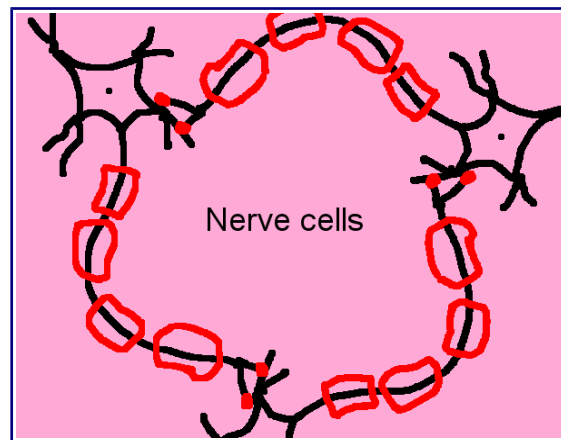
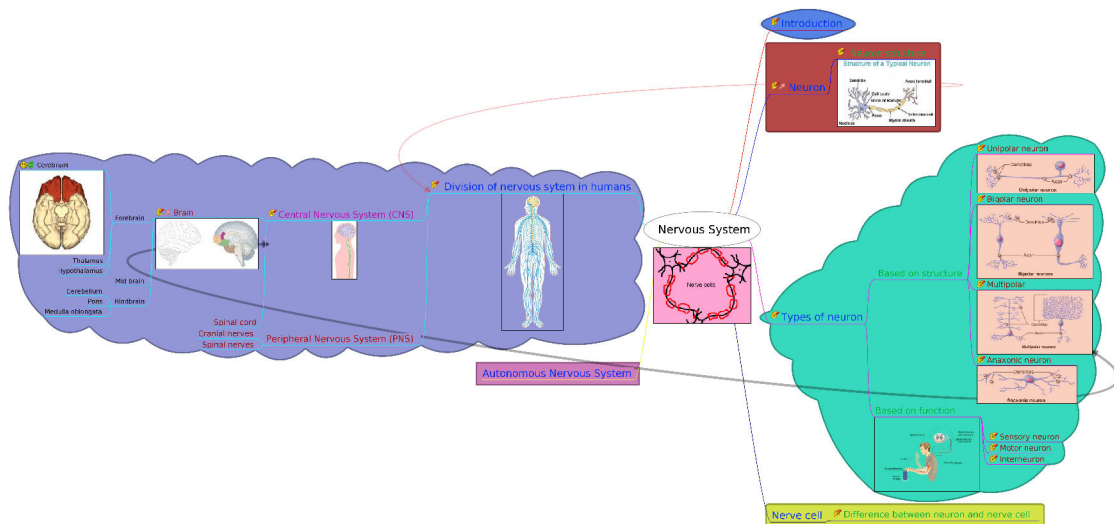


# Nervous System



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1)

[https://en.wikibooks.org/wiki/Human\\_Physiology/The\\_Nervous\\_System](https://en.wikibooks.org/wiki/Human_Physiology/The_Nervous_System)

This resource is useful for both students and teachers as well.

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2) <http://cognitivepsychology.wikidot.com/cognition:brain-structure>

This source is very useful for teachers to get more information.

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3) <https://courses.lumenlearning.com/biology2xmaster/chapter/neurons-and-glial-cells/>

This information is very useful for students.

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4) <https://scientia.wikispaces.com/The+Structure+of+Neurons+and+Glia>

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## **1 Introduction**

In our daily life we perform various activities like eating food, playing, reading writing etc.

Some of the actions that we perform consciously and some without conscious.

As we all aware our body is filled with very curious and interesting process.

Similarly each and every action that we perform either consciously or unconsciously there is a system in our which is controlling.

There are mainly two systems which control and coordinate our actions inside and outside.

They are:

a) *Endocrine system*

## b) Nervous system

In this report I have discussed about nervous system.

### 2 Neuron

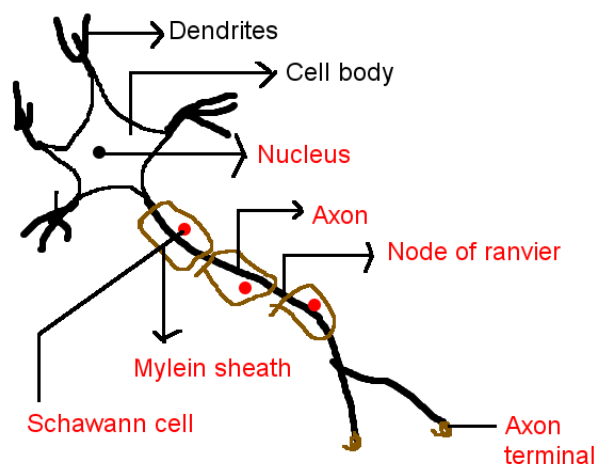
[../https://pressbooks.bccampus.ca/conceptsofbiologymolnarcamosun/chapter/16-1-neurons-and-glia-cells](https://pressbooks.bccampus.ca/conceptsofbiologymolnarcamosun/chapter/16-1-neurons-and-glia-cells)

The basic structural and functional unit of life is "**cell**".

Similarly, the basic structural and functional unit of nervous system is "**neuron**".

Neuron function is similar to that of electric wire, because even here neuron transmits signals from different parts of body to main controlling unit. Neuron is spread throughout the body.

### Neuron structure



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1. Neuron has a **cellbody** that contains a nucleus, smooth and rough endoplasmic reticulum, Golgi apparatus, mitochondria, and other cellular components.
2. **Dendrites** are the structures that branches out from cellbody which play an important role in the receiving and sending information to and from the cellbody.
3. From the cellbody a tail like extends which is referred as **axon**. An **axon** is a tube-like structure that propagates the integrated signal to specialized endings called axon terminals.
4. At the end of axons there are terminals called axon terminals. These terminals get connected to another neuron or to a muscle cell or to a gland. Chemicals released at axon terminals allow signals to be

communicated to these other cell.

5. Some axons are covered with myelin, which acts as an insulator. In some neuron there is a gap between myelin sheath which is referred to as node of Ranvier.

### 3 Types of neuron

Neurons are classified according to two characteristics. One is based on structure and the other is on function.

Based on structure, a neuron is classified into 4 types. They are as follows:

Unipolar

Bipolar

Multipolar

Anaxonic

Based on function, a neuron is classified into 3 types:

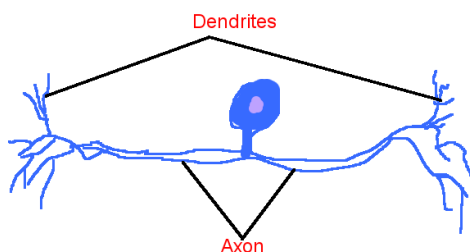
Sensory neuron

Motor neuron

Interneuron

#### • Based on structure

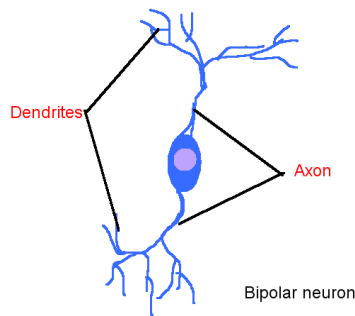
##### ○ Unipolar neuron



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Unipolar neurons have a single process that emanates from the cell body. The single process has dendrites on one end and the rest of the process is an axon.

##### ○ Bipolar neuron



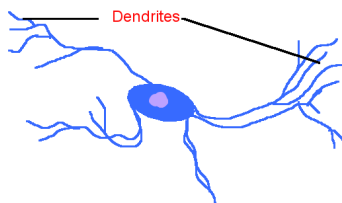
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Bipolar neurons have a single dendrite extending from one side of the cell body and a single axon extending from the other side. Bipolar neurons are small cells, typically extending for less than 30 microns from dendrite to axon terminal.

- Multipolar

Multipolar neurons have two or more dendrites on one side and a single axon on the other side of the soma. Multipolar neurons are the most common neurons in the CNS.

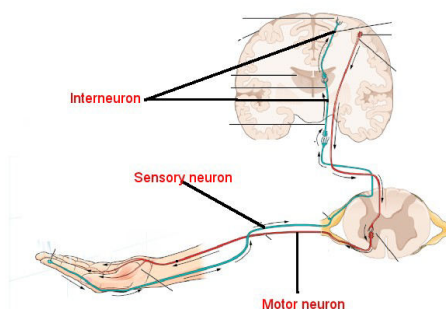
- Anaxonic neuron



[Source : tux paint Attribute – (CC) BY - SA]

- Anaxonic neurons are small, stellate (star-shaped) cells with processes that all look alike with no apparent axon

## ● Based on structure



[Source : Wikimedia; edited in tux paint]

- **Sensory neuron**

- Sensory neuron main function is to carry the stimuli from sense organ to

brain and spinal cord.

- **Motor neuron**

- Motor neuron transmits the information from brain and spinal cord to muscles or glands.

- **Interneuron**

- Interneuron connects sensory and motor neuron in brain and spinal cord.

## 4 Nerve cell

### 4.1 *Difference between neuron and nerve cell*

Neuron are specialized cell that is present in nervous system.

The dendrites and axons of neuron bundle together to form nerve cell.

## 5 Division of nervous sytem in humans

Nervous system in humans is mainly divided in two divisions which play a very important in controlling entire actions and process of the body.

- Central Nervous System (CNS)

- Central nervous system (CNS) is the main data collector of the body which gets information from different parts of the body.
- Central nervous system is further divided into two important divisions i.e brain and spinal cord.
- Brain and spinal cord are the main controlling unit, these oragns control different activities of the body and they send messages for the specific stimuli.
- Brain

<http://philschatz.com/anatomy-book/contents/m46533.html>

**Brain** is one of the most important controlling unit of the organisms with developed nervous system.

- Brain is located in head region.
- It is protected by a bonycase called skull and it is surrounded by a structure called cranium.

- Brain is surrounded by 3 layered membrane called meninges.

1. Meninges is a 3 layered structure consists of:

- Outer duramater
- Inner archanoid
- Middle piamater

These meninges not only protect brain they also protect the spinal cord. They run till the end of spinal cord.

Their main function is to protect the brain and spinal cord from the shock or any damage.

■ Brain is mainly divided into 3 major divisions:

1. Forebrain
2. Mid brain
3. Hindbrain

Now let us study divisions of brain.

■ Forebrain

- Cerebrum
- Thalamus
- Hypothalamus

■ Mid brain

■ Hindbrain

- Cerebellum
- Pons
- Medulla oblongata

○ Spinal cord

● Peripheral Nervous System (PNS)

- Cranial nerves
- Spinal nerves

## **6 Autonomous Nervous System**

## **7 Reflex action**

The reflex action is a sudden and involuntary response to a stimulus. Spinal cord is the controlling unit of reflex action.