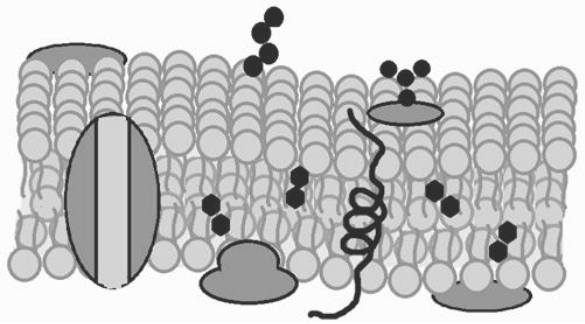
Plasma Membrane Review and Practice Problems



1. Using the image to the left, label: integral protein(s), peripheral protein(s), cholesterol(s), glycoprotein(s), glycolipid(s), phospholipid heads, phospholipid tails.

2. Which part of phospholipids is hydrophobic? Hydrophilic?

3. What is meant by "fluid mosaic" model?

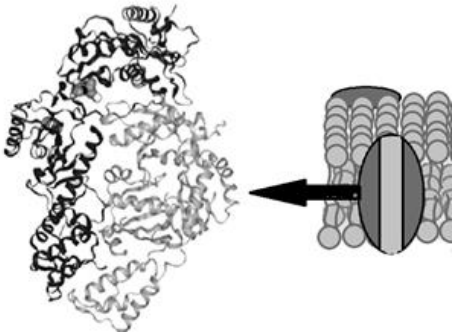
4. Why do phospholipids form a bilayer?

5. How does cholesterol help stabilize the plasma membrane in hot and cold temperatures?

6. How do the unsaturated hydrocarbon tails (kinks) help stabilize membrane fluidity?

7. Some plants, like winter wheat, have evolved to tolerate extreme cold. Specifically, the winter wheat plant can increase the percentage of unsaturated phospholipids in their membrane during the winter season. How is this helpful to the plant? Be specific and draw a picture of winter wheat's plasma membrane before and during the winter season.

8. The image below represents the 3D protein structure of an integral protein.

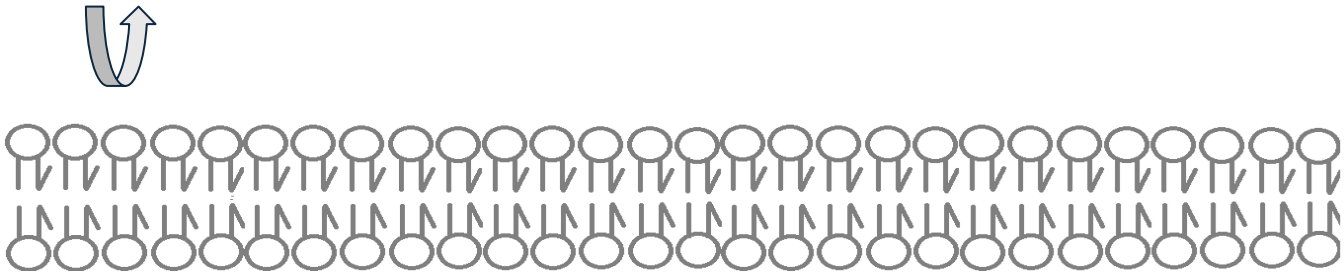


a. Label the hydrophilic and hydrophobic portions of the 3D integral protein.

b. What would happen to transport across the membrane if the protein did not fold correctly?

9. Below is a simple illustration of a plasma membrane. For each type of molecule listed, perform the following tasks:
    1. **Draw** an arrow
        - If the molecule can diffuse through the membrane, draw an arrow passing through the plasma membrane.
        - If the molecule requires facilitated or active transport, draw an arrow bouncing off the plasma membrane.
    2. **Justify** your drawing for each type of molecule. One has been done for you.
        - ❑ Charged molecules (such as ions)
        - ❑ Gases (such as O_2, CO_2, N_2)
        - ❑ Hydrophobic molecules

Large polar molecules



➢ Large polar molecules: cannot diffuse across the plasma membrane because they cannot interact with the hydrophobic interior of the membrane. They require channel proteins or active transport.