

Topic: HUMAN PHYSIOLOGY

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NERVOUS SYSTEM

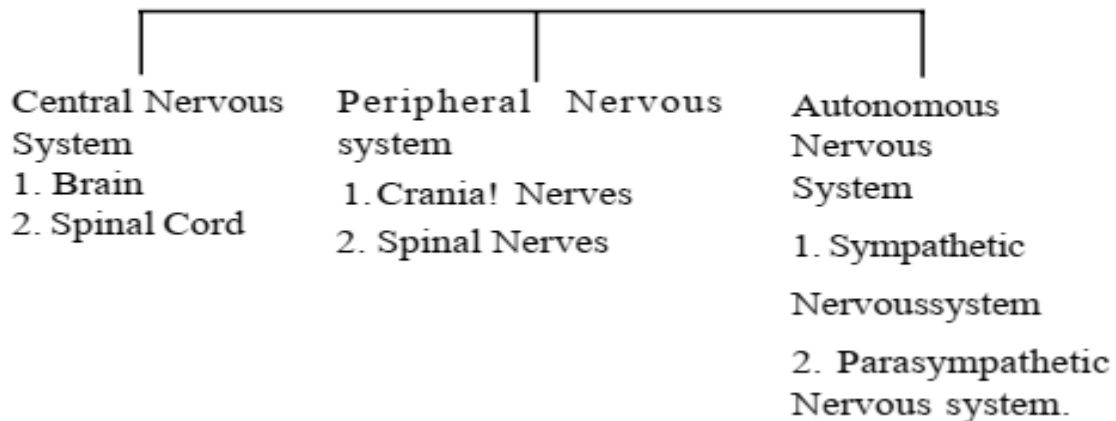
Nervous system is the most important system in our body because it is mainly concerned with the behaviour of the individual. Nervous system is essential for the reception of stimulus, and release of different responses. It also helps in initiating or controlling a particular behaviour. Many bodily functions are controlled and integrated only with the help of nervous system.

The system can be divided into,

- Central Nervous System
- Peripheral Nervous System
- Autonomous Nervous System.

The Central Nervous system includes brain and the spinal cord. Peripheral nervous system consists of cranial and spinal nerves. Autonomous nervous system consists of sympathetic and parasympathetic nervous system.

Nervous System



The nervous system consists of a vast number of units called **neurons** which are supported by a special type of connective tissue called **neuroglia**. Neurons are commonly referred to as 'nerves'.

Structure of a neuron.

The structural and functional unit of the nervous system is the **neuron**. A nerve cell with all its processes is called a neuron. The processes are collectively called the nerve fibers. They are of two parts.

1. Axon or axis cylinder
2. Dendron

Neuron consists of a central body and one or more projections. One projection which does not give out branches is long and is known as **axis or axon**. The branches or the projections are termed as **Dendrons**. There are no branches near the central axis, but towards the end of the axis there are minute branches. Sometimes there may be scattered branches at right angles to the axon. The minute branches of one axon touches the dendron of other neurons. The place where they touch each other is called '**Synapse**'.

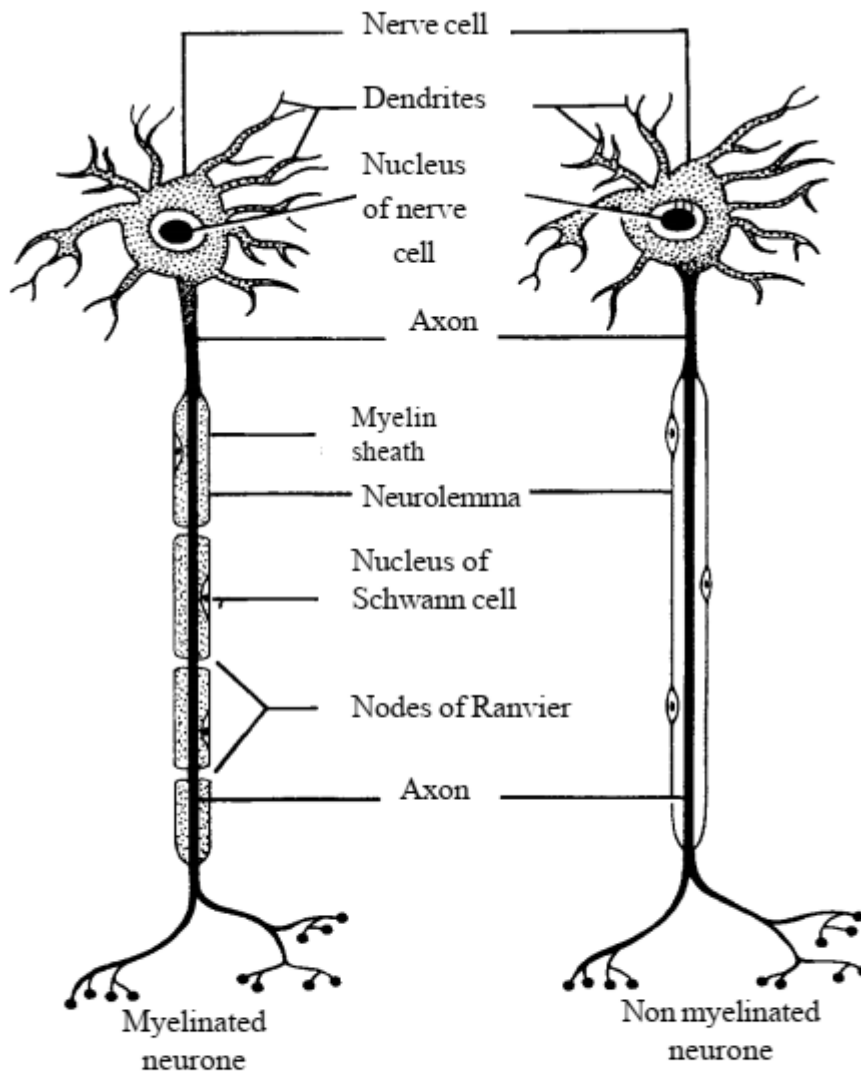


Fig. 14 - Structure of a neuron

Dendron brings messages to the neuron. This is known as the **afferent process**. Axon takes out the messages from the neuron. Axons are referred to as **efferent process**. Hence dendrons and axons can be referred to as one-way traffic. Each nerve cell consists of a nucleus. Axon is

covered by an outer membrane called **neurilemma**. The fatty sheath or the medullary sheath is interrupted by the **nodes of Ranvier**.

Types of Neurons : Neurons are classified according to their processes.

1. **Apolar** having no process.
2. **Unipolar** having only one process - the axon and fibre.
3. **Bipolar** - These are spindle-shaped cells possessing the axon at one pole and a dendrite at the other.
4. **Multipolar** - one axon and many dendrites.

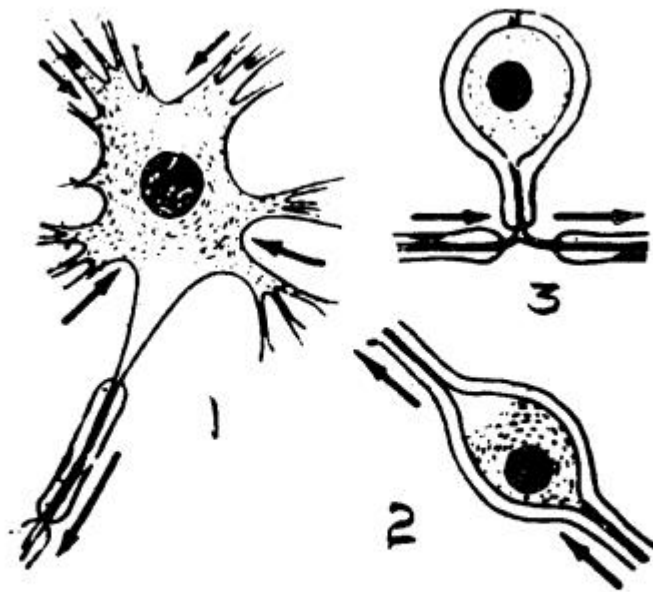


Fig.15- Types of Neurons

1. multipolar

2. bipolar

3. unipolar

Properties of Nerve tissue

Nerve tissue has the characteristics of **irritability and conductivity**.

Irritability is the ability to initiate nerve impulses in response to stimuli from:

1. Outside the body e.g. touch
2. Inside the body e.g. a change in concentration of CO₂ alters respiration.

Conductivity means the ability to transmit an impulse from:

1. One part of the brain to another.
2. The brain to voluntary muscle.
3. Muscles and joints to the brain, contributing to the maintenance of balance and posture.
4. The brain to the organs of the body resulting in smooth muscle contraction.
5. The outside world to the brain through sensory nerves in the skin stimulated by temperature, touch, pain and through the sense organs such as eye, nose, ear etc.