

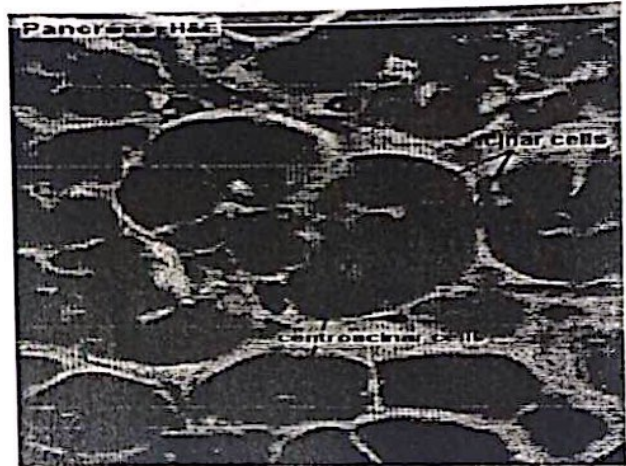
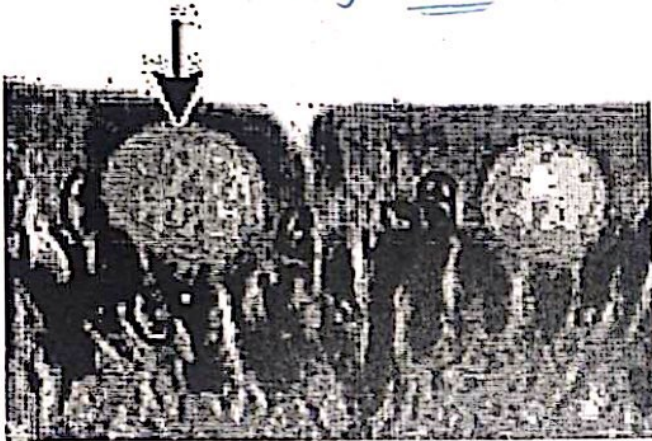
Focus ^^ : in covering the epithelium the classification based on Number of Layer

Number of cells

Unicellular : work as
(goblet cell) gland

only this!

Multicellular
(Most of the glands
e.g. Salivary glands)



the main function of the membrane is transport either

Mechanism (Mode) of Glandular secretions

↳ micro molecule
↳ or macro molecules

- **Merocrine glands** & the cell secret the secretion without any changing in it. (remain intact)
- The secretion released through exocytosis e.g. Pancreas

merocrine

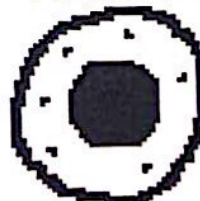


- **Apocrine glands** & shedding of the apical part to product and apical cytoplasm e.g. Mammary glands

apocrine



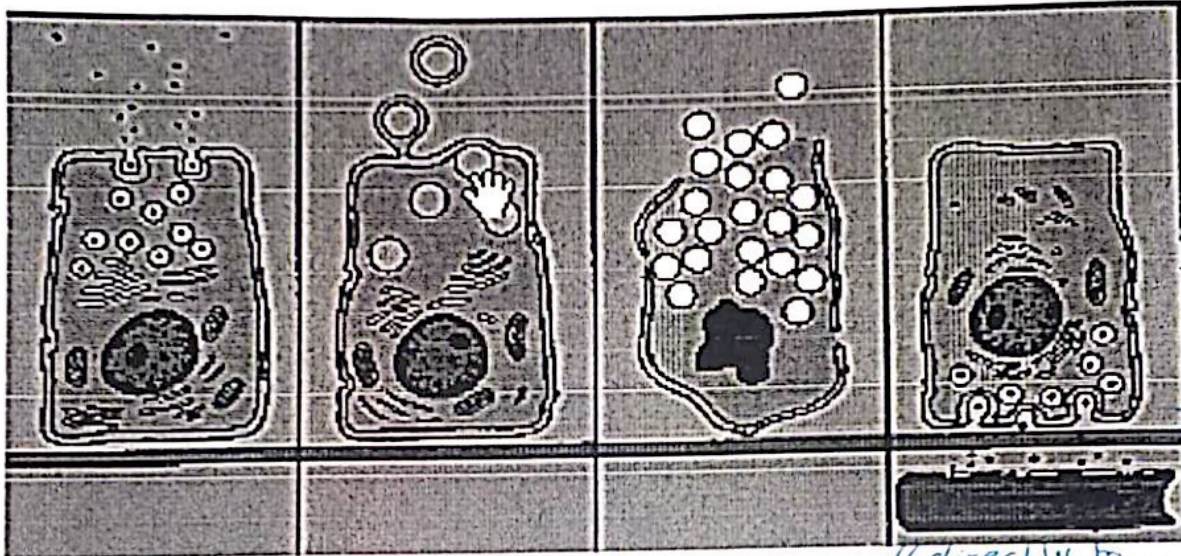
- **Holocrine gland** : the whole cell breaks to the secretion. The secretion destroys the cell



Presence of a duct system

Exocrine Endocrine mixed

Exocrine Glands			Endocrine Glands
Merocrine	Apocrine	Holocrine	



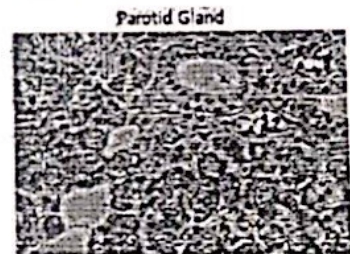
↳ secretion in the duct system

↳ directly to blood vessel

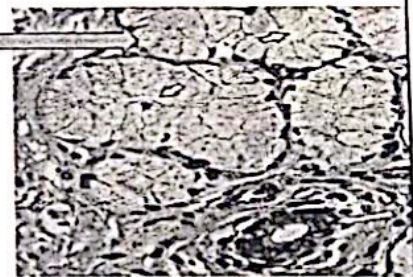
Nature of Glandular secretions

main types of salivary glands -

- Serous glands: ^{*1} parotid gland
under ear



- Mucous glands: ^{*2} sublingual gland
under tongue



- Mixed glands: ^{*3} submandibular gland
under mandible



- Glands with special secretion:

- sebaceous gland (oily secretion)
- lacrimal gland watery secretion (tears)
- Mammary gland : Milk secretion
- Glands in the ear : wax

shape of secretory portion

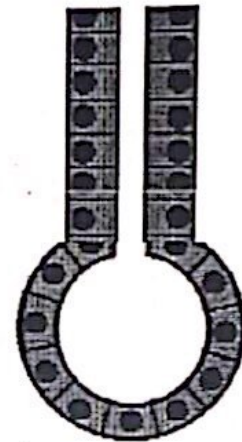
tubular



alveolar / acinar



tubular-alveolar



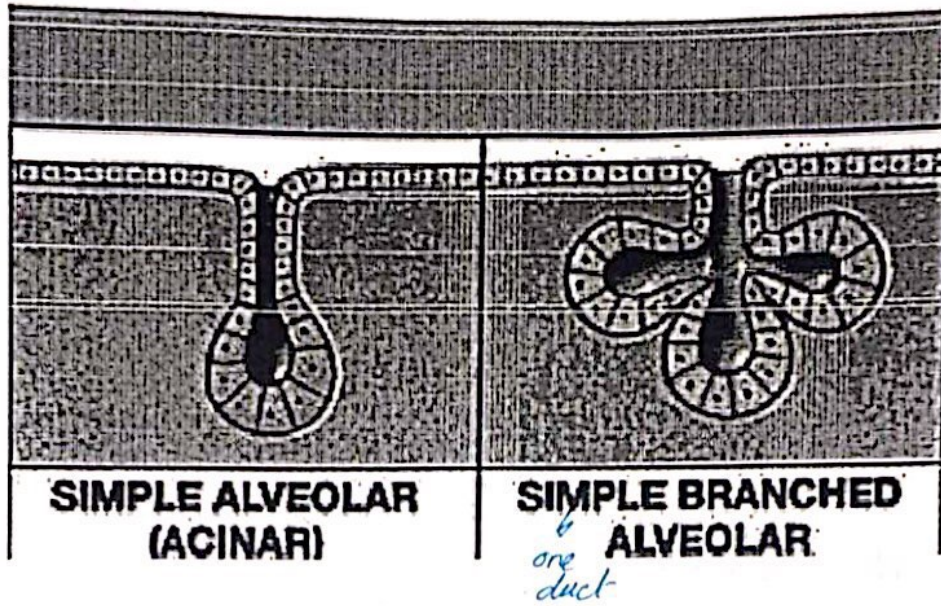
Classification of Tubular Glands

one duct / one gland: simple

shape: coiled tubular

SIMPLE GLANDS		
<p>Gland cells</p>	<p>Duct</p>	
<p>SIMPLE TUBULAR</p> <p>↳ Large intestine</p>	<p>SIMPLE COILED TUBULAR</p>	<p>SIMPLE BRANCHED TUBULAR</p> <p>↳ in fundus of stomach</p>
<p>Intestinal glands</p>	<p>Sweat glands</p>	<p>Fundic glands</p>

Classification of Alveolar Glands



Sebaceous glands

around hair follicle

Tarsal glands

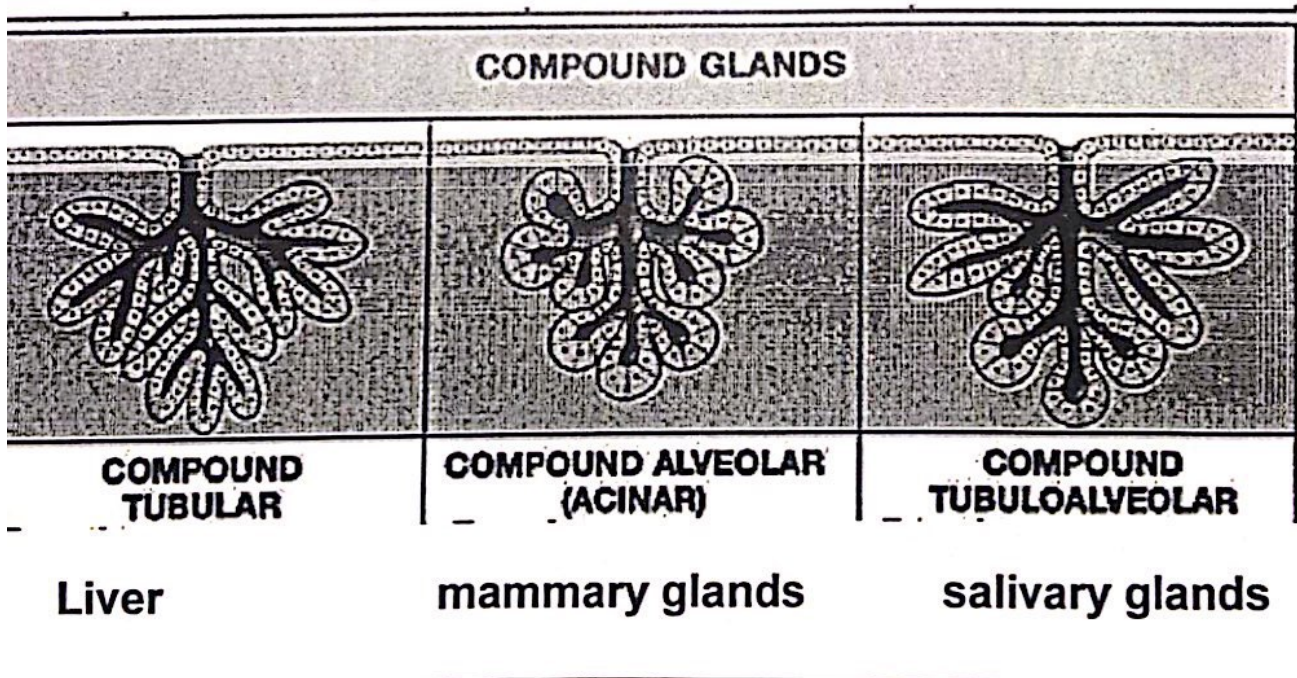
in structure of the eyelid

⇒ modified sebaceous gland.

Classification of Compound Glands

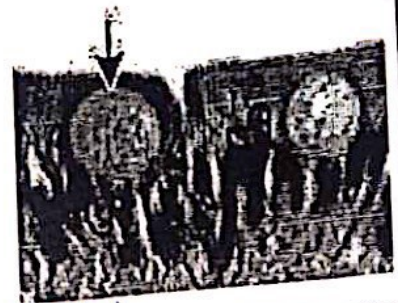
*↳ the duct system branching and
* the secretory part also branching.*

Compound: branched duct, branched secretory portion



Goblet cells

- Unicellular
 - Exocrine : secretion in duct
 - Shape of the cell : flask shape with basal nuclei (secretion from the apical part)
 - Mode of secretion: Merocrine
 - Nature of secretion : Mucus
 - Site : Respiratory system , GIT
 1. ciliated epithelium
 2. pseudostratified columnar epithelium
 3. goblet cell
- in respiratory system



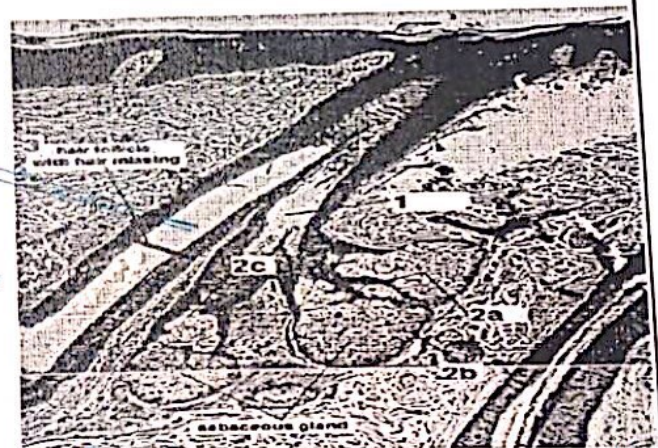
treatment of acne is -

Keratonic antibiotic → if infection happen.

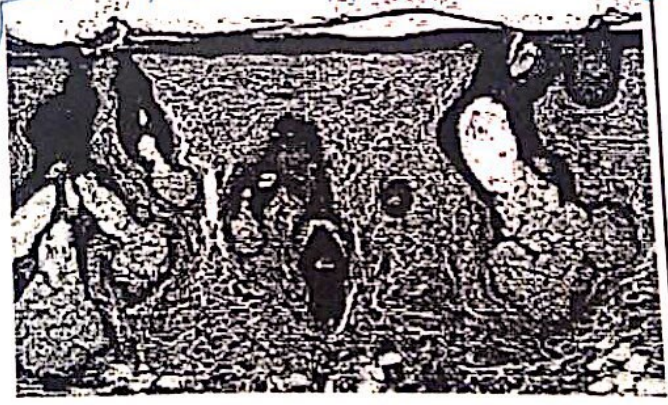
Sebaceous gland

- Exocrine
- Mode : Holocrine
- Nature : (oily secretion) ^{sticky}
- Shape of secretory units : Branched alveolar
- Site : Related to hair follicles
- Activity of the gland increase at the age of puberty
- Obstruction of the duct by thick secretion & keratin → Acne

shaft of the hair follicle



if infection happen it become dangerous



↳ Acne : disease/pathology of sebaceous gland in puberty / in male more than female

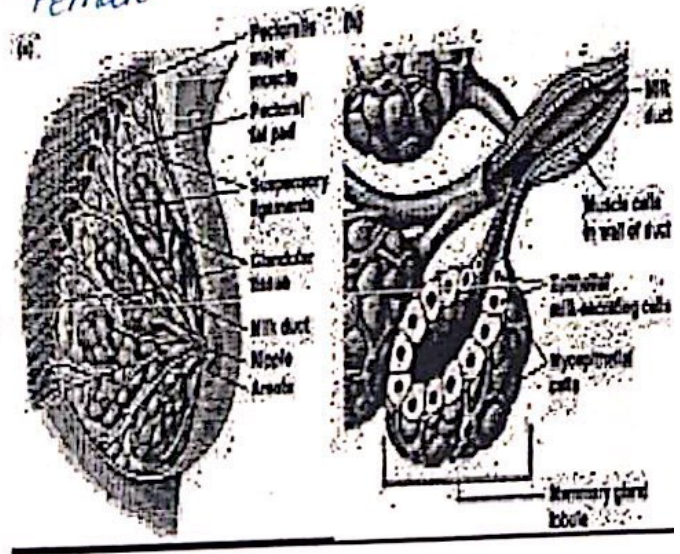
modified sebaceous gland ⇒ tarsal gland.

Mammary gland

in male and female

multicellular gland.

- Exocrine
- Mode : Apocrine
- Nature : (milk secretion)
- Shape of secretory units : Compound alveolar
- Site : Related to skin

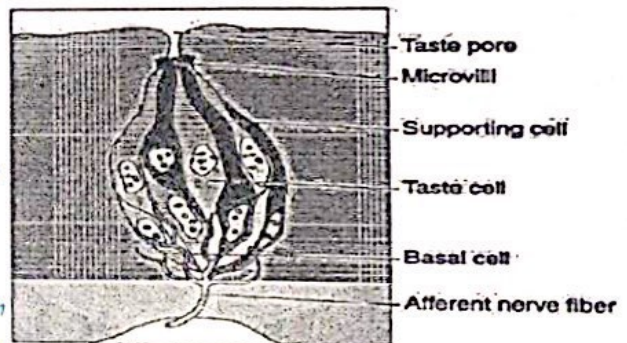


in special cells organ

Special types of epithelium

epithelium in nature

- **1-Neuroepithelium**
- E.g. Taste buds / *taste part (taste sensation)*
- Site : dorsal surface of the tongue *2- Olfactory mucosa in nose => smell sensation*
- Function : sensation



→ receive stimulation and conduct it. "Act as a nerve cell"

3- ear : hearing, equilibrium

4- eye : vision

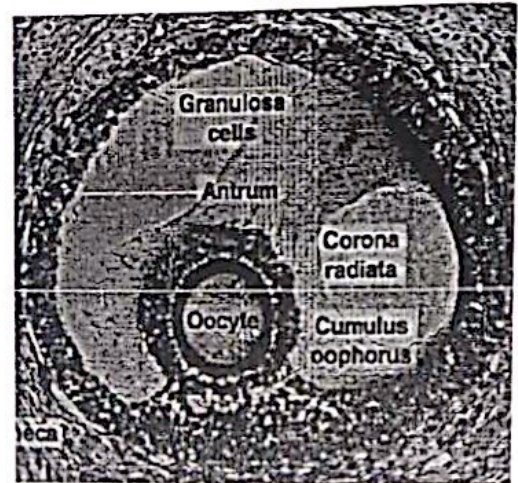
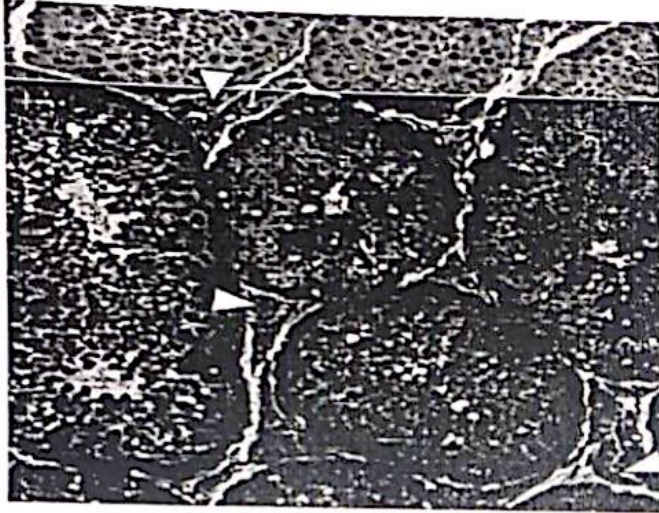


Special types of epithelium

** reproduction*

2. Germinal epithelium

Testis: sperm



Ovary: ovum

Function:

Reproduction

3- Myoepithelium

work as muscle but it epithelium in nature.

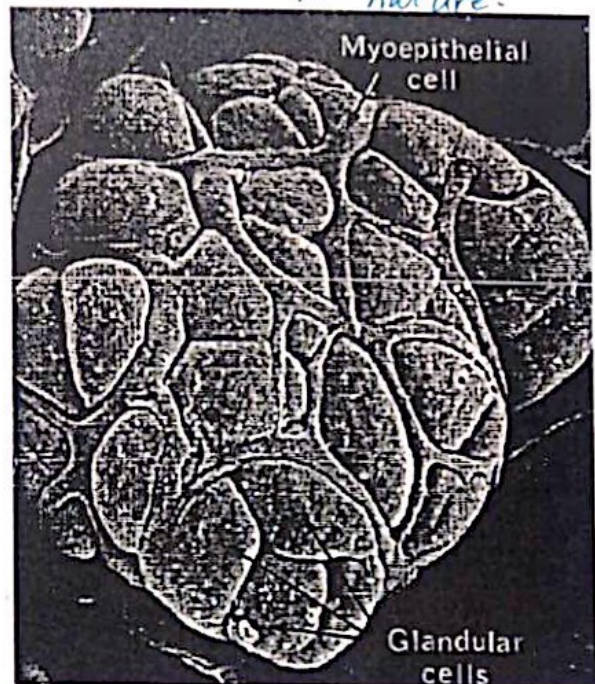
Shape : Irregular with many processes

Contain actin & myosin in the cytoplasm

Site : Acini & ducts of the gland

Function : *(actin, myosin)*

Contraction for squeezing the secretion *→ because the secretion is thick and sticky*



Functions of epithelium

- Protection
- Secretory
- Absorption
- Filtration and gas exchange
- Sensation (neuroepithelium)
- Reproduction (germinal epithelium)
- Contraction in myoepithelial cells

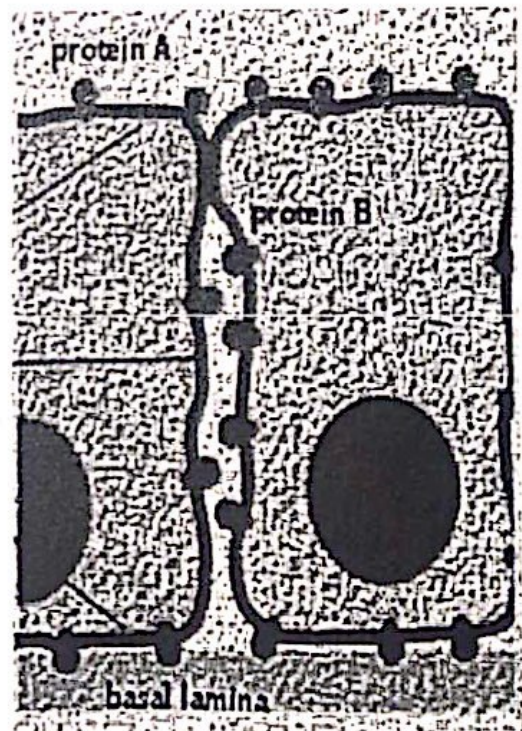
⇒ each function is according to the site and the kind of the epithelium.

حسب نوعه و موقعه

Epithelial polarity

- Cells have a top , lateral side and a bottom
- So different activities take place at different places
- Apical modifications
- Basal modifications
- Lateral modifications

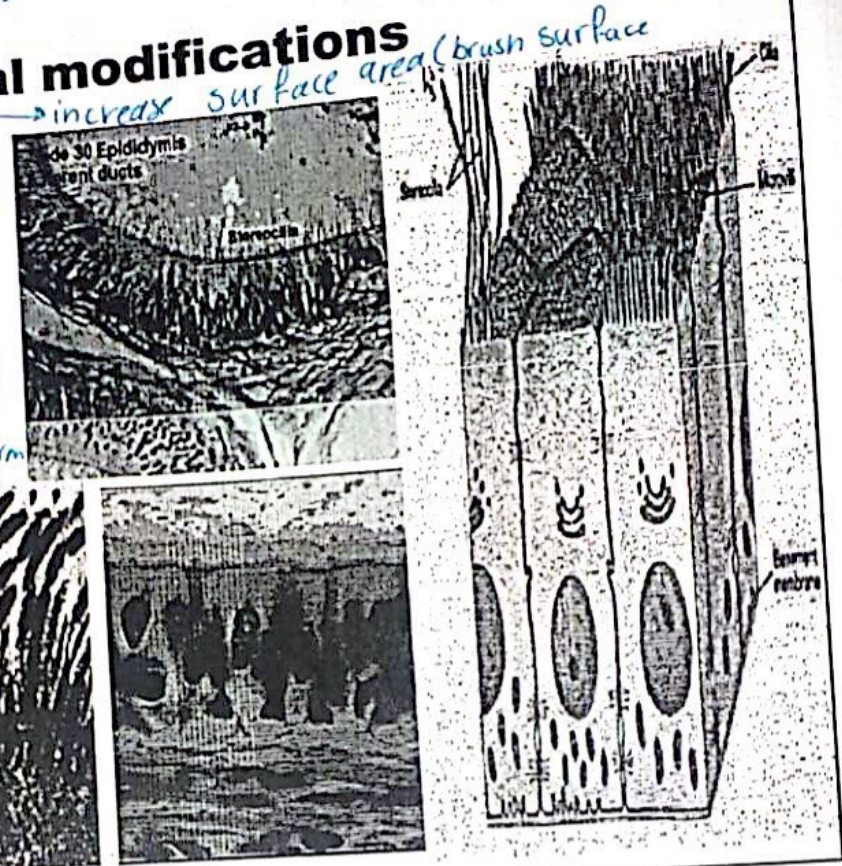
↳ cells make modification to adapt it function.



Note: the sperm at first is immature.

Apical modifications

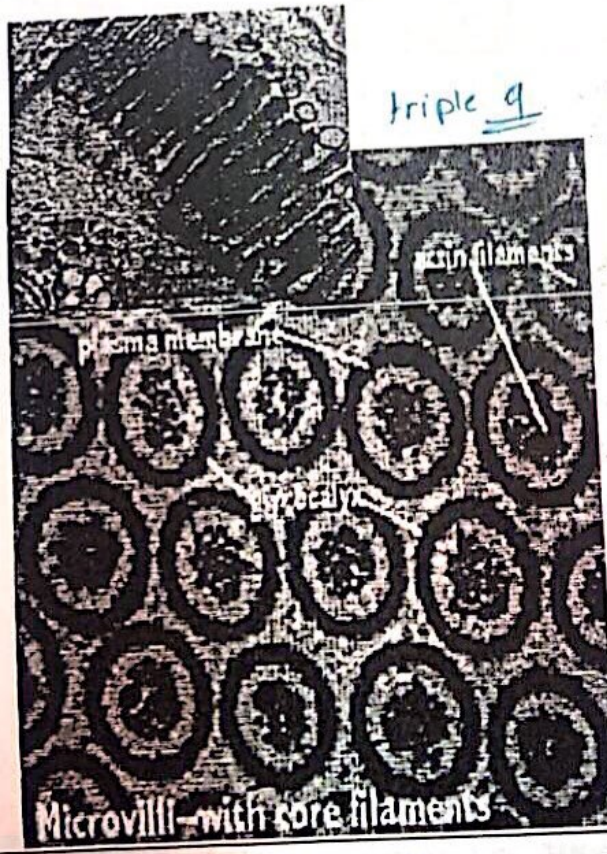
- long / motile
- **Cilia**
- short / non-motile
- **Microvilli**
- **Stereocilia**
- ↳ long, non-motile
- ⇒ in male genital duct
- help in ⇒ ① mature
- ② nutritive sperm



centrosome 27 microtubule

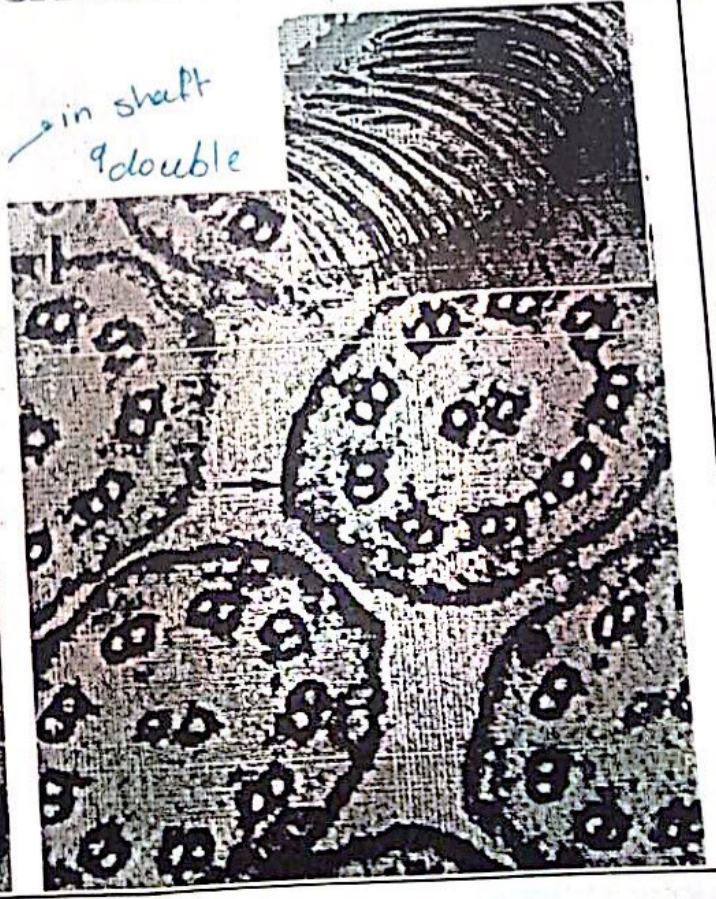
Apical modifications

act in filaments



triple 9

in shaft 9 double



Lateral modification.

Intercellular junctions (cell to cell adhesion)

- The intercellular junctions are more numerous between the epithelial cells. They are three types

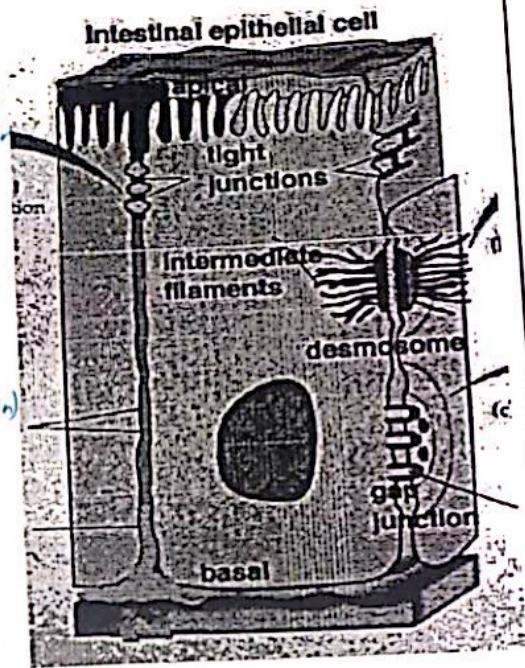
1- Occluding junctions: (Tight) \Rightarrow intestine to absorption link cells to form an impermeable barrier.

2- Anchoring junctions: (Adhering)

- provide mechanical stability to the epithelial cells.
- Zonula adherens:
- Macula adherens = desmosomes: *(Layer in skin)*

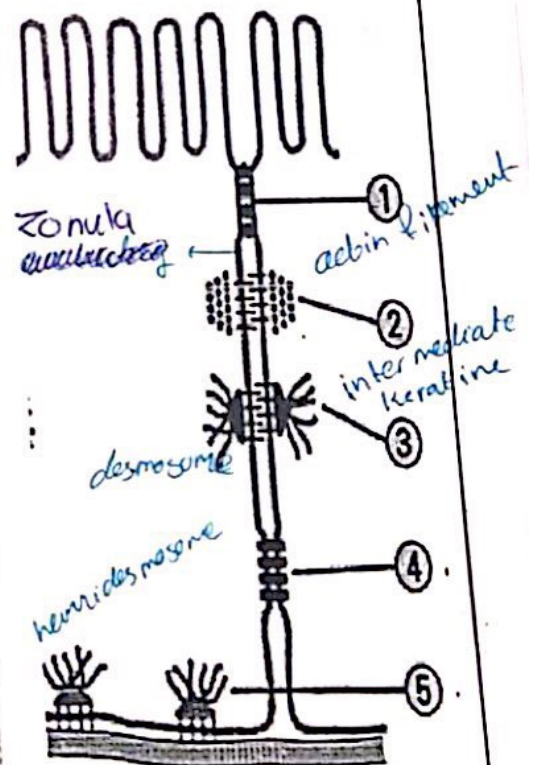
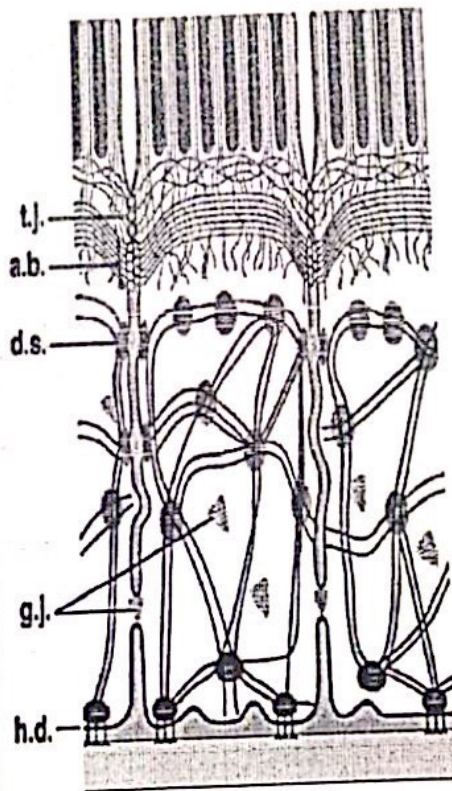
3- Communicating junctions: (Gap) allow movement of molecules between cells. It permits the exchange of molecules e.g. ions, amino acids allowing integration, communication and coordination between cells

It is found mainly in cardiac and smooth muscle cells



*act as a one unit
micro filament, microtubule, intermediate filament.*

Intercellular junctions

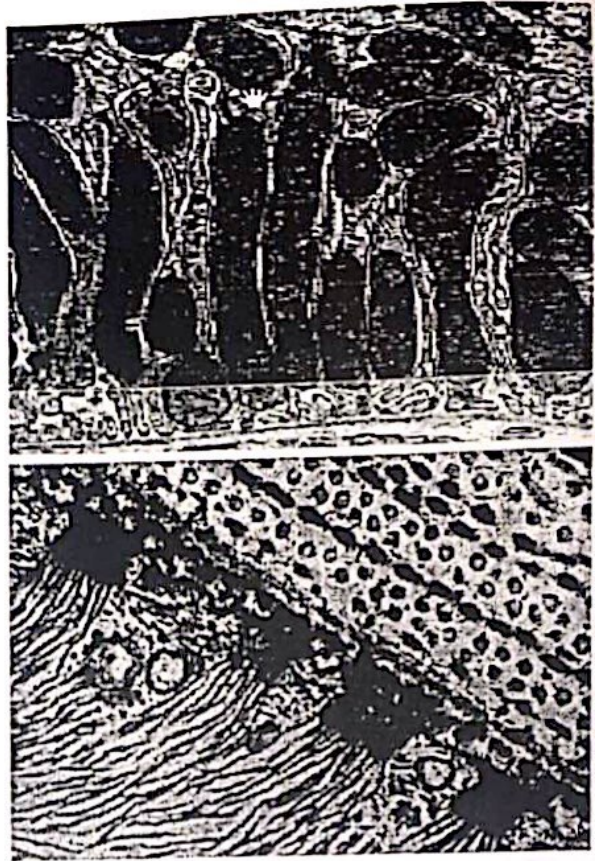
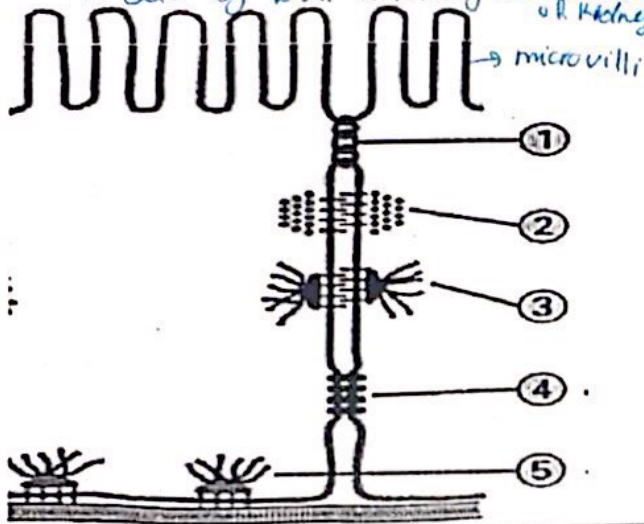


cilia \Rightarrow microtubules

Basal modifications

- Basement membrane
- Basal infolding : in kidney tubules (1-1.5 L)
- Hemidesmosome

and the other is gob ← urine in side by basal infolding in the tubules of kidney



Basement membrane

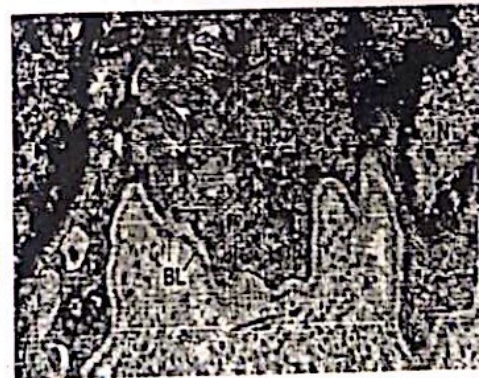
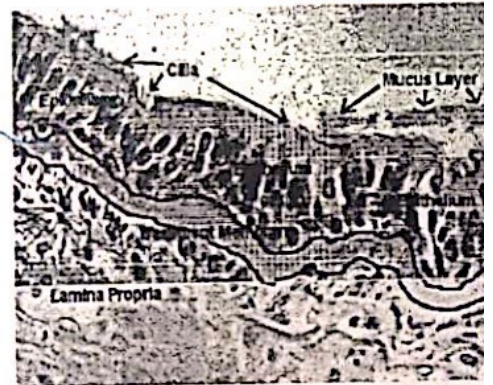
- Thin extracellular layer having two parts:
 - ↳ Basal lamina : type IV collagen + laminin
 - Produced by epithelial cell
 - Reticular lamina : Type VII collagen + type III collagen (reticular F) → to fix
 - Secreted by C.T. cells fiber

if it across the basement membrane it will develop.

Separation

Function :

1. Attach epithelium to C.T. → connective tissue.
2. Separate epithelium from other tissue
3. Regulate (filter) substances passing from C.T. to epithelium
4. Guide during tissue regeneration



cancer and its stage