PLASMA MEMBRANE

1. INTRODUCTION :-

- Term Plasma Lemma was given by J.Q. Plowe (1885).
- Term Plasma membrane was given by Nagelli (1931).
- Term Unit membrane was given by Robertson.
- At first, Structure of cell membrane was studied by Overton (1895).
- Overton postulated that cell membrane is composed of a layer of lipid material.
- Plasma membrane is also called cell membrane or Unit membrane.
- It is outmost boundary of animal cell

2. SPECIAL POINT :-

- Plasma membrane is a thin live membrane.
- It is flexible and porus membrane.
- In this layer Protein coated with small pores are found, 7 A° in diameter.
- Plasma lemma of animal cell is elastic due to the presence of Lipids

3. MODEL OF PLASMA MEMBRANE :-

To describe structure of Plasma membrane, numerous models have been proposed which are as follows :—

A. GORTER AND GRANDEL'S LIPID BIOMOLECULAR MODEL (1925)

This postulated that membrane are

Composed of Lipid bilayer only.

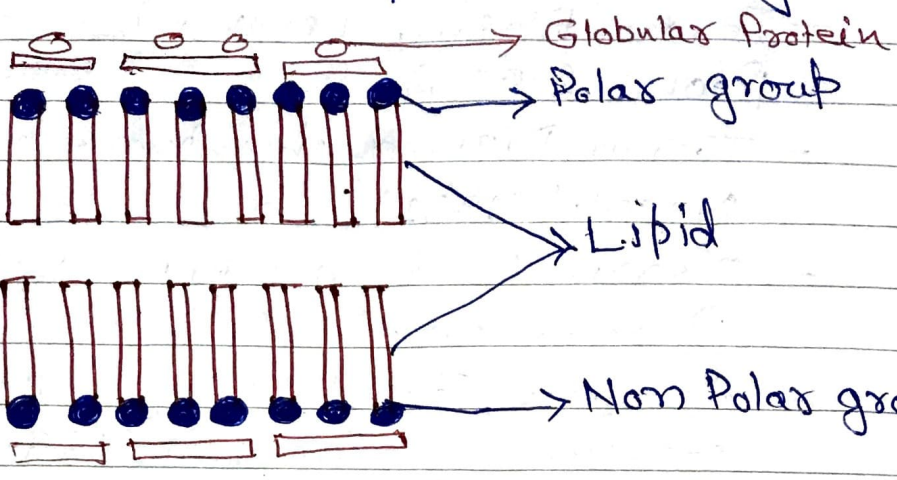

Fig:- Gurter-Grandel and Davsondanielli Model.

B. LAMELLAR MODEL:-

- This model was proposed by Danielli and Davidson in 1935.
- It is also called Trilayer, Trilamellar or Sandwitch model.
- According to this model Plasma membrane is a trilayered structure Composed of lipoprotein.
- The bilayered Phospholipid is Sandwitched in between two layer of a Protein molecule.
- The bilayered lipid is 35 A° thick whereas, each layer of Protein is 20 A° thick So Plasma membrane is 75 A° thick.
- The polar heads of the phospholipids molecules are directed towards protein. The two are held together by electrostatic forces.
- The non polar tails of the two lipid layer is directed towards the centre Where they are held together by Vander Walls forces.

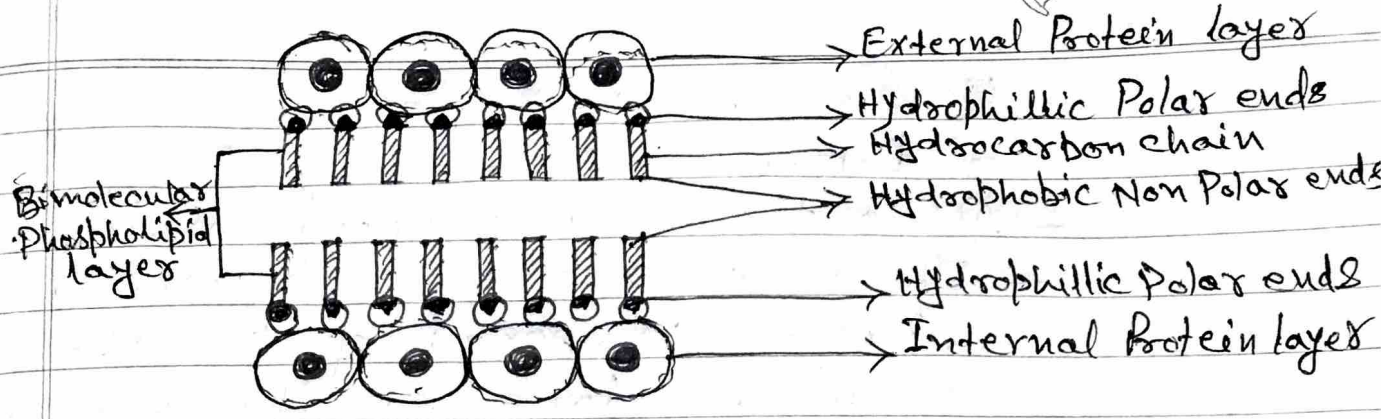

Fig :- SANDWITCH MODEL.

C. UNIT MEMBRANE MODEL :-

- It was proposed by J. David Robertson (1959 AD)
- Robertson coin the term, Unit membrane
- Robertson supported and modified Danielli and Davidson model.
- This model states that protein molecules are extended β-Protein or fibrous not α or globular.

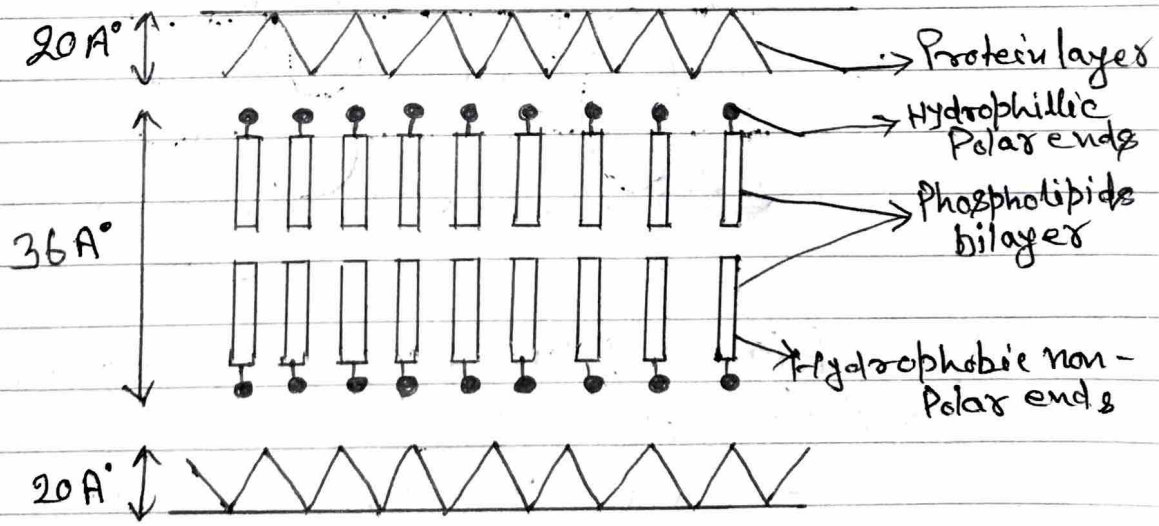

Fig :- UNIT MEMBRANE MODEL.

D. FLUID MOSAIC MODEL :-

- This model was proposed by Singer and Nicholson in 1972.

- It described Proteins as ice bergs in a sea of Lipids.
- It is the most accepted model.
- Their is a central bilipid layer (2 layer) composed of phospholipids arranged in a specific manner.
- Hydrophillic Polar head constitute top and bottom surfaces.
- Hydrophobic non Polar end are buried in the membrane.
- Within Phospholipids, Proteins are arranged in two forms.
  - (a) Extrinsic Protein
  - (b) Intrinsic Protein

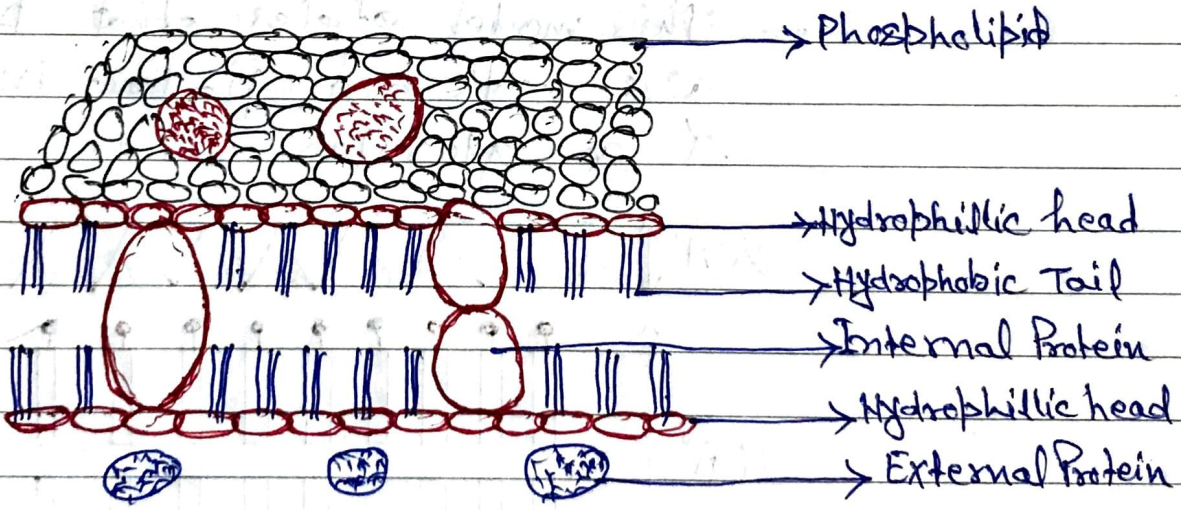

Fig:- Fluid Mosaic Model.

(a) EXTRINSIC PROTEIN :-

- Such Proteins are arranged superficially On the outer and inter surface of membrane
- Such Proteins are soluble and unstable.
- Such Proteins Can be separated by change in pH.
- It is 30% of the Whole Protein
- Spectrin, acetylcholine, Cytochromes is its Example