



Medical Biology

Histology: is the study of the tissues of the body.

Tissue: group of similar cells combined to perform a common function.

The human body is composed of only 4

basic types of tissue:

- 1. epithelial tissues.**
- 2. connective tissues.**
- 3. muscular tissues.**
- 4. nervous tissues.**

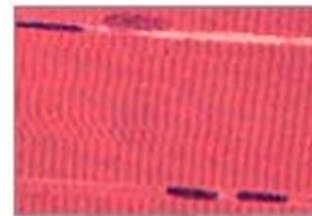
Four types of tissue



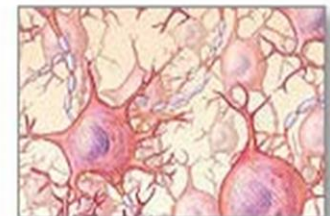
Connective tissue



Epithelial tissue



Muscle tissue



Nervous tissue

Epithelial Tissues:

Features of epithelium:

- 1. Covering & lining**
- 2. Homeostasis**
- 3. No intercellular space**
- 4. No bl. Vessels**
- 5. 3 germ layers**

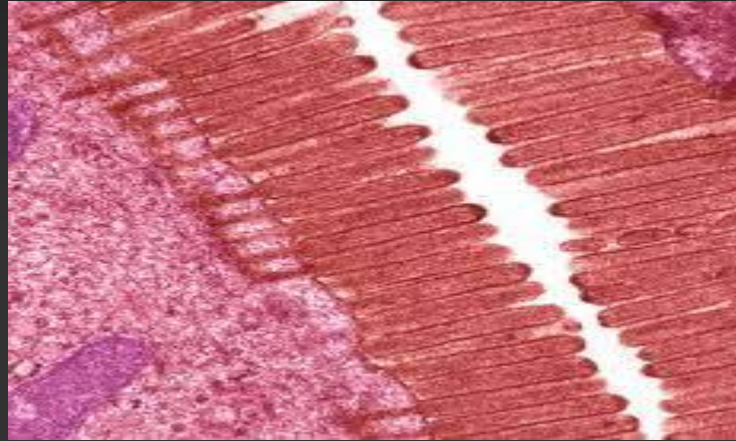
Functions of epithelium:

- 1. Protection:**
- 2. Sensation**
- 3. Secretion**
- 4. Absorption:**
- 5. Cellular transport:**

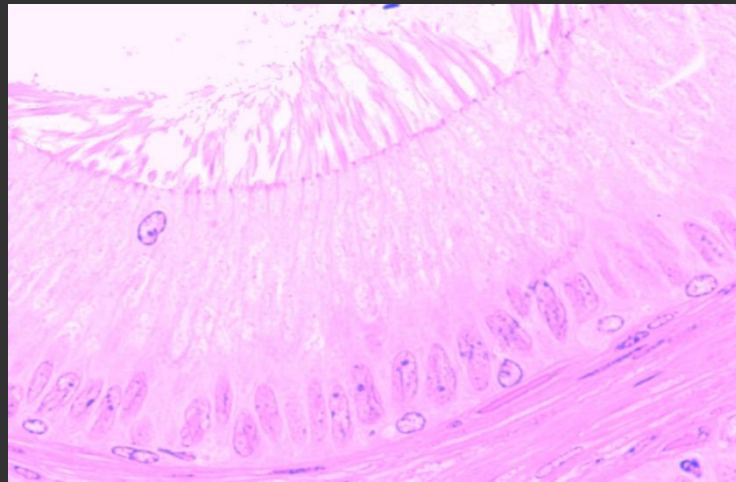
polarity

Apical modification of plasma membrane

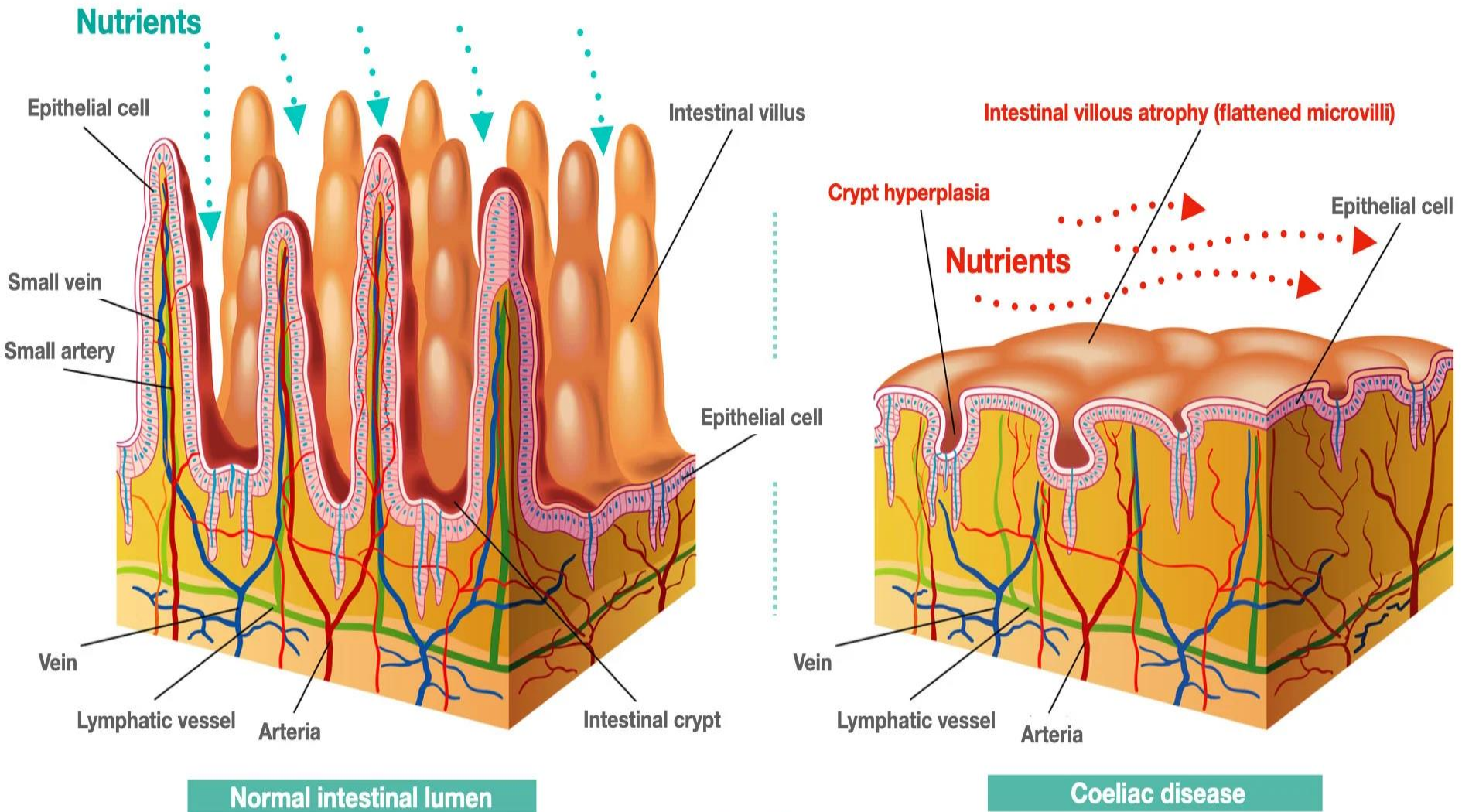
microvilli:



Stereocilia:



Coeliac disease: flattened microvilli & nutrient malabsorption



Lateral modification of plasma membrane

Tight or occluding junctions: claudin and occluding.

Adherent or anchoring junctions: E-cadherin family.

Desmosome: maculae adherens, cadherin family.

Gap or communicating junctions: numerous hexameric complexes of transmembrane connexons.

Hemidesmosomes: transmembrane integrins.

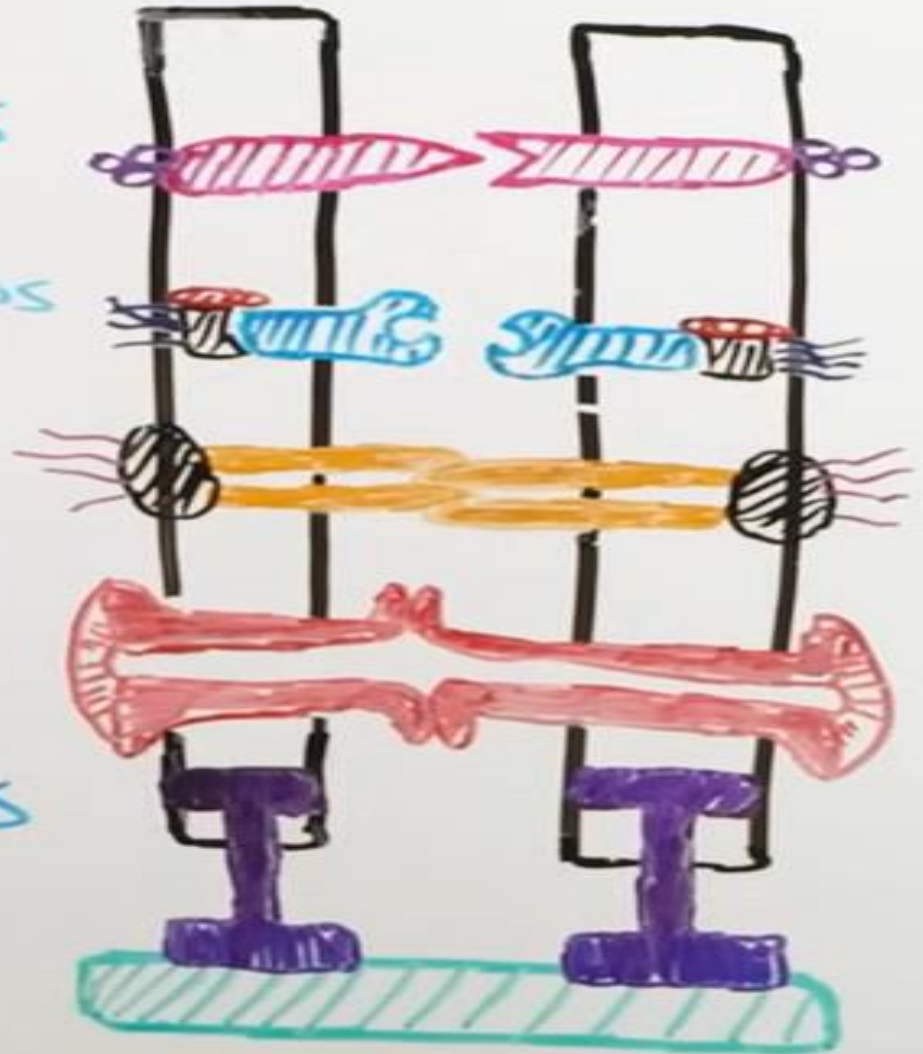
TIGHT JUNCTIONS

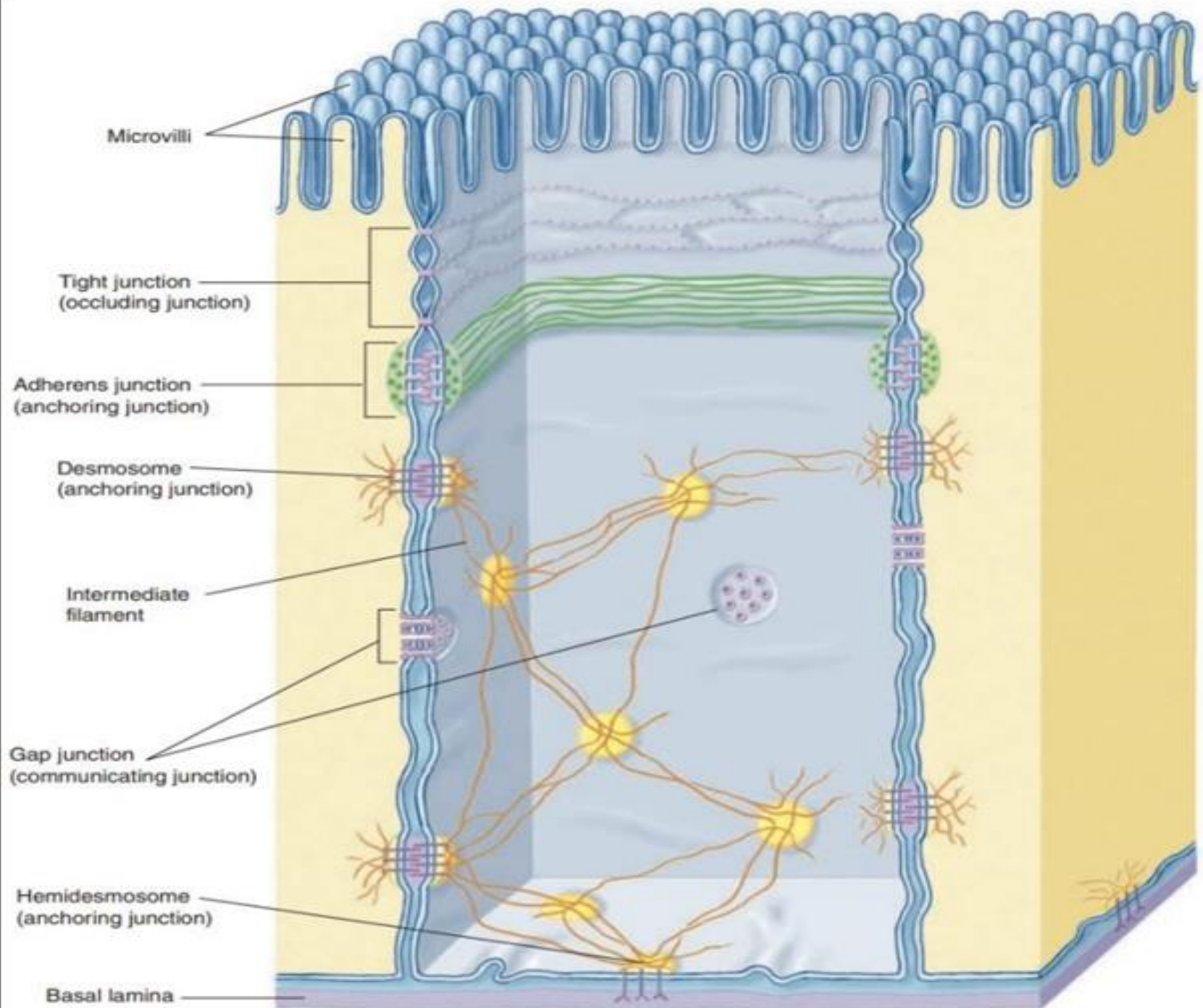
ADHERENS JUNCTIONS

DESOMOSOMES

GAP JUNCTIONS

HEMIDESMOSOMES



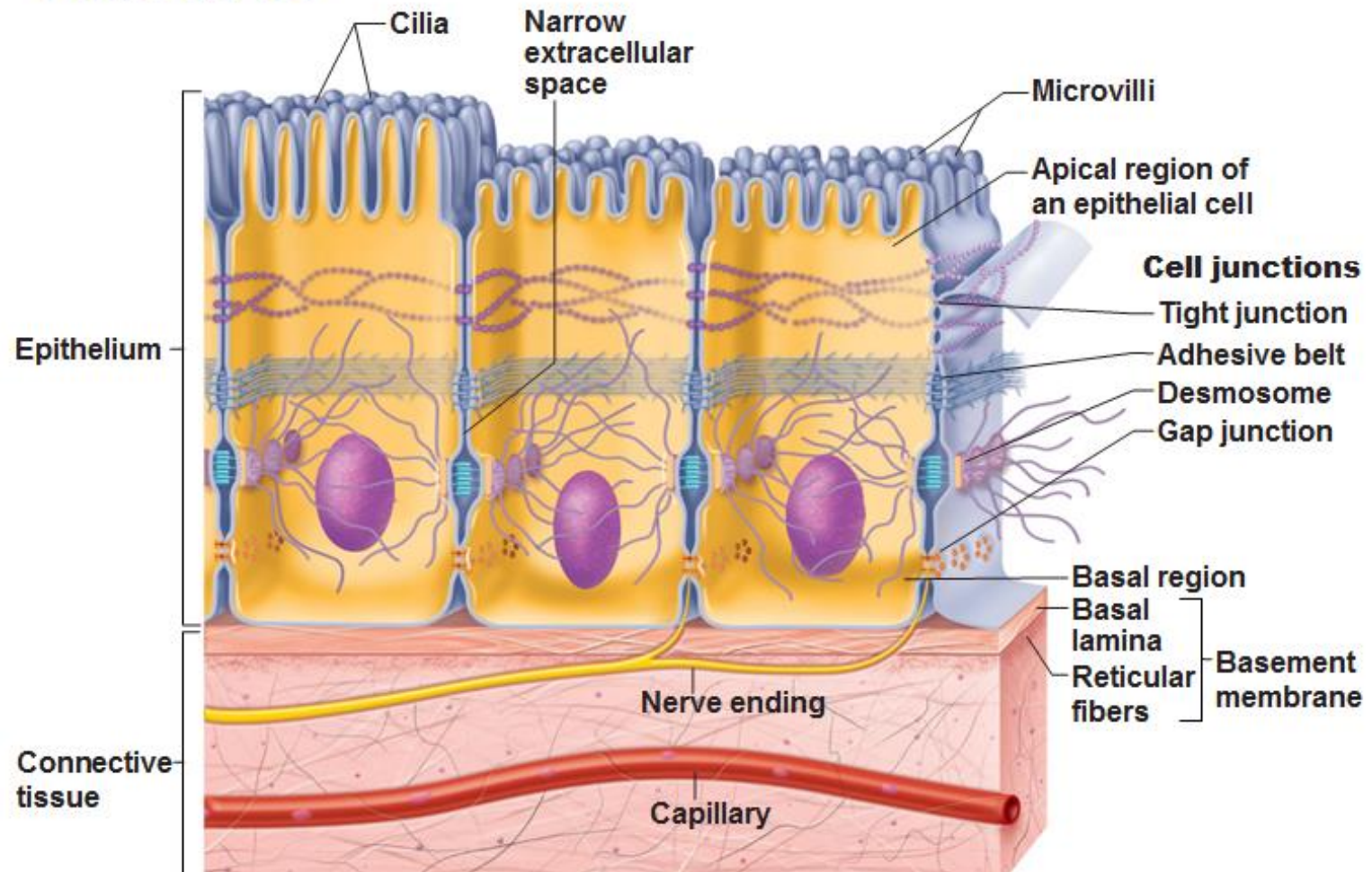


Medical notes:

1. Defect in occludins of tight junction may compromise the fetal blood-brain barrier leading to severe neurologic disorders.
2. Loss of E-cadherin in adhesion junction in epithelial cell tumours promotes tumour invasion.

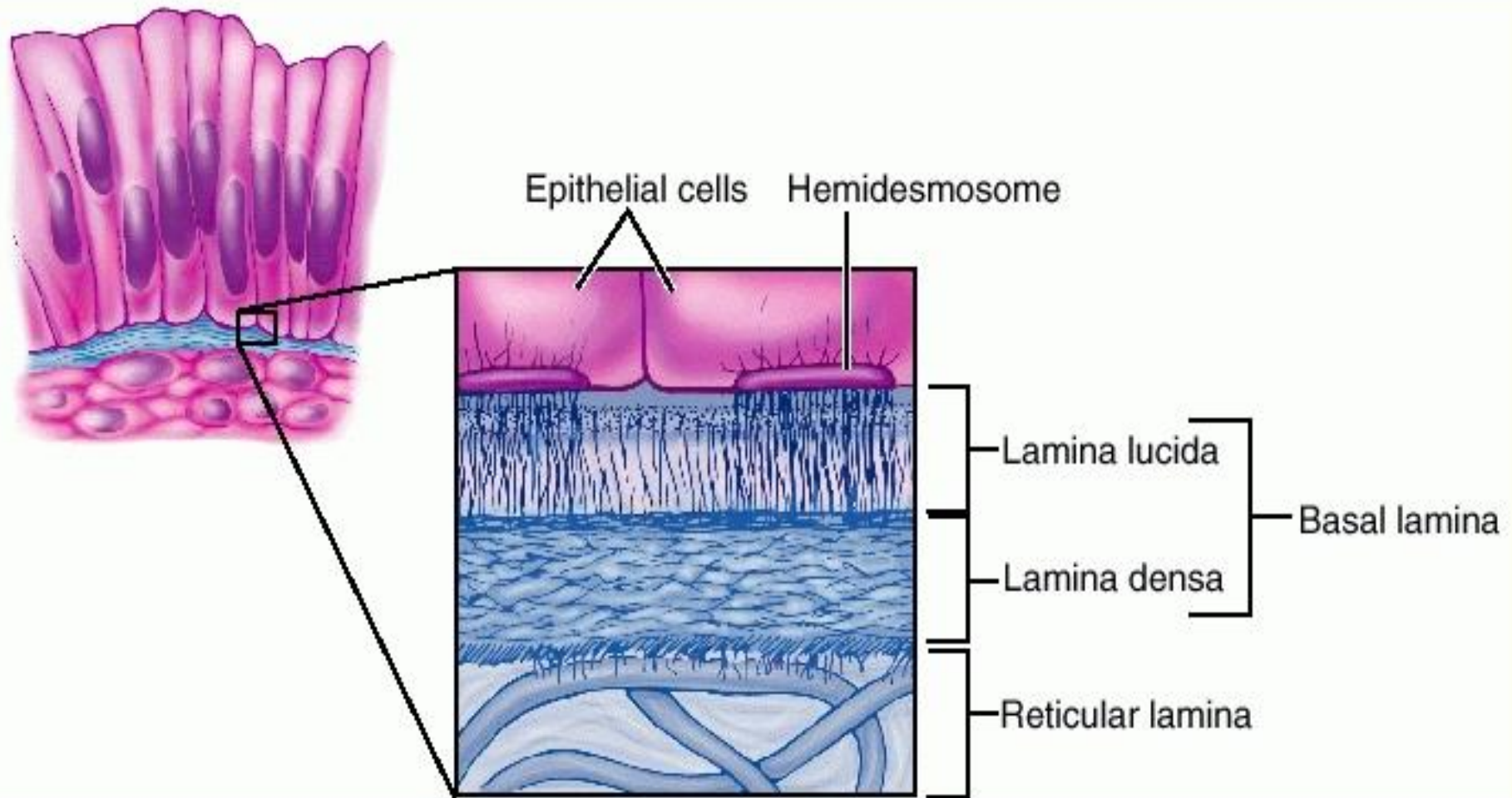
Basal modification of plasma membrane

Special Characteristics of Epithelia-Cell Junctions

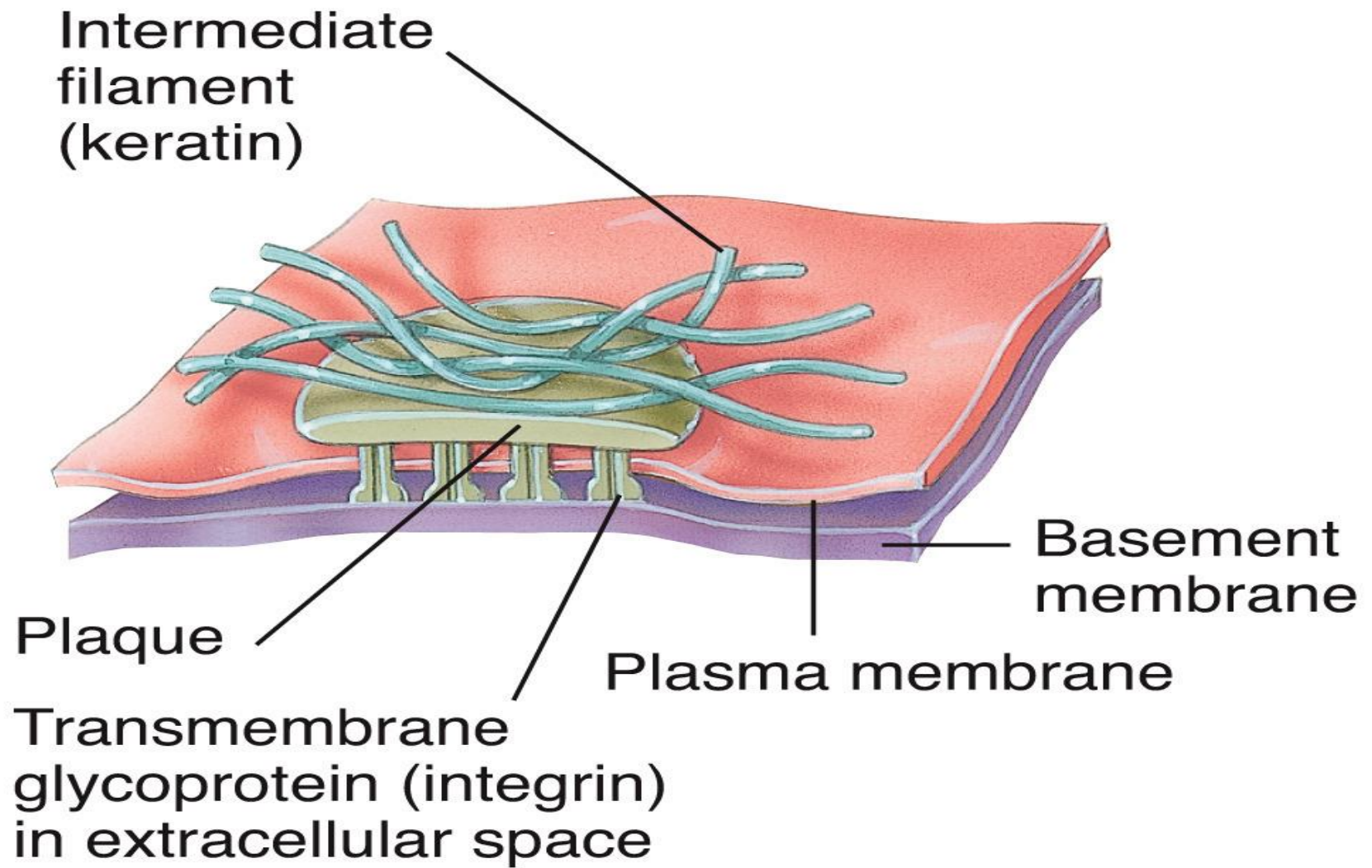


Basal lamina:

- 1. lamina lucida: which appear to be transparent.**
- 2. lamina densa: a delicate network of fine fibrils.**



➤ **Basement membrane:**



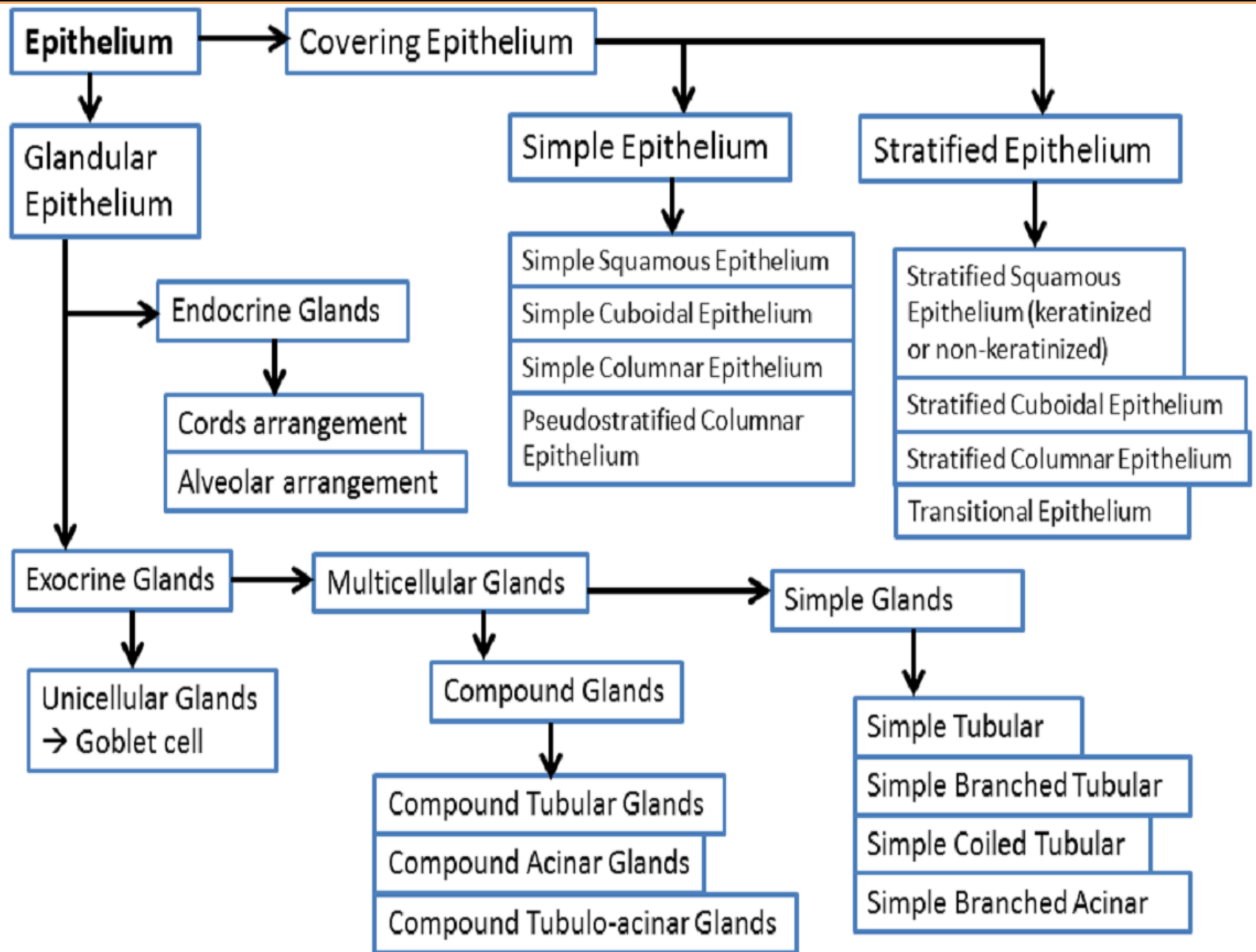
(d) Hemidesmosome

Functions of basal lamina:

- 1. firm support for the overlying epithelium.**
- 2. provide a selective barrier**
- 3. establishment of new neuromuscular junctions.**
- 4. cell polarity.**
- 5. cell proliferation and differentiation by binding with growth factors.**
- 6. cell metabolism.**

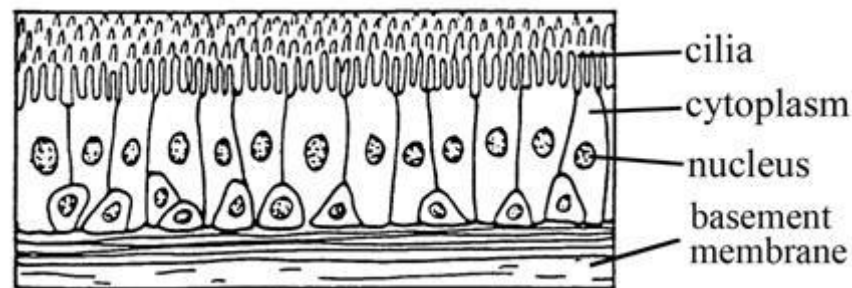
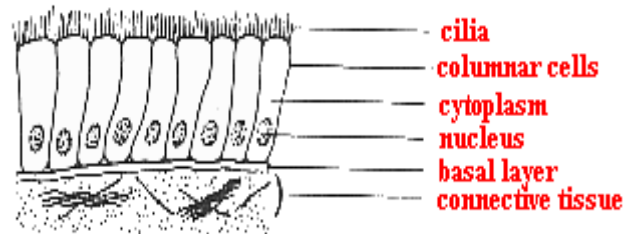
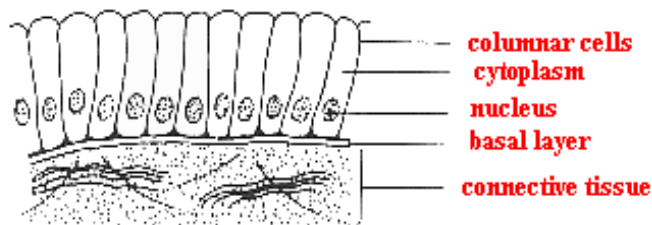
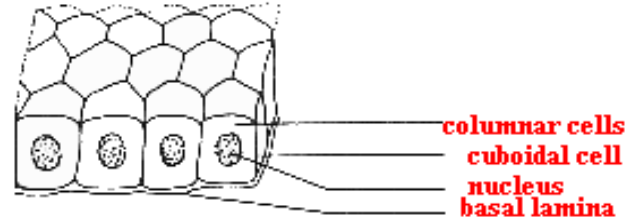
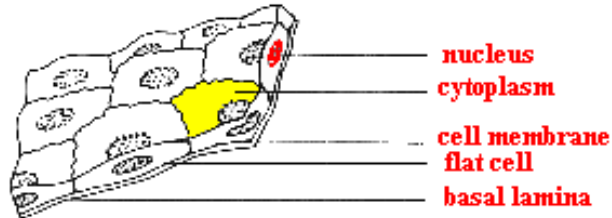
Classification of epithelia:

covering epithelium.
glandular epithelium.



Covering epithelium:

Simple epithelia:





Thank you