

Module 05: Membranes — Keys to Success

Key Learning Objectives

1. Membrane Structure

- Describe the fluid mosaic model of membrane structure
- Identify the components of the plasma membrane (phospholipids, proteins, cholesterol, carbohydrates)
- Explain how the structure of phospholipids creates the lipid bilayer
- Understand membrane fluidity and factors that affect it

2. Membrane Proteins

- Distinguish between integral and peripheral proteins
- Describe the functions of membrane proteins (transport, enzymatic activity, signal transduction, cell recognition, intercellular joining, attachment)
- Explain how glycoproteins and glycolipids contribute to cell recognition

3. Passive Transport

- Define passive transport and explain why it requires no energy
- Describe simple diffusion and the factors that affect it
- Explain facilitated diffusion and the role of channel and carrier proteins
- Define osmosis and predict water movement based on solute concentrations

4. Tonicity and Osmotic Balance

- Define isotonic, hypertonic, and hypotonic solutions
- Predict what happens to cells in different solution types
- Explain how organisms maintain water balance

5. Active Transport

- Distinguish between passive and active transport
 - Describe how ATP powers the sodium-potassium pump
 - Explain endocytosis and exocytosis (bulk transport)
 - Compare phagocytosis, pinocytosis, and receptor-mediated endocytosis
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Study Tips

1. **Draw the fluid mosaic model** with all components labeled
2. **Create concentration gradient diagrams** for each transport type
3. **Practice predicting osmosis** in different scenarios
4. **Compare transport types** in tables
5. **Use animations** to visualize active transport mechanisms