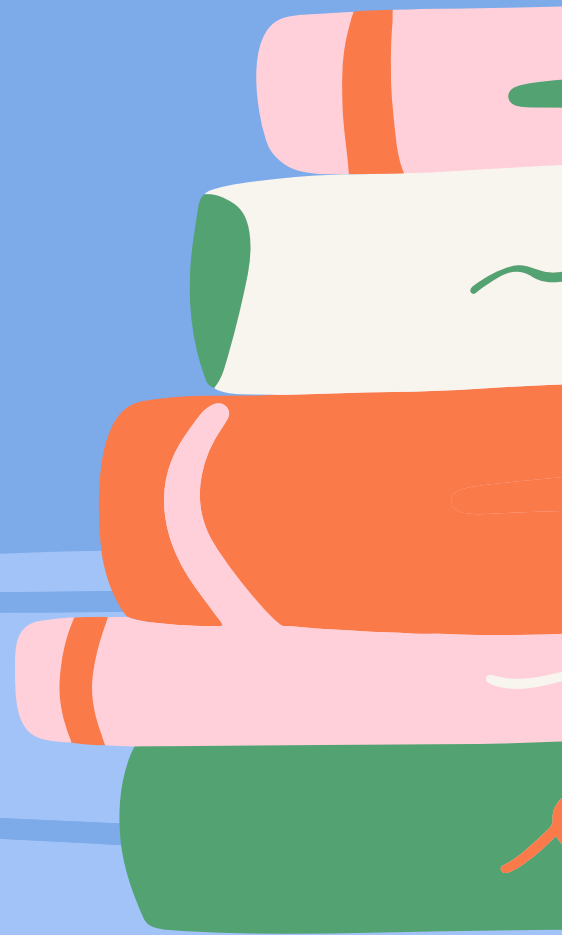


Silapathar College

# Cell Junction

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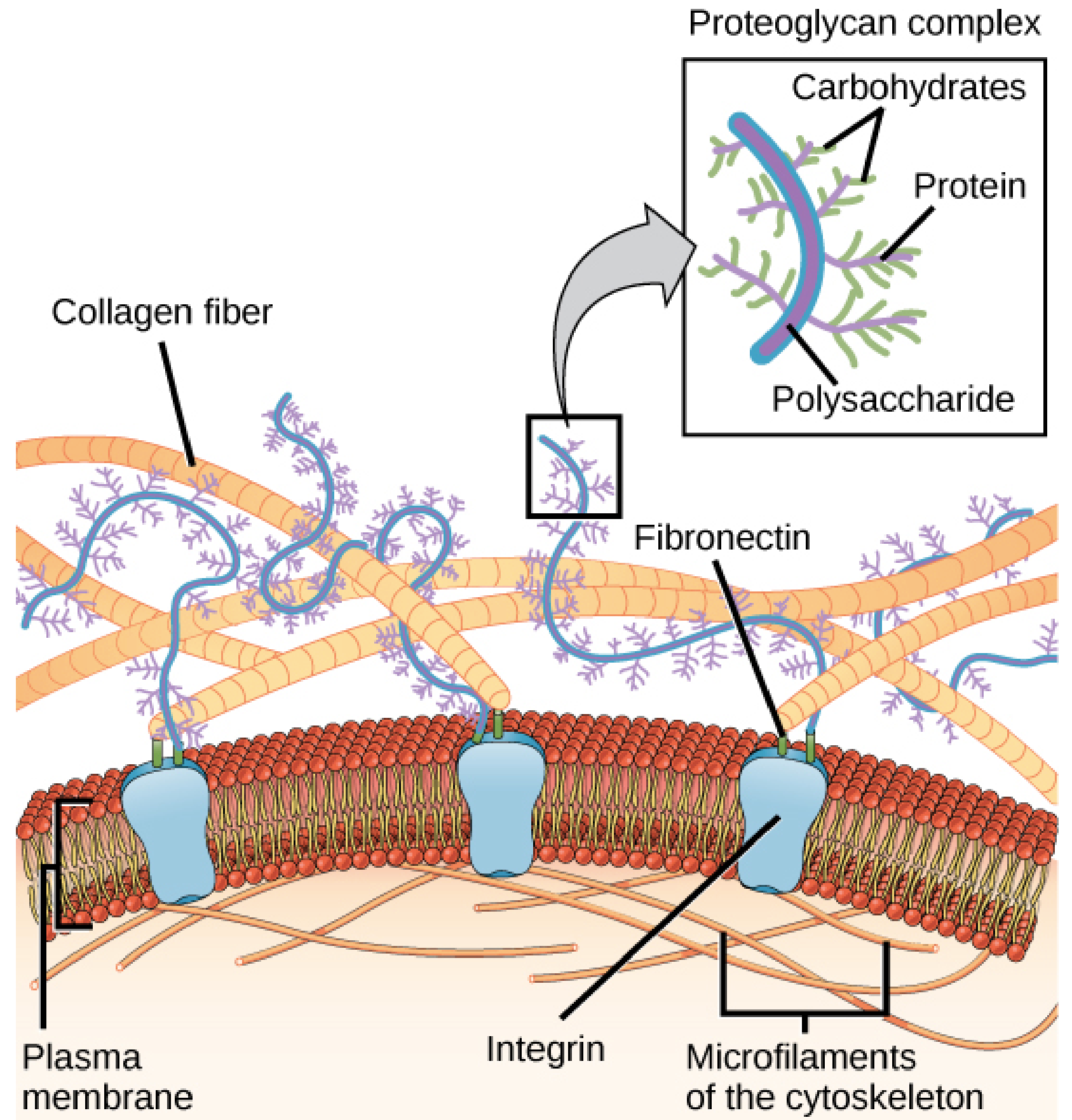


Like our human society, all cells in a multicellular organism have social interaction and are somehow bound to each other.

Cells may be linked by direct interaction (Mostly by Proteins), or maybe held together within the extracellular matrix.

**What is an extracellular matrix???????**

A complex network of proteins and polysaccharides chain that the cells secrete.



# WHY WE NEED CELL JUCTION

1. In order to get a tissue system
2. Communicate between cell
3. To form an organized multicellular structure
4. Respond to various external forces
5. Provide a barrier to the external and internal environment (Cytoplasm / extra cellular fluid)



# Types of junction

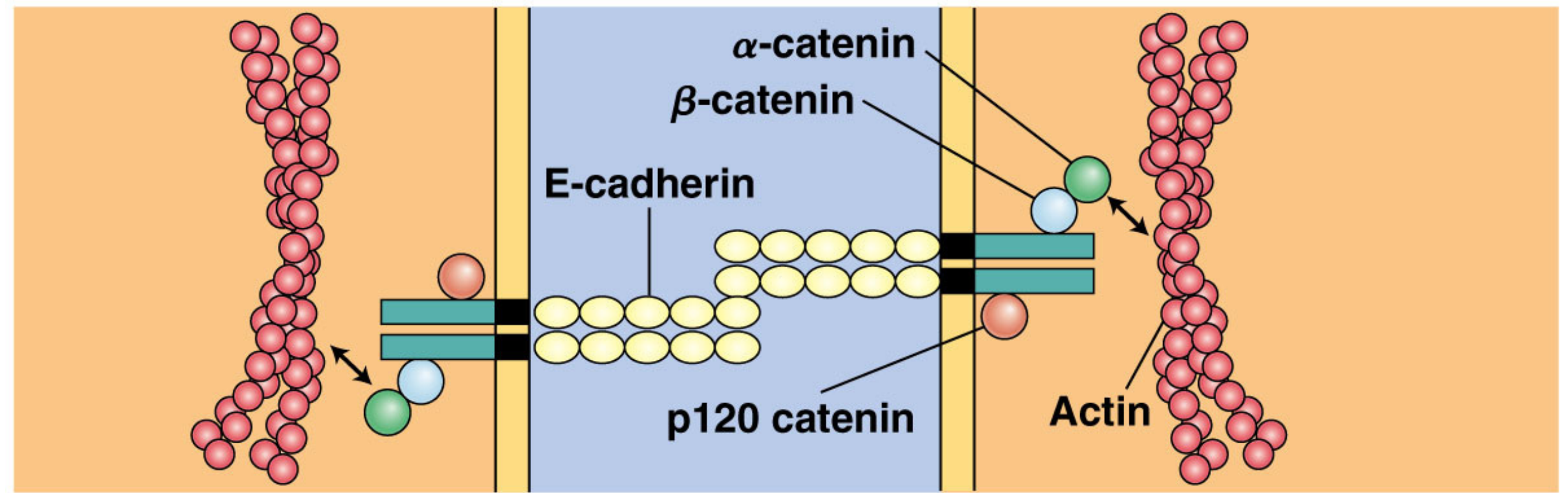
Adherens  
junction

Tight  
Junction

Gap  
Junction

Desmosome  
Junction

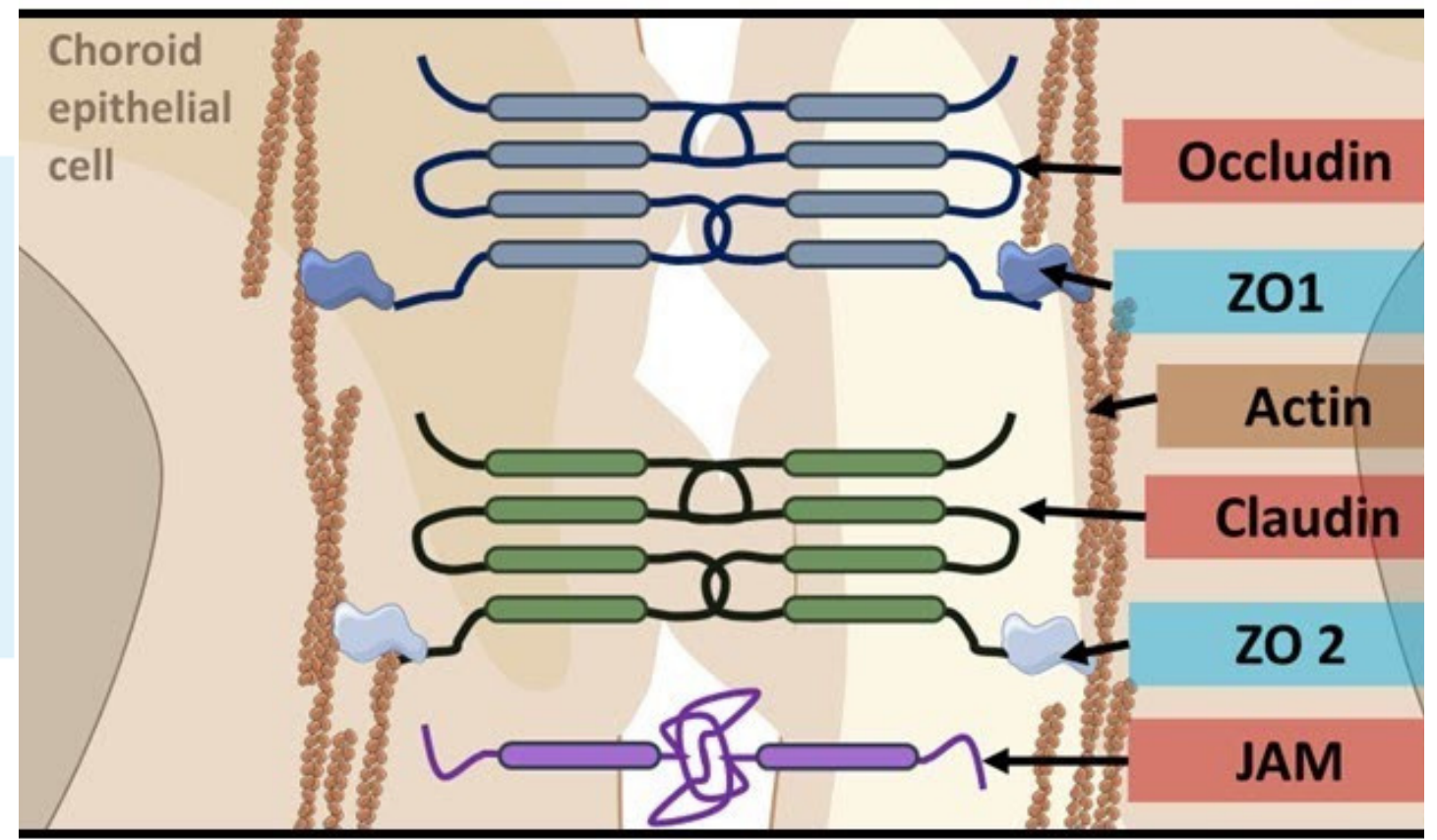
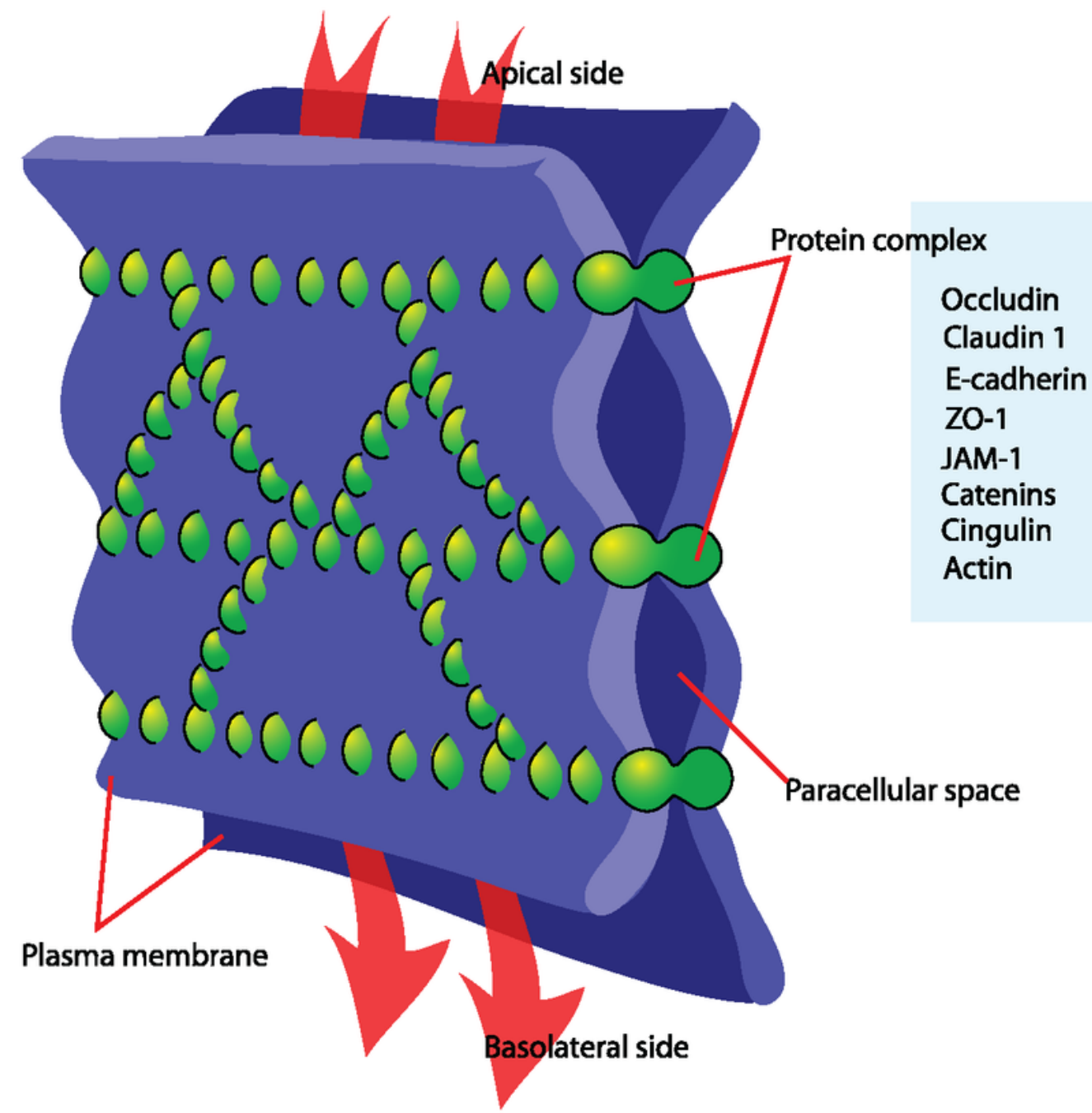
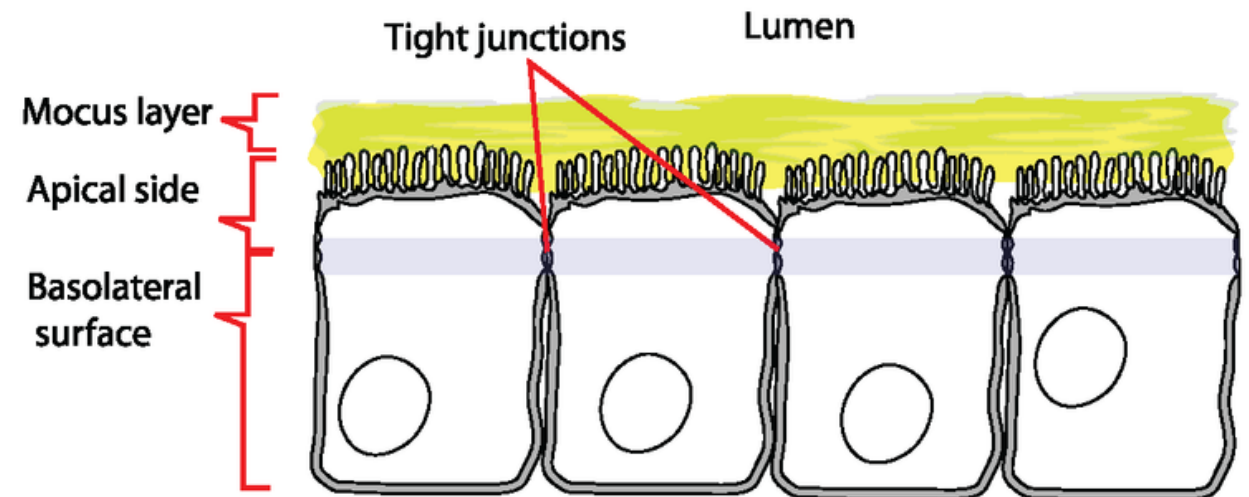
# Adherens Junction

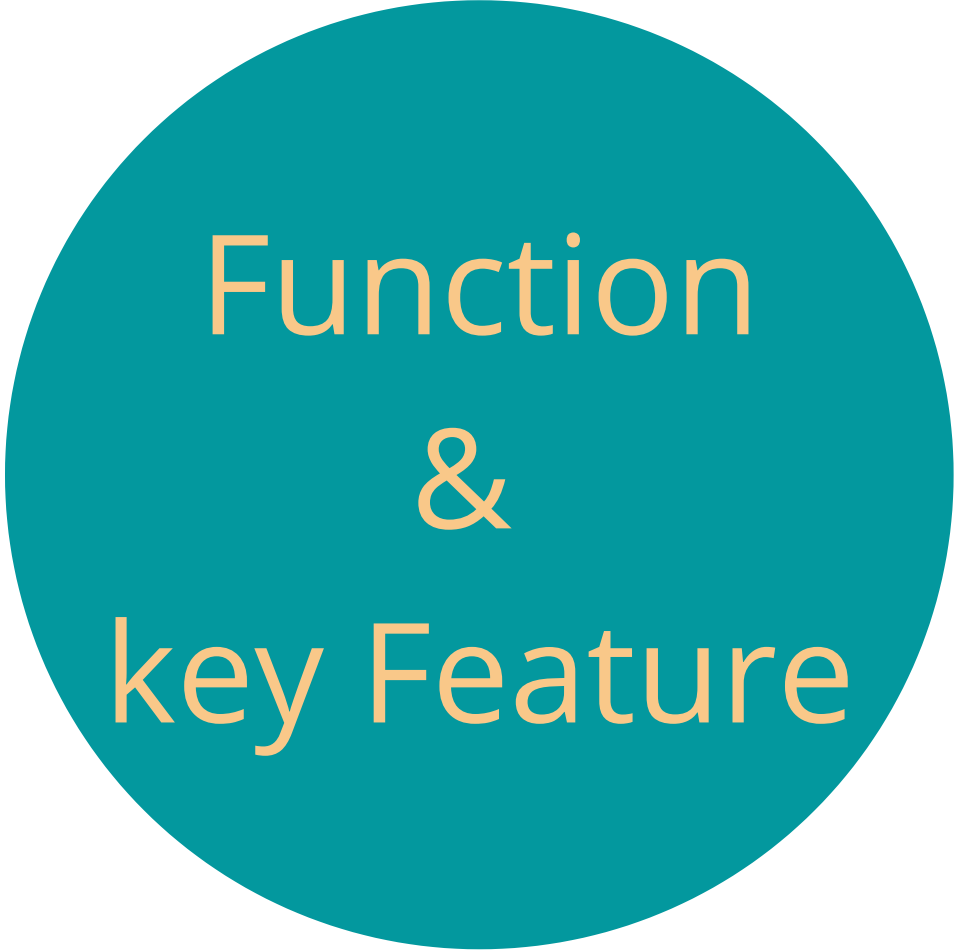


**(a) Adherens junction**

- This is a Cell-cell junction.
- Transmembrane adhesion protein is **Cadherins**.
- Extracellular ligands are cadherins of neighboring cells.
- Intercellular cytoskeleton attachment on the actin filament.
- Intracellular adaptor proteins are: alpha, beta, p120 catenin.

# Tight Junction





Function  
&  
key Feature

The borders of two cells are fused together, often around the whole perimeter of each cell, forming a continuous belt-like junction known as a tight junction or zonula occludens (zonula = Latin for belt)

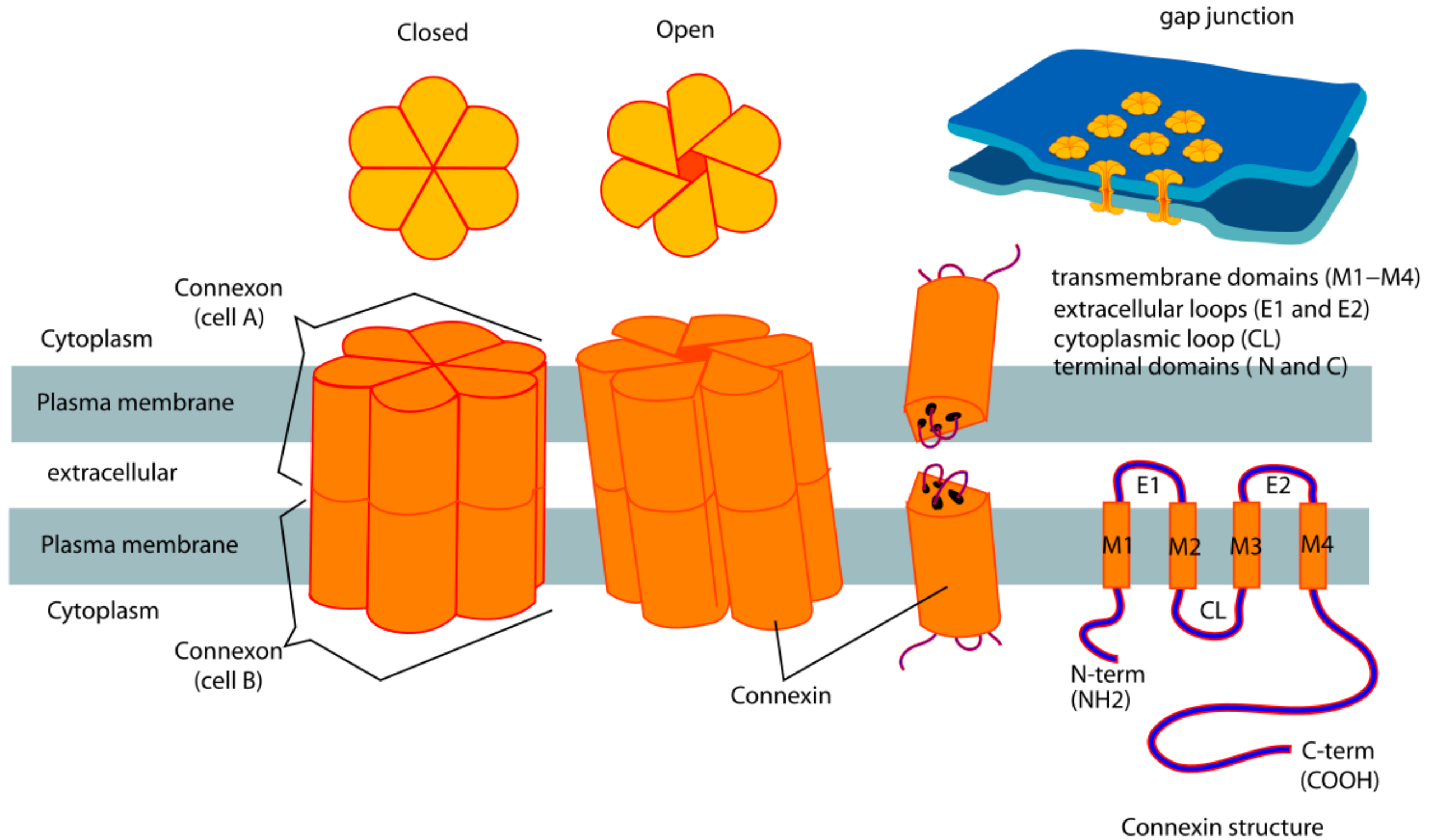
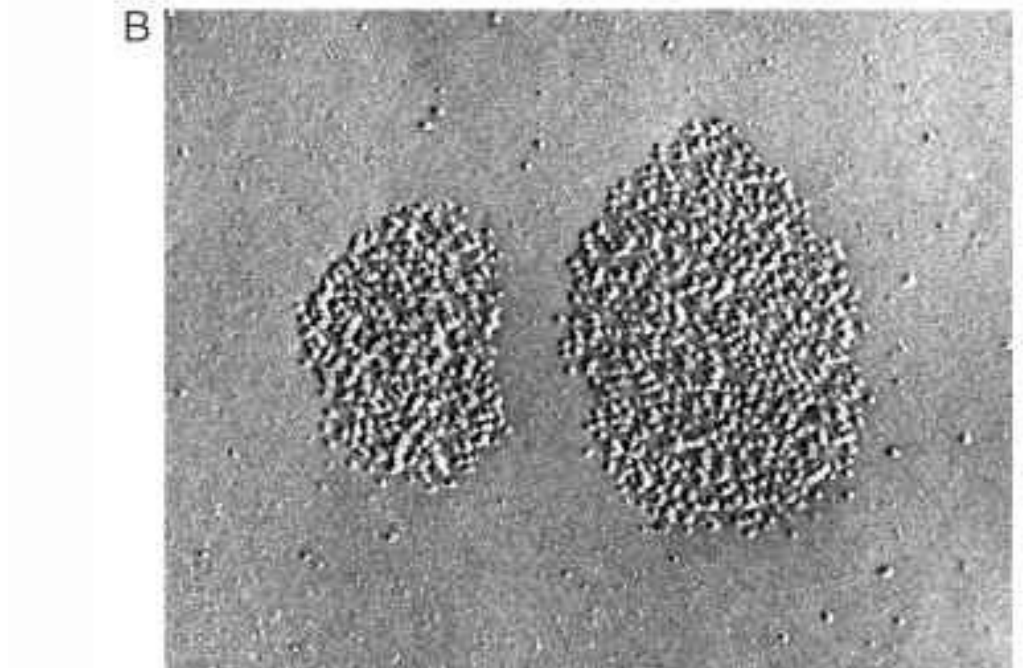
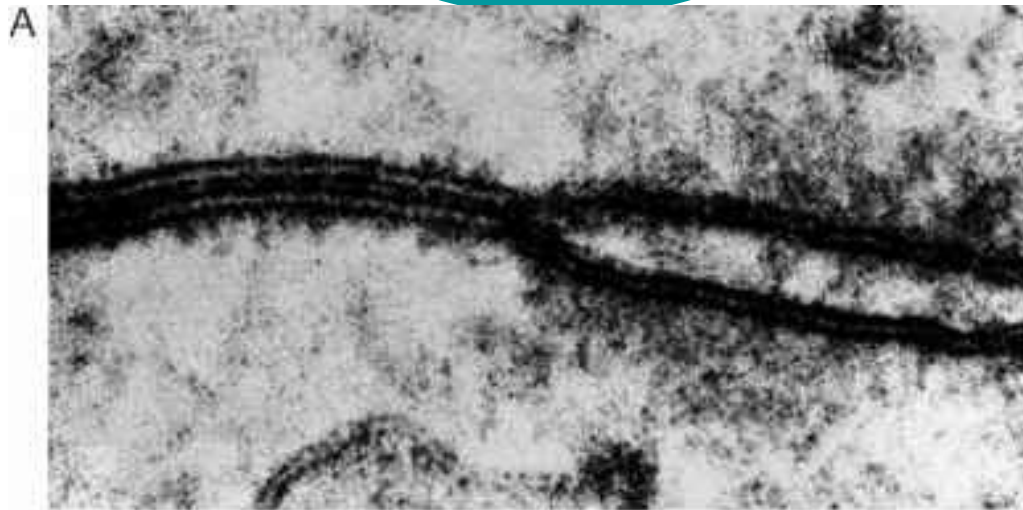
Proteins in the membrane of adjacent cells called occludin/cludins interact with each other to produce this tight seal.

In the cytoplasm of the cell, occludin/cludins interact with the actin cytoskeleton via another protein called ZO-1 and ZO2.

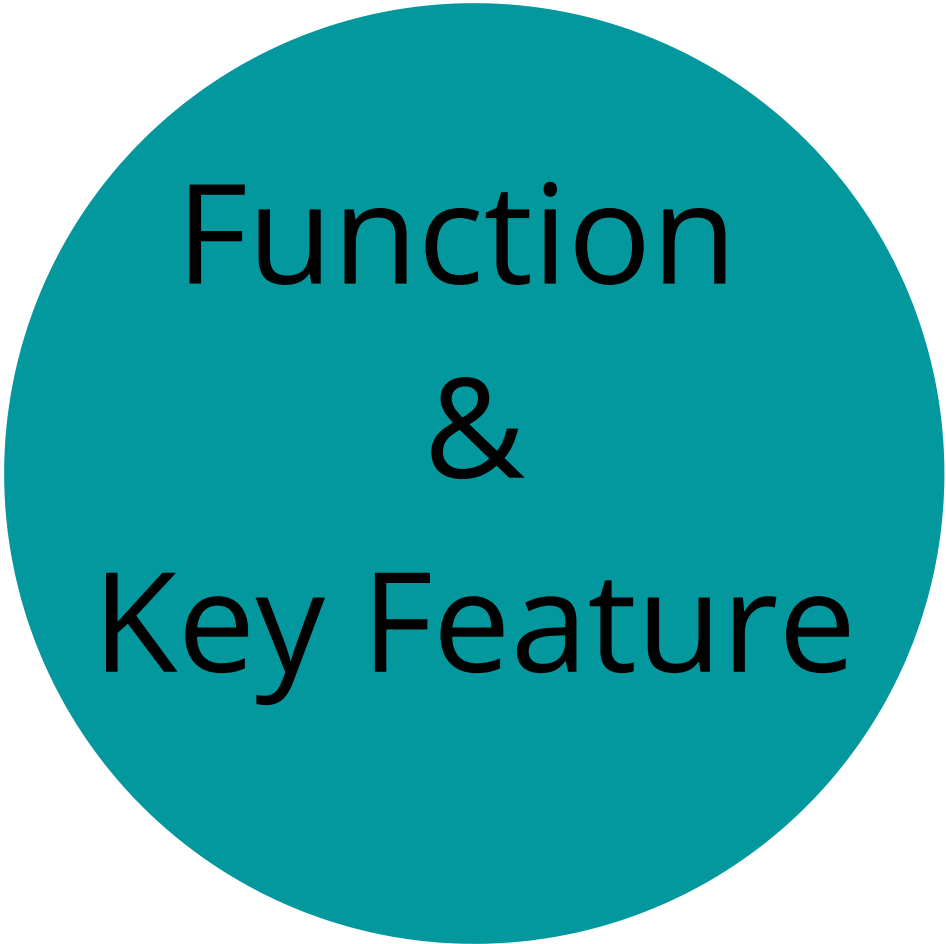
This type of junction greatly restricts the passage of water, electrolytes, and other small molecules across the epithelium.

Transmembrane proteins from each cell membrane interlock across the intercellular space, all around the cell, in this belt

# Gap Junction





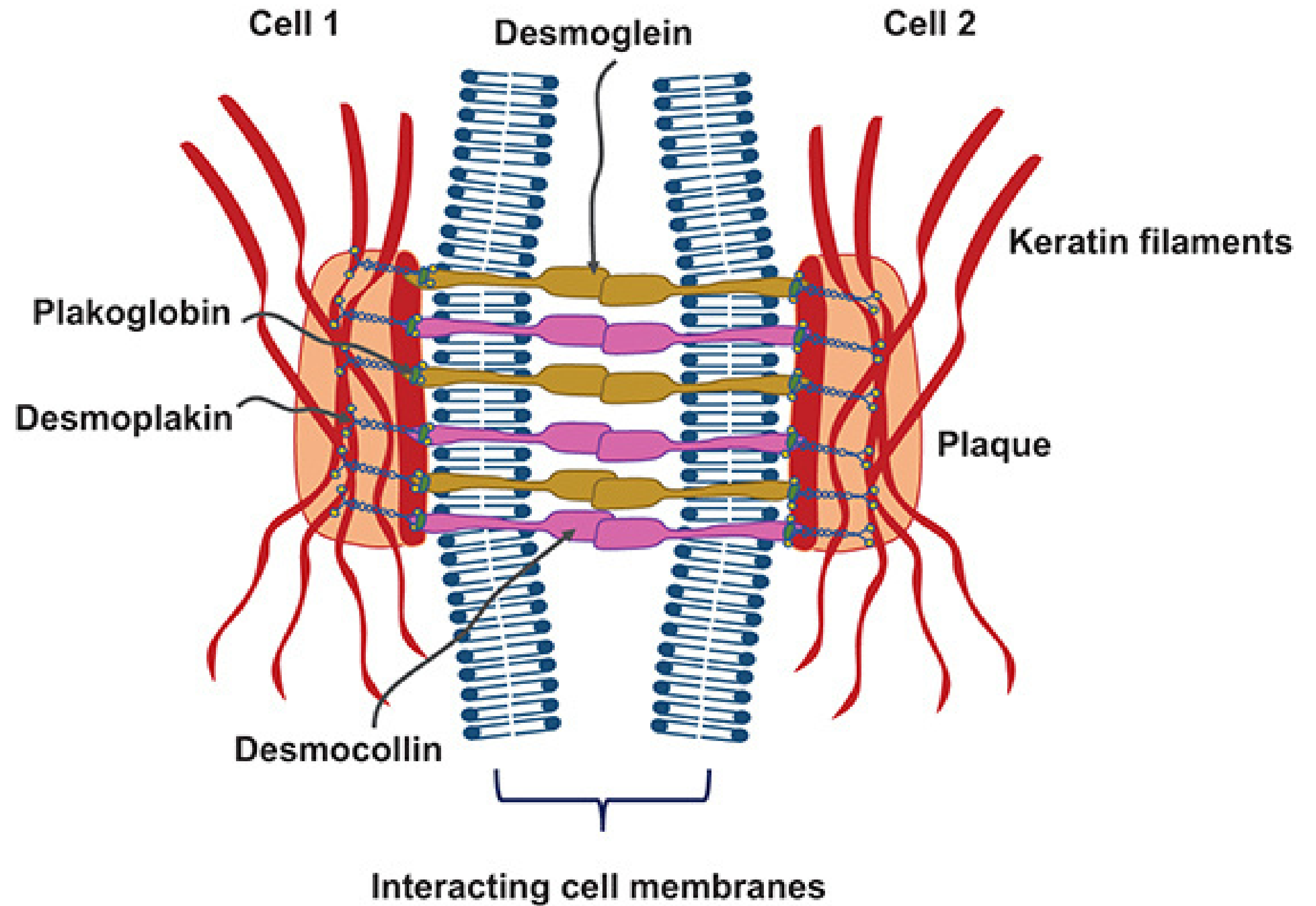


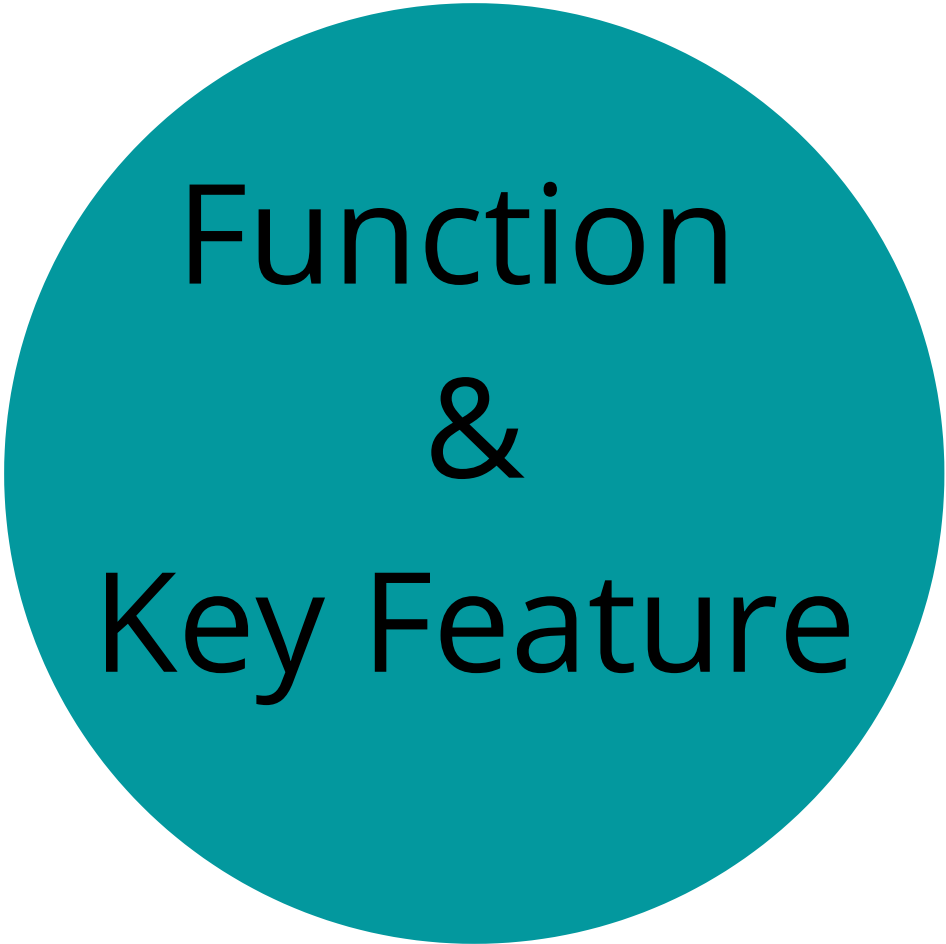
Function  
&  
Key Feature

A group of protein molecules called connexins form a structure called a connexon. When connexons from two adjacent cells align, they form a continuous channel between them.

This channel is big enough to allow small molecules such as inorganic ions, and other small water-soluble molecules (smaller than 1000kDa) to pass between the cells. However, the channel is too small for proteins, nucleic acids, or sugars to pass through.

Desmosome





Function  
&  
Key Feature

Desmosomes connect two cells together. A desmosome is also known as a spot desmosome or macula adherens (macula = Latin for spot), because it is circular or spot-like in outline, and not belt- or band-shaped like adherens junctions.

Desmosomes are particularly common in epithelia that need to withstand abrasion. Desmosomes are also found in cardiac cells, but the intermediate filament, in this case, is desmin, not keratin (which is found in epithelial cells).

This junction is made up of transmembrane linker glycoproteins (e.g. desmogleins and desmocollins - which are cadherin proteins)