Plasma membrane (P.m)

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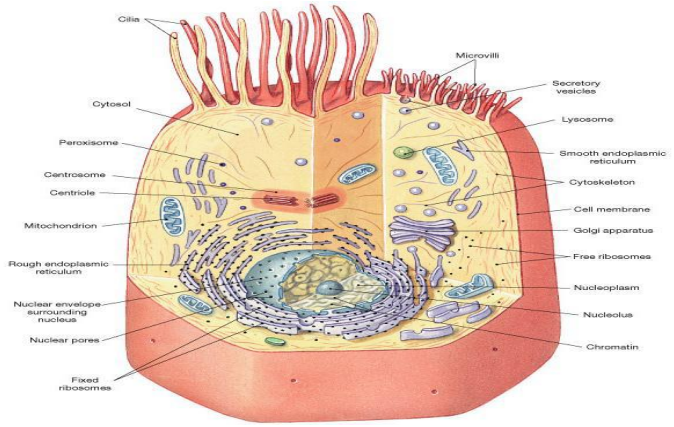
Outer layer of the cell is the plasma membrane . the cell membrane is also found to enclose the nuclear components, nuclear envelope and many of the cytoplasmic organelle as that of the mitochondria and lysosome known as mitochondrial membrane and lysosomal membrane.

Plasma membrane also participates in many cellular activities, such as growth, reproduction, and communication between cells, and is especially important in regulating what can enter and leave the cell. The plasma membrane serves as the attachment points for into provide shape to the cell, and in attaching to the extracellular matrix to help group cells together in the formation of tissue.

The plasma membrane may also function in absorption of materials from the cell's environment. For this purpose, the membrane of some cells is folded out into multiple small projections called microvilli . These projections increase the membrane's surface area, allowing for greater absorption, much as a sponge's many holes provide increased surface for absorption.

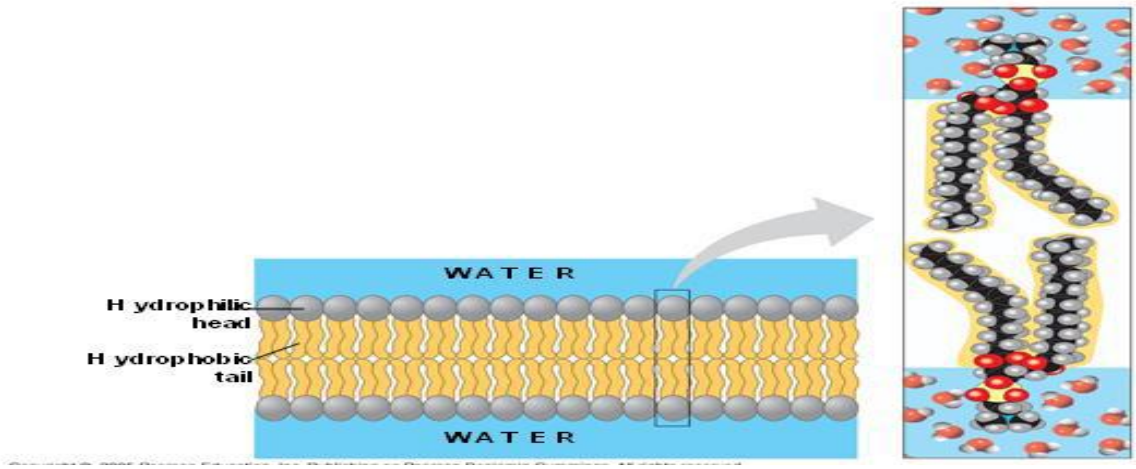


Microvilli are found on cells that line the small intestine, where they promote absorption of digested foods into the circulation. They are also found on kidney cells, where they reabsorb materials that have been filtered out of the blood.

Components of the plasma membrane

The main substance of the plasma membrane is a double layer or bilayer of lipid molecules. Because these lipids contain the element phosphorus, they are called phospholipids. Along with cholesterol, another type of lipid found in the plasma membrane. Phospholipids are amphipathic molecules, containing hydrophobic and hydrophilic regions.

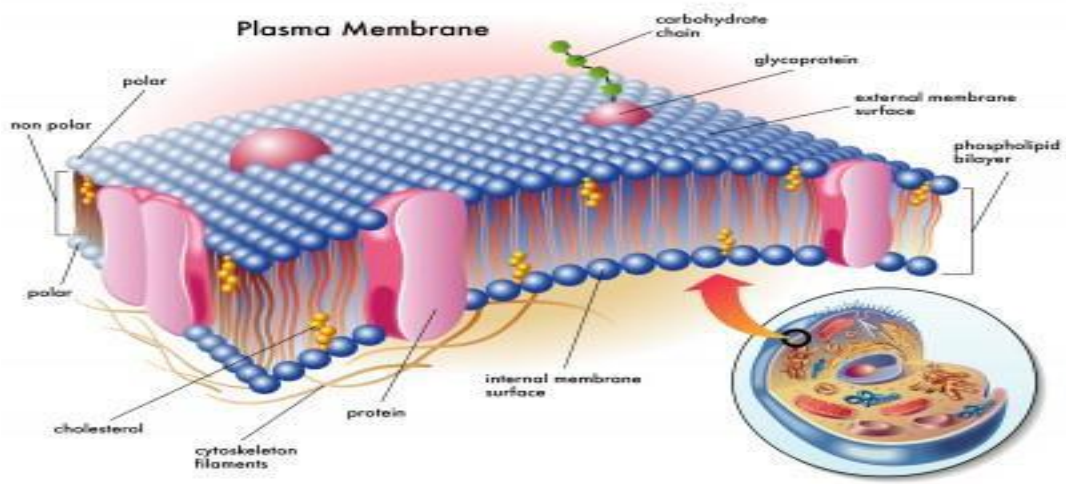
The two fatty acids, only one of which is usually saturated, are covalently bound to glycerol. Cholesterol molecules are amphipathic and have a kinked conformation, thus preventing overly dense packing of phospholipids fatty acid tails (strengthen) whilst at the same time filling the gaps between the kinks of the unsaturated fatty acid tails. Cholesterol forms more than 20% of the lipid membrane acting in the flexibility and stability of the membrane.



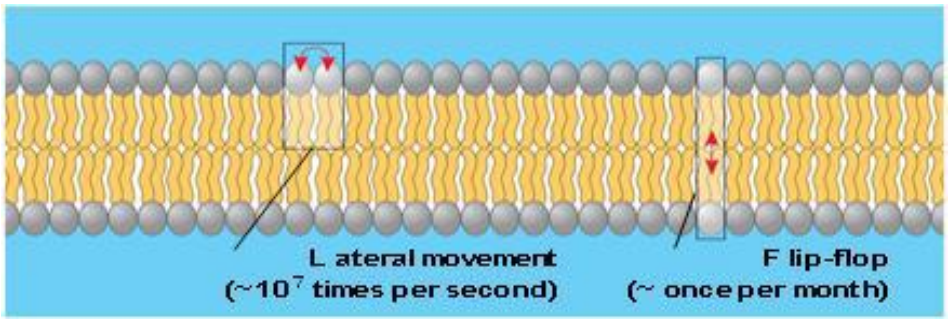
Carbohydrate Chains

Both phospholipids and proteins can have attached carbohydrate chains. If so, these molecules are called glycolipids and glycoproteins respectively. Since the carbohydrate chains occur only on outside surface and peripheral proteins occur asymmetrically on one surface or the other, the two sides of the membrane are not identical.

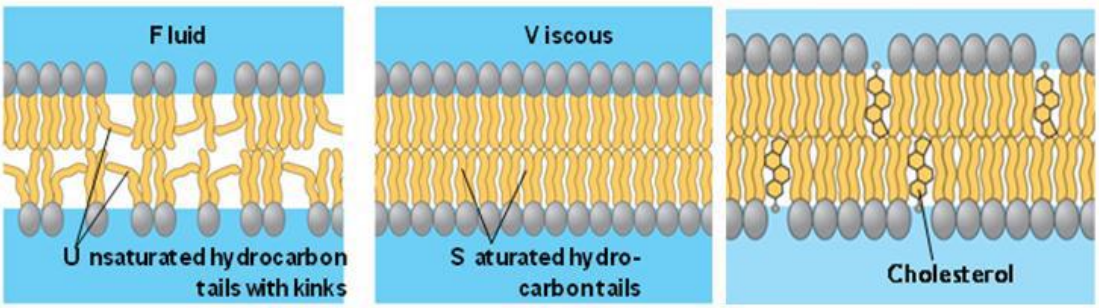
In humans, carbohydrate chains are also the basis for the A,B and O blood groups. A variety of different proteins float within the lipid bilayer. Some of these proteins extend all the way through the membrane, and some are located near the membrane's inner or outer surface.



Different components of plasma membrane and arrangement a model called "The fluid mosaic model" states that a membrane is a fluid structure with a —mosaic of various proteins embedded in it. The fluid mosaic model of membranes incorporated this information, showing (integral) floating protein in a fluid lipid bilayer likes icebergs in the sea of phospholipids. Phospholipids in the plasma membrane can move within the bilayer, most of the lipids, and some proteins, drift laterally.



As temperatures cool, membranes switch from a fluid state to a solid state. The temperature at which a membrane solidifies depends on the types of lipids. Membranes rich in unsaturated fatty acids are more fluid than those rich in saturated fatty acids. Membranes must be fluid to work properly; they are usually about as fluid as salad oil.



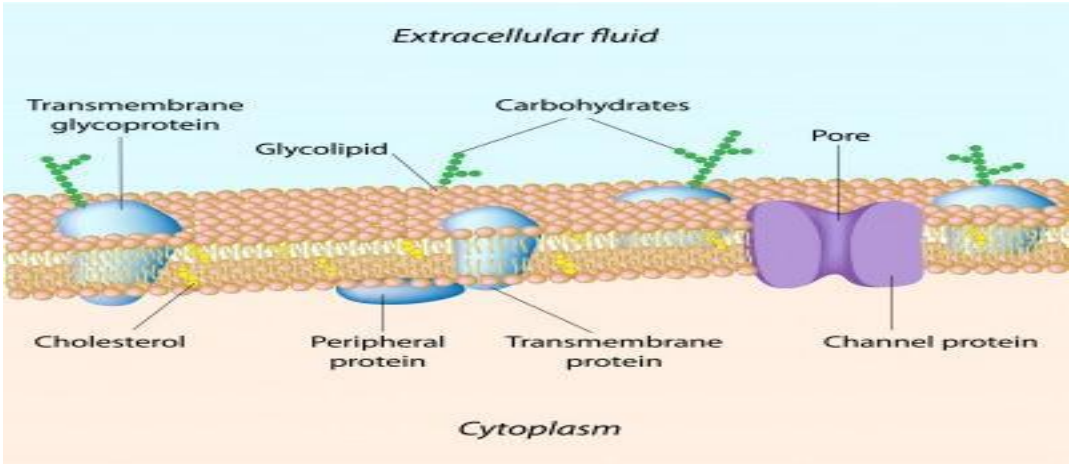
Structures of many proteins that span the lipid bilayer, the existence of lipid anchors on some membrane proteins, and a network of cytoplasmic proteins that restricts the motion of many integral membrane proteins.

Membrane proteins

A membrane is a collage of different proteins embedded in the fluid matrix of the lipid bilayer:

1-Peripheral proteins are not embedded

2-Integral proteins penetrate the hydrophobic core and often span the membrane.



Functions of the proteins

Channels

pores in the membrane that allow specific substances to enter or leave. Certain ions travel through channels in the membrane.

Transporters

Shuttle substances from one side of the membrane to the other. Glucose, for example, is carried into cells using transporters.

Enzymes

Participate in reactions occurring at the plasma membrane.

Cell identity markers

Proteins unique to an individual's cells. These are important in the immune system and are also a factor in transplantation of tissue from one person to another.

Receptors

Points of attachment for materials coming to the cell in the blood or tissue fluid. Some hormones, for example, must attach to receptors on the cell surface before they can act upon the cell.

Linkers Give shape to the membrane and help cells.