



CELL TRANSPORTATION

Transportation

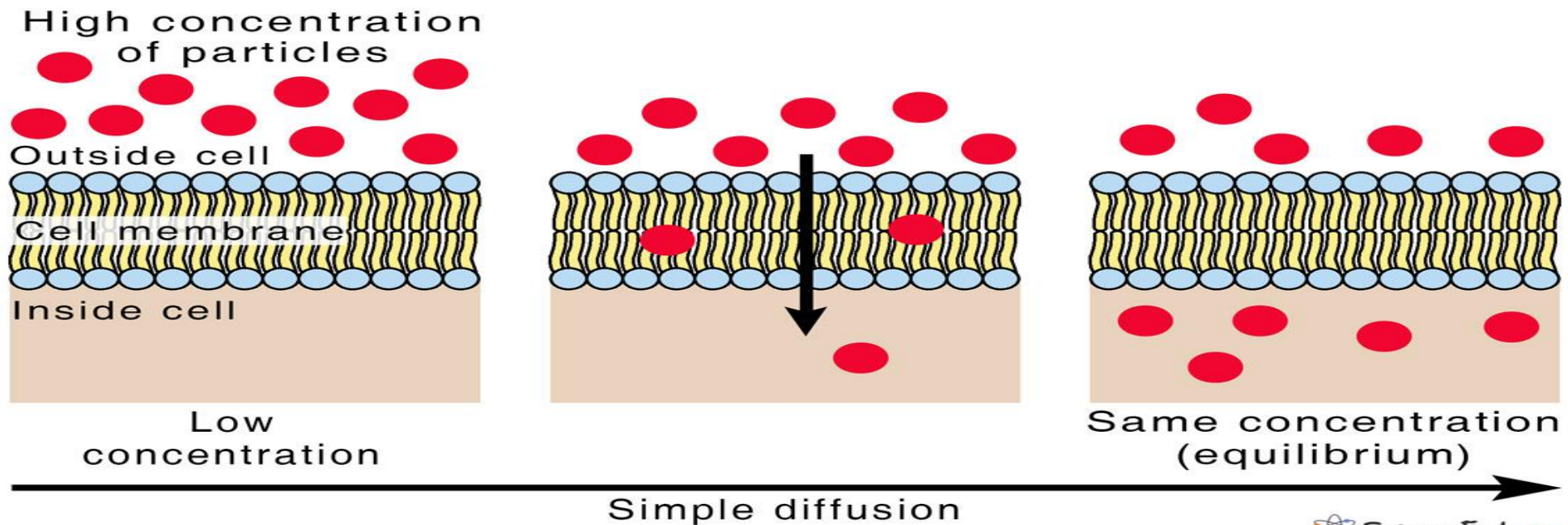
- Plasma membrane is selectively permeable.
- The lipid bilayer is permeable to non-polar, uncharged molecule but impermeable to ions, large, uncharged polar molecules like glucose.
- To support metabolic reactions, certain substances need to move into the cell. The substances move through transport process :
 - Passive transport
 - A substance moves down its conc. or electrical gradient to cross the membrane using kinetic energy
 - Active transport

Passive Transport

- Simple diffusion:**- A passive process in which substances move freely through the lipid bilayer of plasma membrane of cells without the help of membrane transport proteins.
Eg: non-polar, hydrophobic molecules

Simple Diffusion

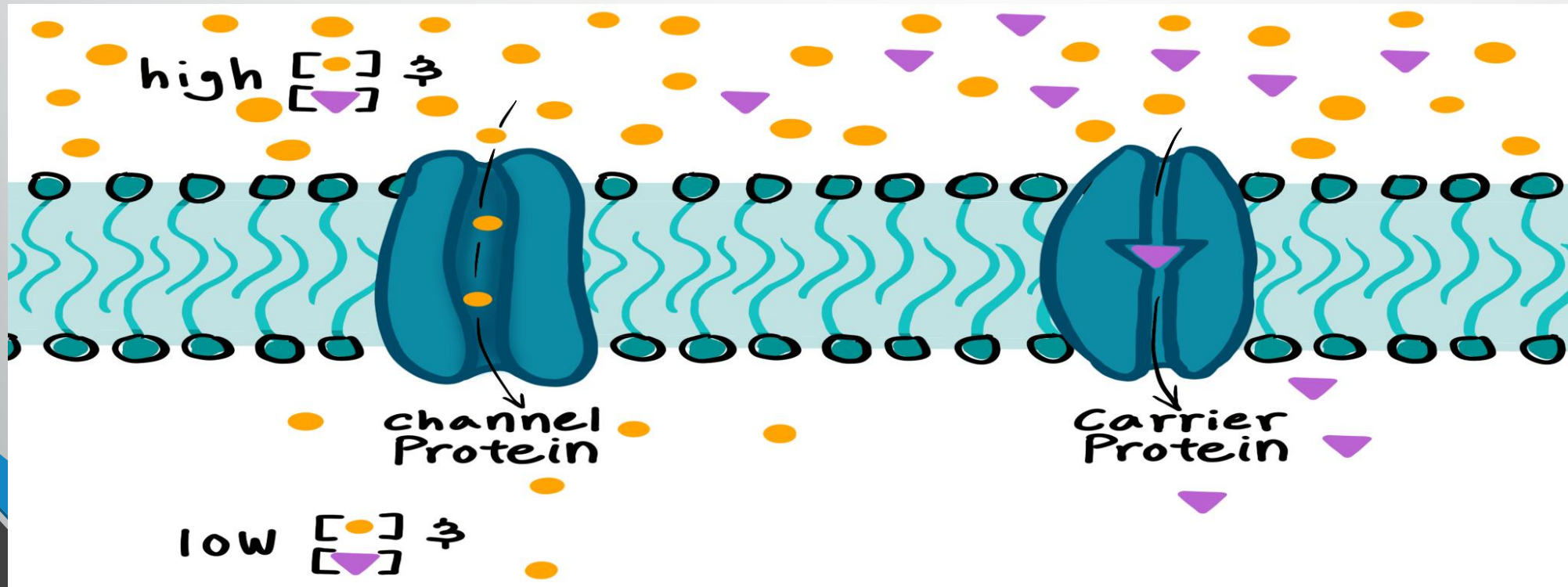
Movement of particles from high to low concentration without a protein



I. **Facilitated diffusion**:- Too polar & highly charged solutes move through the membrane by the help of integral membrane proteins which may be a carrier or channel.

II. Channel mediated: eg- K⁺ ions through a gated K⁺ channel

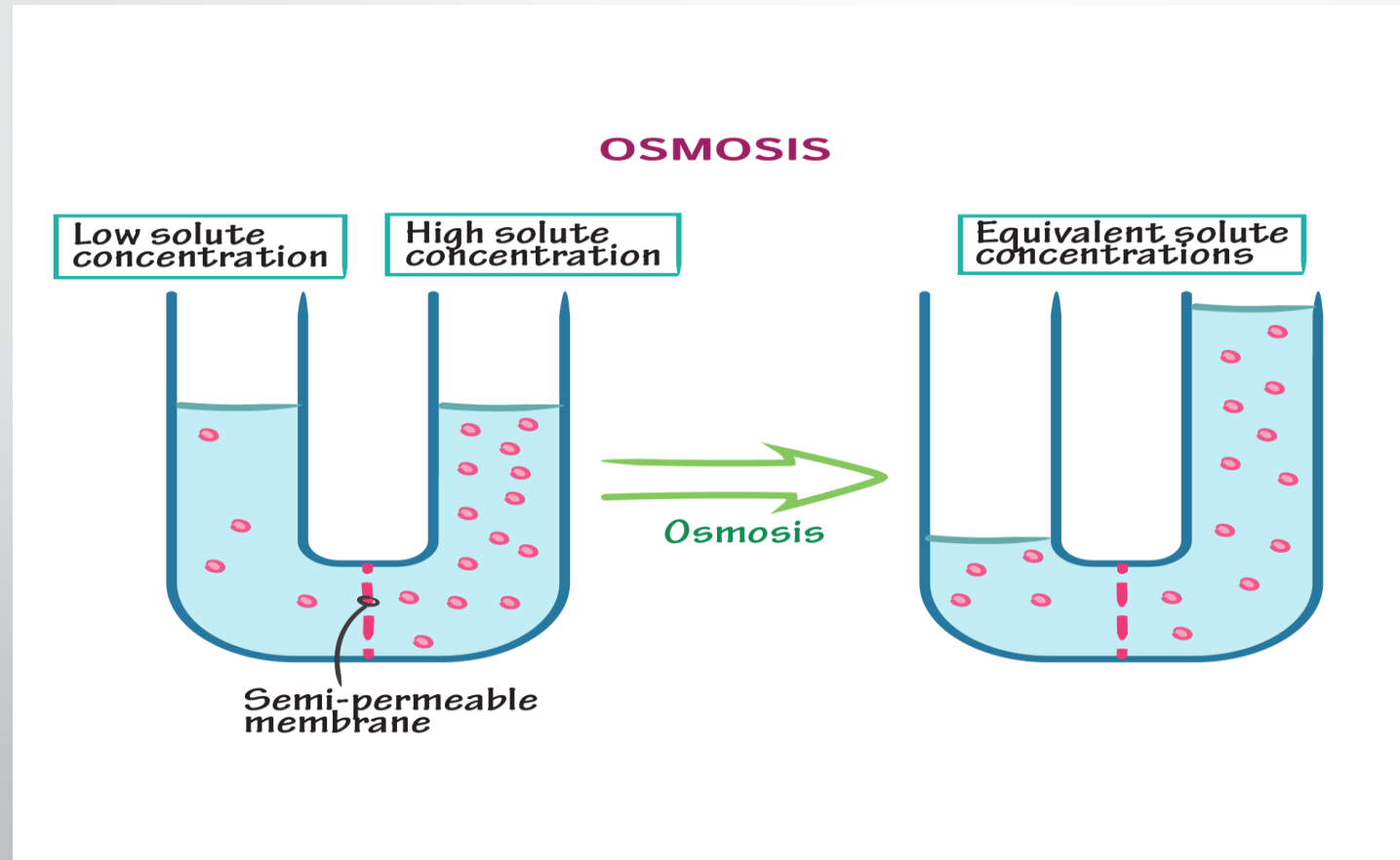
III. Carrier mediated: eg-glucose by the help of glucose transport



Osmosis:-

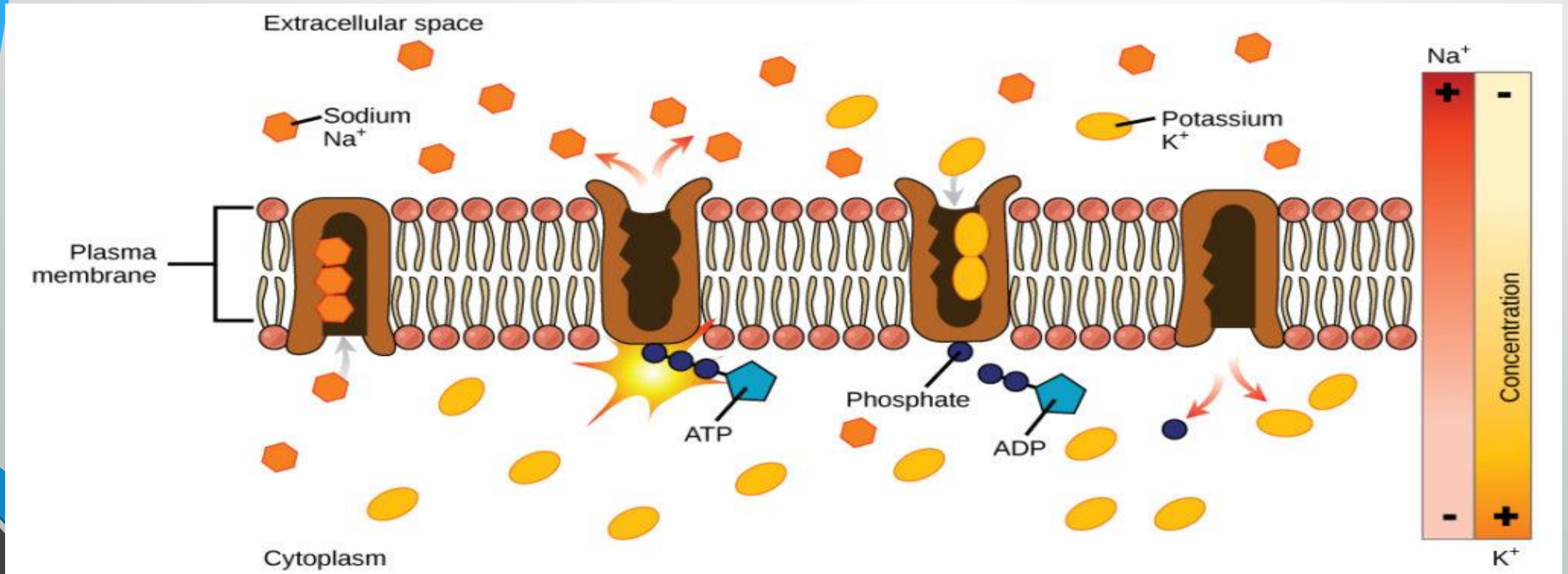
The process by which solvent moves from higher conc. to lower conc. through a selectively permeable mem. to maintain its equilibrium.

In living systems, the solvent is water.

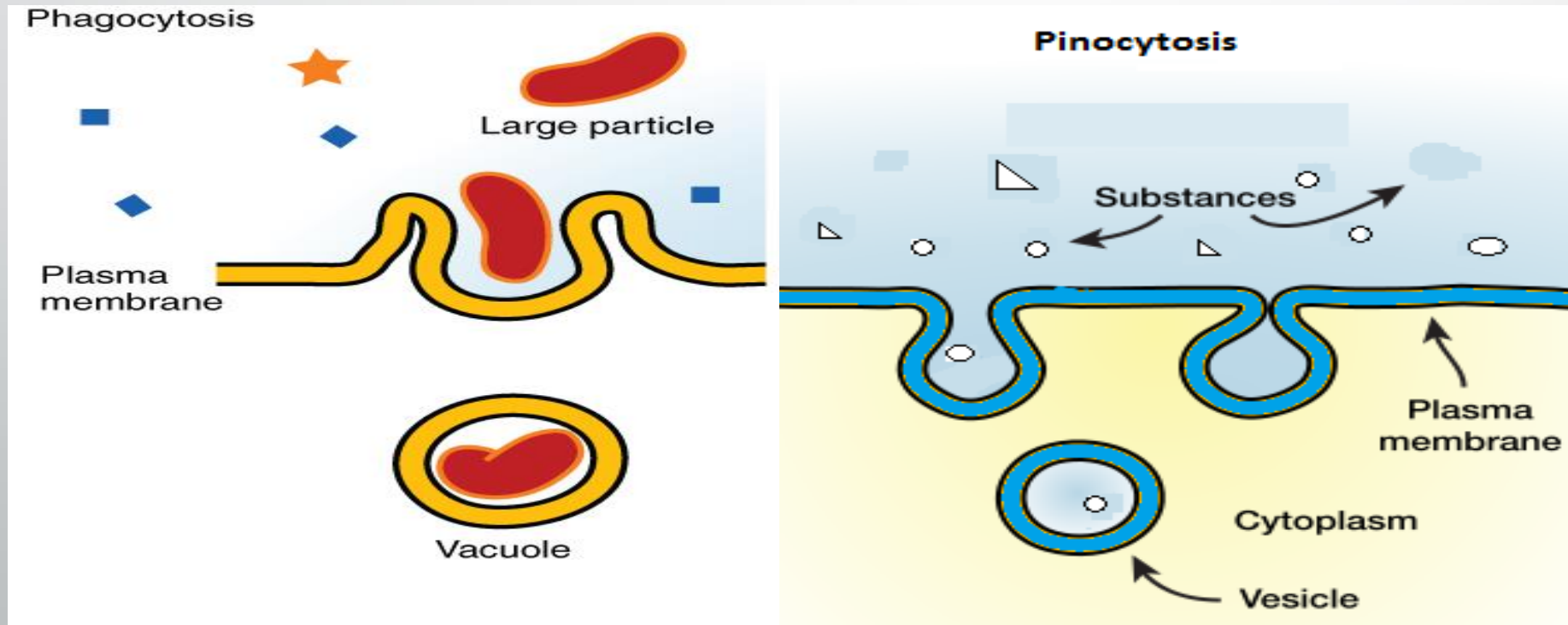


Active Transport

- A substance moves against its conc. & electrical gradient to cross the membrane using cellular energy
 - 1. Sodium-potassium pump- maintain unequal conc. Of sod. & pot



- I. Bulk transport- by the process of phagocytosis & pinocytosis
 - I. Phagocytosis(cell eating)
 - II. Pinocytosis(cell drinking)





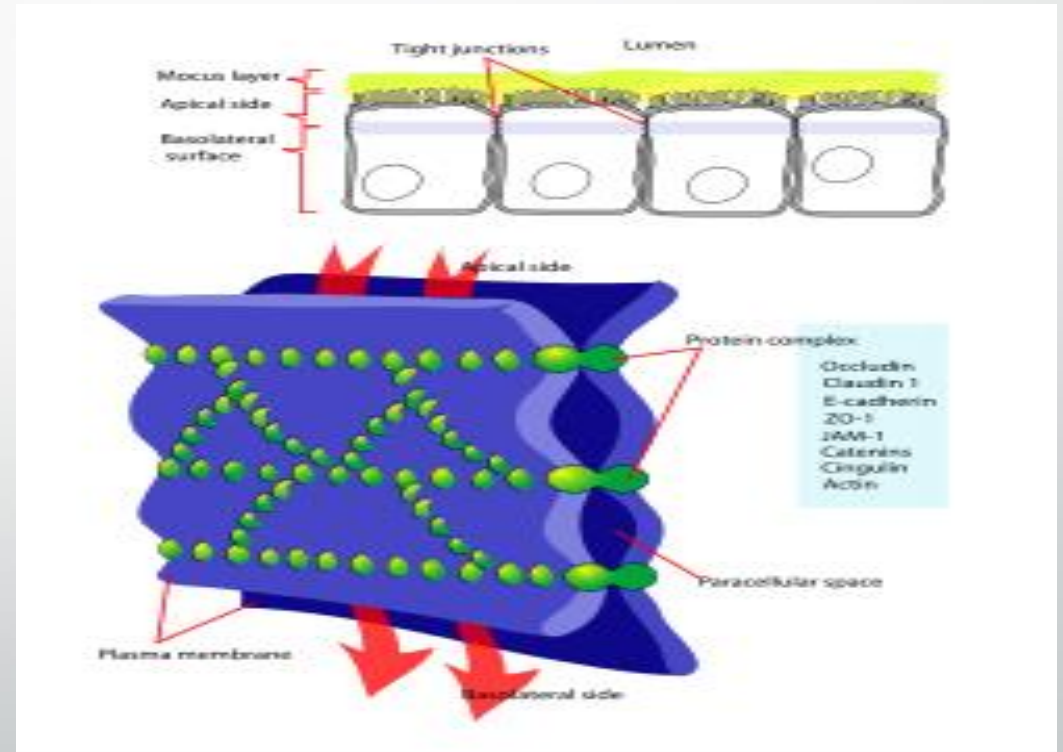
CELL JUNCTION

Cell Junction

- Cells are held together to form tissues. most of the cells are tightly joined into functional units.
- Cell junctions are the contact points between the plasma membranes of tissue cells.
- There are 5 most important types of cell junctions
 - 1) Tight junction
 - 2) Adherens
 - 3) Desmosomes
 - 4) Hemidesmosomes
 - 5) Gap junction

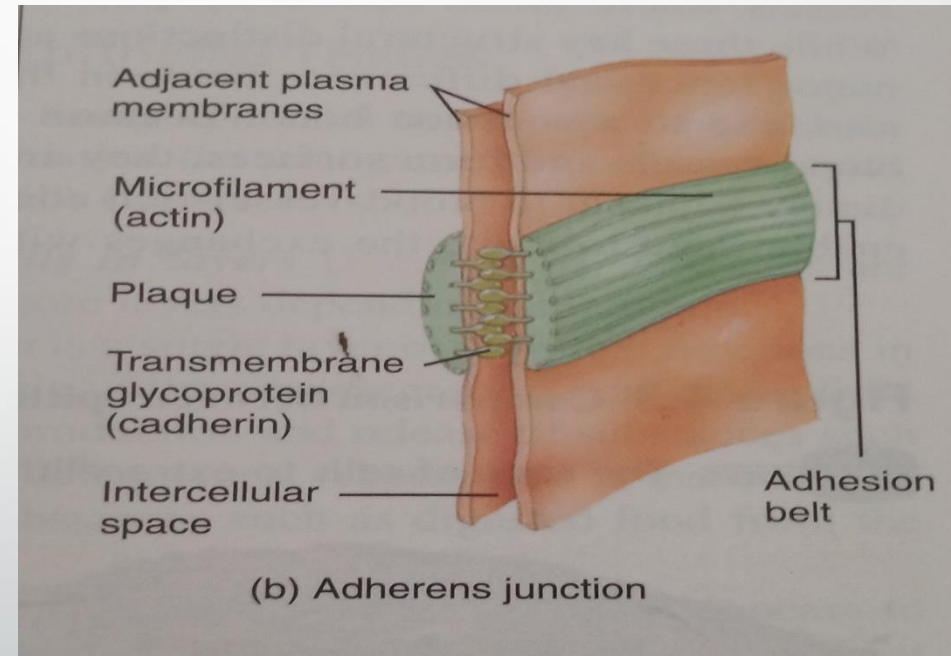
Tight junction

- It consists of web like strands of transmembrane proteins that fuse together
- The outer surface of adjacent plasma membrane seal off the passageways between adjacent cells.
- Eg: cells of lining of stomach, intestine, urinary bladder
- Prevents the content of organs from leaking into blood
- Inhibit the passage of substances between cells.



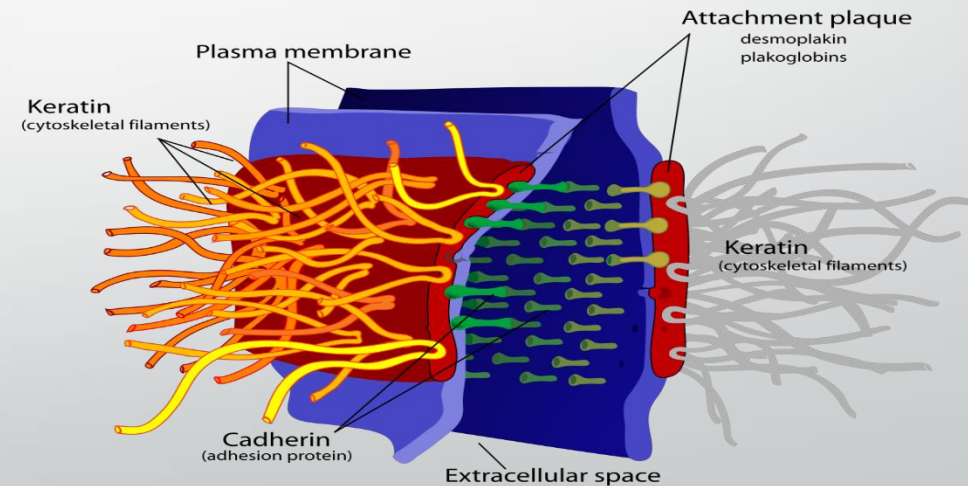
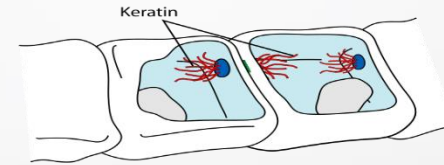
Adherens

- Contains plaque, a dense layer of proteins on the inside of the plasma membrane that attaches both membrane.
- Transmembrane glycoproteins that join the cells – cadherin
- Helps the surface to resist various contractile activity.



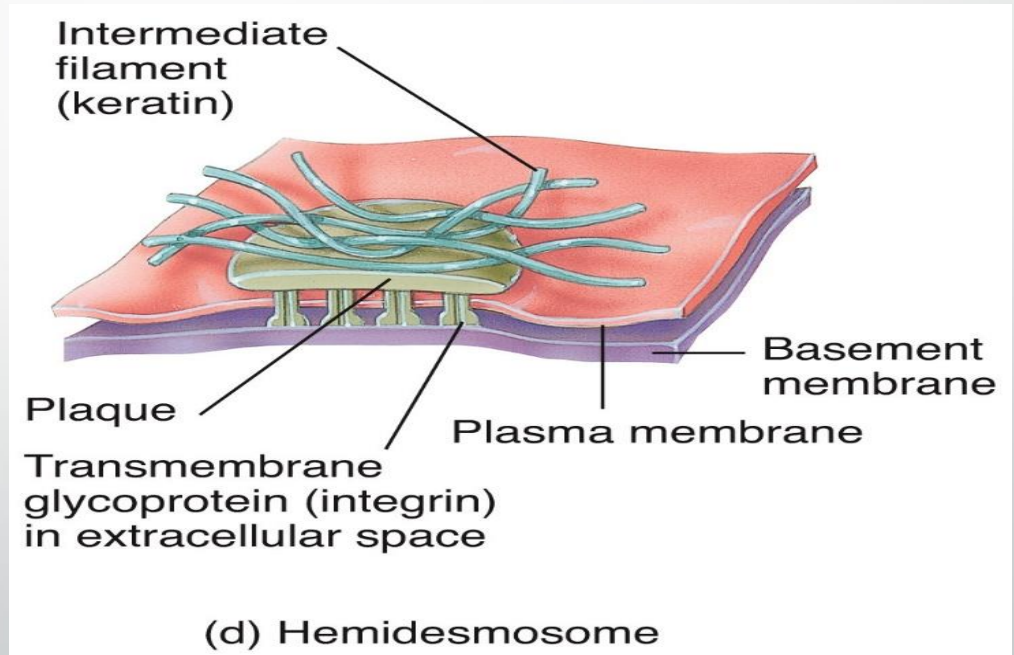
Desmosomes

- Contain plaque & cadherins
- Cadherins attach to each other
- Plaque does not attach to microfilaments
- Found in epidermis, cardiac muscle cells
- Prevents the epidermal cells from separating under tension



Hemidesmosomes

- Resemble desmosomes
- Do not link to adjacent cells
- Contains integrins i.e. transmembrane glycoproteins in extracellular space
- Integrins attach to intermediate filament i.e. keratin
- Integrins attach to basement membrane



Gap junction

- At gap junction, connexons connect adjacent cells
- Connexons are the tiny fluid-filled tunnels formed by membrane proteins i.e. connexins.
- Plasma membranes are not fused together but separated by narrow intercellular gap
- Transfer of small molecules, ions, nutrients, wastes take place.
- It allows the cells of a tissue to communicate with one another.

