

3rd lecture, last part of epithellium:

Intercellular junctions (cell to cell adhesion)

Before starting you should have known that cytoskeleton is made up of microfilaments (7nm) that is made up of actin and myosin filaments, and microtubules (25nm), and finally of intermediate filaments (7-25) nm that is made up of keratin.

The intercellular junctions are more **numerous between the epithelial cells**, found on the lateral and basal part of tissue. They are three types:

1- Occluding junctions: (Tight)

Link cells to form an impermeable barrier, it seals the cells together tightly and it has very small space between cells (20-30) nm, it prevents any thing to pass throw cells without absorption, and this found on the between lateral and basolateral surfaces, found in intestine and kidney tubules. So found especially in absorptive cells that has microvilli and absorption enzymes.

2- Anchoring junctions: (Adhering)

Provide mechanical stability to the epithelial cells, the space between the cells in this part is more than 30nm, and it is two types between cells and one with basement membrane.

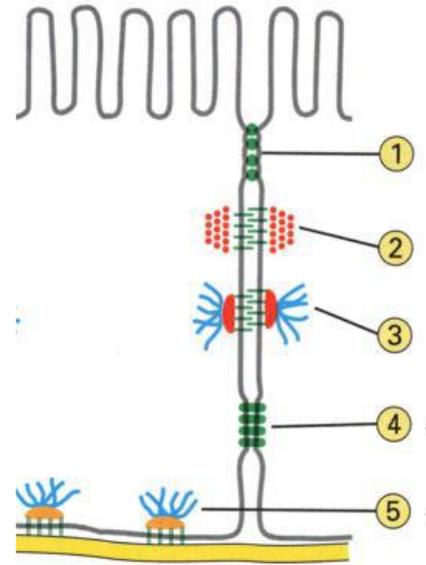
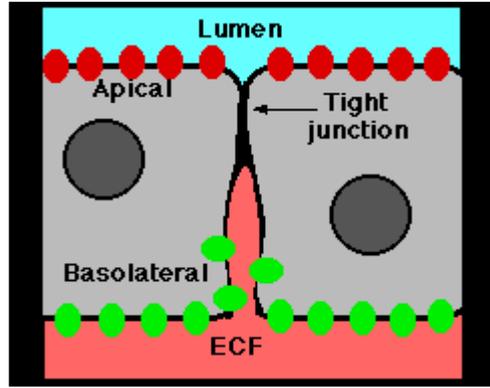
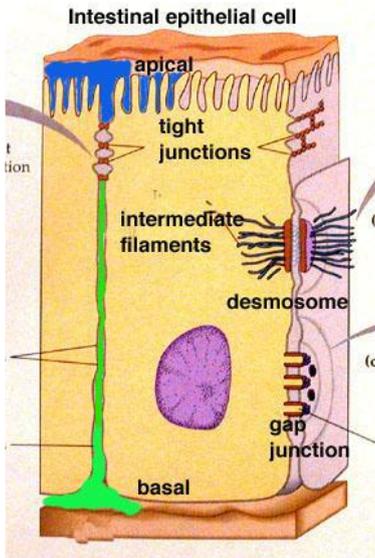
- Zonula adherens and is linked in cytoplasm via microfilaments.
- Macula adherens (desmosome) and is linked in cytoplasm via intermediate filaments, and prevents shear forces.
- Hemidesmosome and this is for basement membrane.

3- Communicating junctions: (Gap)

Tubes (channels) for rapid and fast communication between cells, it is found especially in cardiac and smooth muscles. So it is a gate for movement of ions and molecules between cells.

Cell Junctions Types

- ❑ **Tight Junctions** (Occluding Junctions)
 - ❑ Seal adjacent epithelial cells together
 - ❑ Prevent passage of most dissolved molecules, membrane-bound lipids and proteins between apical and basolateral surfaces
- ❑ **Gap Junctions** (Communicating Junctions)
 - ❑ Allow adjacent cell communication; pass ions & small molecules between cytoplasm
- ❑ **Focal Adhesions & Hemidesmosomes**
(Anchoring Junctions, Actin & Intermediate Filament Attachment Sites)
 - ❑ Form around integrin-mediated cell-ECM contacts
 - ❑ Focal adhesions connect integrins to actin filaments
 - ❑ Hemidesmosomes connect integrins to intermediate filaments
- ❑ **Adherens Junctions & Desmosomes**
(Anchoring Junctions, Actin & Intermediate Filament Attachment Sites)
 - ❑ Form around cadherin-mediated cell-cell contacts
 - ❑ Adherens junctions connect cadherins to actin filaments
 - ❑ Desmosomes connect cadherins to intermediate filaments



Basal modifications

- **Basement membrane**

- **Flagella**

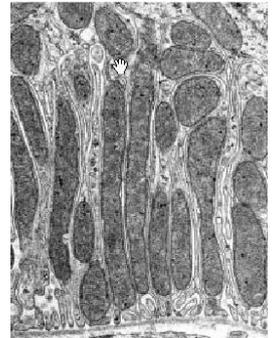
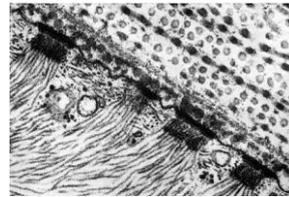
- It has an important role for movement of sperms.

- **Basal infolding**

- This one found inside the cells for reabsorption and around it many large mitochondria in order to supply it with power.

- **Hemidesmosome**

- In some epithelial tissue, basal cells anchored to basement membrane with junctions called **hemidesmosomes**



في شغلة ذكرتها عبثا بالمحاضرة الي هي انه الاساس للسلييا هو السنتروزوم بس

Basement membrane

- is extracellular layer between epithelium and connective tissue often visible with microscope

- Thin extracellular layer having **two parts**:

- **Basal lamina**: type IV collagen + laminin (adhesion protein), the cell rests on this part.

- Produced by epithelial cell

- Reticular lamina:** Type VII collagen + type III collagen (reticular F) [this part is more near for connective tissue than basal part.](#)

- Secreted by C.T. cells

Function:

1. Attach epithelium to C.T.

2. Separate epithelium from other tissue

3. Regulate (filter) substances passing from C.T. to epithelium

4. Guide during tissue regeneration

5. [It has important role in protection of tumors, the tumor will go inside other parts of the body if it is broken down or if we don't have it.](#)