



Science-Infused Biology Online Learning

Let's
study!

Cell Types

Prepared by:



Biological Levels of Organization

CELL > TISSUES > ORGAN > ORGAN SYSTEM > ORGANISM

Four Main Types of Cell

- 1. EPITHELIAL CELLS**
- 2. CONNECTIVE TISSUE CELLS**
- 3. MUSCLE CELLS**
- 4. NERVE CELLS**

TISSUE

- A group of cells that possess a similar structure and perform a specific function.
- The word tissue originates from

French, which means “to weave.”

Four Basic Types of Tissues

1. EPITHELIAL TISSUE

2. CONNECTIVE TISSUE

3. MUSCLE TISSUE

4. NERVE TISSUE



1. Epithelial Tissue

1.

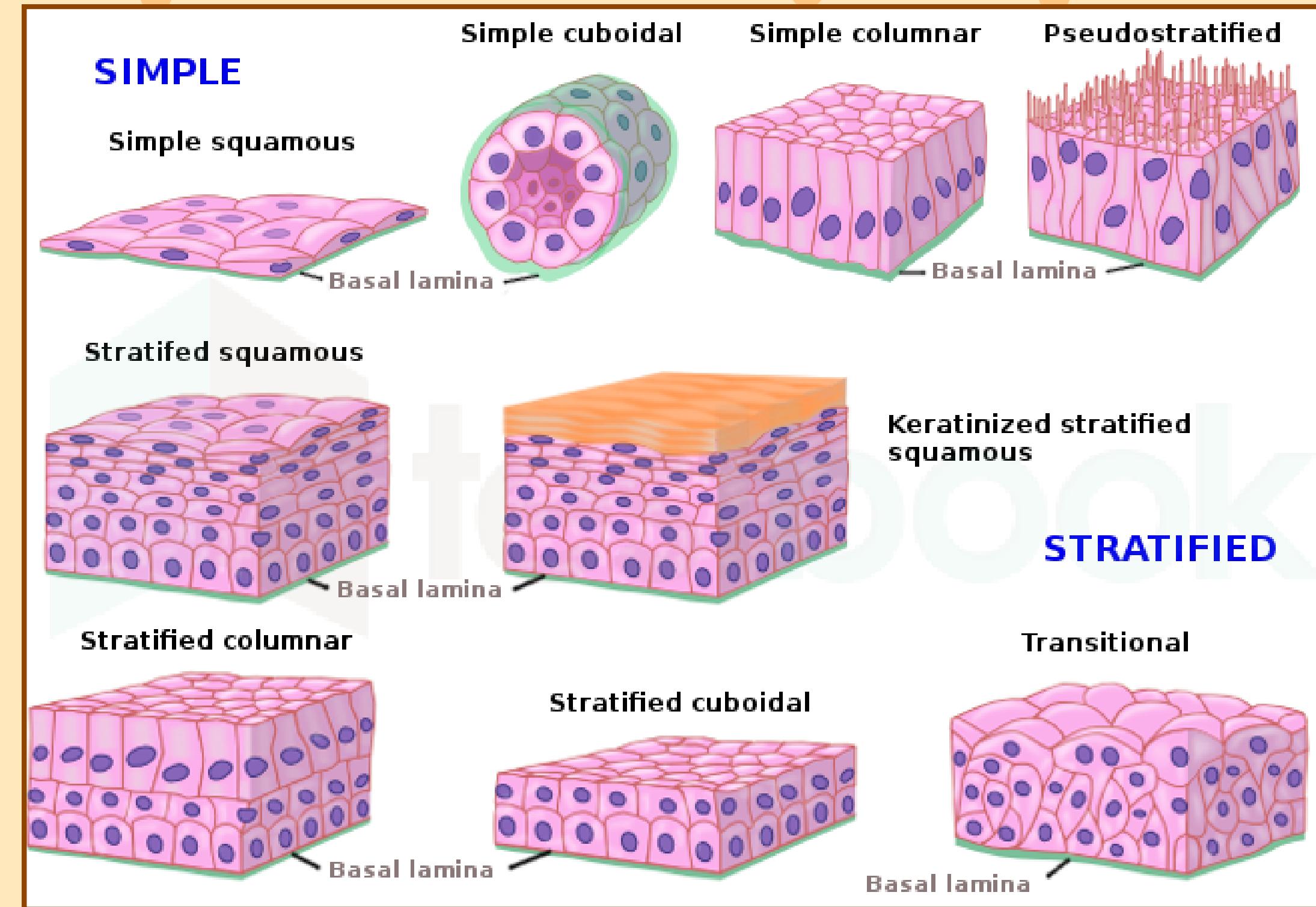
EPITHELIAL TISSUE

- Occurs as sheets of tightly packed cells that cover body surfaces and line internal organs and cavities.
- They are characterized by closely joined cells with tight junctions (i.e., a type of cell modification).

CELLS THAT MAKE UP EPITHELIAL TISSUES CAN HAVE DISTINCT ARRANGEMENTS:

- 1. Simple Squamous**
- 2. Simple Cuboidal**
- 3. Simple Columnar**
- 4. Pseudostratified Columnar**
- 5. Stratified Squamous**
- 6. Stratified Cuboidal**
- 7. Transitional**

CELLS THAT MAKE UP EPITHELIAL TISSUES CAN HAVE DISTINCT ARRANGEMENTS:



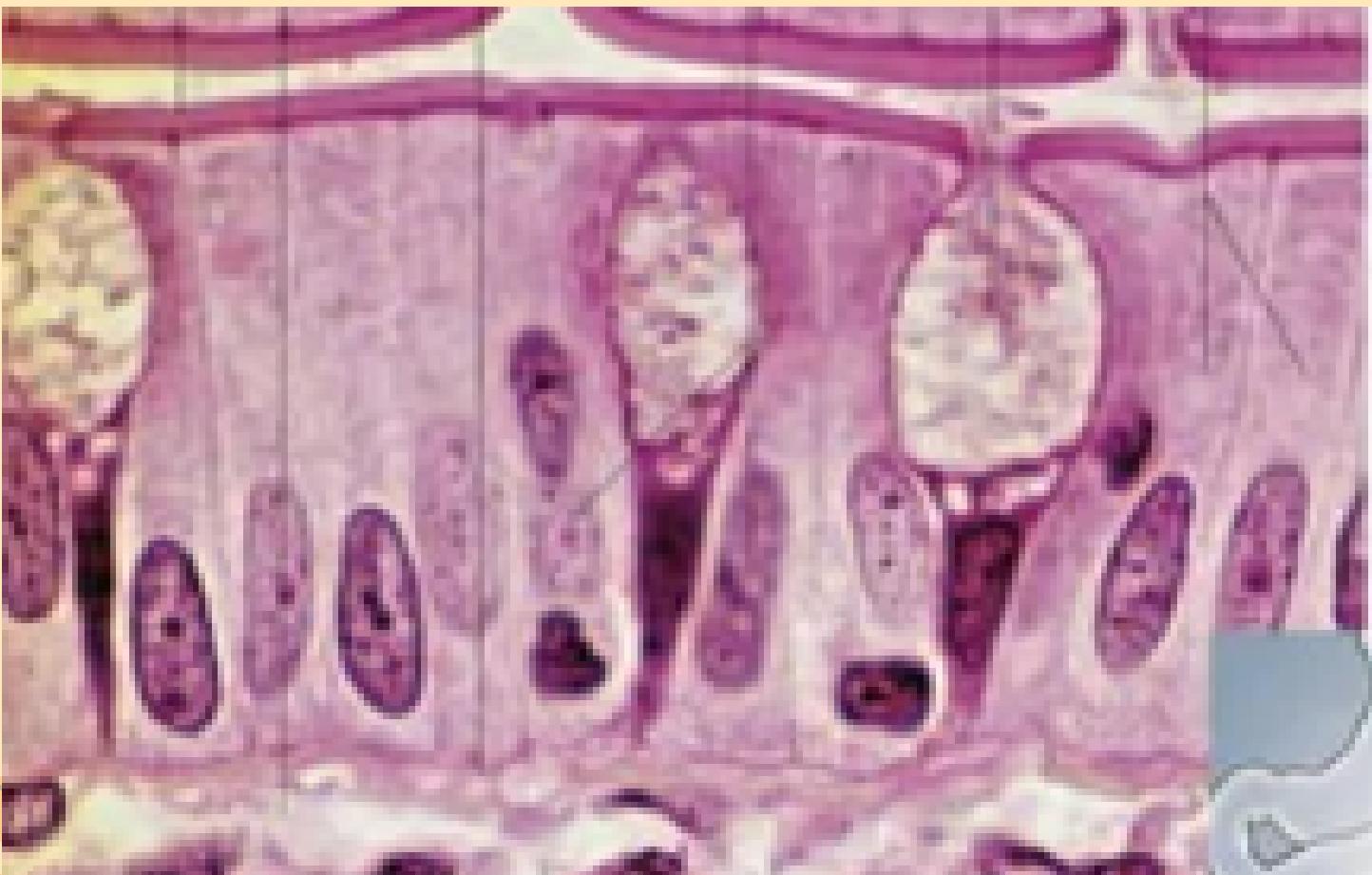
SIMPLE SQUAMOUS

- Cells are flat in shape and arranged in a single layer
- This single layer is thin enough to form a membrane that compounds can move through via passive diffusion
- This epithelial type is found in the walls of capillaries, linings of the pericardium, and the linings of the alveoli of the lungs.

SIMPLE CUBOIDAL

- The important functions of the simple cuboidal epithelium are secretion and absorption.
- This epithelial type is found in the small collecting ducts of the kidneys, pancreas, and salivary glands.

SIMPLE COLUMNAR



- These cells are found in areas with high secretory function (such as the wall of the stomach), or absorptive areas (as in small intestine).

PSEUDO-STRATIFIED COLUMNAR

- Found most heavily along the respiratory tract
- Help trap and transport particles brought in through the nasal passages and lungs.

STRATIFIED SQUAMOUS

- Found in the skin
- It covers the external dry surface of the skin
- Serves the function of protection from wear and tear.

STRATIFIED CUBOIDAL

- They protect areas such as ducts of sweat glands, mammary glands, and salivary glands. stratified squamous epithelium

TRANSITIONAL EPITHELIUM

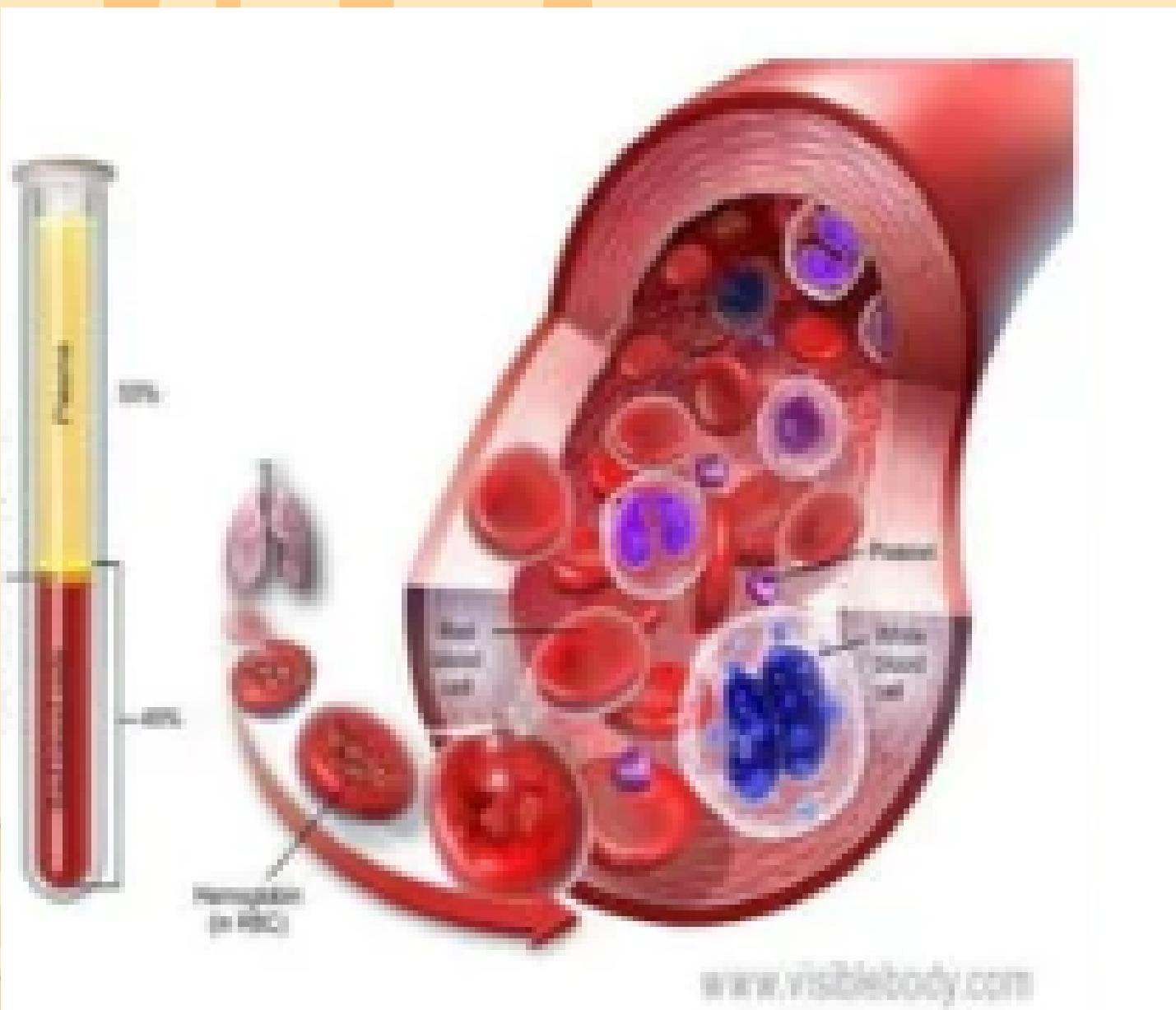
- The primary function is to enable tissue to contract and expand.

2. Connective Tissue

CONNECTIVE TISSUES ARE COMPOSED OF:

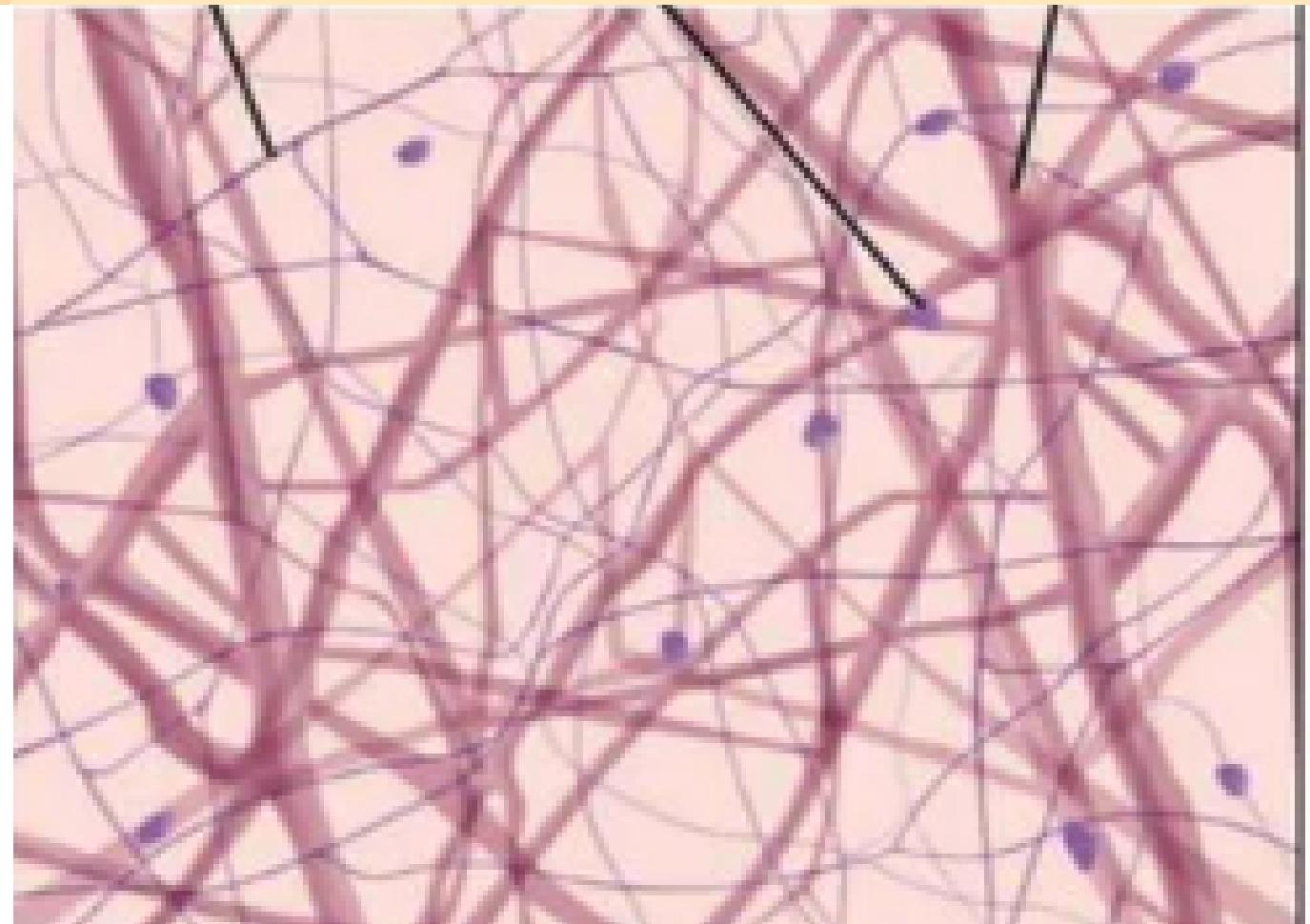
- 1. Blood**
- 2. Connective Tissue (CTP)**
- 3. Cartilage**
- 4. Bone**

BLOOD



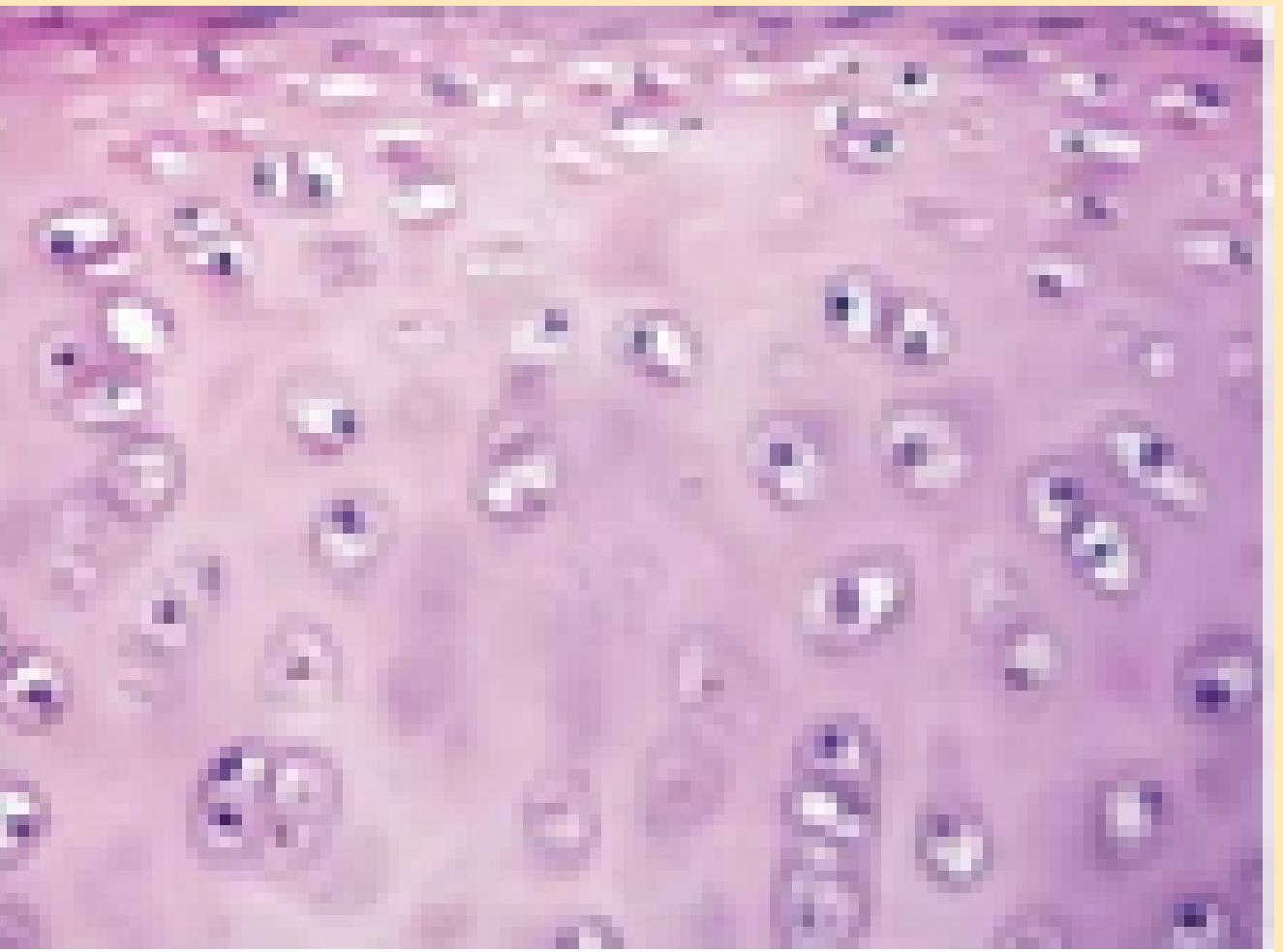
- Made up of plasma; contains water, salts, and dissolved proteins; erythrocytes that carry oxygen (RBC), leukocytes for defense (WBC), and platelets for blood clotting.

CONNECTIVE TISSUE PROPER (CTP)



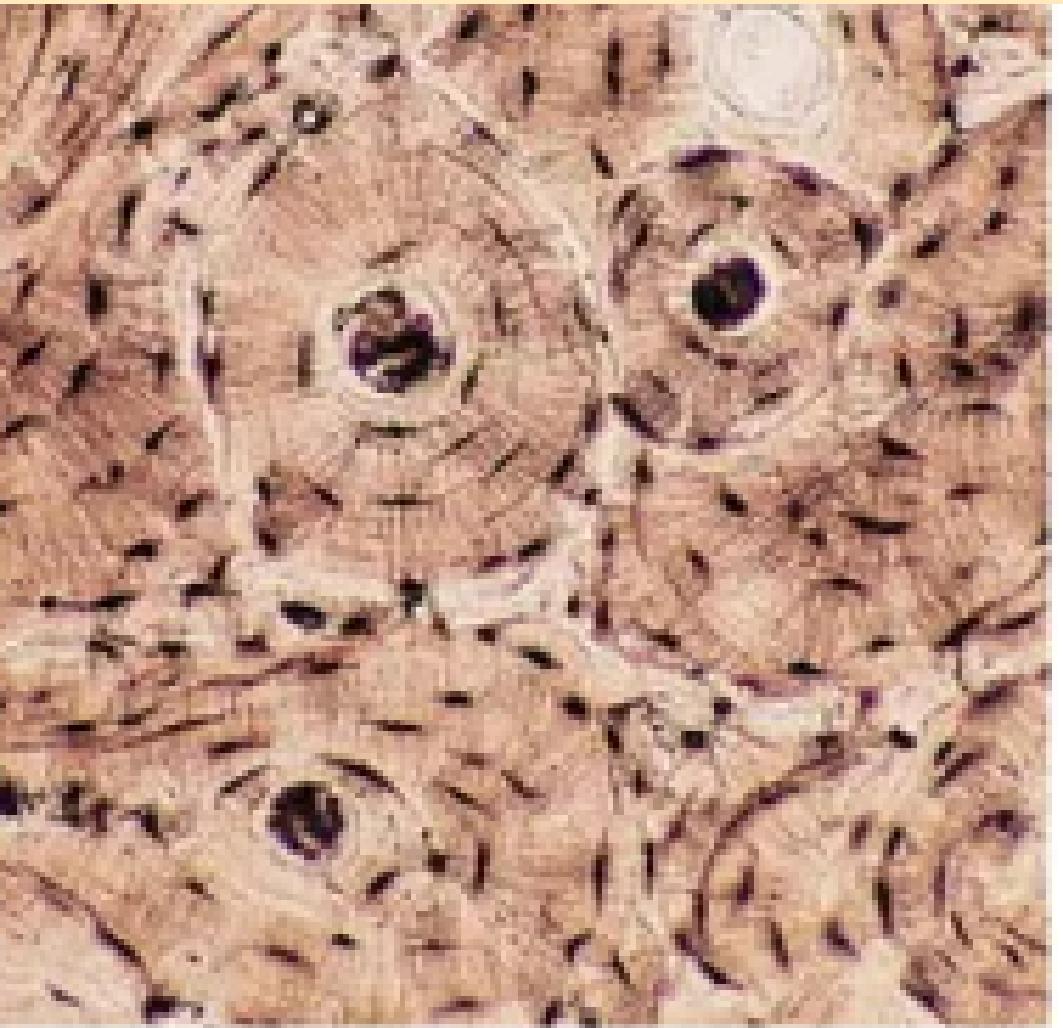
- **Made up of loose connective tissue that is found in the skin and fibrous connective tissue that is made up of collagenous fibers found in tendons and ligaments.**
- **Adipose tissues are also examples of loose connective tissues that store fats which functions to insulate the body and store energy.**

CARTILAGE



- Characterized by collagenous fibers embedded in chondroitin sulfate.
- Chondrocytes are the cells that secrete collagen and chondroitin sulfate.
- Cartilage functions as cushion between bones.

BONE



- Mineralized connective tissue made by bone-forming cells called osteoblasts which deposit collagen.)
- The matrix of collagen is combined with calcium, magnesium, and phosphate ions to make the bone hard.
- Blood vessels and nerves are found at a central canal surrounded by concentric circles of osteons.

3. MUSCLE TISSUE

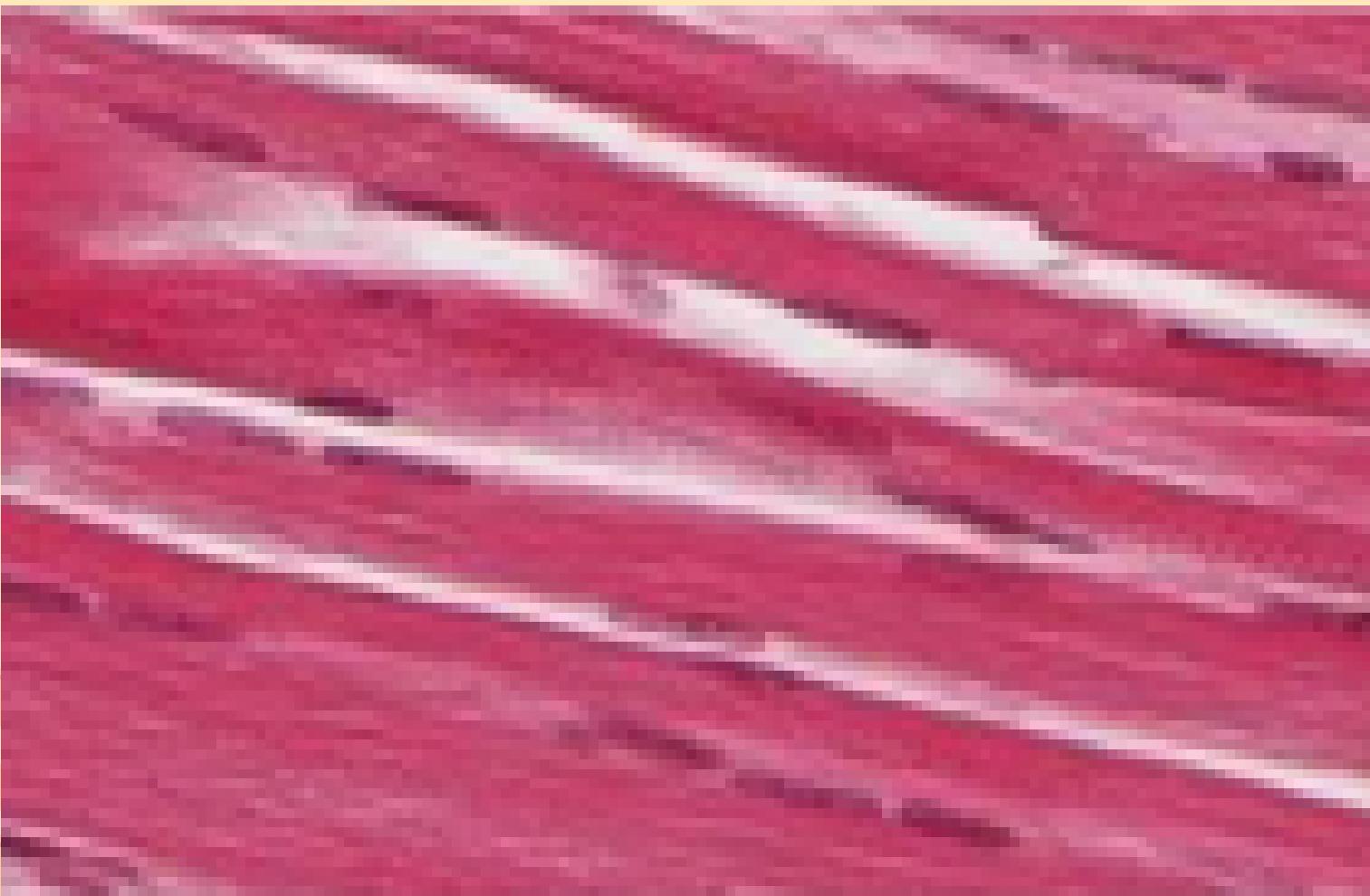
MUSCLE TISSUE

- These tissues are composed of long cells.
- called muscle fibers that allow the body to move voluntary or involuntary.
- Movement of muscles is a response to signals coming from nerve cells.

3 TYPES OF MUSCLE TISSUE

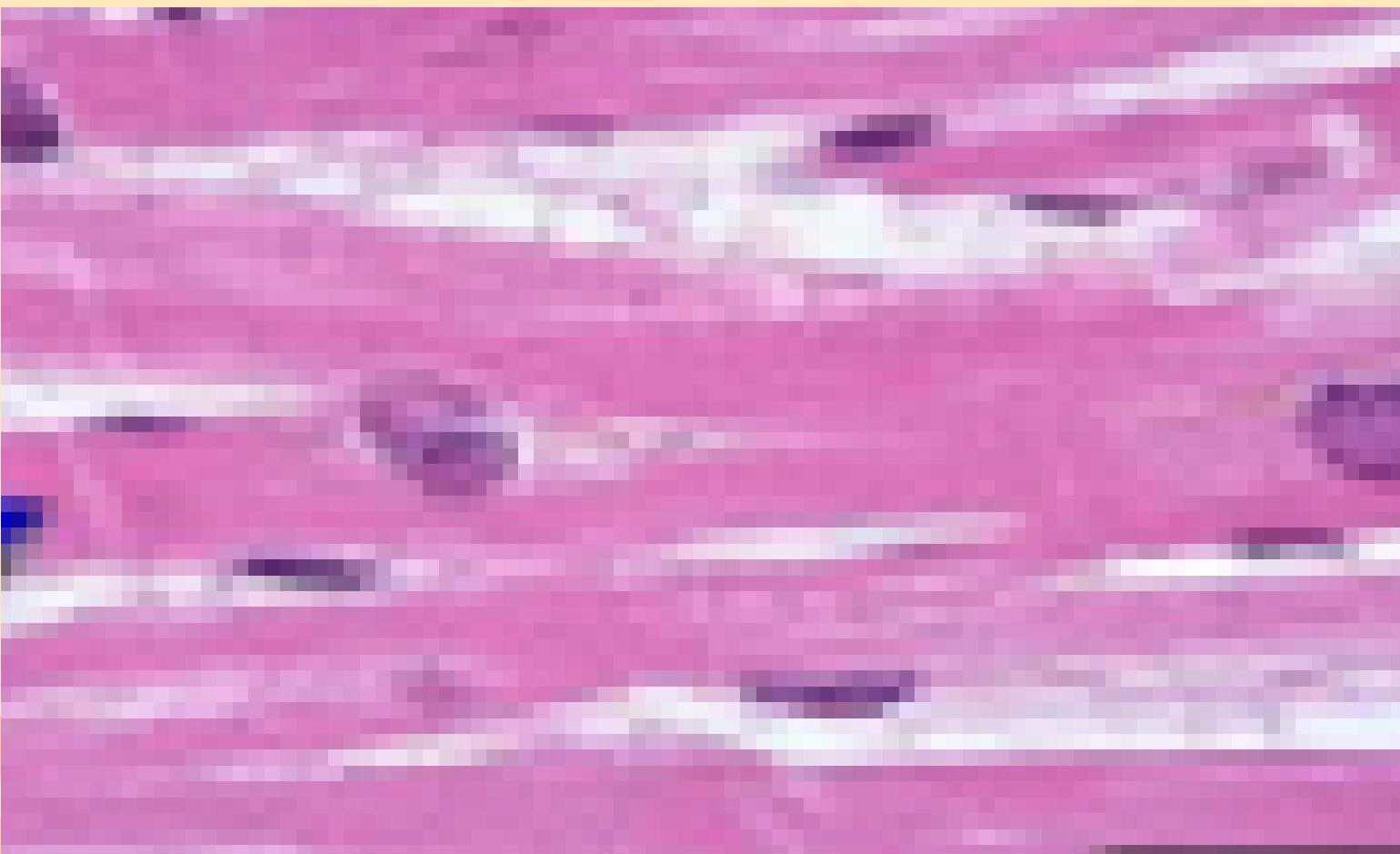
- **Skeletal**
- **Cardiac**
- **Smooth**

SKELETAL

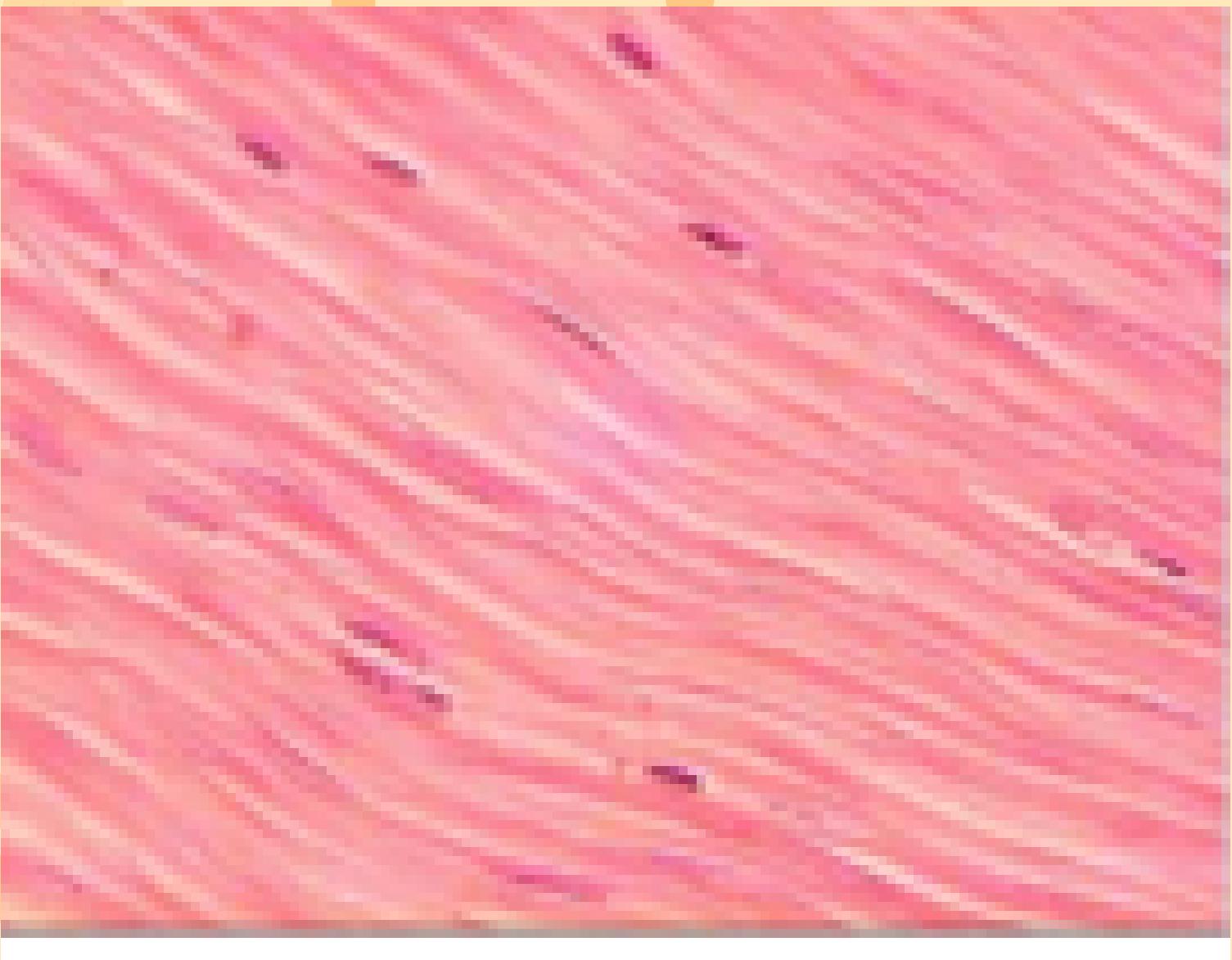


- Striated, voluntary movement
- To generate force to support locomotion and posture.

CARDIAC



- Striated with intercalated disk for synchronized heart contraction; involuntary.
- To pump blood



SMOOTH

- Not striated;
involuntary.
- Can be found in the
intestines, digestive
tract and blood
vessels.
- For digestion and
nutrient collection

4. NERVOUS TISSUE

NERVOUS TISSUE

- Found in the brain, spinal cord, and nerves
- It is responsible for coordinating and controlling many body activities.
- These tissues are composed of nerve cells called neurons and glial cells that function as support cells.

STRUCTURES OF NERVOUS TISSUE

- It is made up of nerve cells or neurons.

Neurons connect to other neurons to send signals.

- Axons
- Cell body
- Dendrite

STRUCTURES OF NERVOUS TISSUE

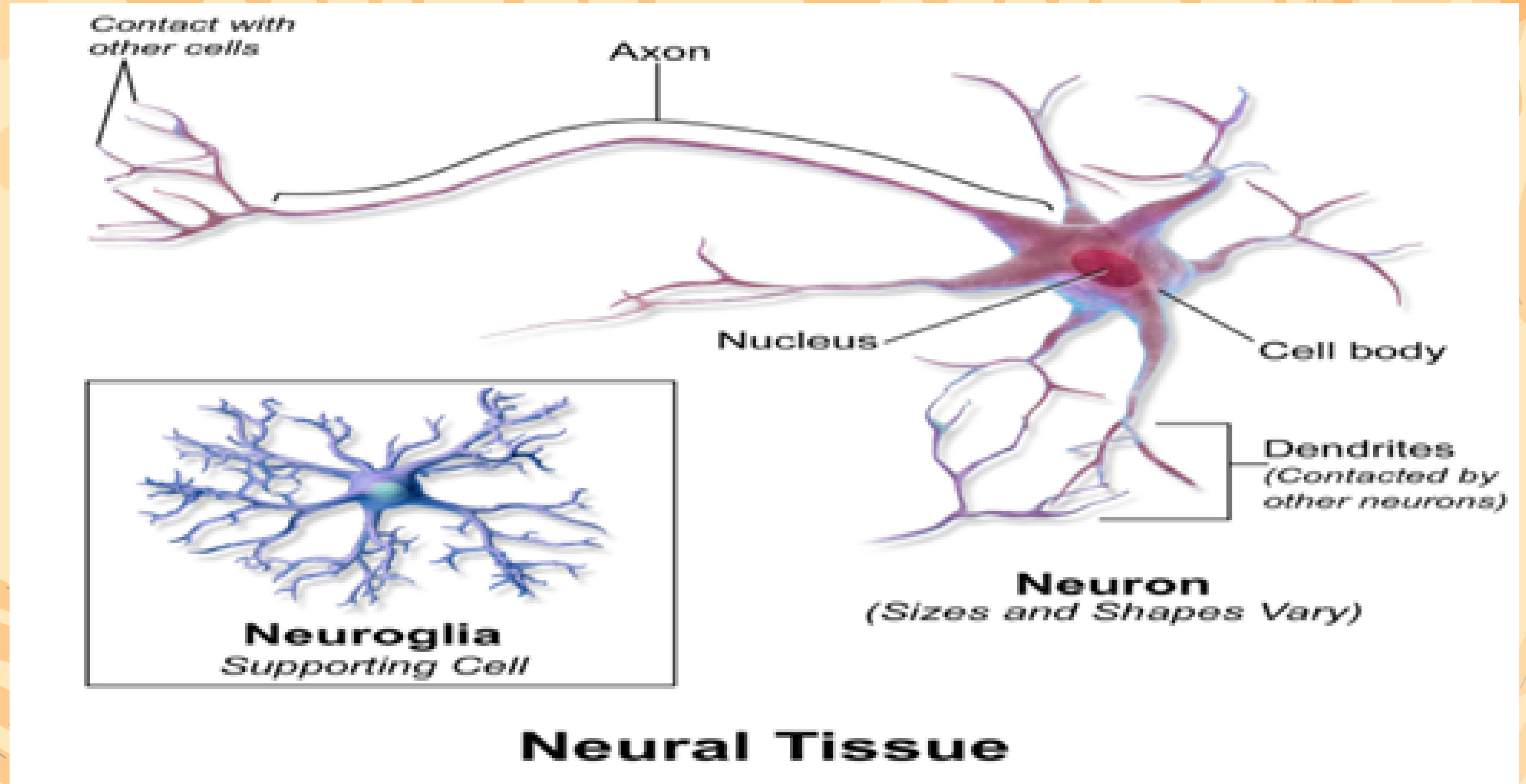
- Axons
 - Long stem-like projections emerging out of the cell
 - Responsible for communicating with other cells called the Target cells, thereby passing impulses

STRUCTURES OF NERVOUS TISSUE

- Cell body.
- Cell body contains the nucleus and connects the dendrites, which bring information into the neuron.

STRUCTURES OF NERVOUS TISSUE

- Dendrites
 - The dendrite is the part of the neuron that receives impulses from other neurons while the axon is the part where the impulse is transmitted to other neurons.





That's All!