



*Plasma membrane*  
*or plasma-lemma*  
*or cell membrane*

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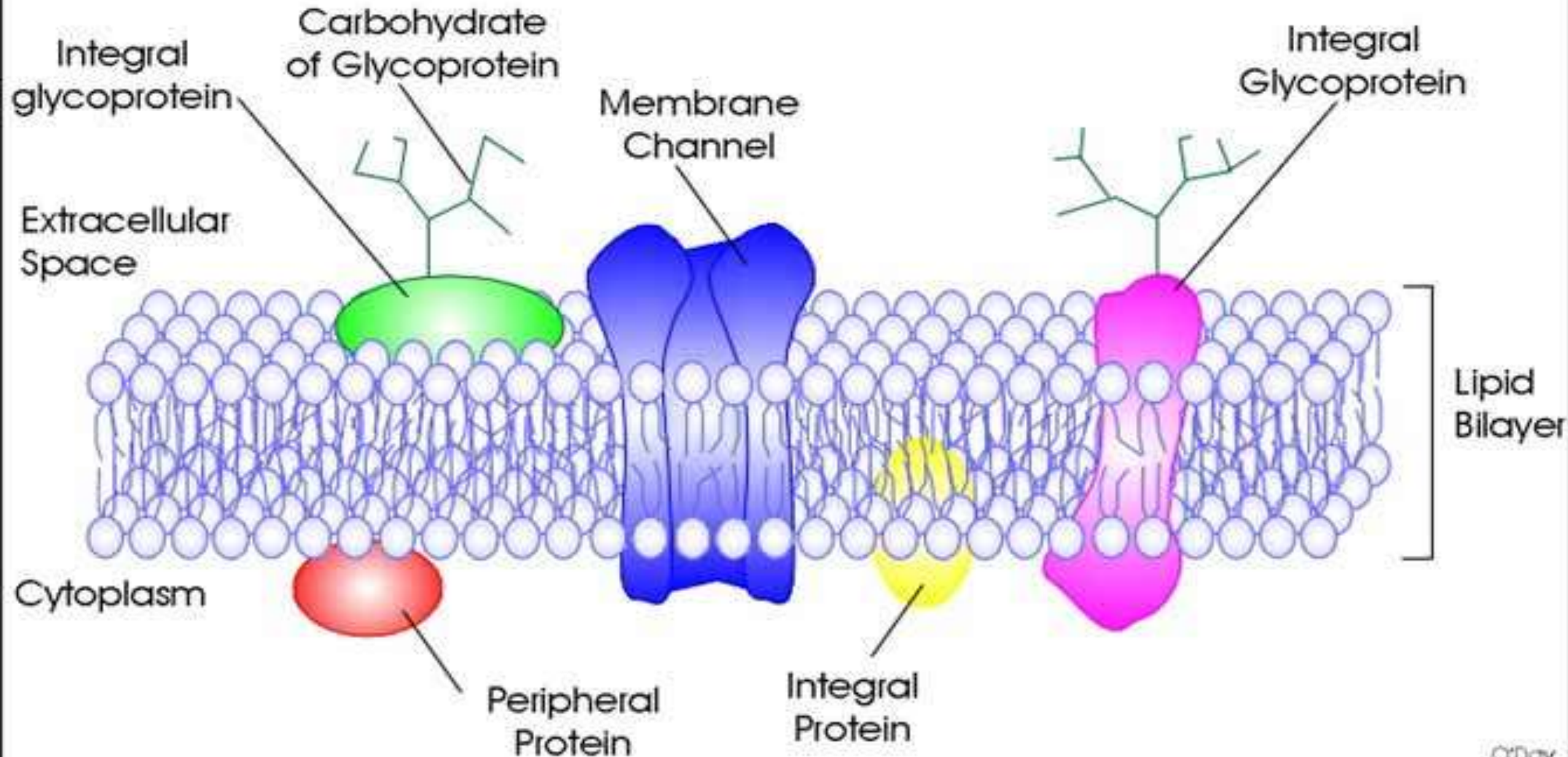
# introduction

- ▶ Plasma membrane can be defined as a biological membrane or an outer membrane of a cell, which is composed of two layers of phospholipids and embedded with proteins. It is a thin semi permeable membrane layer, which surrounds the cytoplasm and other constituents of the cell.
- ▶ Occurs on the outside of the cytoplasm in both prokaryotes and eukaryotic cells.
- ▶ It separates the cellular protoplasm from its external environment.

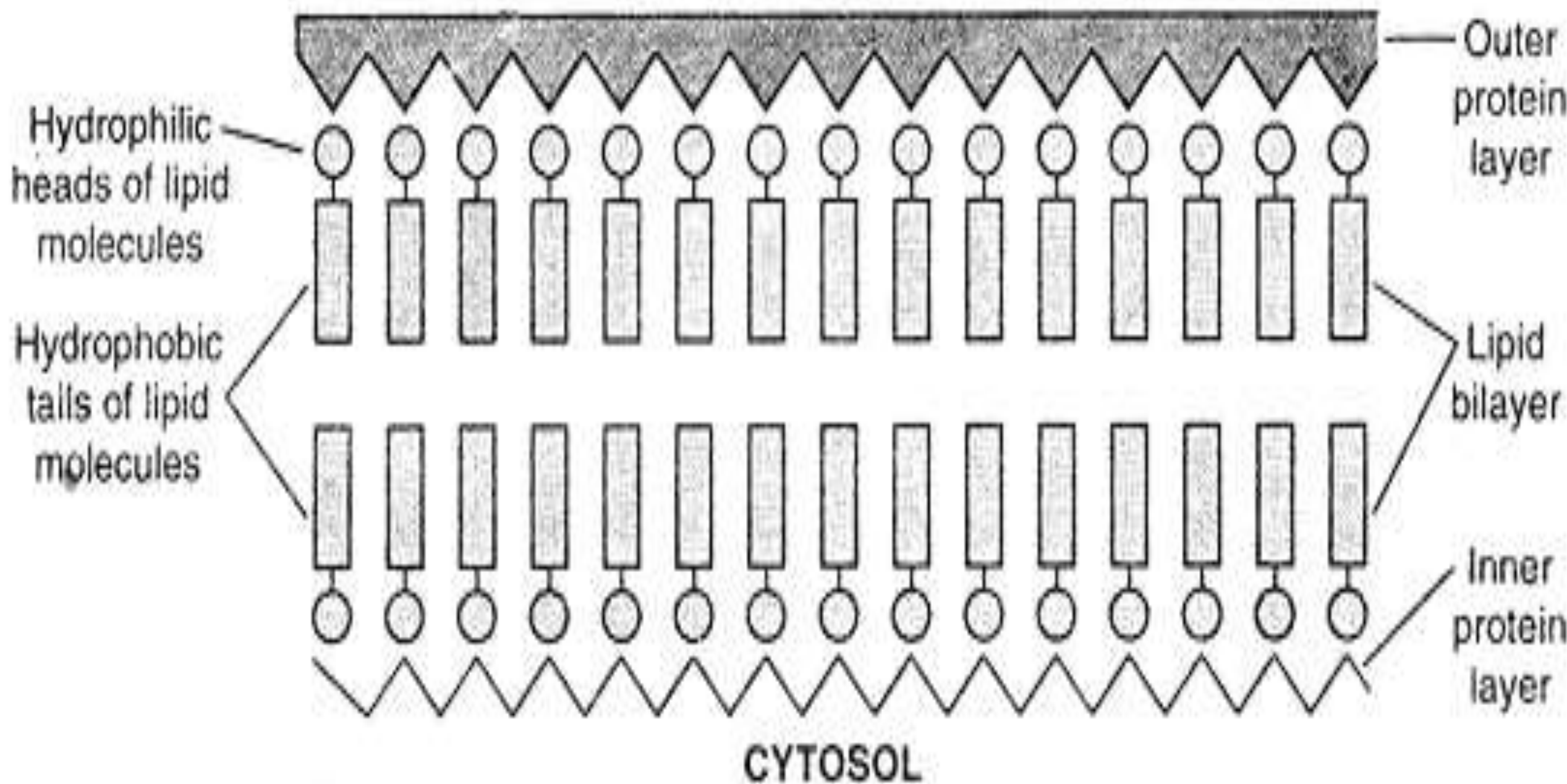
# Structure

- ▶ It is the boundary, which separates the living cell from their non-living surroundings.
- ▶ It is the phospholipids bilayer.
- ▶ Plasma membrane is an amphipathic, which contains both hydrophilic heads and hydrophobic tails.
- ▶ It is a fluid mosaic of lipids, proteins and carbohydrate.
- ▶ It is lipid bilayer, which contains -two layers of phospholipids, phosphate head is polar (water loving), fatty acid tails non-polar (water fearing) and the proteins embedded in membrane.

# Fluid Mosaic Model of Membrane Structure



# EXTRACELLULAR MEDIUM



# permeability of a membrane

- ▶ it is the rate of passive diffusion of molecules through the membrane and the molecules are permeant molecules.
- ▶ depends on the electric charge and polarity of the molecule
- ▶ Due to the cell membrane's hydrophobic nature, small electrically neutral molecules pass through the membrane more easily than charged, large ones.
- ▶ The inability of charged molecules to pass through the cell membrane results in pH partition of substances throughout the fluid compartments of the body.

# Facilitated diffusion

- ▶ Fast
- ▶ Specific
- ▶ Doesn't require energy
- ▶ We only see it from high concentration to low

# Passive diffusion

- ▶ This process does not require ATP but does require cell membrane proteins which are called carrier proteins to carry the molecules across the cell membrane from an area of higher concentration to an area of lower concentration



# Endocytosis

- ▶ Process of taking material into cell by process of infolding or pockets of the cell membrane
- ▶ Pocket breaks loose from cell membrane and forms a vacuole or vesicle inside the cell
- ▶ Large macromolecules require more complex mechanisms to traverse membranes, and are transported selectively
- ▶ essential hydrophobic or toxic small molecules enter and exit cells via these mechanisms
- ▶ lipid diffusion and protein-mediate drugs travel into and out of cells.
- ▶ Two types:phagocytosis and pinocytosis

# phagocytosis

- ▶ “Cell eating”
- ▶ Extensions of cytoplasm surround the particle and packet it within a food vesicle
- ▶ Cell then engulfs the package
- ▶ amoebas

# pinocytosis

- ▶ “cell drinking”
- ▶ When cell needs to take up liquid
- ▶ Tiny pockets in the cell membrane form
- ▶ Fill with liquid or many smaller molecules
- ▶ Then pinch off to form vesicle inside of cell

# exocytosis

- ▶ When cell releases large amounts of material
- ▶ Excretes stuff
- ▶ Membrane of vacuole surrounding particle inside cell fuses with the cell membrane
- ▶ The contents in the vacuole are then forced out of the cell
- ▶ Example : Removal of water by contractile vacuole

Thank You

