Histology Team 431

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NORMAL CELLS OF CNS

1- Neurons:

Components:

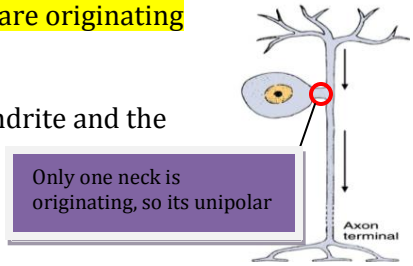
1. Cell body (Perikaryon)
2. Processes:

a. An axon: only one

b. Dendrites: one or more

TYPES OF NEURONS

Based on number of processes "According to number of process that are originating from the cell body" (one will be the axon and rest are dendrites)



1. Pseudounipolar neurons (round Neuron)

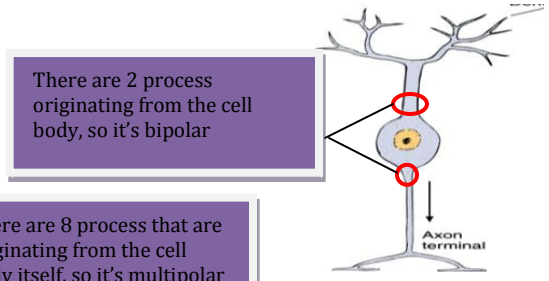
Has only one process that divides into two branches; one acts as a dendrite and the other as an axon

e.g. Mesencephalic nucleus of trigeminal nerve & dorsal root ganglion

2. Bipolar Neuron (spindle-shaped neuron):

Has two processes (one arising from each pole of the cell body), One of them is the dendrite and the other is the axon

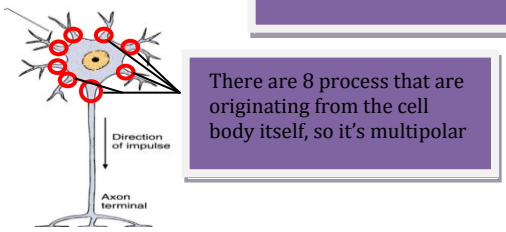
e.g. retina & olfactory epithelium.



3. Multipolar neuron:

Has one axon and multiple dendrites

Types of multipolar neurons:

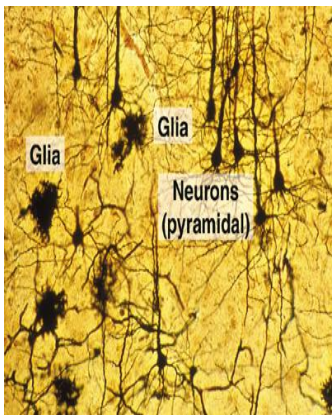


A. Stellate (star shaped) neuron:

- Most common type.
- Distributed in most areas of CNS e.g. anterior horn cells of the spinal cord

B. Pyramidal neurons:

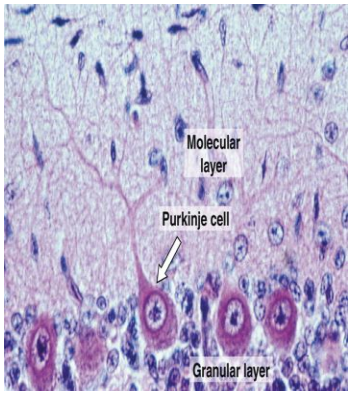
- Distributed in motor area 4 of the cerebral cortex



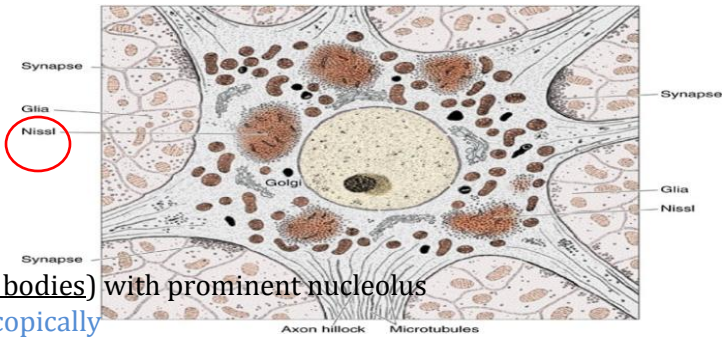
C. Pyriform neurons:

Pear-shaped

e.g. Purkinje cell s of cerebellar cortex



CELL BODY (Perikaryon)

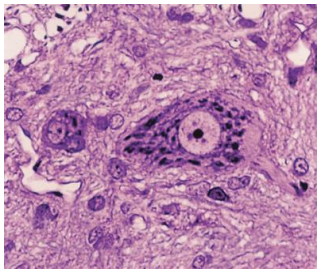


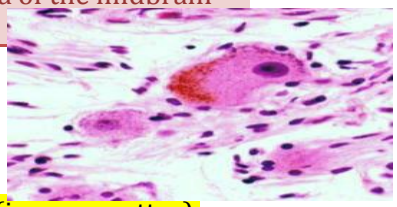
1. Nucleus

. Single
. usually central
. rounded & vesicular(composed of small, saclike bodies) with prominent nucleolus

- If a nucleus is active, it will look pale microscopically

2.Cytoplasm

1. Nissl bodies: 	**Are basophilic patches of rER (rough endoplasmic reticulum) , free ribosomes in the cell body , 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.Microtubles	Are found in the cell body only in axon and dendrites.
4.Golgi apparatus	Surrounds the nucleus all around.
5.Mitochondria	Are neumerous.
6. Centriole	Adult neurons have only one "non functional " ruminant of centriole they cannot divide.
7. Some fat and glycogen granules.	
8. Pigments	-Lipofuscin pigments (in old age). -Melanin pigments (in neurons of substantia nigra of the midbrain

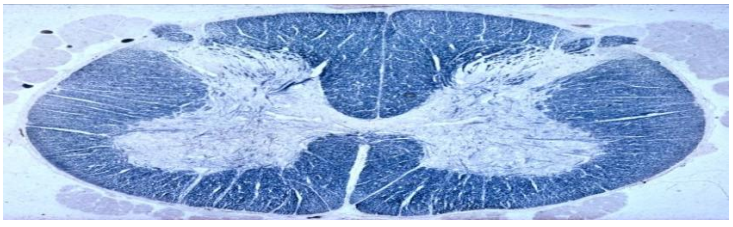


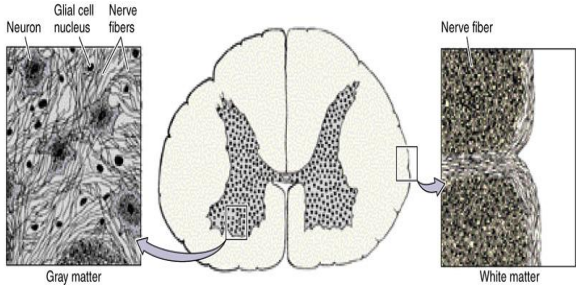
TYPES OF NERVE FIBERS IN CNS

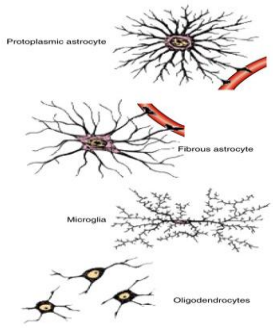
1- Unmyelinated without neurilemmal sheath "sheath of Schwann" (in grey matter).

2- Myelinated without neurilemmal sheath "sheath of Schwann" (in white mater).

* Neurilemmal sheath is only present in the PNS



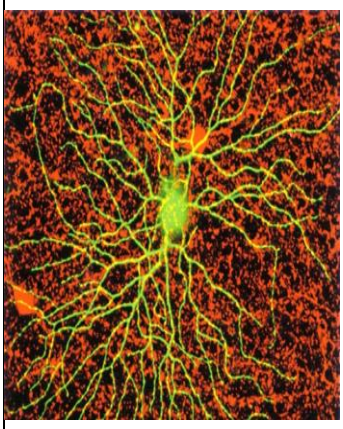
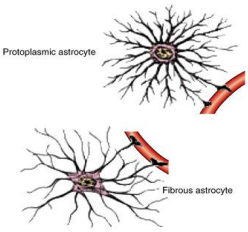
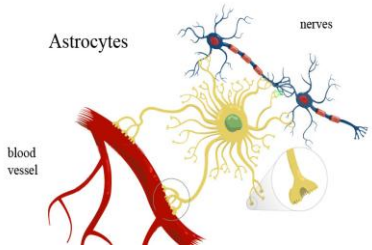
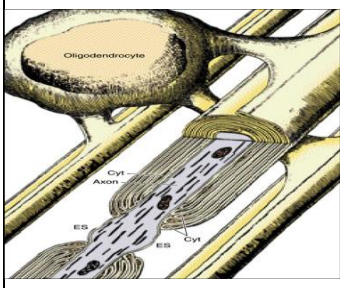
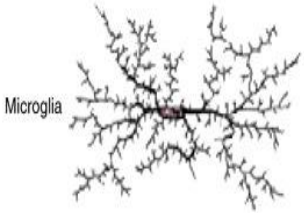
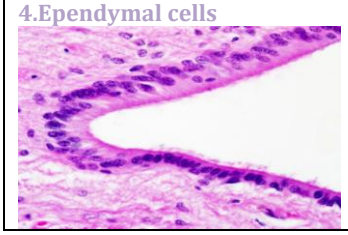




2-NEUROGLIA :

A group of cells Act as a connective tissue in the CNS , to support neurons

Types:

	Characteristics	Types	Functions
1.Astrocytes 	. Commonest type . Found in both the grey and white matter. . Star-shaped, with numerous long processes.	A.Protoplasmic astrocytes: -Are found in the grey matter of CNS. - Branched extensively B.Fibrous astrocytes: - Are found in white matter of CNS. - Fewer branches 	1. (Gliosis): Repair of injury of CNS tissue. 2. Supportive and nutritive functions to the neurons. 3. Participate in the formation of blood-brain barrier *Neurons don't have any direct communications with blood capillaries to avoid toxin leakage 
2.Oligodendrocytes 	• Are branching cells with few, short processes. • They are distributed in the grey and white matter of CNS.		1. Formation of myelin sheath in the CNS. 2. Insulation of nerve fibers. * Oligodendrocytes wrap the nerve fibers , and can myelinate more than one fiber related to a different neuron * the process of Oligodendrocytes from the myelin sheat
3.Microglia 	• 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 For phagocytosis		Phagosytosis
4.Ependymal cells 	simple columnar epithelial cells (partially ciliated) lining the brain ventricles and the central canal of spinal cord		

Questions,

1- **What is the shape of the Bipolar neuron?**
   A- Rounded
   B- Star shape
   C- Spindle shape

2-Where can we find the neurilemmal sheath?
   A-In the CNS
   B-In the PNS
   C- Both

3-What is the commonest type of neuroglial cells?
   A- Astrocyte
   B- Oligodedndrocyte
   C- Microglia

Answers,
1-C
2-B
3-A