INTEGRATED EPITHELIUM

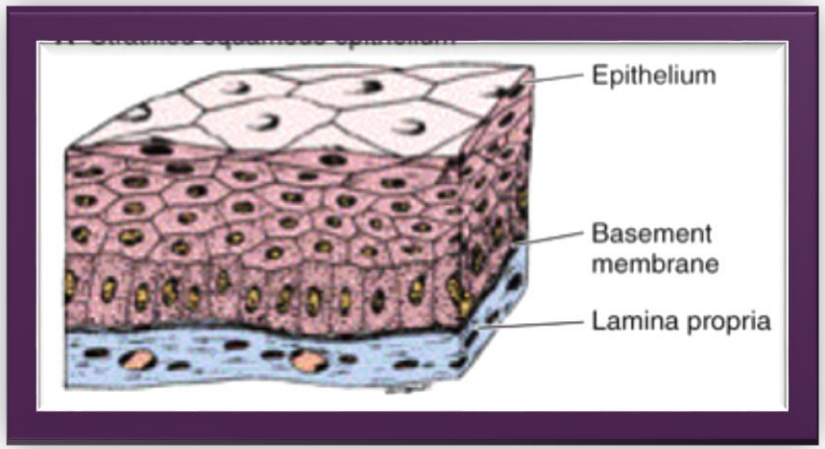
Objectives:

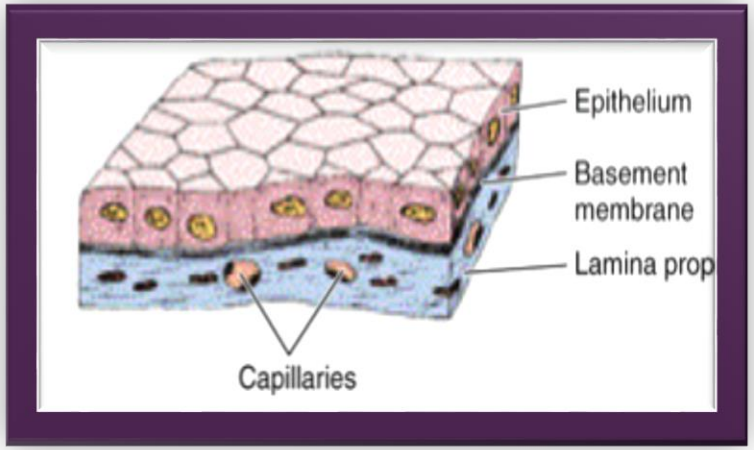
- general characteristics of epithelial tissue.
- General characteristics of epithelial tissue
- Simple epithelial tissue types
- Simple epithelial function
- Classification of Stratified epithelium .
- Classify glandular epithelium according to different parameters.

1-Epithelial tissue

- General characteristics:

- Tightly joined cells with little intracellular space
- Avascular
- Rest on a basement membrane
- High power of regeneration





Epithelial tissue

-Classification :

1) Epithelial membranes

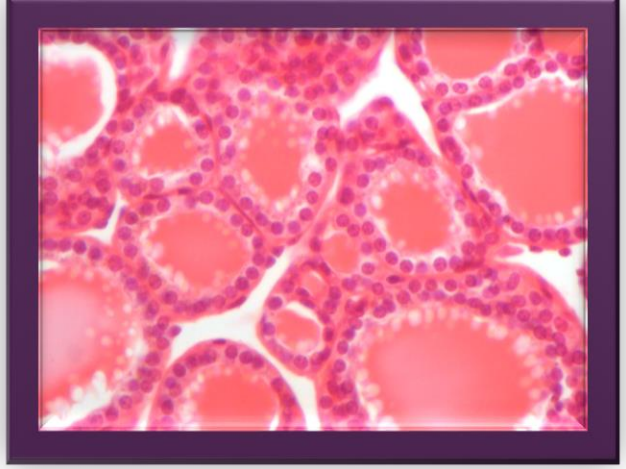
- Simple epithelium
  - One layer
- Stratified epithelium
  - More than one layer

2) Glands(Glandular epithelium)

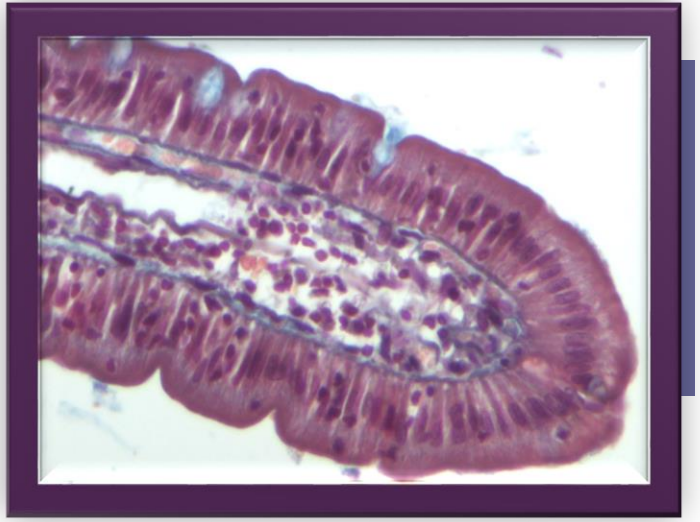
Simple Epithelium

	Definition	Types	Examples
1-Simple squamous epithelium	One layer of flat cells with flat nuclei. Provides smooth thin surface.	_____	• Endothelium (lining the CVS) . • Alveoli of lung.
2- Simple cuboidal epithelium	One layer of cuboidal cells with central rounded nuclei.	_____	Thyroid follicles.
3- Simple columnar epithelium	One layer of columnar cells with basal over nuclei.	• Ciliated (with cilia on the surface) • Non-ciliated (lacks cilia on surface)	• Fallopian tissue (ciliated) • Lining of stomach ,gall bladder, intestines, Goblet cells.(non-ciliated)
4-Pesudo-stratified columnar	One layer of columnar cells, some are tall, others are short that can't make to surface , all cells rest on basement membrane. Nuclei appear at different levels.	• Ciliated with goblet cells • Non-ciliated	• Trachea and bronchi (ciliated) • Vas deferens (non-ciliated)

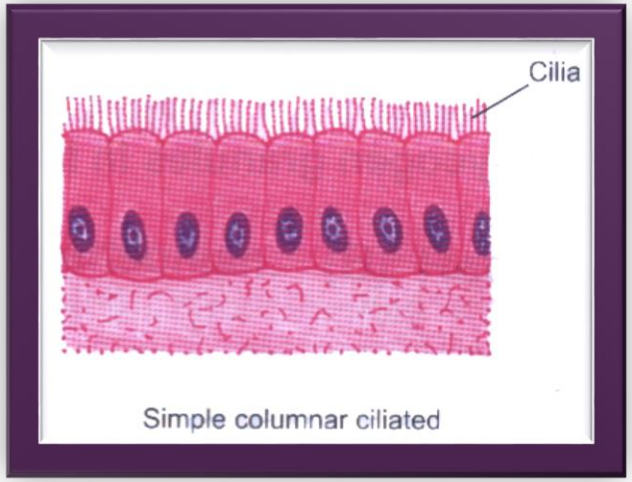
Simple squamous



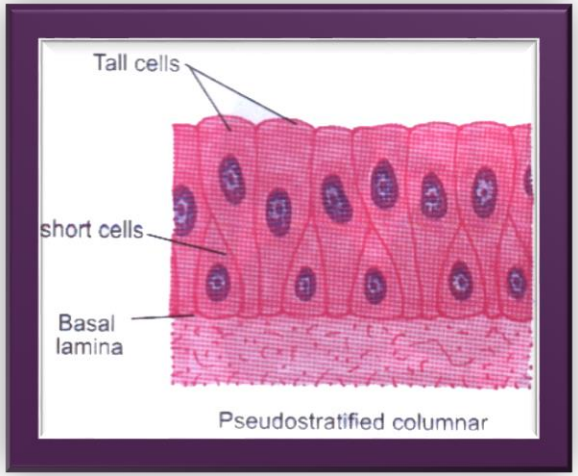
Simple cuboidal



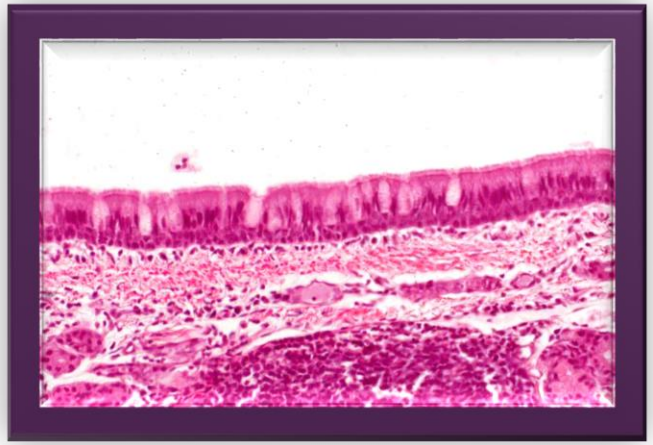
Simple columnar



Simple columnar (ciliated)

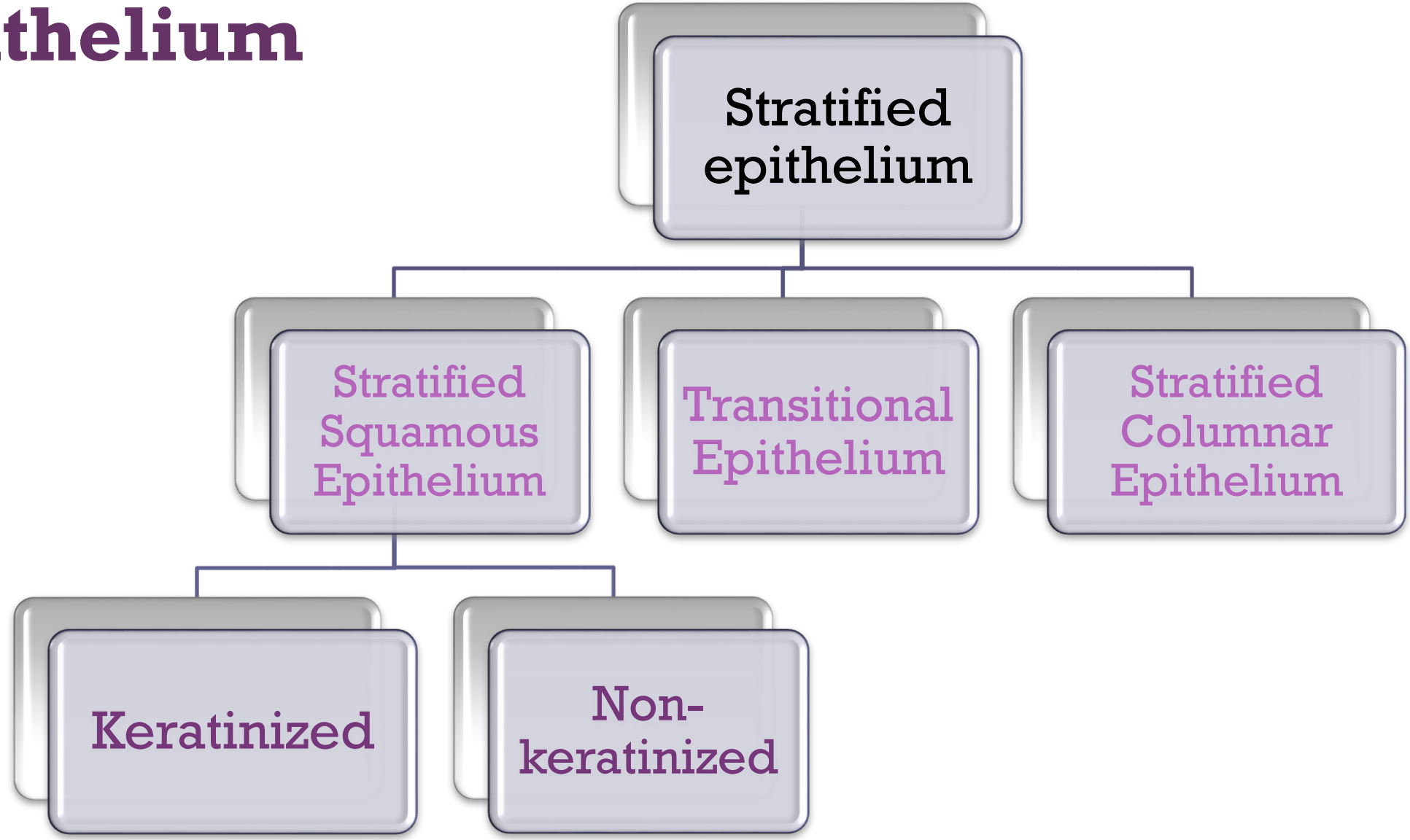


Pseudo-stratified columnar



Pseudo-stratified columnar (ciliated)

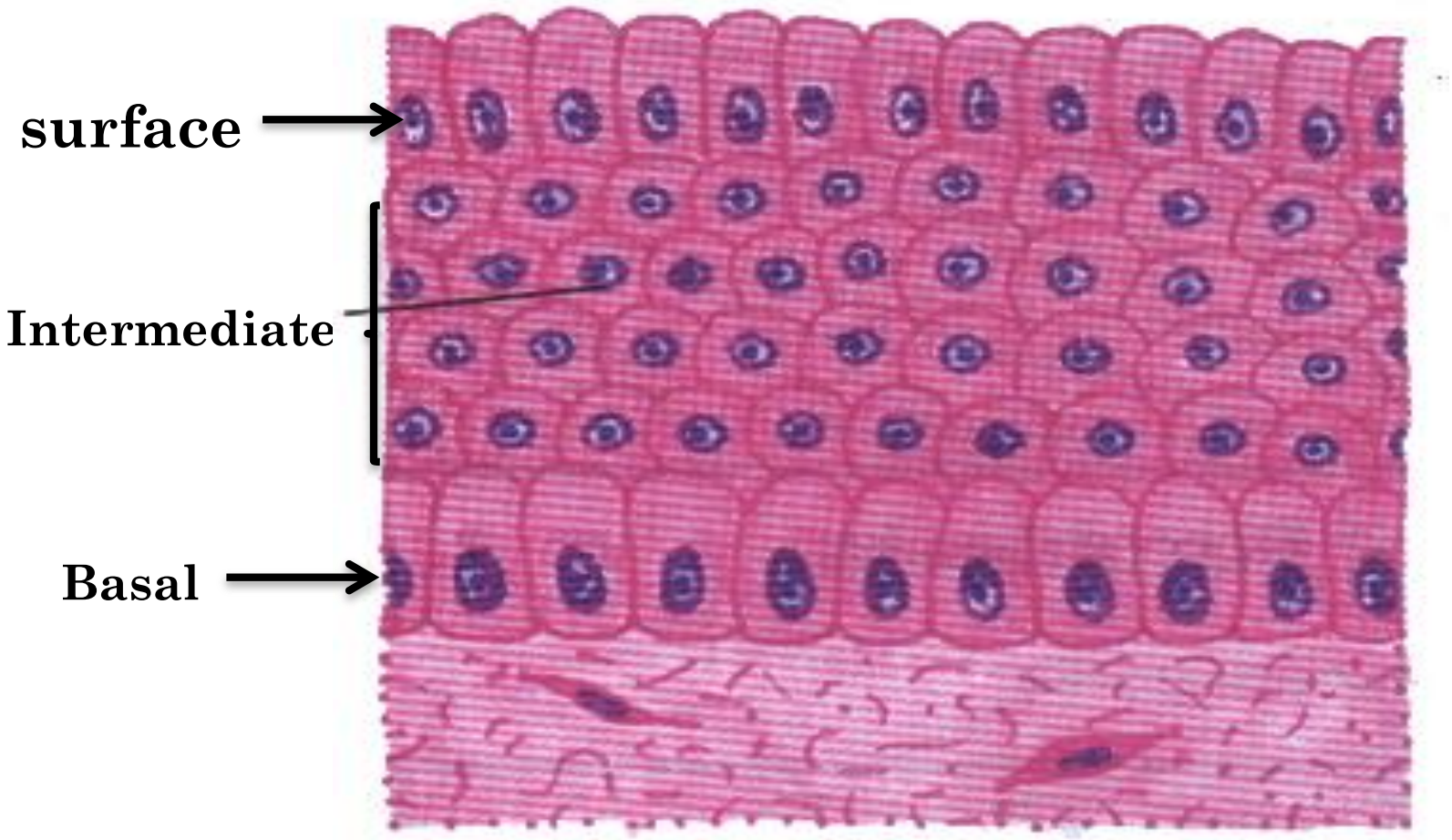
2-Stratified epithelium



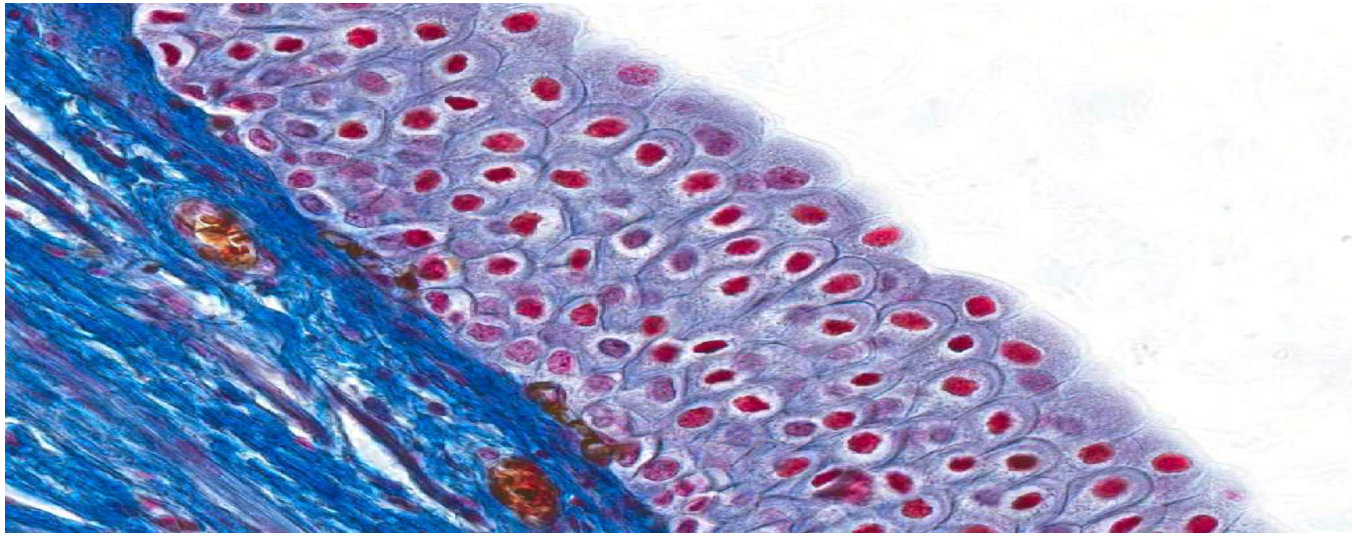
Structure : Multiple layers of cells

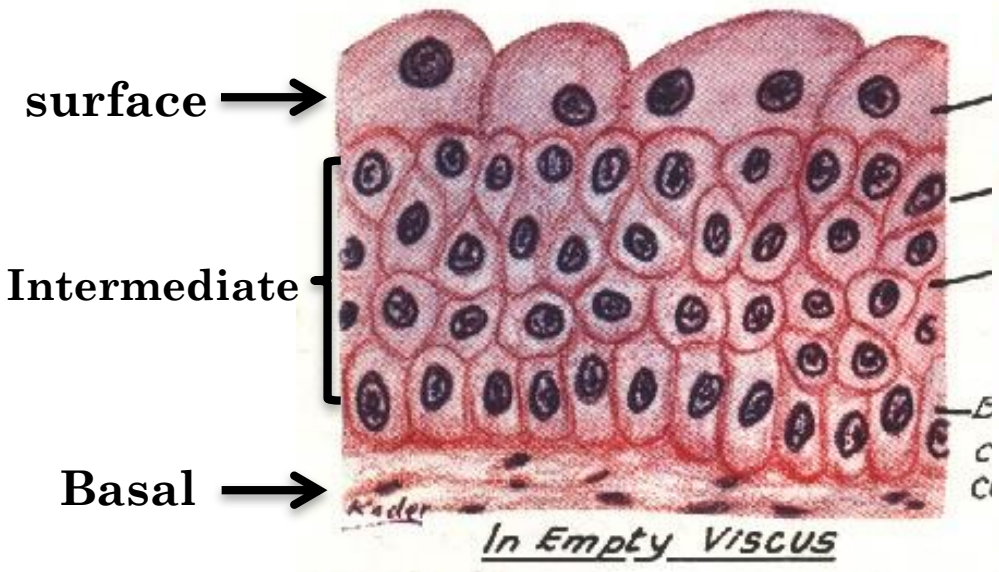
Type / layer	Stratified Squamous Epithelium	Transitional Epithelium	Stratified Columnar Epithelium
Basal	columnar with basal oval nuclei.		
Intermediate	Intermediate cells are polygonal with central rounded nuclei.		
Surface	cells are flat with flattened nuclei.	cells large cuboidal with convex free surface and may be binucleated. Example of sites: Urinary bladder.	cells are columnar. Example of sites: large ducts of glands.

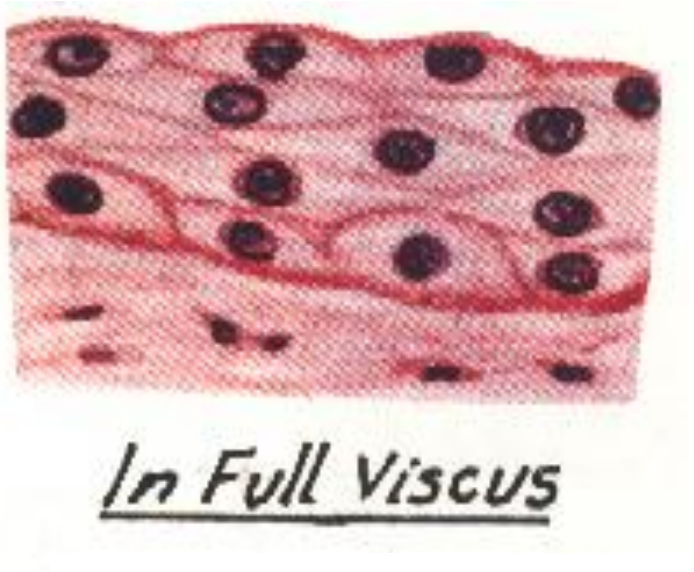
Stratified Columnar Epithelium



Transitional Epithelium







Stratified Squamous Epithelium

Keratinized

with a layer of keratin on the surface.

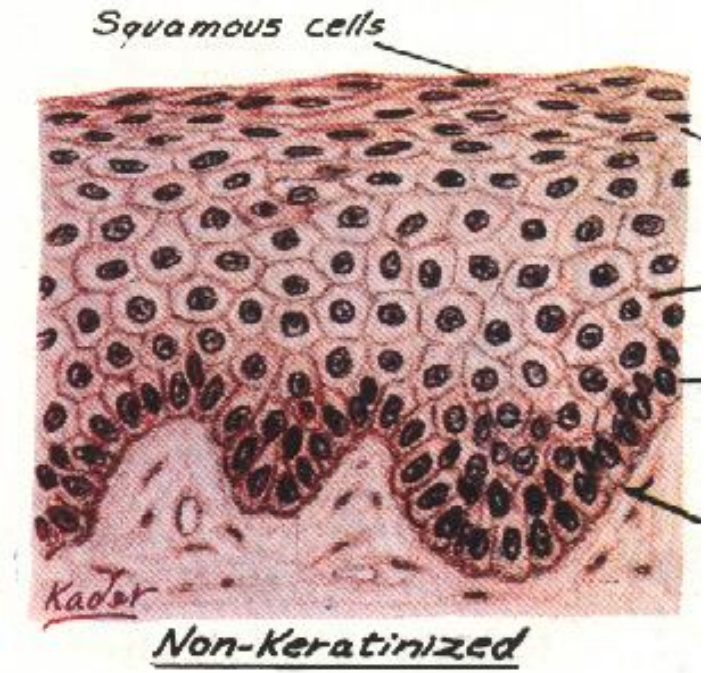
epidermis of skin

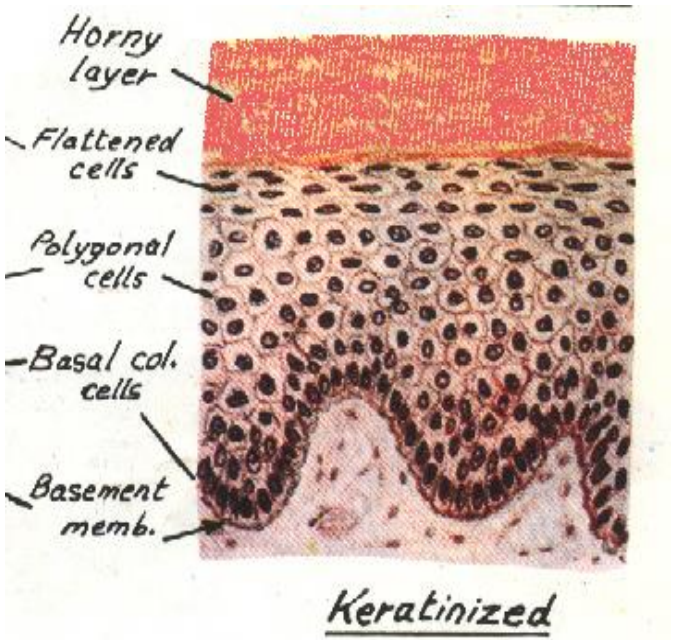
Non-keratinized

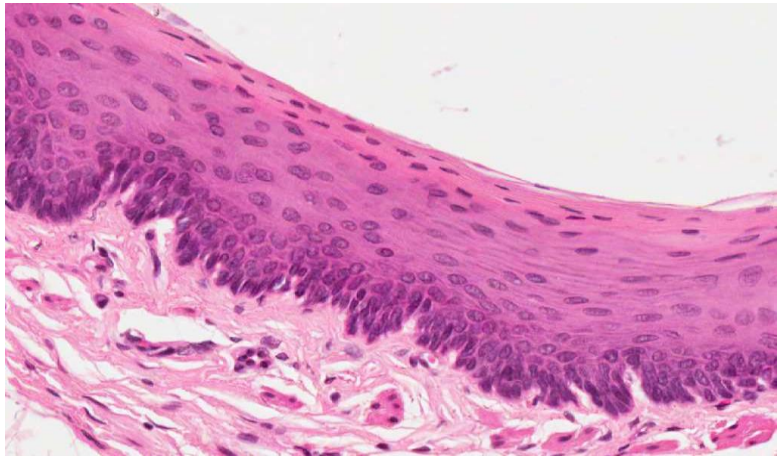
without a layer of keratin on the surface.

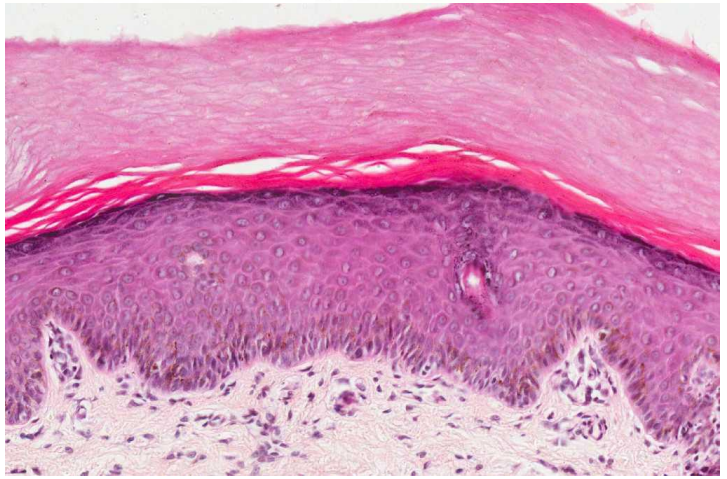
esophagus

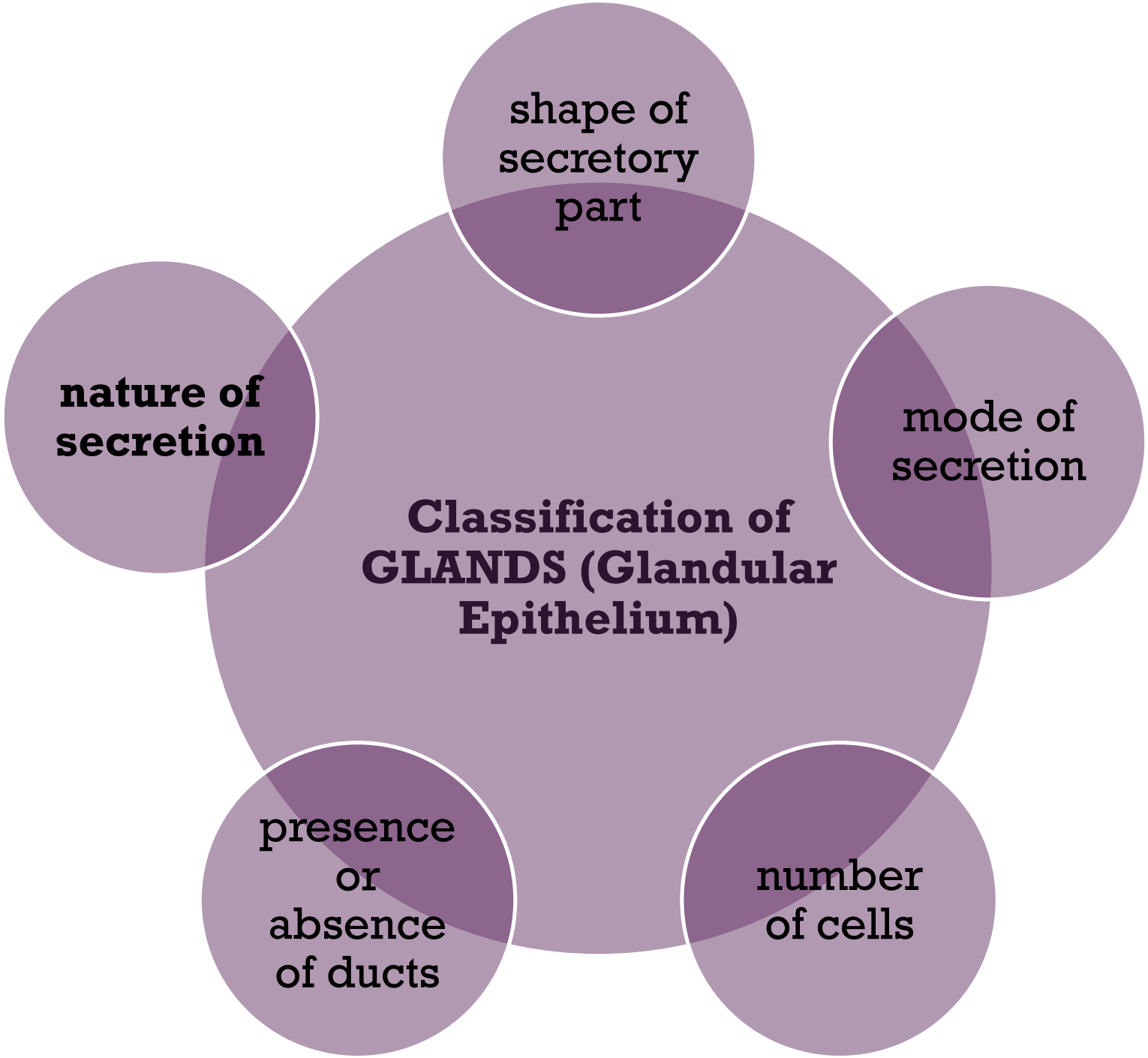
Keratin is a large of dead tissue made to protect some parts of our skin .





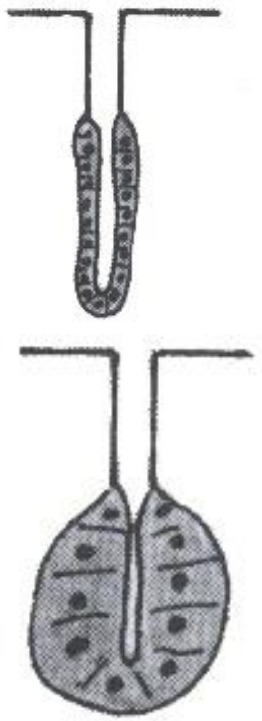





shape of secretory part
nature of secretion
mode of secretion
Classification of GLANDS (Glandular Epithelium)
presence or absence of ducts
number of cells

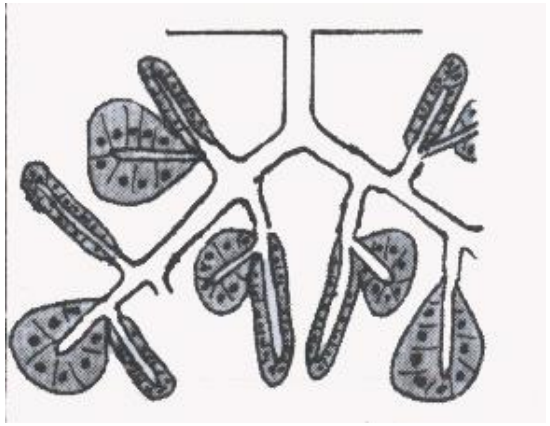
shape of secretory part:

1. Tubular: intestinal gland.



2. Alveolar (acinar) : mammary gland.

3. Tubulo-alveolar: e.g. pancreas.



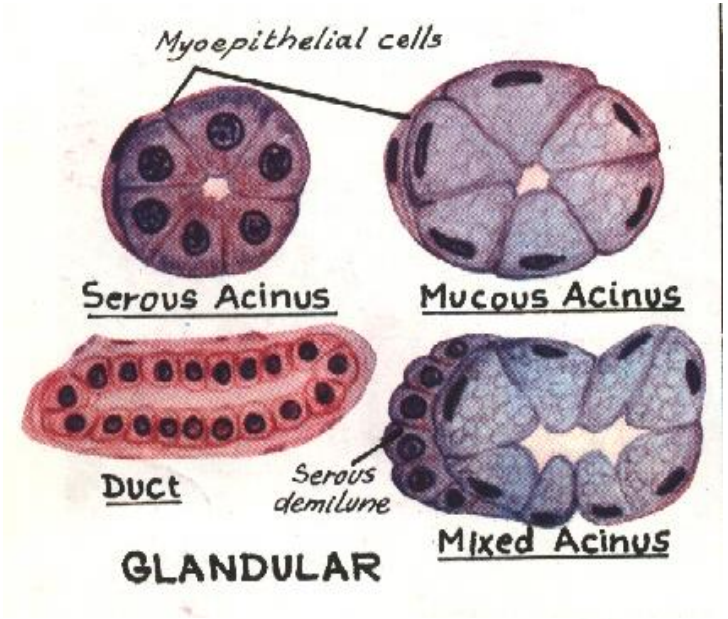
Nature of secretion:

a. Serous : parotid gland

b. Mucous : goblet cells.

c. Muco-serous : sublingual gland.

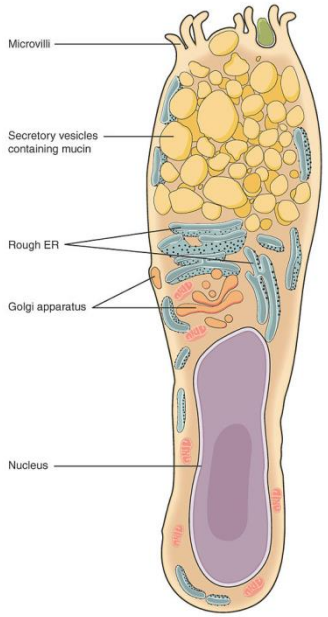
d. Watery: e.g. sweat gland.



Number of cells:

a.Unicellular: e.g. goblet cells.

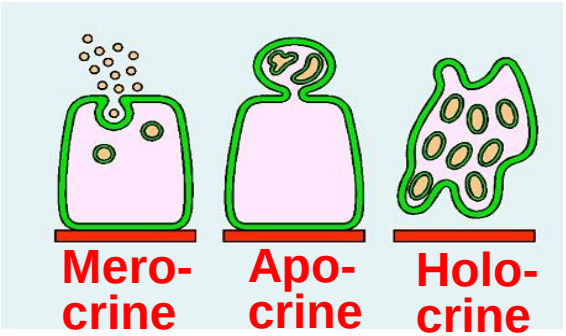
b.Multicellular: e.g. salivary glands.

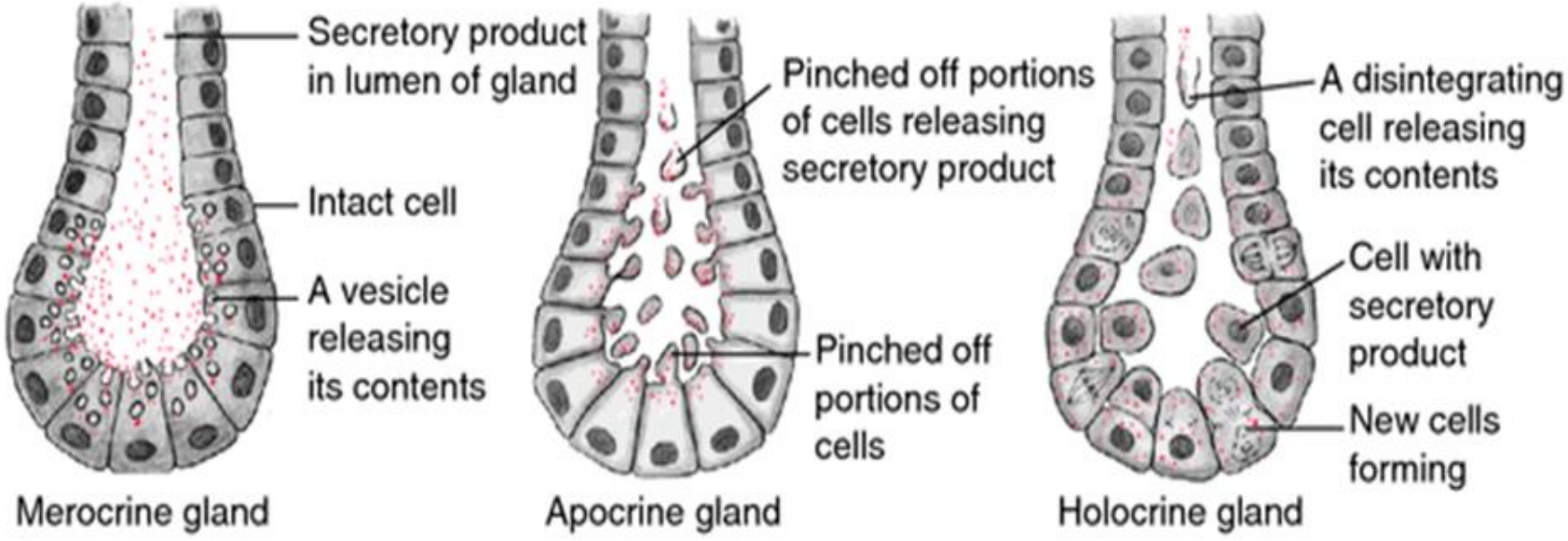


goblet cell

Mode of secretion:

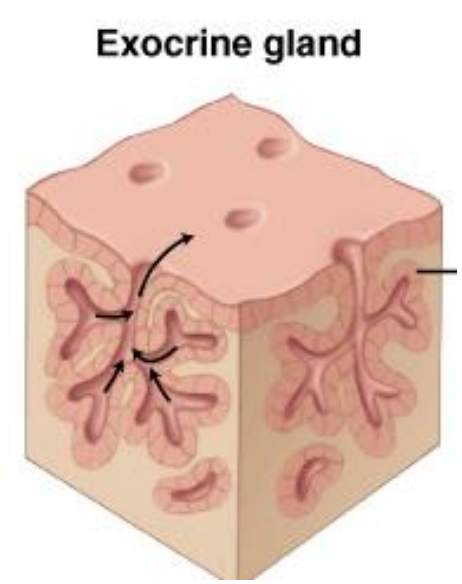
1. **Merocrine**: Nothing is lost (salivary glands).
2. **Apocrine**: Top is lost (mammary gland).
3. **Holocrine**: The whole cell (detaches sebaceous) glands.



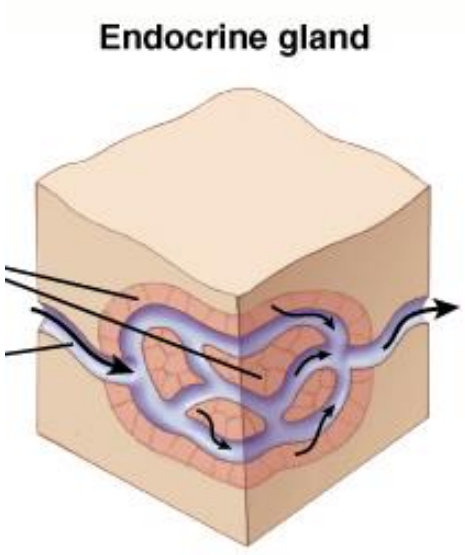


presence or absence of ducts :

1. **Exocrine**: e.g. salivary glands.



1. **Endocrine**: e.g. thyroid gland.



2. **Mixed**: e.g. pancreas.

Function of Epithelium

1- Protection → As in Epidermis of skin

2-Secrtion → As in Glands

3-Absoorption → As in Small intestine

4-Excretion → As in Kidney

5- Reproduction → As in Gonads

6-Smooth lining → As in Blood Vessels

Clinical Applications

1-immotile cilia syndrome

- It causes infertility in male only
- And chronic respiratory tract infection in male and female

What are the causes ?

- It is caused by immobility of cilia and flagella induced by deficiency of dynein
- dynein protein is responsible for movements of cilia and flagella

2-Metaplasia

- It is the transformation of one type of tissue to another. **Why?** response to injury .
- "This condition is usually reversible if the injury is removed"
- **Example:** pseudo stratified ciliated columnar epithelium of the respiratory passages. e.g. trachea, of heavy smokers may undergo squamous metaplasia, transforming into stratified squamous epithelium.

Extra Links

Videos:

- epithelial tissues song

https://www.youtube.com/watch?v=a8tYjxQkKhE

- Crashcourse fast forward to 1:30

https://www.youtube.com/watch?v=lUe_RI_m-Vg

Quiz:

https://www.onlineexambuilder.com/histology-2nd-lecture/exam-36621

Today I will do what others won't so tomorrow I can do what others can't

Credit

TEAM MEMBERS:

- Noura AlTawil
- Shadn Alomran
- Shahad Albeshr
- Sadeem Alqahtani
- Nouf Alabdulkarim
- Muneerah AlOmari
- Hanan Alabdullah
- Ghadah Alqasimi
- Adnan Alkhaldi
- Mohammed Amarshoud
- Abdulkarim Alharbi
- Khalid Alghsoon
- Anas Ali
- Abdullad Alshathry

TEAM LEADERS:

- Areeb AlOkaiel
- Hazim Bajri

Thanks for checking our work,
Good luck.

-Team histology.

HISTOLOGY
435