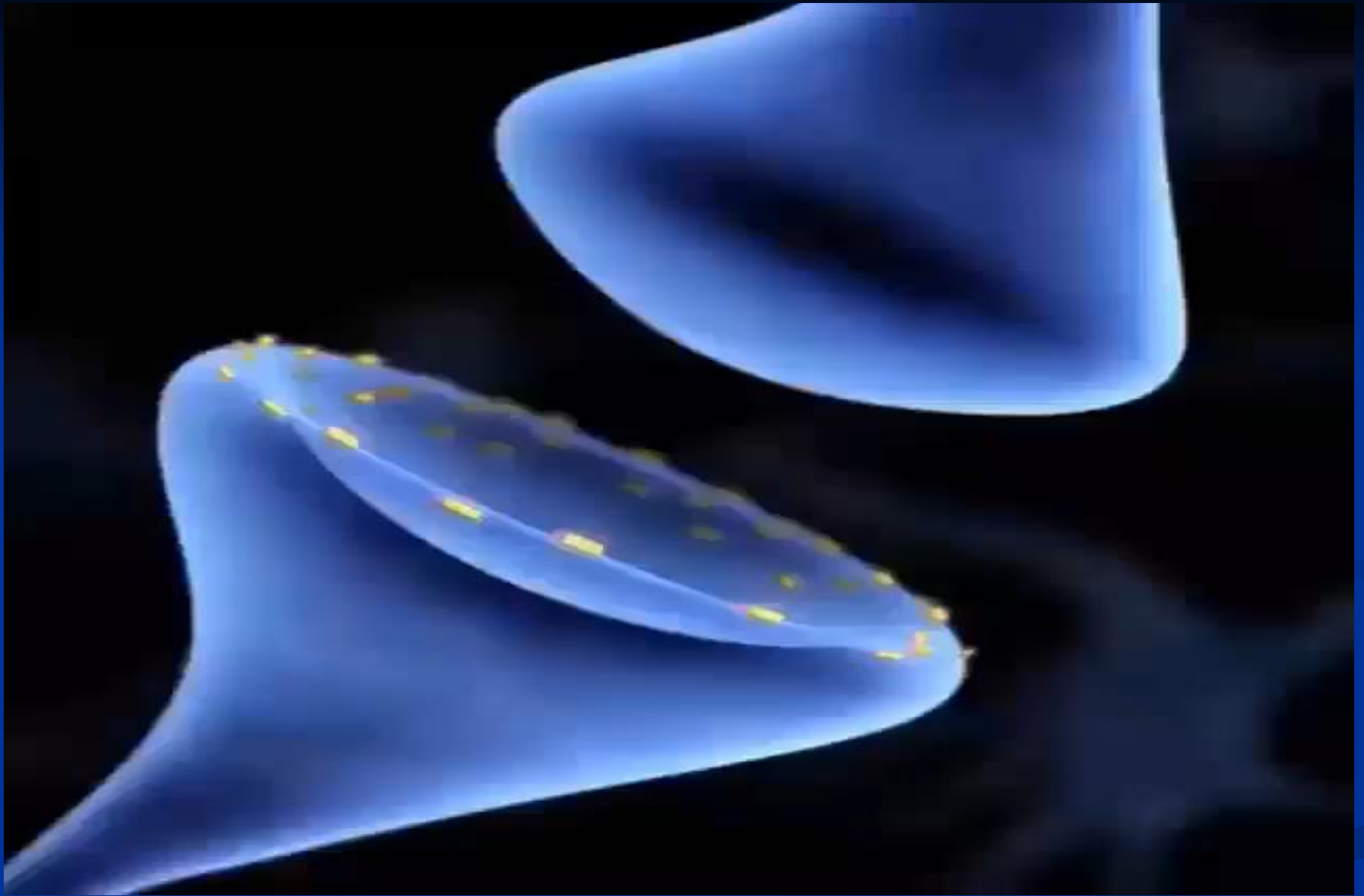


Biology





Synapse

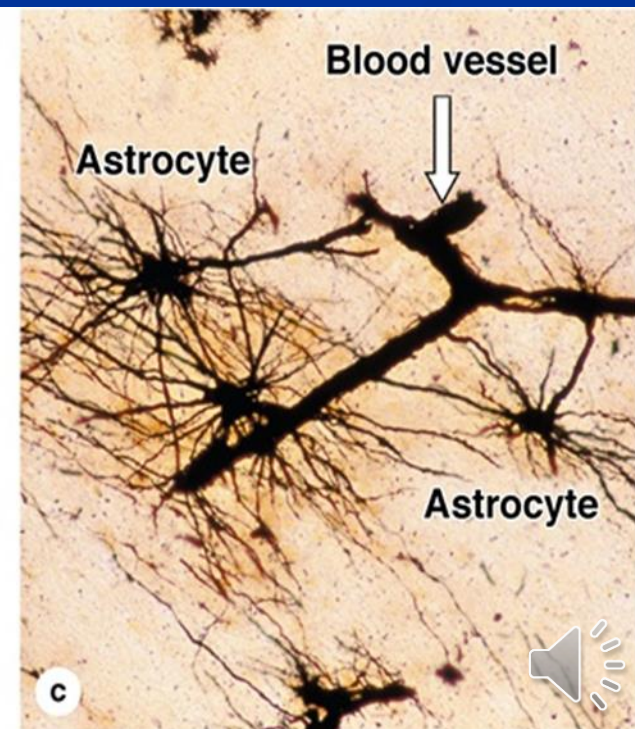
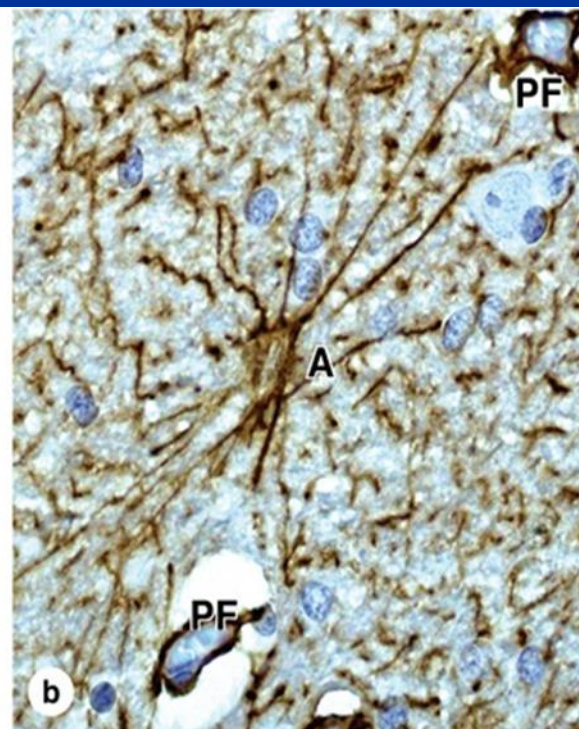
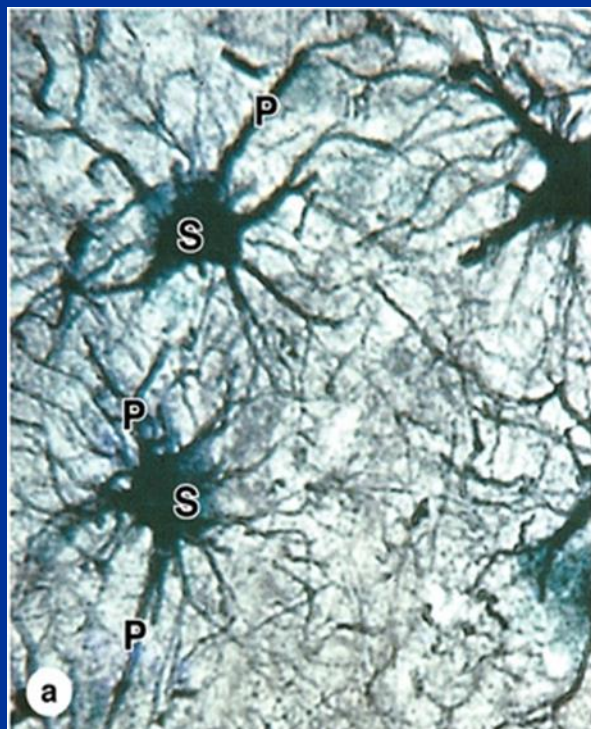


Neuroglia:

- They outnumber neurons by about 10 to 1 in the brain . More than half the volume of the human nervous system is composed of supporting neuroglial cells.



- In the CNS (brain & the spinal cord) there are 4 types of supporting cells:
- **1. Astrocytes:** stellate-shaped cells with fine processes radiating in all directions.

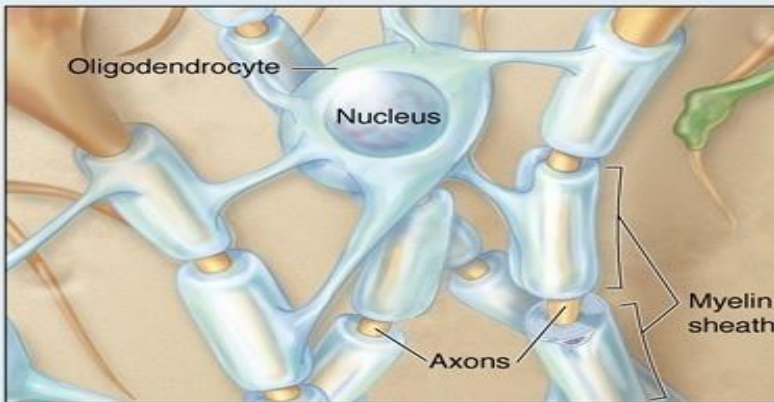


- Astrocytes are of 2 types:
- a. fibrous astrocytes found in the white matter of brain.
- b. protoplasmic astrocyte found in the gray matter of brain.

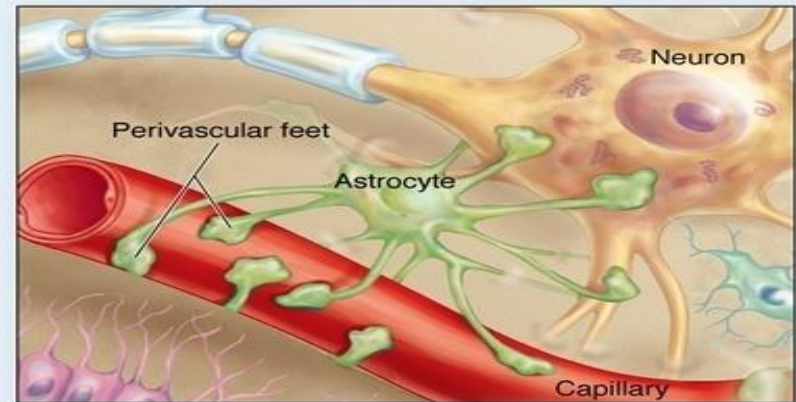


- 2. Oligodendrocytes:
- 3. Ependymal cells:
- 4. Microglia cells:

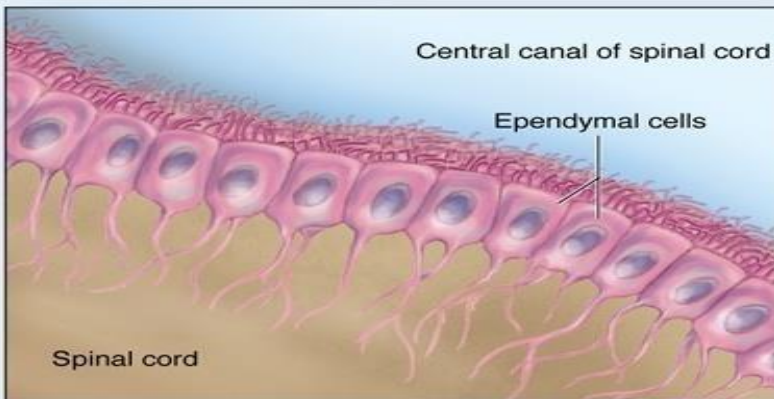
CNS Glial Cells



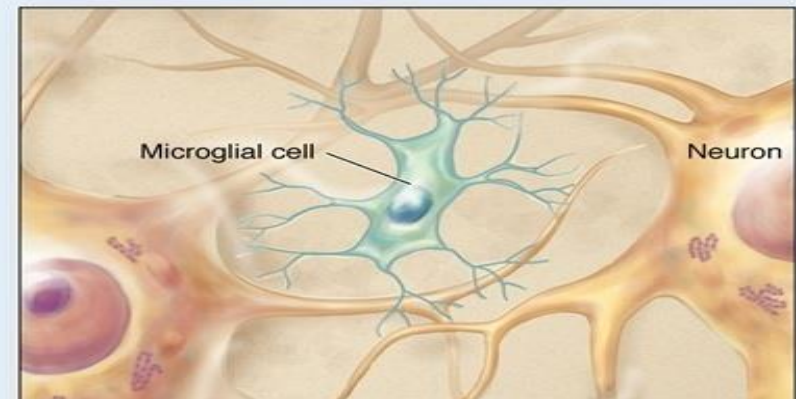
a Oligodendrocyte



b Astrocyte



c Ependymal cells

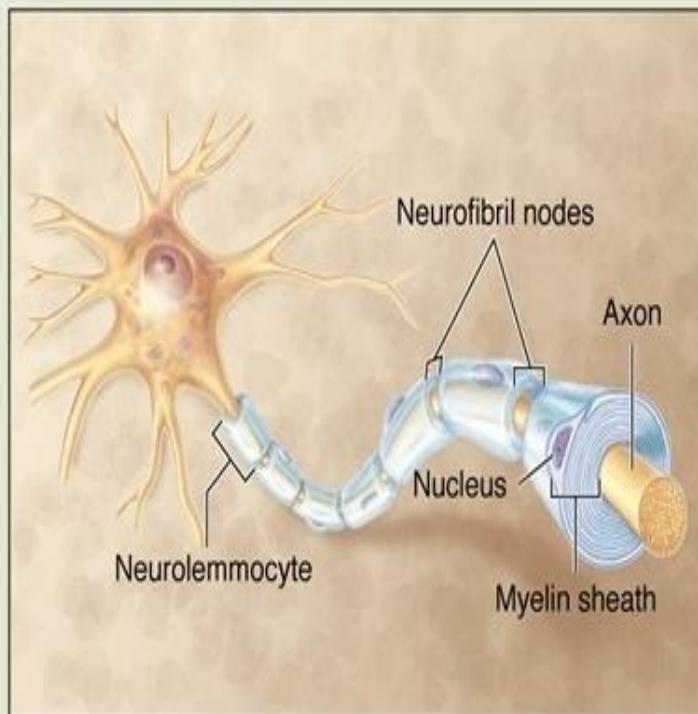


d Microglial cell

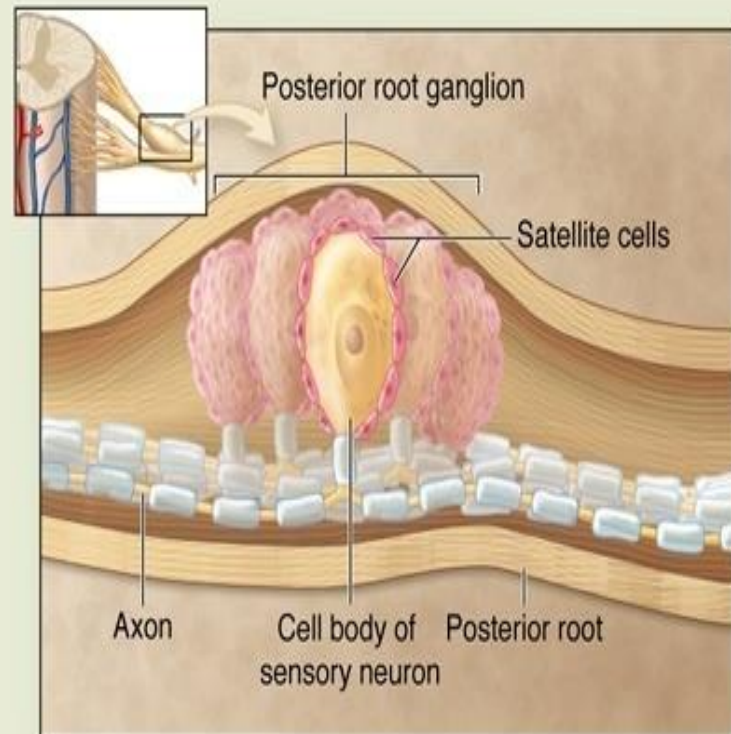


- In PNS:
- 5. Schwann cell (neurolemmocytes):
- 6. Stellate cells of ganglia:

PNS Glial Cells



e Neurolemmocytes



f Satellite cells

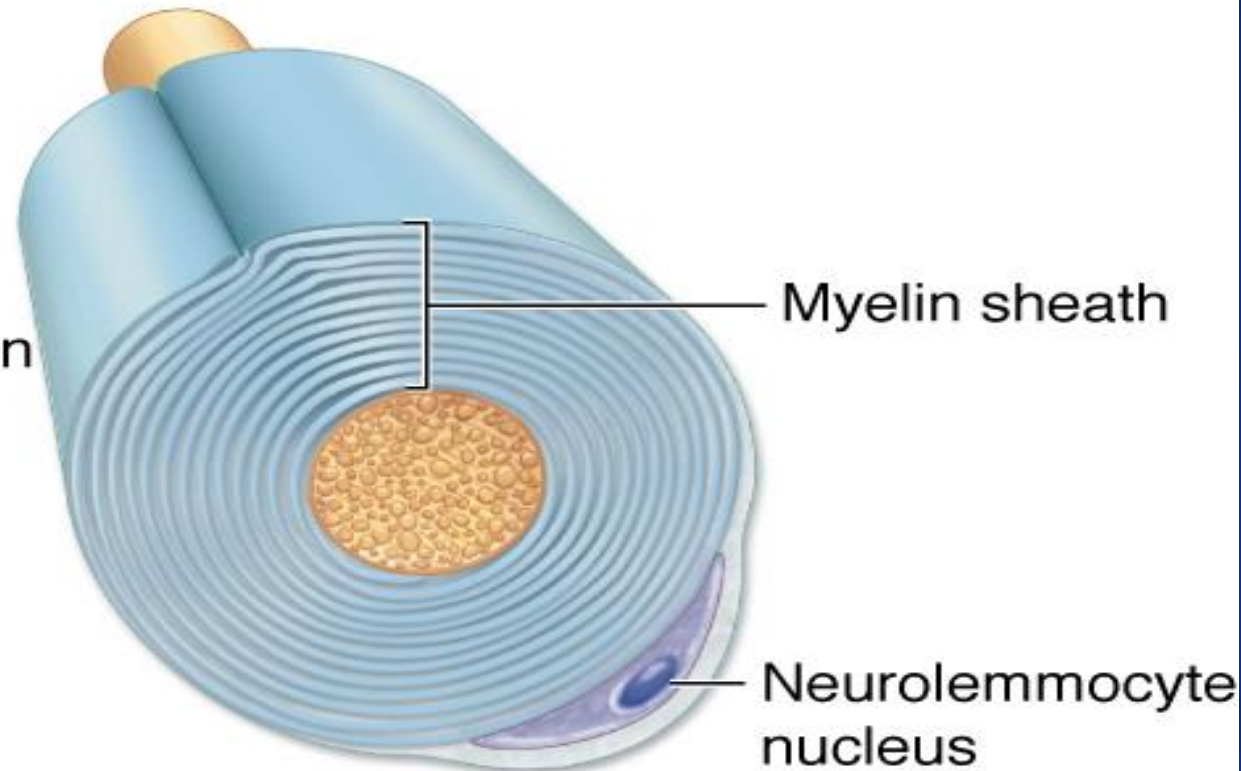


- **The peripheral nervous system**
- The main components of the peripheral nervous system are the nerves, ganglia and nerve endings.
- **Nerves:-** are bundles of nerve fibers surrounded by a series of connective tissue sheaths.
- **Nerve fibers:-**



- There are 2 types of nerve fibers:
- **Myelinated nerve fibers:**

④ Eventually, the neurolemmocyte cytoplasm and nucleus are pushed to the periphery of the cell as the myelin sheath is formed.

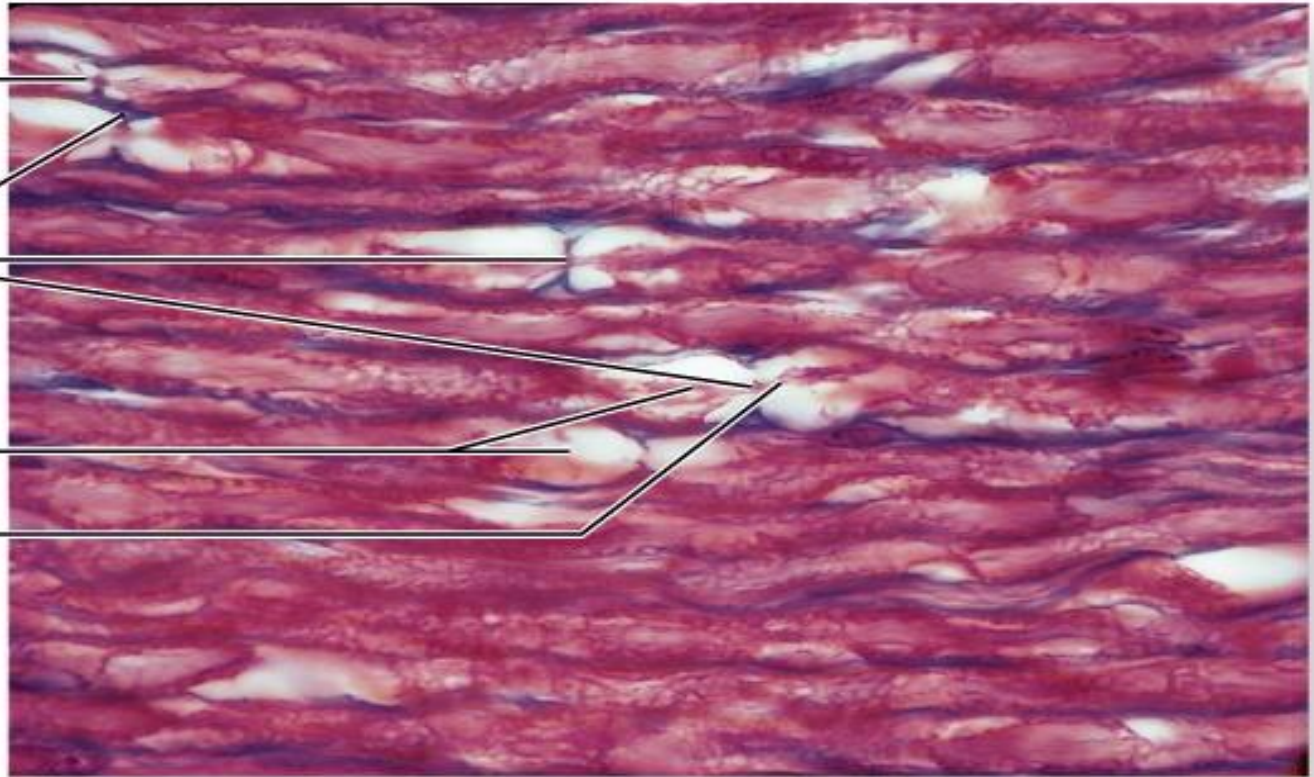


Axon

Nodes of
Ranvier

Myelin sheath

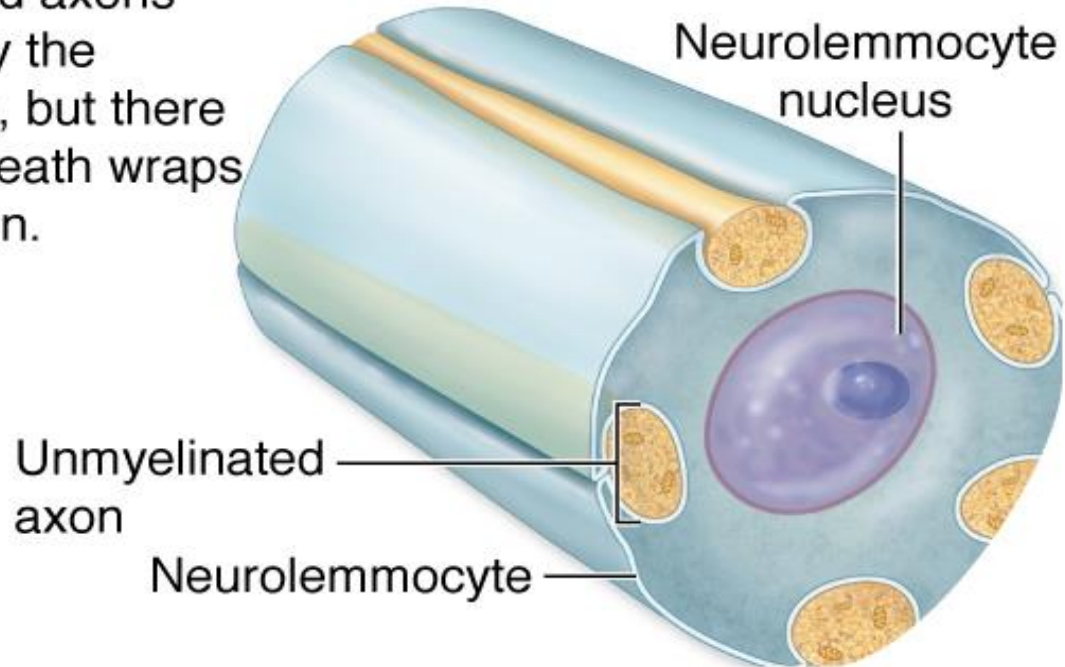
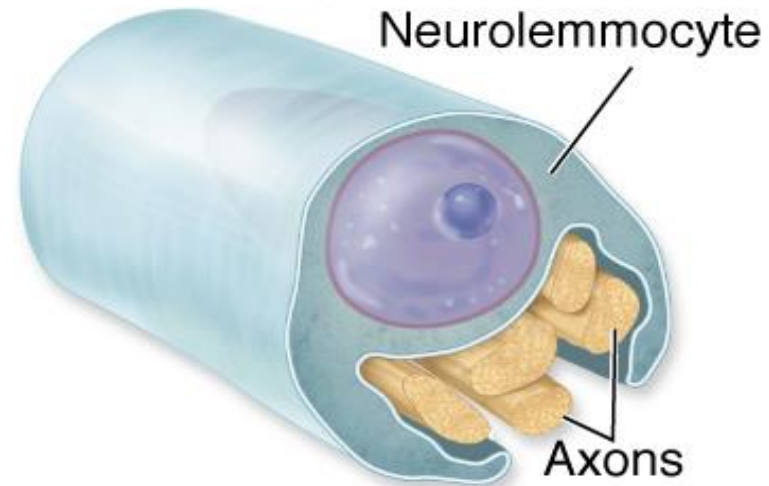
Axon



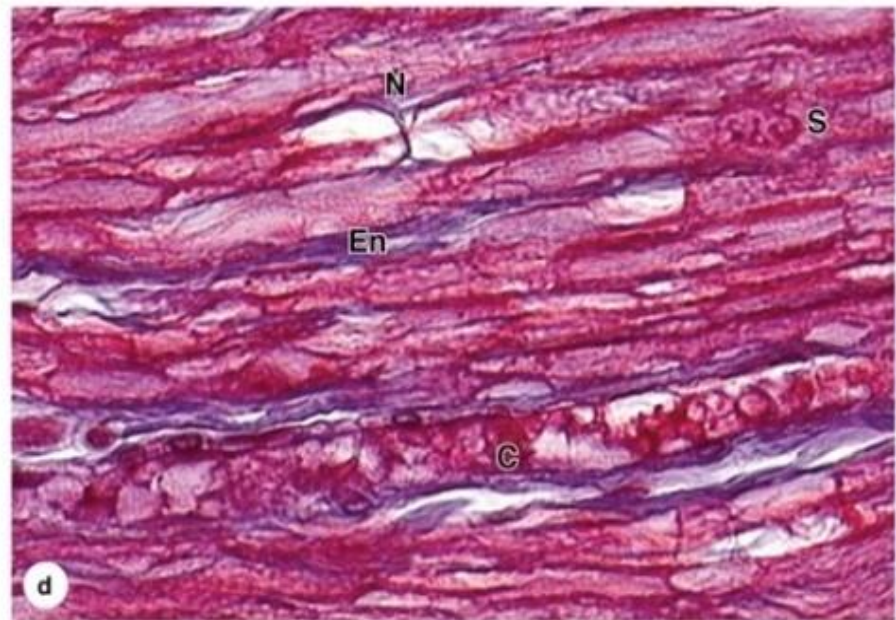
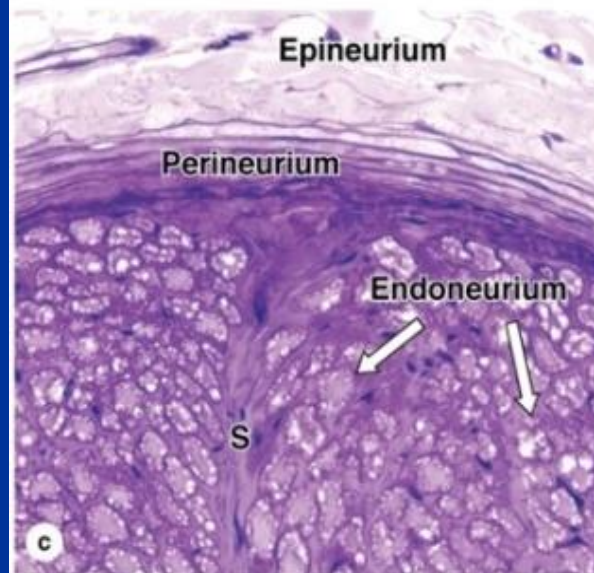
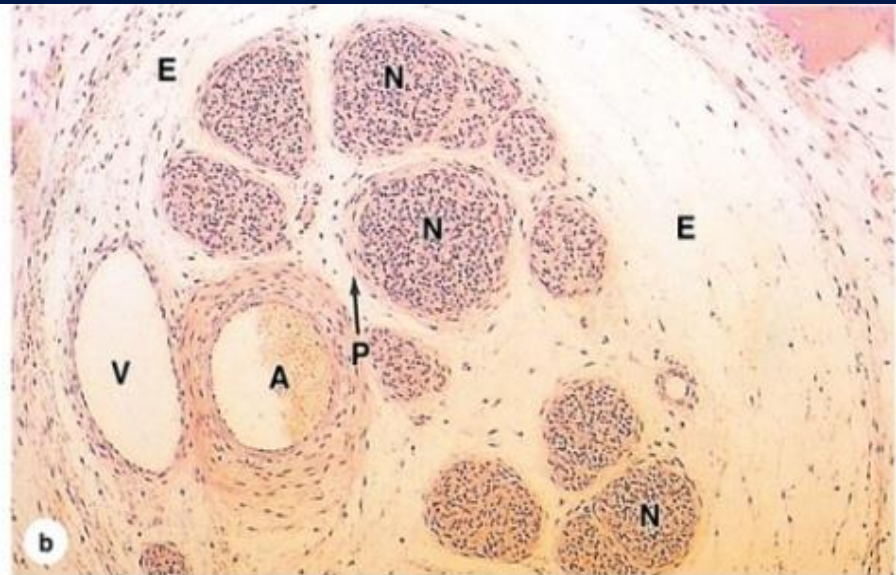
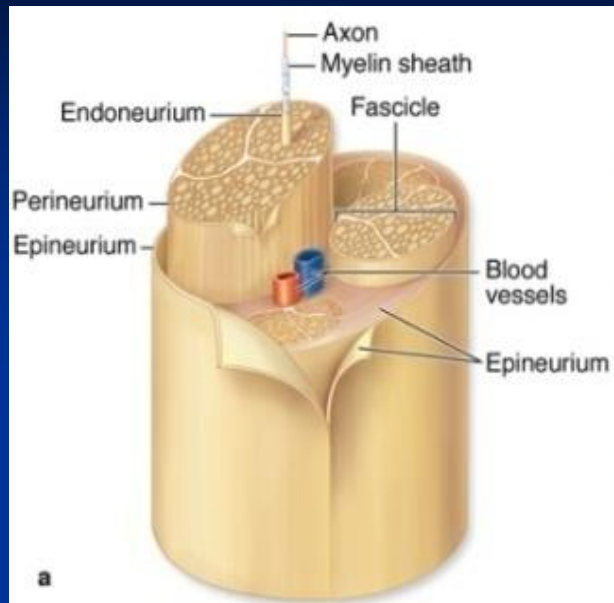
■ unmyelinated nerve fibers:

Unmyelinated axons

- ① Neurolemmocyte starts to envelop multiple axons.
- ② The unmyelinated axons are enveloped by the neurolemmocyte, but there are *no* myelin sheath wraps around each axon.



■ Peripheral nerves:



Clinical notes:

1. Demyelinating Diseases
2. Guillain-Barre syndrome (GBS)

WHAT GUILLAIN-BARRÉ SYNDROME DOES TO A NERVE

NORMAL NERVE



DAMAGED MYELIN





3. Multiple sclerosis (MS)

MULTIPLE SCLEROSIS

IMMUNE-MEDIATED
INFLAMMATORY DEMYELINATING
DISEASE OF THE CENTRAL
NERVOUS SYSTEM

CLUMSINESS
AND MUSCLE
WEAKNESS

OPTIC
NEURITIS

PARESTHESIAS

LHERMITTE
SIGN

ONSET BETWEEN
15 AND 50 YEARS
OF AGE

TX OPTIONS INCLUDE
CORTICOSTEROIDS, BETA
INTERFERONS 1A AND 1B,
& GLATIRAMER ACETATE

4. Injured fibers in peripheral nerves



Thank you

