Learning Objectives for Cell Biology

Exam II

Chapter 4  Protein Structure and Function
- Review peptide bond formation and the orientation of polypeptides.
- Understand how weak interactions determine protein folding and conformation.
- Examine the common structural motifs of proteins and their significance.
- Appreciate protein binding and how it is measured quantitatively
- Distinguish the four levels of protein structure and their molecular basis.
- Outline the process of gel electrophoresis and western blotting and their applications.
- Describe how cells can regulate protein activity and provide specific examples of each.

Chapter 5  DNA and Chromosomes
- Explain basic DNA structure and the importance of polynucleotide polarity.
- Understand the relationship between chromatin and chromosomes.

Chapter 7  Transcription and Translation
- Understand the relationship among DNA polarity, RNA polarity, and polypeptide polarity.
- Describe the composition and significance of a promoter.
- Review basic transcription mechanisms, including the proteins involved.
- Learn the significance of RNA processing and outline the steps involved.

Chapter 8  Control of Gene Expression
- Recognize the importance of gene expression for cellular differentiation and dynamics.
- Explain the five ways in which gene expression is controlled (see Figs.7-42 and 8-3)
- Provide detailed examples of how gene expression is controlled in eukaryotes.
- Outline the process by which proteins are targeted for degradation.

Chapter 9  Genome Organization and Evolution
- Describe the overall organization of the human genome, including its size, the kinds of sequences found and their distribution.
- Summarize the DNA sequences that distinguish coding and non-coding regions of the genome.
- Provide an outline of how genome changes can result in evolutionary change.

READING AND PROBLEM ASSIGNMENTS
Essential Cell Biology, Alberts et al., 4th edition

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