

A microscopic image of nervous tissue, showing a large, dark, triangular structure (likely a neuron or glial cell) with a prominent nucleus and surrounding lighter-colored tissue. The image is stained with hematoxylin and eosin (H&E), giving it a purple and pink hue.

# HISTOLOGY

## NERVOUS TISSUE

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## NORMAL CELLS OF CNS

1- **Neurons:** Cell body (perikaryon). Processes: An axon and dendrites.

2- **Neuroglia:** Astrocytes. Oligodendrocytes. Microglia. Ependymal cells.

### Components:

**Cell body (Perikaryon)**

**Processes:** a. An axon: only one b. Dendrites: one or more

### TYPES OF NEURONS Based on number of processes

Pseudounipolar neurons	Bipolar neurons	Multipolar neurons		
rounded neuron	spindle-shaped neuron	-		
Has one process only, that divides into two branches; one acts as a dendrite and the other as an axon	Has two processes (one arising from each pole of the cell body). One of them is the dendrite and the other is the axon	Has one axon and multiple dendrites		
Mesencephalic nucleus of trigeminal nerve	retina & olfactory epithelium	<b>Stellate neuron</b>	<b>Pyramidal neurons</b>	<b>Pyriform neurons</b>
		The commonest type e.g. anterior horn cells of the spinal cord	Distributed in motor area 4 of the cerebral cortex	Pear-shaped, e.g. Purkinje cells of cerebellar cortex

### Structure of cell body:

1. **Nucleus:** Single, usually central, rounded and vesicular with prominent nucleolus.

2. **Cytoplasm.**

1- **Nissl bodies:**

Are basophilic patches of rER and free ribosomes in the cell body and bases of wide dendrites.

## 2- Neurofilaments

Are intermediate filaments which are bundled together to form neurofibrils. Are found in the cell body, axon and dendrites.

## 3- Microtubules:

Are found in the cell body, axon and dendrites.

## 4- Golgi apparatus:

Surrounds the nucleus all around.

\* There is **NO Golgi apparatus** in the **axon**

## 5- Mitochondria:

Are numerous

**6. Centriole:** Most adult neurons have only one rudimentary centriole, so they cannot divide.

**7. Some fat and glycogen granules.**

## 8. Pigments:

Lipofuscin pigments (in old age). (accumulation of waste products in lysosomes)

Melanin pigments (in neurons of substantia nigra of the midbrain).

## TYPES OF NERVE FIBERS IN CNS

- **Unmyelinated** without neurilemmal sheath (in grey matter).
- **Myelinated** without neurilemmal sheath (In white matter).

**Myelinated** with neurilemmal sheath (**PNS**)

## NEUROGLIA

Are group of cells that act as the supportive tissue of CNS

	Astrocytes	Oligodendrocytes	Microglia	Ependymal cells
	They are the commonest type of neuroglia cells. They are found in both the grey and white matter. They are star-shaped cells with numerous long processes	Are branching cells with few, short processes. They are distributed in the grey and white matter of CNS	Are spindle-shaped cell with branching processes raise from each pole of the cell. Are distributed in the gray and white matter of CNS. Are rich in lysosomes.	Are simple columnar epithelial cells (partially ciliated) lining the brain ventricles and the central canal of spinal cord
<b>function</b>	Repair of injury of CNS tissue (gliosis). Supportive and nutritive functions to the neurons. Participate in the formation of blood-brain barrier	Formation of myelin sheath in the CNS. Insulation of nerve fibers	Their main function is phagocytosis	-

### Types

#### Protoplasmic astrocytes:

Are found in the gray matter of CNS

Their processes branch extensively

#### Fibrous astrocytes:

Are found in white matter of CNS.

Their processes have fewer branches but longer

### Myelin sheath ->

PNS: shwan cell      CNS: oligodendrocyte

