

# Animal tissues

## Tissues

**Tissues** are groups of cells with the same structure and general function .there are four types of tissue in animals: **Epithelial** , **Connective** , **Muscle** and **Nervous** tissue .

## Organ

**Organ** are composed of one or more tissues and have more specialized functions than tissue .the heart contains all four type of tissues.

## system

A **system** consist of two or more organs which perform a specific task such as the circulatory , digestive , reproduction , and respiratory system .

## I-Epithelial Tissue:

**Epithelial Tissue** exists in mane structural forms. In general, it either covers or lines something and typically consists of renewable sheets of cells that have surface specialization adapted for their specific roles.

Usually a basement membrane separates Epithelial Tissue from underlying , adjacent tissue .

### Function:

- Absorb (e.g., the lining of intestine )
- Transport (e.g., kidney tubules)
- Excrete (e.g., sweat glands)
- Protect (e.g., the skin )
- Contain nerve cell for sensory reception (e.g., the teste buds in the tongue ).

The **size**, **shape**, and **arrangement** of Epithelial cells are directly related to these specific functions.

**Location**: found lining the inside and outside of most body structures.

**Classified** : by the **number of layers** of the cells or **shape**.

## **Classification of Epithelium**

### **1- Classified by arrangement of cells into layers**

a) **Simple Epithelium tissue** = one cell layer thick  
found in regions where secretion or absorption occurs.

b) **Stratified Epithelium tissue** = many cell layers thick  
found in areas subject to mechanical or chemical stresses .

### **2- Classified by shape of surface cells**

a) **Squamous** =flat, round

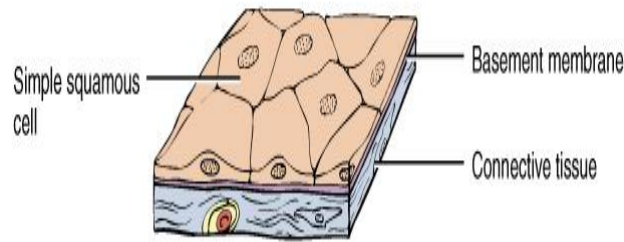
b) **Columnar** = tall, rectangular

c) **Cuboidal** = cube-shaped

## **Simple Epithelium tissue**

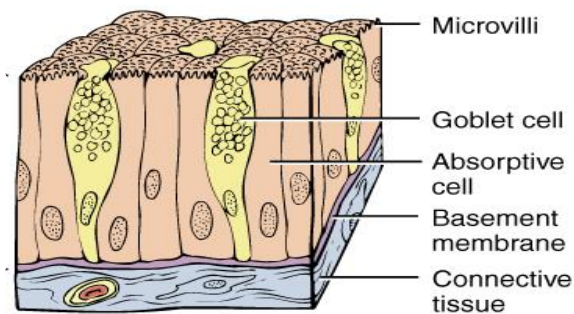
1. **Simple Squamous Epithelium tissue** : consist of a single layer of tightly packed, flattened cell with a disc shaped central nucleus

- **Location**: lining of vessels; lining of body cavities; alveoli of lungs.
- **Function**: controls vessel permeability( allows passage of material by diffusion and filtration.



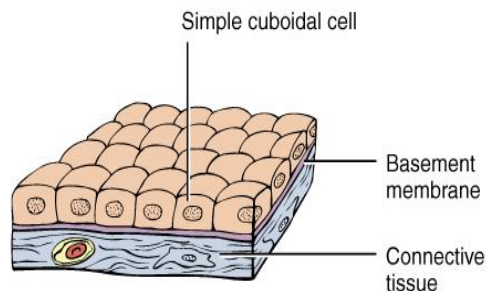
**2- Simple Columnar Epithelium tissue** : consists of a single layer of elongated cells.

- **location:** lining of stomach, intestine, lungs, gallbladder .
- **function:** protection, anzyme secretion and absorption.



**3- Simple Cuboidal epithelium tissue:** consists of a single layer of tightly packed, cube shaped cells.

- **Location:** Lines tubes of kidney, surface of ovary .
- **Function:** Absorption or secretion



#### 4- pseudo stratified Epithelium tissue type:

**A. pseudo stratified ciliated columnar epithelium** : the pseudostratified ciliated columnar epithelium possess cilia and appear stratified or layered , but they are not; hence , the prefix pseudo . they look layered because their nuclei are at two or more levels within cells of the tissue and they grow in height as old cells are replaced by new ones.

- **Location**: lines the bronchi , uterine tubes .
- **Function**: propels mucus or reproductive cells by ciliary action.

**B. pseudo stratified non-ciliated columnar epithelium:**

this type is found in the inner side of the large canals of the salivary glands.

### **Stratified Epithelium tissue**

1- **Stratified Squamous Epithelium tissue** : this tissue found in the surface of skin; lining of esophagus; and vagina

2- **Stratified cuboidal Epithelium tissue:** this tissue found in the inner side of sweat gland.

3- **Stratified columnar Epithelium tissue:** this kind of tissue line the male urethra and the esophagus of the embryo.

4- **Stratified transitional Epithelium tissue:** this type of tissue found in uterus and urine bladder.

## **II. Connective Tissue**

**Connective Tissue** support and bind. Unlike epithelial tissue , connective tissue are distributed throughout an extracellular matrix. This matrix frequently contains fibers that are embedded in a ground substance with a consistency anywhere from liquid to solid.

**Functions** : bind, support, protect, fill spaces, store fat, produce blood cells, protect against infection, and repair tissue damage.

**Connective tissue have two general type of fiber arrangement :**

1- **Loose (areolar) connective tissue** : contains numerous fibroblast that produce collagenous and elastic fibers .

**Location**: widely distributed under the epithelial of the human body.

**Function**: wraps and cushion organs .

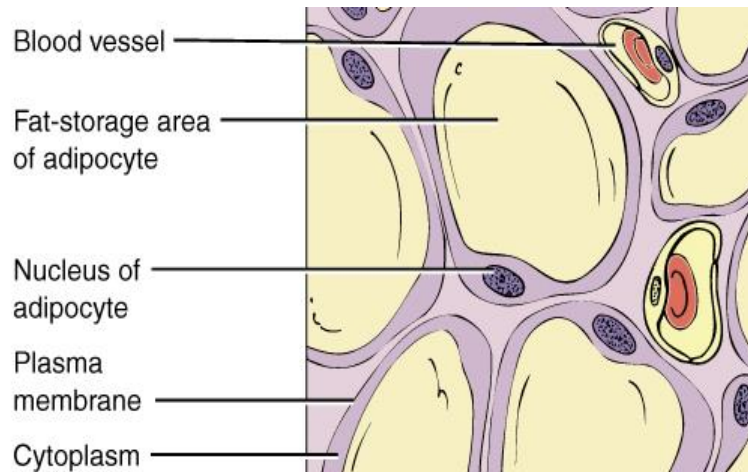
2- **Fibrous connective tissue** : consists largely of tightly packed collagenous fibers.

**Location**: dermis of the skin ,wraps and cushion organs , submucosa of the digestive tract.

**Function**: provides structural strength.

### **Adipose Tissue cells**

- a) Is a type of loose connective tissue
- b) Stores fat.
- c) Found beneath the skin, around joints, padding internal organs
- d) Reduces heat loss, energy storage, protection



## Cartilage

- a) supports and cushions
- b) Joints, nose, ears, trachea
- c) Chondrocytes (cartilage cells) sit in spaces called lacunae
- d) Matrix
- e) No blood vessels or nerves so repair is very slow

## Bone

- a) Bone - support, muscle attachment, body form, produces blood cells, stores minerals.
- b) Bone cells, called osteocytes.
- c) Bone has a good blood supply, enabling rapid recovery after an injury.

# **Blood**

carries nutrients, wastes, oxygen, carbon dioxide, fights infection.

## **Composition:**

**1. Plasma** - fluid part, carries dissolved substances and blood cells

**2- Platelets** (thrombocytes) - aid in clotting

**3. Erythrocytes** - red blood cells, (RBC's)

a. Small biconcave discs, no nucleus when mature

b. Carry oxygen with hemoglobin

**4- Leukocytes** - white blood cells, (WBC's),

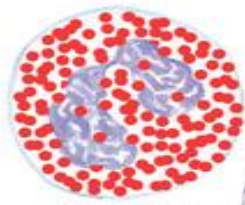
### **fight infection**

a. Can produce antibodies

b. Release chemical enzymes

c. Can be phagocytic

**FORMED ELEMENTS OF HUMAN BLOOD**



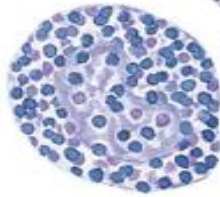
**Eosinophil**



**Neutrophil**



**Monocyte**



**Basophil**



**Lymphocyte**

**Leukocytes (white blood cells)**



**Red blood cells**



**Platelets**