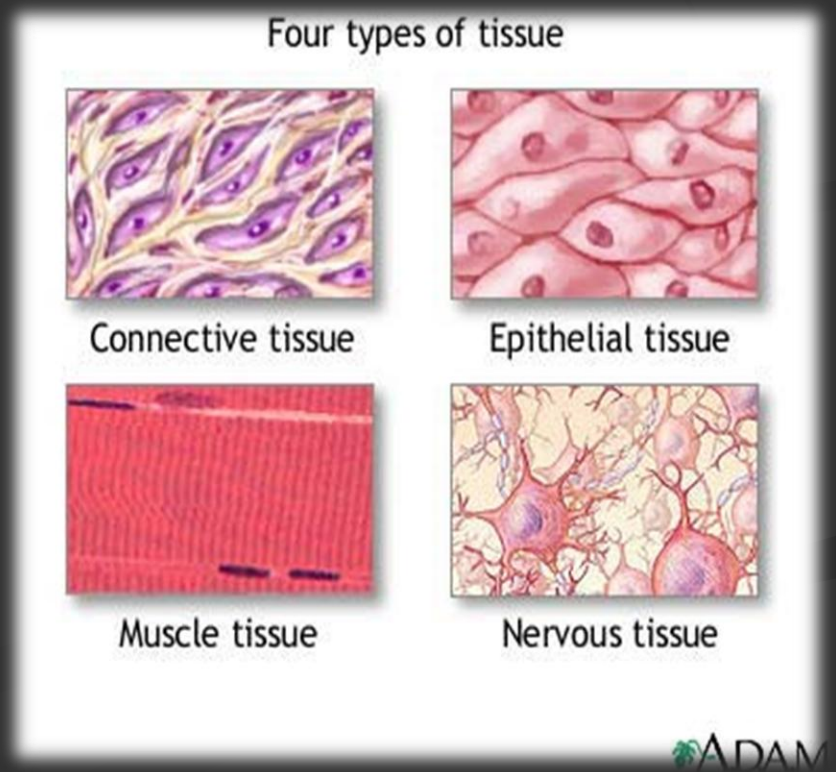
Medical Biology

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.



Epithelial Tissues:
Features of epithelium:

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

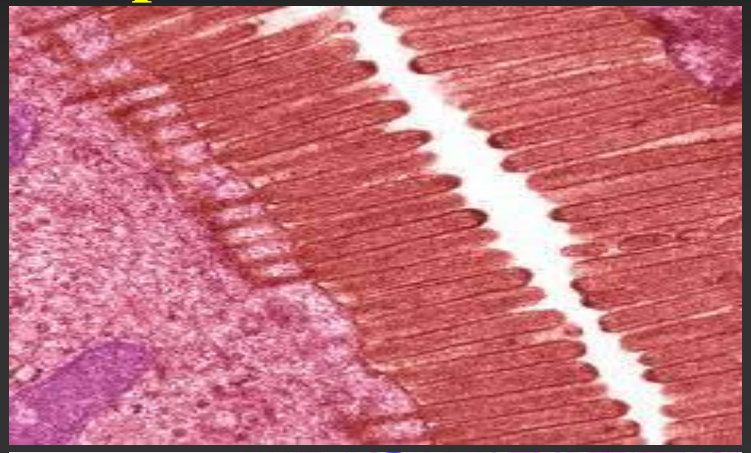
Functions of epithelium:

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

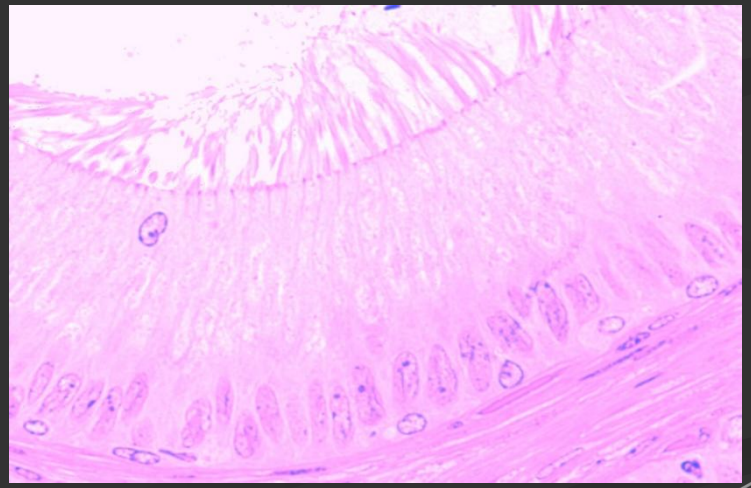
polarity

Apical modification of plasma membrane

microvilli:

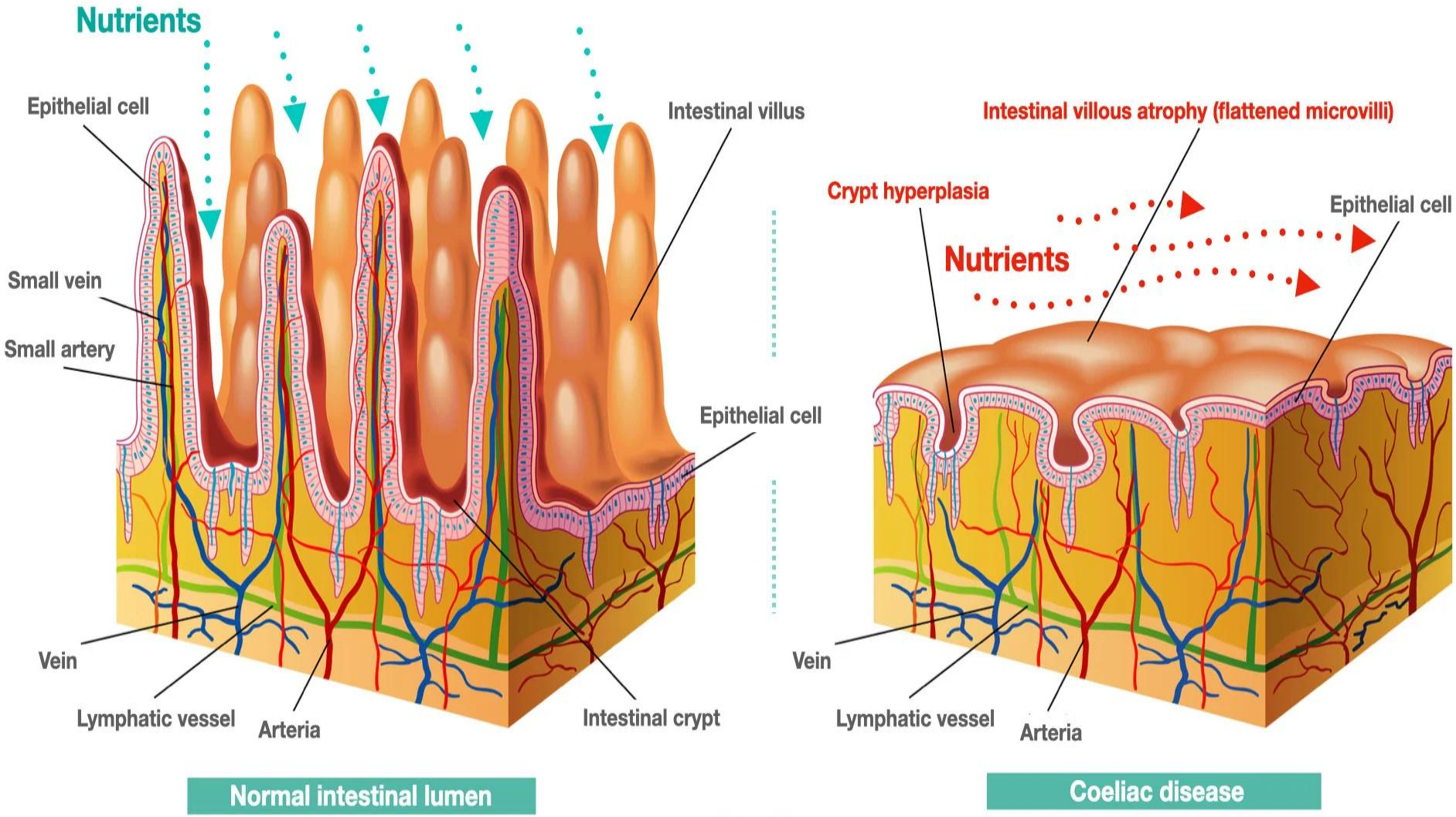


Stereocilia:



cohohealth

Coeliac disease: flattened microvilli & nutrient malabsorption



Lateral modification of plasma membrane

Tight or occluding junctions: claudin and occludin.

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.

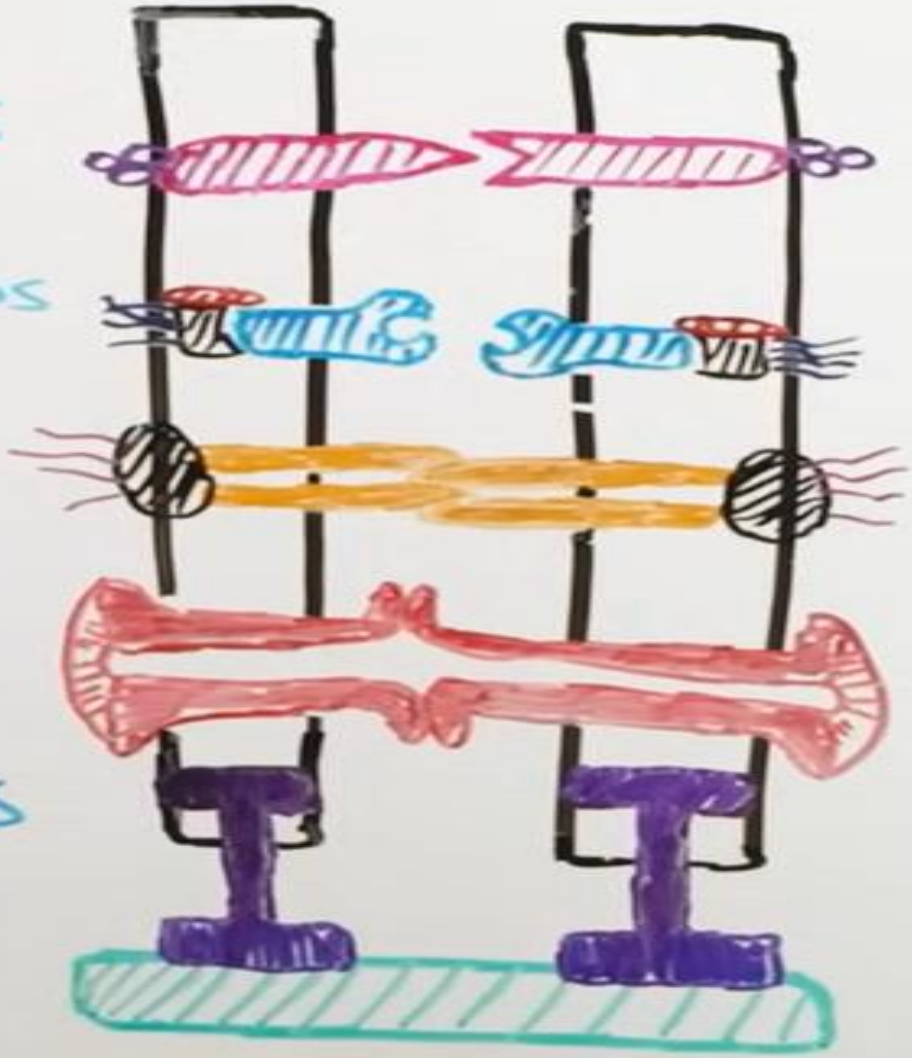
Tight Junctions

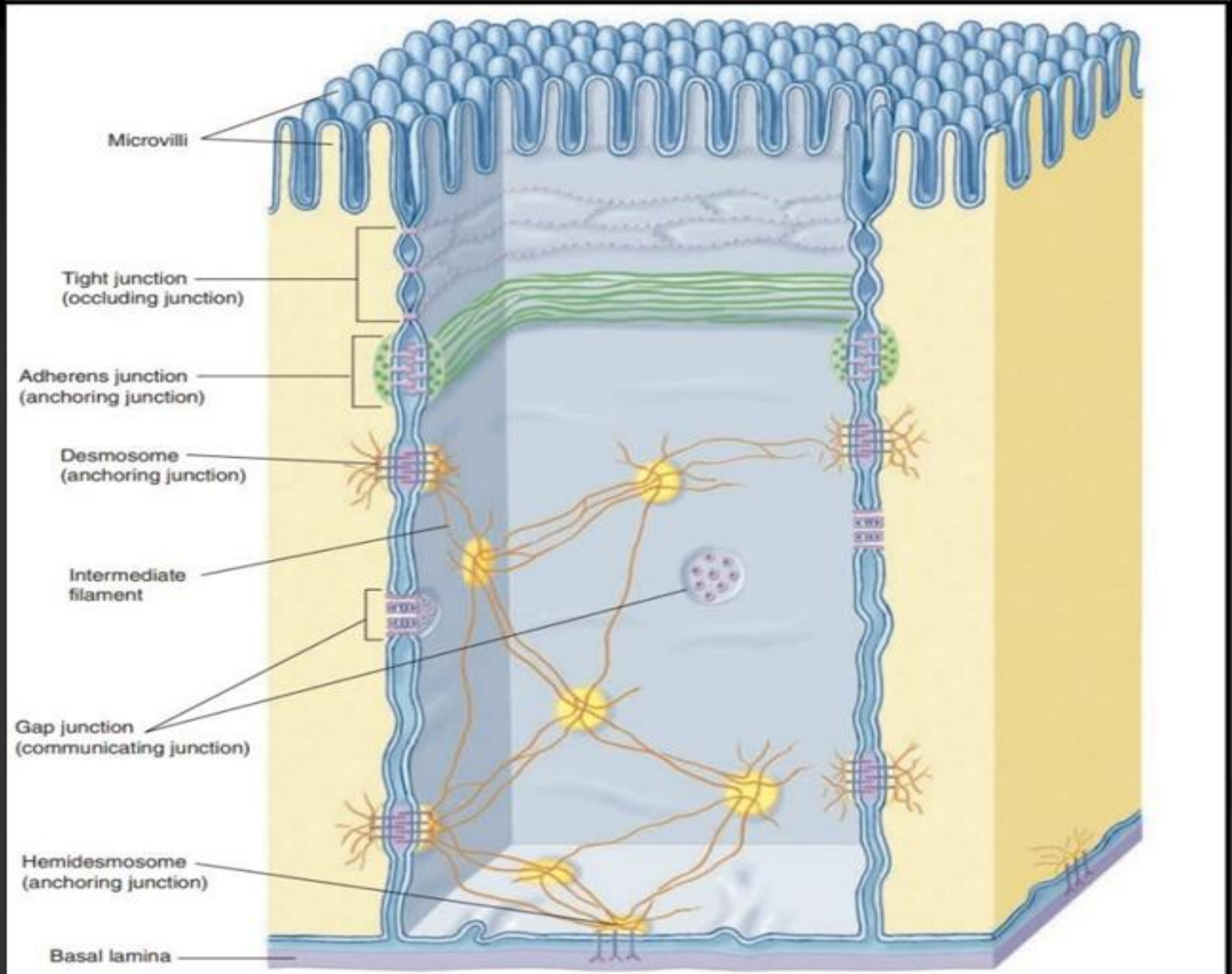
Adherens Junctions

Desmosomes

Gap Junctions

Hemidesmosomes



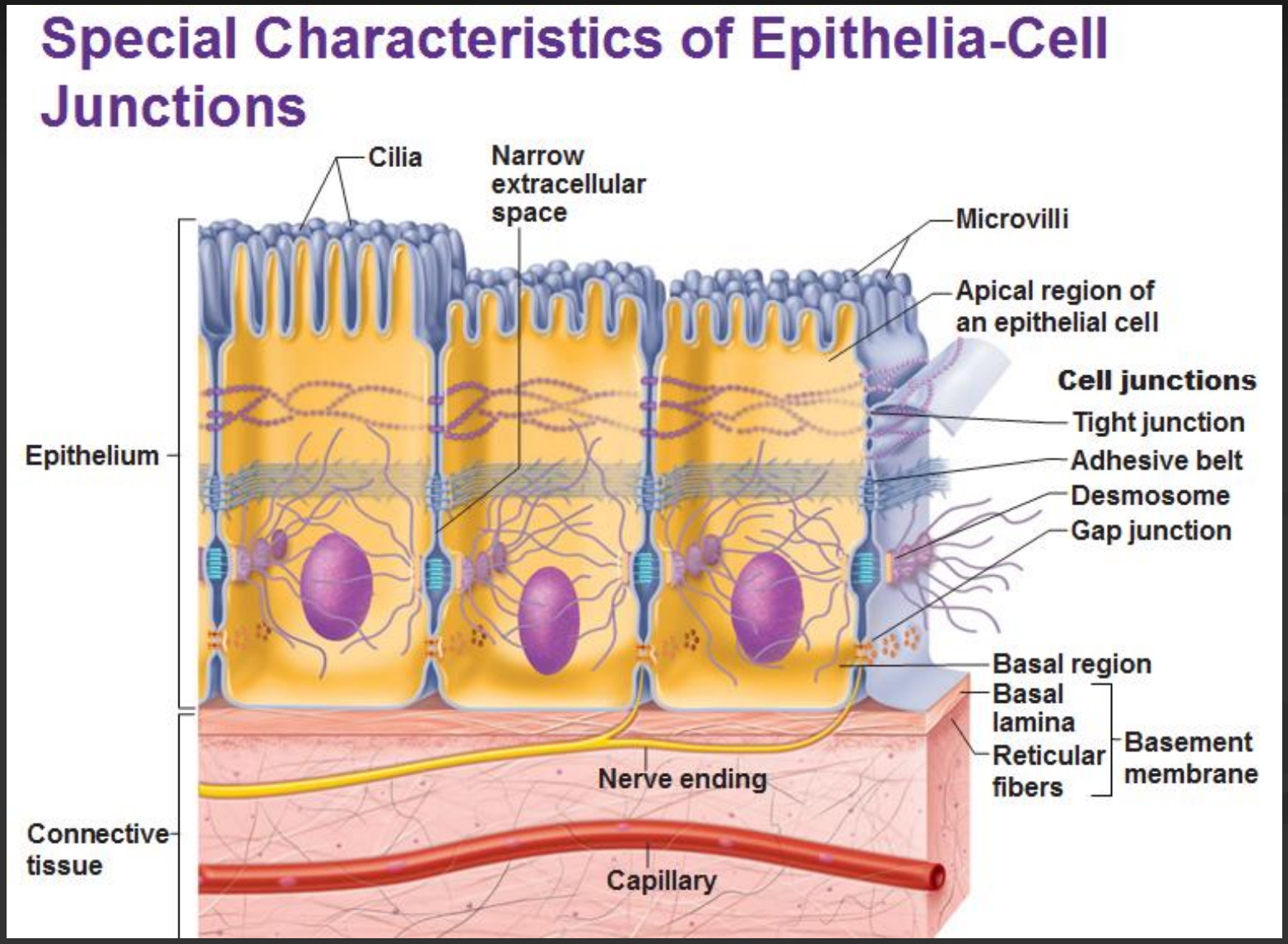

Microvilli
Tight junction
(occluding junction)
Adherens junction
(anchoring junction)
Desmosome
(anchoring junction)
Intermediate
filament
Gap junction
(communicating junction)
Hemidesmosome
(anchoring junction)
Basal lamina

Medical notes:

1. Defect in occludins of tight junction may compromise the fetal blood-brain barrier leading to severe neurologic disorders.

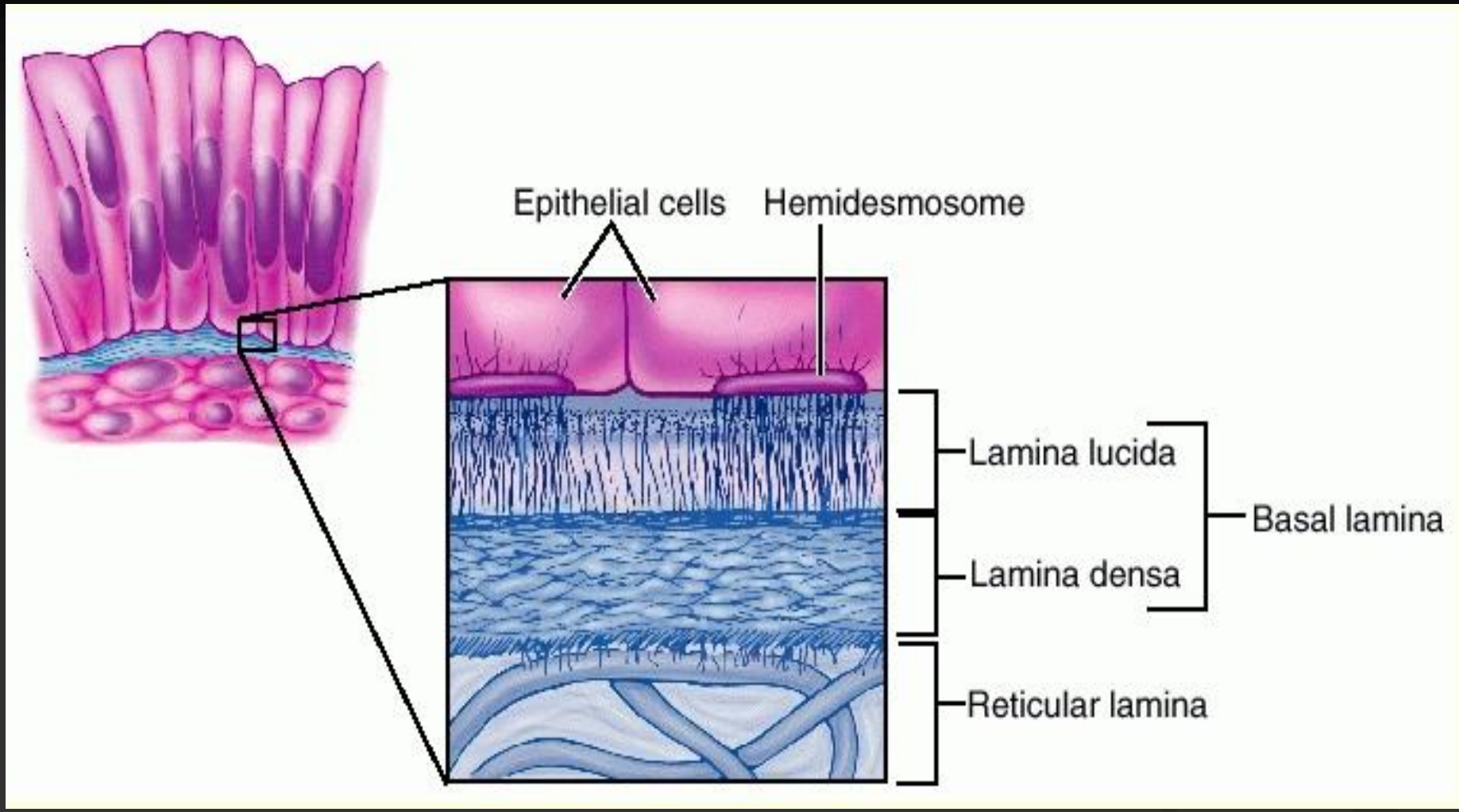
2. Loss of E-cadherin in adhesion junction in epithelial cell tumours promotes tumour invasion.

Basal modification of plasma membrane

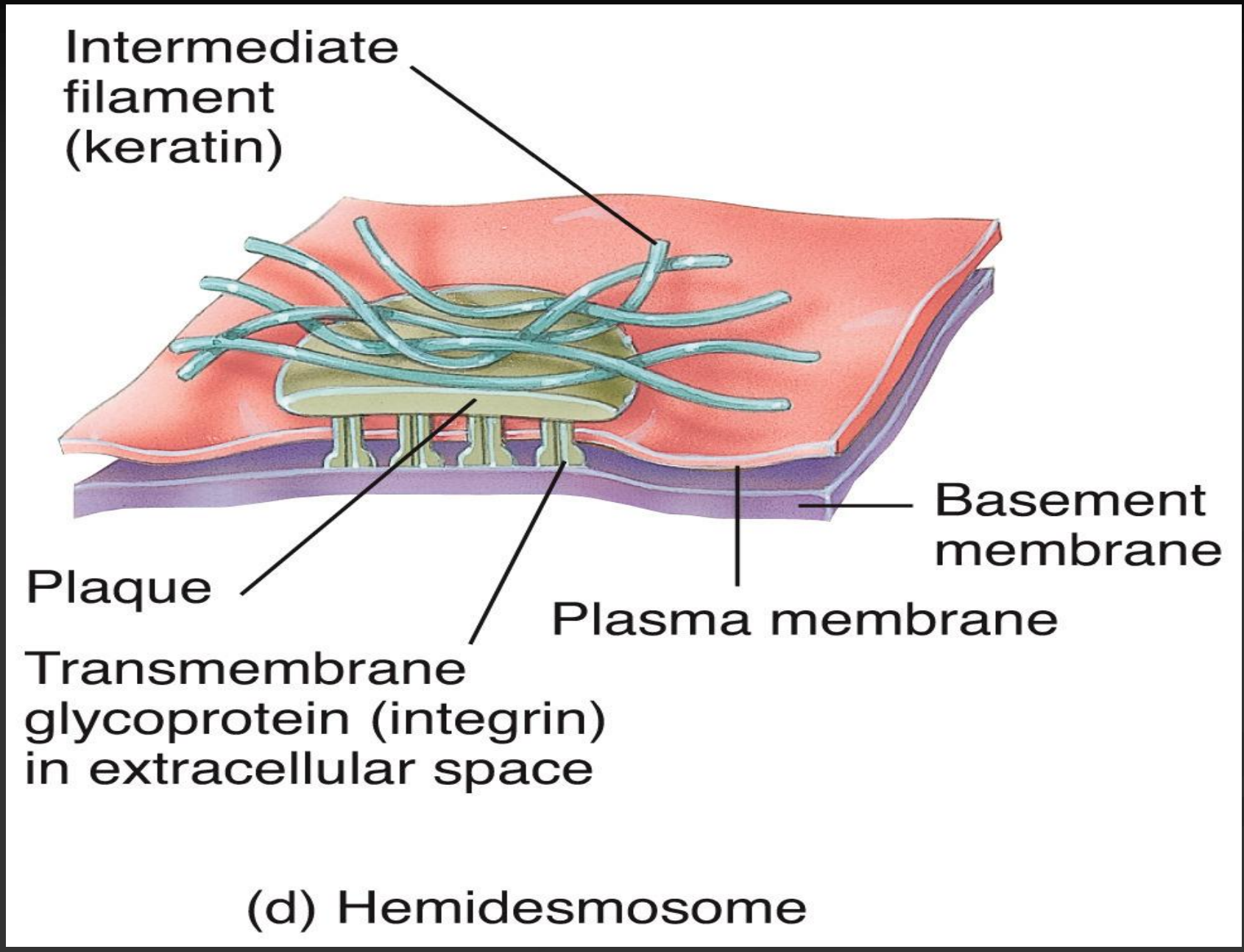


Basal lamina:

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



- **Basement membrane:**



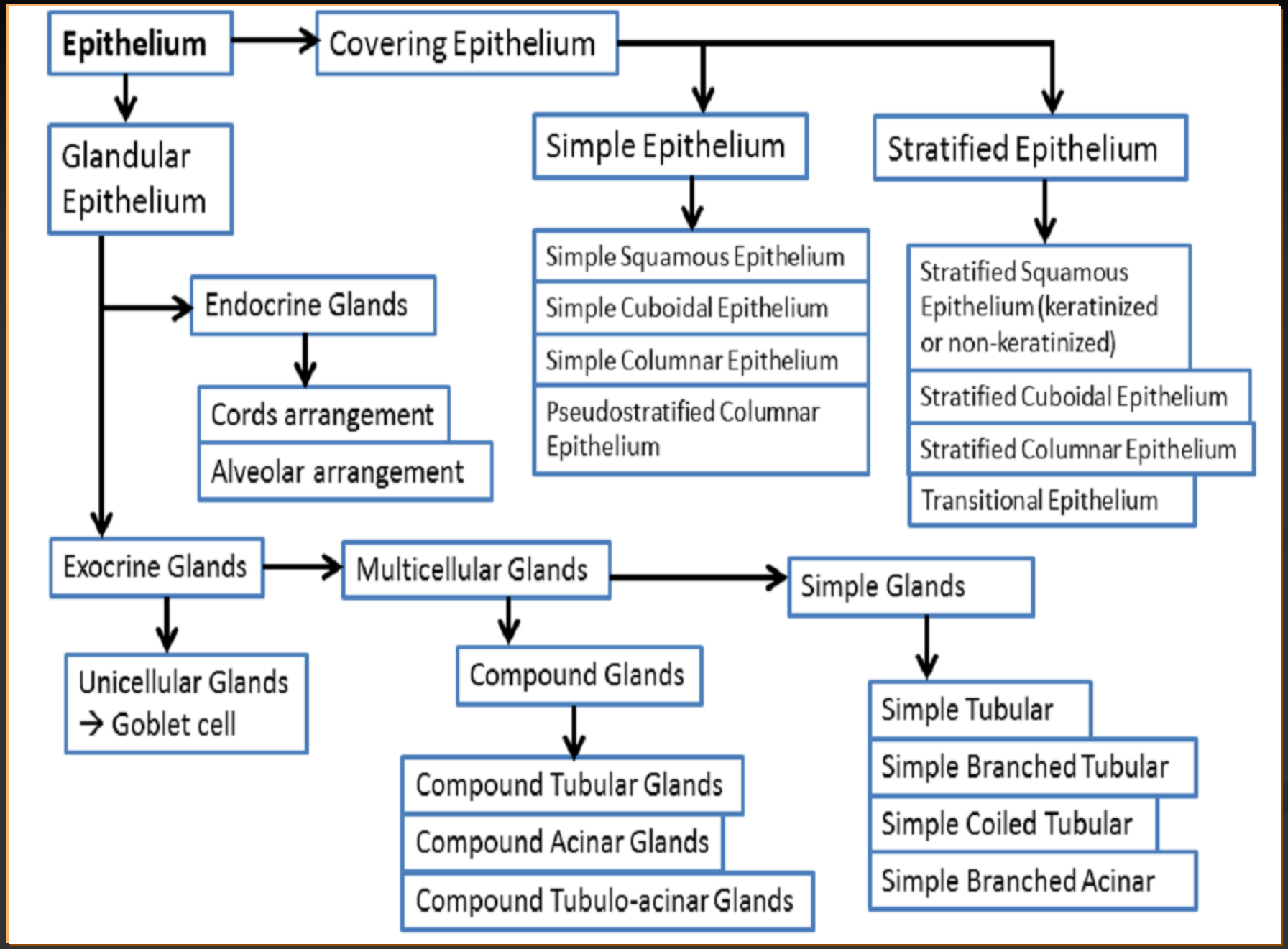
(d) Hemidesmosome

Functions of basal lamina:

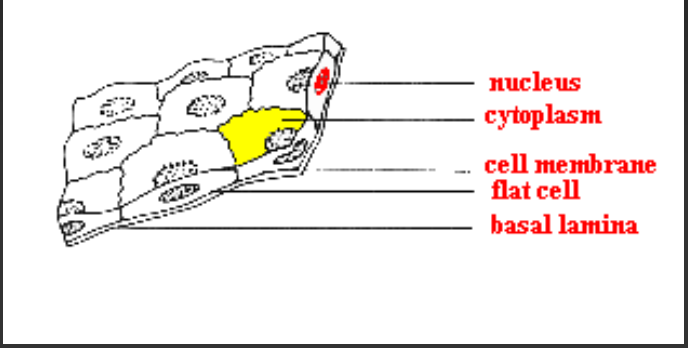
1. firm support for the overlying epithelium.
2. provide a selective barrier
3. establishment of new neuromuscular junctions.
4. cell polarity.
5. cell proliferation and differentiation by binding with growth factors.
6. cell metabolism.

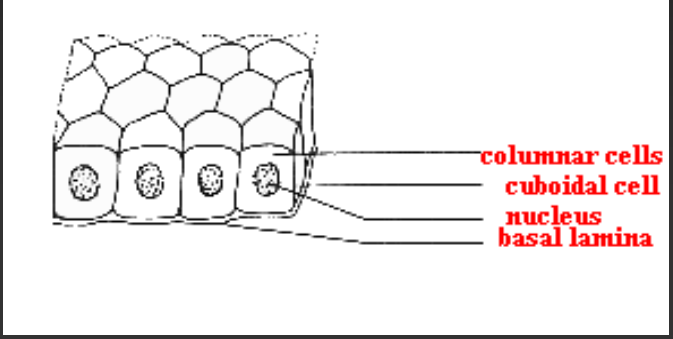
Classification of epithelia:

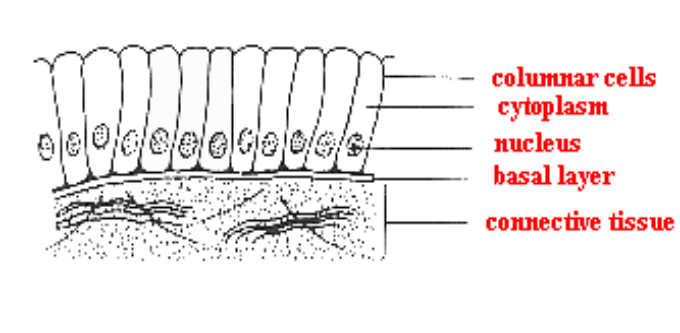
covering epithelium.
glandular epithelium.

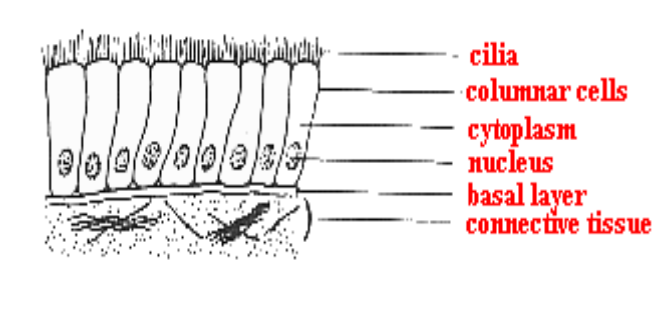

Epithelium
Covering Epithelium
Glandular Epithelium
Simple Epithelium
Stratified Epithelium
Simple Squamous Epithelium
Simple Cuboidal Epithelium
Simple Columnar Epithelium
Pseudostratified Columnar Epithelium
Stratified Squamous Epithelium (keratinized or non-keratinized)
Stratified Cuboidal Epithelium
Stratified Columnar Epithelium
Transitional Epithelium
Endocrine Glands
Cords arrangement
Alveolar arrangement
Exocrine Glands
Multicellular Glands
Simple Glands
Unicellular Glands → Goblet cell
Compound Glands
Compound Tubular Glands
Compound Acinar Glands
Compound Tubulo-acinar Glands
Simple Tubular
Simple Branched Tubular
Simple Coiled Tubular
Simple Branched Acinar

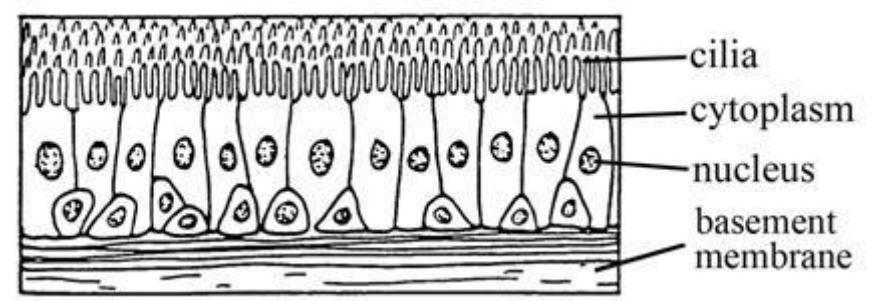
Covering epithelium:
Simple epithelia:












Thank you