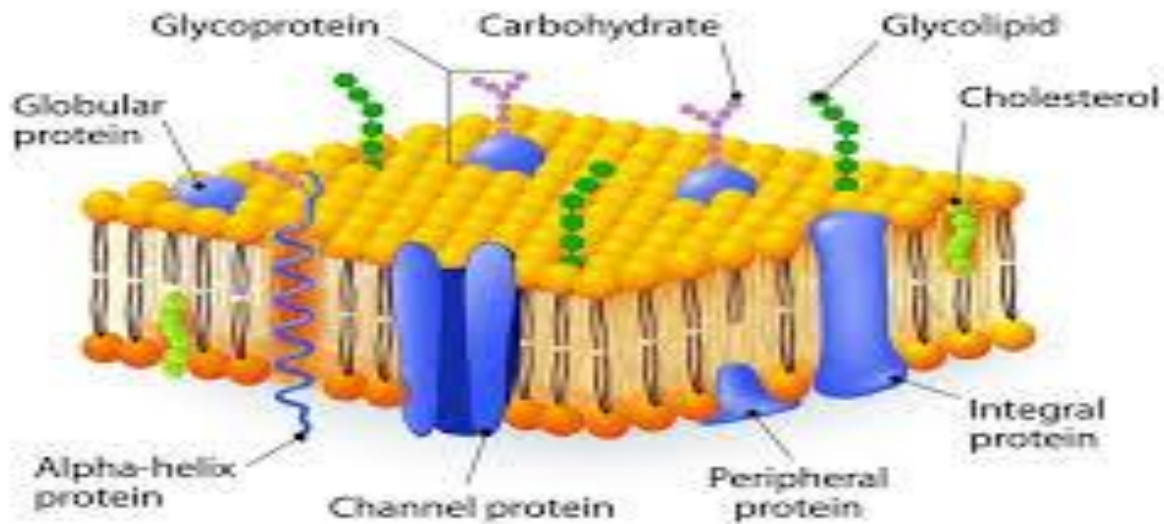


Cell membrane

Plasma membrane

CELL MEMBRANE



Plasma membrane

- **Fluid mosaic model**
- The currently accepted model for the structure of the plasma membrane, called the **fluid mosaic model**, was first proposed in 1972.
- This model has evolved over time, but it still provides a good basic description of the structure and behavior of membranes in many cells.

Fluid mosaic model

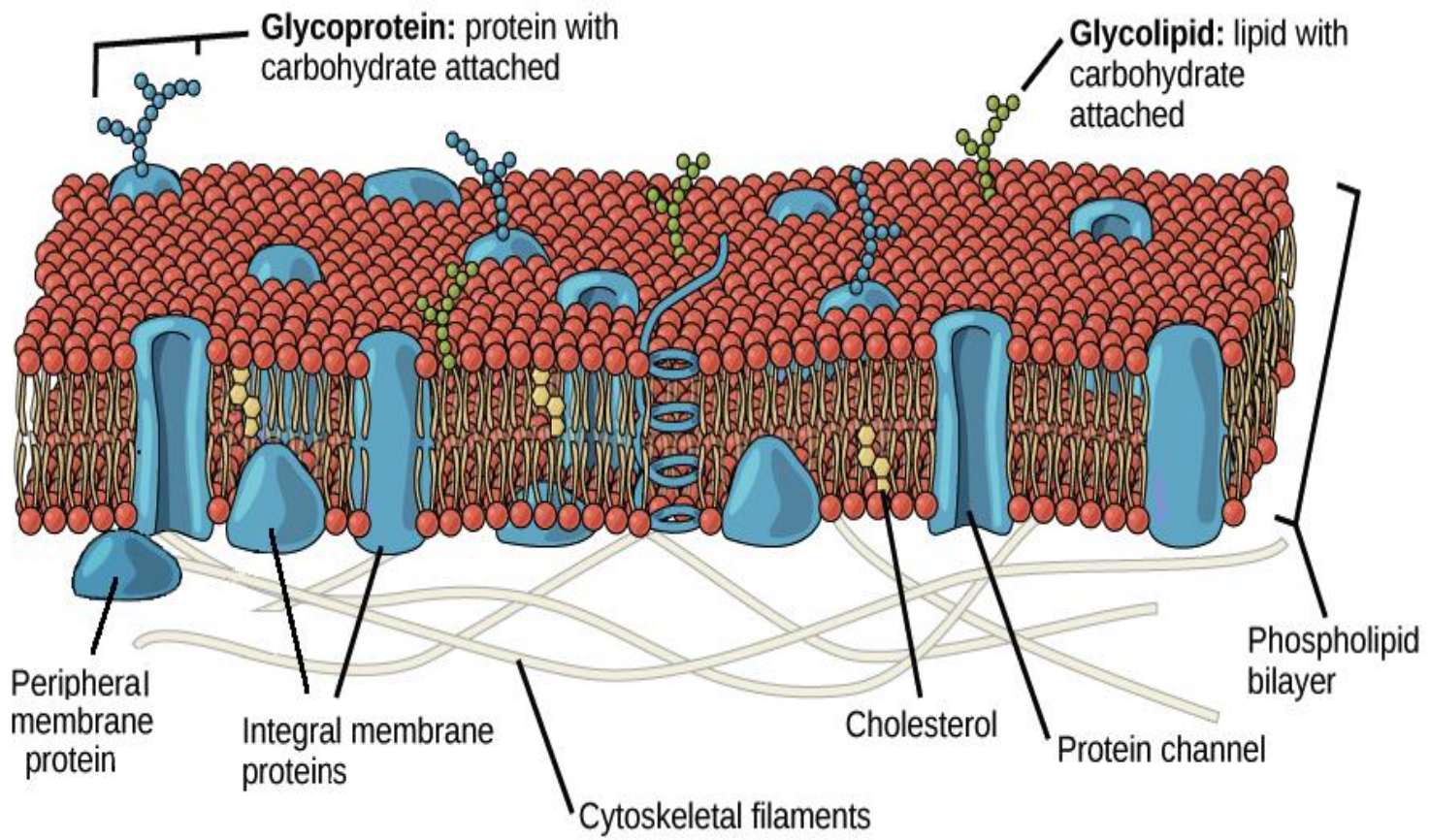
- According to the fluid mosaic model, the plasma membrane is a mosaic of components—primarily, phospholipids, cholesterol, and proteins—
- They move freely and fluidly in the plane of the membrane. the membrane (a dynamic process in which phospholipids and proteins are continually sliding past one another.

- The principal components of the plasma membrane are lipids (phospholipids and cholesterol), proteins, and carbohydrate groups that are attached to some of the lipids and proteins.
- A **phospholipid** is a lipid made of glycerol, two fatty acid tails, and a phosphate-linked head group.
- Biological membranes usually involve two layers of phospholipids with their tails pointing inward, an arrangement called a **phospholipid bilayer**.

- **Cholesterol**, another lipid composed of four fused carbon rings, is found alongside phospholipids in the core of the membrane.
- Membrane proteins may extend partway into the plasma membrane, cross the membrane entirely, or be loosely attached to its inside or outside face.

- Carbohydrate groups are present only on the outer surface of the plasma membrane and are attached to proteins, forming **glycoproteins**, or lipids, forming **glycolipids**.
- The proportions of proteins, lipids, and carbohydrates in the plasma membrane vary between different types of cells.
- For a typical human cell, however, proteins account for about 50 percent of the composition by mass, lipids (of all types) account for about 40 percent, and the remaining 10 percent comes from carbohydrates.

- **Phospholipids**
- Phospholipids, arranged in a bilayer, make up the basic fabric of the plasma membrane. They are well-suited for this role because they are **amphipathic**, meaning that they have both hydrophilic and hydrophobic regions.



Proteins

- Proteins are the second major component of plasma membranes. There are two main categories of membrane proteins: integral and peripheral.
- **Integral membrane proteins** are, as their name suggests, integrated into the membrane: they have at least one hydrophobic region that anchors them to the hydrophobic core of the phospholipid bilayer.
- Some stick only partway into the membrane, while others stretch from one side of the membrane to the other and are exposed on either side¹¹start superscript, 1, end superscript.

- Proteins that extend all the way across the membrane are called **transmembrane proteins**.

Carbohydrates

- Carbohydrates are the third major component of plasma membranes. In general, they are found on the outside surface of cells and are bound either to proteins (forming **glycoproteins**) or
- to lipids (forming **glycolipids**).
- These carbohydrate chains may consist of 2-60 monosaccharide units and can be either straight or branched.

Active transport

- **Active transport** is the movement of dissolved molecules into or out of a cell through the cell membrane, from a region of lower concentration to a region of higher concentration. The particles move against the **concentration gradient**, using energy released during **respiration**.
- Sometimes dissolved molecules are at a higher concentration inside the cell than outside, but, because the organism needs these molecules, they still have to be absorbed.
- **Carrier proteins** pick up specific molecules and take them through the cell membrane against the concentration gradient.