Learning Objectives
From DNA to Protein

Transcription
- Explain the purpose for this process and its sub-cellular compartment.
- Learn the three steps of transcription and the bio-molecules involved.
- Name the stretch of nucleotides in the DNA that binds RNA polymerase to initiate transcription.
- Name the DNA stretch that causes RNA polymerase to come off DNA terminating transcription.
- Explain the split nature of eukaryotic genes. Distinguish between exon, intron. Which contains information that will specify the amino acid sequence of the protein product?
- Explain RNA processing in human cells.

Genetic code
- Explain the language of nucleic acids: letters and words (nucleotides and codons), number of nucleotides that make up a codon, and total number of codons.
- Which codon marks the initiation of translation, what amino acid does it specify? How many stop codons specify the termination of translation

Translation or protein synthesis
- Where does it take place, what components are necessary, and what are the three steps.
- Which biomolecule can interpret the language of nucleic acids into the language of proteins
- Recognize the importance of proper protein folding for functional activity of the protein and the roles of chaperones and proteasomes.

Mutation
- Define the term mutation and its sources
- Explain the difference between the general types of mutations: base substitutions or point mutations, insertions, and deletions.
- Explain the three types of point mutations: silent, mis-sense, and nonsense.
- Understand what is meant by the reading frame and the effect on insertions or deletions.
- Apply and demonstrate your understanding of mutations, the genetic code, and the flow of genetic information in the cell, by predicting the effect of a particular mutation on the final protein product.