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THE BODY TISSUES

1- Epithelial tissue.
2- Connective tissue.
3- Muscular tissue.
4- Nervous tissue.
Epithelial tissue.
General characters:

- Epithelium is subjected to continuous degeneration and regeneration.
- It is formed of closely aggregated cells with little intercellular substance.
- The epithelial cells rest on and are tightly adherent to a thin membrane (basement membrane) which separates them from the underlying connective tissue.
- No blood vessels enter between the cells but nerves ramify between them.
Type of Epithelium:

- Pseudostratified ciliated columnar
- Stratified squamous
- Simple cuboidal
- Simple squamous
- Stratified columnar
- Simple columnar

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Epithelial tissue.

• Classification:
• Epithelium is classified
  1- Covering Epithelium
  2- Glandular epithelium
  3- Neuroepithelium
(1) COVERING EPITHELIUM

- It is one type of the epithelial tissue which covers the body surface from outside and lines its cavities from inside.
- It can be classified according to the number of cell layers into:

(A) Simple epithelium:
- Formed of one layer of cells lying on the basement membrane.
- Subclassified according to the shape of the cells into 4 subtypes:
  1. Simple squamous epithelium.
  2. Simple cubical epithelium.
  4. Pseudostratified columnar epithelium.

(B) Stratified epithelium:
- Formed of many layers of cells, the first lie on the basement membrane.
- Subclassified according to the shape of the top layer into 3 subtypes:
  1. Stratified squamous epithelium. (Top squamous cells).
  2. Transitional epithelium. (Top cuboidal cells).
  3. Stratified columnar epithelium. (Top columnar cells).
(1) Simple squamous epithelium
(1) Simple squamous epithelium
(2) Simple cubical epithelium
(2) Simple cubical epithelium
(3) Simple columnar epithelium:

- This type can be further subclassified into:
  A- Non-modified simple columnar epithelium
- Consists of a single layer of tall cells (like columns) with basal oval nuclei. E.g., the lining of large ducts of glands.
• **B- Modified simple columnar epithelium:**
  
  **1- Simple columnar secretory epithelium:**
  • The epithelial cells acquire secretory function.
  • The cytoplasm is vacuolated due to dissolution of mucin granules.
  • **Example** the lining of the stomach.
2- Simple columnar absorptive epithelium:

- The epithelial cells have the ability for absorption.
- The apical surface of the columnar cells is provided with microvilli (brush border by L/M) to increase its area.
- Example lining epithelium of the intestine.
• **3- Simple columnar ciliated epithelium**:  
  • Cilia project from the free surface of the cells.  
  • Example - fallopian tube  
  • - uterus.
• **4- Pseudostratified columnar epithelium**

  • This type of epithelium is formed of a single layer of cells which were crowded during development.
  
  • As a result of crowding, some cells became short and not reach to surface and squeezed between the bases of the tall ones.
  
  • The nuclei appeared to be arranged in more than one level, so there is a false appearance for this epithelium to be stratified.
  
  • This type of epithelium can be subclassified into:
Pseudostratified columnar non-ciliated epithelium

- The surface of the tall columnar cells are not provided with cilia e.g:
- Lining of large ducts of the glands.
Pseudostratified columnar ciliated epithelium

- Nasal sinuses
- Trachea, bronchi
- Eustachian tube.
Trachea - Mucus Membrane
TYPES OF STRATIFIED EPITHELIUM

(1) Stratified squamous epithelium
- This type is formed of about 30 layers of cells
- The cells are arranged as follows:
  - **Basal layer** * formed of columnar cells with basal oval nuclei.
  - * The cells are tightly adherent to the basement membrane.
  - * Responsible for regeneration of the other cell layers.
  - **Middle layers** * from the main thickness of the epithelium.
  - * formed of polyhedral cells with central rounded nuclei.
  - **Top layer** * formed of squamous cells (flat cells).
- Stratified squamous epithelium is present in two forms:
**Stratified squamous non keratinized epithelium**

- Mouth cavity.
- Esophagus.
- Vagina.
- Anal canal
Stratified squamous keratinized epithelium

- The top layer of cells is covered by layers of horny scales (dried cells filled with keratin)
**Stratified squamous keratinized epithelium**

- It covers the dry body surface i.e. epidermis of skin.
Transitional epithelium

- A type of stratified epithelium formed of about 6-8 layers of cells.
- The cells lie on a thin, ill defined basement membrane (to allow their sliding).
- The cells are arranged as follows:
  - **Basal layer**: formed of low columnar cells with basal oval nuclei.
  - **Middle layers**: formed of polyhedral cells with rounded nuclei.
  - **Superficial two layers**:
    - **the top layer**: formed of large cubical (cuboidal) cells with convex surface and concave base. These cells may be binucleated and are covered by a protective mucous like substance.
    - **the underlying layer**: formed of flask shaped cells lying in the concavity of the top ones.
Transitional epithelium

- **Sites:**
  - Pelvis of kidney.
  - Ureter
  - Urinary bladder.
  - Prostatic urethera
Transitional epithelium is present in two forms:

- *when the viscus is empty*: it has its full thickness

- *when the viscus is full*: gliding the cells over each other takes place and the epithelium become formed of two cells layers:
  - Basal cubical cells.
  - Top flat cells.
Transitional epithelium
Thank You