

## By the end of this unit, students will be able to...

- Describe the structure of a protein and summarize how a protein is created through transcription and translation.
- Compare and contrast how different proteins are assembled.
- Hypothesize whether or not a gene could be utilized by a cell if it were moved from the cells of one species to the cells of another species.
- Transcribe a section of DNA into mRNA, and translate mRNA into an amino acid sequence of a protein using a chart of the genetic code.
- Summarize how codons relate to amino acids and how a ribosome and tRNA 'know' which amino acid is next in a given sequence.
- Summarize the role of each of the following in the formation of a protein: a. Stop Codon b. Genetic Code c. Start Codon d. Peptide Bond e. Polypeptide
- Identify the three parts of an amino acid and their role in the properties of an amino acid.
- Predict whether or not a pair of amino acids will form a bond based on their charge, and based on their amino acid type (e.g. cysteines).
- Describe where amino acids will be found in a folded protein based on their hydrophobicity.
- Identify a disulfide bond and describe the type(s) of amino acids necessary for it to form.
- Identify a hydrogen bond and describe its role in the folding of a protein.
- Describe and identify each of the following kinds of protein structures: primary, secondary, tertiary, and quaternary.
- Summarize the factors that determine whether a secondary structure will include an alpha helix or a beta sheet and identify each kind of secondary structure in a protein.
- Define "posttranslational processing" and provide examples.
- Define "protein splicing" and describe how it is used to create functional proteins.