



Medical Biology

Histology: is the study of the tissues of the body.

Tissue: group of similar cells combined to perform a common function.

The human body is composed of only 4

basic types of tissue:

- 1. epithelial tissues.**
- 2. connective tissues.**
- 3. muscular tissues.**
- 4. nervous tissues.**

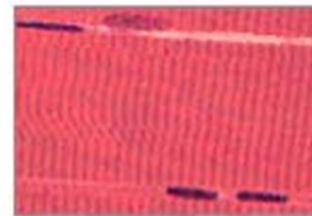
Four types of tissue



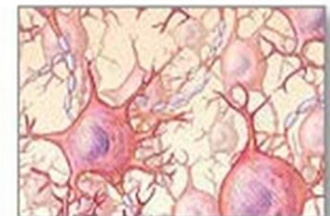
Connective tissue



Epithelial tissue



Muscle tissue



Nervous tissue

Epithelial Tissues:

Features of epithelium:

- 1. Covering & lining**
- 2. Homeostasis**
- 3. Intercellular space**
- 4. No bl. Vessels**
- 5. 3 germ layers**

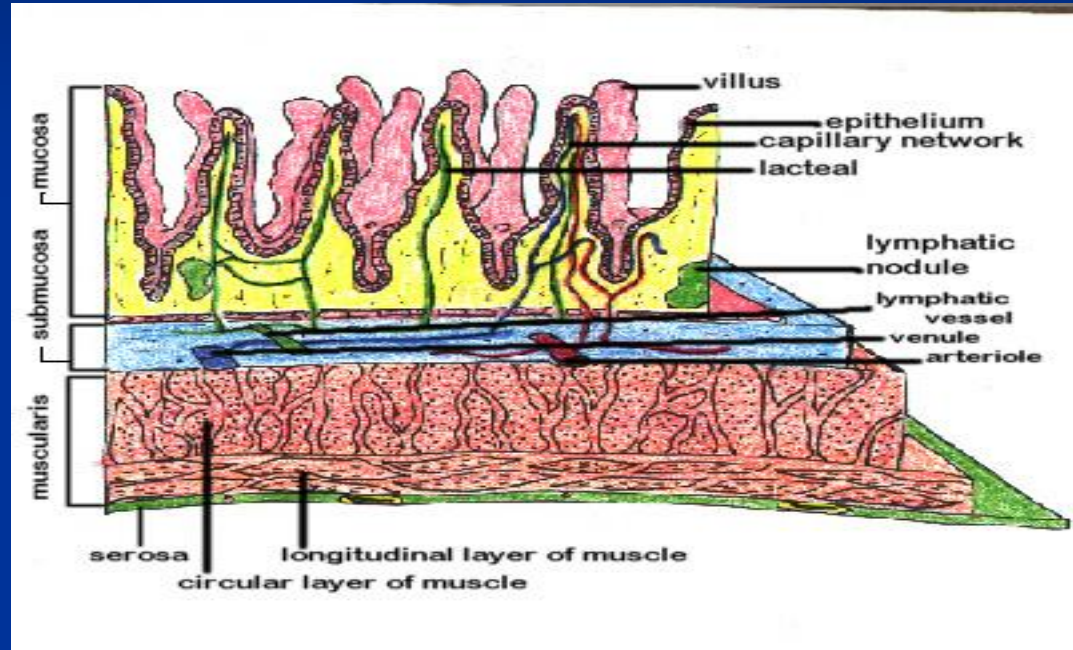
Functions of epithelium:

- 1. Protection:**
- 2. Sensation**
- 3. Secretion**
- 4. Absorption:**
- 5. Cellular transport:**

polarity

Apical modification of plasma membrane

micrvilli:



Stereocilia:

Cell membrane specialization

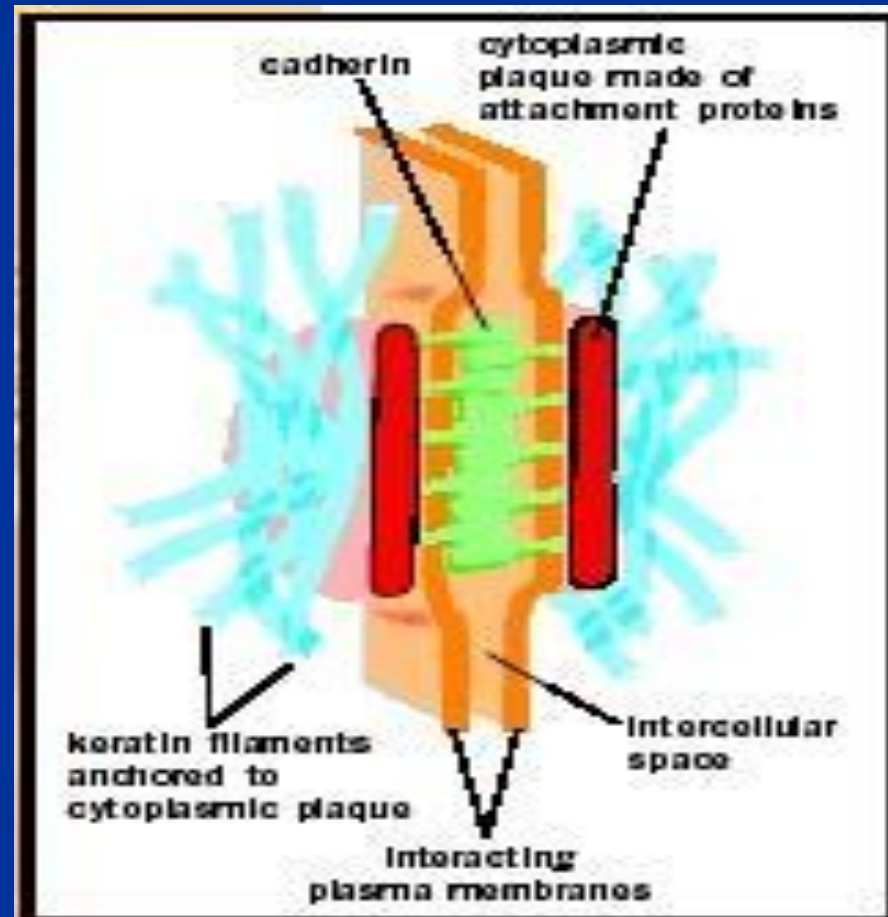
The lateral parts of the cell membrane can show several specialization that form "intercellular junctions".

functions of these junctions:

- 1. they are the sites of adhesion between adjacent cell.**
- 2. they prevent the flow of materials through the intercellular compartment.**
- 3. they help in the intercellular communication.**

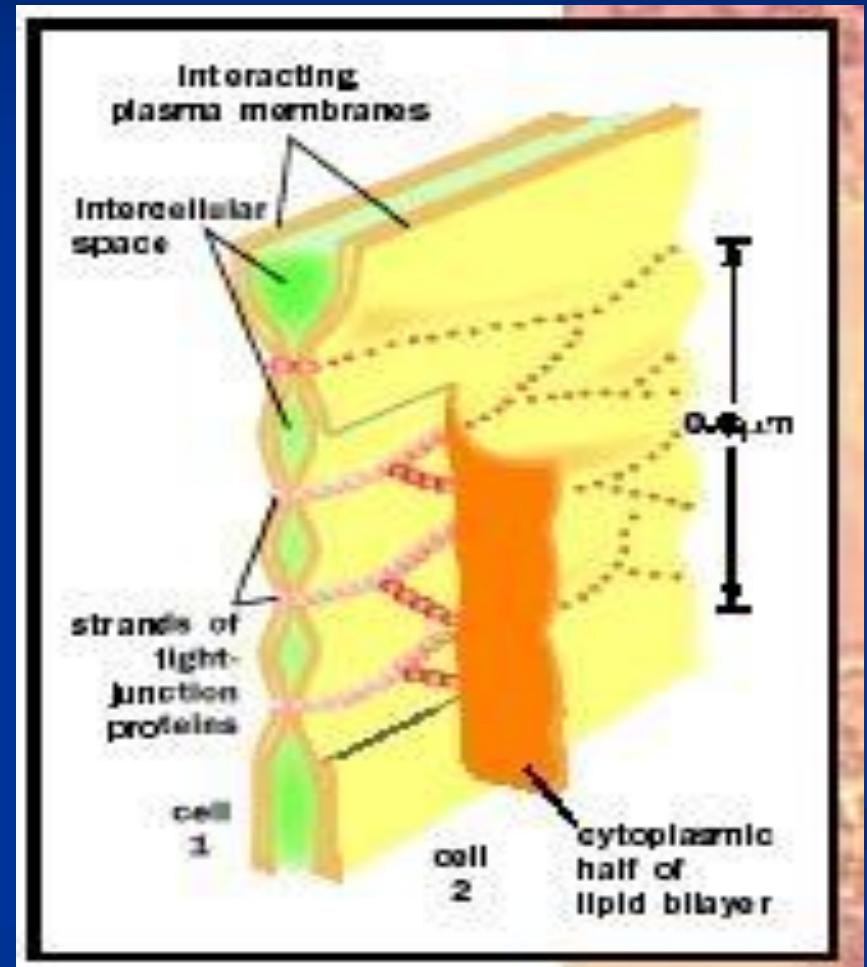
- There are **three** types of junctions:
- **adhesion junctions (desmosomes):**

in this type, the internal cytoplasmic plaques firmly attached to the cytoskeleton within each cell, are joined by intercellular filaments.



- **tight junctions:**

adjacent cells are even more closely joined by tight junctions in which plasma membrane proteins actually attach to each other producing a zipper like fastening.

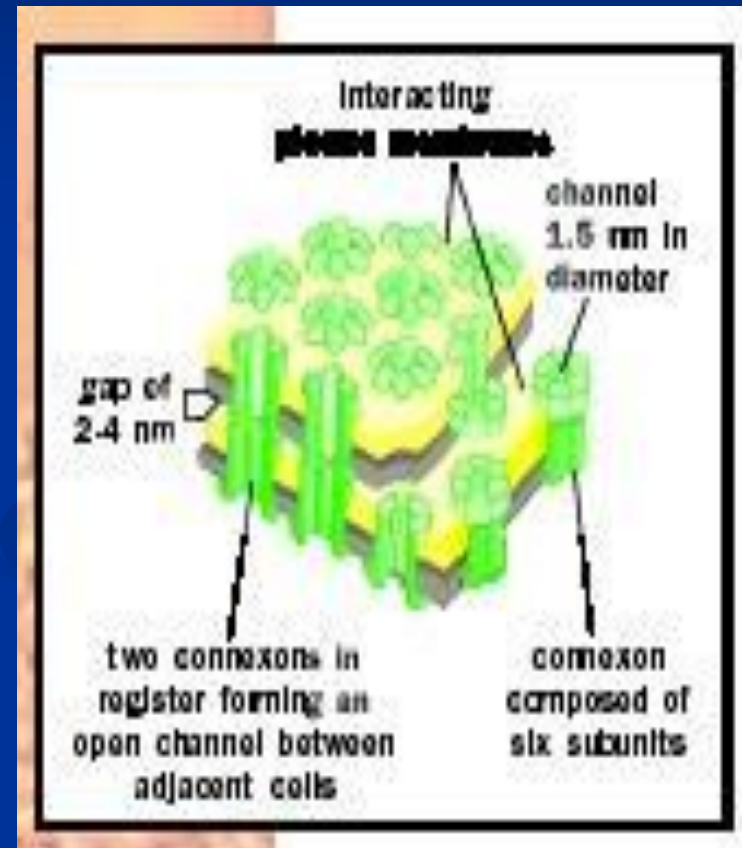


•gap junctions:

it allows cells to communicate, and is formed when two identical plasma membrane channels join.

Functions of gap junctions are:

1. it lends strength to the cells.
2. it allows small molecules and ions to pass between them.

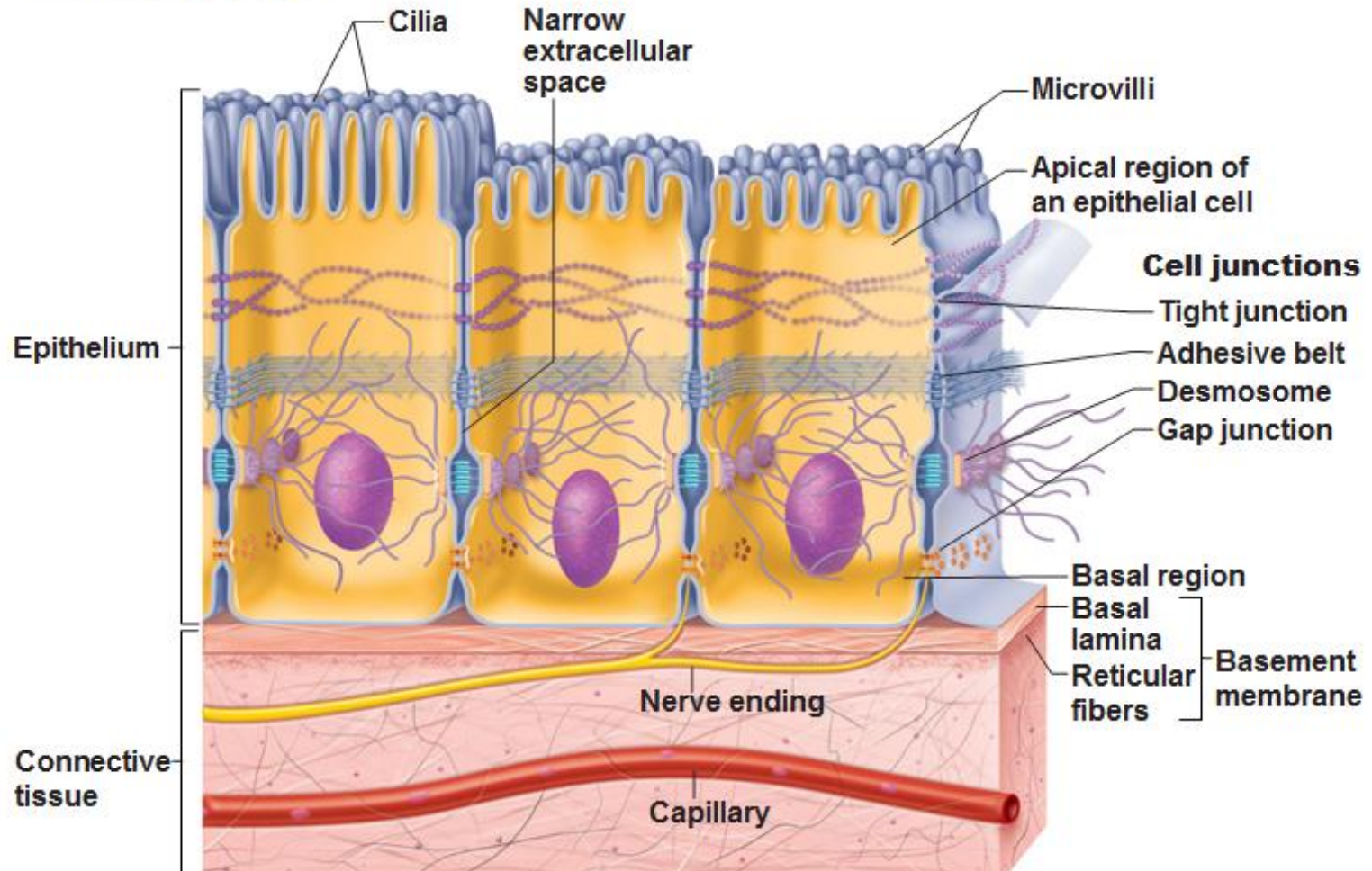




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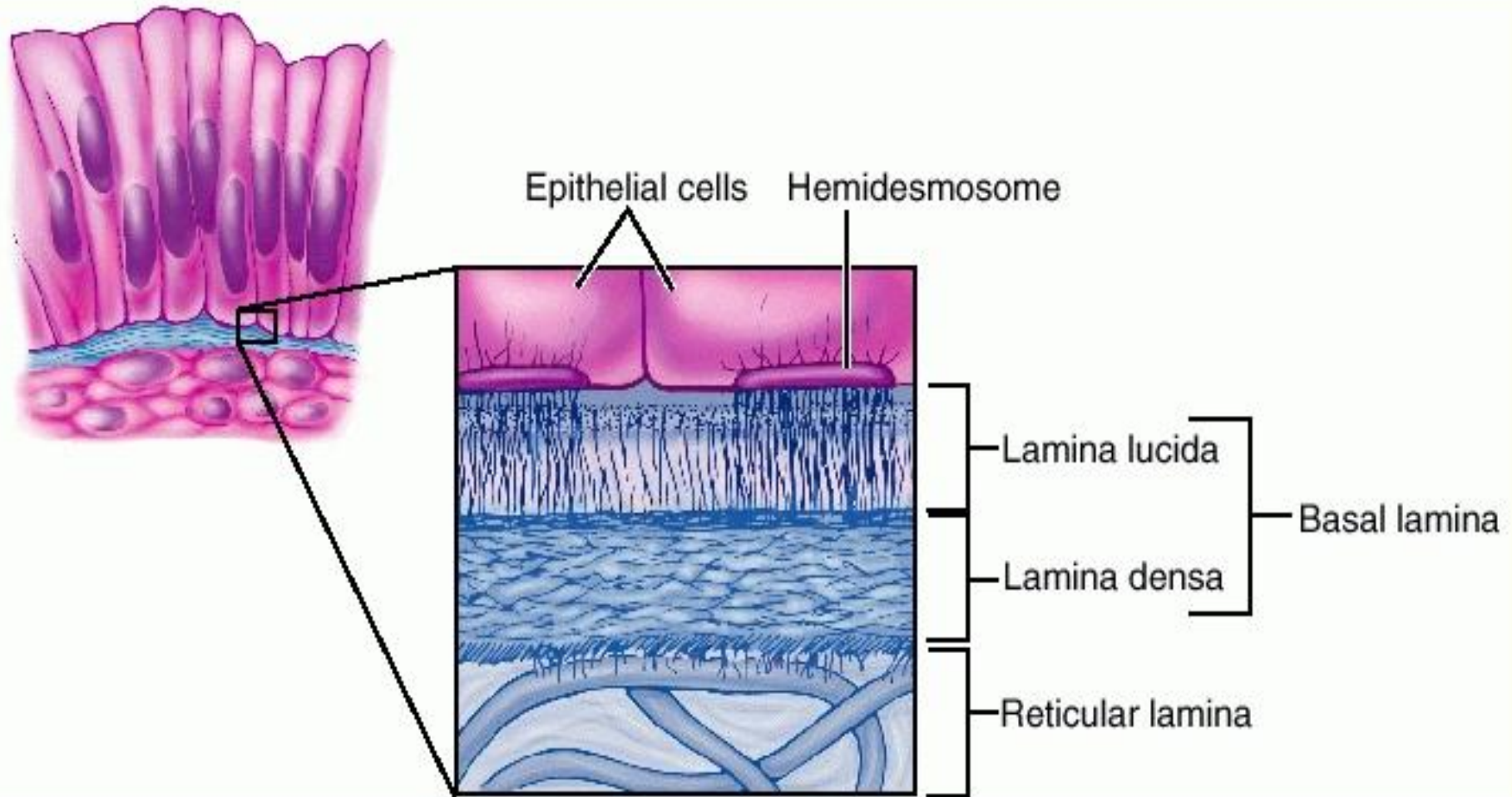
Polarity:

Special Characteristics of Epithelia-Cell Junctions



Basal lamina:

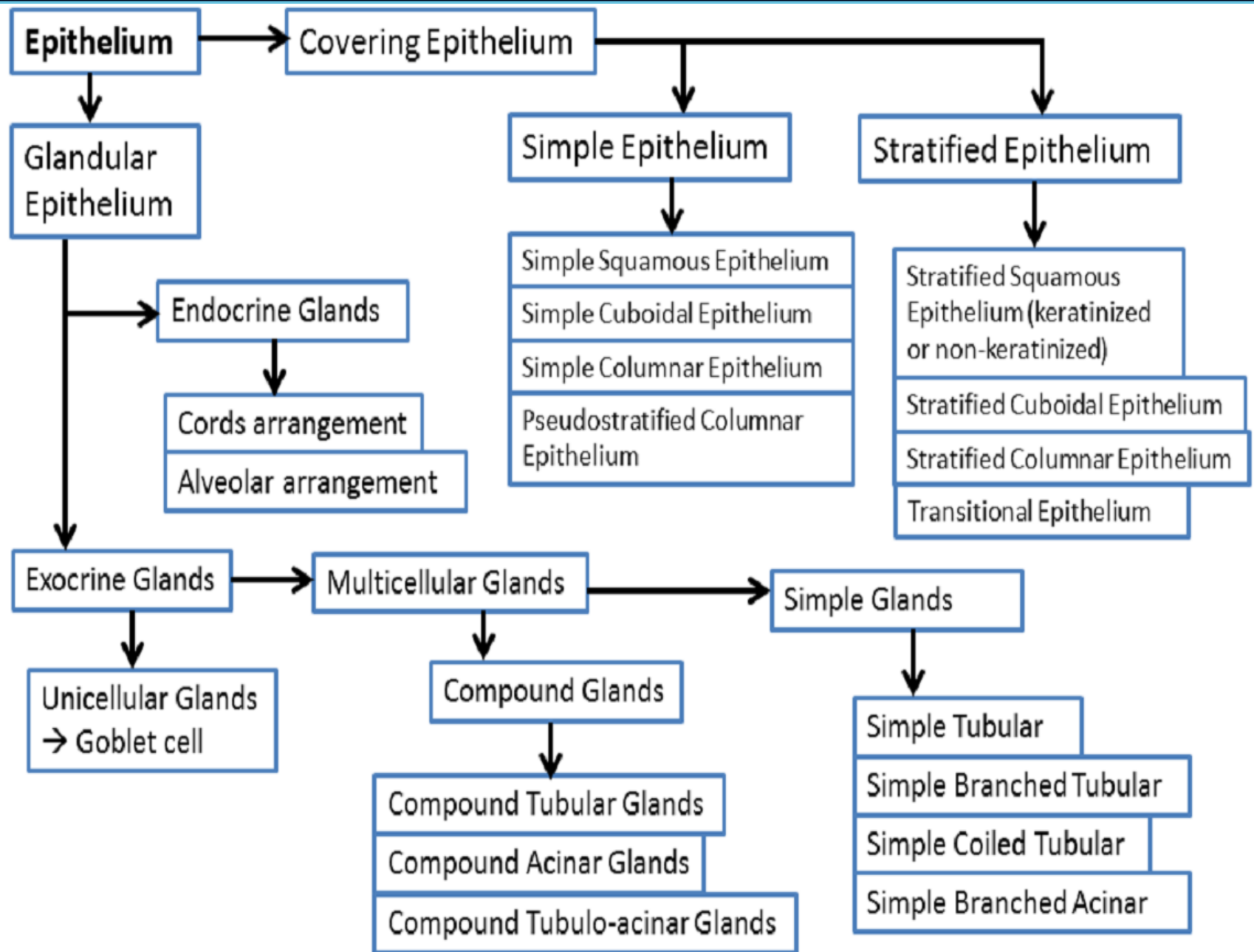
- 1. lamina densa: a delicate network of fine fibrils.**
- 2. lamina lucidae: which appear to be transparent.**



➤ Basement membrane:

Functions of basal lamina:

- 1. it is considered as a molecular filter and as a flexible, firm support for the overlying epithelium.**
- 2. provide a selective barrier between connective tissue and other cells.**
- 3. the presence of the basal lamina around a muscle cell is necessary for the establishment of new neuromuscular junctions.**
- 4. the ability to influence cell polarity.**
- 5. regulate cell proliferation and differentiation by binding with growth factors.**
- 6. influence cell metabolism.**

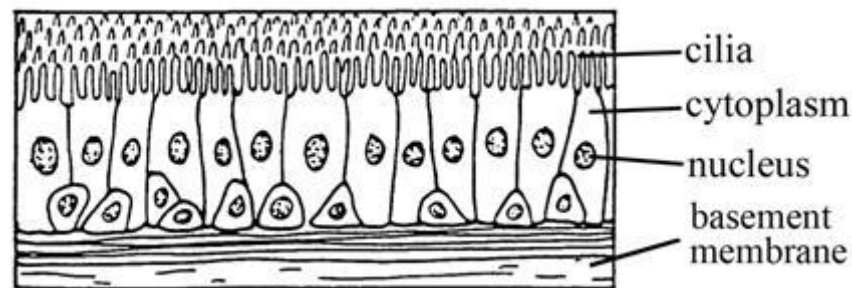
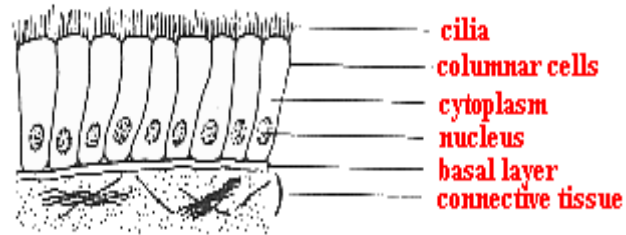
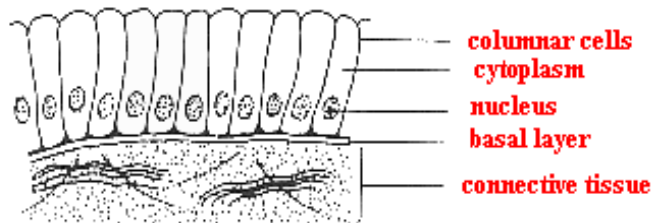
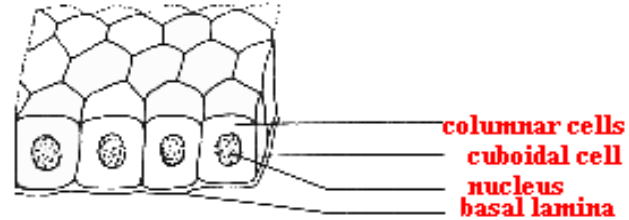
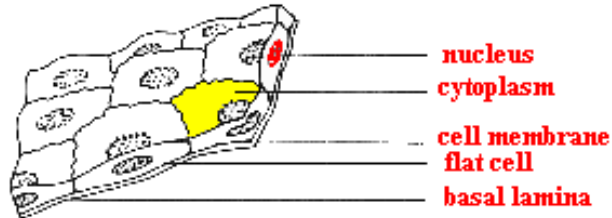


Classification of epithelia:

**covering epithelium.
glandular epithelium.**

Covering epithelium:

Simple epithelia:



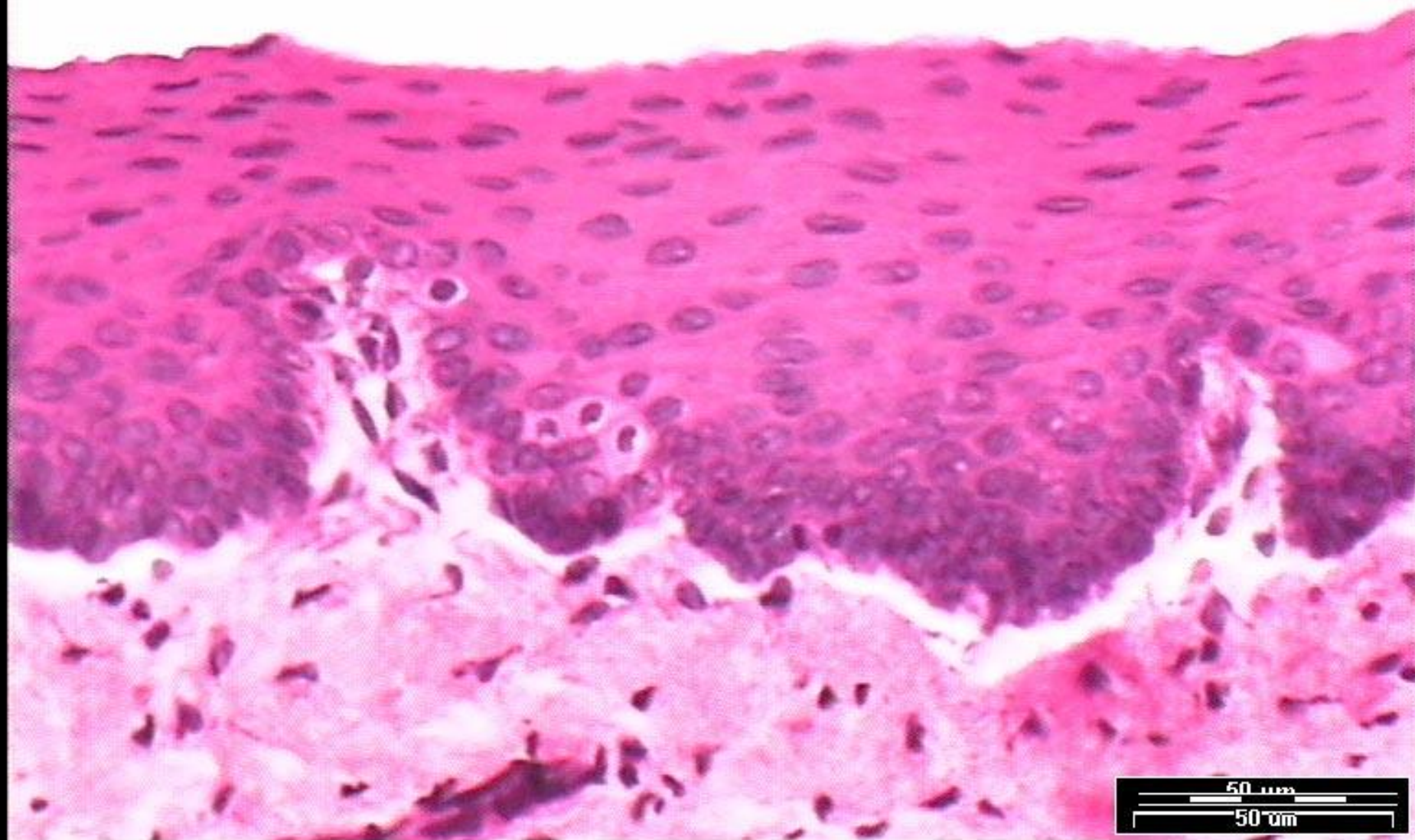
Stratified epithelium:

Stratified Squamous Epithelium
with Keratin
Thick skin. Osmium staining



Stratified Squamous Epithelium

Tongue



Stratified epithelium:

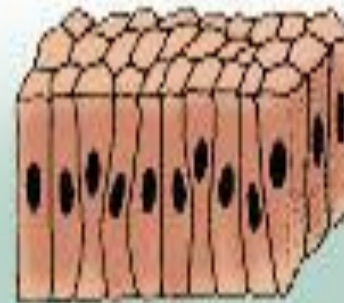
Types of Epithelium



Simple squamous

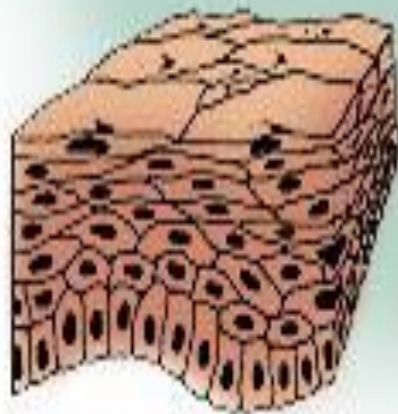
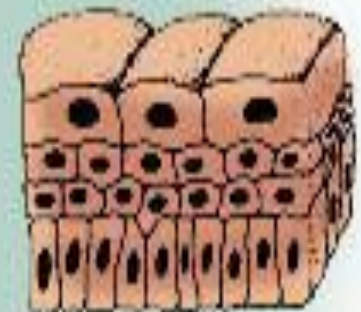


Simple cuboidal

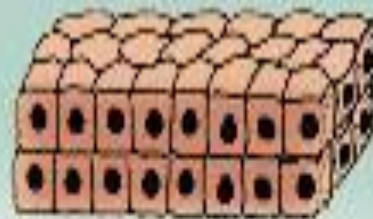


Simple columnar

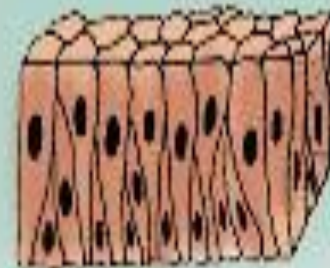
Transitional



Stratified squamous

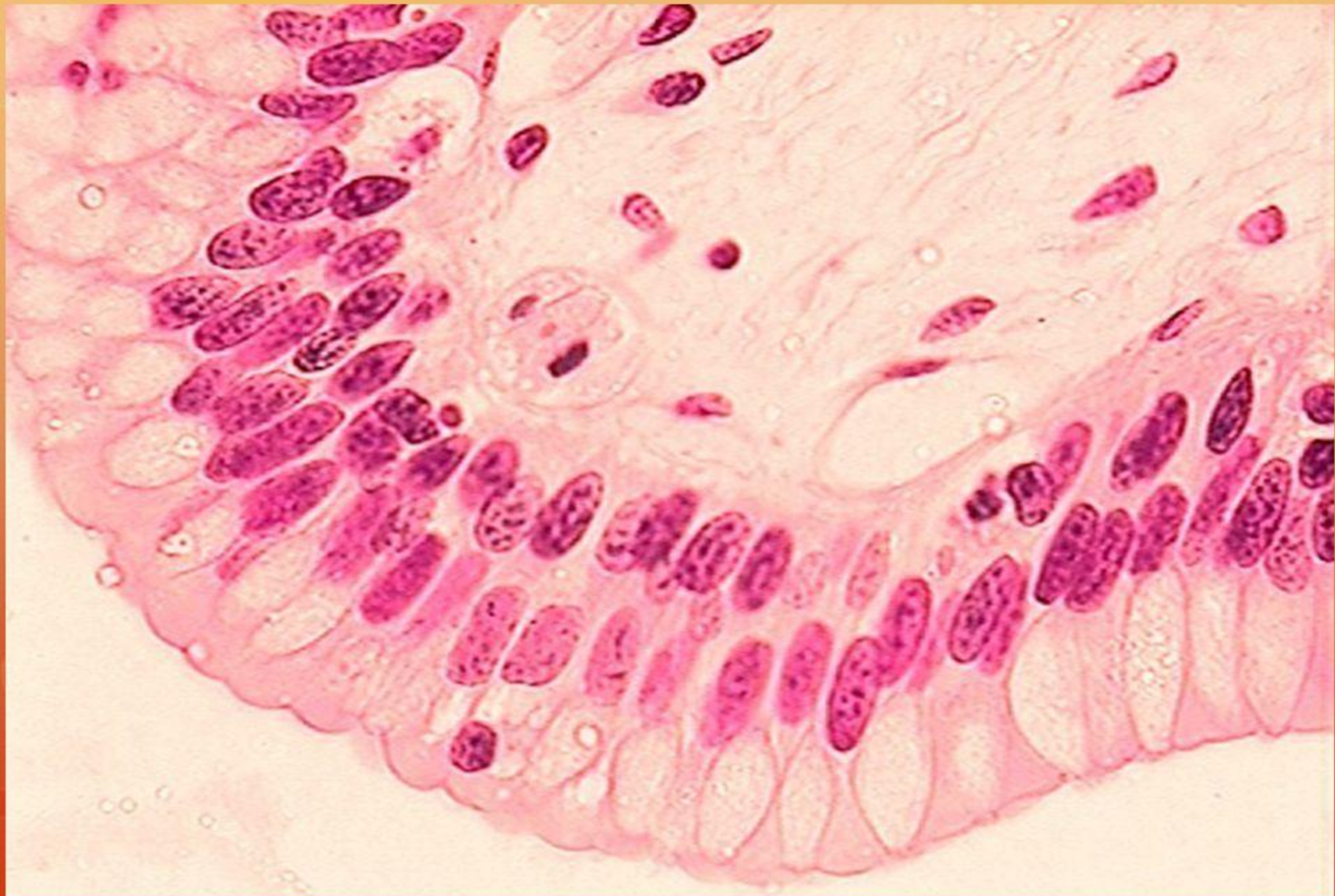


Stratified cuboidal



Pseudostratified columnar

Stratified Columnar Epithelium

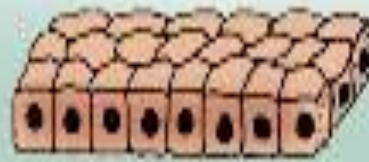


Stratified epithelium:

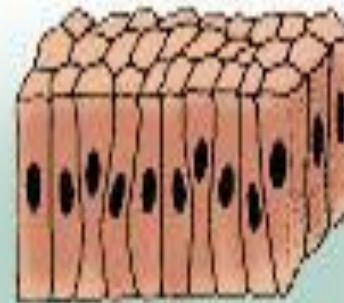
Types of Epithelium



Simple squamous

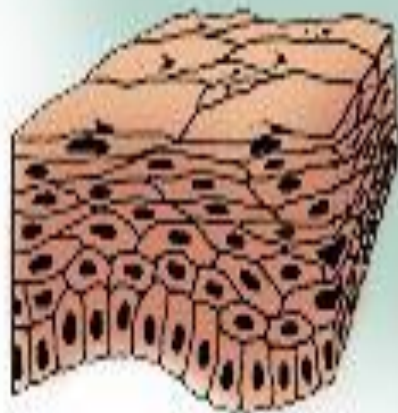
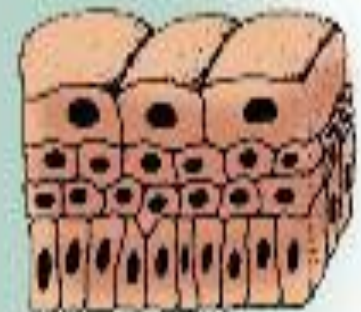


Simple cuboidal

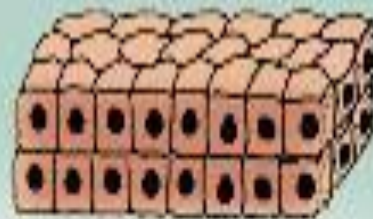


Simple columnar

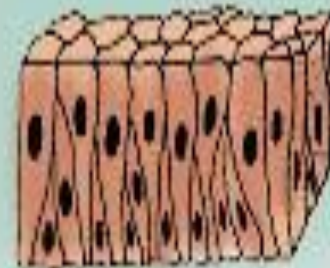
Transitional





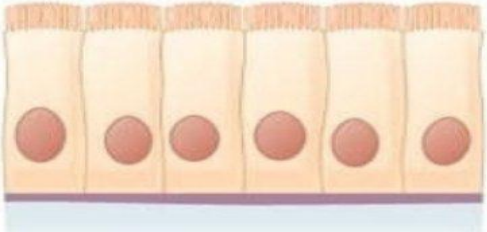
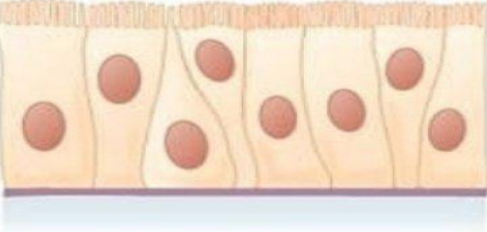


Stratified squamous



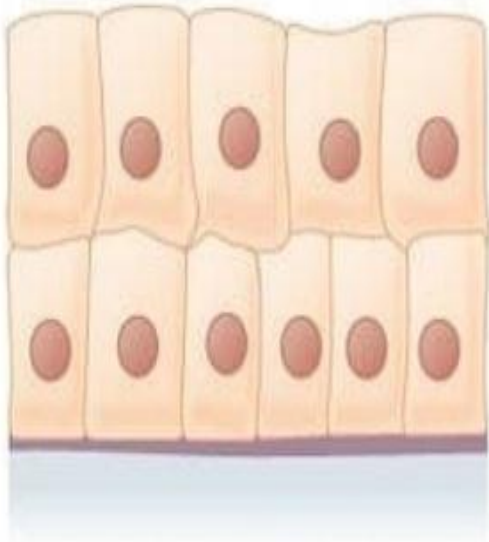
Stratified cuboidal



Pseudostratified columnar

Cells	Location	Function
<p>Simple squamous epithelium</p> 	<p>Air sacs of lungs and the lining of the heart, blood vessels, and lymphatic vessels</p>	<p>Allows materials to pass through by diffusion and filtration, and secretes lubricating substance</p>
<p>Simple cuboidal epithelium</p> 	<p>In ducts and secretory portions of small glands and in kidney tubules</p>	<p>Secretes and absorbs</p>
<p>Simple columnar epithelium</p> 	<p>Ciliated tissues are in bronchi, uterine tubes, and uterus; smooth (nonciliated tissues) are in the digestive tract, bladder</p>	<p>Absorbs; it also secretes mucous and enzymes</p>
<p>Pseudostratified columnar epithelium</p> 	<p>Ciliated tissue lines the trachea and much of the upper respiratory tract</p>	<p>Secretes mucus; ciliated tissue moves mucus</p>
<p>Stratified squamous epithelium</p> 	<p>Lines the esophagus, mouth, and vagina</p>	<p>Protects against abrasion</p>
<p>Stratified cuboidal epithelium</p> 	<p>Sweat glands, salivary glands, and the mammary glands</p>	<p>Protective tissue</p>

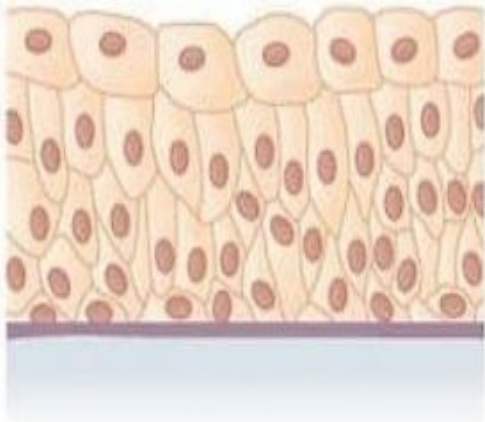
Stratified columnar epithelium



The male urethra and the ducts of some glands

Secretes and protects

Transitional epithelium

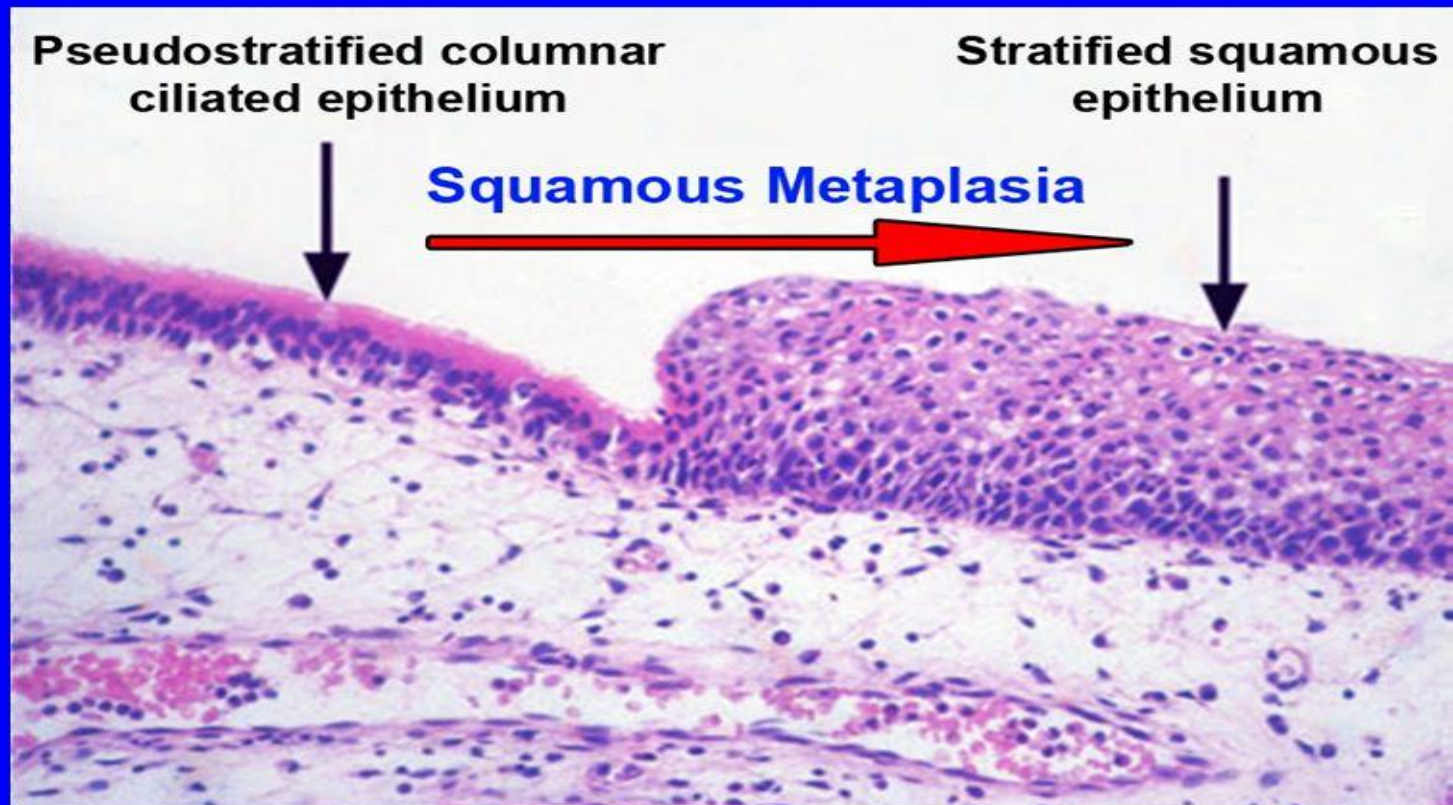


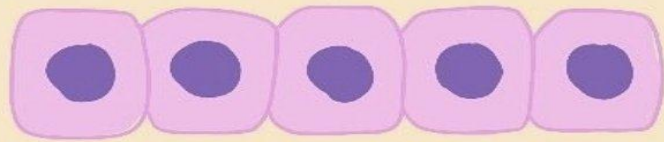
Lines the bladder, urethra, and the ureters

Allows the urinary organs to expand and stretch

Clinical Correlation: Epithelial Metaplasia

Squamous Metaplasia





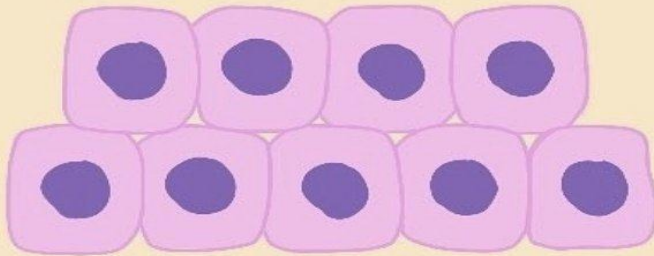
NORMAL



ATROFIA



HIPERTROFIA



HIPERPLASIA



METAPLASIA



DISPLASIA

Thank you