

TISSUES I

I. CLASSIFICATION OF TISSUES

- A. **Histology**: microscopic study of tissues
- B. **4 kinds**: **Epithelia, connective, muscle, and nervous**

II. EPITHELIA

A. **Characteristics of Epithelia**: covers body/organ surfaces, lines body cavities and forms glands

- 1. very cellular
- 2. has a free surface (apical surface)
- 3. bound to underlying tissue by a **basement membrane**
- 4. avascular: don't have blood vessels

B. Classification

1. Classified by **LAYERS**:

- a. **Simple Epithelium** – one layer thick
- b. **Stratified Epi.** – many layers thick

2. Classified by cell **SHAPE**:

- a. **Squamous** – flattened cells
- b. **Cuboidal** – cube-shaped cells (height and width are equal)
- c. **Columnar** – rectangular-shaped cells (cell is taller than it is wide)

III. TYPES OF SIMPLE EPITHELIA

A. Simple Squamous Epithelium

- 1. One layer of flattened cells
- 2. Location: lines lumen (cavity) of blood vessels, tiny air sacs of lungs, covers organs, and lines body cavities
- 3. Function: rapid diffusion and filtration

B. Simple Cuboidal Epithelium

- 1. One layer of cube-shaped cells

2. Location: lines ducts and tubules (e.g., salivary glands and kidneys)

3. Function: secretion and absorption

C. Simple Columnar Epithelium

1. One layer of tall, rectangular-shaped cells. May have microvilli, goblet cells, or cilia.

2. Location: lines most of GI (gastrointestinal tract)

3. Function: secretion and absorption

D. Pseudostratified Columnar Epithelium

1. One layer of columnar or irregularly shaped (tall and short) cells. Some kinds have cilia (pseudostratified CILIATED columnar epithelium) and goblet cells

2. Location: lines trachea and bronchi

3. Function: protection and secretion (secretion here is about mucus)

IV. TYPES OF STRATIFIED EPITHELIA

A. Stratified Squamous Epithelium: Upper layers of cells are flattened, lower layers appear cuboidal. Deepest layers highly mitotic. Two kinds:

1. Keratinized: contains **keratin**, superficial layers consist of dead cells

a. Location: epidermis

b. Function: protection

2. Nonkeratinized: superficial cells are alive and kept moist

a. Location: oral cavity, pharynx, vagina, and the lower part of the anal canal

b. Function: protection

B. Transitional Epithelium: some cells are **binucleated**. Surface cells may be dome-shaped or flattened.

a. Location: found in most of the urinary tract

b. Function: withstands distention (stretching) and relaxing

V. GLANDULAR EPITHELIA: Specialized epithelial tissues that have excretory functions

A. Exocrine Glands formed from epithelial tissues - they secrete their materials onto a free surface

1. Unicellular: Goblet cells.

a. Location: respiratory and digestive systems

b. Function: secretes mucus

2. Multicellular: secrete materials through a **duct** to a free surface

a. merocrine glands: secretes a watery fluid through the cell membrane. Example-salivary glands

b. apocrine glands: top part of the cell is pinched off, it becomes the secretion. Example - mammary glands

c. holocrine glands: entire cell is released and it ruptures and dies. Example- sebaceous (oil) glands

Which of the following epithelial tissues allows for rapid filtration and diffusion?