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# Neuron Structure NEURON

- Structural and functional unit of nervous tissue is neuron.
- Cell body of neuron is also called perikaryon or soma or cyton
- Perikaryon has nucleus and cytoplasm that contains nissl bodies.
- Nissl bodies are formed of REP and ribosomes.
- Occasionally pigments present in the cytoplasm of cell body are lipofuscin.
- Short branches arise from cell body of neurons are dendrites
- Dendrites conduct the impulse to the cell body.
- Single long cylindrical process arise from the cyton is axon.
- Axon originates from the short cone-shaped-region of perikaryon called the axon hillock.
- Plasma memberane of axon is called axolemma and cytoplasm is called axoplasm.
- Axon conducts nerve impulses away from cell body to other nerve cells, and effectors.
- The axon terminates on other neurons or effectors by small branches called the terminal arborization.
- The small branches of axon end in small swellings called terminal boutons.
- A region formed by an axon terminal on the surface of dendrite of another nerve cells is ynapse.
- Synaptic vesicles present in presynaptic terminal and contain neurotransmitters and numerous mitochondria.
- Most synapses transmit information to the next neuron by releasing chemical neurotransmitters.
- Nerve tissue has only a very small amount of extracellular matrix.

#### **GLIAL CELLS**

- Glial cell of the central nervous system are oligodendrocytes, astrocytes, ependymal cells and microglia.
- Glial cells of the peripheral nervous system of satelite cells and schwann cells.
- The cells that produce the myelin sheath are oligodendrocytes.
- Star shaped glial cells are astrocytes.
- The glial cells which hind neurons to capillaries are astrocytes.
- The glial cells which form blood brain barrier are astrocytes.

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- Columnar epithelial cells lining the ventricles of the brain and central canal of the spinal cord are ependymal cells.
- The cells which facilitates the movement of cerebrospinal fluid are ependymal cells.
- Small elongated cells derived from mesoderm are microglia.
- The cells that represent mononuclear phagocytic system of nerve tissue are microglia.
- Microglia are derived from precursor cells in the bone marrow.
- Phagocytic glial cells are microglia.
- The glial cells of peripheral nervous system surrounding the cell bodies of ganglia are satelite cells.
- The glial cells of peripheral surrounding axons are schwann cells.
- The layer of cell membrane of schwann cell unite and form a whitish myelin sheath around axon called myelin sheath.
- Outer most layer of schwann cells that contains cytoplasm and nucleus is called neurilemma or sheath of schwann.
- Gaps in the meylin sheath are called the nodes of Ranvier.
- The distance between the nodes is called an internode and consists of one schwann cell.
- Supporting cells are absent around the unmyelinated axons of the central nervous system.

#### **TYPES OF NEURONS AND NERVE FIBRES**

- Most neurons of the body are multipolar.
- Multipolar neurons have one axon and two or more dendrites.
- Bipolar neurons have one dendrite and one axon.
- Bipolar neurons are found in the retina of eye, inner ear and olfactory membrane.
- Unipolar neurons have a single process.
- Cytons of unipolar neurons found in the dorsal root ganglia of the spinal nerves.
- Neurons of dorsal root ganglia of the spinal nerves also called pseudounipolar neurons (they are sensory)
- Neurons that control effector organs by carrying impulses are motor (afferent) neurons.
- Neurons involved in the reception of sensory stimuli from the environment are sensory neurons (afferent)
- Sensory and motor neurons are connected by interneurons.
- Motor neurons and interneurons are multipolar.

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- White matter of the brain and spinal cord contains myelinated axons and oligodendrocytes.
- Grey matter contains neuronal cell bodies, dendrites and the unmyelinated axons and glial cells.
- White appearance of white matter is due to myelin, grey apperance of grey matter is due to nissl bodies.
- Groups of nerve fibres in the central nervous system are called tracts.
- Aggregates of neuronal cell bodies in the central nervous system are called nuclei.
- Aggregates of neuronal cell bodies in the peripheral nervous system are called ganglia.
- Nerve is a bundles of nerve fibres.
- Loose connective tissue sheath surrounding a nerve fibre is endoneurium.
- A bundle of nerve fibres is called fascicle.