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ORGANIZATION OF NERVOUS SYSTEM



Suman Kumar Meikap
Asst. Professor
CUTM, Bhubaneswar



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Organization of nervous system

The nervous system senses changes in our **internal & external environments, coordinates and integrates this data, and initiates & transmits action potentials.**

Together with endocrine system maintaining homeostasis.

The nervous system is organized into two (2) basic component:

- **Central nervous system (CNS)** – Brain and Spinal Cord
- **Peripheral Nervous System (PNS)** – 12 pairs Cranial Nerves, 31 pairs of spinal nerves, ganglia





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Peripheral Nervous System

Functionally can be divided into:

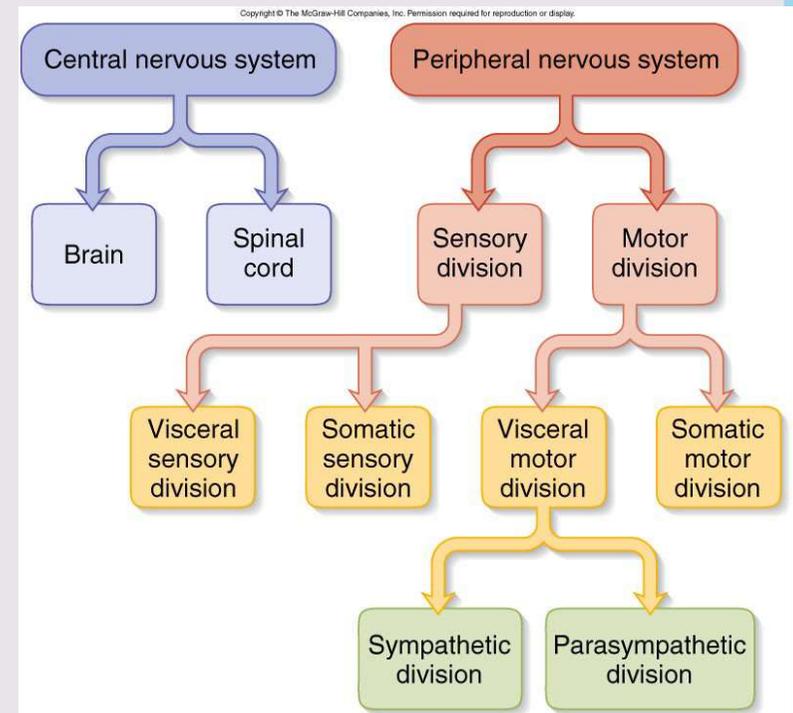
1. Sensory nervous system

- Somatic nervous system
- Autonomic nervous system

2. Motor nervous system

- Somatic nervous system
- Autonomic nervous system

3. Enteric Nervous System





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Function of the Nervous System

1. Sensory function

Sensory receptors detect stimuli (internal and external stimuli) and then carry them to the spinal cord and brain.

2. Integrative Function

Integrates (processes) sensory information by analyzing and storing the information.

Important integrative function is perception. Perception is a conscious awareness of sensory stimuli and occurs in the brain.

3. Motor function

Once sensory information is integrated, the nervous system will elicit an appropriate motor response by activating effectors (muscle and gland) through cranial and spinal nerves.

This stimulation causes the muscles to contract and glands to secrete.



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Components of Nervous system

- 1. NEURON** – main functional unit
- 2. NEUROGLIA** – supportive cell



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1. Neuron

Posses electrical excitability

Able to respond to a stimulus and convert it into an **action potential**

A stimulus **initiate the conduction** of action potential (impulses).

Action potential is an electrical signal that propagates along the surface of the membrane of a neuron.

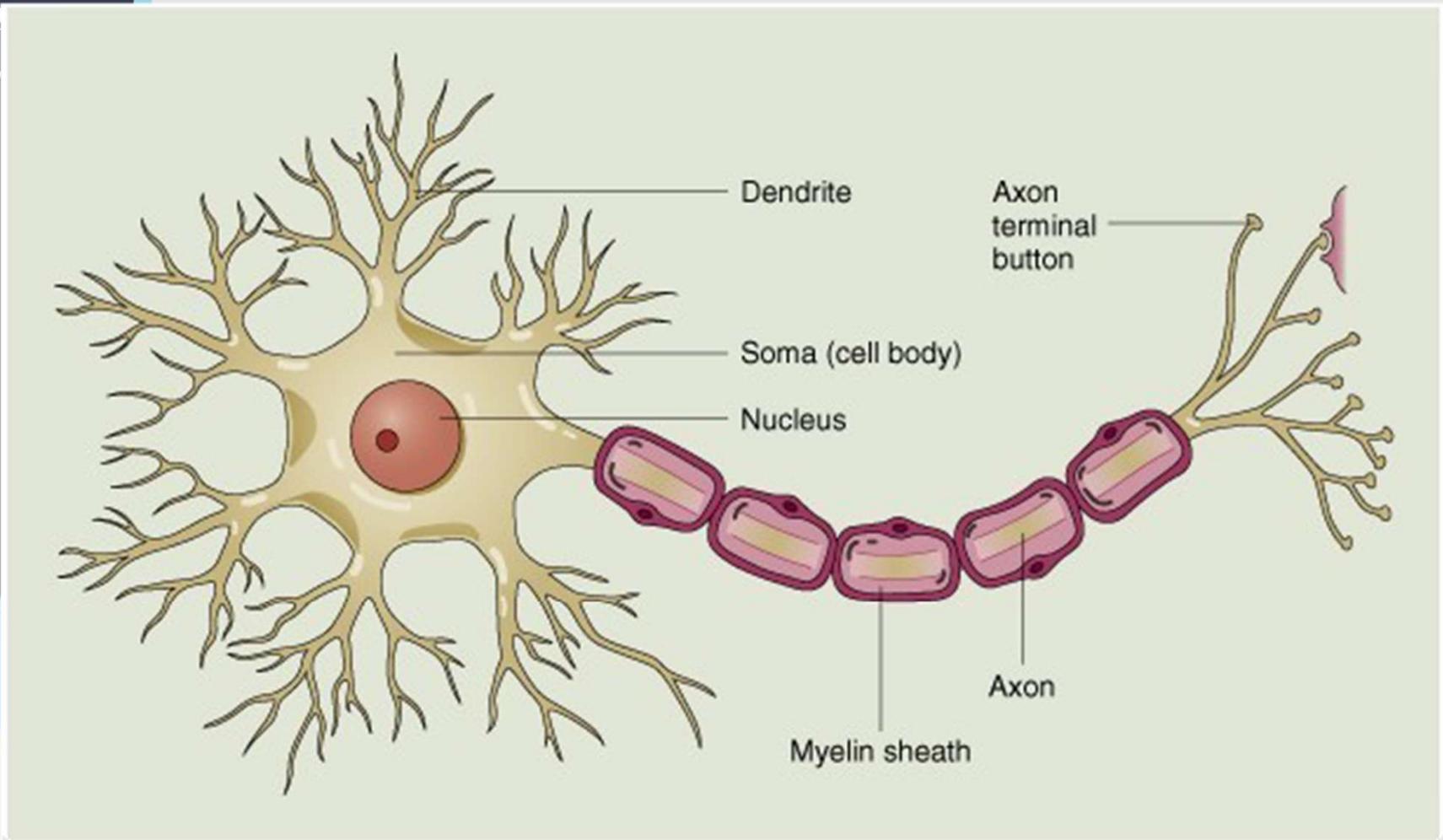
Consist of :

- **Cell Body**
- **Dendrite**
- **Axon**
- **Axon Hillock**
- **Axon Terminal**
- **Myelin Sheath**
- **Nodes of Ranvier**
- **Schwann cell**



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Structure of Neuron





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Cell body (Perikaryon/Soma)

Contain nucleus surrounded by cytoplasm

Cell bodies within the central nervous system (CNS) are frequently cluster into region called **nuclei**.

Cell bodies in the peripheral nervous system (PNS) occur in cluster called **ganglia**.



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Dendrites

Processes emerging from the cell body.

In many neurons its form a tree shaped array of processing extending from the cell body.

Function: Receive information from receptor or other neurons and send it to the neuron cell body or soma.



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Axon

Structure: Long, cylindrical and joint the cell body at a cone shaped, extend from the **axon hillock**.

Nerve impulses arises from axon hillock and initial segment, called **trigger zone** where the **action potential** begin.

Function: Send impulse from cell body towards another neuron, muscles fiber or a gland.