

Membrane Structure and Function

Chapter 7

1. Why do we call the cell membrane a fluid mosaic?
2. a) How would the membrane lipid composition of a native grass found in warm soil in a southern habitat differ from that of a native grass found in cool soil in a northern environment?
b) How could membrane fluidity be maintained in human cell membranes as temperature decreases?
3. Briefly describe the functions of different types of membrane proteins.
4. Carbohydrates are attached to plasma membrane proteins in the ER. On which side of the vesicle membrane are the carbohydrates during transport to the cell surface?
5. How does a protein end up embedded in the outside of a cell membrane?
6. a) What factors contribute to the selective permeability of the cell membrane?
b) How is it that O₂ and CO₂ are able to cross a lipid bilayer without the aid of membrane proteins?
c) Why are transport proteins needed to move water rapidly across a membrane?
7. Describe the process of diffusion. How does diffusion help a cell performing cellular respiration gain oxygen and get rid of carbon dioxide?
8. Define the terms hypotonic, hypertonic and isotonic. Explain what would happen to both a plant cell and an animal cell if it were placed in each of these solutions.
9. What is facilitated diffusion?
10. Why do cells sometimes need active transport?
11. How can a concentration gradient across a membrane be a source of potential energy?
12. Explain how the sodium-potassium pump generates a membrane potential or electrochemical gradient.
13. Why would a sodium-potassium pump not be considered a cotransporter?
14. Describe bulk transport (phagocytosis, pinocytosis and receptor-mediated endocytosis).