

STRUCTURE OF PLASMA MEMBRANE

Lipid Membrane Concept:

- The Lipid membrane model was proposed by Overton (1900).
- The permeation of the substances across the plasma membrane was found to be related to lipid solubility.
- Based on this observation, Overton concluded that cell membranes are composed of lipid layers.

Sandwich models:

- According to these models, both proteins and lipids are present in plasma membrane in the form of distinct layers.

P-L-L-P model of Danielli and Davson:

- This model was proposed independently by James Danielli (1935) and Hugh Davson (1935).
- According to this model, a cell membrane consists of four layers of molecules- external two layers of proteins and internal two layers of lipids.
- Due to this arrangement of layers, this model is also known as P-L-L-P model.
- The lipid molecules phospholipid in nature. Each phospholipid has a polar hydrophilic head and a non-polar hydrophobic tail.
- Phospholipid molecules are oriented at right angles to the direction of membrane with hydrophilic heads towards the surface and hydrophobic tails towards the center.
- Both the outer and inner surfaces of the membrane are formed of globular hydrated α proteins.

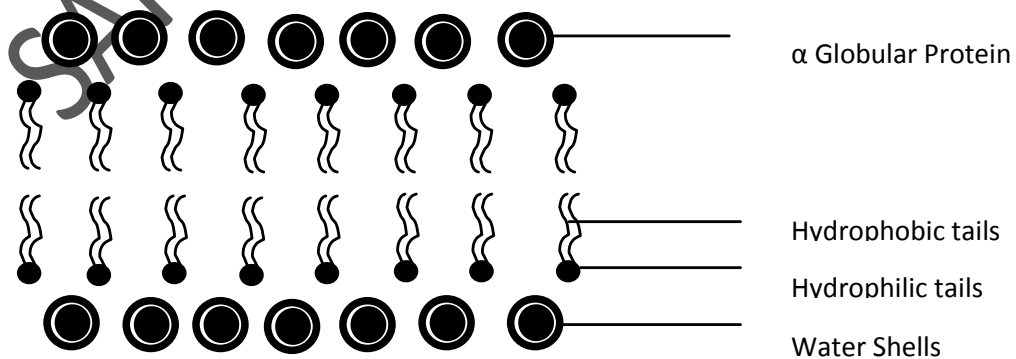


Fig1.: P-L-L-P model of Plasma Membrane by Danielli and Davson

Unit Membrane concept of Robertson:

- Robertson (1959) studied cell membranes from different sources under electron microscope. He found that all types of cell membranes possess a similar trilaminar structure.
- According to this model, a unit membrane has a thickness of 75 Å. If a membrane is thicker than 75 Å, it is made of two or more unit membranes.
- Each of the two outer protein layers is 20 Å thick. It is formed of β protein molecules. The two surface layers are made of chemically different proteins.
- The central lipid bilayer (electron transparent) is 35 Å thick.

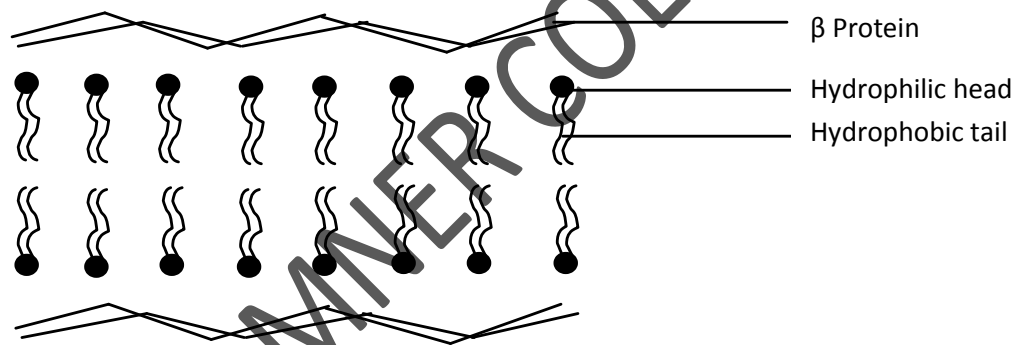


Fig. 2.: Unit Membrane Concept of Robertson