Module 04: Cellular Function — Keys to Success

Key Learning Objectives

1. Cell Theory and Types of Cells

- State the three principles of cell theory
- Compare and contrast prokaryotic and eukaryotic cells
- Identify distinguishing features of plant, animal, and bacterial cells

2. Cell Organelles and Their Functions

- Identify major organelles (nucleus, ribosomes, ER, Golgi, mitochondria, chloroplasts, lysosomes, vacuoles)
- Describe the function of each organelle
- Understand the relationship between structure and function of organelles

3. The Nucleus and Genetic Control

- Describe the structure of the nucleus and its components
- Explain the role of DNA in directing cellular activities
- Understand how information flows from DNA to protein

4. The Endomembrane System

- Trace the pathway of proteins through the endomembrane system
- Explain how the ER, Golgi apparatus, vesicles, and plasma membrane work together
- Describe the role of lysosomes in cellular digestion

5. Energy Organelles

- Compare mitochondria and chloroplasts in structure and function
- Explain the endosymbiotic theory
- Understand the role of ATP in cellular energy

6. Cytoskeleton and Cell Movement

- Describe the components of the cytoskeleton
- Explain how the cytoskeleton supports cell structure and movement
- Identify the roles of cilia and flagella

Study Tips

1. **Label diagrams** of plant and animal cells
2. **Create function cards** for each organelle
3. **Use analogies** (cell as factory, city, etc.)
4. **Compare cell types** in tables
5. **Trace protein pathways** through the endomembrane system