

NERVOUS TISSUE

Lab

Anatomically, the nervous system is divided into:

Central nervous system (CNS).

Brain

Spinal cord

Peripheral nervous system (PNS).

Nerves

Nerve ganglion.

Nerve endings.

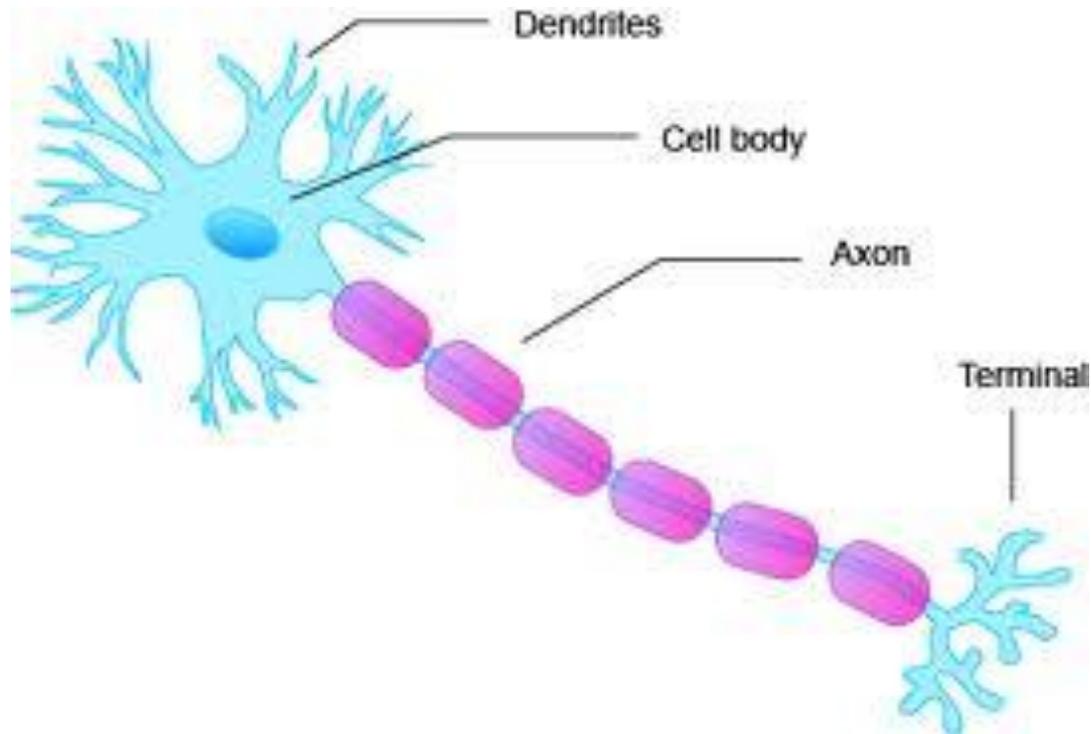
Nervous system consists of two types of cells:

Nerve cells (Neurons).

Glial cells (Neuroglia).

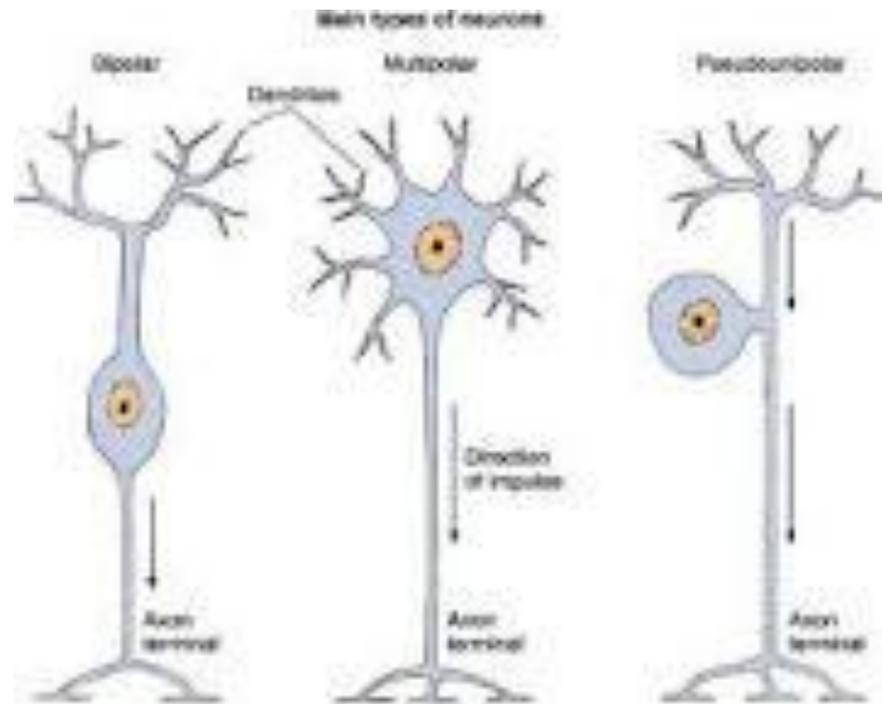
The neuron

the structural and functional unit of the nervous system



Shape of neuron according to number of process

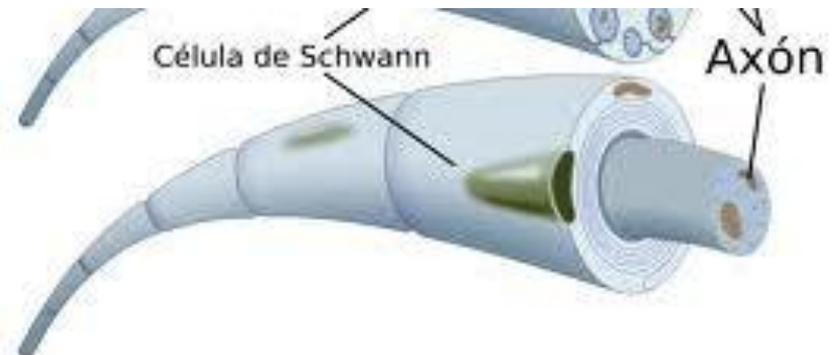
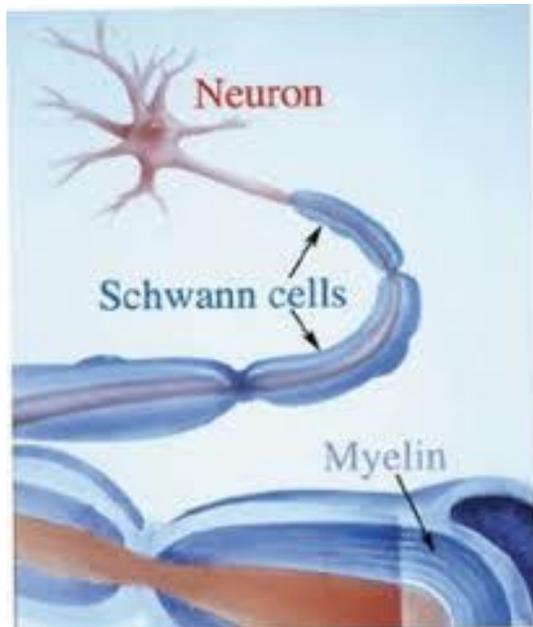
- 1-Pseudo-unipolar
- 2- Bipolar
- 3- Multipolar



Nerve fibers

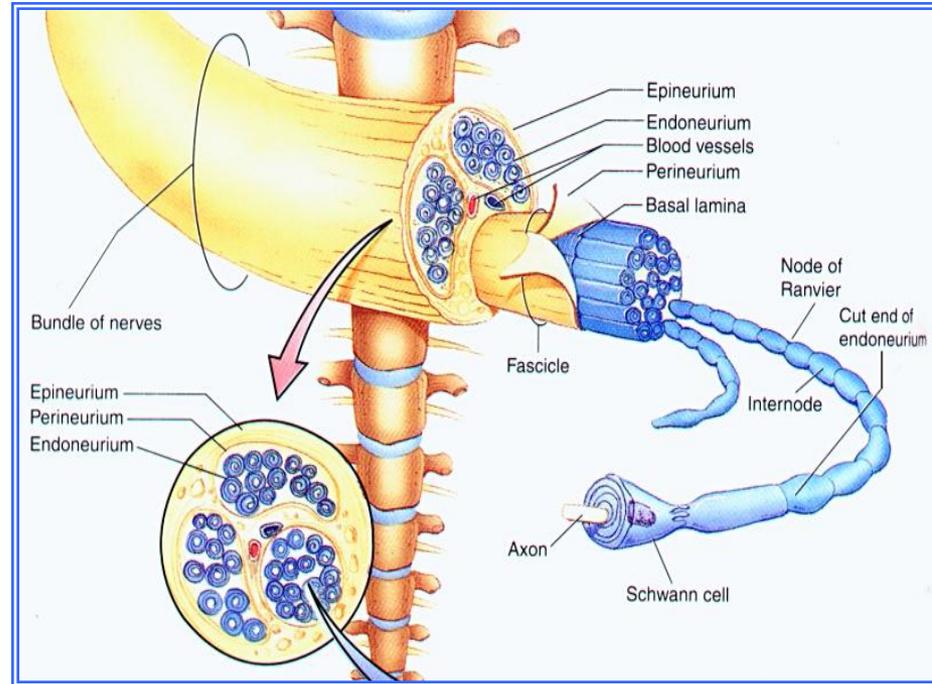
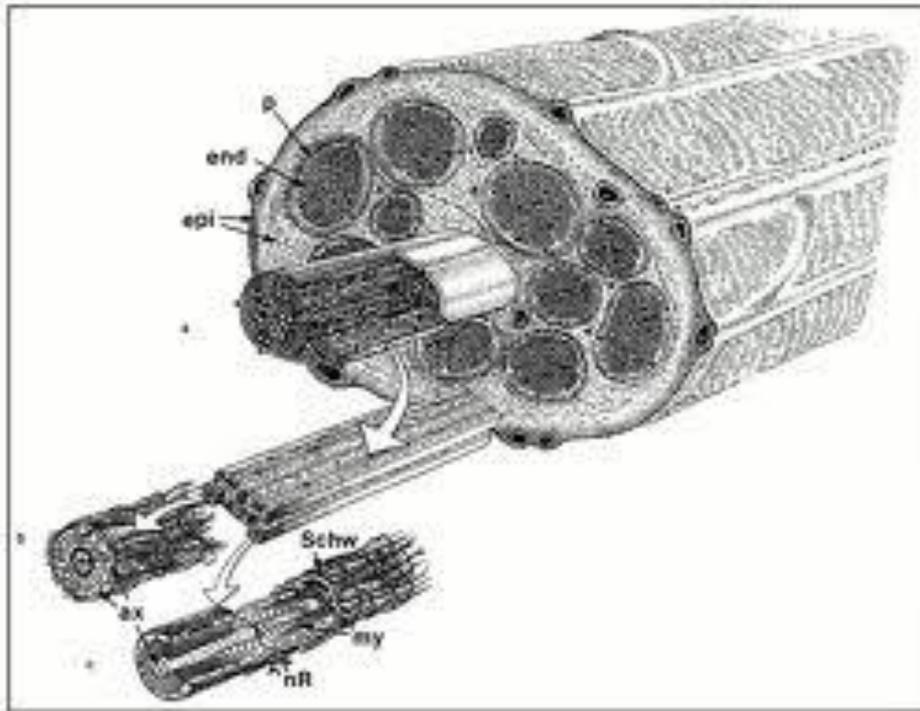
Axon enveloped by special sheath:

- Myelin sheath.
- Cellular sheath.

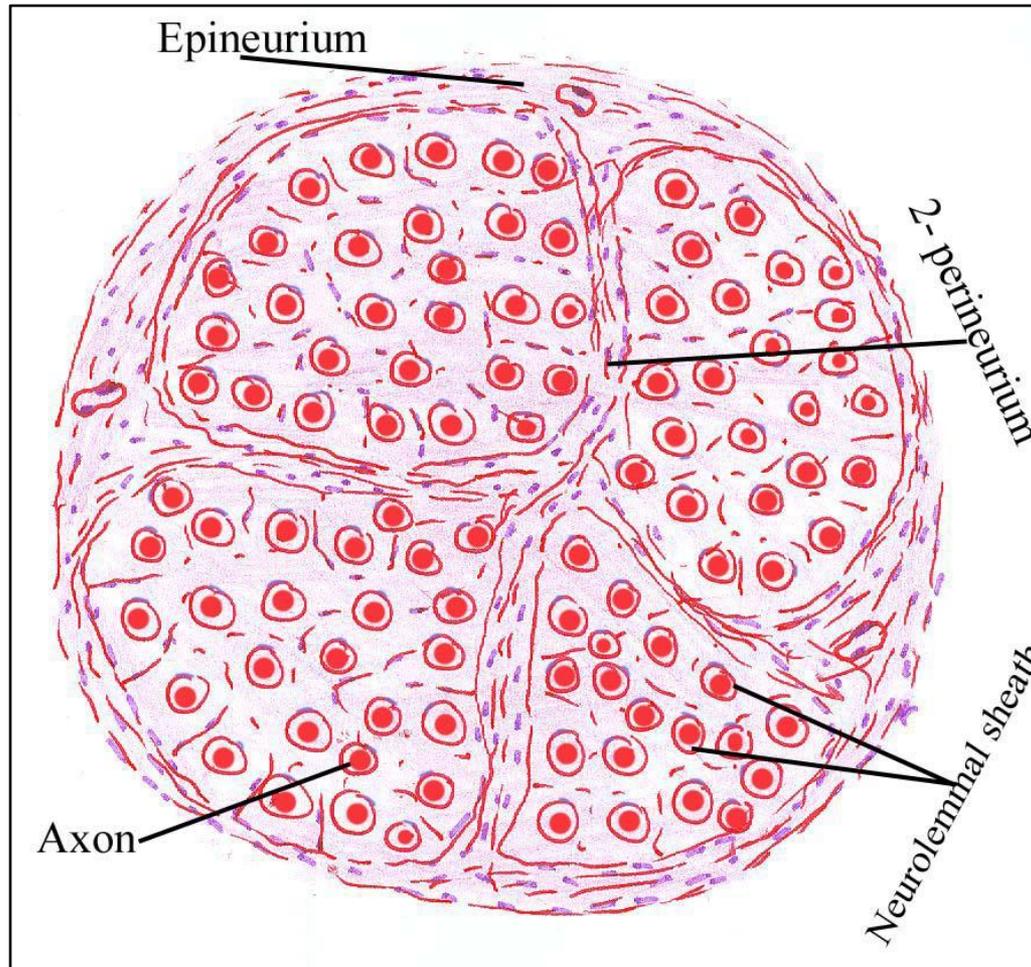


Nerve Trunk

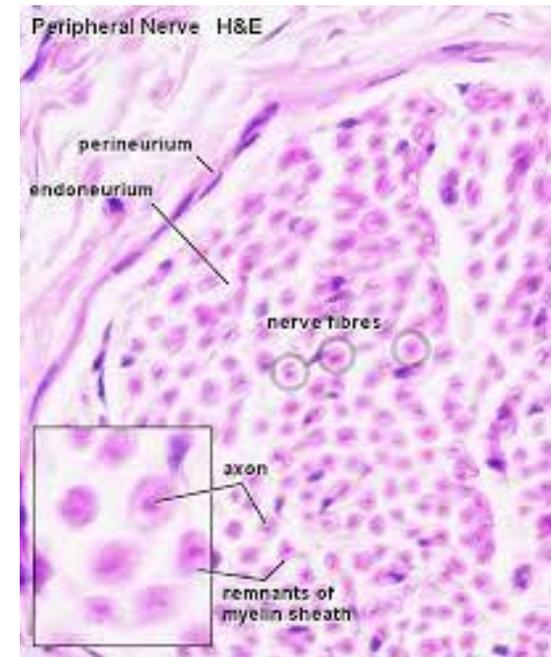
trunk is bundles of longitudinally arranged parallel nerve fibers



Nerve Trunk (H&E)

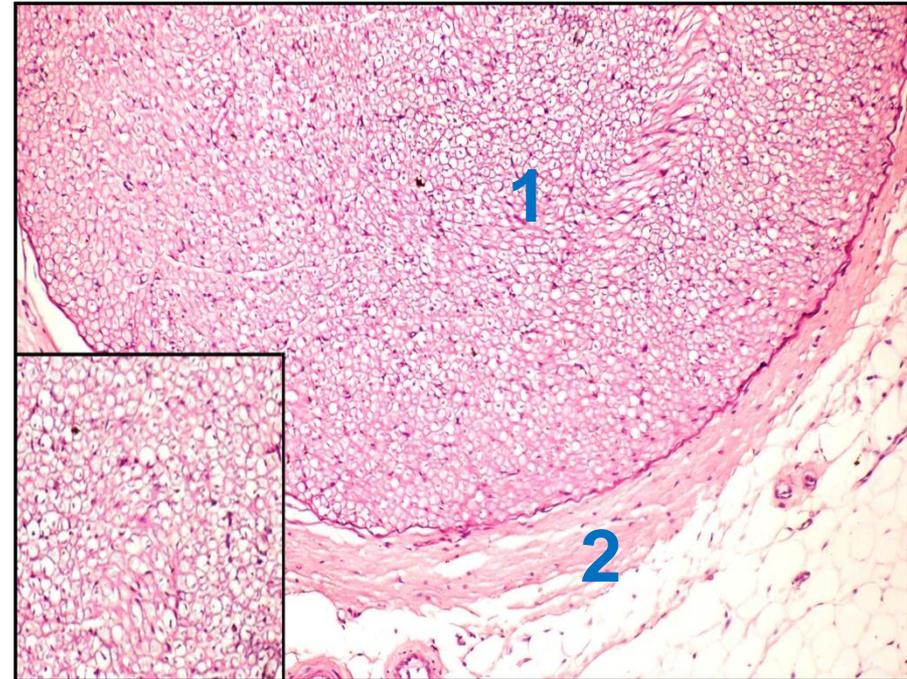
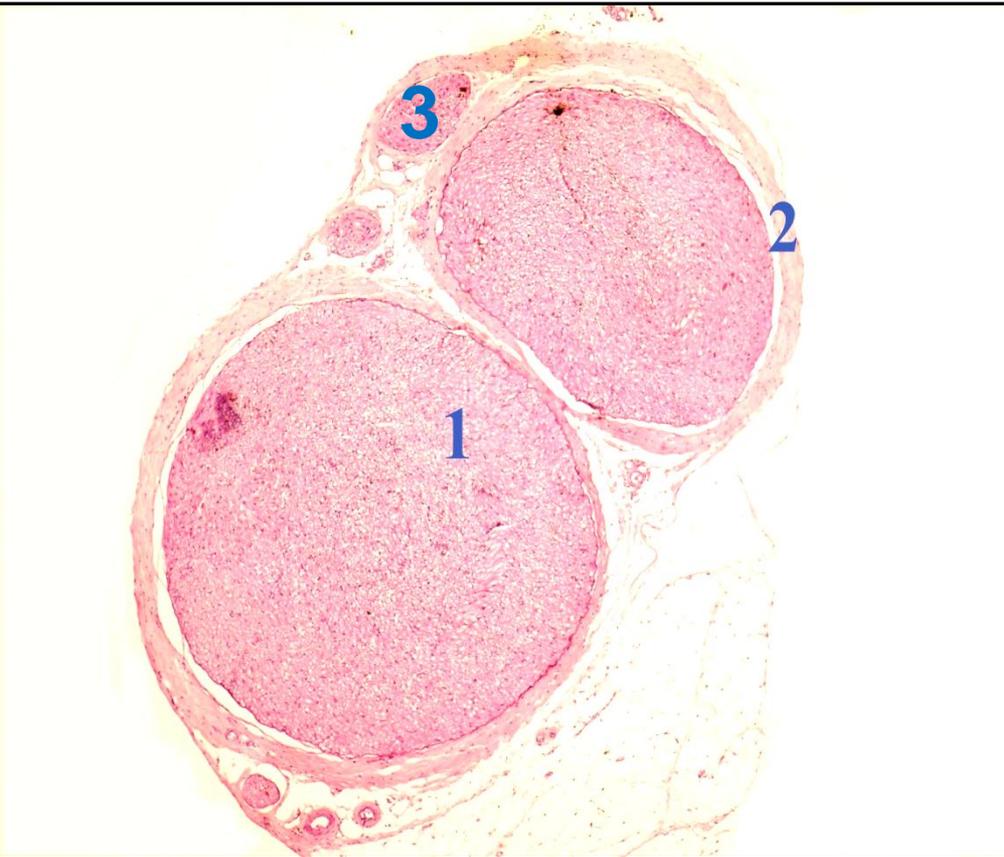


T.S in nerve trunk stained with HX&E.



Each nerve fiber shows **acidophilic axon** in the center surrounded by thin acidophilic neurolemmal sheath because myelin sheath is dissolved during staining.

Nerve Trunk (H&E)



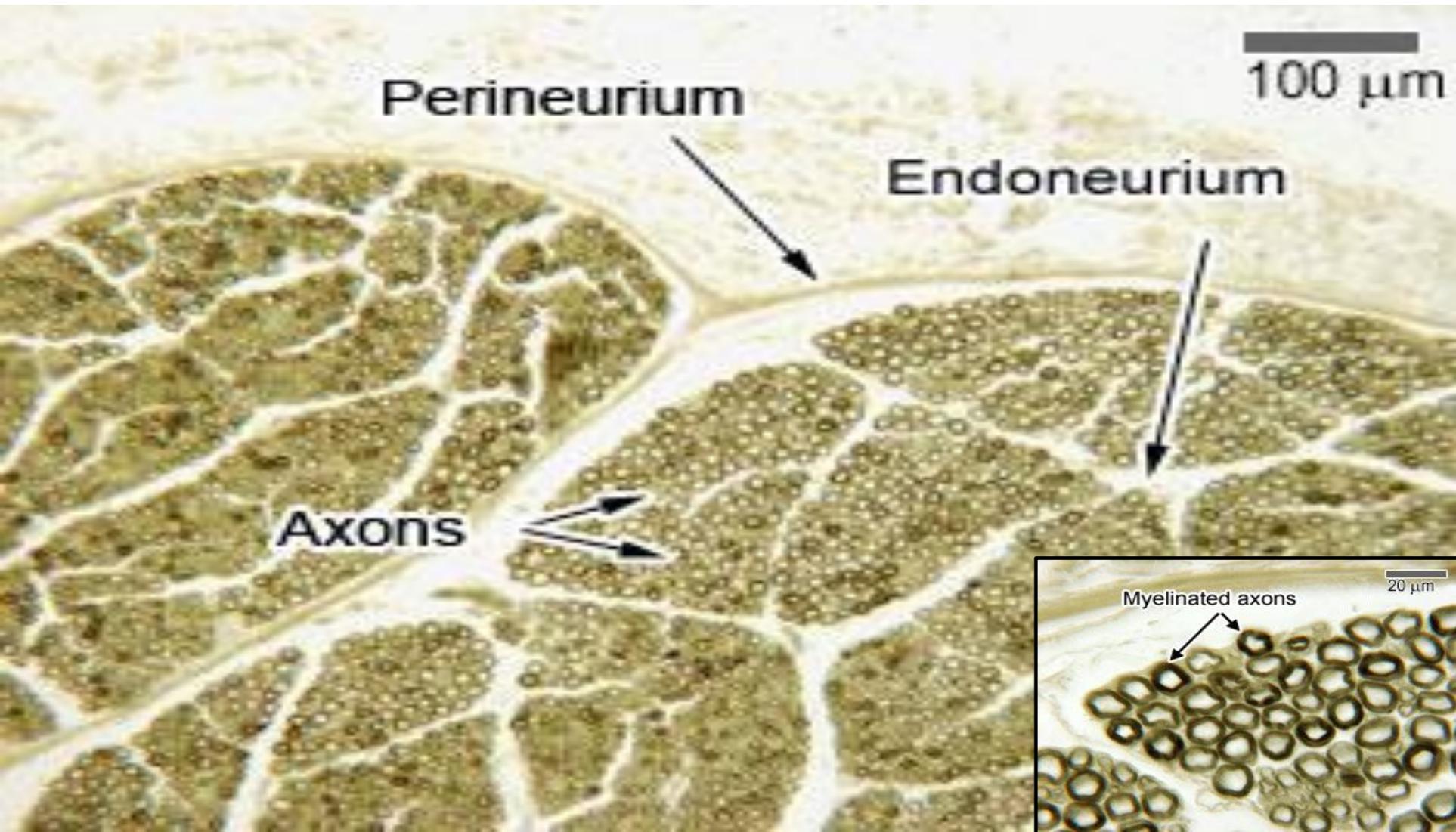
1-nerve bundle

2-perineurium.

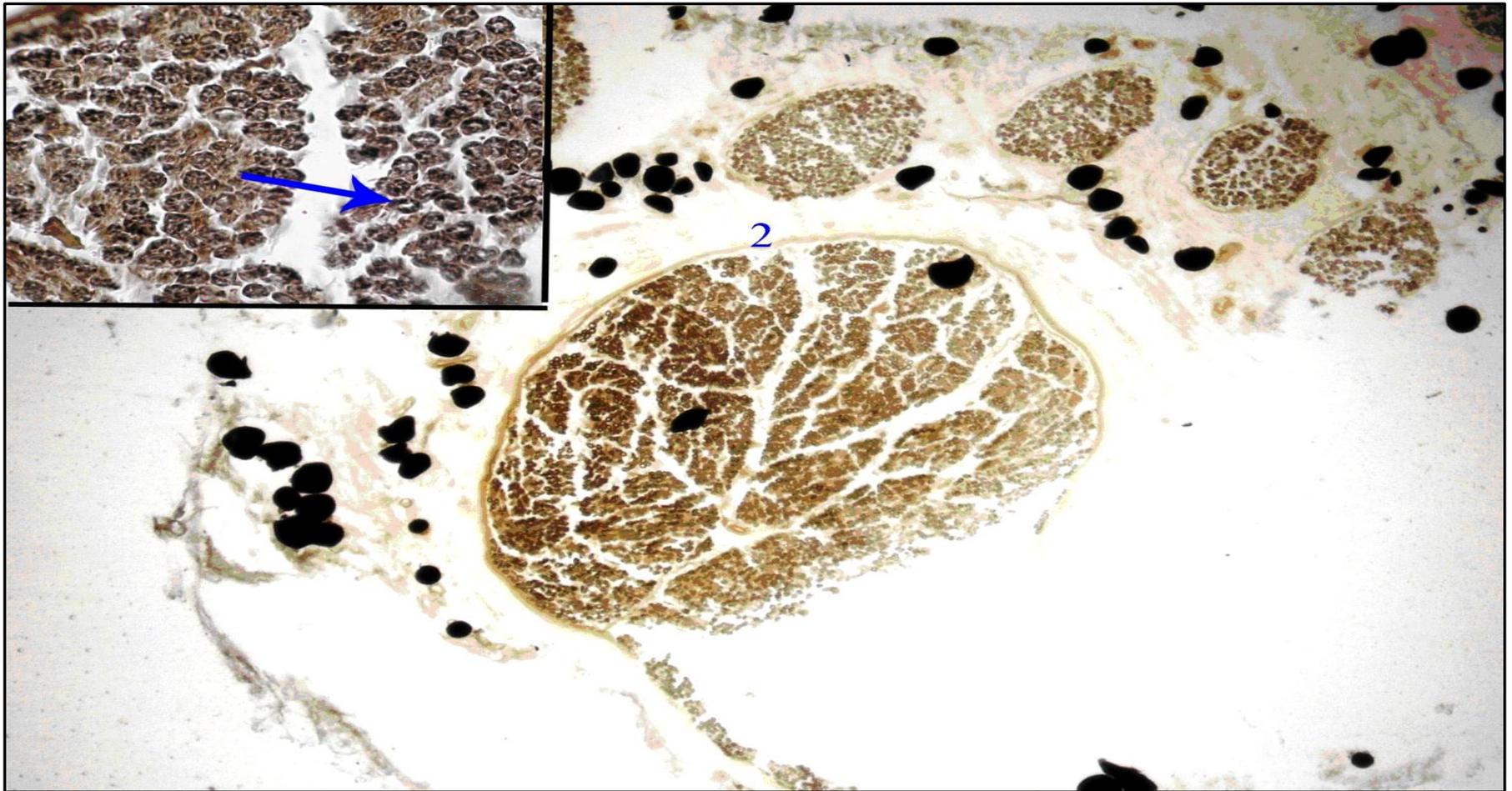
3-epineurium

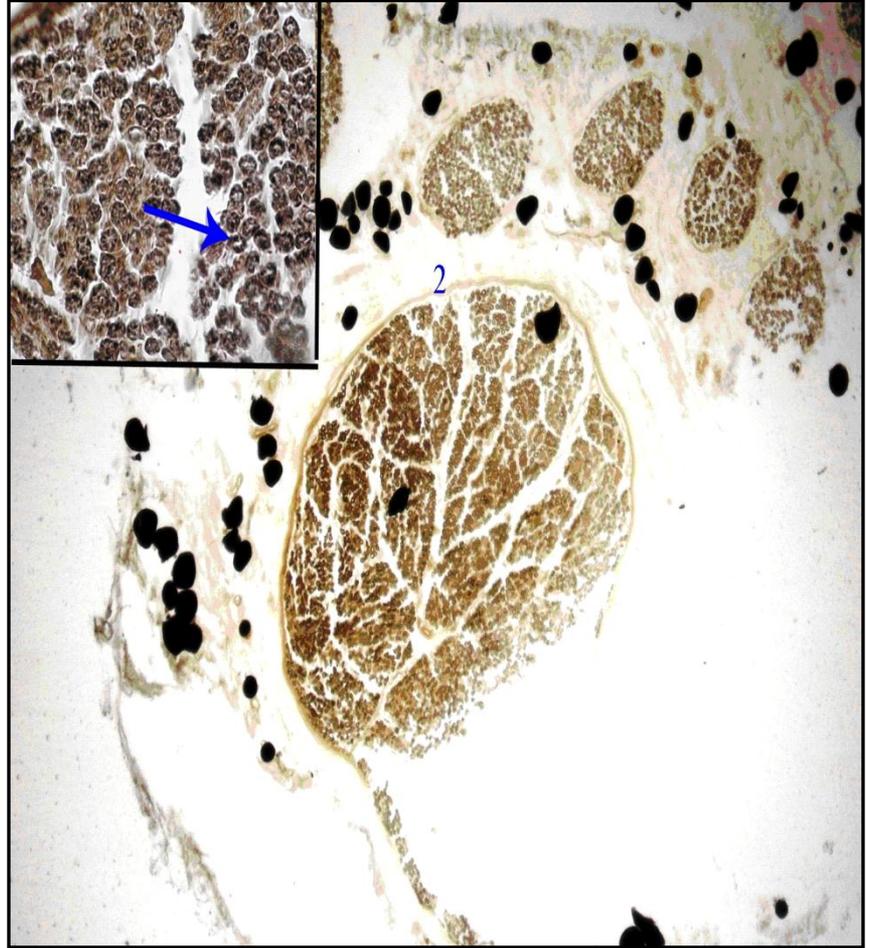
The Nerve trunk

section stained with **osmic acid** myelin sheath appears as rounded black circles.



Nerve Trunk (Osmic acid)





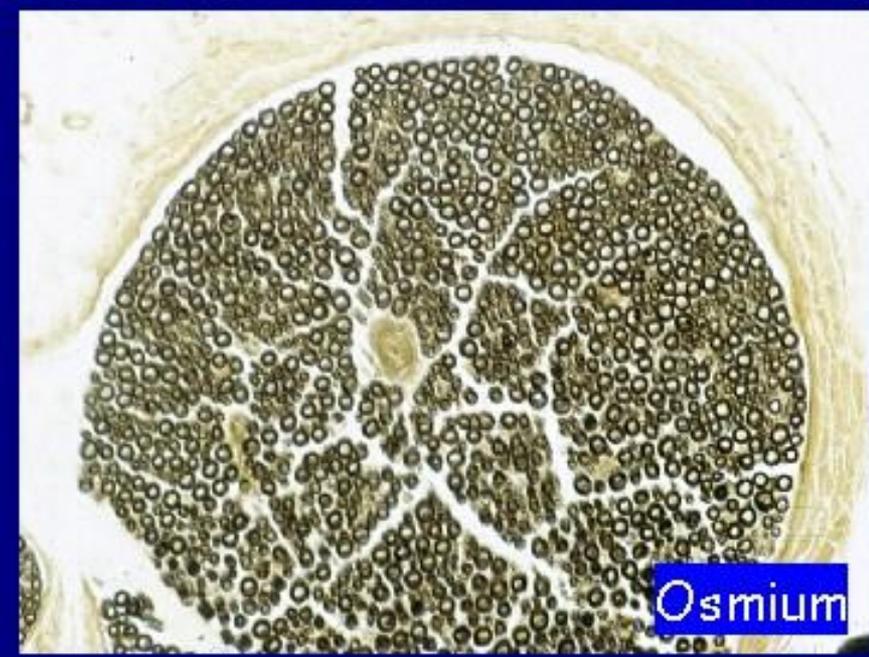
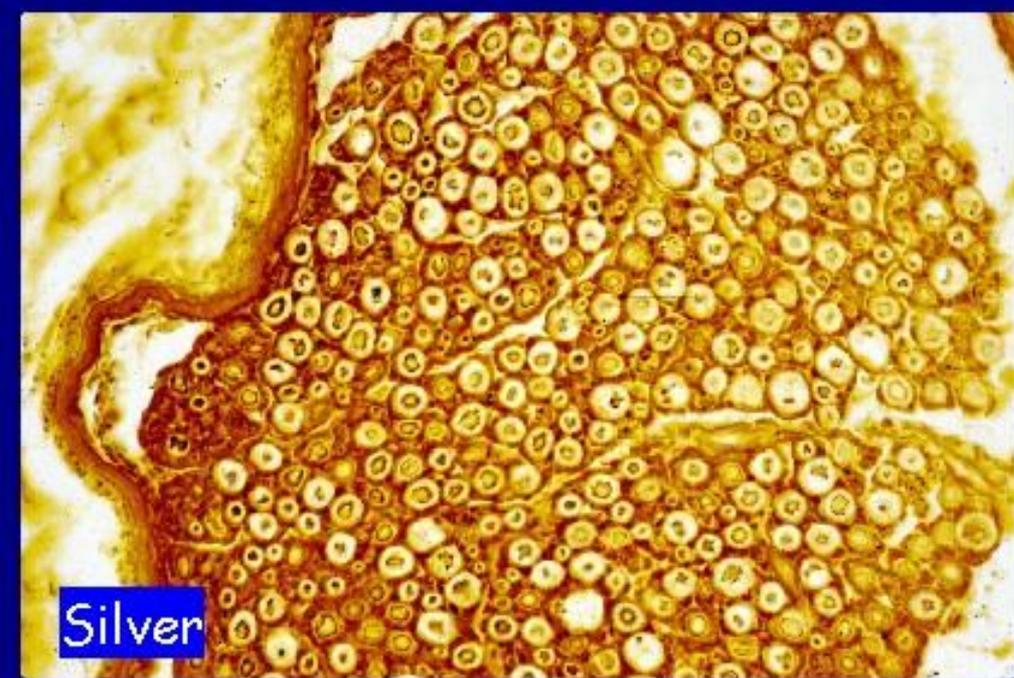
Peripheral Nerves

H&E

Trichrome

Silver

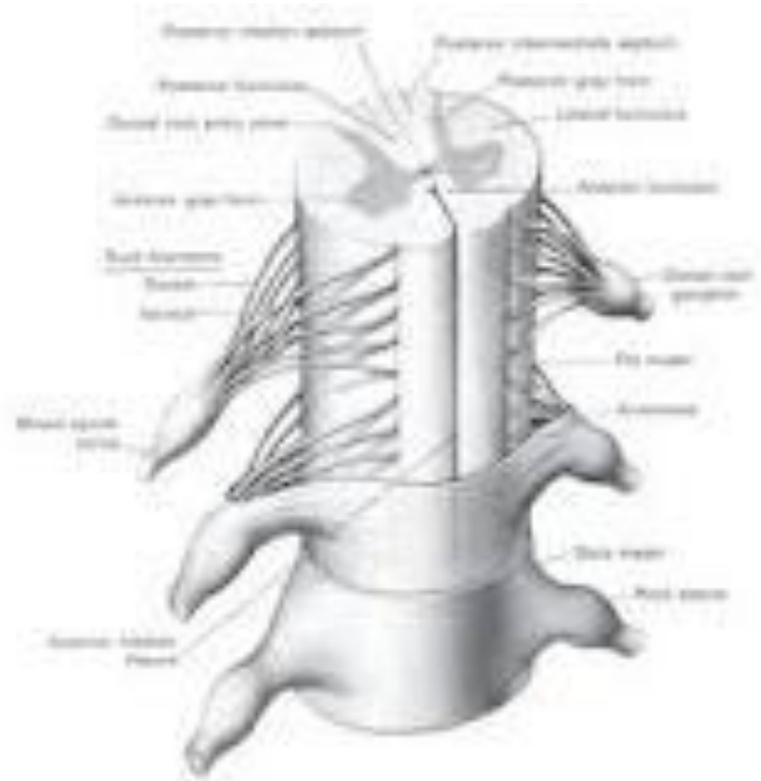
Osmium



Nerve Ganglia

A nerve ganglion is a collection of nerve cell bodies outside the CNS

- 1-Cranio-spinal ganglia
- 2-Autonomic ganglia
e.g. sympathetic ganglia



1-Cranio-spinal ganglia

- **The capsule** is thick (1).

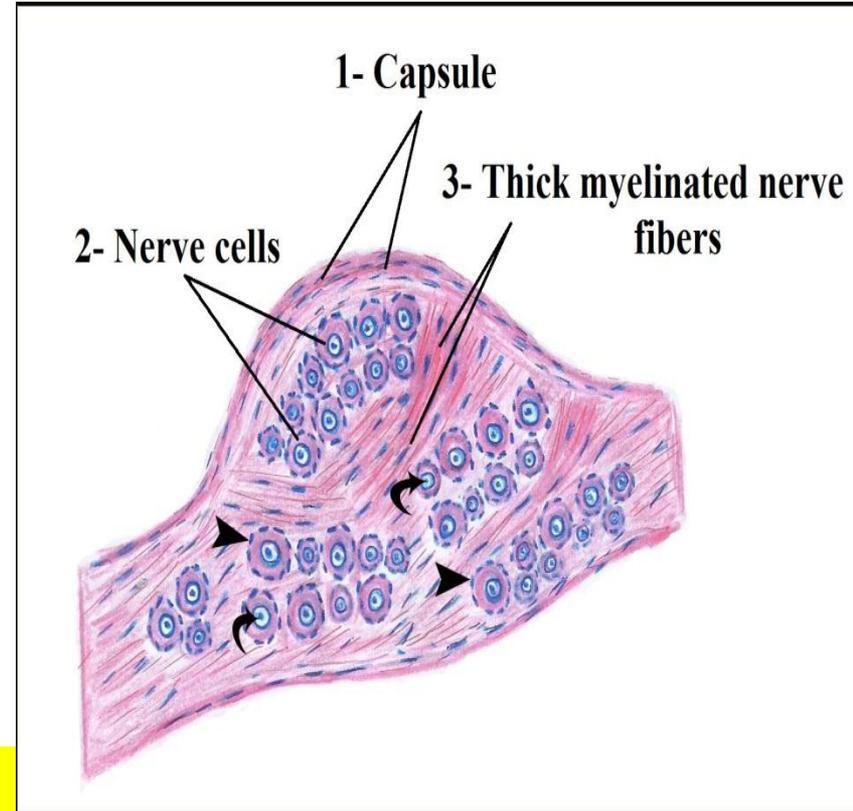
- **The nerve cells** (2) are **pseudounipolar** cells. Their cell bodies, mainly large but some are small.

- They contain central rounded pale nucleus with prominent nucleolus (↗).

- They are arranged in groups.

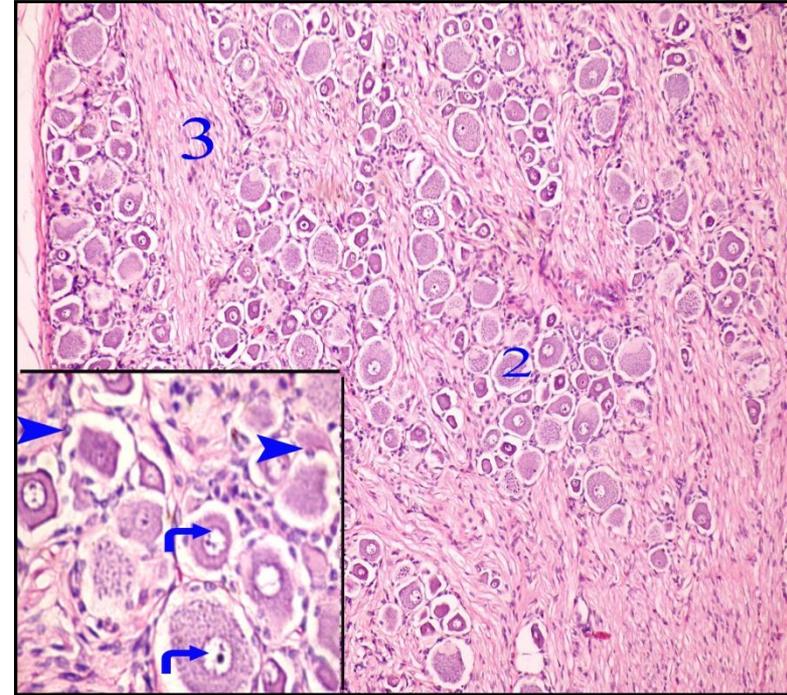
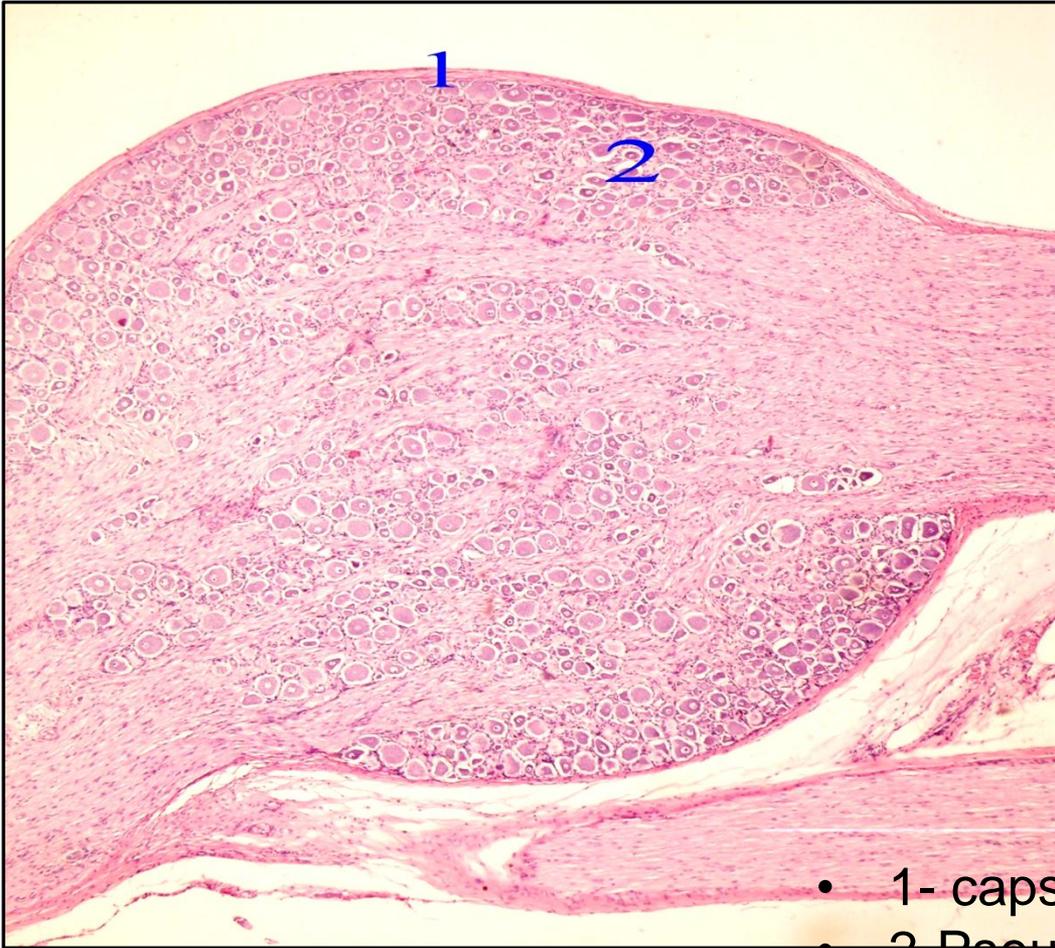
- The cells are surrounded by **complete layer** of small cuboidal cells (satellite or capsular cells) (➤).

- **Thickly myelinated nerve fibers** are present between the cell groups (3).



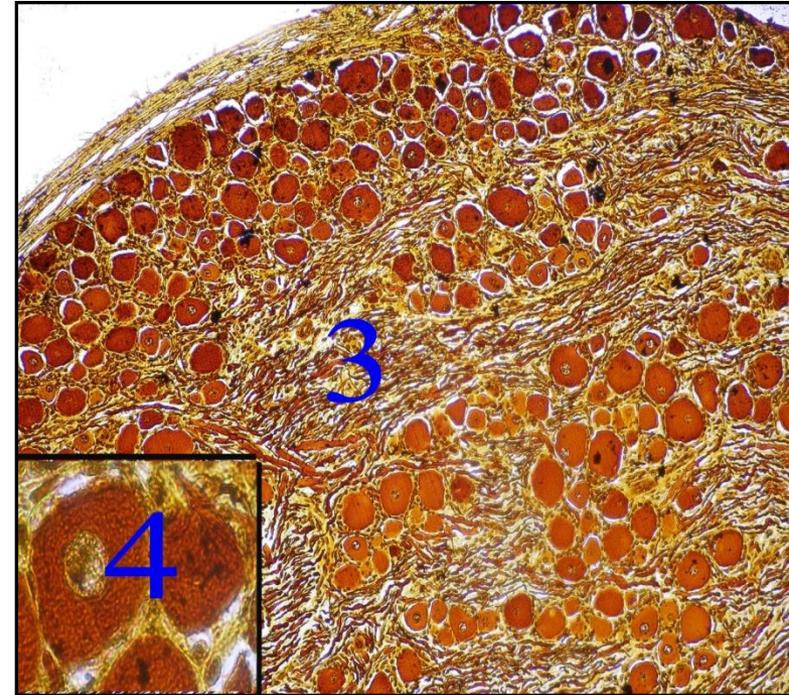
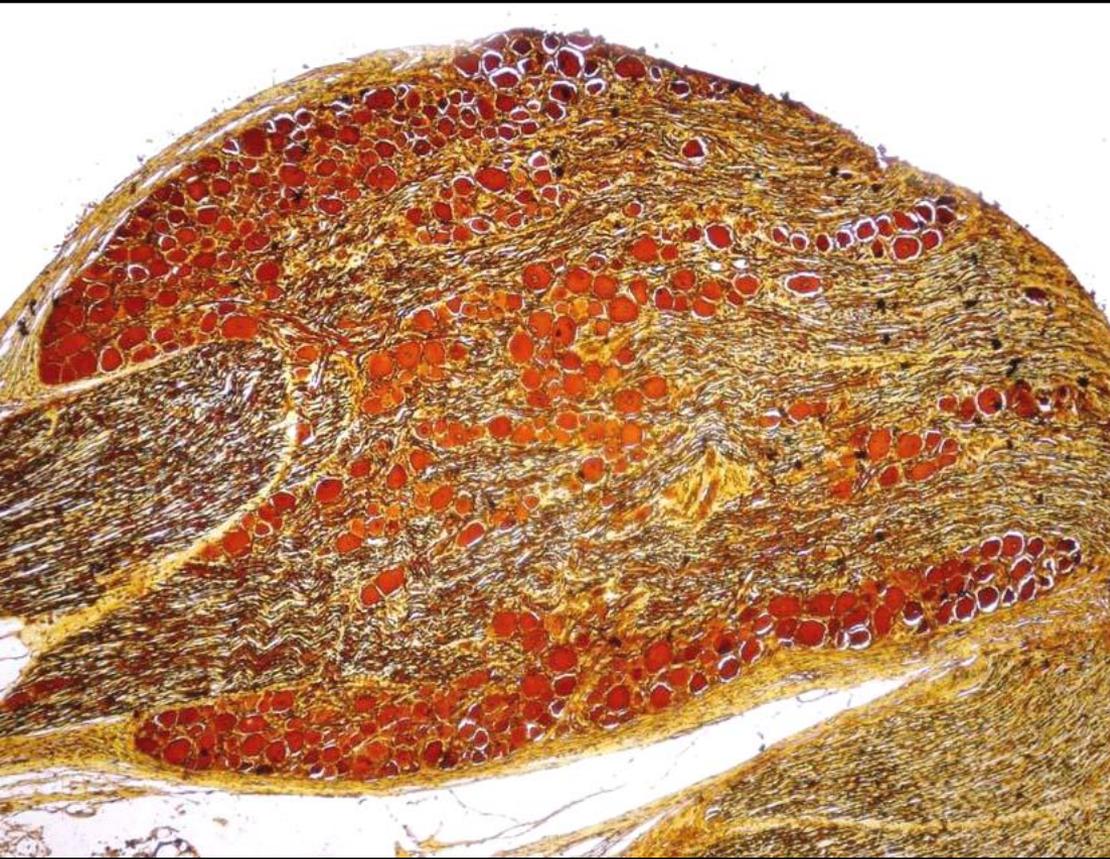
- Pseudo-unipolar nerve cells
- Thick myelinated nerve fibers

Spinal ganglia (H&E)



- 1- capsule
 - 2- Pseudo-unipolar nerve cells groups
 - 3- Thick myelinated nerve fibers
- ➡ Satellite cells

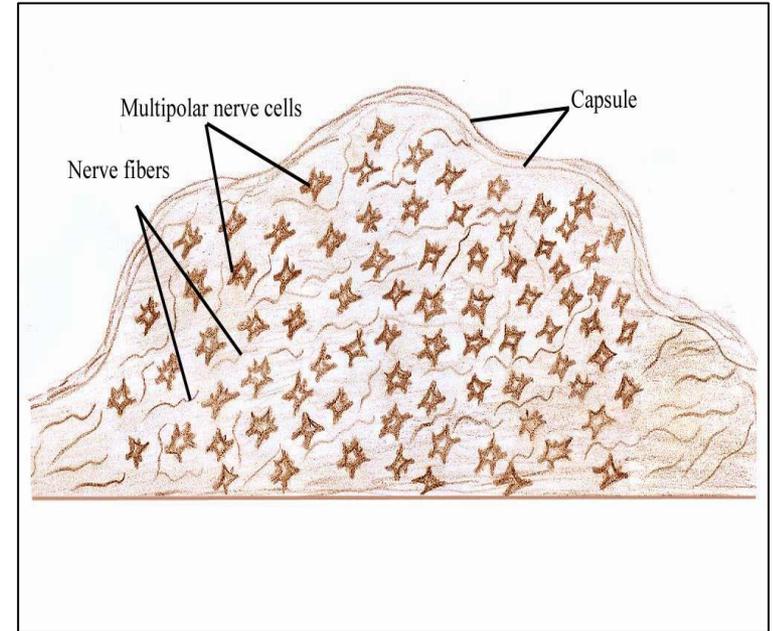
Spinal ganglia (silver)



Sympathetic ganglia

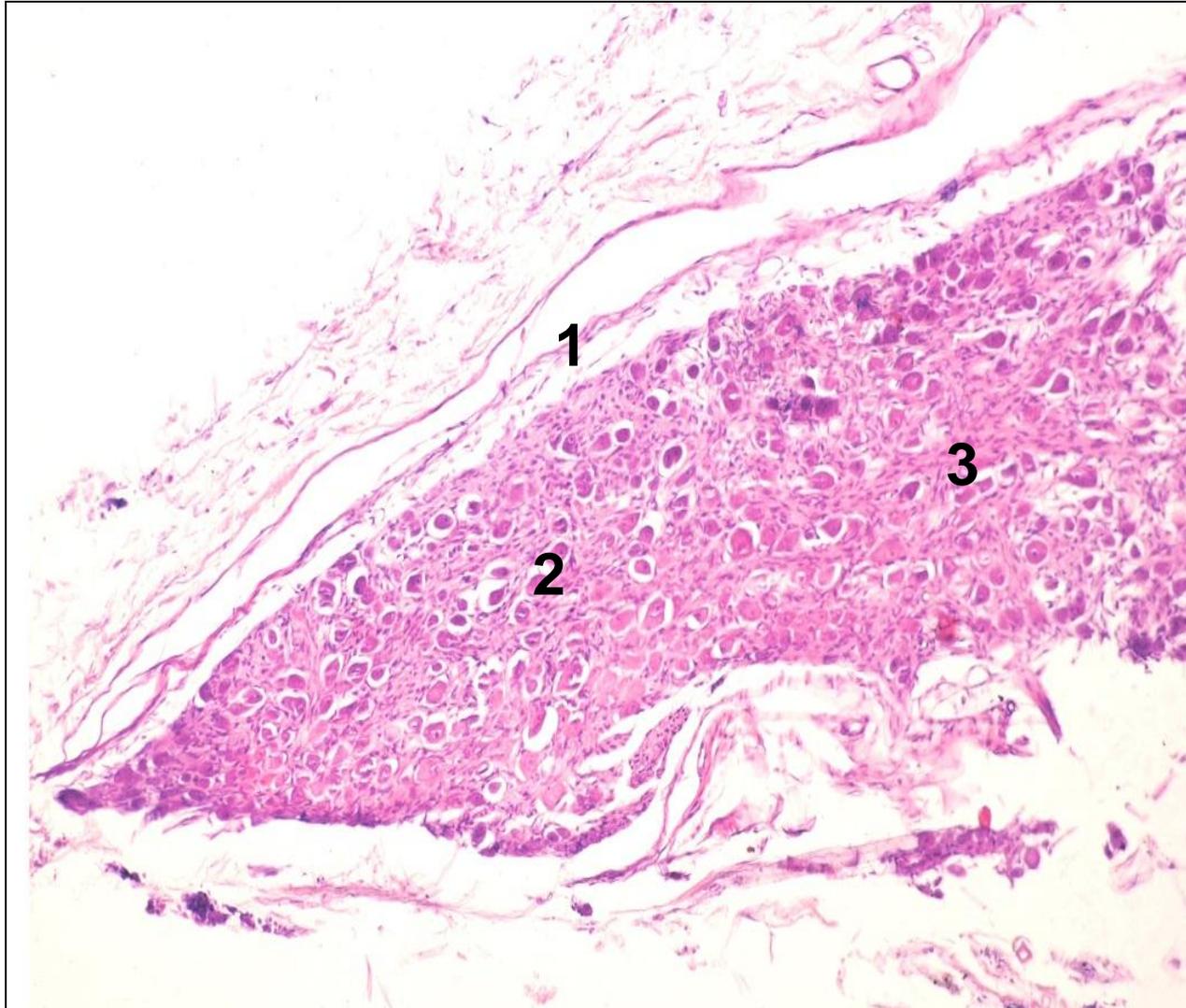
The ganglion is covered with thin CT **capsule**.

- **The nerve cells** are small, of equal size, multipolar and star shaped cells.
- Each cell contains eccentric rounded pale nucleus with prominent nucleolus.
- The nerve cells are **numerous and scattered all over the ganglia**.
- The cell is surrounded by **incomplete layer of satellite cells**.
- The nerve cells are separated by thin or **non myelinated nerve fibers**.



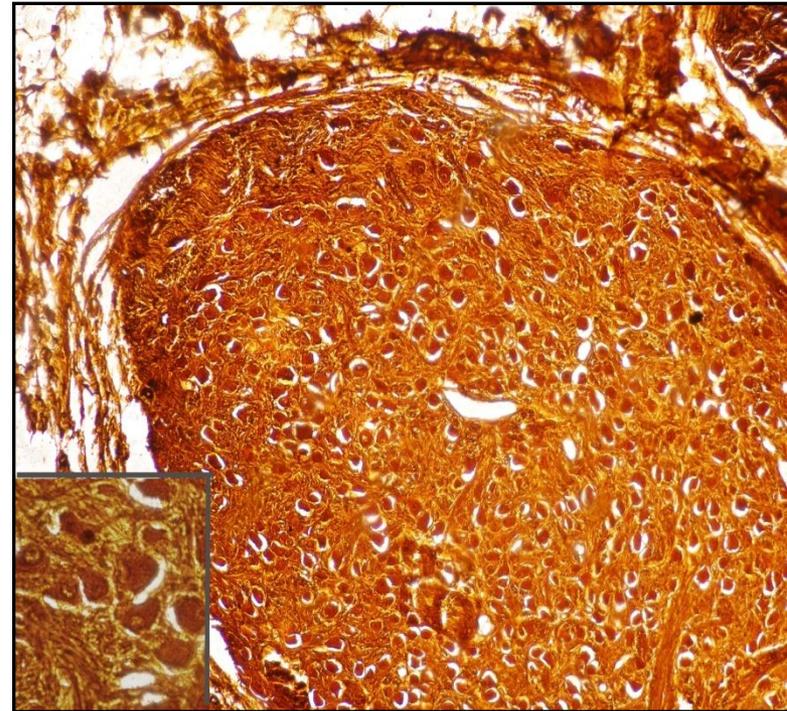
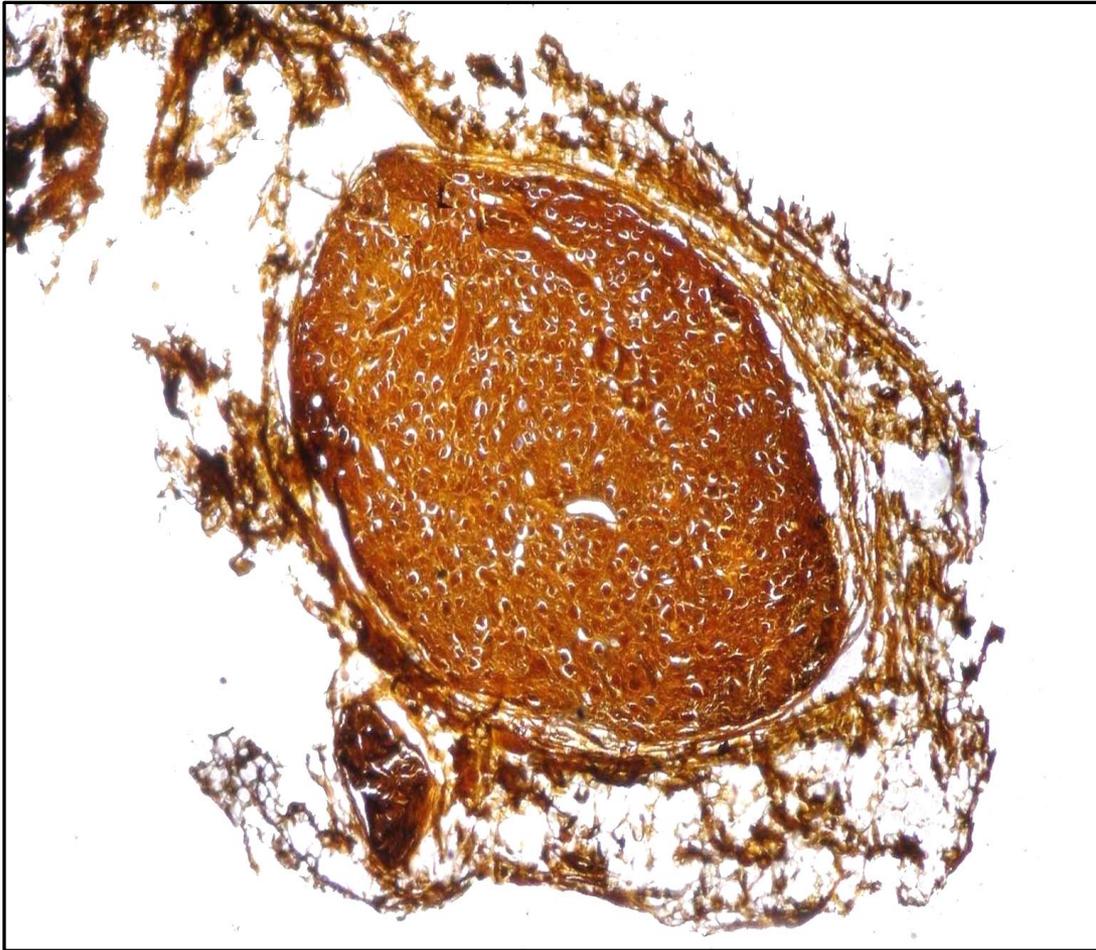
multipolar nerve cells
unmyelinated nerve fibers

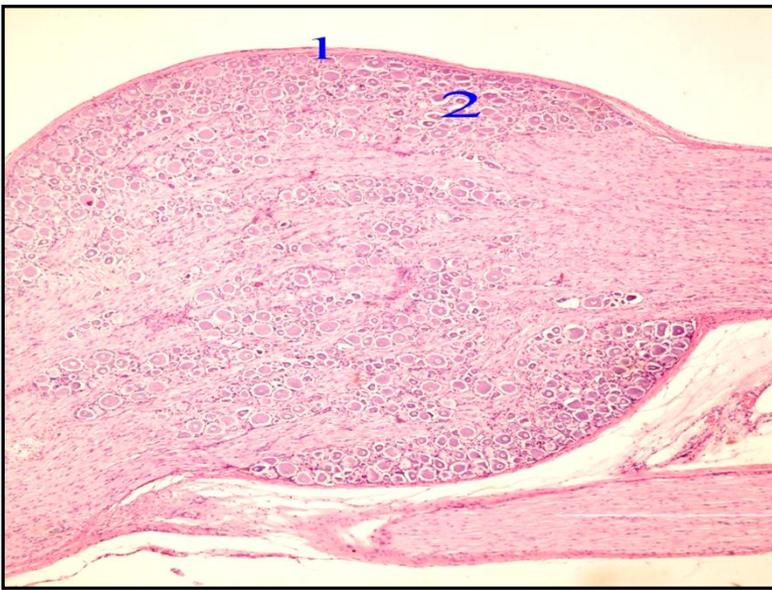
Sympathetic ganglia (H&E)



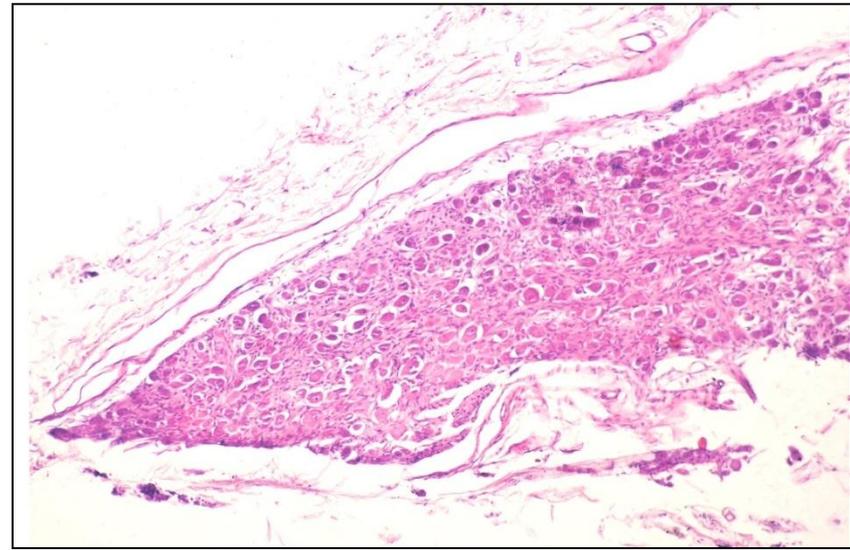
- 1- capsule
- 2- multipolar nerve cells
- 3- unmyelinated nerve fibers

Sympathetic ganglia (silver)

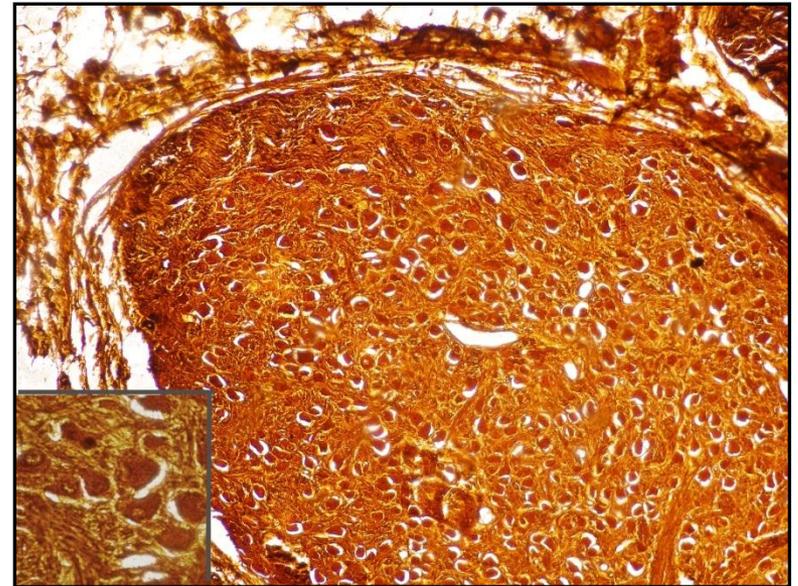
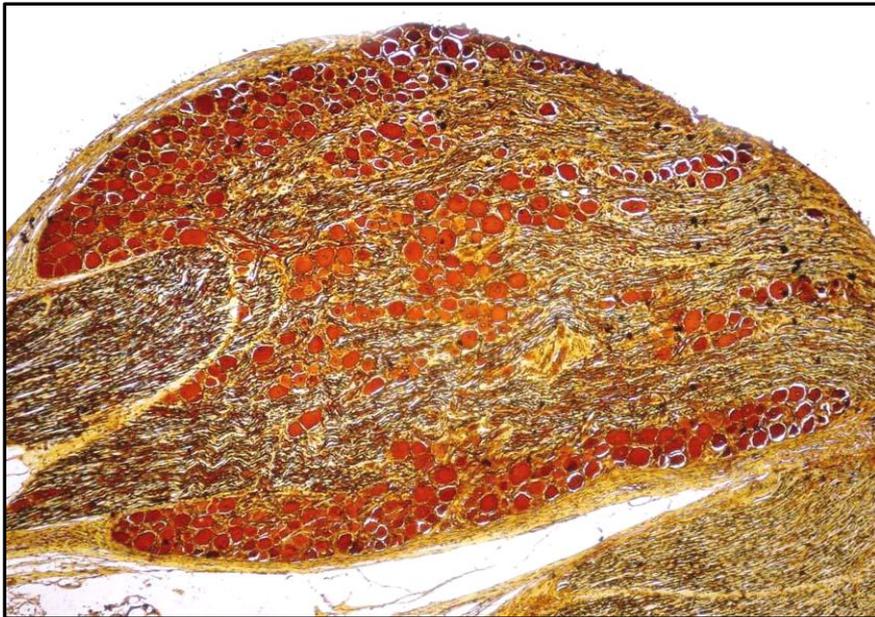




Cranio-spinal ganglia



Sympathetic ganglia



Thank

you

