

Cell membrane

The **cell membrane** or **plasma membrane** is a biological membrane that separates the interior of all cells from the outside environment. The cell membrane is selectively permeable to ions and organic molecules and controls the movement of substances in and out of cells. The basic function of the cell membrane is to protect the cell from its surroundings. It consists of the lipid bilayer with embedded proteins. Cell membranes are involved in a variety of cellular processes such as cell adhesion, ion conductivity and cell signaling.

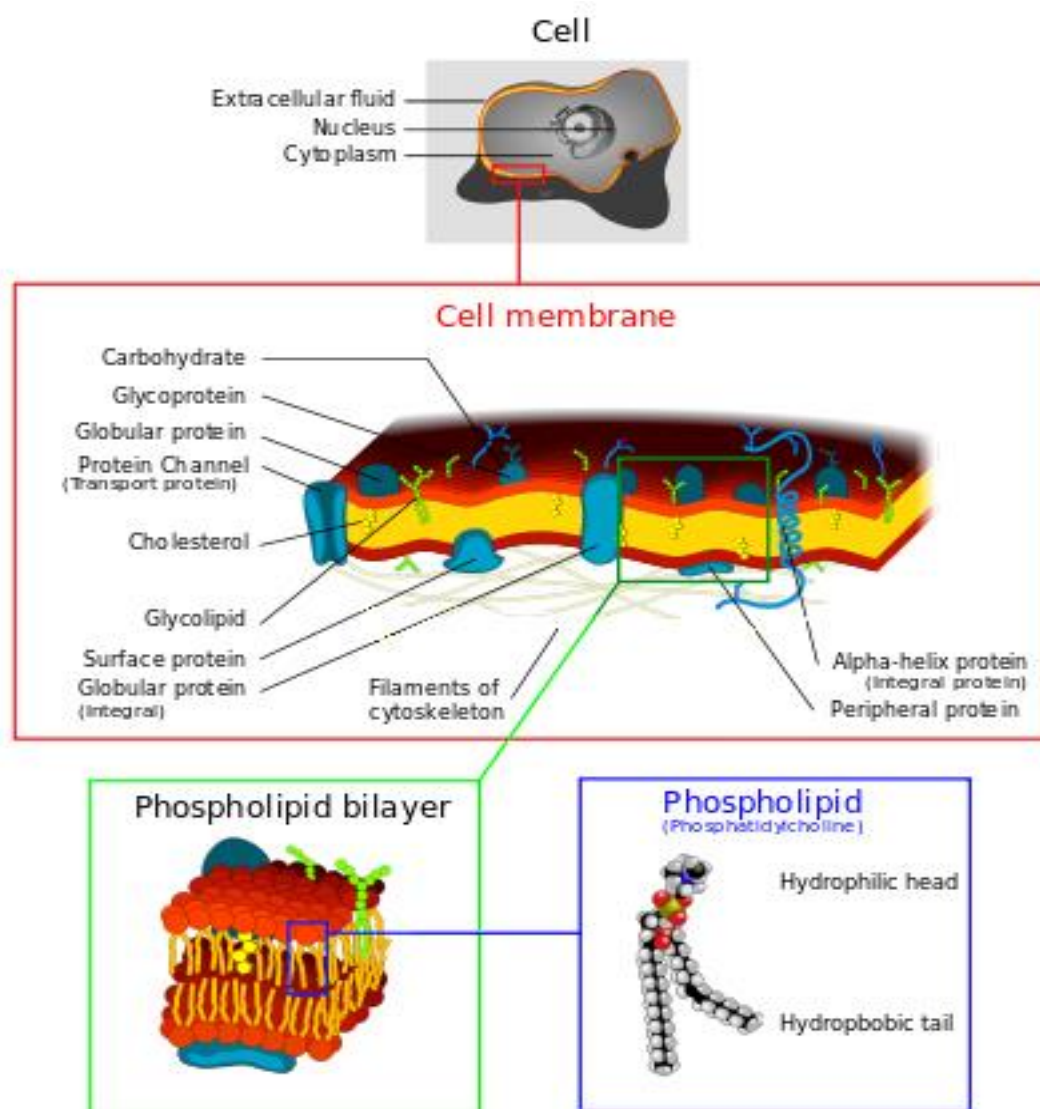


Illustration of a Eukaryotic cell membrane

Function

The cell membrane or plasma membrane surrounds the cytoplasm of animal and plant cells, physically separating the intracellular components from the extracellular environment. Fungi, bacteria and plants also have the cell wall which provides a mechanical support for the cell and precludes the passage of larger molecules. The cell membrane also plays a role in anchoring the cytoskeleton to provide shape to the cell, and in attaching to the extracellular matrix and other cells to help group cells together to form tissues.

The membrane is selectively permeable and able to regulate what enters and exits the cell, thus facilitating the transport of materials needed for survival. The movement of substances across the membrane can be either "passive", occurring without the input of cellular energy, or active, requiring the cell to expend energy in transporting it. The membrane also maintains the cell potential. The cell membrane thus works as a selective filter that allows only certain things to come inside or go outside the cell.

Membrane protein

A **membrane protein** is a protein molecule that is attached to, or associated with the membrane of a cell or an organelle. More than half of all proteins interact with membranes. These proteins are specifically targeted to different types of biological membranes.

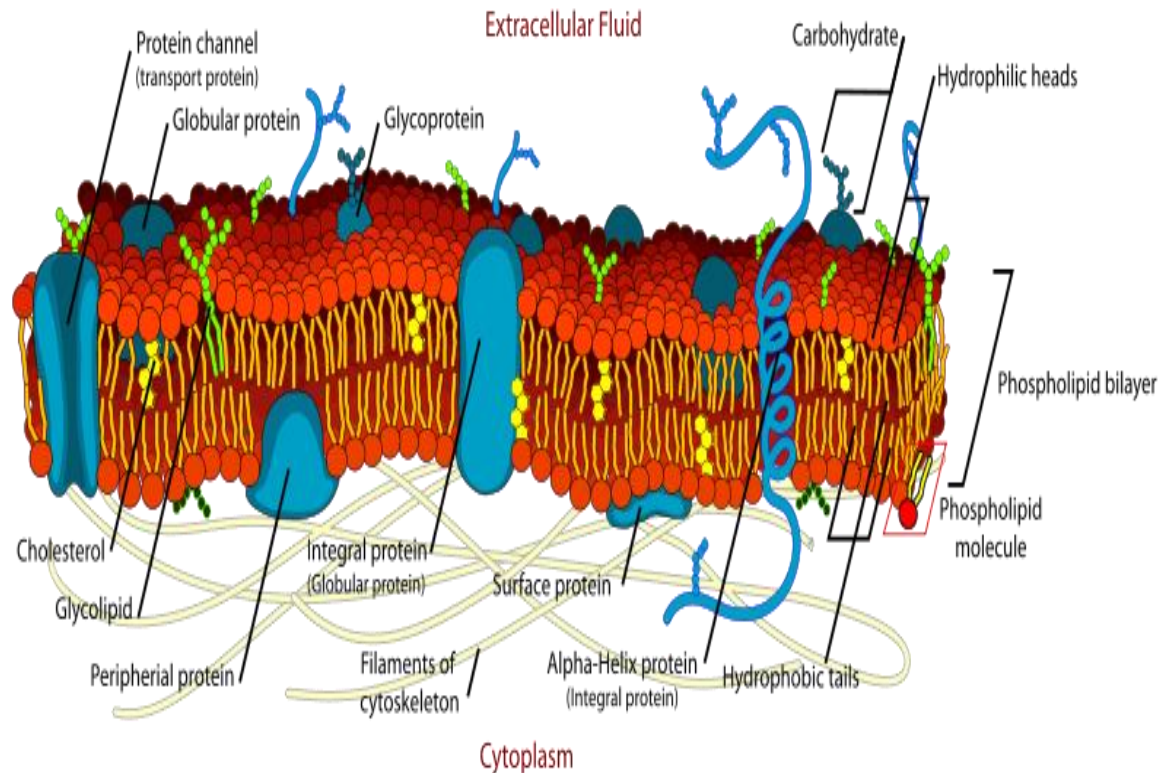


Diagram of a cell membrane showing integral and peripheral membrane proteins

Function

Biological membranes consist of a phospholipid bilayer and a variety of proteins that accomplish vital biological functions.

- Structural proteins are attached to microfilaments in the cytoskeleton which ensures stability of the cell.
- Cell adhesion molecules allow cells to identify each other and interact. Such proteins are involved in immune response, for example.
- Membrane enzymes produce a variety of substances essential for cell function.
- Membrane receptor proteins serve as connection between the cell's internal and external environments.
- Transport proteins play an important role in the maintenance of concentrations of ions. These transport proteins come in two forms: carrier proteins and channel proteins.

Main categories

Membrane proteins can be divided into several categories:

- Integral membrane proteins which are permanently bound to the lipid bilayer
- Peripheral membrane proteins that are temporarily associated with lipid bilayer or with integral membrane proteins
- Lipid-anchored proteins bound to lipid bilayer.