

Chapter 8

CELL-THE UNIT OF LIFE

Cell Membrane:

1. Also called as bio-membrane / Plasma-membrane.
2. Bio chemical investigation revealed that cell membrane possess lipid, proteins and carbohydrates.
3. Ratio of lipids & proteins varies in different cells.
4. In humans the membrane of erythrocytes has approximately 52% of proteins and 40% of lipid.

Average Composition of Cell Membrane

Lipids – 40 % (Phospholipid, Cholesterol, Glycolipid)

Proteins – 58 – 59 % (Arginine, Lysinerich)

Carbohydrates – 1 – 2 %

Structure of cell membrane:

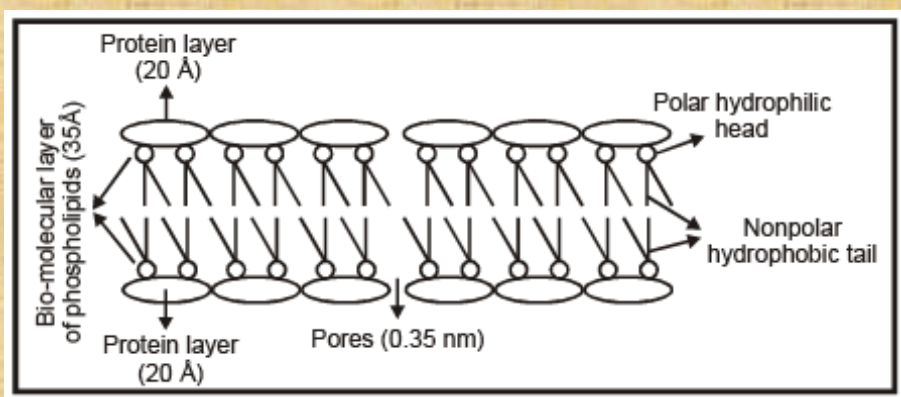
1. **Sandwich (or) Trilamellar model:**

1. Proposed by Davson & Danielli in 1935
2. According to this model, plasma – membrane is made up of 3 – layer in which bio- molecular layer of lipid is sandwich between the two layers of proteins.

3. Each protein layer is $20\text{\AA}$ thick and bilayer of phospholipid is $35\text{\AA}$ thick. Thus, total thickness is $75\text{\AA}$.

4. Phospholipid molecule called as amphipathic molecule due to presence of two types of parts (hydrophilic head & hydrophobic tail).

5. Hydrophobic tails of each phospholipids are attached to each other by Van der waal forces.



2. Unit membrane Model:

1. Proposed by Robertson in 1959.

2. According to this model, all the cellular and organeller membranes are structurally and functionally similar (difference in chemically & size).

3. Both the above models are rejected because they fail to explain selective permeability of plasma lemma.

The detail structure was studied only after the invent of electron microscope in 1950 mean while only the chemical studies on cell membrane especially on RBC enable the scientist to deduce the possible structure of plasma membrane.

3 **Fluid Mosaic Model:**

1. Proposed by Singer & Nicolson in 1972.

2. According to this model, proteins are arranged in phospholipid layer as mosaic manner.

Ex. Gulab Jamun (protein) in a concentrated solution (phospholipid) of sugar.

