



جامعة المستقبل
AL MUSTAQBAL UNIVERSITY

**College of Science, Department of biology
Zoology**

Prof. Dr. Raad Abbas Kadhim & Assist lecture. Retaj Aqeel Dawood

Lab 3: Animal tissues

Tissue: are collection of cells and extracellular material that together carry out a specific function.

Animal tissues are classify into four basic types: **Epithelial tissue, Connective tissue, muscular tissue, and Nervous tissue.**

Epithelium tissue

Epithelium tissue is sheets of cells, closed one of each other that cover or line the body surface. The main function is **protective, secretion, absorption and other.** The epithelium cell are resting on non-cellular layer known **basement membrane or basal lamina**

Classification of Epithelium

Epithelial tissues are classified based on the number of layers and the shape of cells.

Three epithelial cells are: **Squamous, Cuboidal and Columnar.**

1-Squamous epithelium 2- Cuboidal epithelium 3- Columnar epithelium

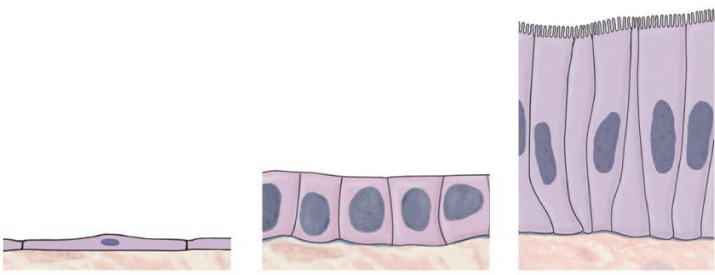
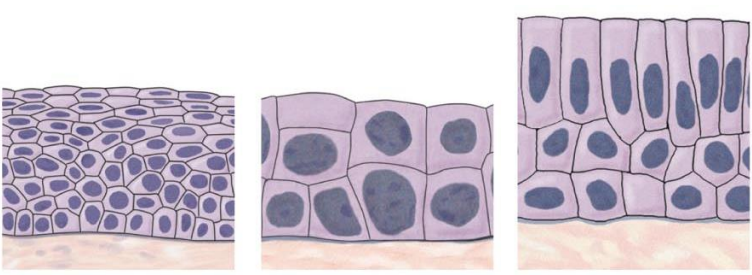
According on number of layers, classified into:

++++
++++
++++

1- Simple epithelium, only one layer of cells.

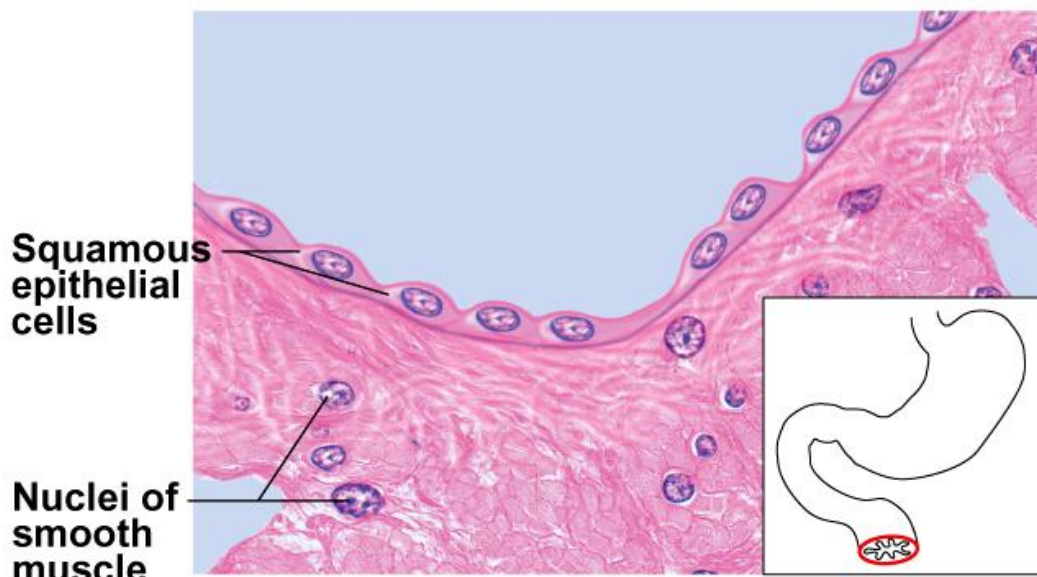
2- Stratified epithelium having two or more layers of cells.

3-Pseudostratified epithelium this epithelium appear as more than one layer of cells, but in fact this is a true simple epithelium since all the cells rest on the basal lamina. The nucleus of these cells at different levels, thus appear as stratified.

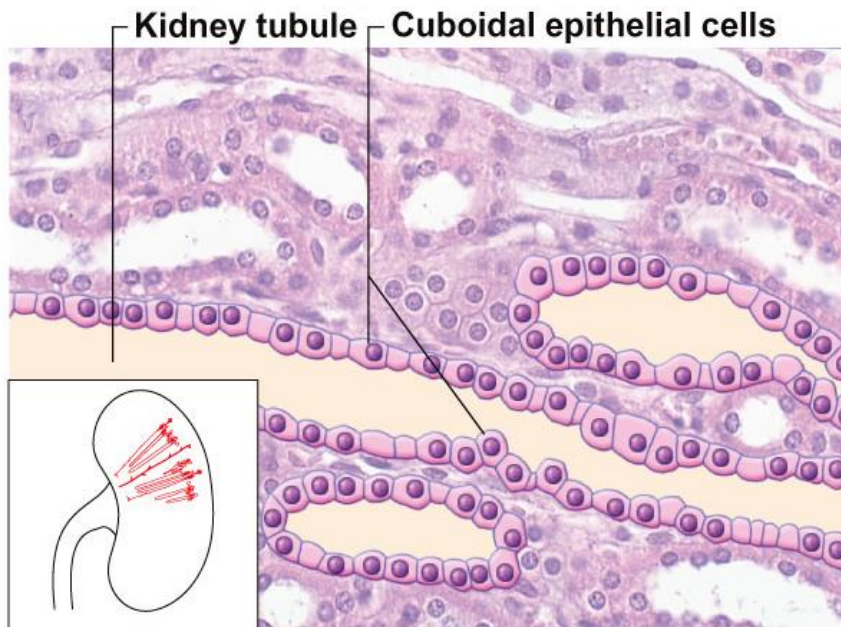
<p>1. Simple epithelium</p>	<ul style="list-style-type: none"> - contains one layer of cells - named by shape of cells
 <p style="text-align: center;">Squamous Cuboidal Columnar</p>	
<p>2. Stratified epithelium</p>	<ul style="list-style-type: none"> - contains more than one layer - named by shape of apical cells
 <p style="text-align: center;">Squamous Cuboidal Columnar</p>	

Simple epithelium

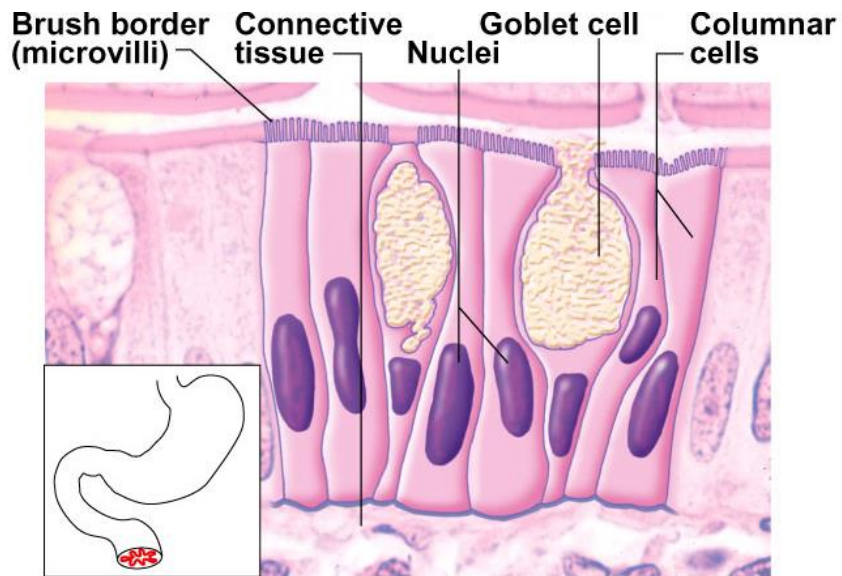
<p style="text-align: center;">Simple Squamous Epithelium tissue</p>	
Structure	Single row of flat cells (scaly)
Functions	Allows rapid diffusion of substances; secretes serous fluid
Locations	in alveoli, glomerular capsule , endothelium (blood vessels and heart), and serosa (external surface) such as stomach & intestines



Simple Cuboidal Epithelium tissue	
Structure	Single row of cube-shaped cells, often with microvilli
Functions	Absorption & secretion; produces mucus
Locations	Liver, thyroid, mammary, salivary and other glands, bronchioles, and most kidney tubules

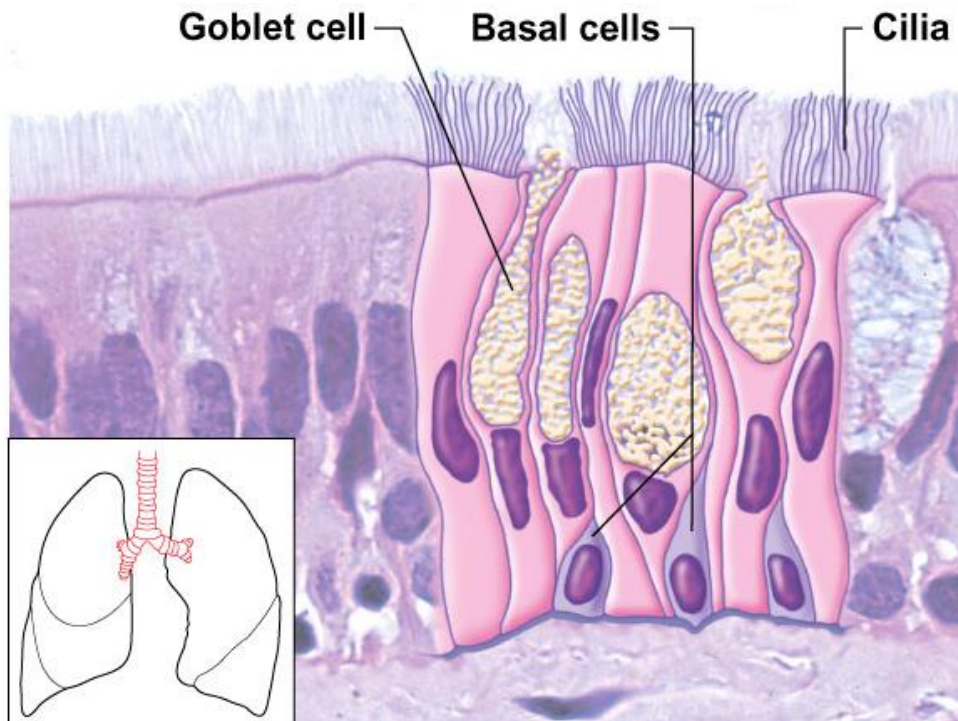


Simple Columnar Epithelium tissue	
Structure	Single row of tall, narrow cells ,vertically oriented, oval nuclei in basal half of cell
Functions	Absorption & secretion; produces mucus
Locations	Inner lining of GI tract from stomach to the anus; ducts of gallbladder; uterus, and uterine tubes; some kidney tubes; a few portions of upper respiratory tract bronchioles, and most kidney tubules



Pseudostratified Epithelium tissue

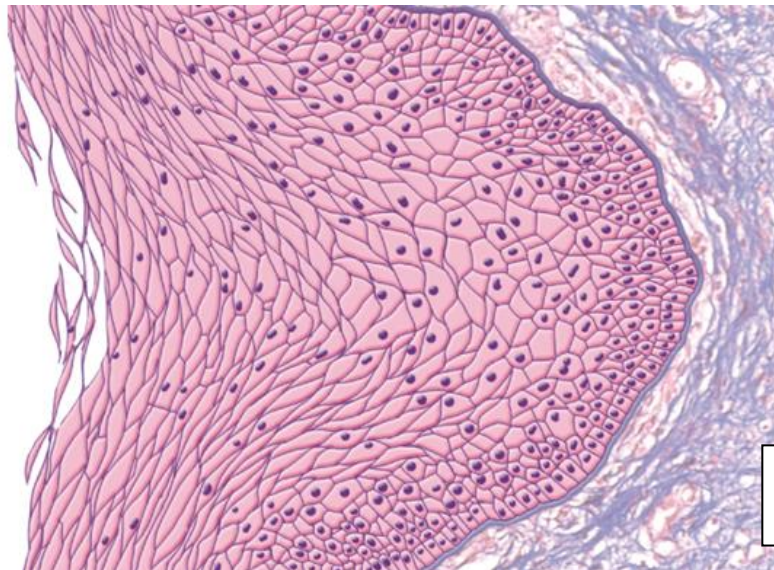
Structure	Single row of cells not all of which reach the free surface; nuclei at different levels
Functions	secretes mucus
Locations	most of the upper respiratory system from nasal cavity to bronchi; part of male urethra



Stratified epithelium

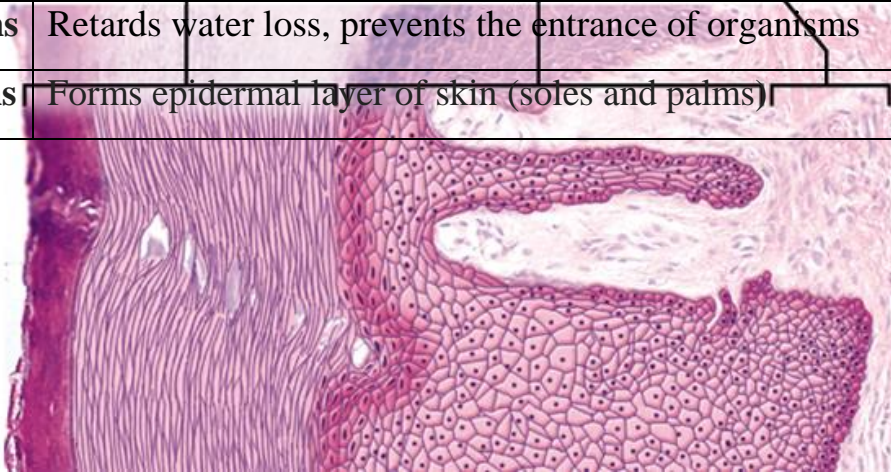
Stratified squamous epithelium tissue: are two type of stratified epithelium, keratinized and non – keratinized.

Non-keratinized Stratified Squamous Epithelium tissue	
Structure	Multilayered epithelium that lacks surface layer of dead cells forming moist, slippery layer
Functions	surfaces must be kept moist to prevent them from drying out
Locations	tongue, oral mucosa, esophagus & vagina



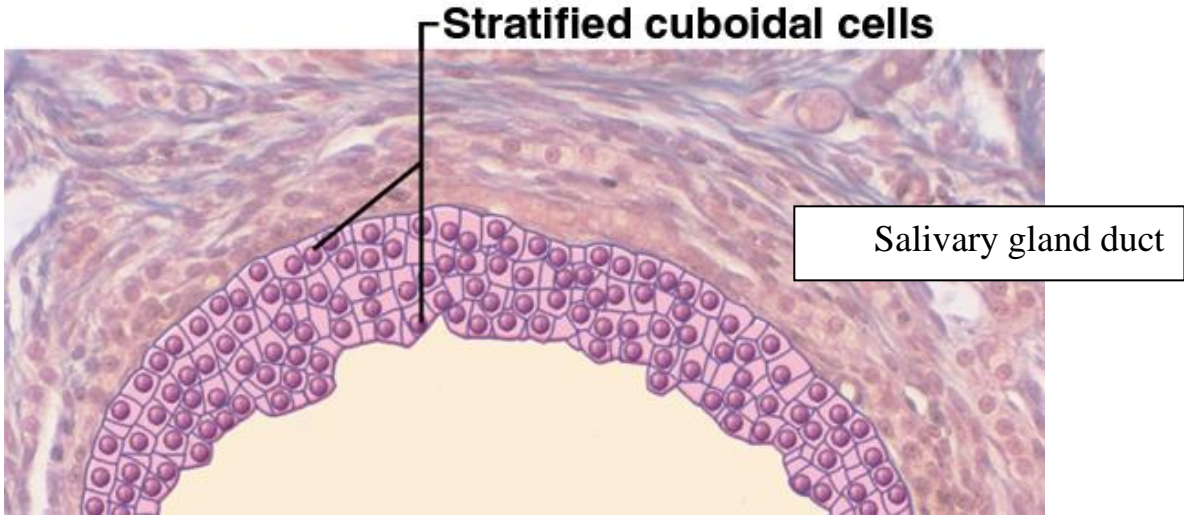
Mucosa of the vagina

keratinized Stratified Squamous Epithelium tissue	
Structure	Layers of epithelium covered with compact, squamous cells (<u>no nuclei</u>) with protein keratin
Functions	Retards water loss, prevents the entrance of organisms
Locations	Forms epidermal layer of skin (soles and palms)

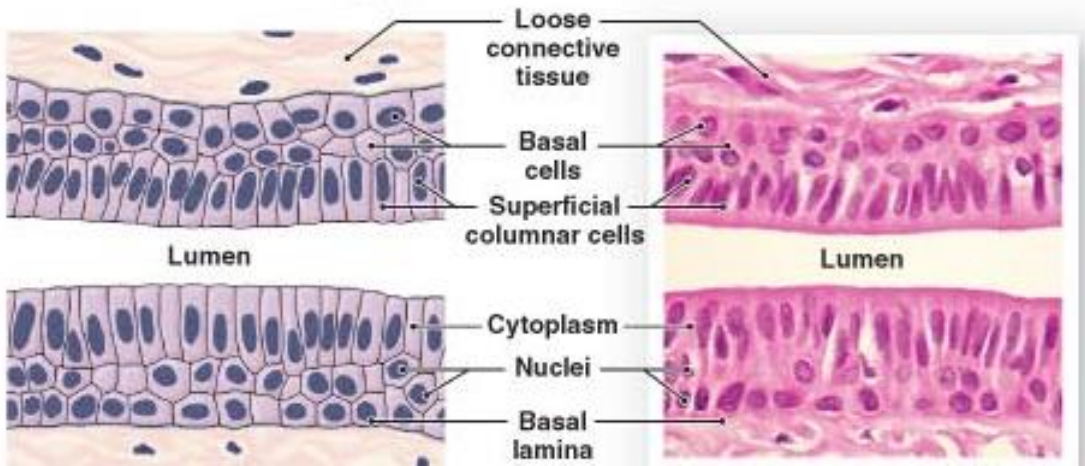


Skin from the sole of the foot

Stratified Cuboidal Epithelium tissue	
Structure	Two or more layers of cells; surface cells square or cube
Functions	Secretion and production
Locations	Sweat glands, mammary glands, salivary glands, ovarian follicles, seminiferous tubules



Stratified Columnar Epithelium tissue	
Structure	epithelial tissue composed of column shaped cells arranged in multiple layers
Functions	Protection of underlying tissues, secretion.
Locations	Found in parts of the pharynx, anus, uterus, duct of salivary gland, and the male urethra and vas deferens.



Transitional Epithelium tissue	
Structure	Multilayered epithelium with rounded (not flattened) surface cells
Functions	Allow stretches and distension
Locations	Urinary tract, part of kidney, ureter, urinary bladder, part of the urethra

