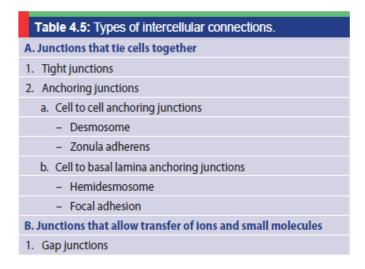
## **Intercellular connections**

- What is intercellular connections
- Functions
- Types of intercellular connections
- Applied physiology

## Note: Draw diagrams

- Intercellular connections are points of contact between the plasma membranes of adjacent cells. It consists of multi-protein complexes that provide contact between neighbouring cells or between a cell and the extracellular matrix.
- Functions of intercellular connections
  - Form fluid-tight seal between cells.
  - Anchor cells together or to extracellular materials.
  - Allow ions/molecules to pass from cell to another cell within a tissue



- Tight junctions/ Zonula occludens : Attach 2 cells near apical margins of the cells in epithelia
  - Location: Intestinal mucosa, Renal tubules, and the choroid plexus.
  - There are 3 main families of transmembrane proteins that contribute to tight junctions: occludin, junctional adhesion molecules (JAMs), and claudins.

- Tight junctions permit the passage of some ions and solute in between adjacent cells (paracellular pathway).
- It helps in forming Selective permeability barrier in intestine and renal tubules, blood brain barrier in brain.
- Zonula adherens: is located on the basal side of the zonula occludens,
  - It is a major site of attachment for intracellular microfilaments.
  - It contains <u>cadherins</u>.
- **Desmosomes** are patches characterized by apposed thickenings of the membranes of two adjacent cells.
  - Attached to the desmosomes in each cell are <u>intermediate</u> <u>filaments</u>.
  - Between the two membrane thickenings the intercellular space contains <u>cadherins.</u>
- **Hemidesmosomes**: look like half-desmosomes that attach cells to the underlying basal lamina and are connected intracellularly to <u>intermediate</u> <u>filaments</u>. They contain <u>integrins</u> rather than cadherins.
- **Focal adhesions** also attach cells to their basal laminas. They are associated with <u>actin filaments</u> inside the cell, and they play an important role in cell movement. Between the two membrane thickenings the intercellular space contains <u>Integrins</u>.
- **Gap junctions:** At gap junctions, the intercellular space narrows from 25 nm to 3 nm, and units called **connexons** in the membrane of each cell are lined up with one another . Each connexon is made up of six protein subunits called **connexins.** 
  - X-linked Charcot–Marie–Tooth disease is a peripheral neuropathy associated with mutation of one particular connexin gene
  - Cardiac muscles form functional synctitium due to presence of gap junctions in the intercalated disc.