

BIOLOGICAL MEMBRANES

The biological membranes enclose the cell and cell organelles (in case of eukaryotic cells). The membranes are principally made up of membrane lipids and membrane proteins in addition to carbohydrates.

The functions of biological membranes:

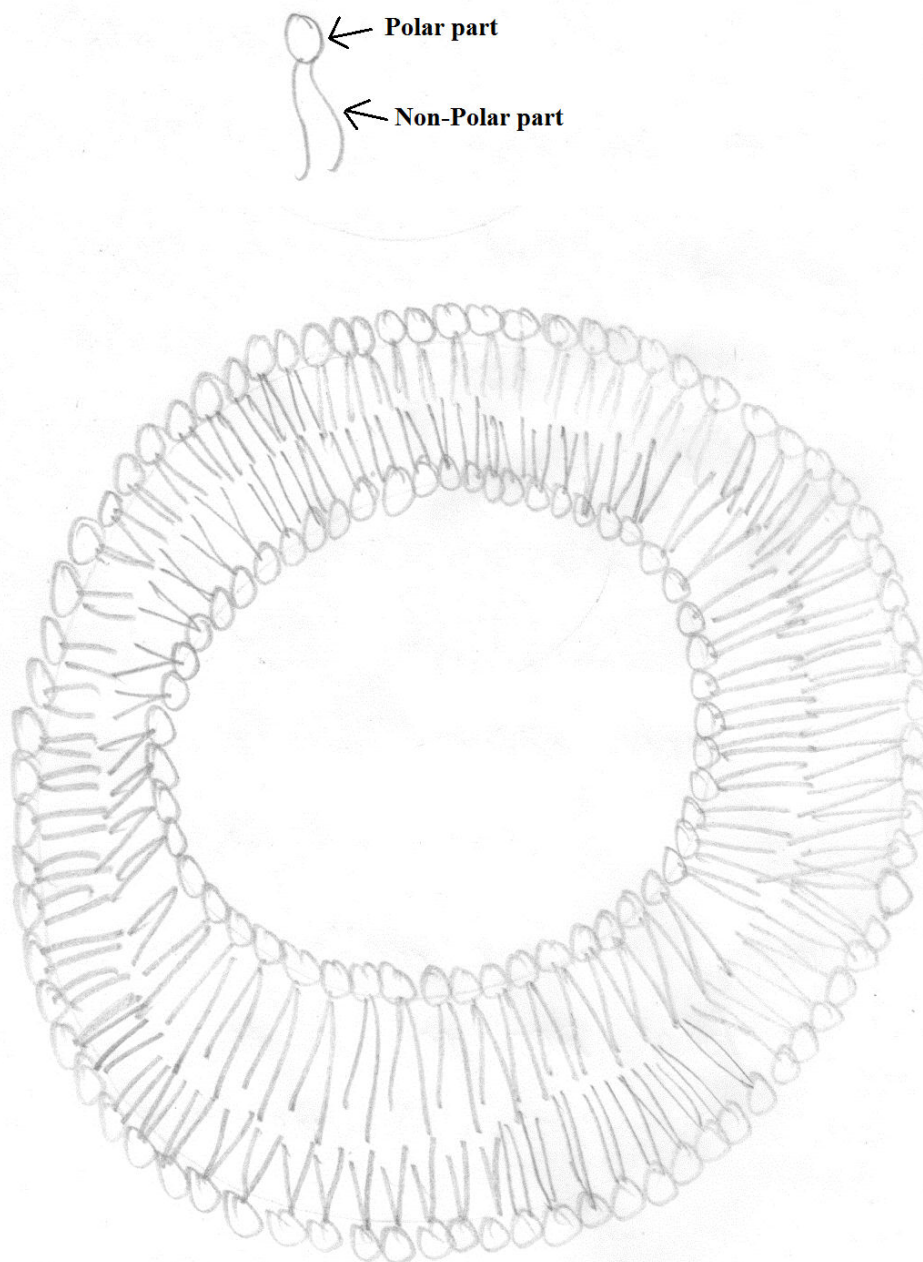
1. Membranes enclose the cells and cell organelles.
2. They help in the selective movement of molecules across the membranes (semi-permeable membrane).
3. They help in transmission of molecular signals between different cells and organelles.
4. They help in locomotion of cells.
5. They give protection to the cell organelles.
6. They accommodate the receptor proteins on their surface for transmission of signals brought by signalling molecules such as hormones.

The composition of biomembranes:

The structure of biomembranes is defined by Fluid Mosaic Model. According to this model the membrane bilayers is formed by two layers of phospholipids, where the polar part of amphipathic phospholipids face either side of the membrane interacting with water and the non-polar part of phospholipids face the core of the membrane bilayers. The proteins are embedded in this membrane where the non-polar amino acids of the membrane proteins interact with the non-polar part of biomembrane. The proteins are free to move in the sea of lipid in the membrane.

There are three types of membrane proteins:

1. Integral Membrane Protein: This group of membrane proteins are inserted inside the membrane and are difficult to remove from the membrane.
2. Peripheral Membrane Protein: this group of proteins are present on the inner surface of membrane. These proteins are attached through polar interaction between polar amino acids of the protein and polar part of membrane phospholipids.
3. Amphitropic proteins: This group of proteins are present in both cytosol and in membrane. This group of proteins have a non-polar part that inserts inside the membrane through hydrophobic interaction with non-polar part of the membrane.



Membrane Bilayer

Fig. 1. Membrane bilayer made of amphipathic membrane lipid

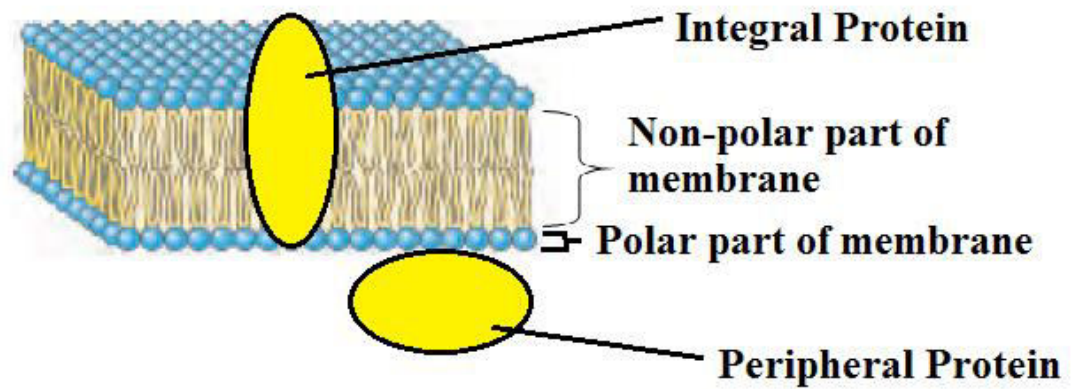


Fig.2. Membrane proteins.