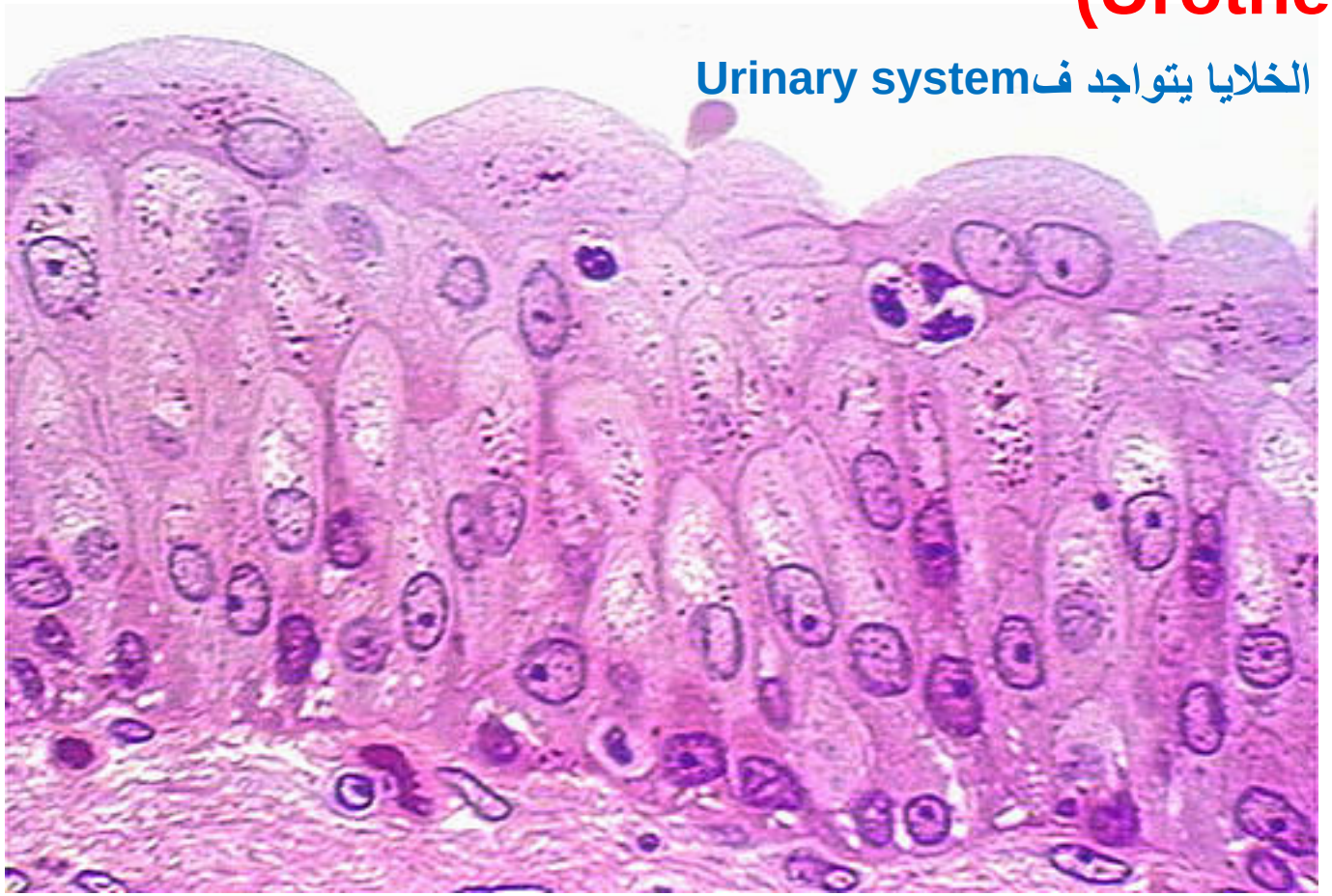
Transitional epithelium

Other name (Urothelium)

كونه هذ النوع الخلايا يتواجد فUrinary system..



(urinary bladder - empty)

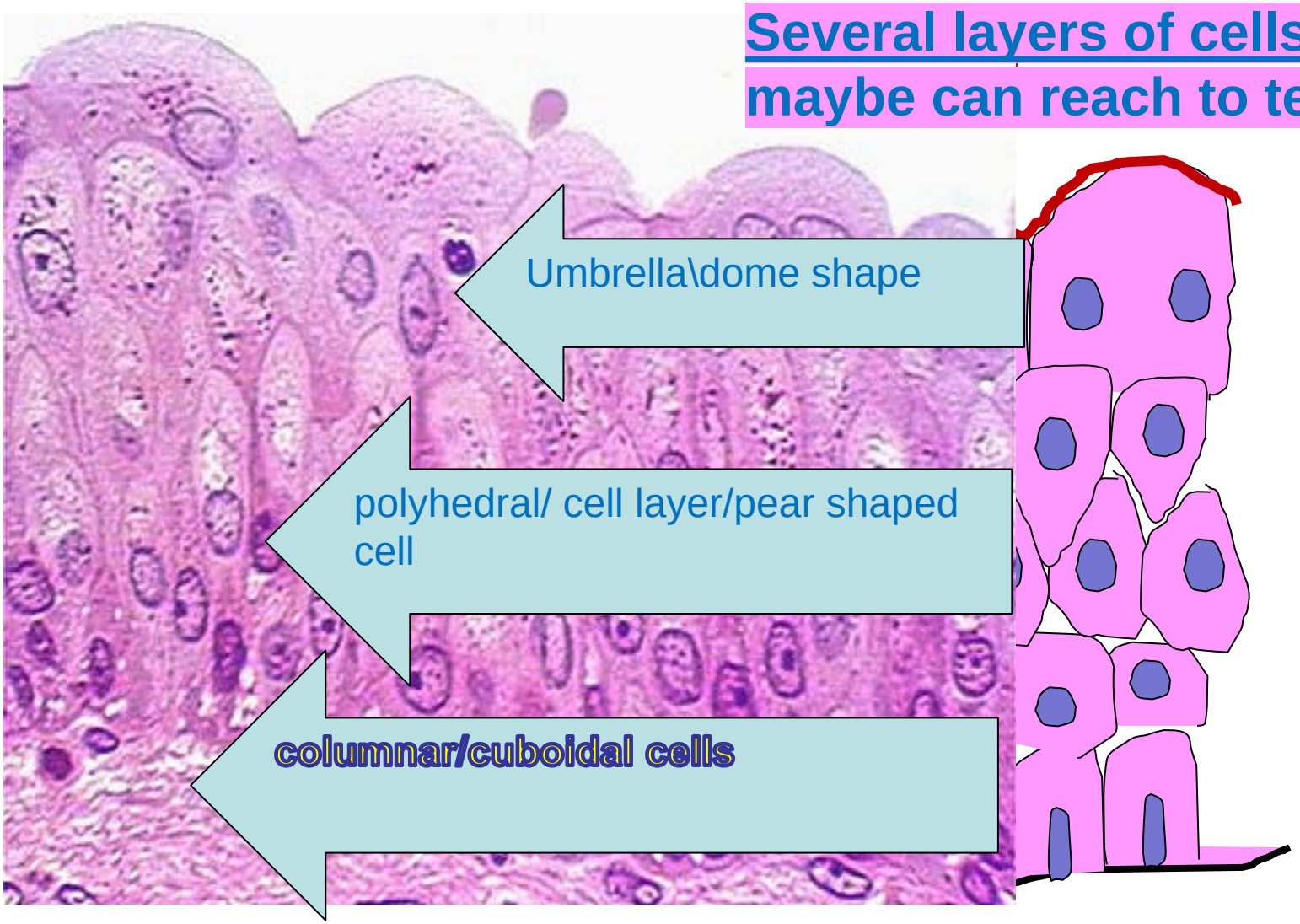
Other site:

(Renal pelvis //urethra (مجرى البول)الاحليل // ureter الحالب)

Transitional Epithelium

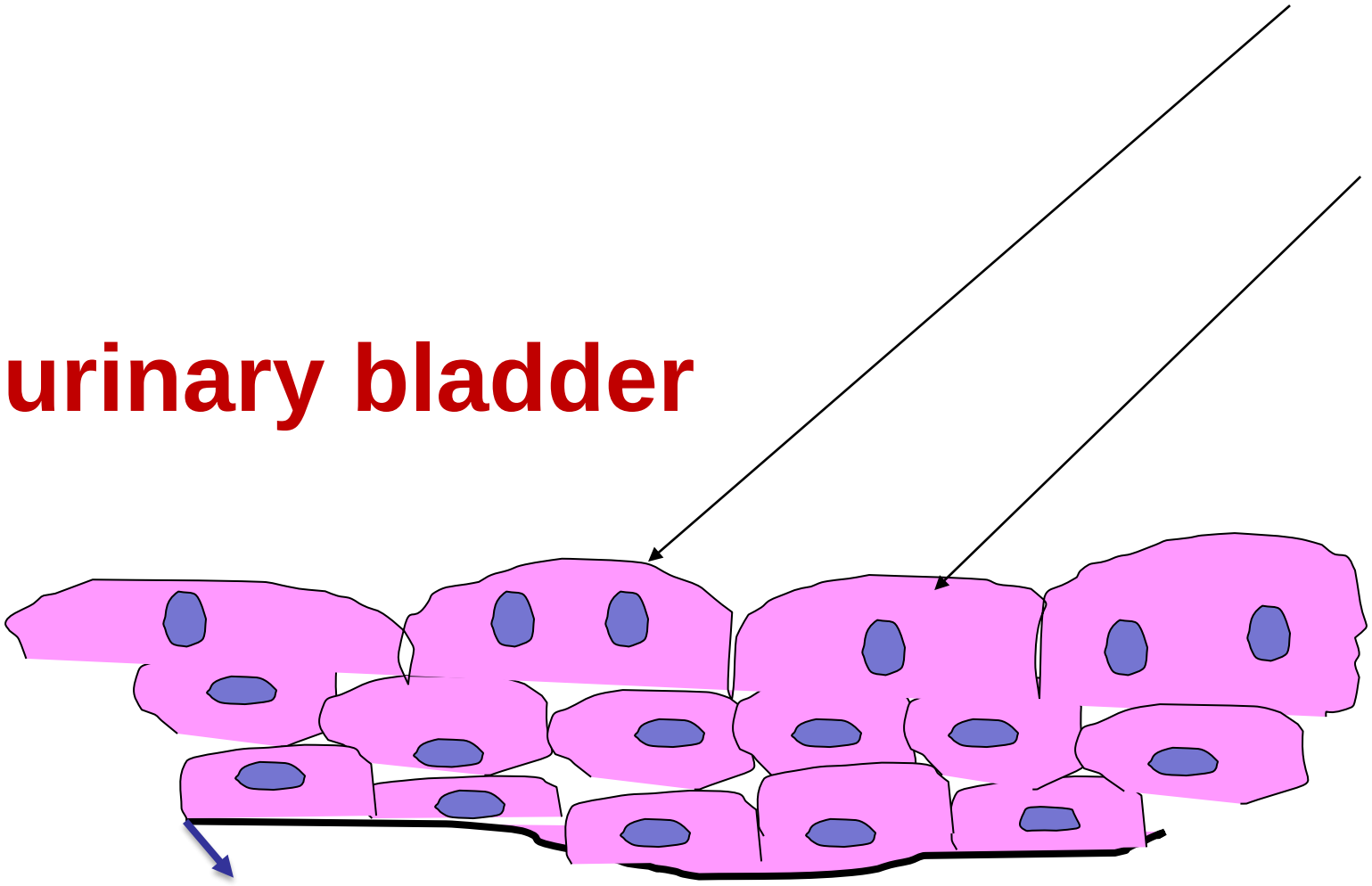
Several layers of cells

maybe can reach to ten layers



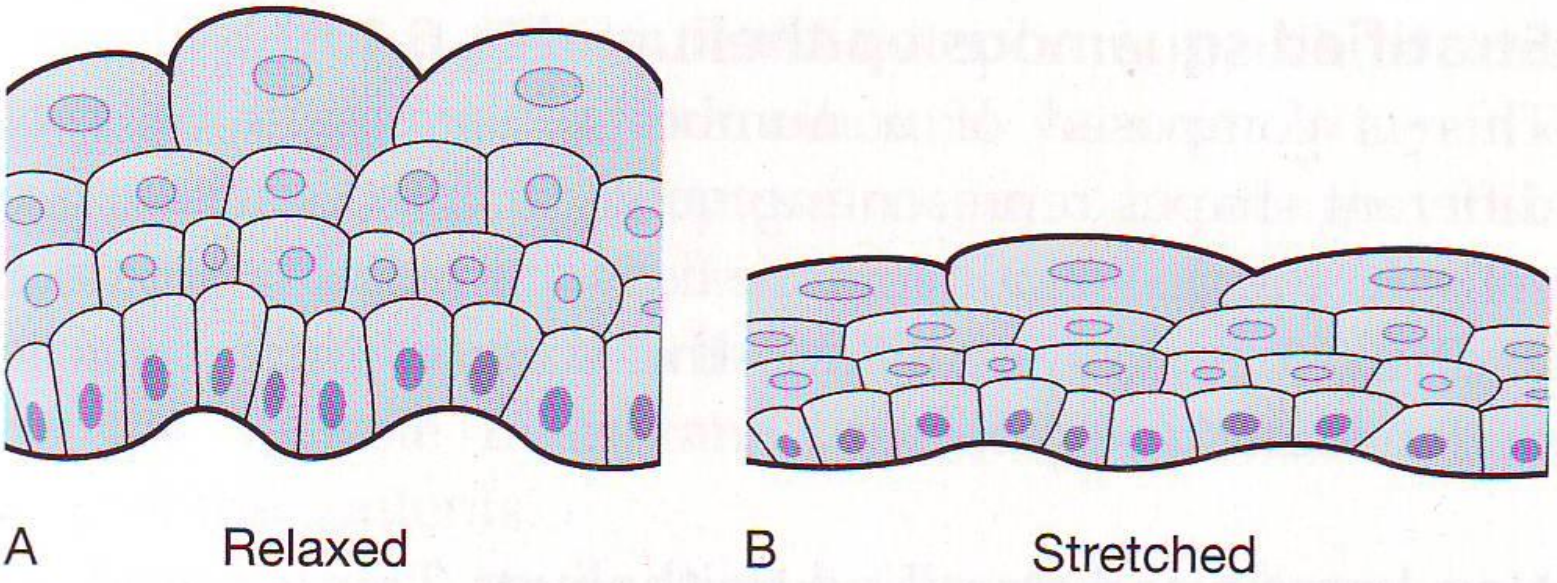
Transitional Epithelium

Full urinary bladder



Thin layers of basement membrane enhance of expand and flexes of cell bladder when full urinary bladder happened .

Transitional epithelium



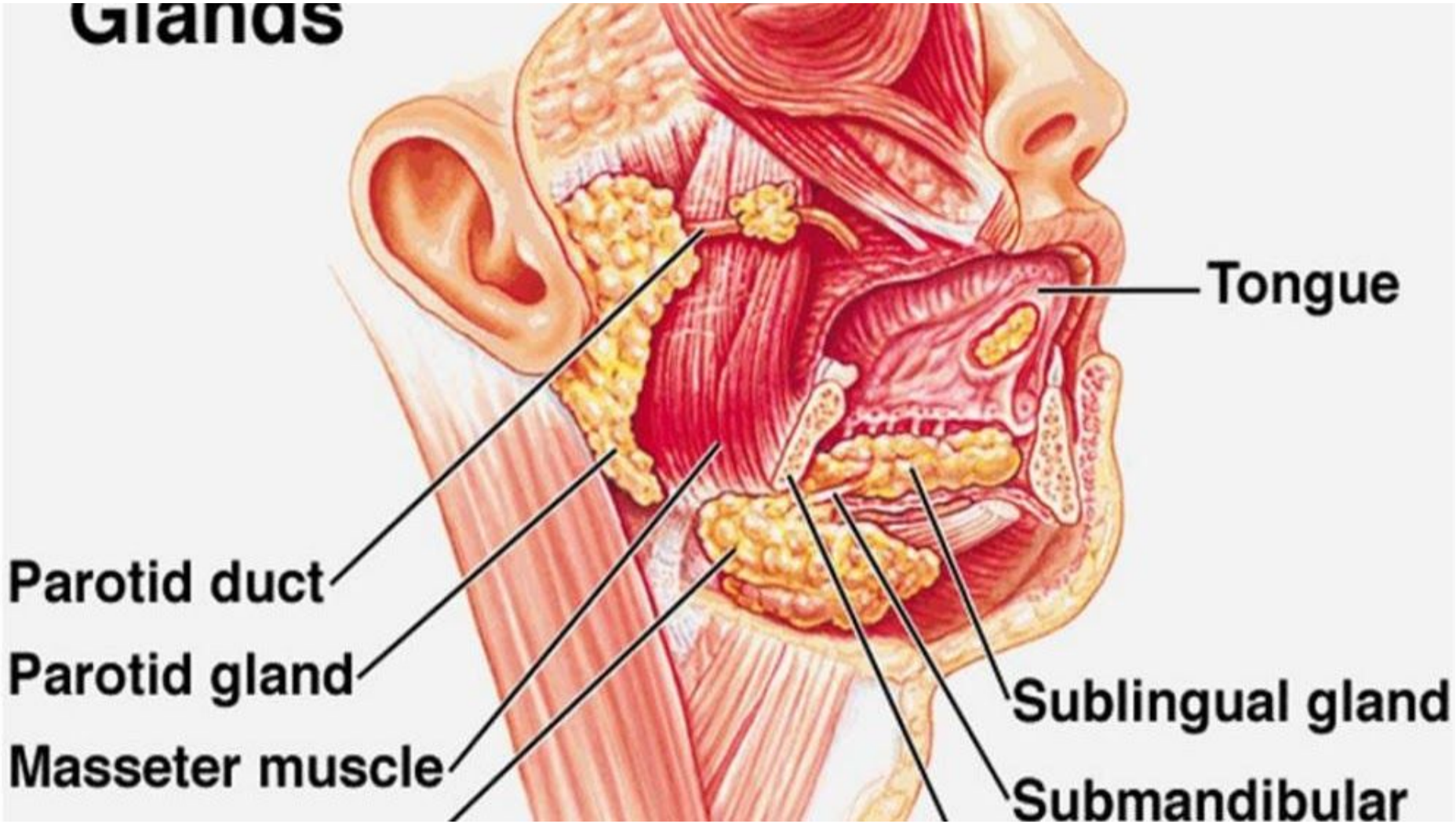
Transitional epithelium: A. Relaxed. B. Stretched.

Transitional epithelium

Adaptation of Transitional epithelium to its function:

- **Thin corrugated basement membrane**
- **Abundant mucoid intercellular substance to allow gliding of cells on each other.**
- **Cuticular border at the free surface.**

Glandular Epithelium *(Secretory)*



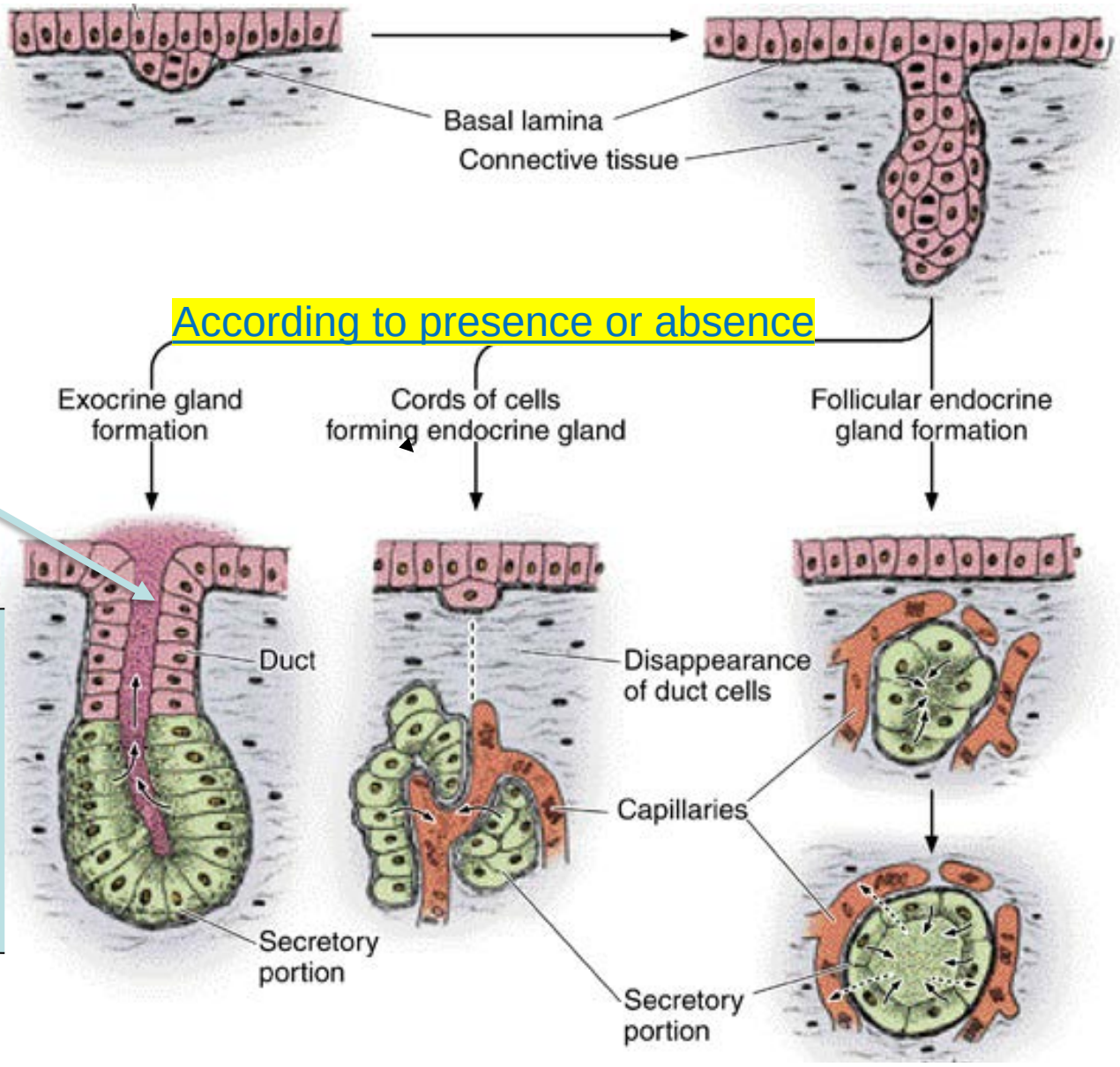
Glandular Epithelium

origin

lumen

Differentiation

In nature is epithelium but it goes underline to make connective tissue with secretion features



Types of glandular epithelium

It is classified according to:

1- Number of cells

2- Presence or absence of a duct system

3- Mode of secretion (mechanism) How it comes out?

4- Nature of secretion Which type is?

5- Shape of the secretory portion

6- Branching of duct

Number of cells

One cell

Unicellular

(goblet cell)

Secret :mucous

extra information

قناة الدكتور خالد

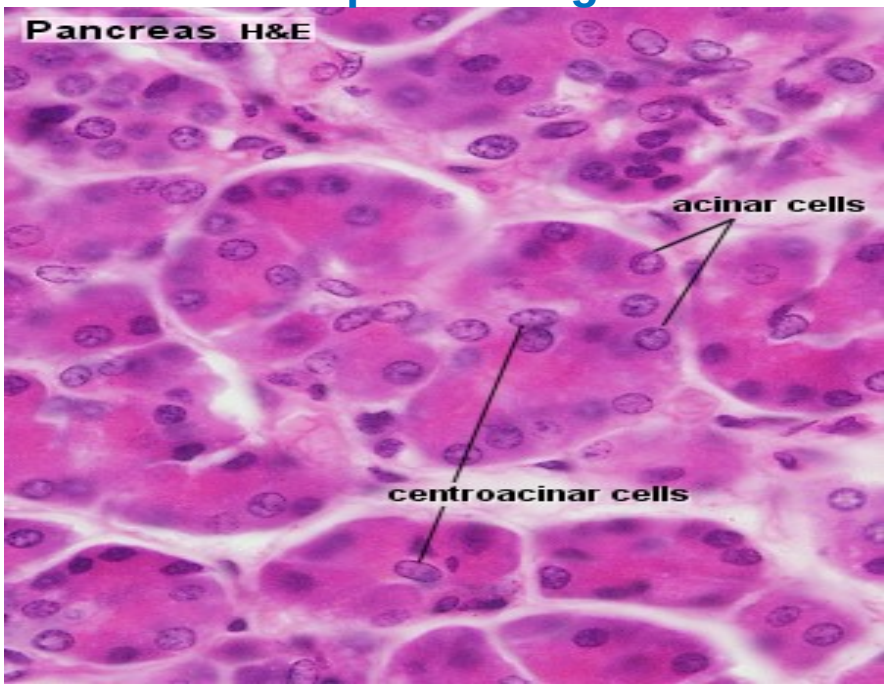
pro.dr.khaled

Many cell

Multicellular

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

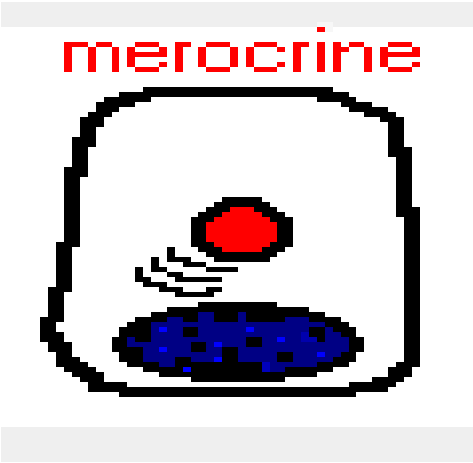
Sweat and pancreas glands



Mechanism (Mode) of Glandular secretions

- **Merocrine glands** **(Without injury or change of cellular shape)**
- **The secretion released through exocytosis e.g. Pancreas**

The molecule comes out of cell



- **Apocrine glands**

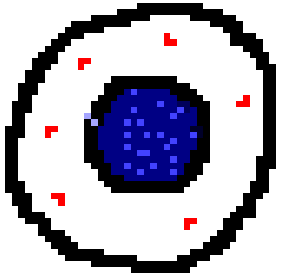
The secretion involves the loss of both product and apical cytoplasm e. g. Mammary glands

. Holocrine gland

The secretion destroys the cell

Sebaceous glands

Holo- means : all



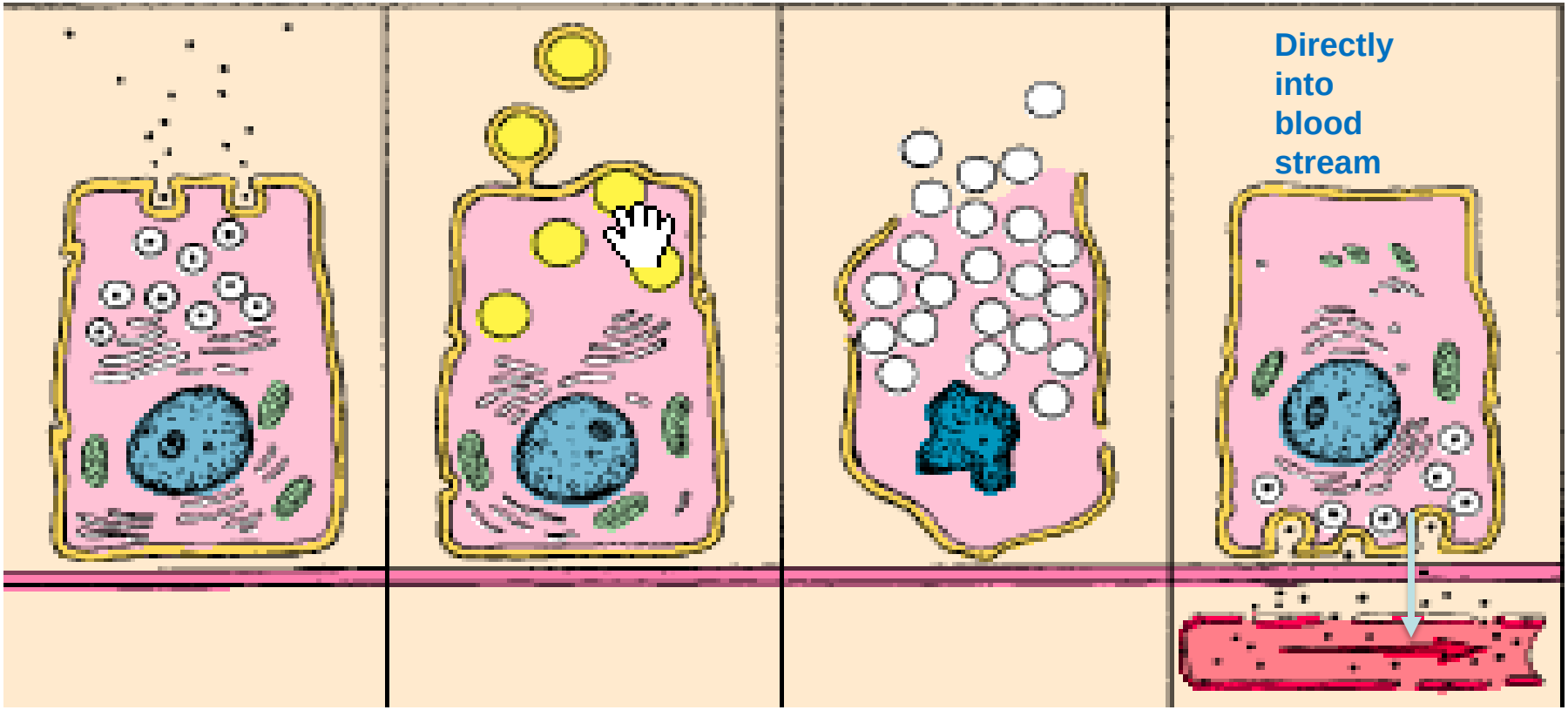
Presence of a duct system

Exocrine Endocrine mixed

1-Pancreas (digestive enzyme / insulin)

2-Liver (amino acid / glucose)

Exocrine Glands			Endocrine Glands
Merocine	Apocrine	Holocrine	



Nature of Glandular secretions

- **Serous glands: parotid gland**
  Mode : merocrine gland
  Exocrine gland

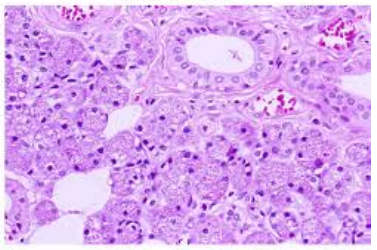
- **Mucous glands: sublingual gland**
  viscous

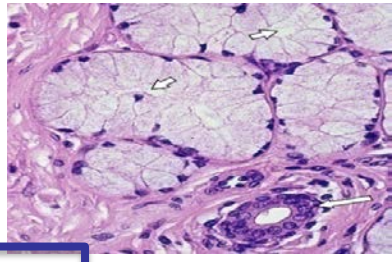
- **Mixed glands: submandibular gland**
  Secret both (serous & mucous)

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

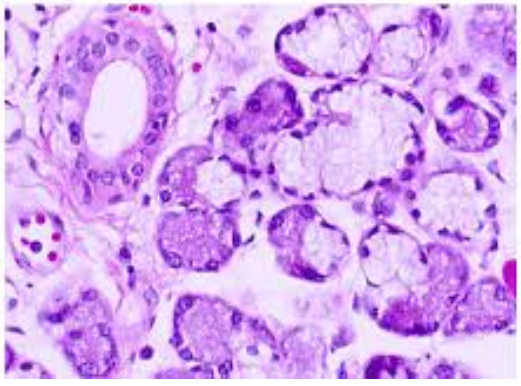
Salivary gland

Parotid Gland

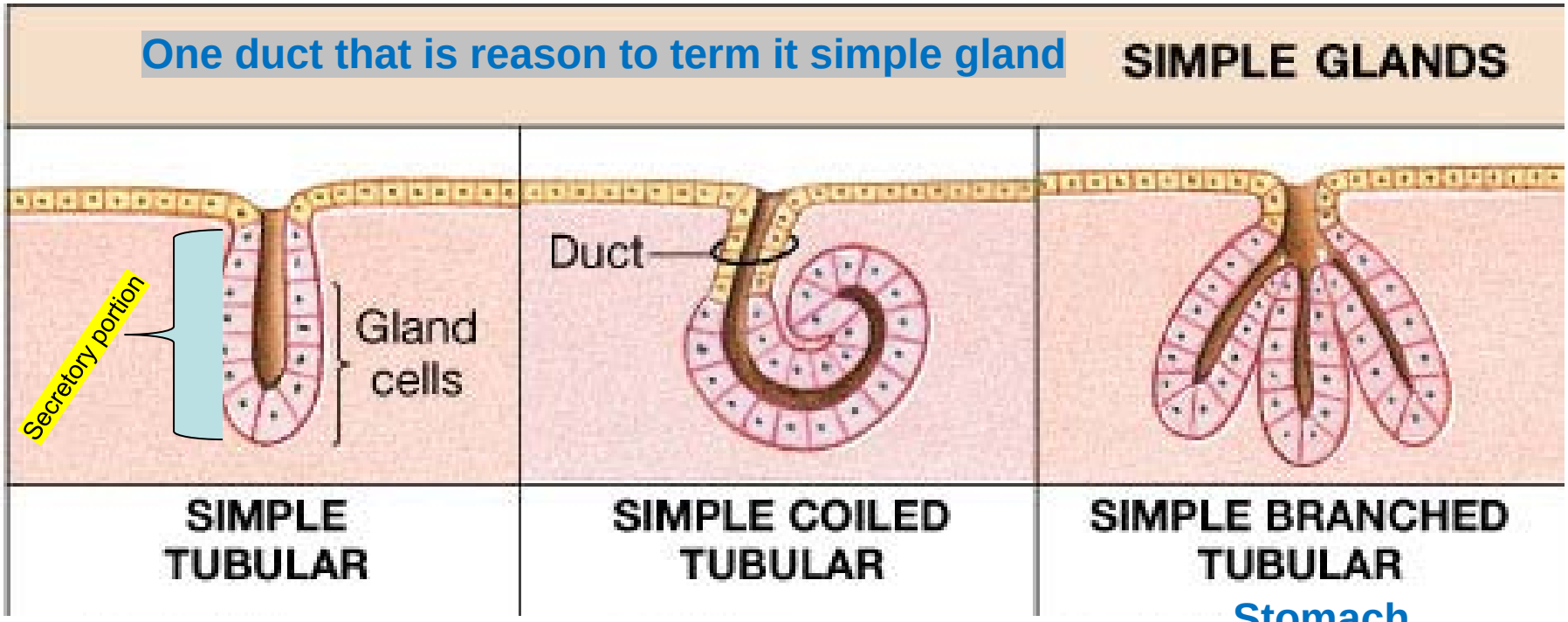




Submandibular Gland

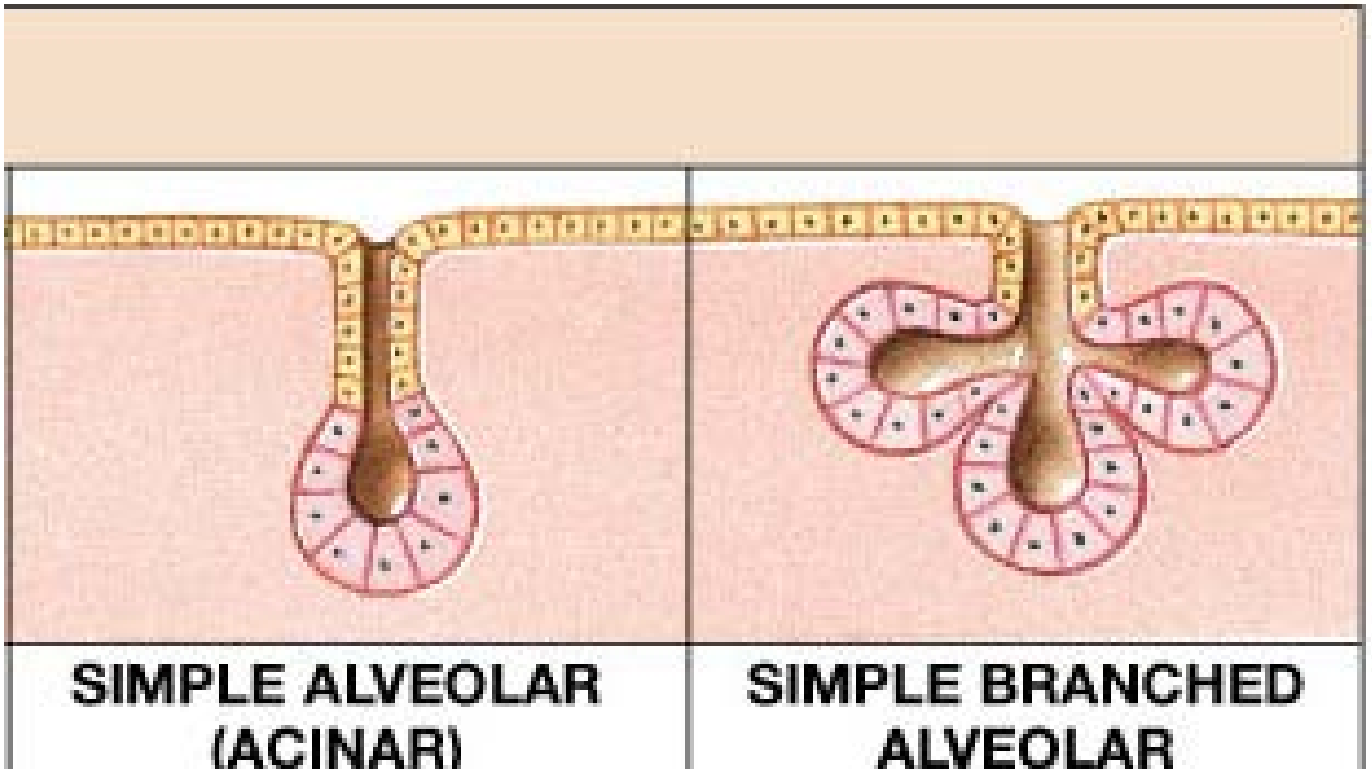


Classification of Tubular Glands



Intestinal glands **Sweat glands** **Fundic glands**

Classification of Alveolar Glands



Related to the follicle *special gland*

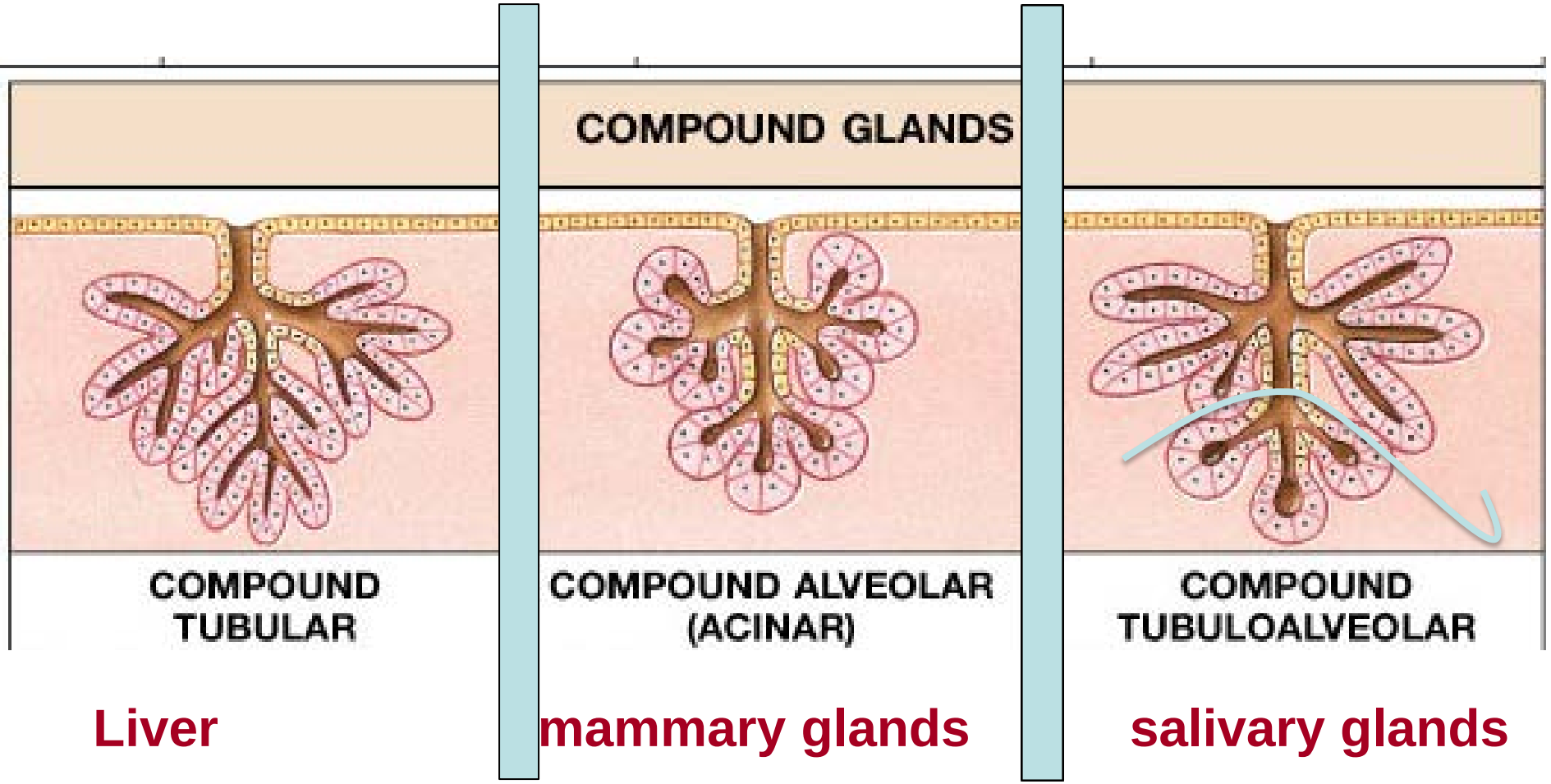
Sebaceous glands

Modification /special gland *hair follicle

Tarsal glands

Classification of Compound Glands

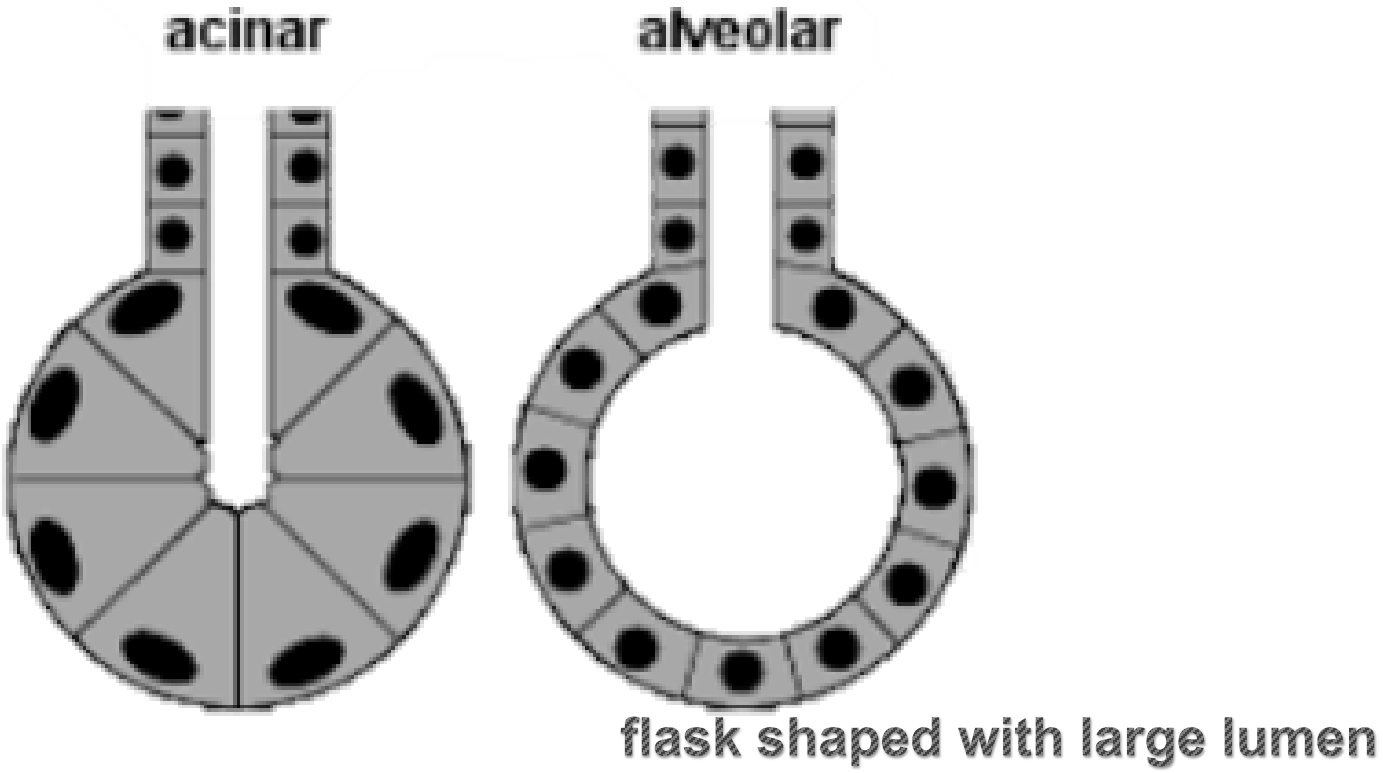
Compound: branched duct, branched secretory portion



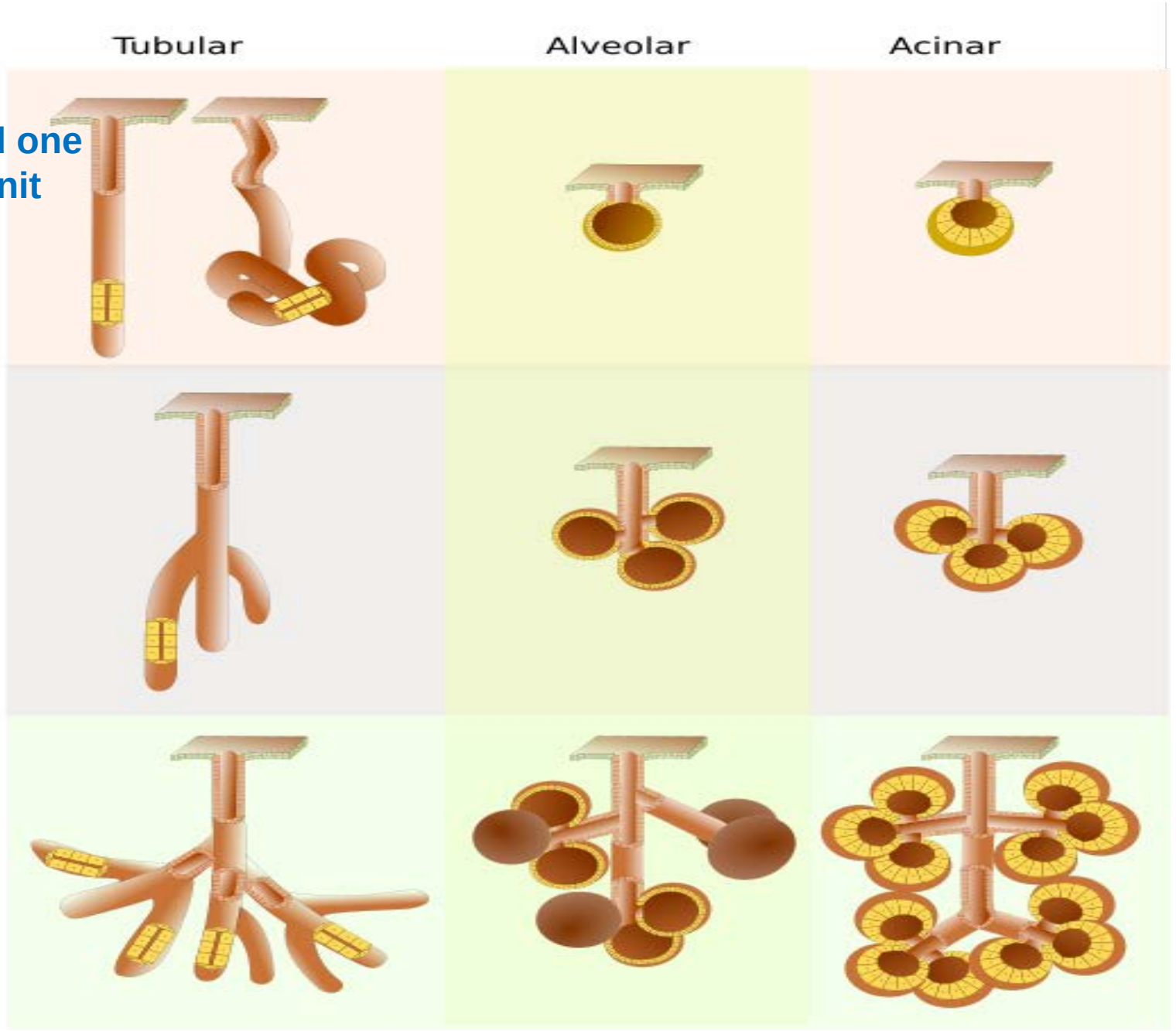
Liver **mammary glands** **salivary glands**

Acinar VS alveolar

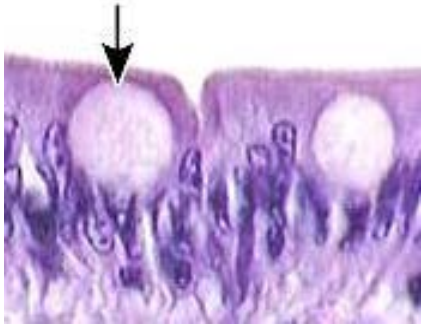
غير مطالبين فيه فقط للفهم



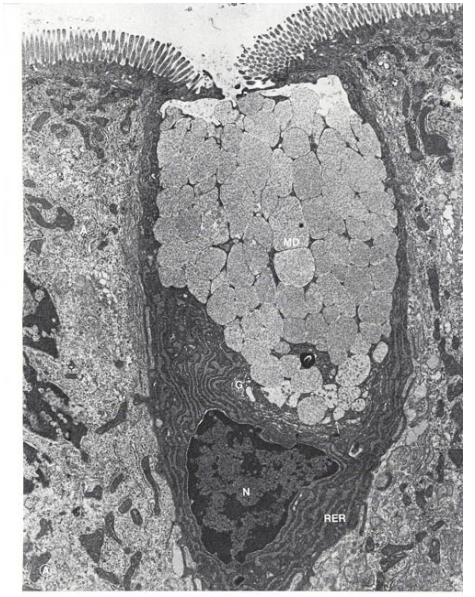
Example :Goblet cell


Tubular
Alveolar
Acinar
Have only on unbranched and one unit secretory unit
Simple types
Branched
Unbranched duct with branched secretory unit
Compound
Branched duct & secretory unit

Goblet cells



- Unicellular
- Exocrine
- Shape of the cell : flask shape with basal nuclei
- **Mode** of secretion: Merocrine
- **Nature** of secretion : Mucus
- **Site** : Respiratory system , GIT



بشكل مختصر و مفهوم

Flask shaped (nucleus toward to base, the apical part full with mucus secretion)

Why?

In respiratory system : present of mucus(sticky in nature) which secret from goblet cell, makes the dust to adhere with it and goes to lung .

GIT: In intestinal the epithelium tissue is columnar in shape so what is the something that protection intestinal from dry reduces which comes from digestive for food ?

Answer: the presence of goblet cell in jejunum and duodenum secret the mucus that covers different types of epithelium in GIT and protection it from injury

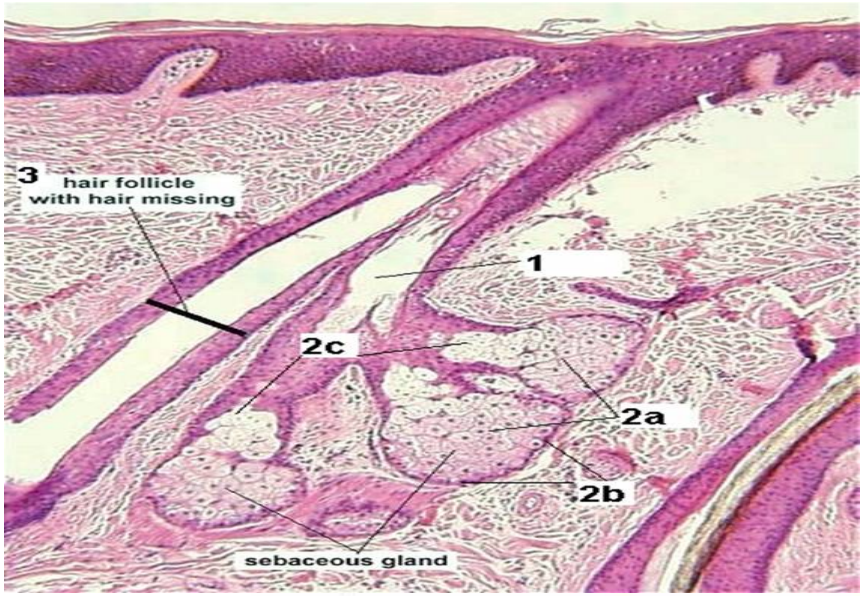
Sebaceous gland

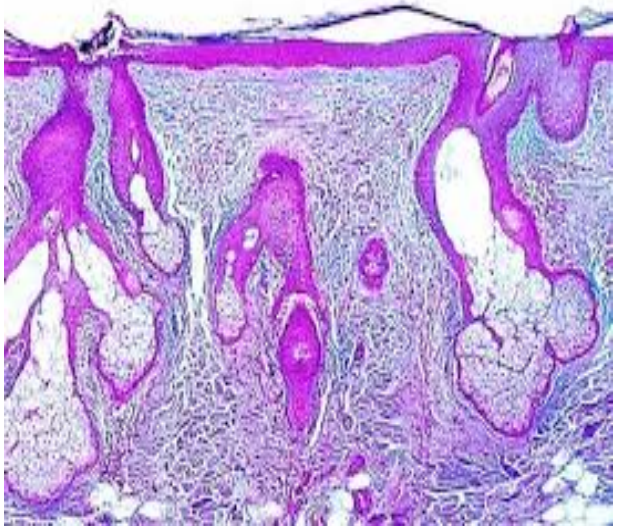
Multicellular
- Exocrine
- Mode : Holocrine
- **Nature : (oily secretion)**
- **Shape of secretory units : Branched alveolar or simple alveolar According to place**
- **Site : Related to hair follicles**
- **Activity of the gland increase at the age of puberty**
- **Obstruction of the duct by thick secretion & keratin**

حب الشباب (Acne)

Males are more exposed than female

Hair follicle

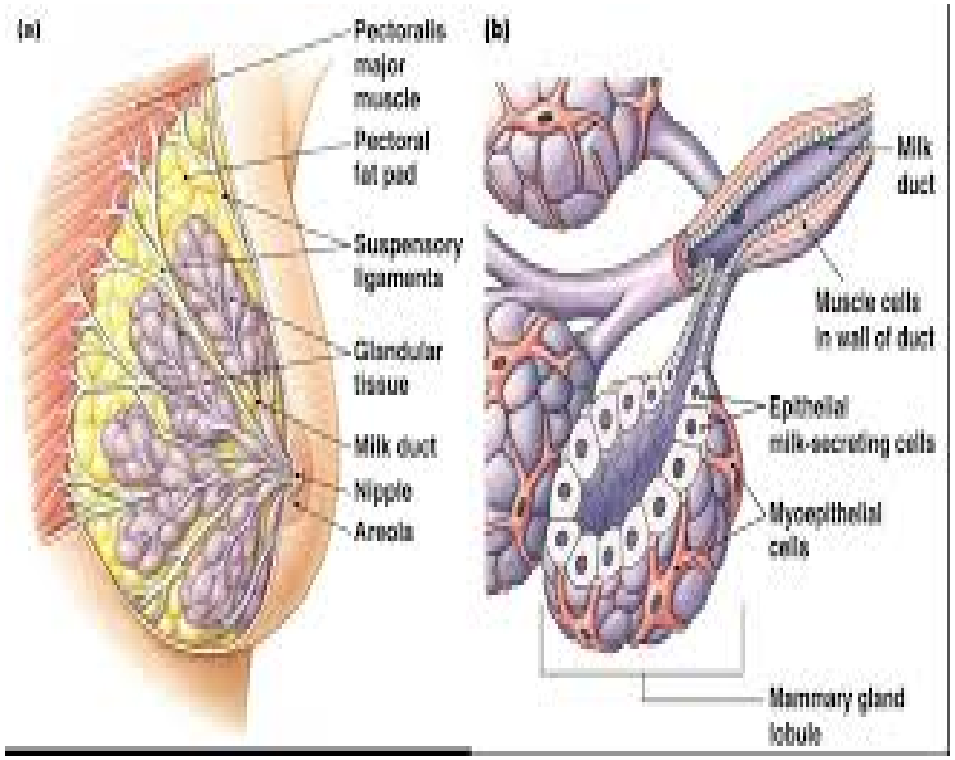




Its shape that helps to do it

Mammary gland

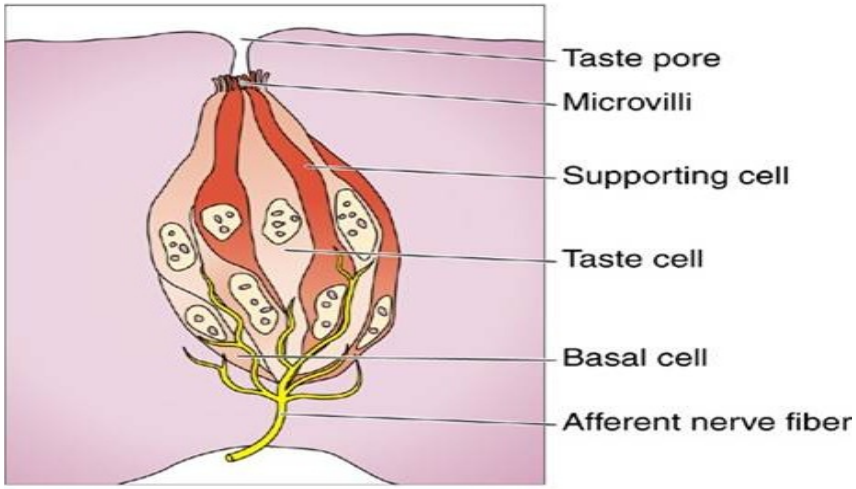
- Exocrine
- Mode : Apocrine
- **Nature : (milk secretion)**
- **Shape of secretory units : Compound alveolar**
- **Site : Related to skin**



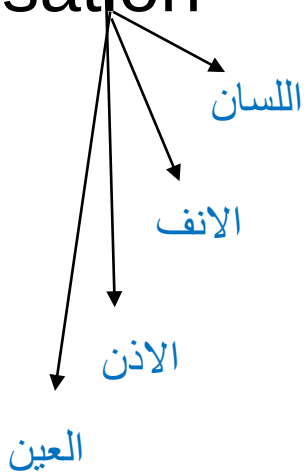
Destroy apical part -_-

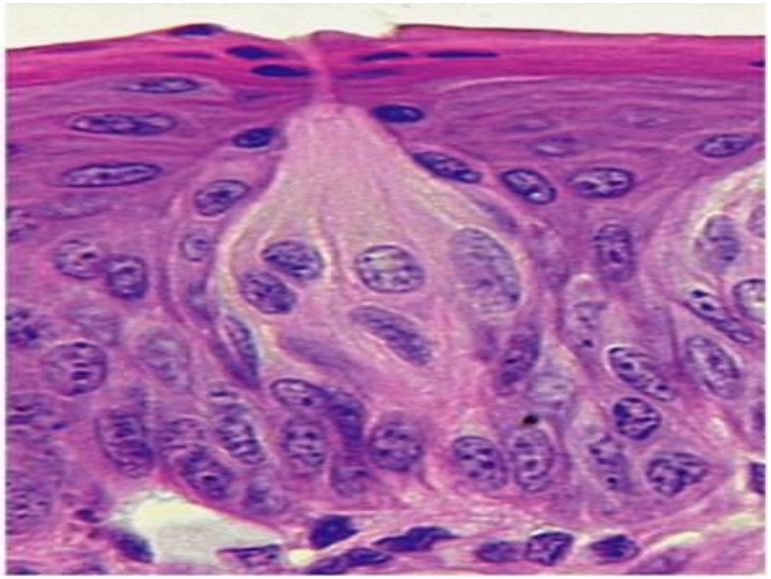
Special types of epithelium

- 1-Neuroepithelium
- E.g. Taste buds
- Site : dorsal surface of the tongue
- Function : sensation



When we say :something
Has epithelium in nature
?
It means the same
features of epithelium
tissue

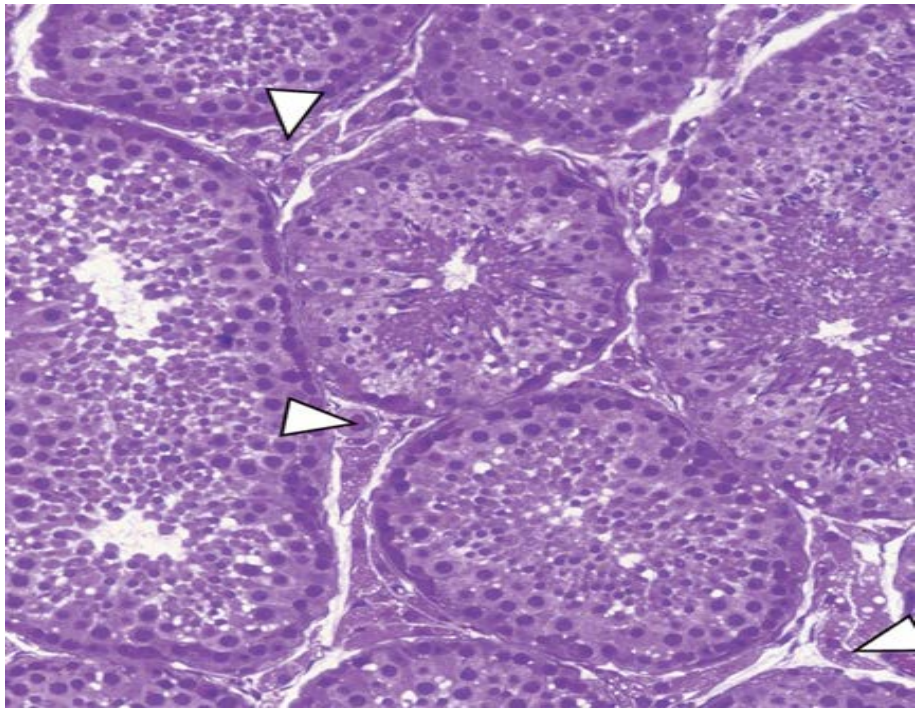


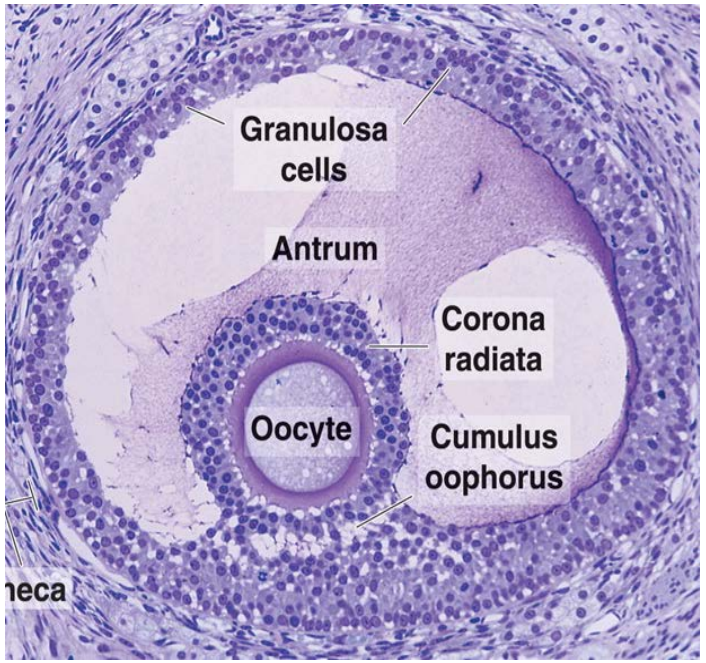


Special types of epithelium

2. Germinal epithelium

Testis: sperm





Ovary: ovum

Function: :
Reproduction

3- Myoepithelium

They are modified stellate epithelial cells which surround the secretory units and the ducts of the glands. They contain myosin and actin , hence they are able to contract and squeeze the secretion from the glands

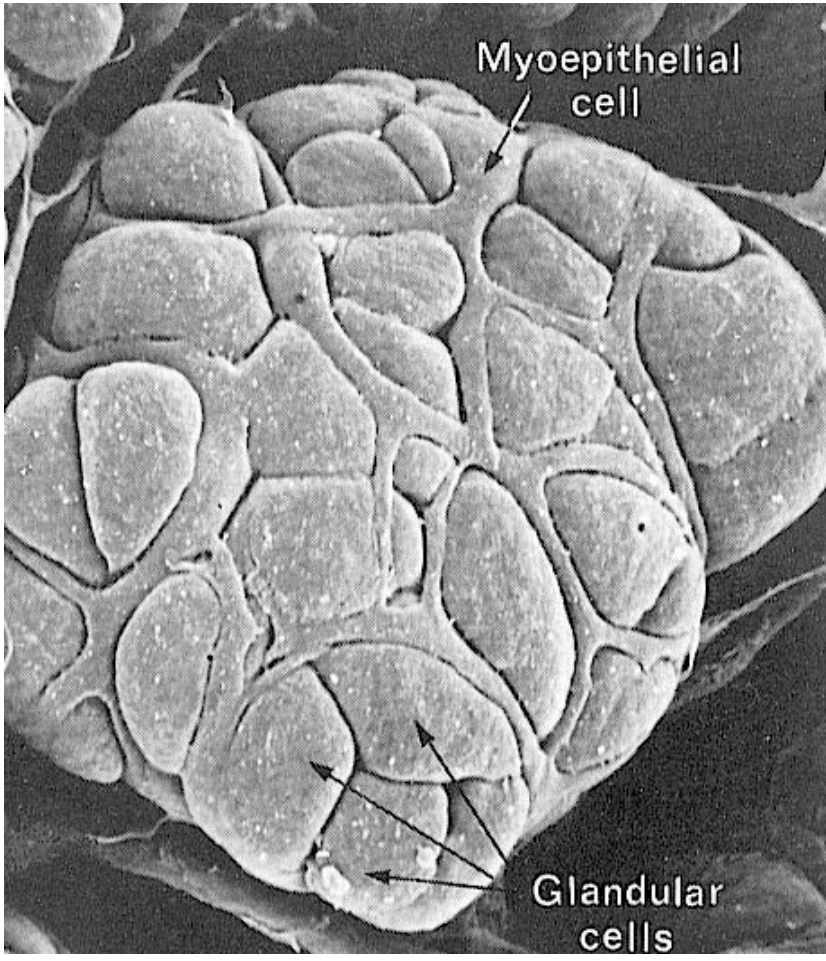
Shape : Irregular with many processes

Contain actin & myosin in the cytoplasm

Site : Acini & ducts of the gland

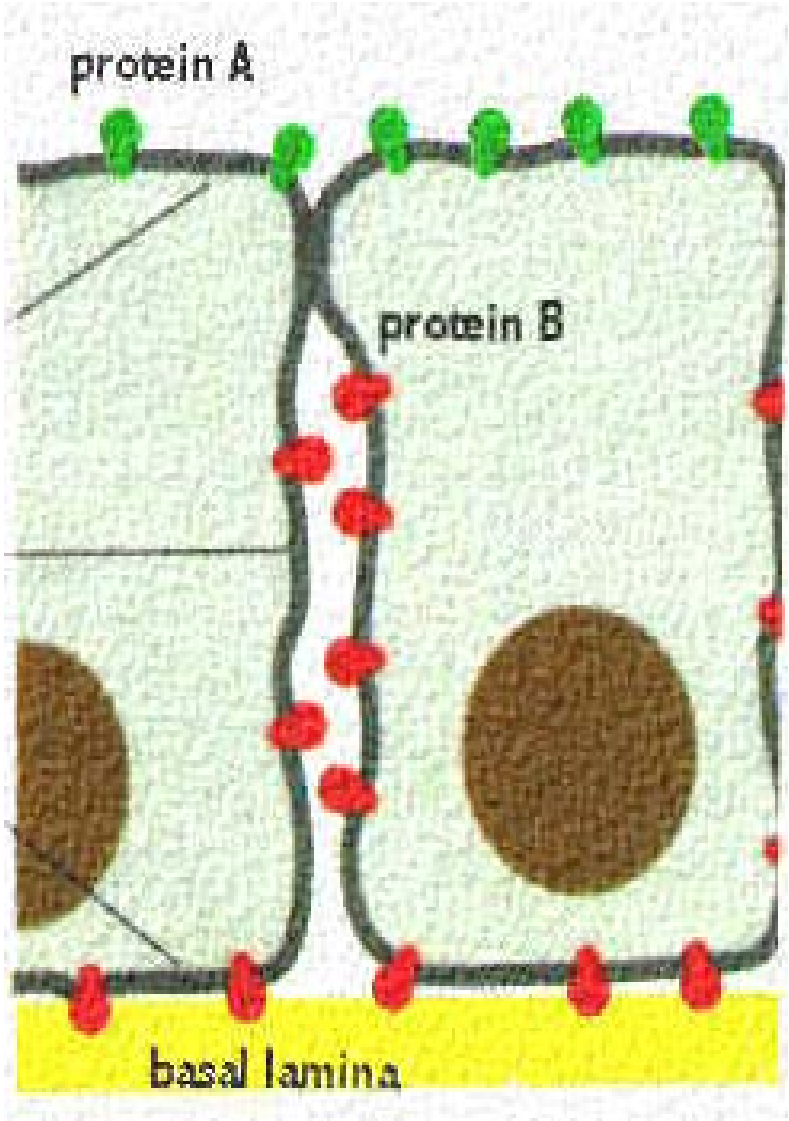
Function :

Contraction for squeezing the secretion



Epithelial polarity

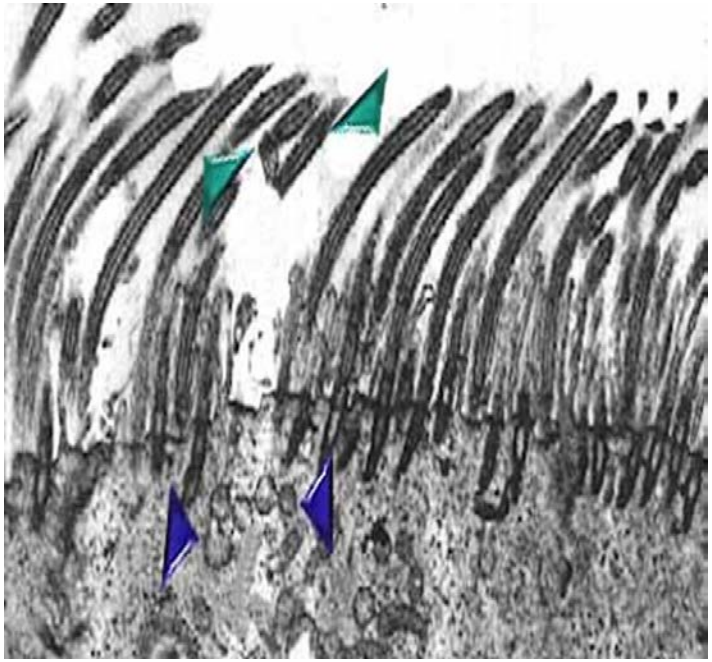
- Cells have a top , lateral side and a bottom
- So different activities take place at different places
- **Apical modifications**
- **Basal modifications**
- **Lateral modifications**

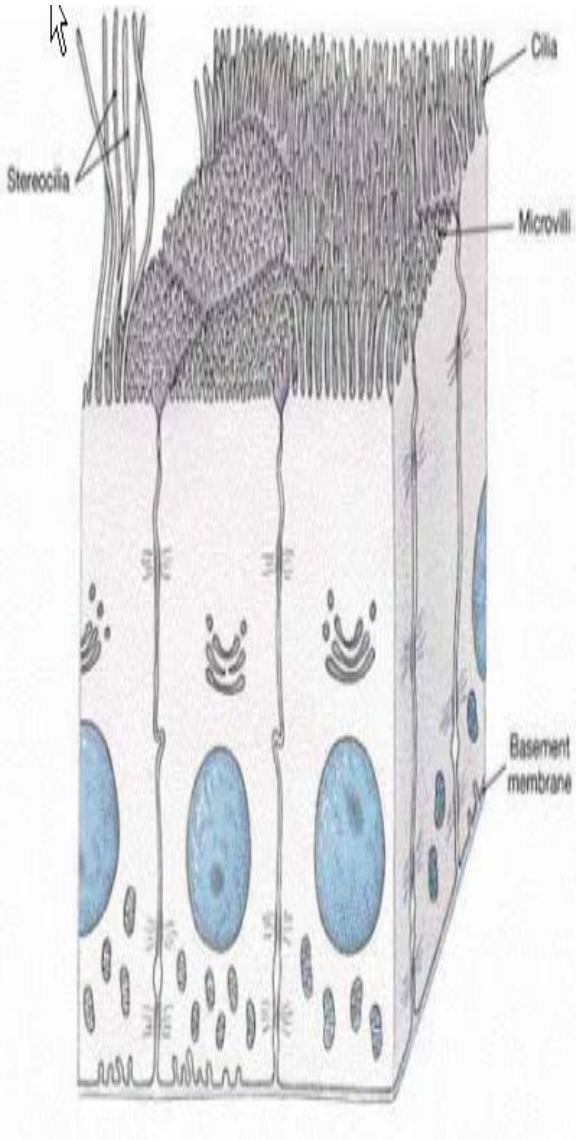


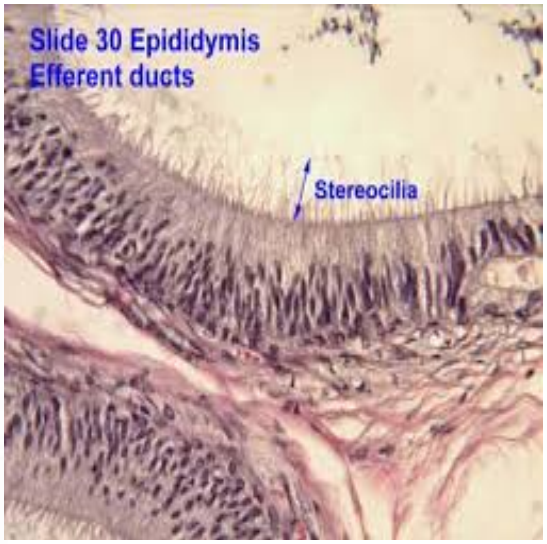
Polarity : adaptation by modification

Apical modifications

- Cilia
- Microvilli
- Stereocilia

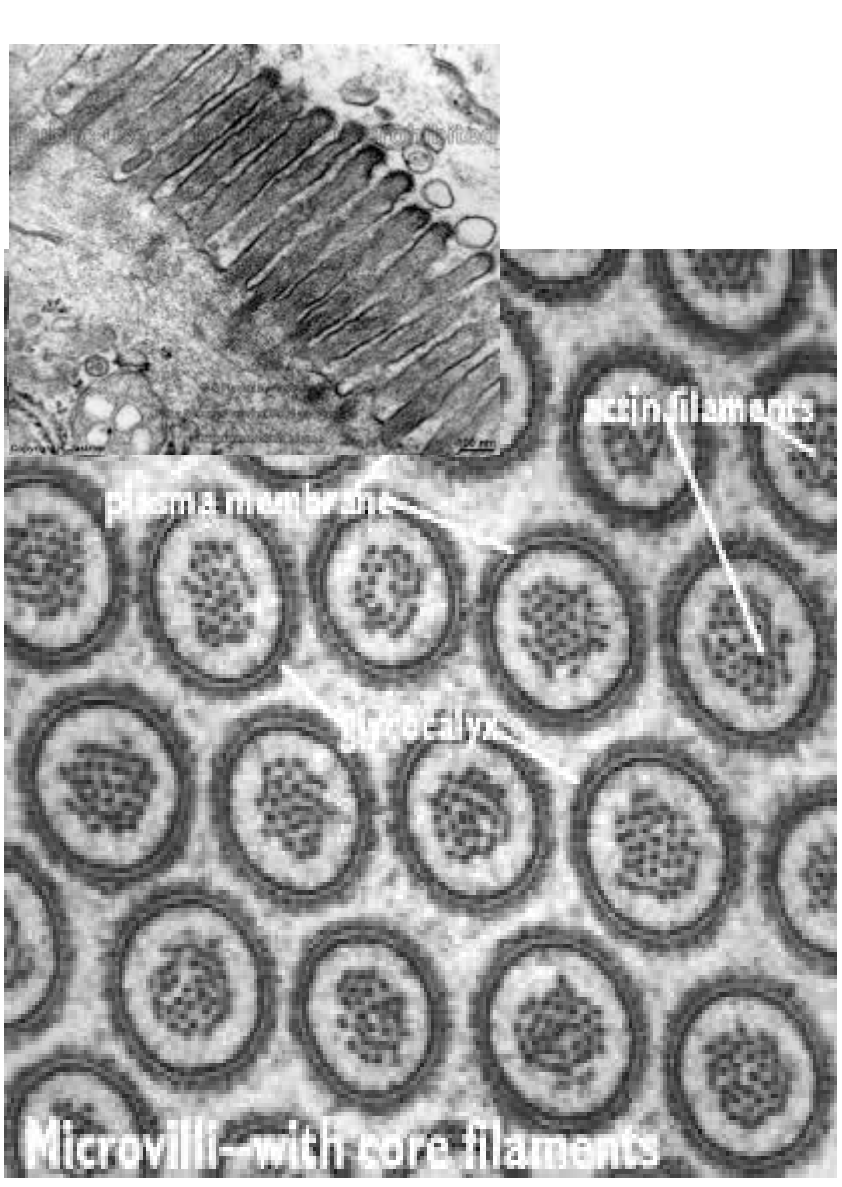


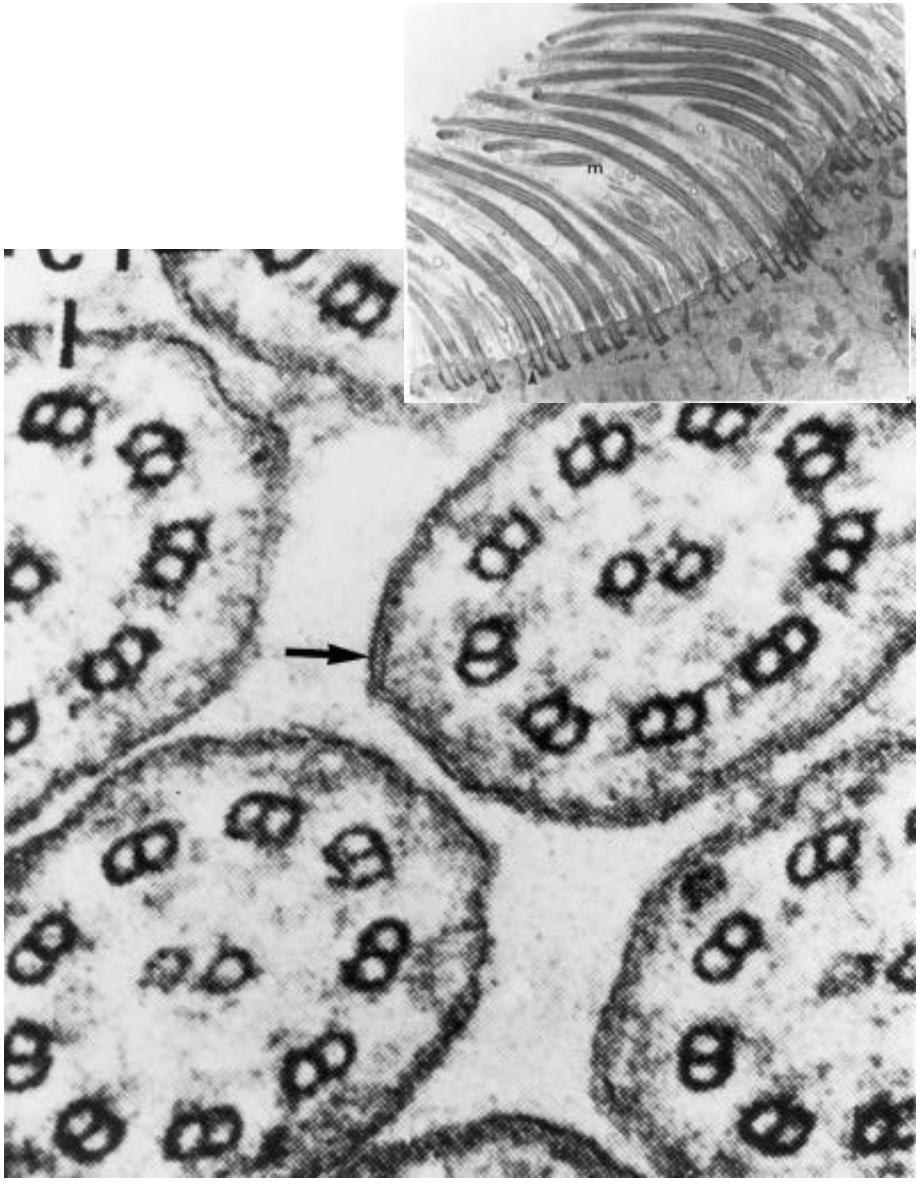




	Cilia	Microvilli
Function	• movement	• Increase area for absorption
site	• Respiratory system	• -Kidney -intestinal

Apical modifications





Do not pay attention

	Microvilli	Stereocilia	Cilia (kinocilia)
1.	Superficial evaginations of cells	Superficial evaginations of cells	Cell surface prolongations which develop from inside the cell
2.	Glycocalyx present	Glycocalyx present	Glycocalyx inconspicuous
3.	Length 0.6-2.0 μm; thickness - 0.1 μm	Length - 2-15 μm; thickness-upto 0.25 μm	Length 2-150μm; thickness - about 0.5 μm
4.	Cylindrical in outline	Elongated, wavy and tapering structures	Thread-like structures with tapering ends
5.	Supported internally by actin filaments	Supported internally by actin filaments	Supported internally by microtubules
6.	Basal granule absent	Basal granule absent	Basal granule present
7.	Interconnections absent	Adjacent stereocilia often develop interconnections	Interconnections rare
8.	Not vibratile	Not vibratile	Vibratile
9.	Take part in absorption of materials	Sensory transductors absorptive in function	Take part in material movement


Thank
You