**PLASMA-MEMBRANE**  1. The plasma-membrane is very thin, elastic and semipermeable. 2. It is also called as the names like cell-membrane, bio-membrane or plasma-lemma. 3. It is generally known as the outermost living part of the cell. 4. In plant cell, there is a additional cell wall external to the plasma-membrane. 5. It controls the entry and exits of molecules, ions and thus helps in maintaining the difference in the ionic concentration of the cytoplasm. **STRUCTURE OF PLASMA-MEMBRANE** 1. Plasma-membrane is a living, thin, flexible, porous and semipermiable structure. 2. There are several theories and models have been proposed by many scientists to explain its structure. 3. Some of the important models with their scientist are given below :- I. Paucimolecular theory ------ Danielli & Davson. II. Unit membrane model ------ Robertson. III. Kavanau’s lipid pillars model ------ Kavanau. IV. Hydrophobic binding model ------ Benson & Korn. V. Greater membrane model ------ Lehninger. VI. Composite model ------ Scheide & Lin. VII. Fluid mosaic model ------ Singer & Nicolson. 4. Out of these models, the model proposed by Robertson called unit membrane is most acceptable. **UNIT MEMBRANE MODEL** 1. According to this model, the plasma-membrane is a 3 – layered (trilamellar) structure. 2. Its thickness is about 75 A\*. 3. The outer layer of both sides are made up of protein and are osmophilic in nature. 4. Each layer measures a thickness of about 20 A\*. 5. A layer of lipid is present between the two protein layers. 6. The lipid layer is hydrophobic in nature. 7. Its thickness is about 35 A\*. 8. This lipid layer is actually composed of two phosphor-lipid layers. 9. These phospholipid layers are arranged closely, so looks like a single layer. 10. So the plasma-membrane appears to be trimallelar, inspite of 4 – layers (two protein and two lipid).



11. All the cell-organelles have the similar trilamellar membrane as discussed in the plasma-mambrane. Due to this Robertson named it as Unit membrane model.

**CHEMICAL COMPOSITION OF PLASMA-MEMBRANE** Chemically the plasma-membrane is consist of lipid and protein, but a small amount of carbohydrate such as polysaccharides, sialic acid, RNA and DNA may also be present in certain plasma-membranes. **I. LIPID FRACTION OF PLASMA-MEMBRANE** 1. The percentage of lipid is 20 – 40% in the plasma-membrane. 2. The main lipid constituents are phospholipids, cholesterol, sphingolipids, glycolipids and glycophosphatides. 3. The phospholipids contains phosphate groups, glycerol, fatty acids and a nitrogenous bases. 4. The glycolipid contains sugar and lipid components. **II. PROTEIN FRACTION OF PLASMA-MEMBRANE** 1. The percentage of protein is 60 – 80% in the plasma-membrane. 2. The proteins are made up of amino acids, which are united by peptide linkages. 3. The proteins may be glycoproteins, phospholipoglycoproteins etc. **III. CARBOHYDRATES IN PLASMA-MEMBRANE** 1. The presence of carbohydrate in the plasma-membrane are in small amount. 2. This amount varies in the cell-organelles of the plasma-membrane. 3. The most common carbohydrates in plasma-membrane are hexose, hexosamine, fucose, sialic acid etc. **IV. ENZYMES OF PLASMA-MEMBRANE** 1. About 30 enzymes have been identified from plasma-membrane. 2. The most common and important enzymes are 5-nucleotidase, Mg++ ATPase, Na+ - K+ activated Mg++ ATPase, Alkaline phosphotase, Acid phosphomonoesterase, Glucose 6 – phosphotase, NADPH**2** & Cytochrome – C reductase etc.

**FUNCTIONS OF PLASMA MEMBRANE** 1. It acts as a permeability barrier. 2. It controls and co-ordinates the rate of substrate transfer and diffusion. 3. It acts as a cytoskeleton frame on which enzymes are specially oriented. 4. It acts as a transport of substances from one cell organelle to the another. 5. It acts as a barrier between the interior and exterior of the cell. 6. It bounds and protects the protoplasm.

JANARDAN PRASAD SINGH DEPARTMENT OF BOTANY VISTHAPIT MAHAVIDYALAYA, BALIDIH