Practical Biology Dr. Mayada S.H.

**Types of Animal Tissues**

**Categories of Tissues:-**

* **Epithelium**
* **Connective**
* **Muscle**
* **Nervous**

**Epithelium:-**

* Lines, covers, and protects other tissues and organs.
* Characterized by: Cells tightly **junked together** ,the presence of a cell secretion called the **basement membrane**.
* Named by:-**Cell shape**, other characteristics of the cells.

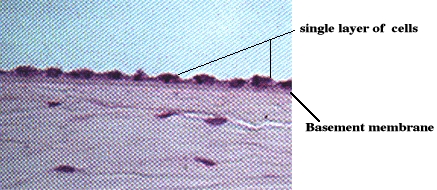
-**Squamous, Cuboidal, and Columnar**

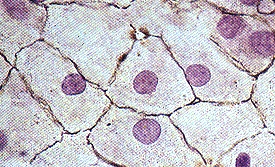
**Squamous Epithelium:-**

* Cells very thin, much wider than they are thick.

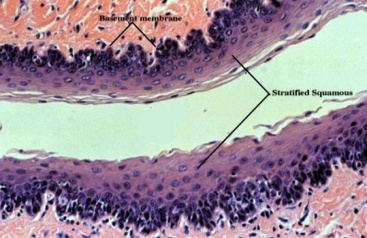
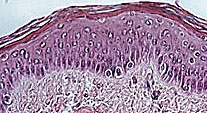
1. **Simple Squamous Epithelium**
   * + Air sacs of respiratory
     + Lining of blood **vessels, heart and lymphatic tubes**.
2. **Stratified Squamous Epithelium**
   * + **Skin, Vagina, Esophagus, Mouth .**

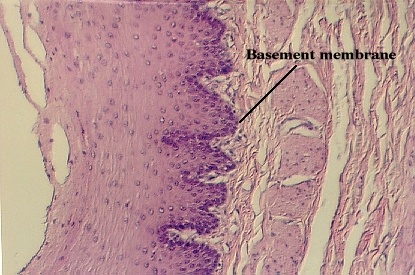
**Examples of Simple Squamous Epithelium**


SimpSqua2.jpg                                                  00025923Macintosh HD                   ABA78158:



**Stratified Squamous Epithelium**



**Cuboidal Epithelium**

* Cells cube shaped- secretion and absorption.

**-Kidney tubules, Duct and small glands, Surface of ovary.**


Cuboidal2.jpg                                                  00025923Macintosh HD                   ABA78158: 
Cuboidal1.jpg                                                  00025923Macintosh HD                   ABA78158:


cuboidal3.jpg                                                  00025923Macintosh HD                   ABA78158:

**Columnar Epithelium**

* Elongated cells, much longer than they are wide.

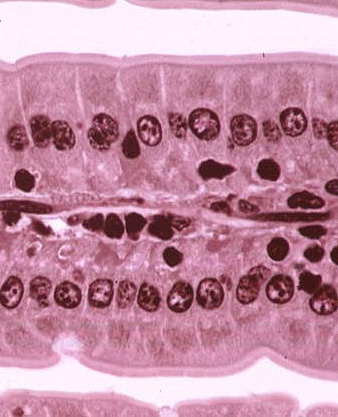
1. **Simple Columnar Epithelium**
   * + A single layer of cells that line the digestive tract, **gallbladder and excretory ducts of some glands**. Has microvilli at surface for absorption.

**-Pseudostratified ciliated columnar epithelium**

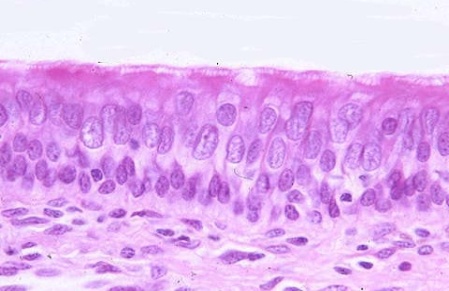
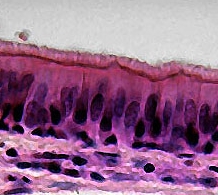
* + - Lines the **bronchi**, **trachea**, **uterine** **tubes** **and some of the uterus.** Propels mucus or reproductive cells by ciliary action.

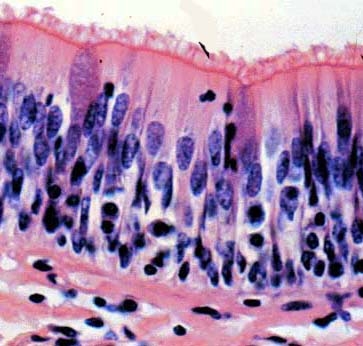
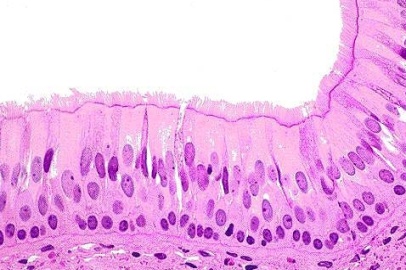
**Simple Columnar Epithelium**


Columnar1.jpg                                                  00025923Macintosh HD                   ABA78158: 
columnar2.jpg                                                  00025923Macintosh HD                   ABA78158: 
Columnar3.jpg                                                  00025923Macintosh HD                   ABA78158:


Columnar4.jpg                                                  00025923Macintosh HD                   ABA78158: 

**Pseudostratified Ciliated Columnar Epithelium**

**Connective Tissue**

* Characterized by the cells widely separated from each other in a matrix that is produced by the cells.
* Tissue protects and supports.
* Cell Matrix composed of two regions

-Ground:- Liquid , Gel, Gum or solid

-Fibers:- Non-elastic (= white or Collagen),Elastic (= yellow fiber

**Types of Connective Tissue**

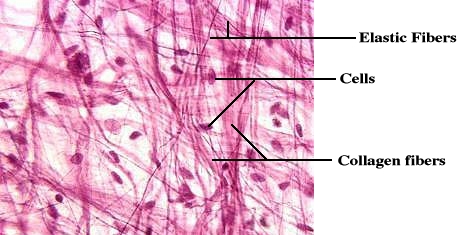
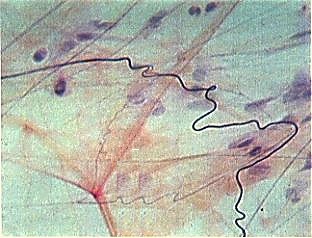
* **Loose (Areolar) Connective Tissue**
* **Dense Connective Tissue**
* **Adipose**
* **Cartilage**
* **Bone**
* **Blood**

**Loose Connective Tissue (Areolar)**

* Gel like ground with both elastic and non-elastic fibers running though the ground in many directions.

-Wraps and cushions organs.

-Under the skin.

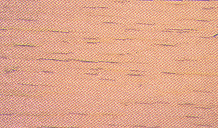


**Dense Regular Connective Tissue**

* Nuclei and fibers arranged in parallel rows.

-Tendons and ligaments

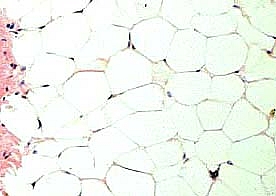
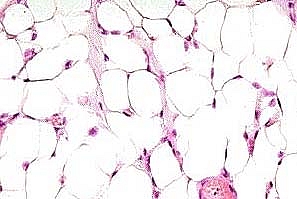
-Fibers mostly non-elastic



**Adipose (Fat)**

* Function as **storage cells for adipose** (lipids).
* Adipose cells contain a **large vacuole** which in the live cell contains lipids.

Cell **nucleus and cytoplasm are pushed out to edge** of cell membrane



**Cartilage**

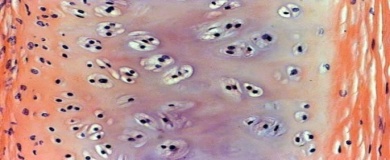
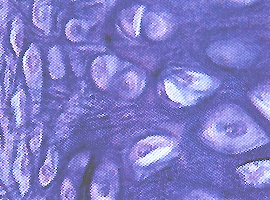
* Ground of **matrix is gum** like.
* Cells are found in **Lacunae** within the matrix.
* Fibers may be **elastic or non-elastic**, or a form of non-elastic called **reticular**(where the non-elastic fibers of very thin)

**-Hyaline Cartilage**-example on the **ends of bones**

**-Elastic Cartilage**- example **ear cartilage**

**-Non-elastic Cartilage**- example **nose cartilage**.

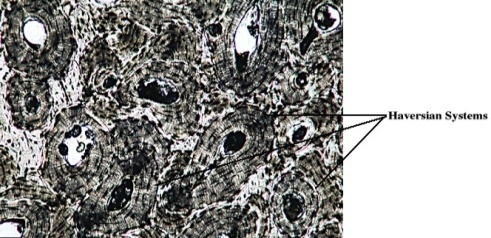
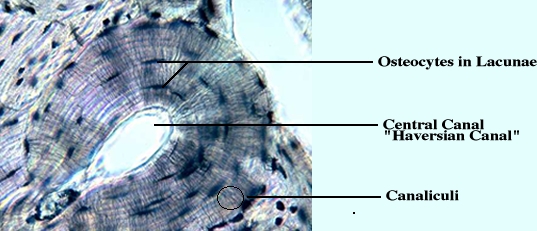
**Hyaline cartilage Elastic Cartilage**


Cartlage1.jpg                                                  00025923Macintosh HD                   ABA78158: 

**Bone**

-Ground of matrix is Solid (Calcium carbonate).

-Has blood supply and nerves running through the Haversian canal systems.



**Vascular Tissue (Blood)**

* Liquid matrix = plasma

-90% water

-10%Plasma proteins, electrolytes, hormones, oxygen, glucose etc.

* Formed elements:-

-Erythrocytes -48billion(female) to 54 billion (male) cell / ml of blood in humans.

-Leukocytes -about 7.5 million / ml of blood.

-Platelets -blood clotting.


Blood1.jpg                                                     00025923Macintosh HD                   ABA78158:
blood5.jpg                                                     00025923Macintosh HD                   ABA78158:
platelets.jpg                                                  00025923Macintosh HD                   ABA78158:

**Muscle Tissue**

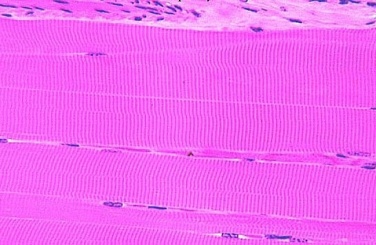
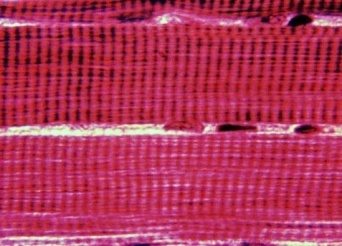
* Tissue with cells having fibers specialized for contraction.

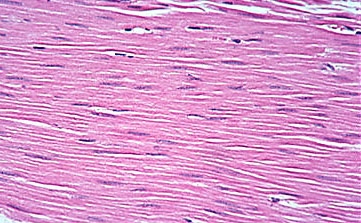
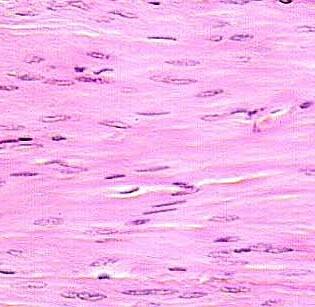
**A-Skeletal Muscle** (Striated, voluntary), Parallel elongated cells (fibers), multinucleated and each cell is the length of the muscle.

**B-Smooth Muscle** (Visceral, involuntary),Cells are long and tapered.

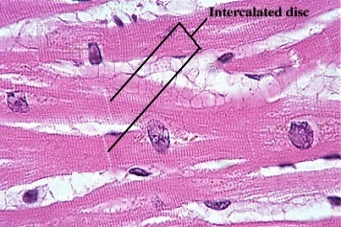
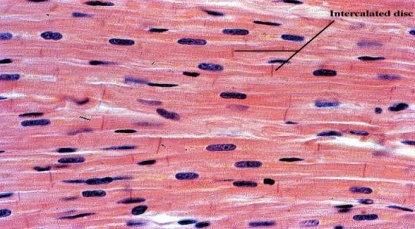
**C-Cardiac Muscle:-**Intercalated disc, Myogenic. Branched.

**Skeletal Muscle**


Skeletalm.jpg                                                  00025923Macintosh HD                   ABA78158: **Smooth Muscle**

**Cardiac Muscle**



**Nervous Tissue**

* Cells specialized to polarize and depolarize, Cell is a neuron.

