

CLASSIFICATION OF NEURON

Neurones are classified in various ways:

- a. According to the nos. of processes/arrangement of axon.
- b. According to the length of axon.
- c. According to the function
- d. According to the shape of cell body/dendritic pattern.

A. According to the no. of processes:

1. Apolar – Neurons having no processes, eg. The chromaffin cells of adrenal medulla which are actually postganglionic sympathetic neurons
2. Unipolar (fig A)– Neurons having only one process, eg. The cells of mesencephalic nucleus of the trigeminal nerves. (They are usually found in invertebrates. In vertebrates they are in ANS).
3. Pseudounipolar (fig B)– These neurons are actually unipolar having one axon and the cell body is attached by a process, ie, axon after originating from the soma, splits into central and peripheral processes. Eg. Dorsal root ganglion cell (DRG) of spinal nerve (primary sensory neurons with cell bodies in dorsal root ganglion.)
4. Bipolar (fig C)– Neurons having two processes, one axon and the other being dendrite. Eg. The bipolar cells of retina.
5. Multipolar (fig D) – Neurons having multiple processes, one of which is axon and the rest are dendrites, typical eg. The anterior horn cells of spinal cord (spinal motor neuron)

B. According to the length of the axon:

1. Golgi type-I neurons – Neurons having long axons forming the peripheral nerves and the nerve tracts in CNS are of this type. The neuron which extends from toe to the nucleus gracilis in medulla is the largest, its cell body is in DRG.
2. Golgi type-II neurons – Neurons having short axons, these are usually found within the grey matter of CNS, eg. Basket cells in cerebellum.

C. According to the functions:

Neurons can be divided into sensory motor neurons and interneurons.

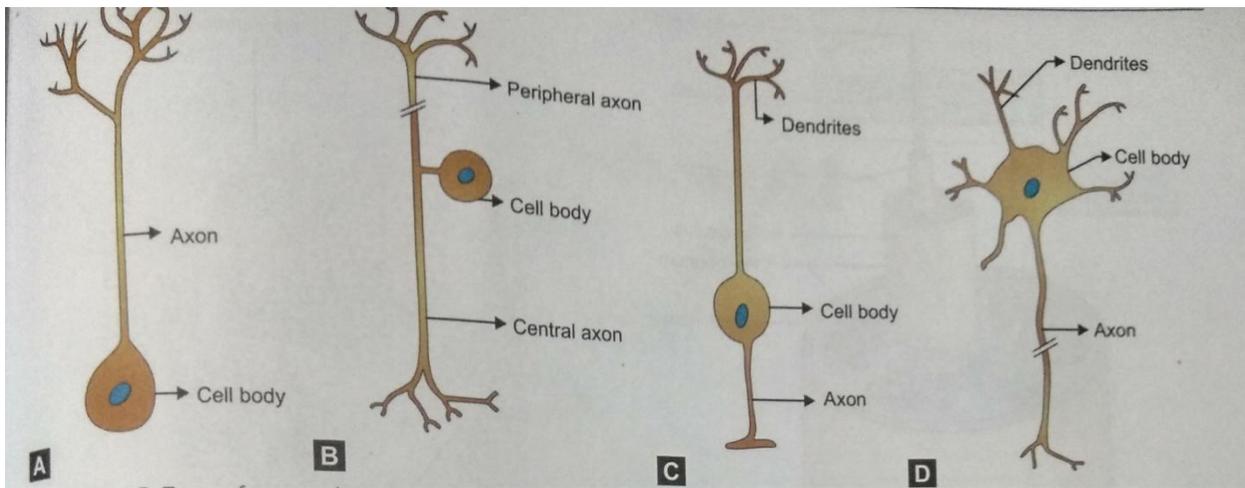
1. Sensory neurons -- They carry impulses from the receptors to CNS. These are called afferent neurons (fibres).
2. Motor neurons – They transmit output of the CNS to periphery (muscle or glands). They may be – somatic and autonomic. Somatic neurons are subdivided into upper and lower motor neurons, whereas autonomic neurons are divided into pre and post ganglionic fibres of sympathetic and parasympathetic subdivisions.
3. Interneurons – These are situated inbetween two neurons and relay information in between them with necessary modification ie they may be inhibitory or excitatory. Interneurons are small and have short processes.

D. According to dendritic pattern or shape of cell body:

Neurons are classified as pyramidal, stellate, fusiform etc.

1. Pyramidal – Dendrites of these cells spread like pyramids. The example is hippocampal pyramidal neurons (found in cerebral cortex, hippocampus and amygdala)
2. Stellate cells – Radial shaped spread of dendrites (star like) occurs in these cells. Eg. Cortical stellate cells.

The long axons of both afferent and efferent peripheral neurons are bundled together with connective tissue into cord –like fibers called nerves. — sensory nerves, motor nerves and mixed nerves



CLASSIFICATION OF NEURONS ACCORDING TO NO. OF PROCESSES