

Nervous System: Anatomy and Function

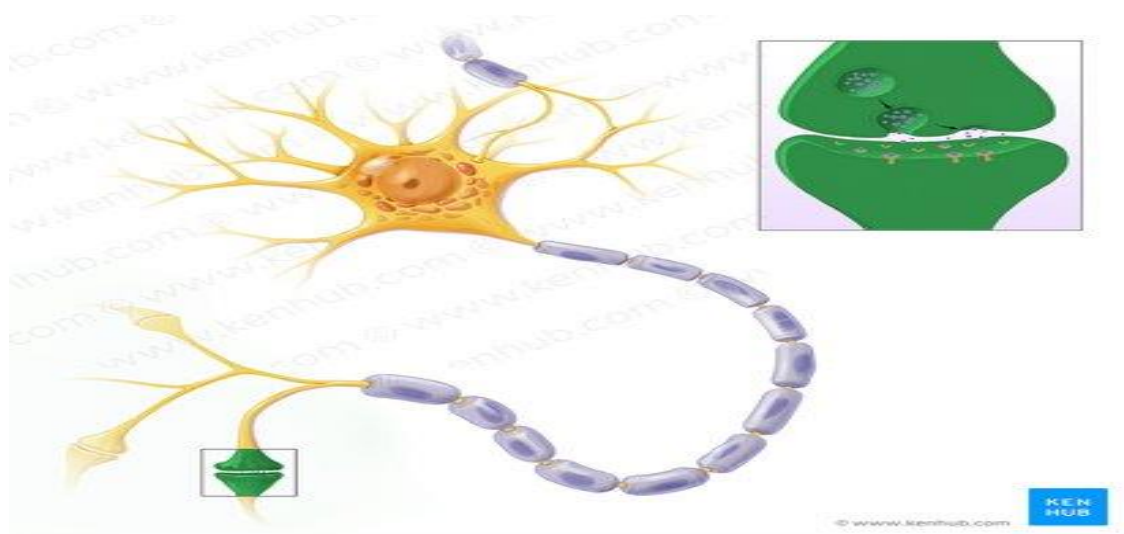
The nervous system is a complex and vital part of the human body, responsible for transmitting signals between different parts of the body. It can be divided into two main parts. Each part contains billions of cells called **neurons, or nerve cells**.

❖ Neurons:

are the basic building blocks of the nervous system. They transmit electrical impulses and release neurotransmitters to communicate with other neurons or target cells.

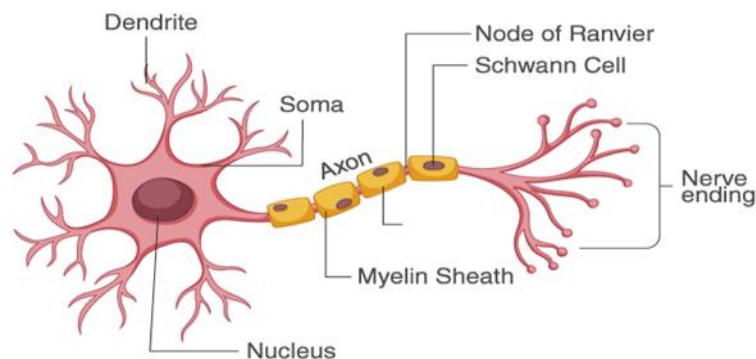
❖ Structure of Neuron

1. Cell Body (Soma): The cell body contains the nucleus and other organelles. It is the metabolic center of the neuron.
2. Dendrites: A branch-like structure that functions by receiving messages from other neurons and allows the transmission of messages to the cell body.
3. Axon: The axon is a long, slender projection that carries electrical impulses away from the cell body. It is covered by a fatty substance called myelin, which insulates the axon and speeds up signal transmission.
4. Synapse : It is also called the nerve ending or nerve junction, which is mainly involved in permitting the entry of a neuron to move electrical signals from one neuron to another neuron.



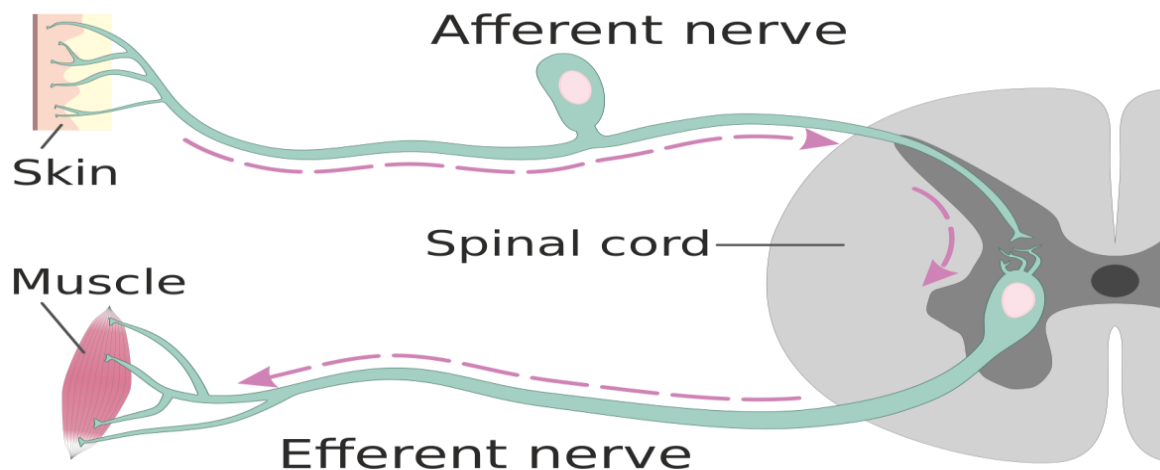
STRUCTURE OF NEURON

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The Learning App



❖ Types of Nerve Cell

1. Sensory (Afferent) neurons : which transmits sensory information from the organ and receptor to the CNS, There are about 9 to 10 million sensory nerves in the human body and are found in sense organs – eyes, ears, nose, tongue and skin.
2. Motor (Efferent) : transmits signal from the CNS to muscles and gland .There are about 50 to 60 thousand motor neurons in the human body and are found in glands and muscles.



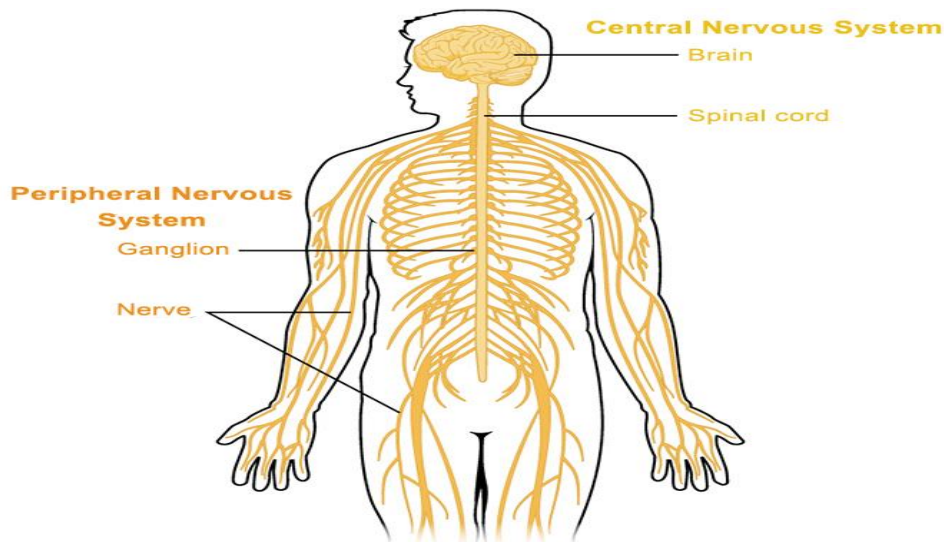
❖ Anatomical Classification of nervous system:

1- Central Nervous System (CNS):

- Includes the brain and spinal cord.
- Responsible for processing and integrating information, as well as generating responses.

2- Peripheral Nervous System (PNS):

- Comprises nerves and ganglia outside the CNS.
- Acts as a communication system between the CNS and the rest of the body.



❖ Functional Classification of nervous system:

- Somatic Nervous System (SNS):
 - Controls voluntary movements and transmits sensory information from the external environment to the CNS.
 - Involves skeletal muscles.
- Autonomic Nervous System (ANS):
 - Regulates involuntary physiological processes.
 - Divided into the sympathetic and parasympathetic divisions, which often have opposing effects to maintain homeostasis.
 - Involves smooth muscles, cardiac muscles, and glands.

❖ major functions of the nervous system

The 4 main functions of the nervous system are:

1. Reception of general sensory information (touch, pressure, temperature, **pain**, vibration)
2. Receiving and perceiving special sensations (taste, smell, vision, sounds)
3. Integration of sensory information from different parts of the body and processing them
4. Response generation