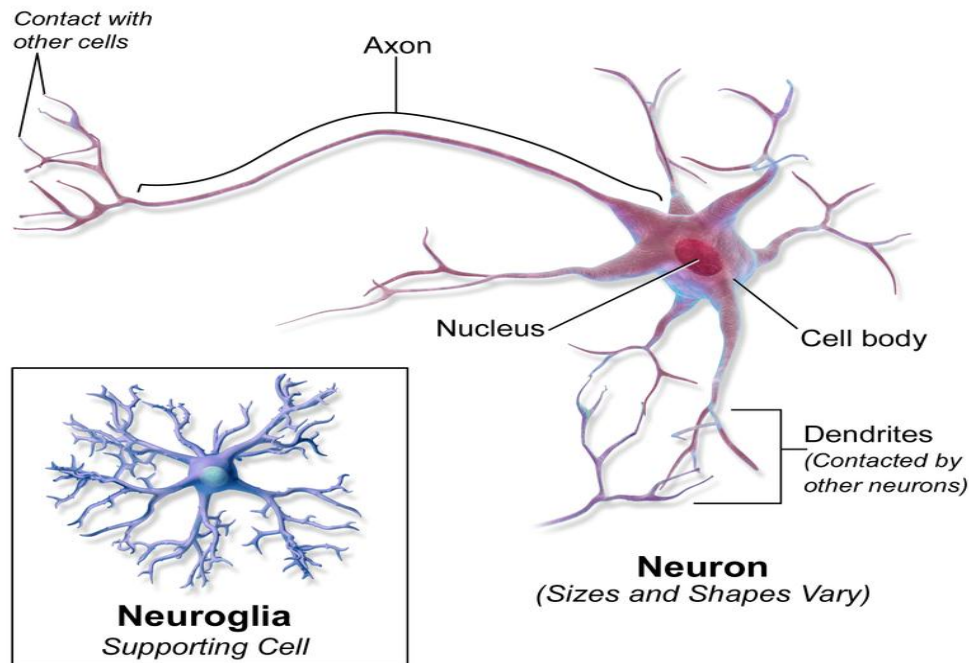


Nervous tissue is composed of 2 main types of cells:

- 1- **Neurons**- nerve cells that are specialized to detect and react to stimuli, by generating and conducting nerve impulses.
- 2- **Neuroglial cells**- accessory cells for filling spaces and supporting neurons.



Neural Tissue

Anatomy of neurons:

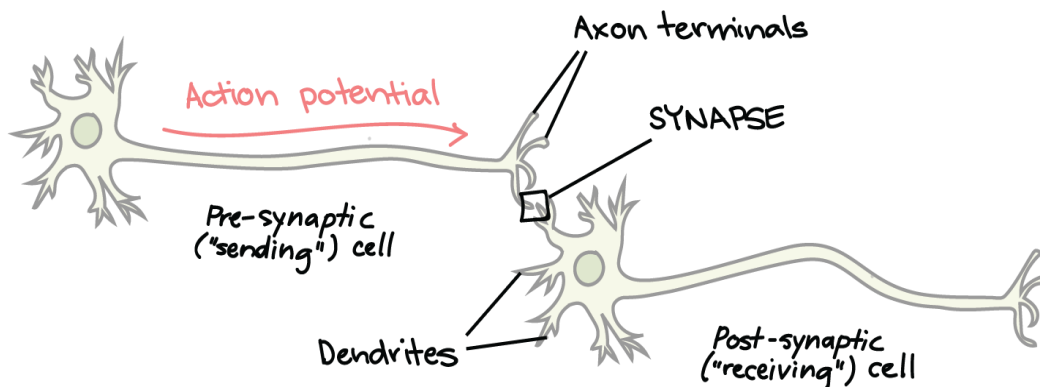
All neurons composed of:

- 1- **Cell body** called soma which contains a nucleus and other organelles. Although there is DNA in the neuron, somehow DNA replication and mitosis do not occur, resulting in the neurons lack of ability to reproduce or regenerate.
- 2- Extensions of the soma form **dendrites** which conduct nerve impulses toward the soma
- 3- **Axon** which conducts nerve impulses away from the soma (to another neuron, or to an effect or organ).

- Longer axons are enclosed by a lipoprotein substance called myelin sheath produced by a type of neuroglia cell called **schwann cells**.
- Axons enclosed by myelin sheath are called myelinated axons which make up the **white matter** in the nervous system.
- While axons that have no myelin sheath are called unmyelinated axons which make up **the gray matter** in the nervous system.

Synapse:

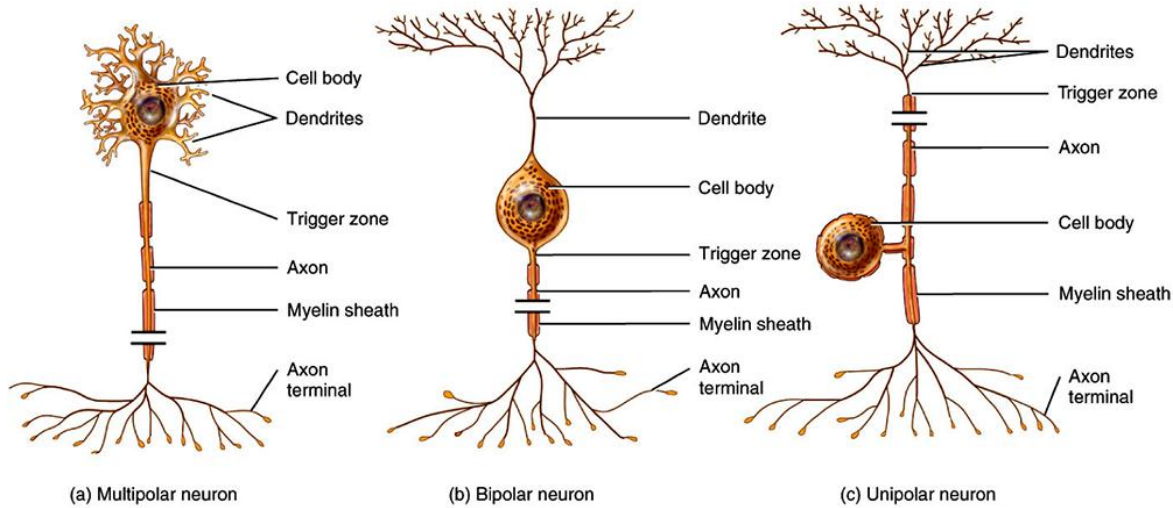
- **A synapse** :-is the junction between two neurons, or between a neuron and an effector organ (muscle or gland).



Classification of neurons

Classification based on structure:

- 1- Multipolar — three or more processes
- 2- Bipolar — two processes (axon and dendrite)
- 3- Unipolar (pseudounipolar)— single, short process (usually dendrite)



Classification based on function:

- a) Sensory or afferent neuron: conducts nerve impulses from the body to the brain or spinal cord.
- b) Interneuron: relays nerve impulse from sensory neuron to motor neuron.
- c) Motor or efferent neuron: conducts nerve impulses from the brain or spinal cord to the effector organ (muscles or glands).

Classification of Neuroglia

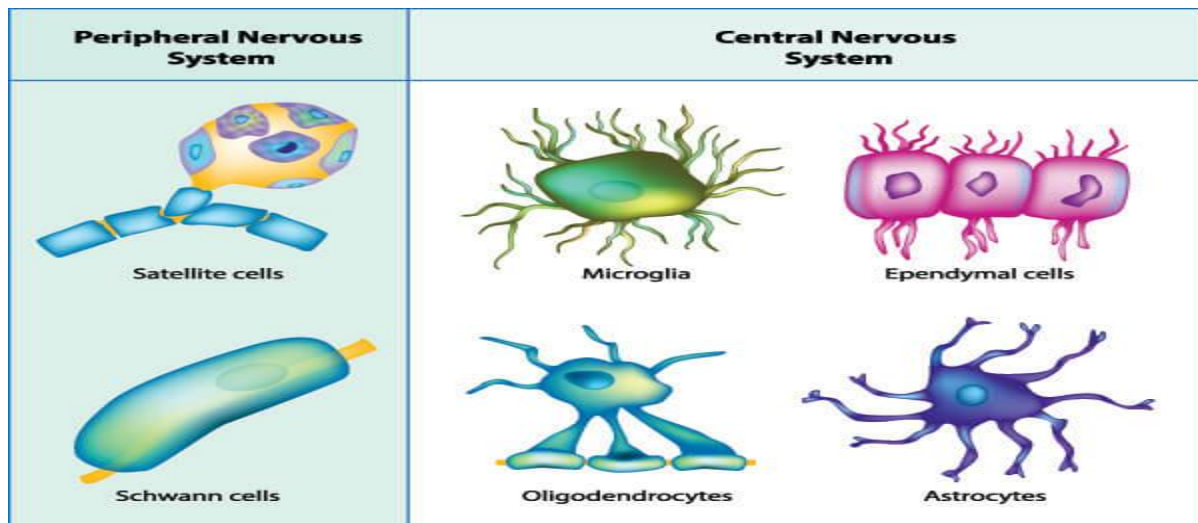
- **Neuroglia:** are the supporting cells of the nervous system.

1. **Astrocytes:** star shaped cells found between neurons and blood vessels. They are the most abundant glial cells, and help form the blood – brain barrier. Function: structural support, transport of substance between blood vessels and neurons.
2. **Microglial cells:** small ovoid cells. Function: structural support and phagocytosis (immune protection).

3. **Ependymal cells:** cuboidal or columnar shaped cells. Function: form a porous layer through which substances diffuse between the interstitial fluid and the cerebrospinal fluid.

4. **Oligodendrocytes:** resemble astrocytes but have less processes.

Function: produce myelin sheet within the brain and spinal cord.



Structure of a Typical Motor Neuron

