Epithelial tissue

Red: important.
Black: in male|female slides.
Gray: notes|extra.

Editing File

Revised by
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➢ OBJECTIVES

- Describe general characteristics of epithelial tissue.
- Discuss microscopic structure and distribution of different types of epithelial membranes.
- Classify glandular epithelium according to different parameters.
- Enumerate the functions of epithelial tissue.
- Understand the following clinical applications:
  - Immotile cilia syndrome (Kartagener's syndrome).
  - Metaplasia.

➢ EPITHELIAL TISSUE

General characteristics:

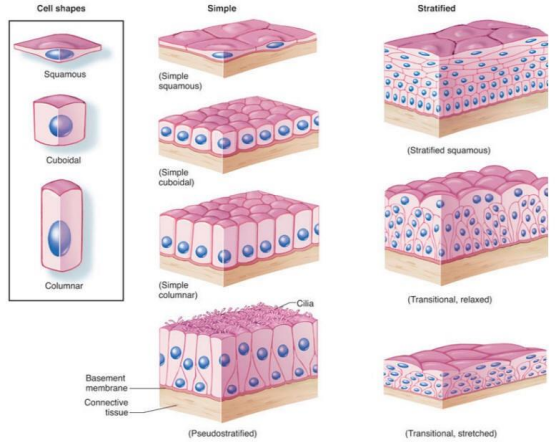
- Cells are tightly joined with little intercellular space.
- Rest on a basement membrane.
- Avascular. "lack of blood vessels"
- High power of regeneration.

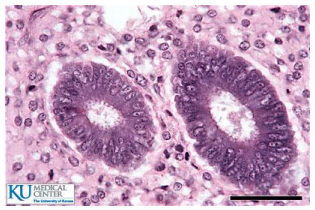
Classification:

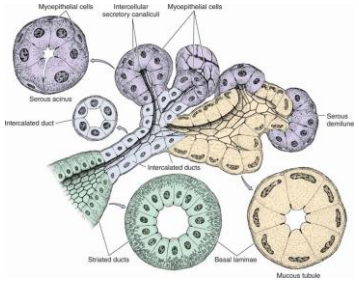
1. Epithelial membranes:
   - Simple epithelium: one layer.
   - Stratified epithelium: more than one layer.
2. Glands (Glandular Epithelium).

Functions :

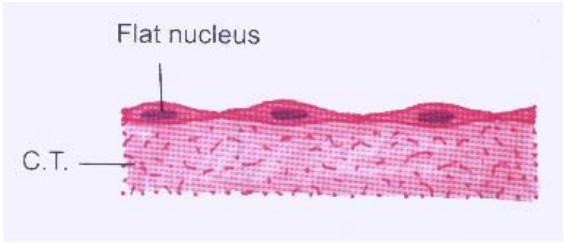
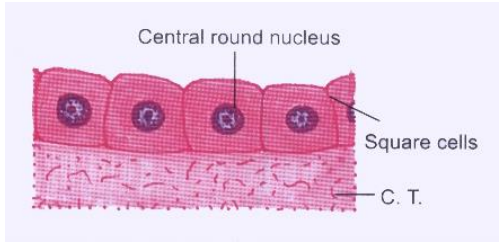
- Protection as in epidermis of skin.
- Secretion as in glands.
- Absorption as in small intestine.
- Excretion as in kidney.
- Reproduction as in gonads.
- Smooth lining as in blood vessels.



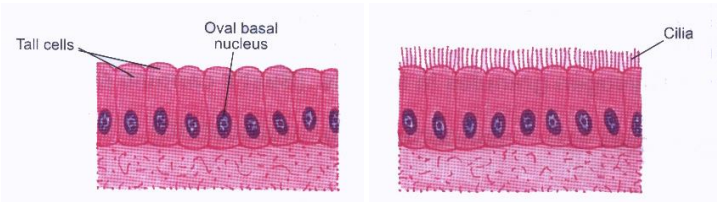
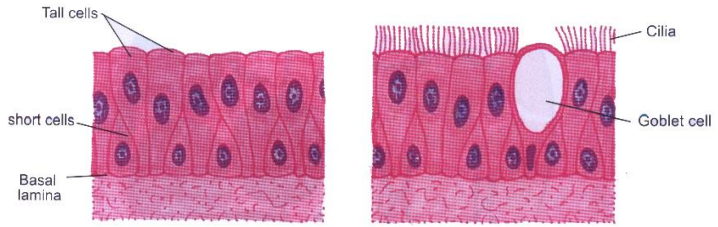




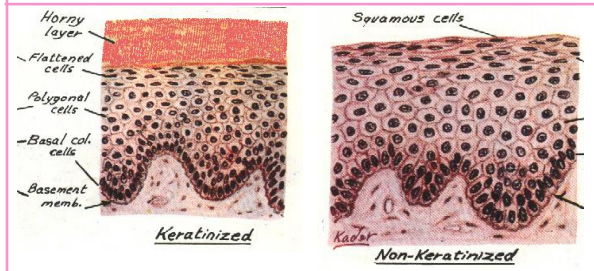
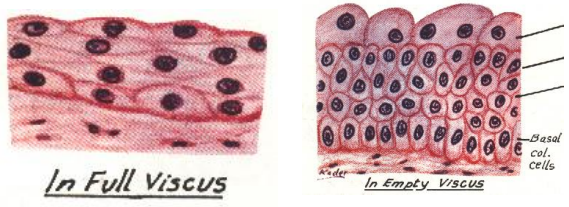
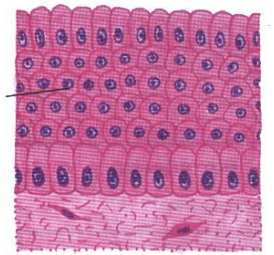
➢ SIMPLE EPITHELIUM

1) Simple Squamous Epithelium	2) Simple cuboidal Epithelium
• One layer of flat cells • Flat nuclei • Provides smooth thin surface	• One layer of cuboidal cells • Central rounded nuclei
Examples: • Endothelium (lining the CVS "cardiovascular system") • Alveoli "air sacs" of lung	**Example:** • Thyroid follicles
	

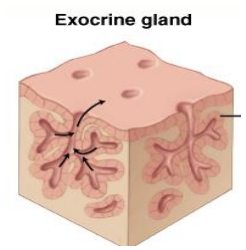
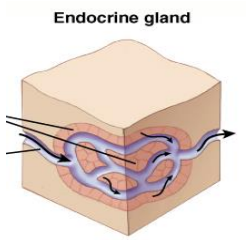
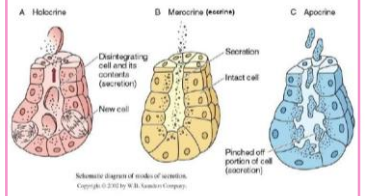
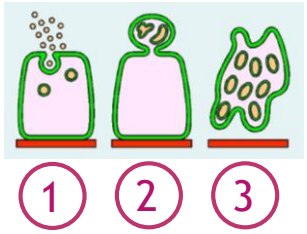
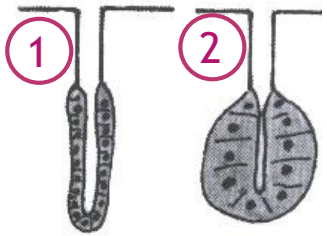
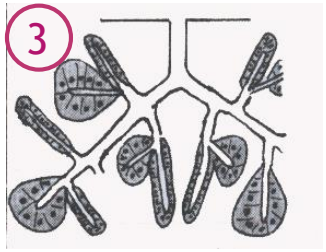
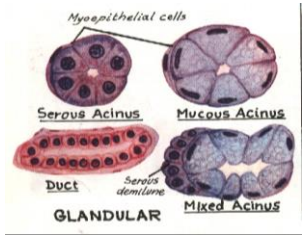
➢ SIMPLE EPITHELIUM

3) Simple Columnar Epithelium	4) Pseudo-Stratified Columnar
• One layer of columnar cells • Basal oval nuclei • **Types:** 1. ciliated "with cilia on free surface" 2. Non-ciliated	• One layer of columnar cells • Nuclei appear at different levels • Some cells are tall, others are short and don't reach the surface • All cells rest on the basement membrane • **Types:** 1. ciliated "with Goblet cells" 2. Non-ciliated
Examples: • Ciliated: Fallopian tubes • Non-ciliated: lining of stomach, gall bladder, and intestines (with goblet cells).	**Examples:** • Ciliated: (respiratory epithelium) trachea & bronchi • Non-ciliated: vas deferens
	

➢ STRATIFIED EPITHELIUM

1) Stratified Squamous Epithelium	2) Transitional Epithelium	3) Stratified Columnar Epithelium
• Multiple layers of cells • **Basal cells** are columnar with basal oval nuclei • **Intermediate cells** are polygonal with central rounded nuclei. • **Surface cells** are flat with flattened nuclei. • **Types:** 1. Keratinized "with a layer of keratin on the surface" 2. Non-keratinized	• Multiple layers of cells • **Basal cells** are columnar • **Intermediate cells** are polygonal. • **Surface cells** large cuboidal with convex free surface and may be binucleated.	• Multiple layers of cells. • **Basal cells** are columnar • **Intermediate cells** are polygonal • **Surface cells** are columnar
Examples: • Keratinized: epiderms of skin • Non-Keratinized: oesophagus	**Examples:** • Urinary bladder.	**Examples:** • large ducts of glands.
	 	

➢ GLANDS (GLANDULAR EPITHELIUM) classification according to :

Presence or absence of ducts	Number of cells	Mode of secretion	Shape of secretory part	Nature of secretion
Exocrine: e.g. salivary glands **Endocrine:** e.g. thyroid gland. **Mixed:** e.g. pancreas.  	**Unicellular:** e.g. goblet cells. **Multicellular:** e.g. salivary glands. 	**1) Merocrine:** No part of the cell is lost with the secretion, e.g. salivary glands. **2) Apocrine:** The top of the cell is lost with the secretion, e.g. mammary gland **3) Holocrine:** The whole cell detaches with the secretion, e.g. sebaceous glands 	**1) Tubular:** e.g. intestinal gland **2) Alveolar (acinar):** e.g. mammary gland **3) Tubulo-alveolar:** e.g. pancreas.  	**Serous:** e.g. parotid gland **Mucous:** e.g. goblet cells **Muco-serous:** e.g. sublingual gland **Watery:** e.g. sweat gland 

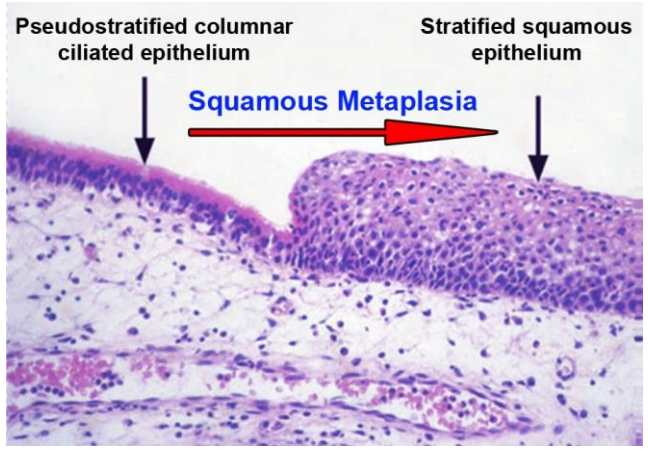
➢ CLINICAL APPLICATION

IMMOTILE CILIA SYNDROME (KARTEGENER'S SYNDROME):

- Disorder that causes infertility in male and chronic respiratory tract infection in both sexes.
- It is caused by immobility of cilia and flagella induced by deficiency of dynein.
- Dynein protein is responsible for movements of cilia and flagella

METAPLASIA

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



➢ QUESTIONS:

Q1: Urinary bladder is example of?

A) pseudo-stratified columnar B) transitional epithelium C) simple cuboidal epithelium D) stratified columnar epithelium

Q2: All epithelial tissue rest on?

A) Lamina B) Nuclei C) basement membrane D) basal cell

Q3: What differences between nuclei of simple squamous epithelium & simple cuboidal epithelium?

A) simple squamous epithelium: flat nuclei
simple cuboidal epithelium: basal oval nuclei

B) simple squamous epithelium: basal oval nuclei
simple cuboidal epithelium: central rounded nuclei

C) simple squamous epithelium: central rounded nuclei
simple cuboidal epithelium: flat nuclei

D) simple squamous epithelium: flat nuclei
simple cuboidal epithelium: central rounded nuclei

Q4: If the injury is removed, metaplasia is usually?

A) Reversible B) irreversible C) chronic D) acute

Q5: What function of Dynein protein?

A) protection the cilia & flagella B) growth of cilia C) movements of cilia and flagella D) movement of cilia only

Q6: Kartegener's syndrome causes chronic respiratory tract infection in?

A) children B) males C) females D) both sexes

1- B
2- C
3- D
4- A
5- C
6- D

HISTOLOGY TEAM 437

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وتحمّلوا شقاء اليوم لأجل حلم الغد "

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