

Human Anatomy

Part I
The Body Plan
Cells & Tissues

The Body Plan

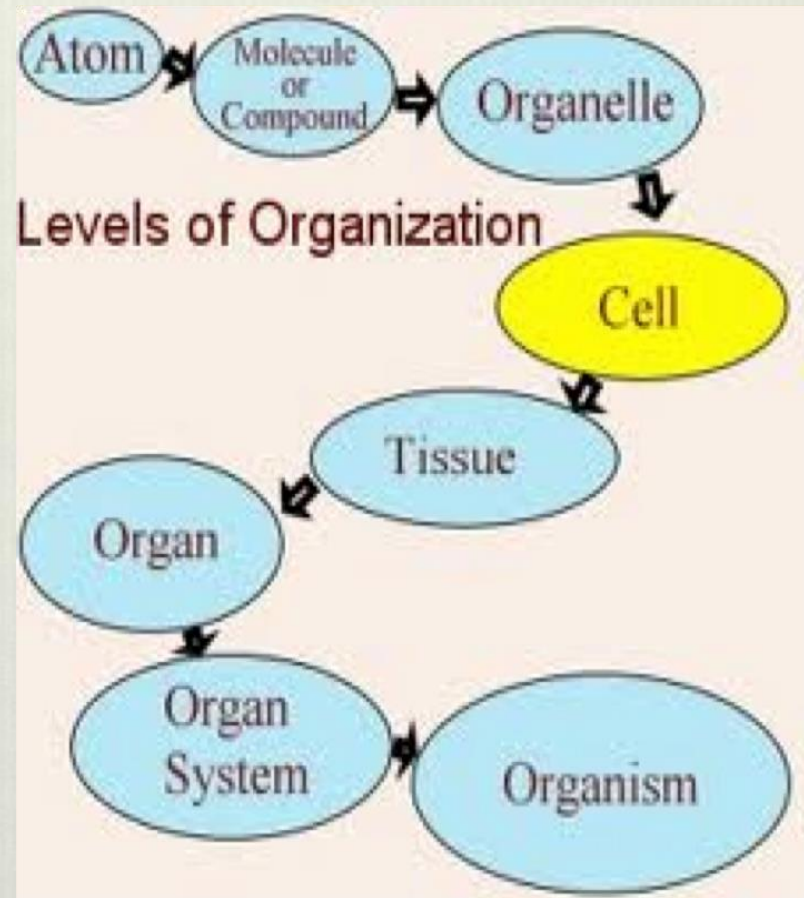
❖ Cells → Tissues →
Organs → Systems

Cells – basic unit of life

Tissues – groups of cells with similar structure and function.

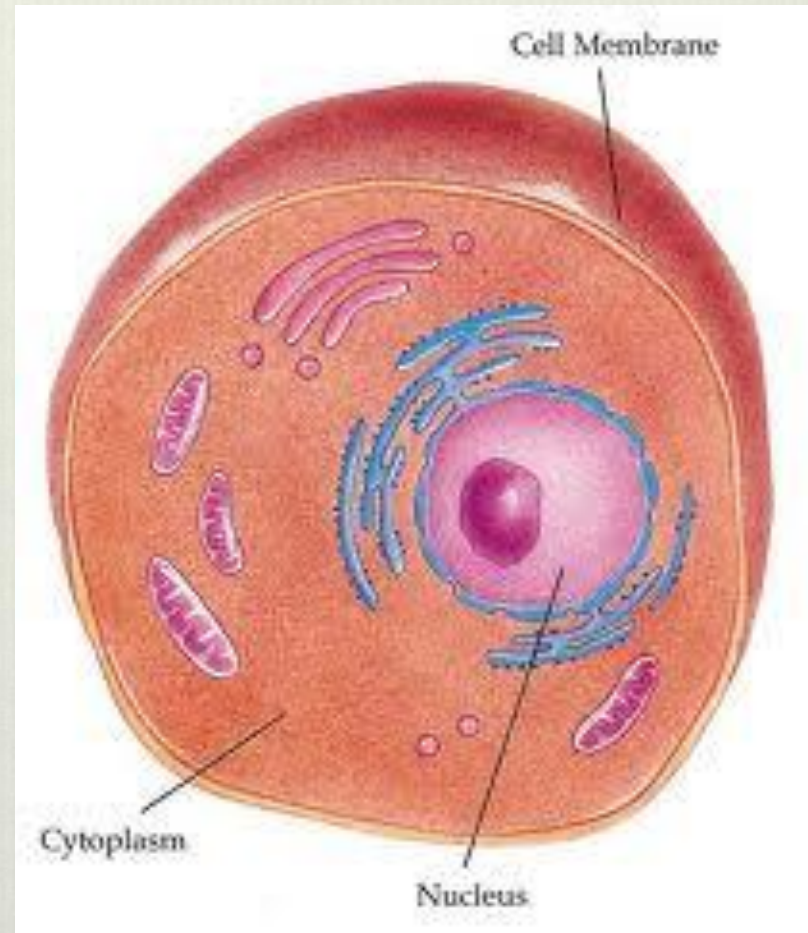
Organs – different tissues working together to do a special function

Organ Systems – several organs working together



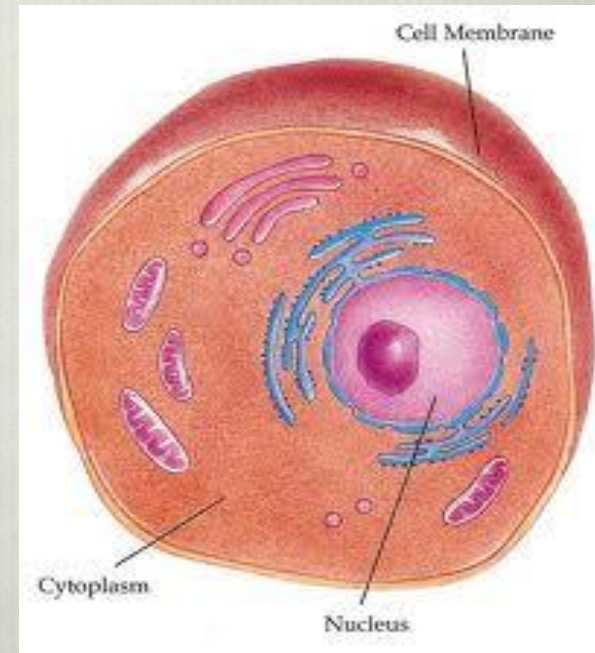
Animal Cells

- ❖ All Animal Cells have 3 main parts:
 1. The **Nucleus**
 2. The **Cytoplasm** or **Cytosol**
 3. The **Cell Membrane** or **Plasma Membrane**



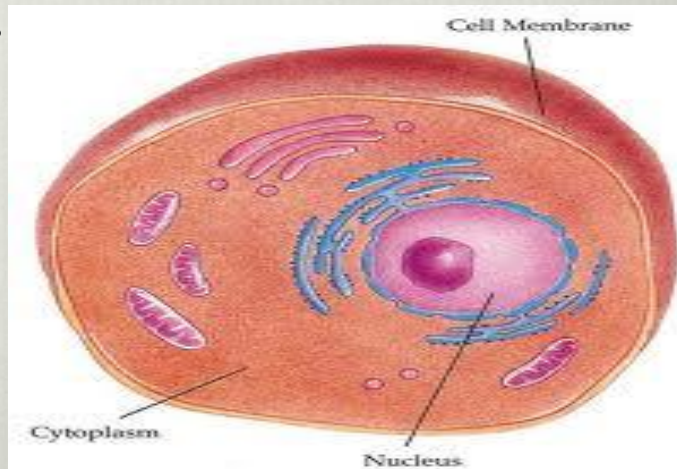
The Cytoplasm

- ❖ The fluid portion of the cell outside the nucleus.
- ❖ Contains many **ORGANELLES**. (little organs)
- ❖ A few important organelles include:
 - ❖ **Endoplasmic Reticulum (ER)**
 - ❖ **Ribosomes**
 - ❖ **Golgi Body**
 - ❖ **Mitochondria**



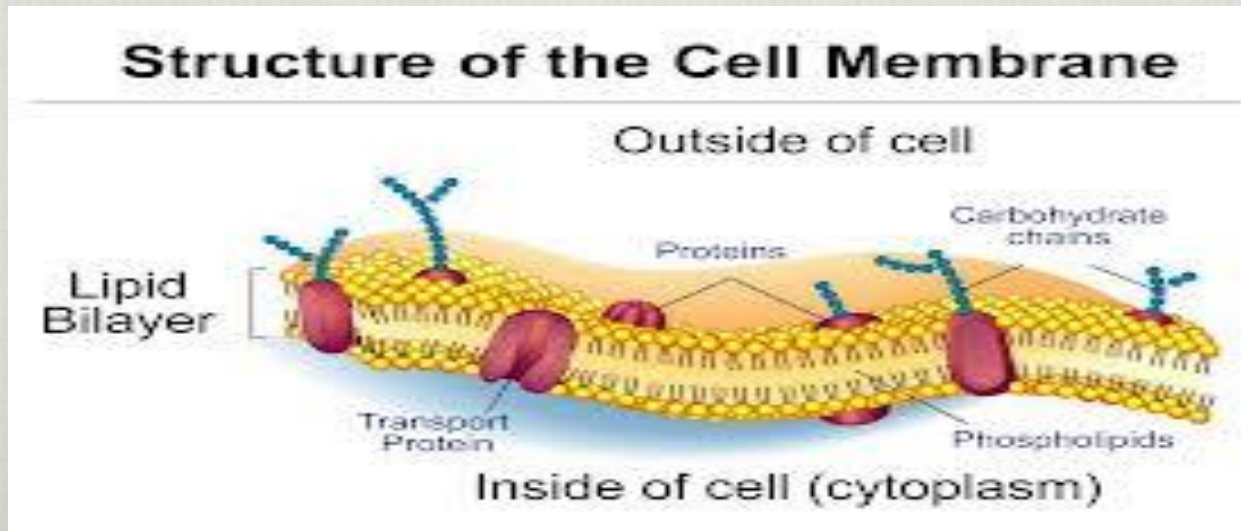
The Nucleus

- ❖ The Nucleus **controls** all cell activities.
- ❖ It houses all **genetic information** (DNA), which codes for **making proteins**. This determines the characteristics of the cell and the entire organism!
- ❖ The **Nuclear Envelope** encloses the nucleus & separates it from the cytoplasm.



The Cell Membrane

- ❖ The **Cell Membrane** or **Plasma Membrane** is a barrier around the cell.
- ❖ Consists of a **Fatty (Lipid) Bilayer**.
- ❖ **Regulates** what goes in and out of the cell.



Tissues

❖ Tissues are **groups of similar cells with similar structure that perform a similar function.**

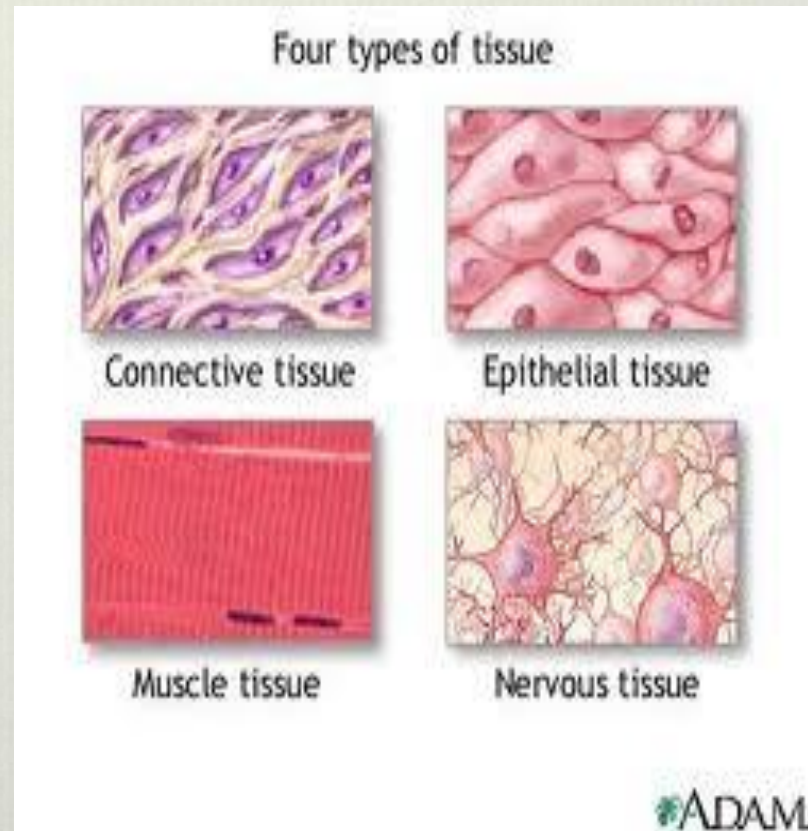
❖ Division of Labor:

A. **Epithelial**

B. **Muscle**

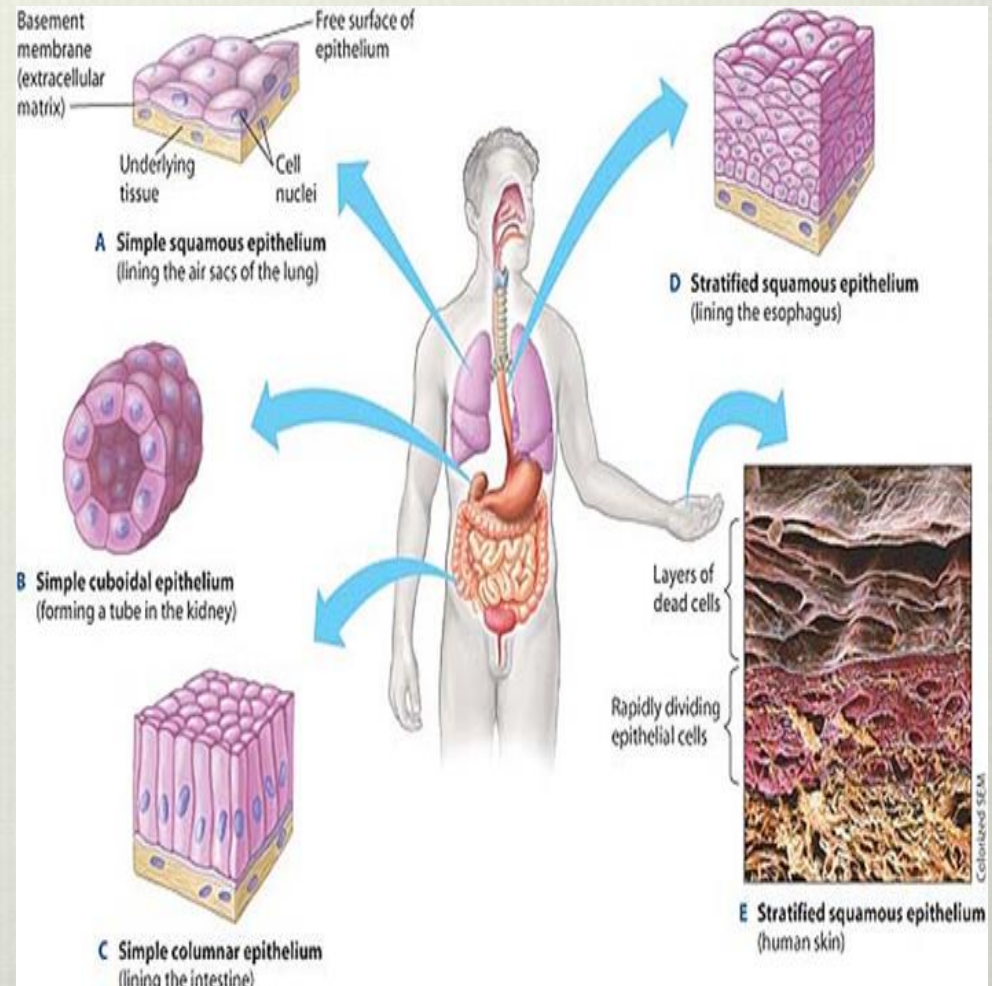
C. **Connective**

D. **Nervous**



Epithelial Tissue

- ❖ **Covers and protects external & internal body surfaces.**
- ❖ Skin, lining of digestive tract, blood vessels, heart, lungs, glands, kidneys
- ❖ **Cells fit closely together and may form layers.**
- ❖ **Cells regenerate quickly & easily.**



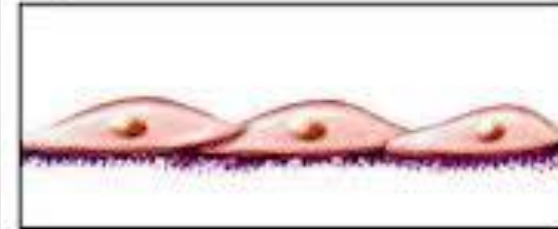
Types of Epithelial Tissue

- ❖ Classified by shape:
 - ❖ **Squamous** or FLAT
 - ❖ **Cuboidal** or CUBE
 - ❖ **Columnar** or RECTANGULAR

Single Layer = **SIMPLE**

More Layers = **STRATIFIED**

Squamous

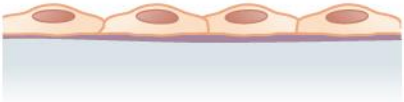
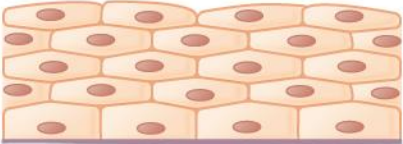


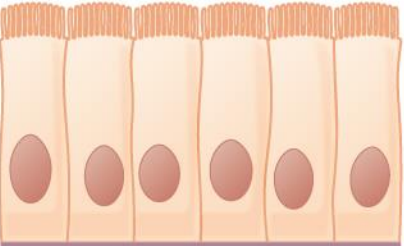
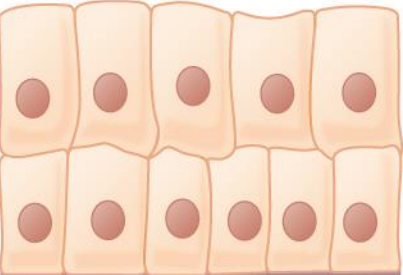
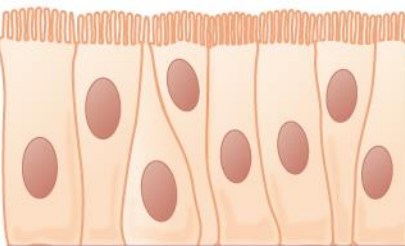


Cuboidal



Columnar



	Simple	Stratified	
Squamous	 <p>Simple squamous epithelium</p>	 <p>Stratified squamous epithelium</p>	
Cuboidal	 <p>Simple cuboidal epithelium</p>	 <p>Stratified cuboidal epithelium</p>	
			Pseudostratified
Columnar	 <p>Simple columnar epithelium</p>	 <p>Stratified columnar epithelium</p>	 <p>Pseudostratified columnar epithelium</p>

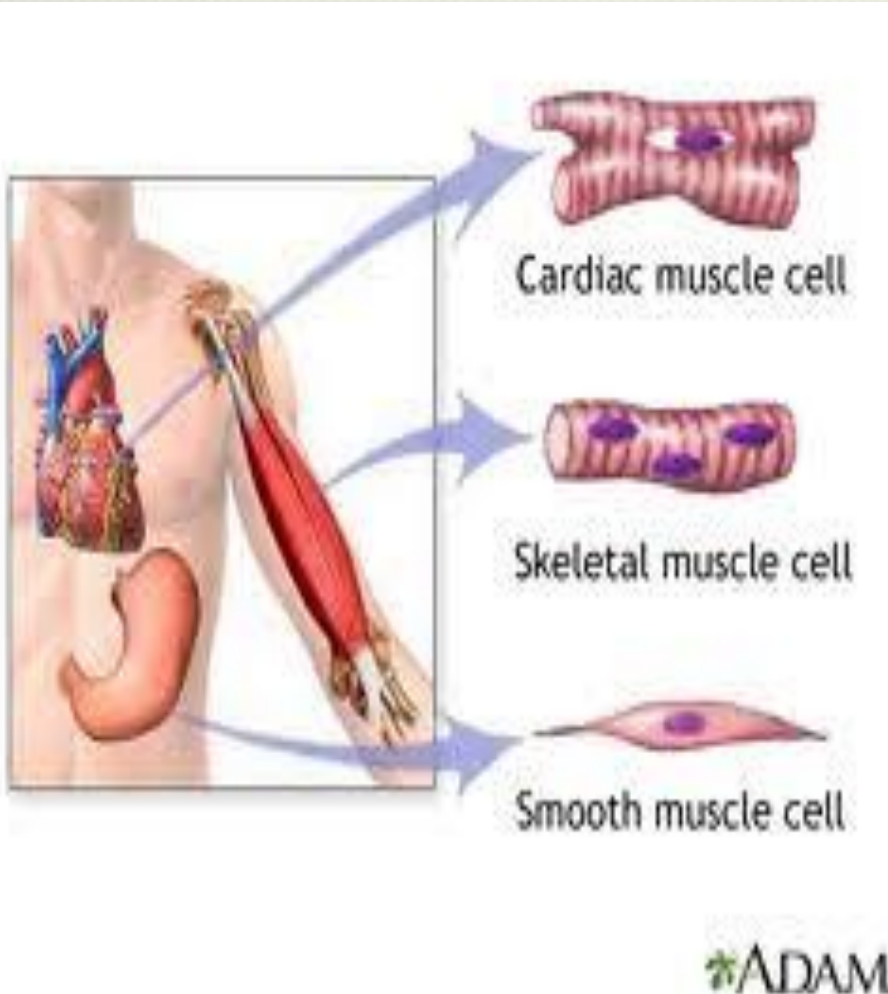
Connective Tissue

- ❖ The **most abundant** and **widely distributed** type of tissue in the body.
- ❖ **Examples:** Bone, Blood, Cartilage, Fat.
- ❖ Multiple functions:
 1. Holds body structures together.
 2. Provides support to other cells and tissues.
 3. Protection.

Muscle Tissue

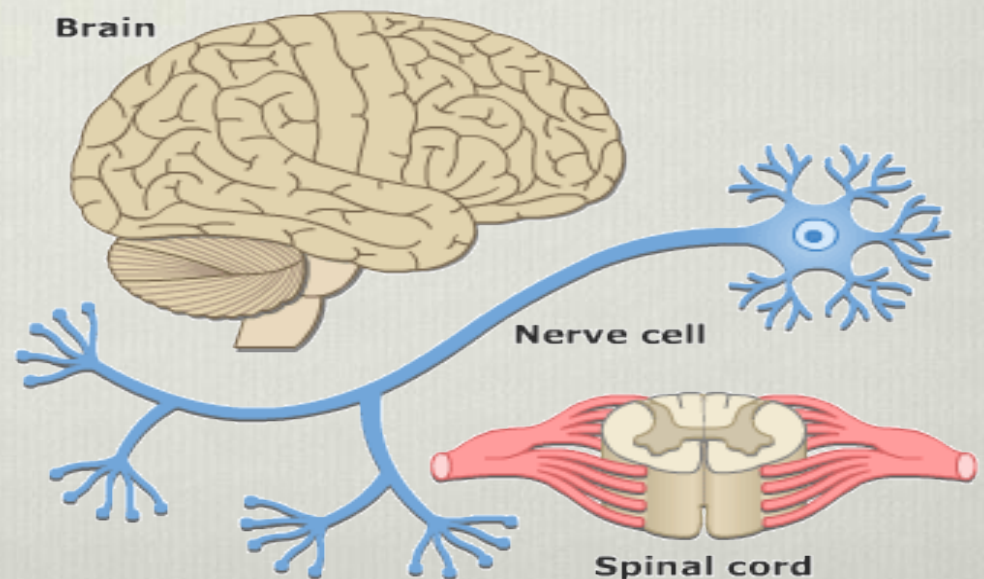
❖ Three types:

1. **Cardiac** – Only in the heart. Contract independently. Cells are branched & striated.
2. **Skeletal** – Moves bones & skin. Under voluntary control. Cells are multinucleate, striated, cylindrical.
3. **Smooth** – Lines digestive tract & blood vessels. Involuntary. No striations, single nucleus.



Nervous Tissue

- ❖ Includes the **brain, spinal cord** and individual **nerves** throughout the body.
- ❖ Cells are called **Neurons**.
- ❖ Neurons **send and receive electrical and chemical stimuli**.



Body Regions and Planes

- ❖ Regions:

- ❖ Anterior & Posterior

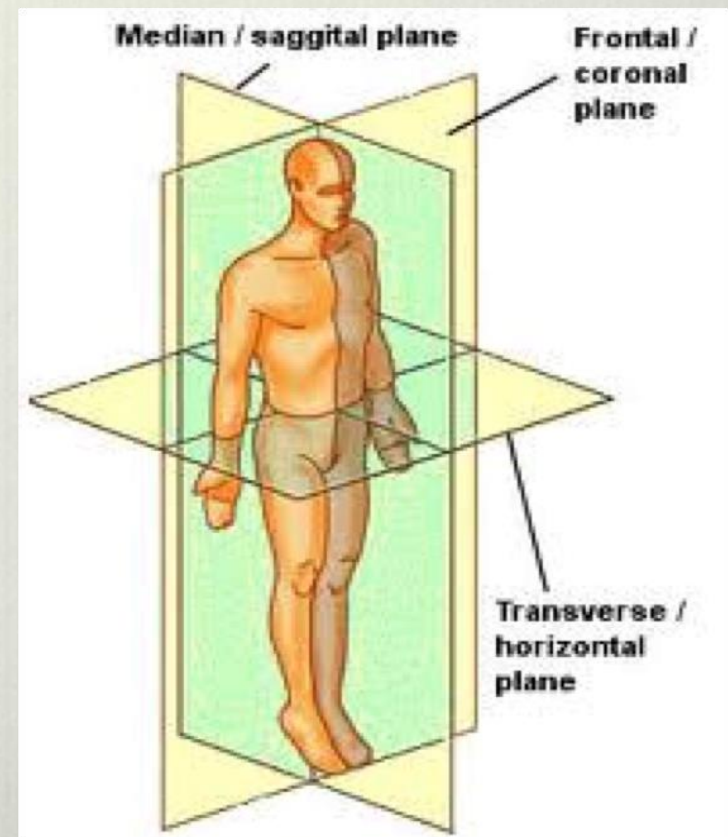
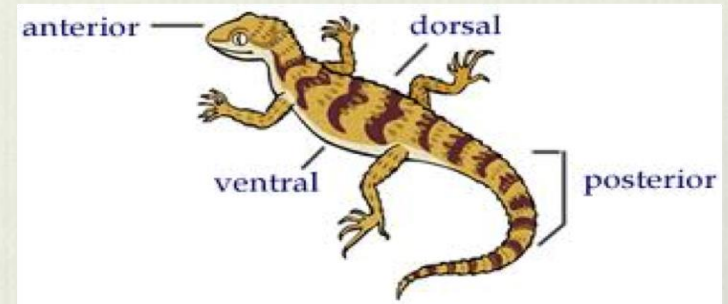
- ❖ Ventral & Dorsal

- ❖ Planes:

- ❖ Frontal/Coronal

- ❖ Median/Sagittal

- ❖ Transverse/Horizontal



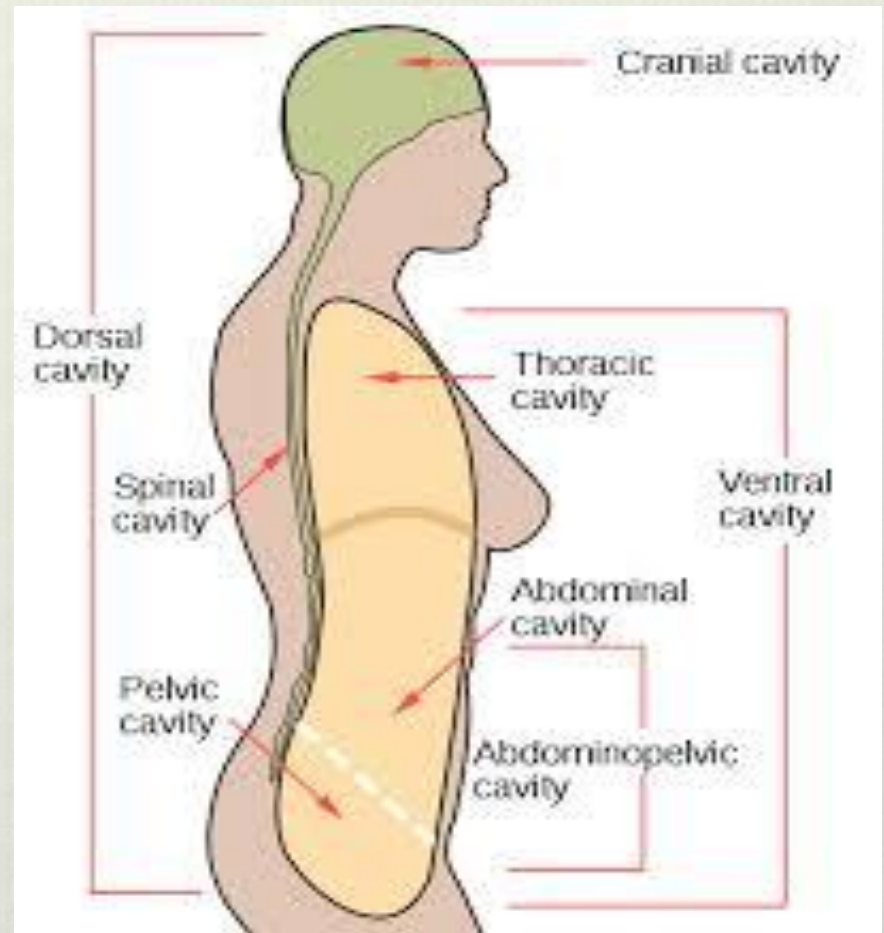
Body Cavities

❖ Dorsal Cavity:

- ❖ Cranial
- ❖ Spinal

❖ Ventral Cavity:

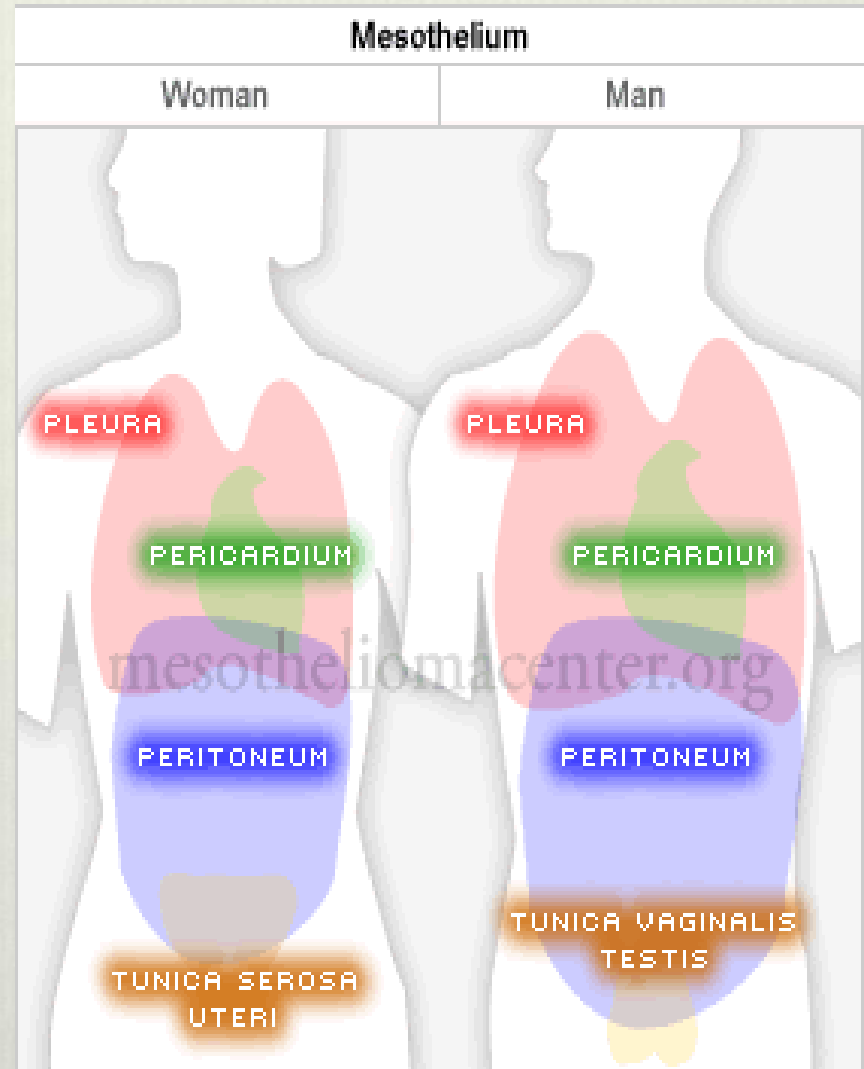
- ❖ Thoracic
- ❖ Abdominal
- ❖ Pelvic



SEPARATED BY A MUSCULAR DIAPHRAGM

Body Membranes

- ❖ The organs in body cavities are surrounded by membranes:
 - ❖ **Pleural Membrane:** covers the lungs.
 - ❖ **Pericardium:** covers the heart.
 - ❖ **Peritoneum:** lines the abdominal cavity.
- ❖ Fluids **lubricate & reduce friction** between organs.



Organ Systems

- ❖ **Groups of organs working together to perform a particular function for the body.**
- ❖ **There are 10 major organ systems.**
- ❖ Go to www.innerbody.com/html/body.html
- ❖ Complete the chart for each body system by reading the introductory paragraph. (The male & female reproductive system counts as 1 system. Plus- OMIT immune/lymphatic system)