excreted from the cell

1. During protein synthesis, which molecule serves as the template for mRNA synthesis?

- a) tRNA
- b) rRNA
- c) DNA
- d) mRNA

2. Which of the following is a characteristic of mRNA?

- a) It carries amino acids to the ribosome during translation.
- b) It contains the genetic code for protein synthesis.
- c) It catalyzes chemical reactions during protein synthesis.
- d) It forms a part of the ribosome.
- e) All of the above are characteristic of mRNA.

3. Which of the following mRNA sequences is complementary to the DNA sequence CGAAT?

- a) GCUUA
- b) GCTTA
- c) AUUCG
- d) ATTCG

4. During translation, which of the following processes occur in the ribosome?

- a) Separation of the two strands of the DNA double helix
- b) Synthesis of mRNA
- c) Pairing of the tRNA anticodon with its corresponding codon
- d) Formation of alpha helices and beta pleated sheet
- e) Two of these answers are correct

5. Which of the following statement about transcription is true?

- a) Transcription occurs in the cytoplasm.
- b) Transcription produces a complementary RNA strand to the DNA template.
- c) Transcription involves the synthesis of DNA from an RNA template.
- d) Transcription produces a protein directly.

6. In translation, what is the role of the anticodon on the tRNA?

- a) It binds to the mRNA codon through complementary base pairing.
- b) It determines the amino acid sequence of the protein.
- c) It catalyzes the formation of peptide bonds.
- d) It signals the ribosome to initiate translation.

7. Where does translation occur in eukaryotic cells?

- a) In the cytoplasm
- b) In the nucleus
- c) It can occur either in the nucleus or in the cytoplasm
- d) In the mitochondria

Hemophilia is a disease characterized by the malfunction of the blood clotting system, which can lead to abundant bleeding. Reece has hemophilia A, caused by a mutation in the gene coding for a protein called clotting factor VIII (8).

8. Based on this information, we can say that Reece's mutation affects:

- a) The primary structure of clotting factor VIII.
- b) The tertiary structure of clotting factor VIII.
- c) The function of clotting factor VIII.
- d) Two of the above answers are correct.
- e) Answers a, b and c are correct