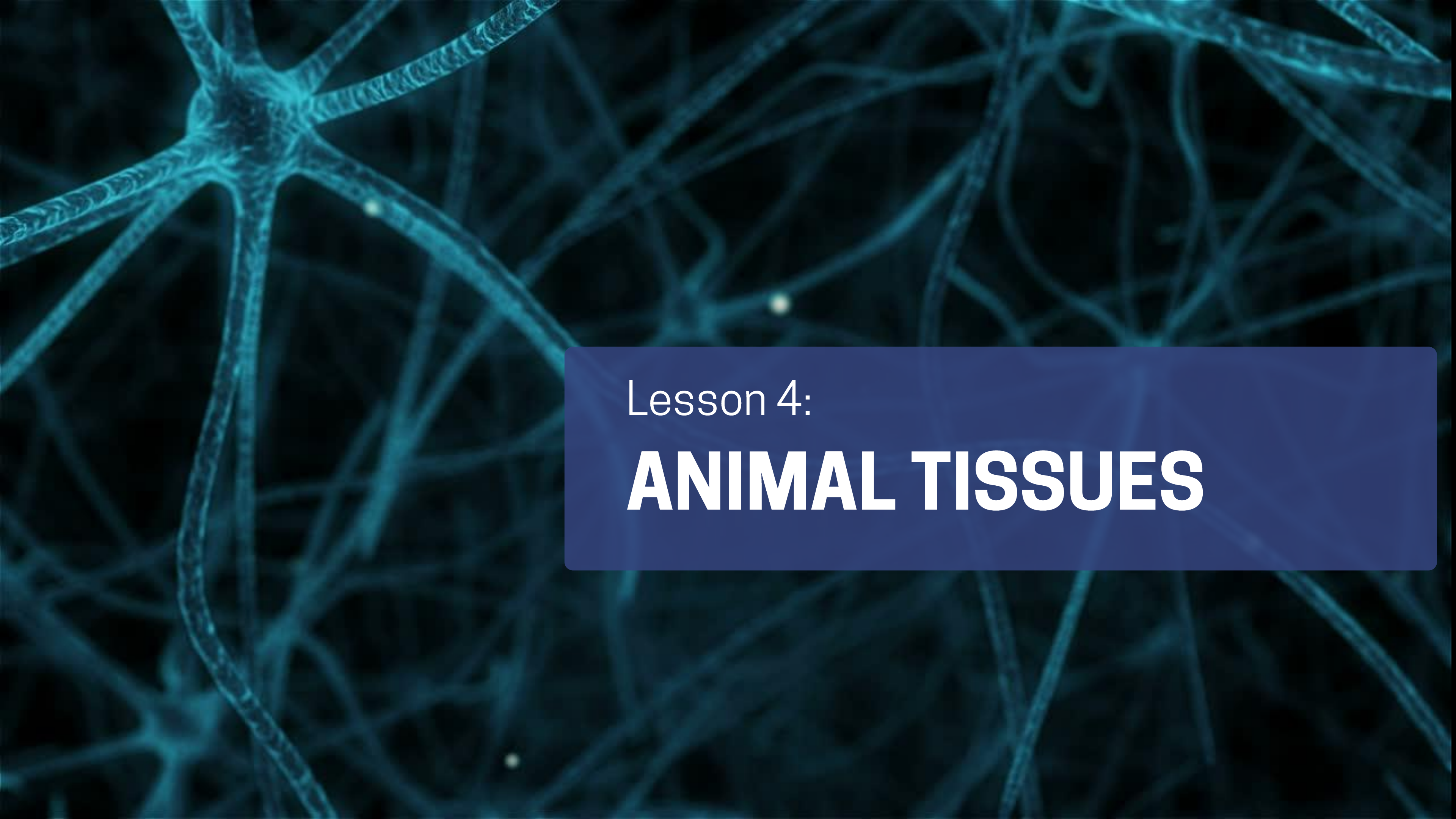


A microscopic image of neural tissue, showing a dense network of neurons with their cell bodies and long, branching axons. The image is overlaid with a semi-transparent blue layer. A dark blue rectangular box is positioned in the lower right quadrant, containing the text for the lesson.

Lesson 4:

ANIMAL TISSUES

Animal tissue is a group of cells along with intercellular substances that perform one or more functions in the body. The structure of animal tissues depends on their function and location in the body.

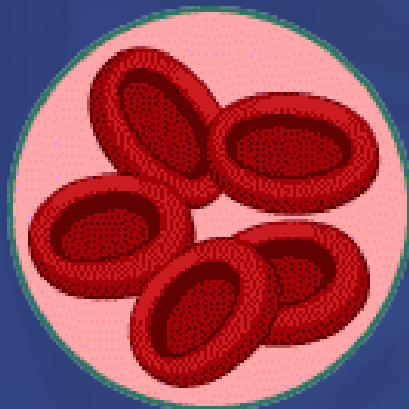


ANIMAL TISSUE

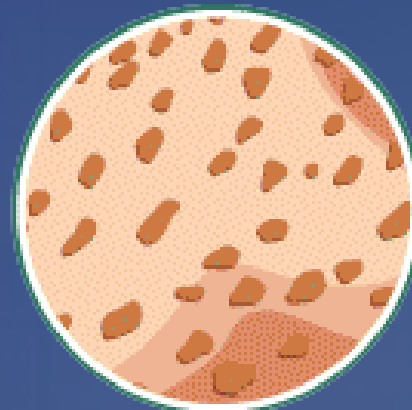
- Tissues work together in a coordinated manner to maintain the structural integrity and physiological functions of the body.
- They help in movement, provide structural support and protection, and facilitate communication and coordination within the body.



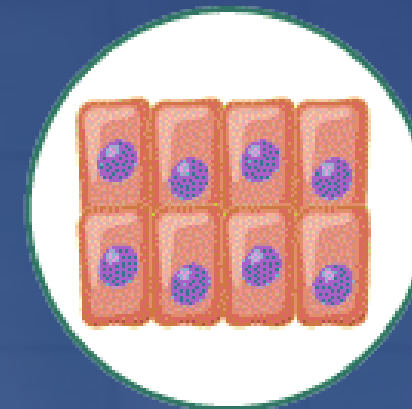
TYPES OF ANIMAL TISSUE



Blood



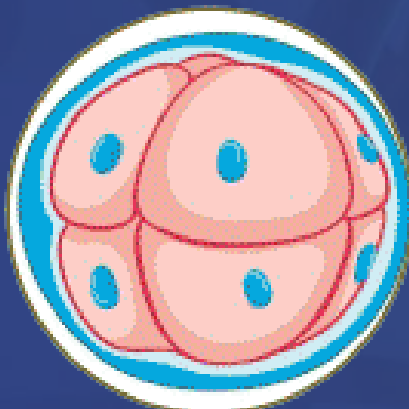
Bone Tissue



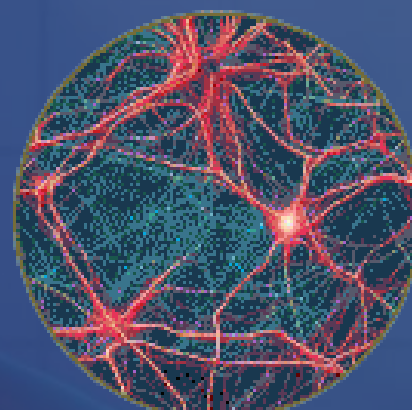
Epithelial Tissue



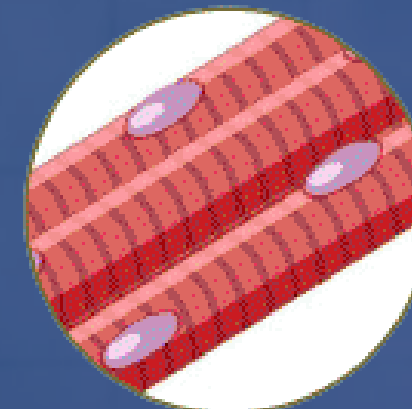
Cartilage Tissue



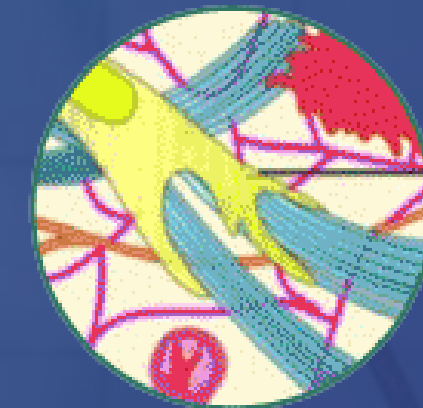
Adipose Tissue



Nervous Tissue

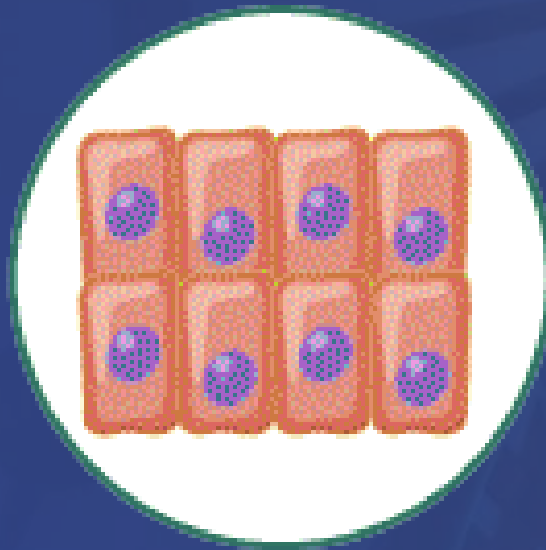


Muscle Tissue

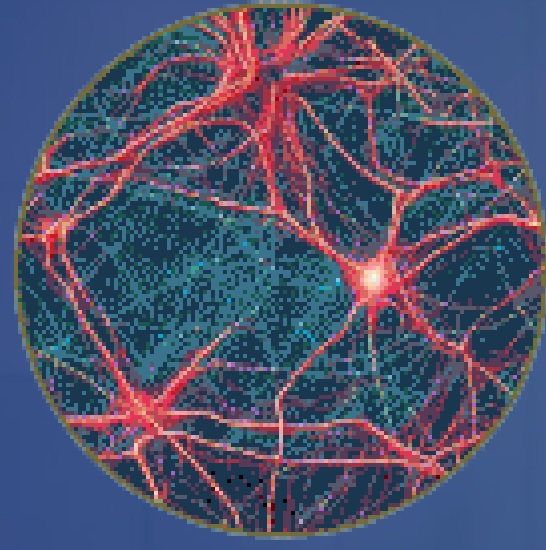


Connective Tissue

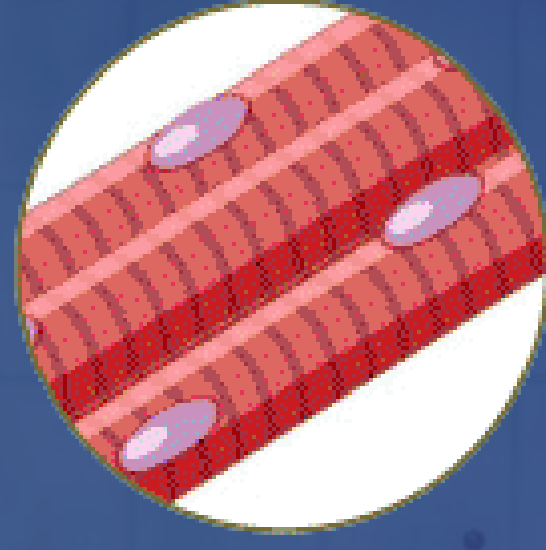
FOUR TYPES OF ANIMAL TISSUE



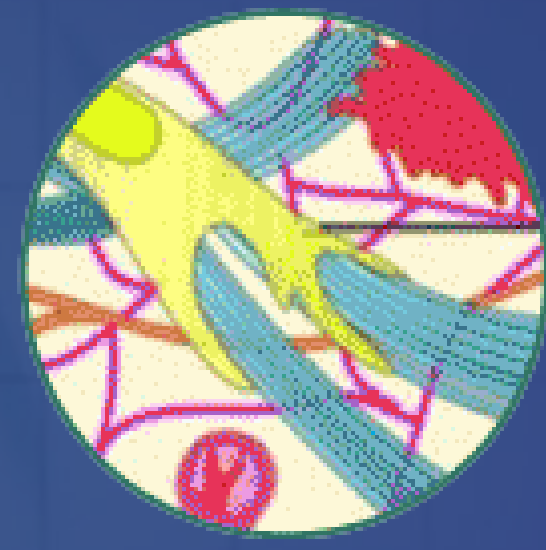
Epithelial Tissue



Nervous Tissue



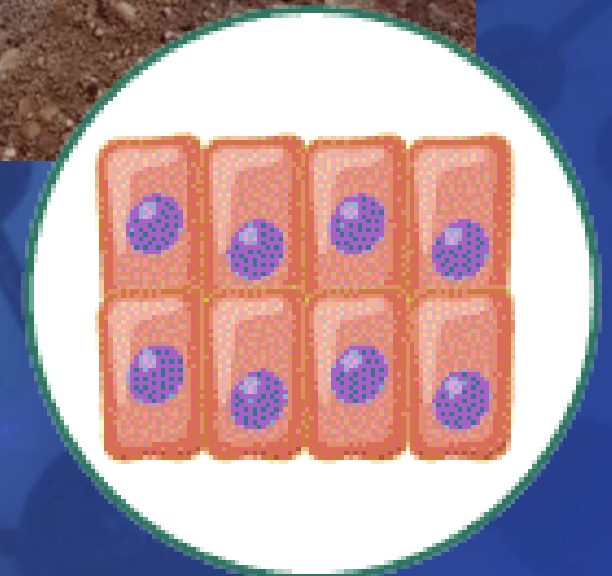
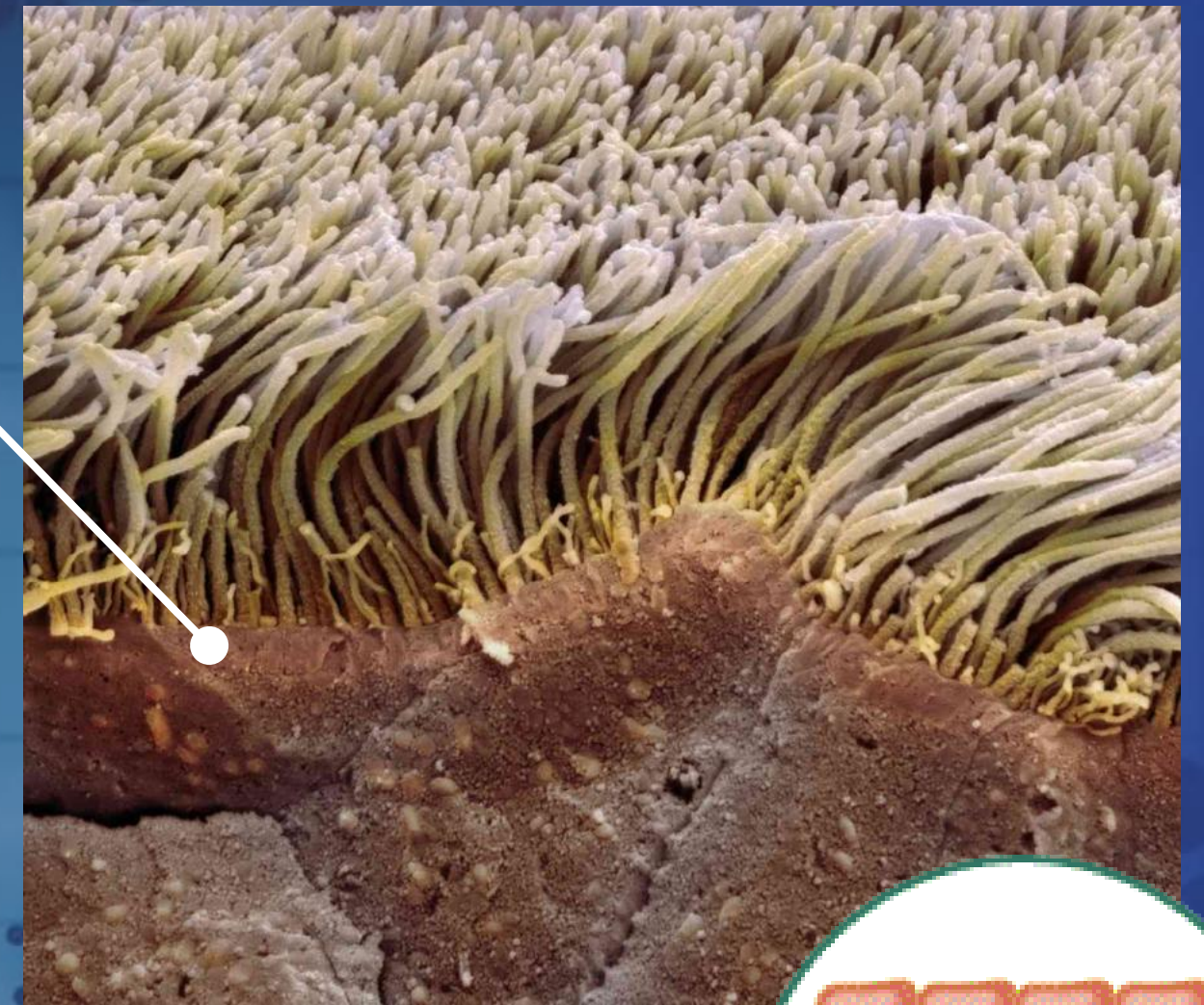
Muscle Tissue



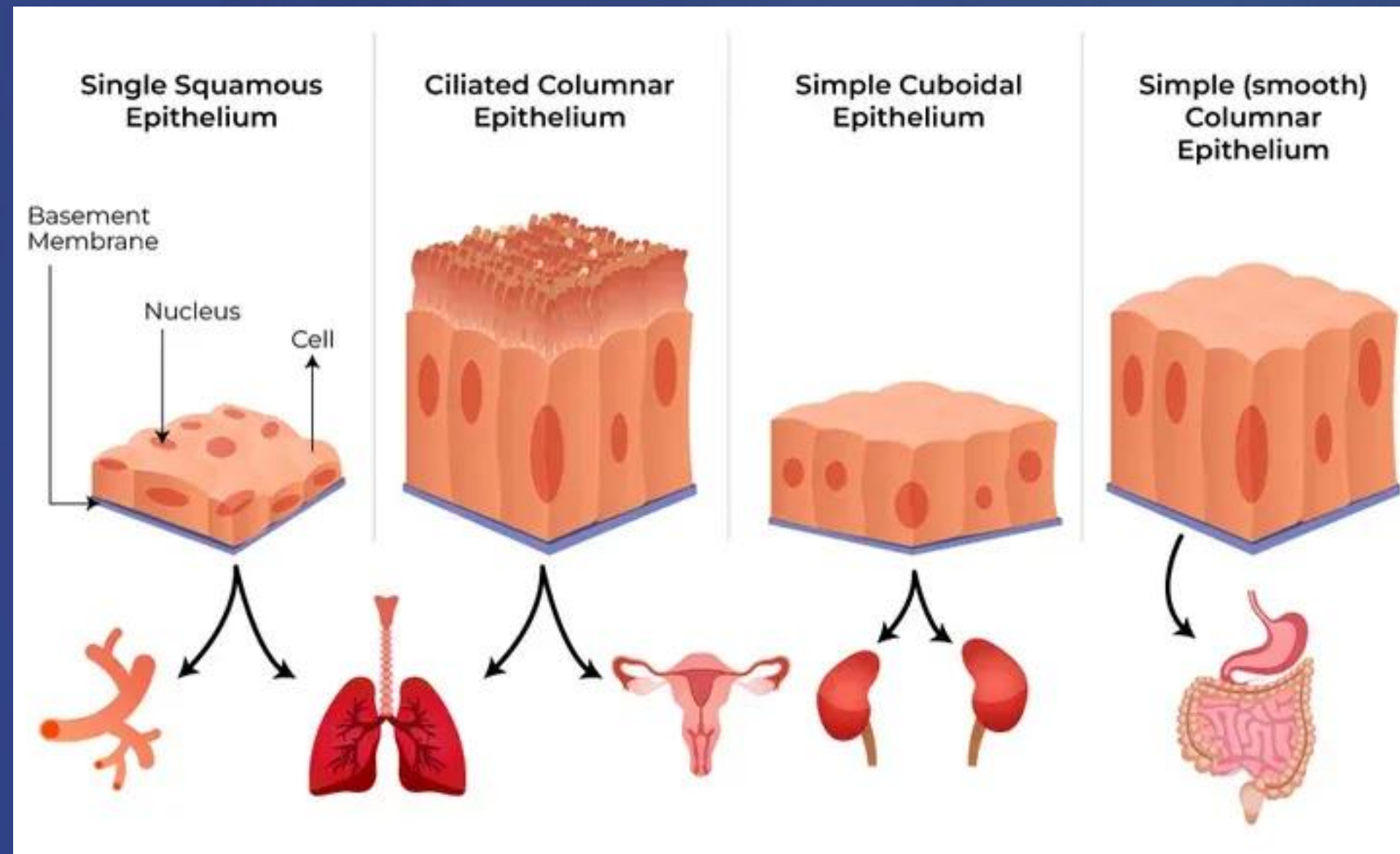
Connective Tissue

EPITHELIUM TISSUES

They originate from the ectoderm, mesoderm, and endoderm of the embryo. They are found on the external body surface and internal organs of the body.



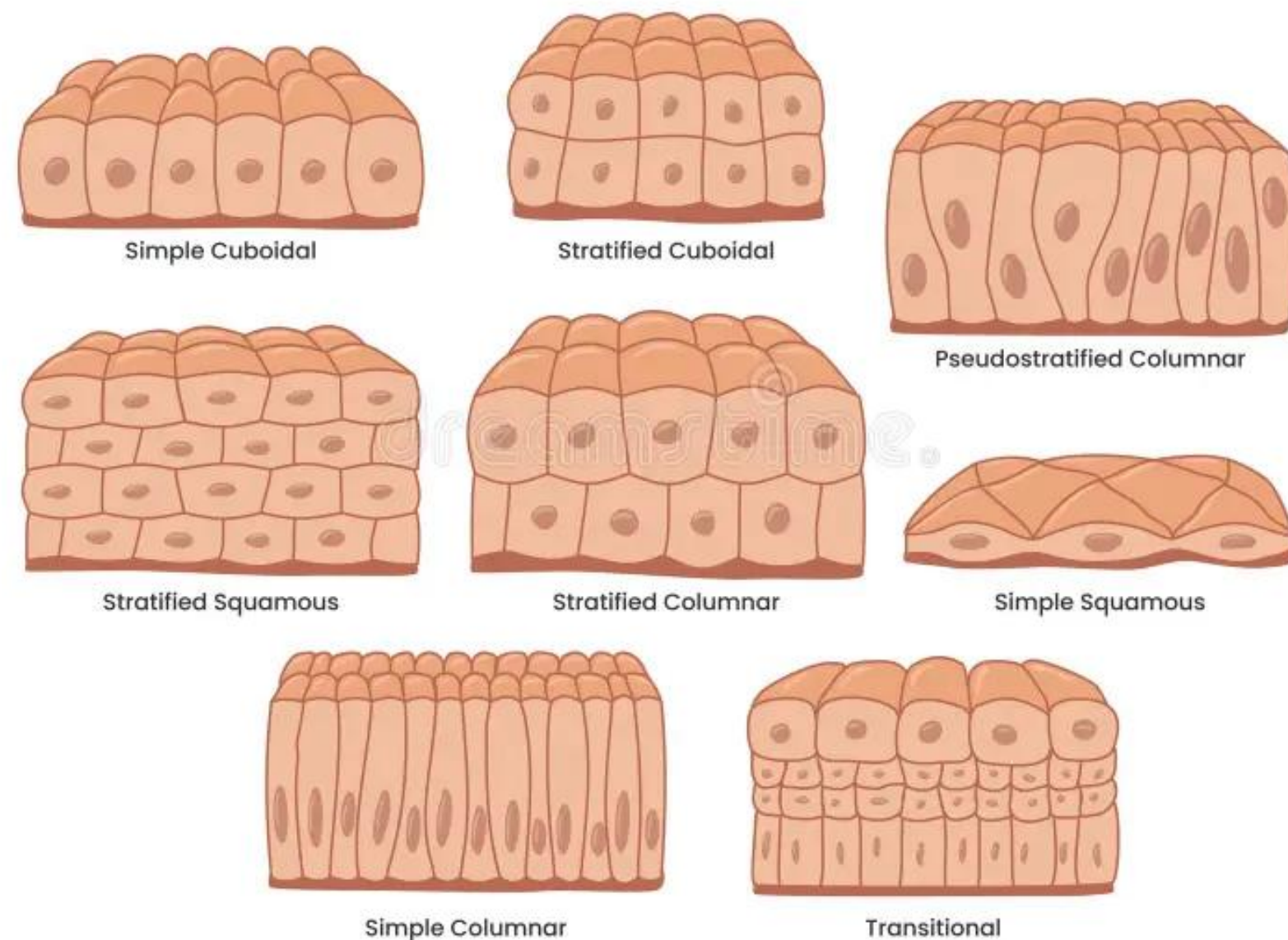
TYPES OF EPITHELIAL CELLS



- Epithelial tissue is composed of closely packed cells that form continuous sheets and covers the body's external and internal surfaces. These cells are tightly joined together by specialised structures like tight junctions and desmosomes.

TYPES OF EPITHELIAL CELLS

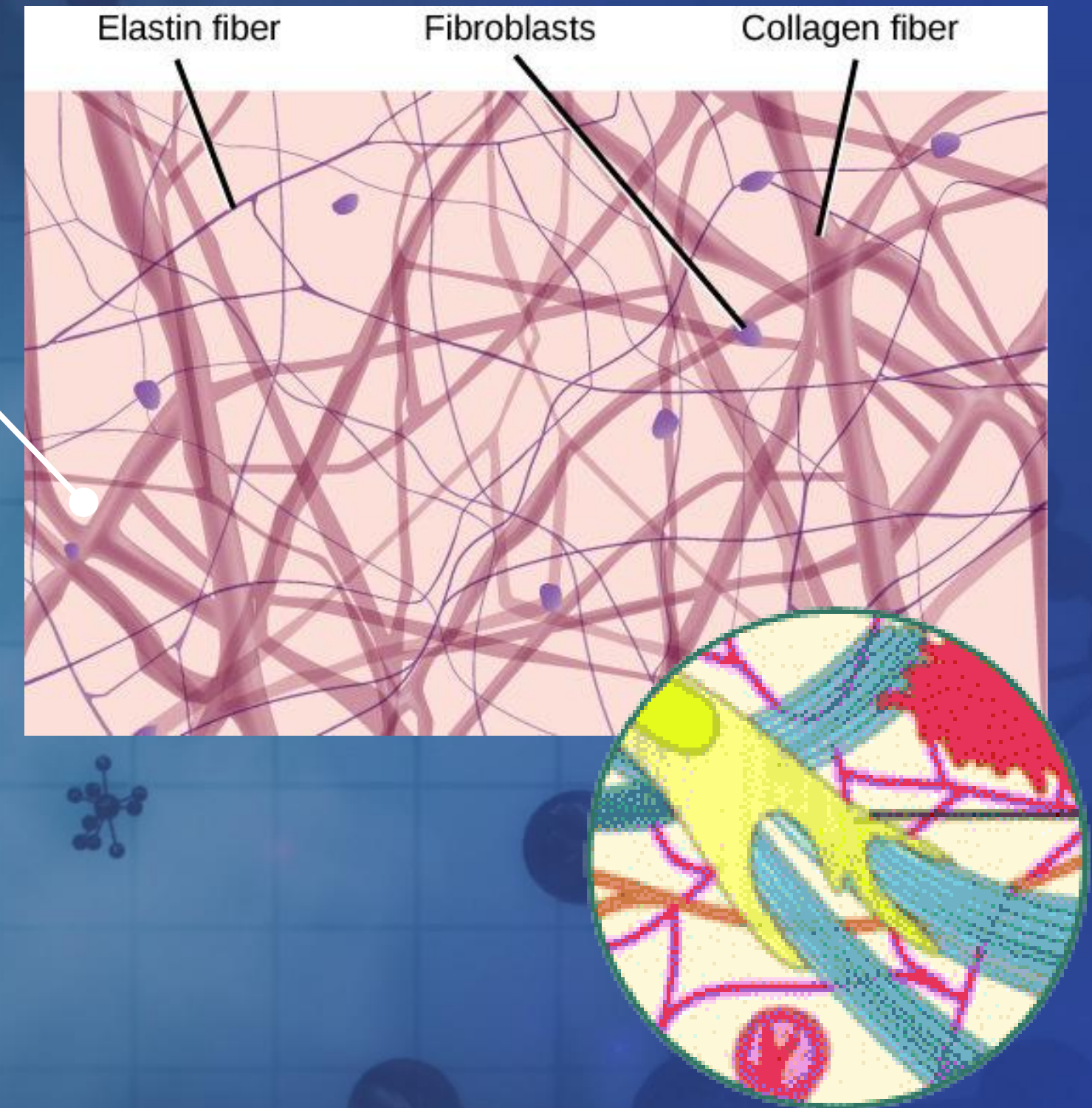
- **Types:** Various types of epithelial tissue are divided based on the shape of the cell. They are as follows:

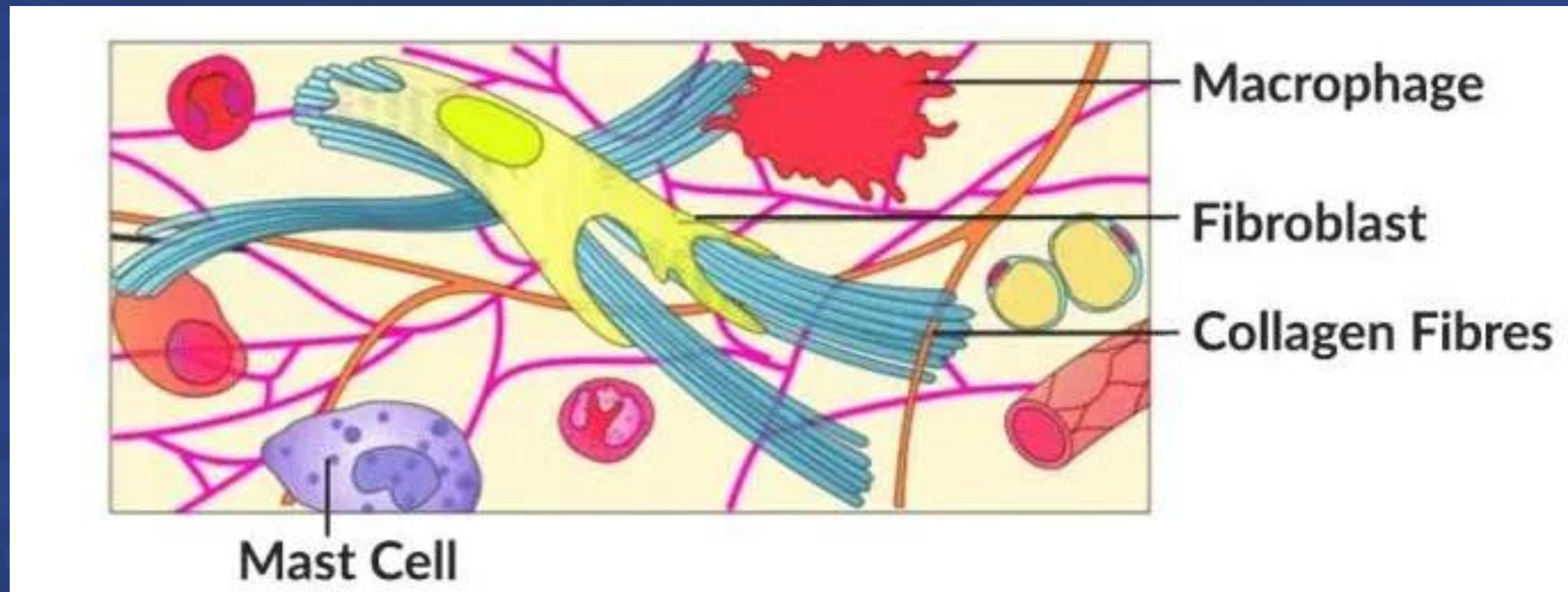


Types of Epithelial Tissues	Description
Simple Squamous epithelial tissue	A single layer of flat, scale-like cells is found in the lining of blood vessels and air sacs of the lungs.
Stratified Squamous epithelial tissue	Multiple layers of flat cells form the outer layer of the skin and the lining of the oral cavity.
Simple Cuboidal epithelial tissue	Single layer of cube-shaped cells, lining small ducts in glands and kidney tubules.
Simple Columnar epithelial tissue	Single layer of tall, column-shaped cells, lining the digestive tract.
Pseudostratified Columnar epithelial tissue	Appears stratified but is a single layer of cells with cilia, lining parts of the respiratory tract.
Transitional epithelial tissue	Found in the urinary bladder, able to stretch

CONNECTIVE TISSUES

Connective tissues originate from the mesodermal cells of the embryo. It provides attachment and support to the different tissues of the body.





Structure: The connective tissue consists of the cells, fibres and ground substance.

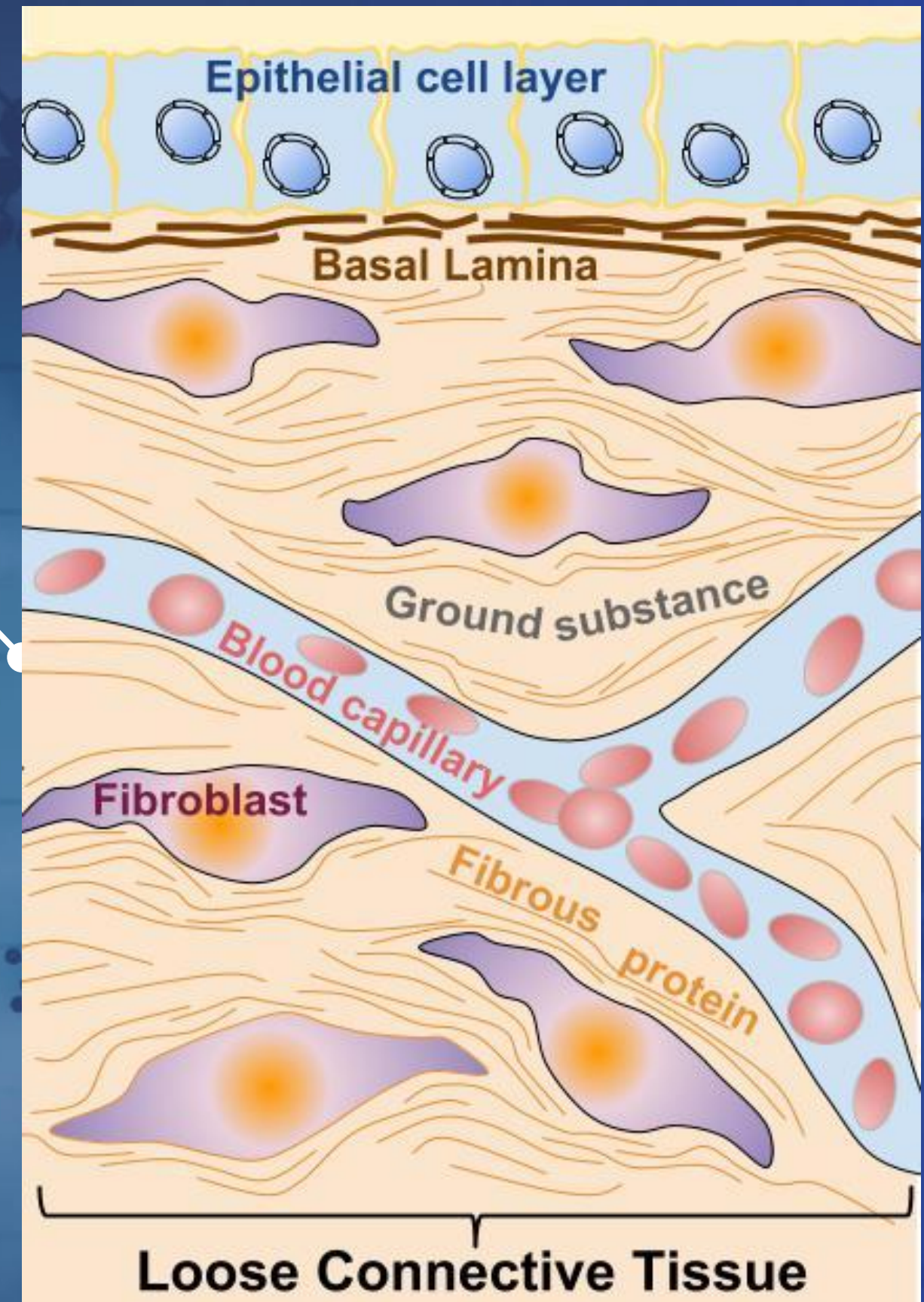
Cells: The connective tissue contains various types of cells, including:

1. Fibroblasts: They produce the extracellular matrix.
2. Adipocytes: These are fat cells that provide insulation.
3. Macrophages: These are immune cells that are involved in defence and tissue repair.
4. Mast cells: They provide an inflammatory response.

CONNECTIVE TISSUES

Extracellular Matrix: The extracellular matrix of connective tissue consists of:

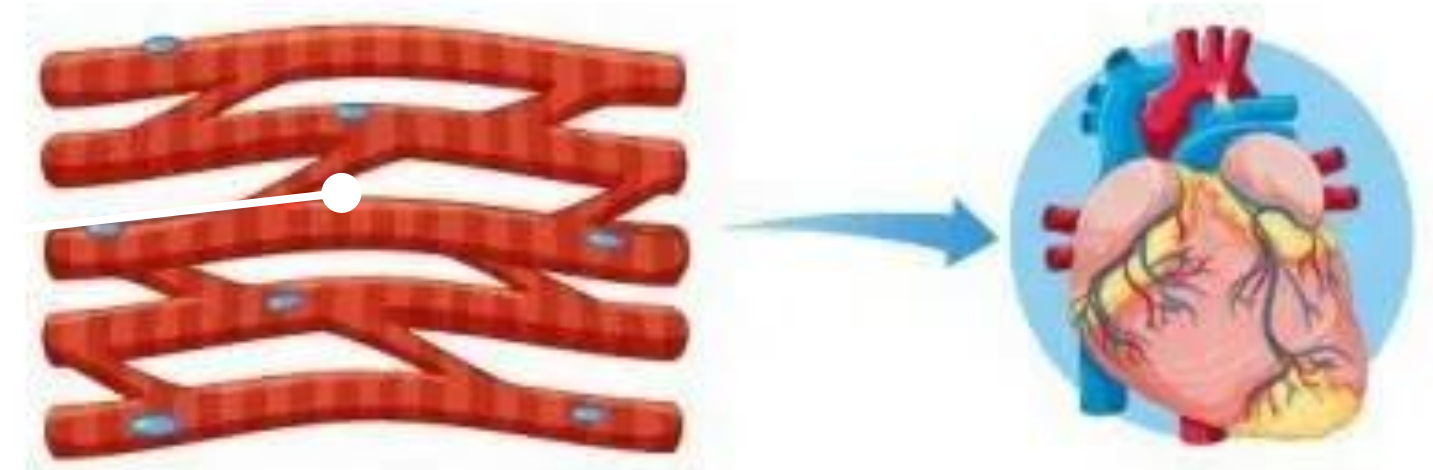
1. Fibres: These include elastin (provides elasticity), collagen (provides strength and flexibility), and reticular fibres (form supporting networks).
2. Ground Substance: It forms a gel-like material that surrounds cells and fibres and contributes to the tissue's consistency.



Types of Connective Tissues	Description
Areolar	It is loose connective tissue that provides a space for blood vessels and supports organs.
Adipose	It stores fat and provides insulation, cushion, and energy storage.
Cartilages	It is a firm and flexible tissue found in the ears, nose, and joints.
Bone	It supports the body and gives it proper shape and form.
Blood	It is a fluid <u>connective tissue</u> , also known as vascular tissue, that consists of <u>red and white blood cells</u> and platelets. It is responsible for transporting substances throughout the body.

MUSCLE TISSUES

The [muscular tissue](#) originates from the mesoderm of the embryo. It helps in movement or locomotion and supports the bones and other structures of the body. Different types of muscle cells are:



Cardiac muscle



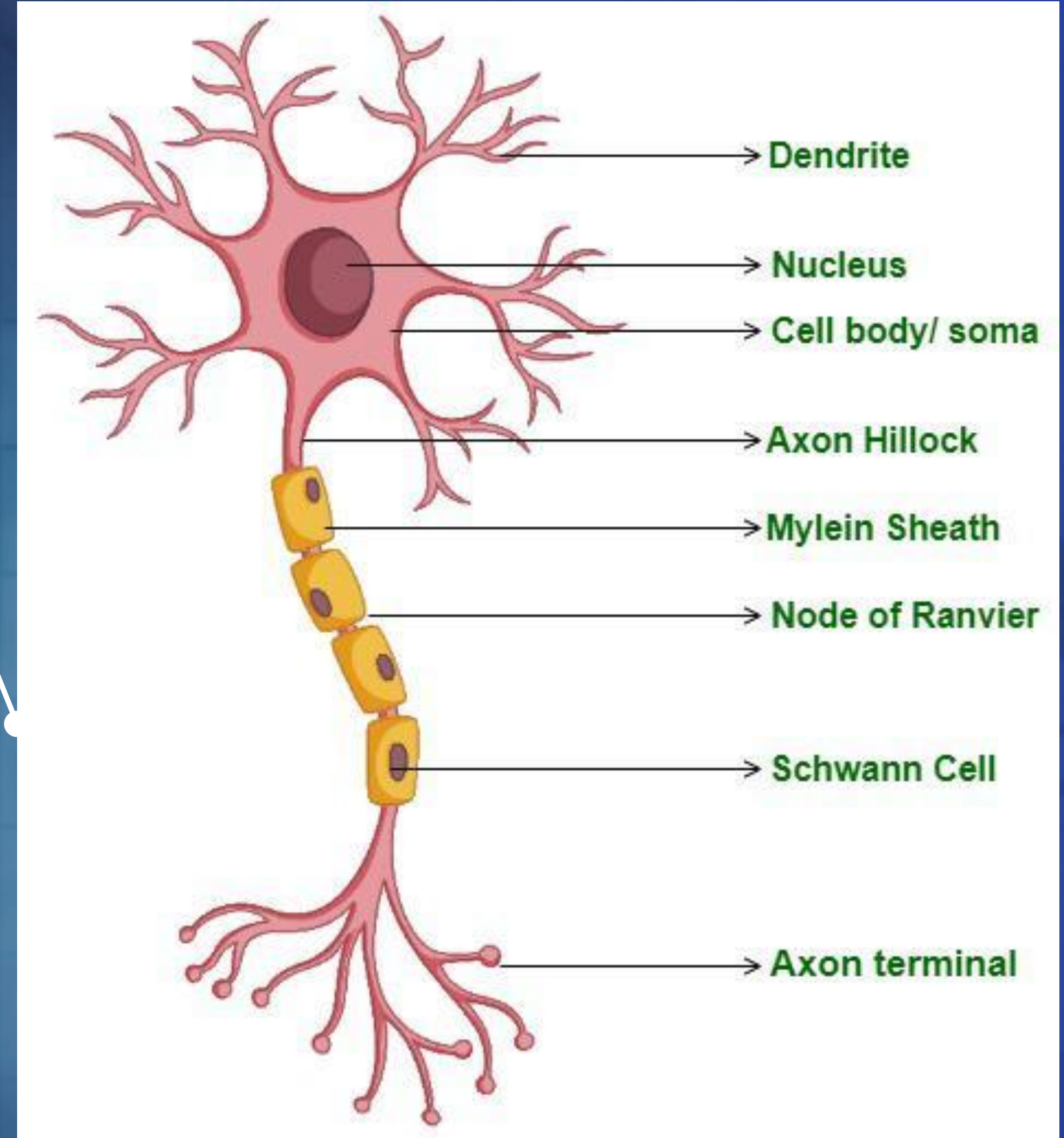
Skeletal muscle



Smooth muscle

NERVOUS TISSUE

Nervous tissue originates from the ectoderm of the embryo. It mainly consists of nerve cells or neurons and glial cells, which provide support and insulation.

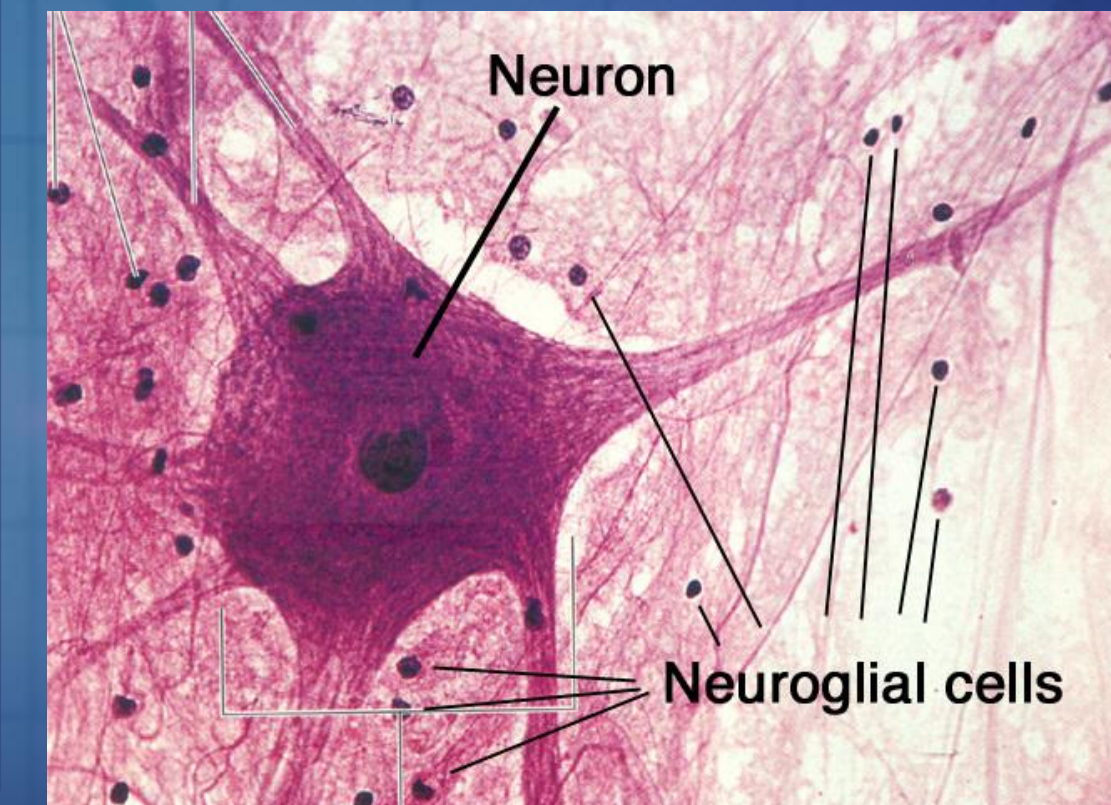
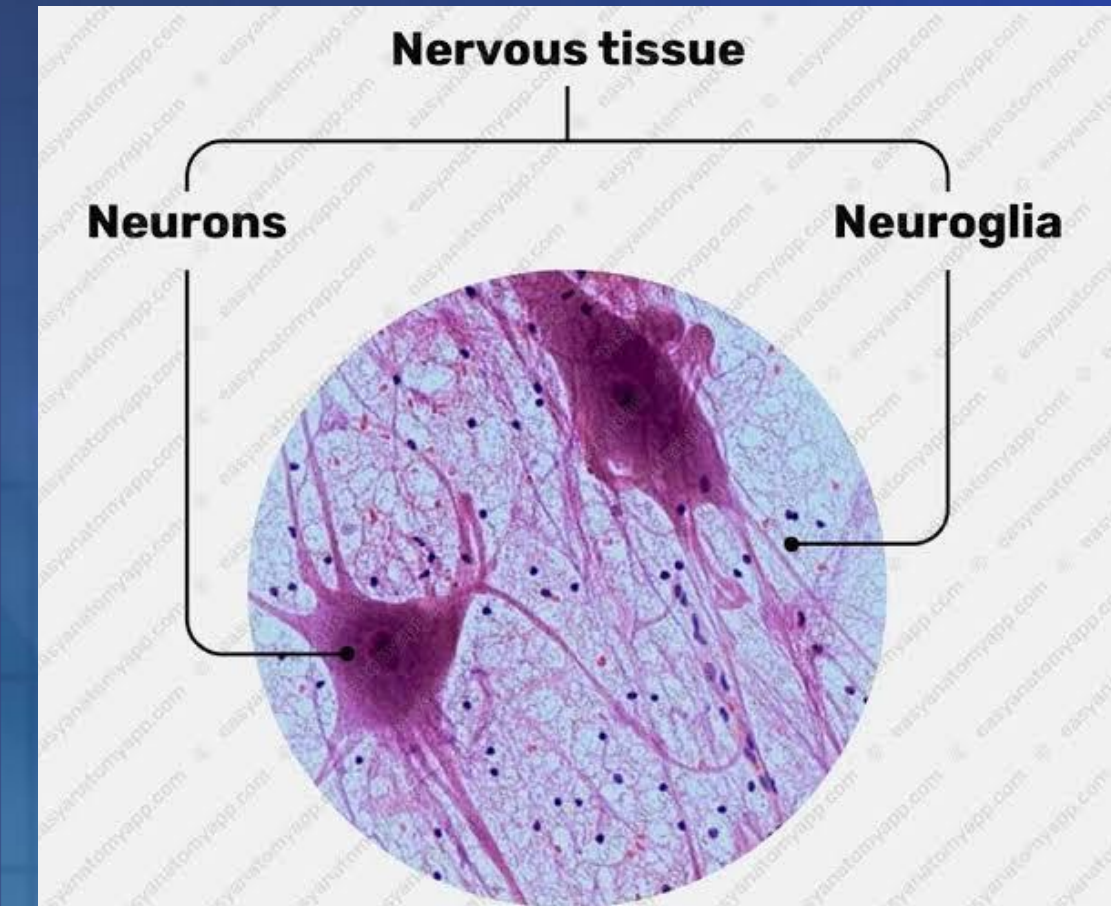


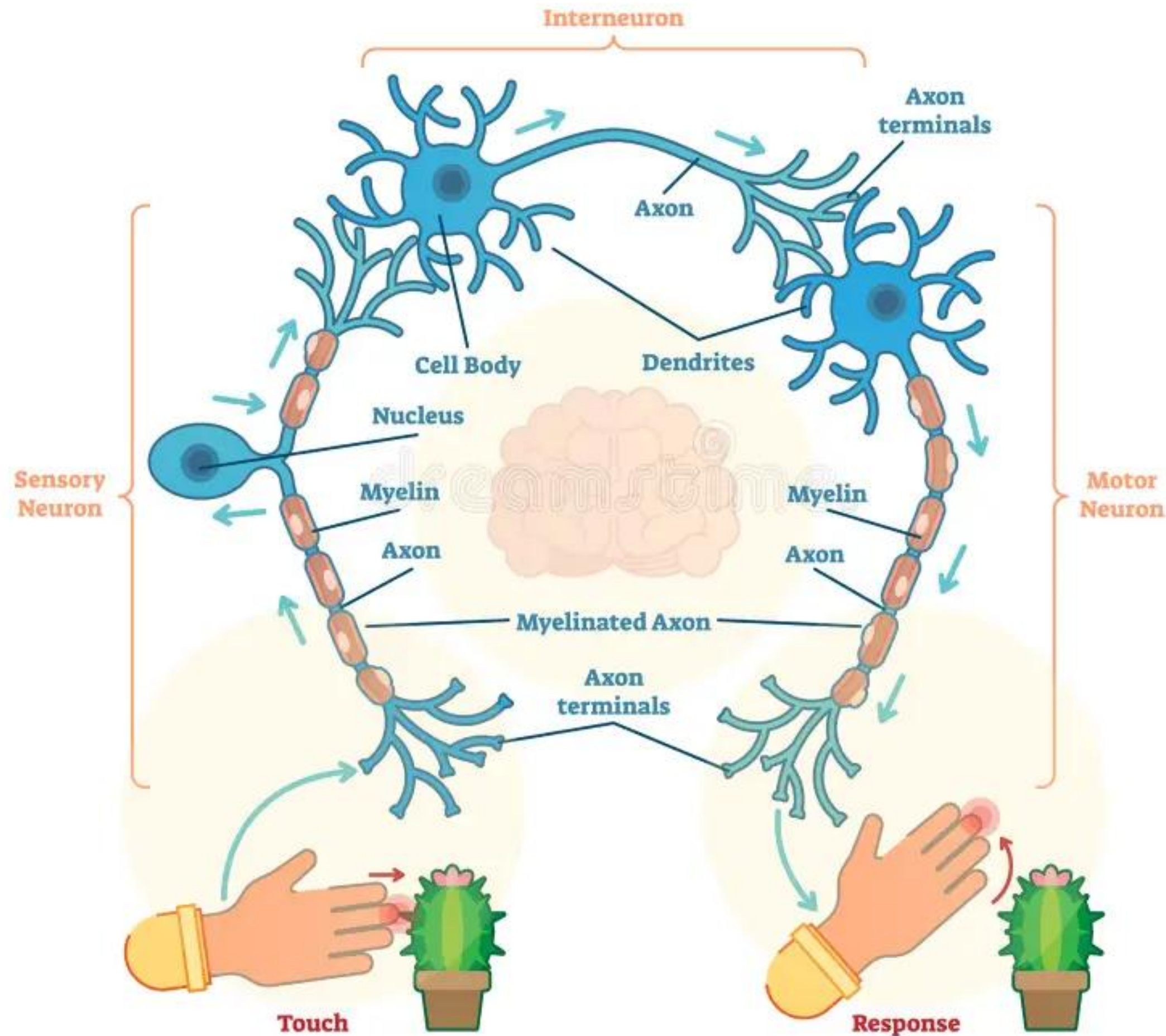
NERVOUS TISSUE

Structure: Nervous tissue consists of neurons (nerve cells) and glial cells, which are connected by synapses.

1.Neurons: Neurons are the functional unit of nervous tissue. They consist of a cell body, dendrites (branch-like extensions that receive signals), and an axon (a long projection that transmits signals to other neurons).

2.Glial Cells: Glial cells, or neuroglia, are non-neuronal cells that support and protect neurons. They provide insulation and help maintain the extracellular environment.





1.Sensory Neurons – Carry information from the senses to the CNS.

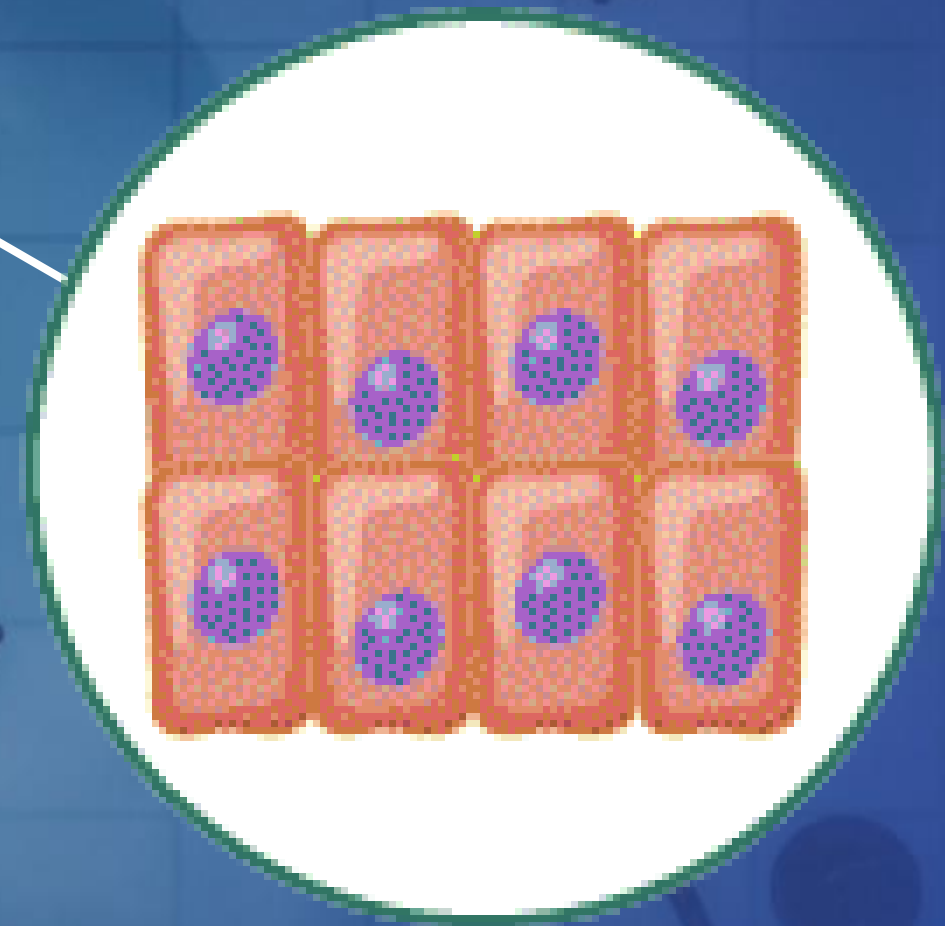
2.Motor Neurons – Carry signals from the CNS to muscles and glands.

3.Interneurons – Process information and connect sensory and motor neurons.

Functions of Animal Tissues

Epithelial Tissue

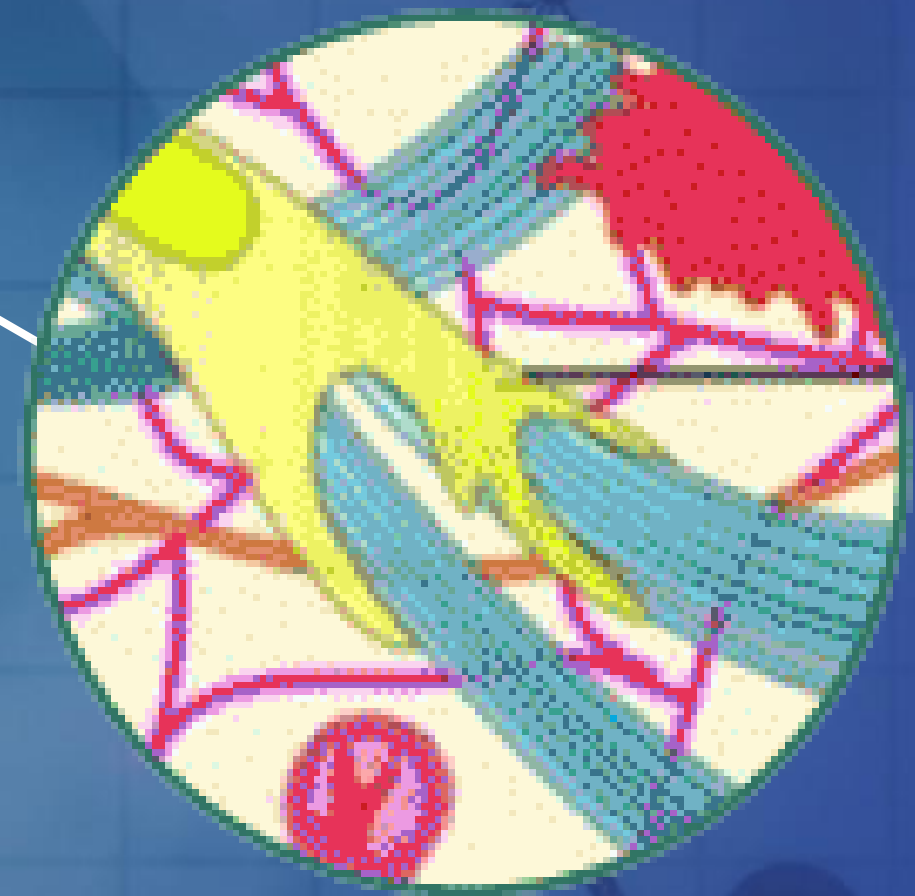
- Forms protective barriers on body surfaces.
- Facilitates absorption in the digestive and respiratory tracts.
- Secretes hormones and [enzymes](#).
- Participates in sensory perception, such as taste and smell.



Functions of Animal Tissues

Connective Tissue

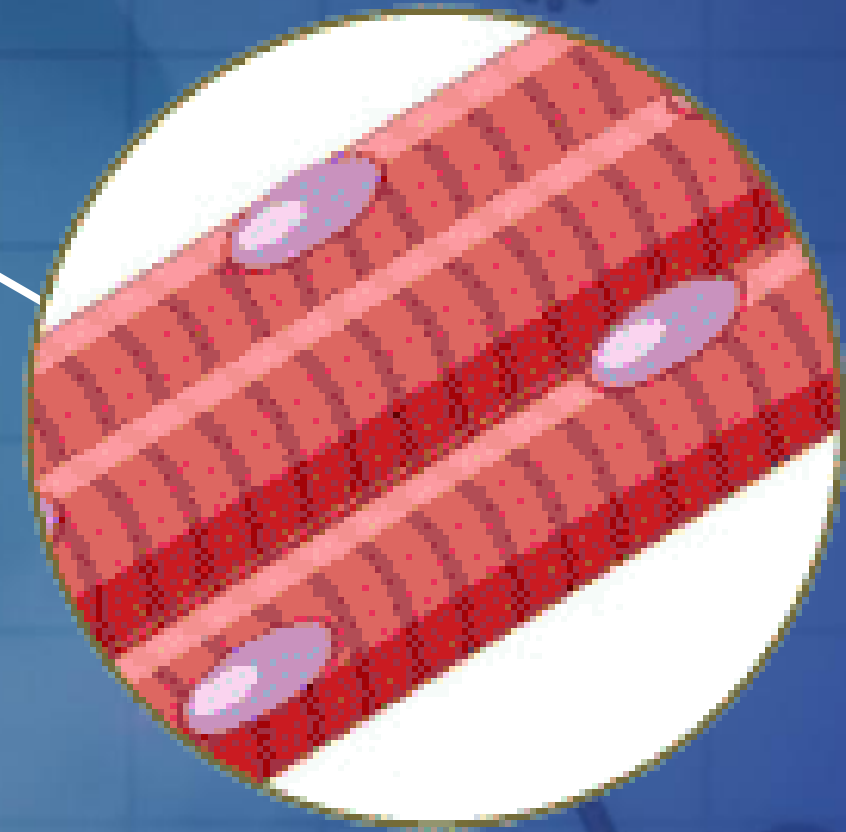
- Provides structural support to organs and tissues.
- Connects and anchors bones, tendons, and ligaments.
- Stores energy in the form of fat.
- Acts as a transportation medium for [blood](#).



Functions of Animal Tissues

Muscle Tissue

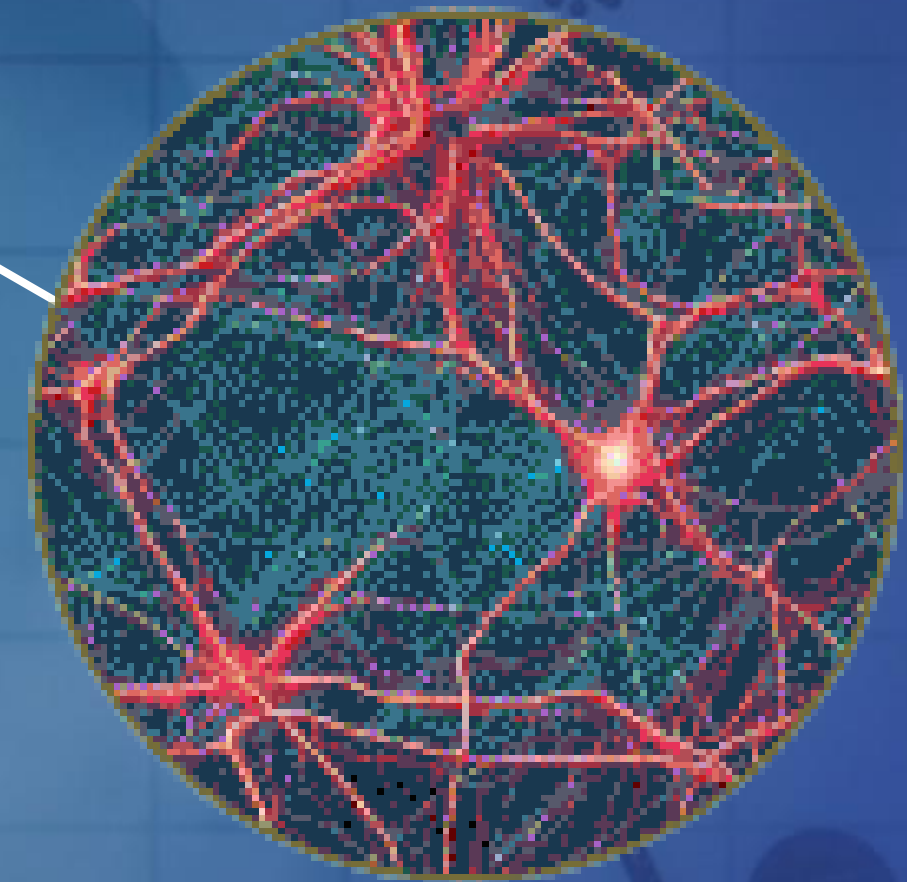
- Enables voluntary and involuntary movement.
- Generates force for activities like walking and lifting.
- Supports posture and maintains body temperature.



Functions of Animal Tissues

Nervous Tissue

- Facilitates the transmission of electrical signals.
- Coordinates sensory perception and motor responses.
- Regulates and controls body functions, including heartbeat and breathing.
- Stores and processes information in the brain.



REFLECTION

“What does animal tissue teach us about ourselves?”

After our discussion on Animal Tissues, take a moment to look beyond the definitions, structures, and functions. Think about how these tiny groups of cells work together to create movement, sensation, protection, communication, and ultimately, **human life**.

Write a short but meaningful reflection answering the following:

If every tissue in the human body has a specific role, what does this teach you about the importance of having different roles, abilities, and functions in human life?