Cell Junctions (Cell Biology)

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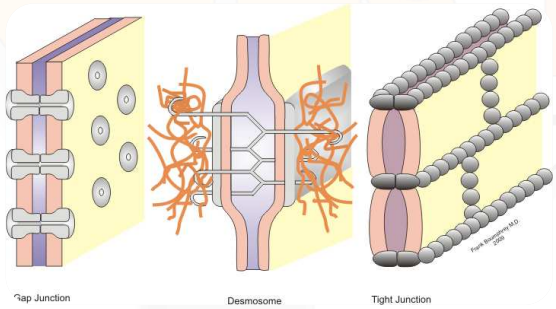
- Cell Junctions Introduction
- Gap Junctions
- Tight Junctions
- Anchoring Junctions



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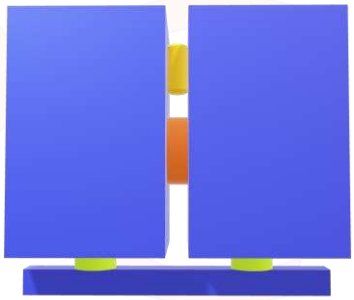
Cell Junction Introduction

- **Cell junctions or Intracellular Bridge:** Bridge or Junction between two Cell
- These are a class of cellular structures consisting of multiprotein complexes that provide contact or adhesion between neighboring cells or between a cell and the extracellular matrix in animals



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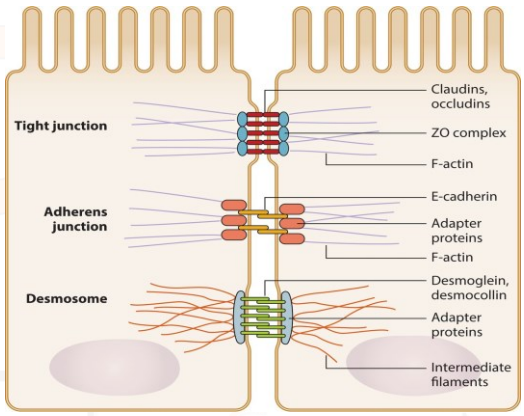
Cell Junction Introduction

- They also maintain the paracellular barrier of epithelia and control paracellular transport.
- Cell junctions are also especially important in enabling communication between neighboring cells via specialized protein complexes called **communicating (gap) junctions**
- Also provide the integrity of the cells (**anchoring the cells**)



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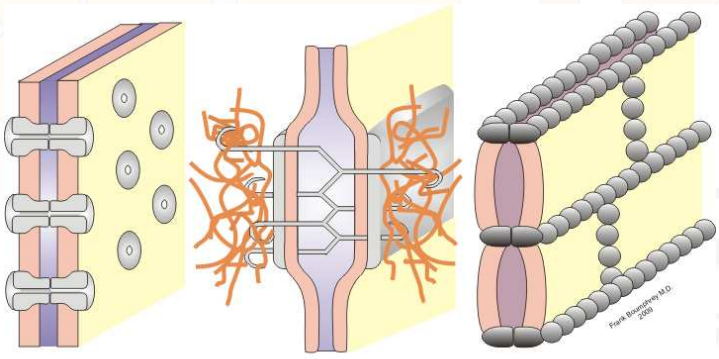
Cell Junctions

- Gap Junctions (Communicating Junction)
- Tight Junction
- Anchoring Junctions: Desmosomes, Hemidesmosomes, Adherens Junctions



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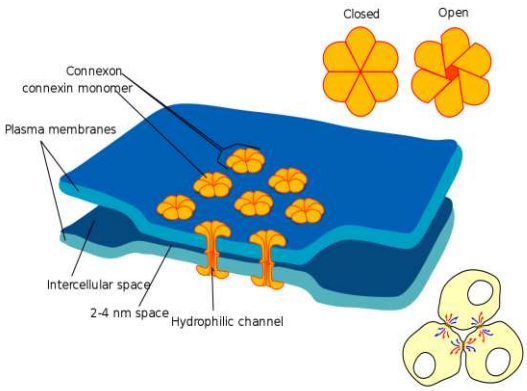
Cell Junctions

1. Gap Junctions (Communicating Junction)

- These junction provide direct electro-chemical communication between adjacent cells through diffusion without contact with the extracellular fluid
- One gap junction channel is composed of two **connexons** (or hemichannels), which connect across the intercellular space.
- Gap junctions are found almost all tissues of the body except fully developed skeletal muscle and mobile cell types such as sperm or erythrocytes.
- A gap junction may also be called a *nexus* or *macula communicans*



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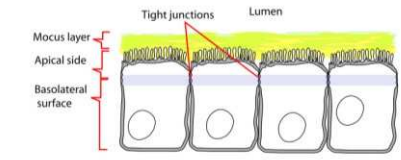
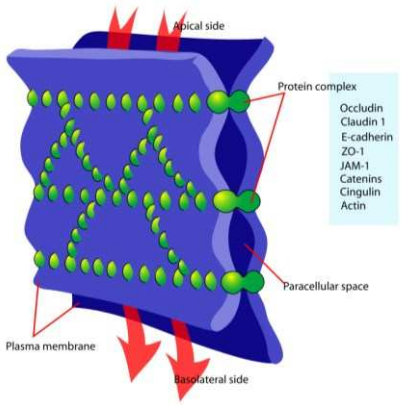
Cell Junctions





2. Tight Junction

- also known as **occluding junctions** or **zonulae occludentes**
- These are multiprotein junctional complexes, which prevent the leakage of transported solutes and water and seals the paracellular pathway
- Tight junctions may also serve as leaky pathways by forming selective channels for small cations, anions, or water.

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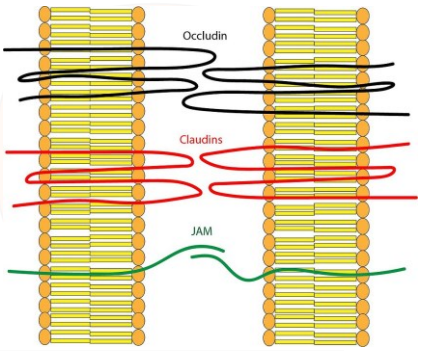
Cell Junctions

2. Tight Junction

- Tight junctions are present mostly in vertebrates
- Mainly proteins are involved: Occludin, Claudins, and Junction Adhesion Molecules (JAM)



Function:

- They hold cells together.
- Barrier Function
- Maintain osmotic balance

Types:

- *Tight epithelia* have tight junctions that prevent most movement between cells, found in Distal Convoluted Tubules, Collecting ducts, Bile duct
- *Leaky epithelia* do not have these tight junctions, or have less complex tight junctions, found in Proximal Convoluted Tubules

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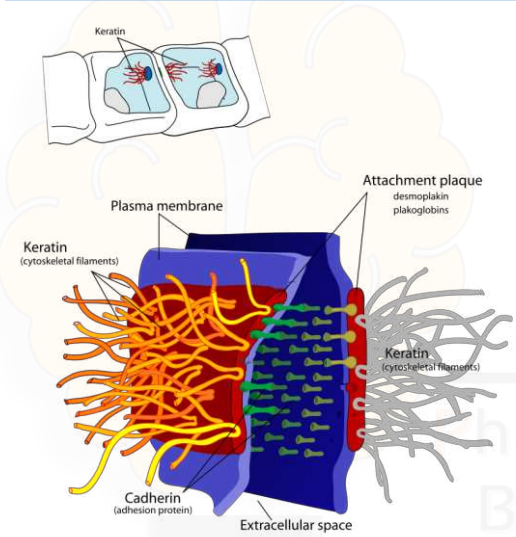
Cell Junctions



3. Anchor Junction

- Cells within the tissue must be anchored to each other and attached to components of extracellular matrix. There are main three types of junctions: Desmosomes, Hemidesmosomes, Adherens Junctions
- **Desmosomes (macula adherents):** Cell to cell junction through Cadherin transmembrane protein. Found in Cardiac muscles, GI mucosa, bladder tissues, and epithelia

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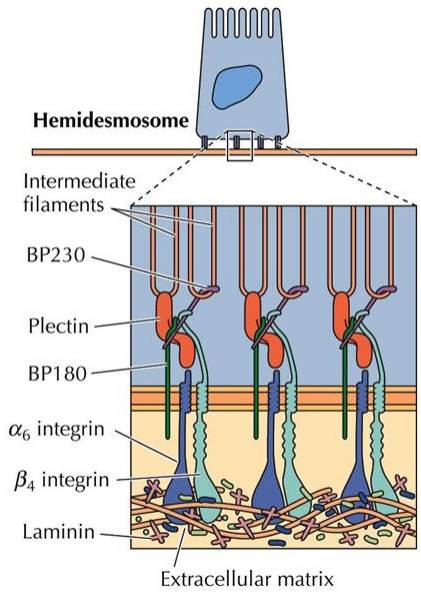
Cell Junctions



3. Anchor Junction

- **Hemidesmosomes** are very small stud-like structures found in keratinocytes of the epidermis of skin that attach to the extracellular matrix (ECM)
- It is the type of cell to ECM junction through **Integrins** protein,

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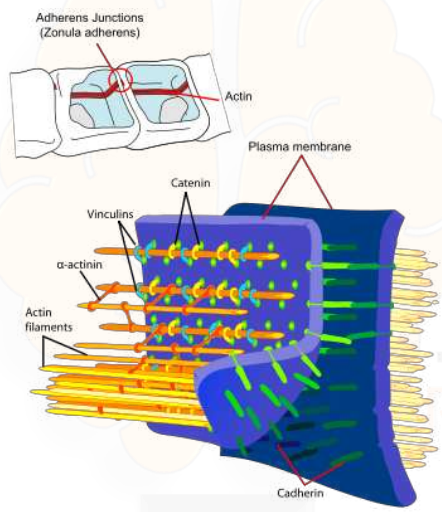
Cell Junctions



3. Anchor Junction

- **Adherens Junctions,** cell junction whose cytoplasmic face is linked to the actin cytoskeleton
- anchoring cells through their cytoplasmic actin filaments
- Similarly to desmosomes and hemidesmosomes, their transmembrane anchors are composed of cadherins in those that anchor to other cells and integrins in those that anchor to extracellular matrix

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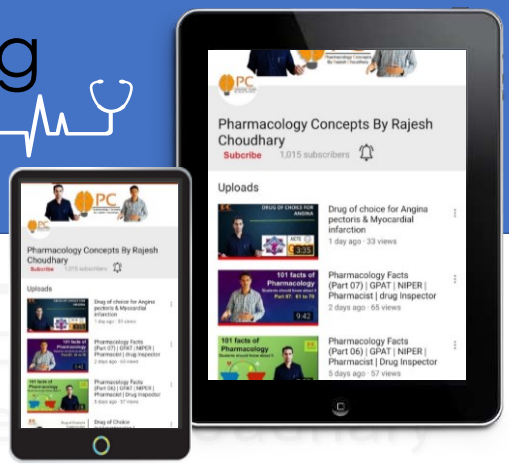

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