Tissue and membrane

Cell Structure and Function

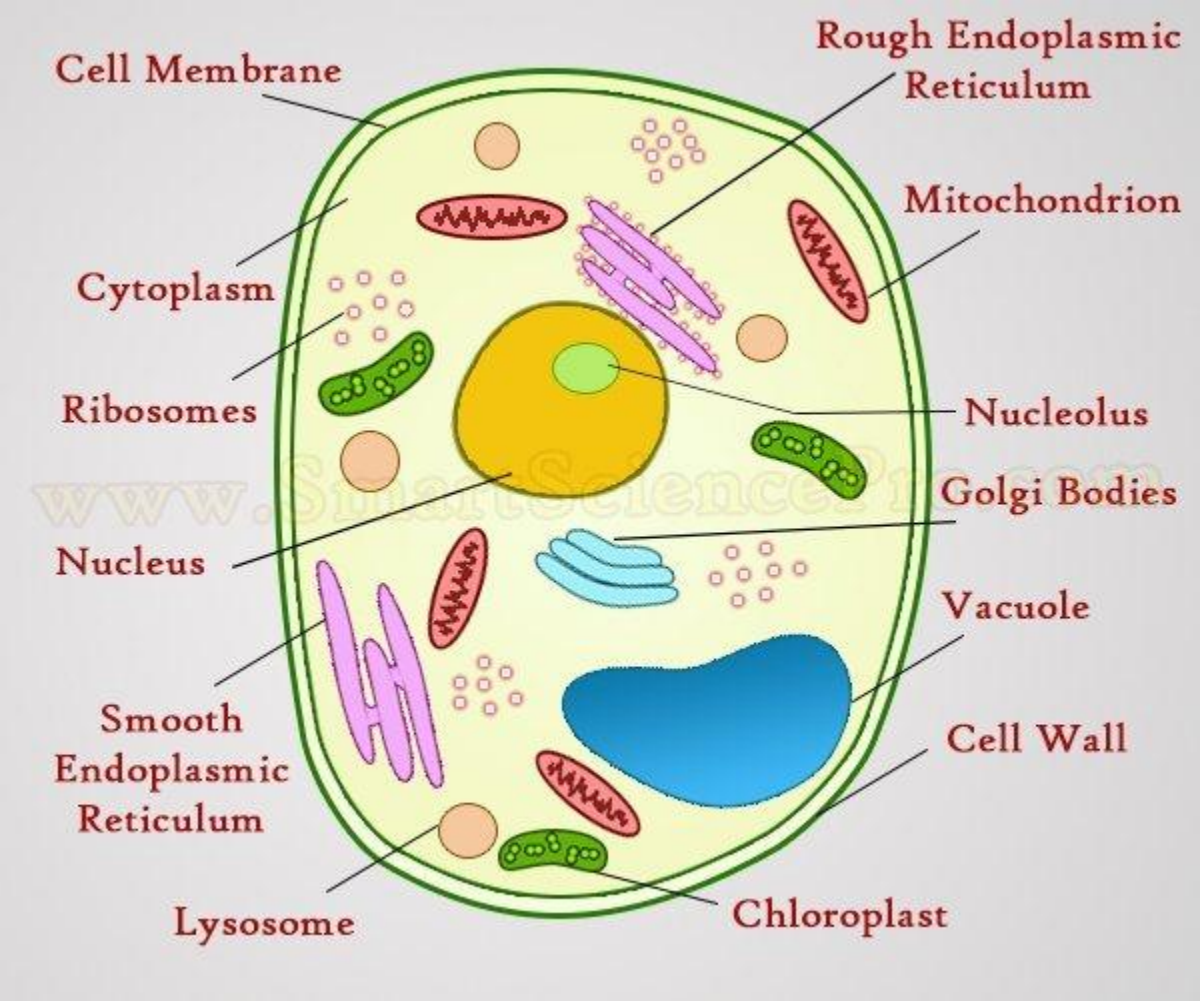
A cell is the basic unit of life

All cells have three main regions:

1) Nucleus

2) Cytoplasm

3) Plasma membrane



Human cells contain the following major part:

1-Cell membrane it is outer layer of the cell, Composed mainly of lipid and proteins, surrounding the cell to control the entry and exit of certain substances.

2-Cytoplasm: It is made up of a jelly-like fluid (called the cytosol). It is which protects the cell by keeping the cell organelles separate from each other. This helps to keep a cell in stable. Cytoplasm is the site, where many vital biochemical reactions take place.

3-Nucleus: Large, dark-staining body near the center of the cell; composed of DNA and protein

4-Nucleolus: small body found inside the nucleus. Composed of DNA, RNA,and protein

5-Endoplasmic reticulum: Network of membrane in the cytoplasm. used for storage and transport: hold ribosomes

6-Ribosome: Small bodies in the cytoplasm composed of RNA and protein

7-Mitochondria: Large organelles with folded membranes inside, manufacture energy.

8-Golgi Bodies: layer of membranes.put together special substance such as mucus.

9-Lysosomes: Small sacs of digestive enzymes.

10-Centrioles: Rod-shaped bodies near the nucleus. help separate the chromosomes

11- Cilia: Short hair like projections from the cell, create movement around cell.

Tissue definition & classification

A tissue is composed of specialized cells of the same type that perform a common function in the body.

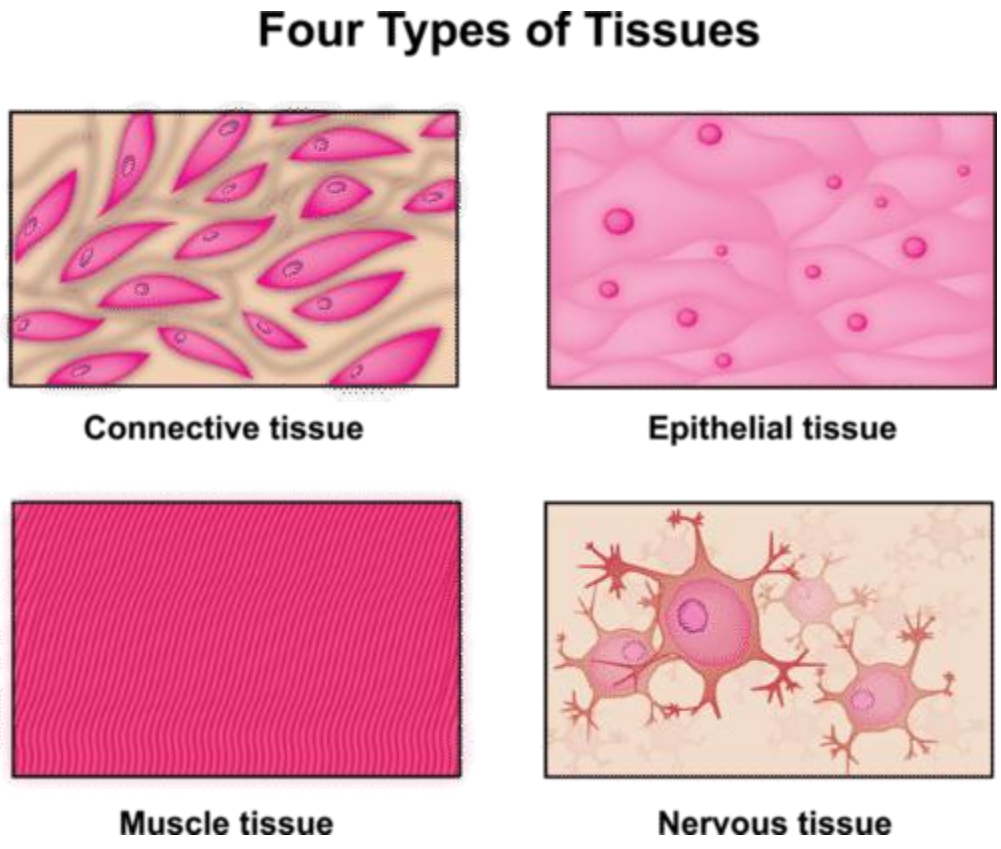
The tissues of the human body can be categorized into four major

1-Epithelial tissue

2-connective tissue

3. Muscular tissue

4. Nervous tissue



Types	Funuction	Example
1. Epithelial tissue	Protection	Skin
2. Connective tissue	Support	Bones
3. Muscular tissue	Movment	Skeletal
4. Nervous tissue	Communication	Brain

1-Epithelial tissue

forms coverings and linings throughout the body.

They are classified according to the number of structural layers into simple and stratified epithelium.

1. **Simple epithelium, it includes:**

a. Simple squamous epithelium:

This type of tissues is found in the following parts in the body:

1-lining the inside of the blood vessels [endothelium]

2- lining the inside of the lung cavities [mesothelium]

3- lining the inside of the mouth and esophagus

b. Simple cuboidal epithelium:

This type of tissues is found in the following parts in the body:

- lining the tubules within the kidney

- lining the ducts of many glands

c. Simple columnar epithelium:

This type of tissues is lining the stomach and the intestines.

d. Pseudostratified epithelium:

It is a simple epithelium consists of many types of cells arranged in different levels and therefore it gives this tissue a pseudostratified shape. Non-ciliated pseudostratified columnar epithelia are located in the membranous part of male vas deferens, while ciliated type of this tissue is found in the trachea.

2- Stratified epithelium:

This type of epithelium consists of many cell layers. There are also many types of this epithelium:

a. Stratified squamous epithelium:

There are two types of this tissue: Keratinized which is found in the skin (epidermis), and non-keratinized, which found in the mouth and vagina.

b. Stratified cuboidal epithelium:

This type is found in the ducts of the glands.

c. Stratified columnar epithelium:

This type is found in the conjunctiva.

3- Transitional epithelium:

it is so-called because of the gradual changes in the shapes of the apical cells as the bladder fills with urine. It is found only in the urinary system, specifically the ureters and urinary bladder. It appears thicker and more multi-layered when the bladder is empty, and more stretched out and less stratified when the bladder is full and distended.



(a) Squamous



(b) Cuboidal



(c) Columnar (Ciliated)



(d) Stratified squamous

2. Connective tissue: protects and supports the body and its organs. Various types of connective tissue bind organs together, store energy reserves as sfat, and help provide immunity to disease-causing organisms.

classified according to its degree of hardness:

A- Soft Connective Tissue

-fibrous connective tissue. consists of

adipose tissue(store fat)

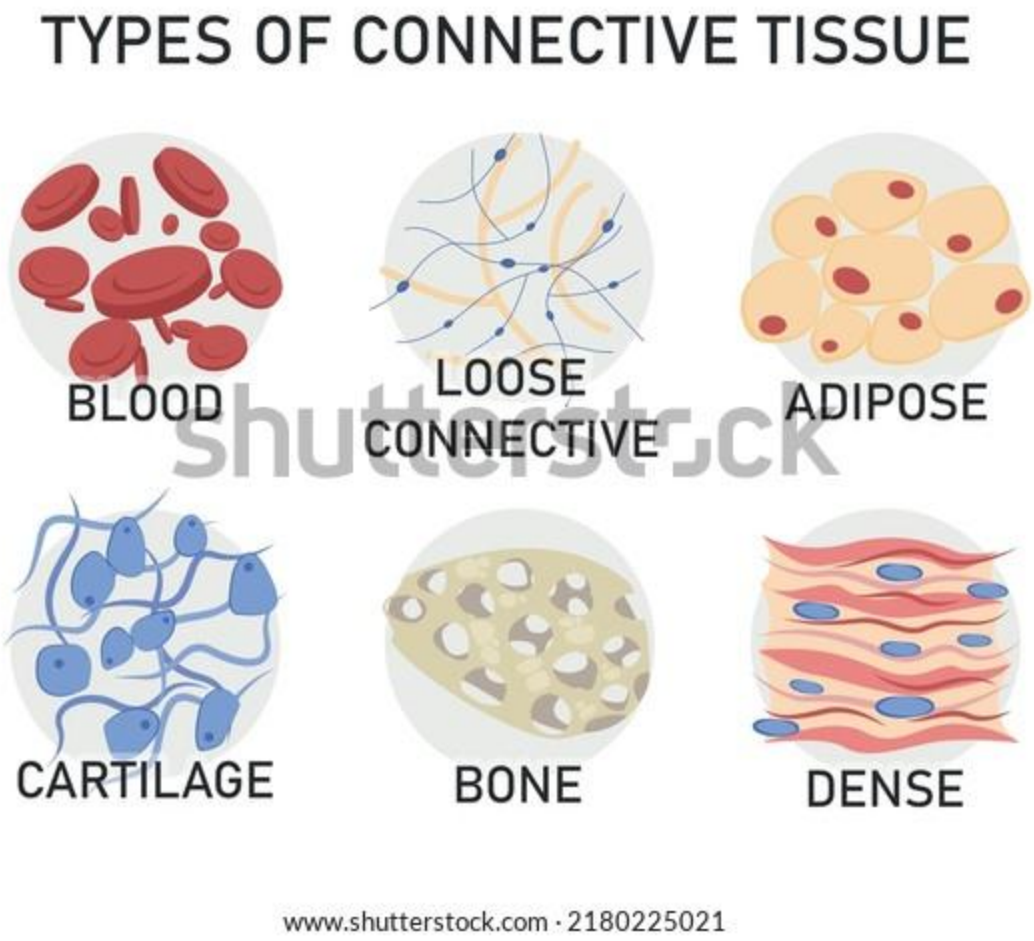
(consists elastic fibers)

B- Hard Connective Tissue. Consists of

cartilage and bone

C- Liquid Connective tissue consists of

Tissue blood and lymph



3-Muscular tissue

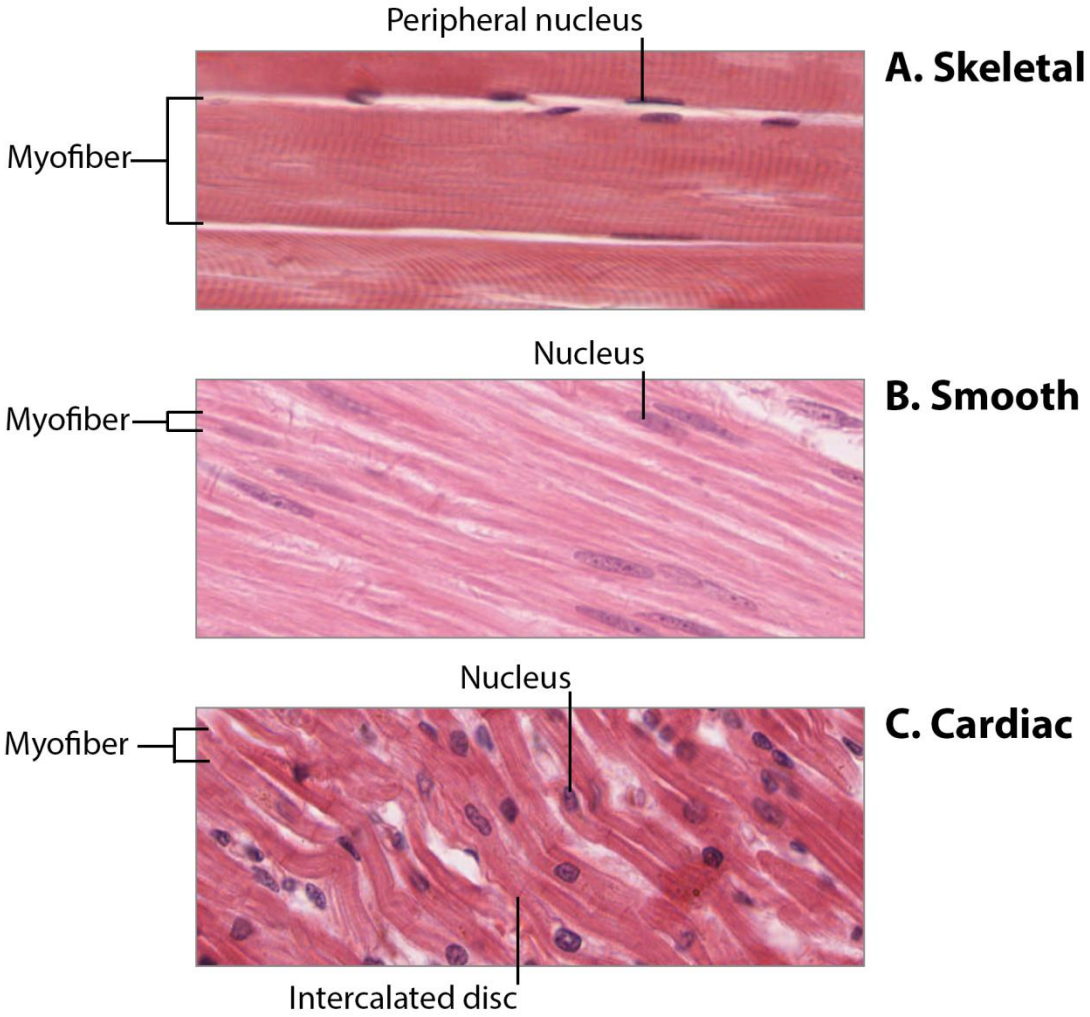
is specialized to contrat. It is composed of cells called muscle fibers, which contain actan and myosin filaments.

The three types of muscular tissue are skeletal, smooth, and cardiac.

1-Skeletal muscle is found through the body attached to bones via tendons

2-Smooth muscle is found in the walls of viscera

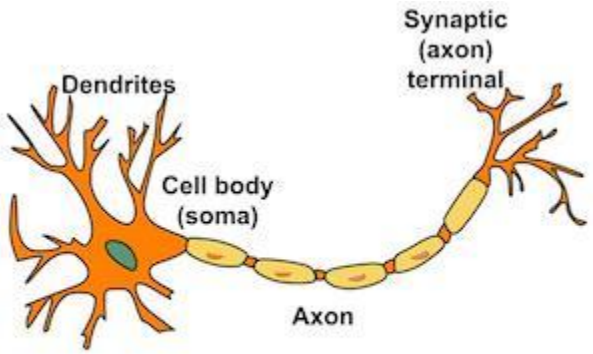
3-Cardiac muscle is found only in the walls of the heart.



4-Nervous tissue

consists of nerve cells, called neuronsthe cells that support and nourish the neurons.

A neuron is a specialized cell that has three parts: dendrites, a cell body, and an axon.



Body membranes

thin sheets of tissue that cover the body, line body cavities,

Membranes are composed of lipids, proteins and sugars