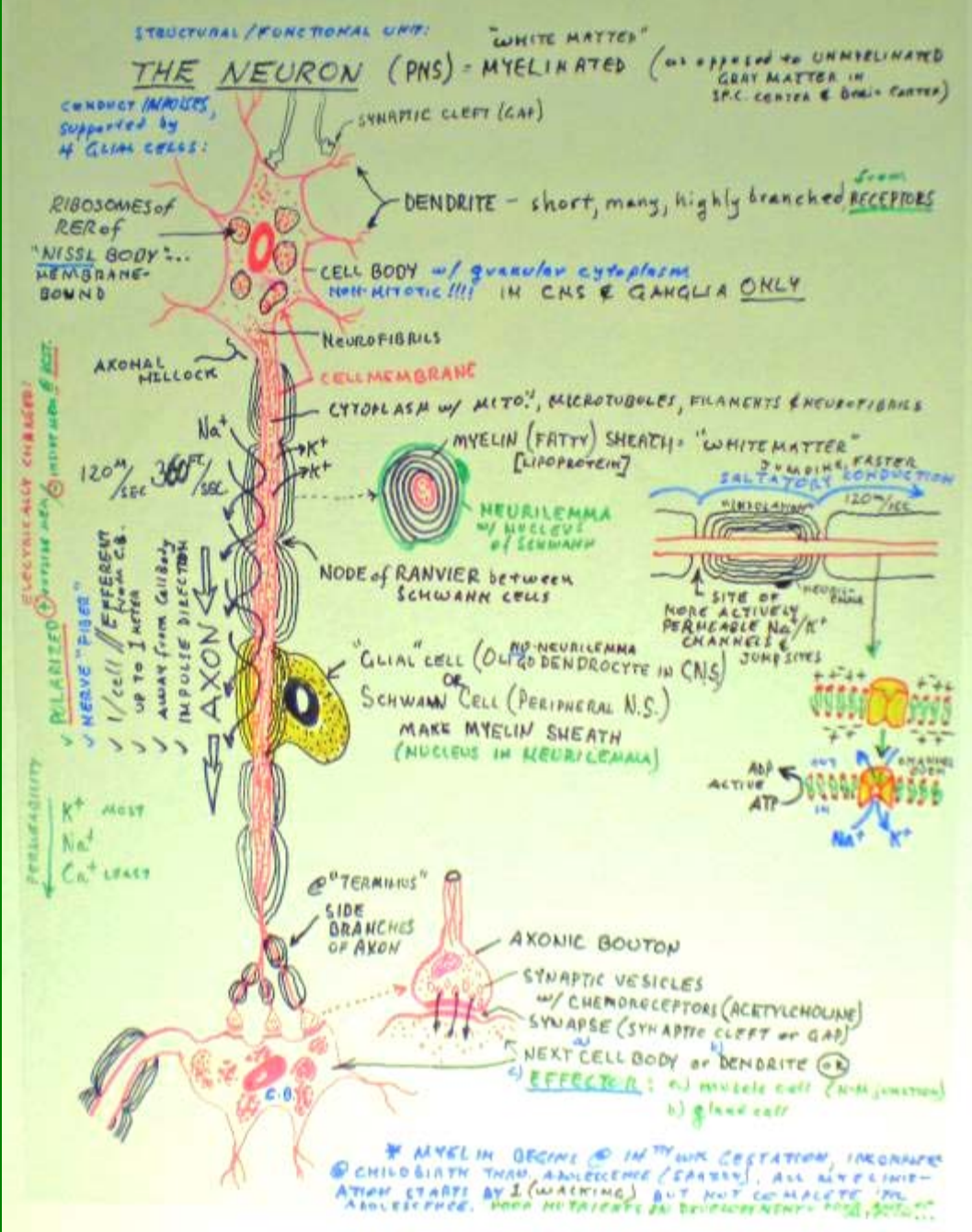


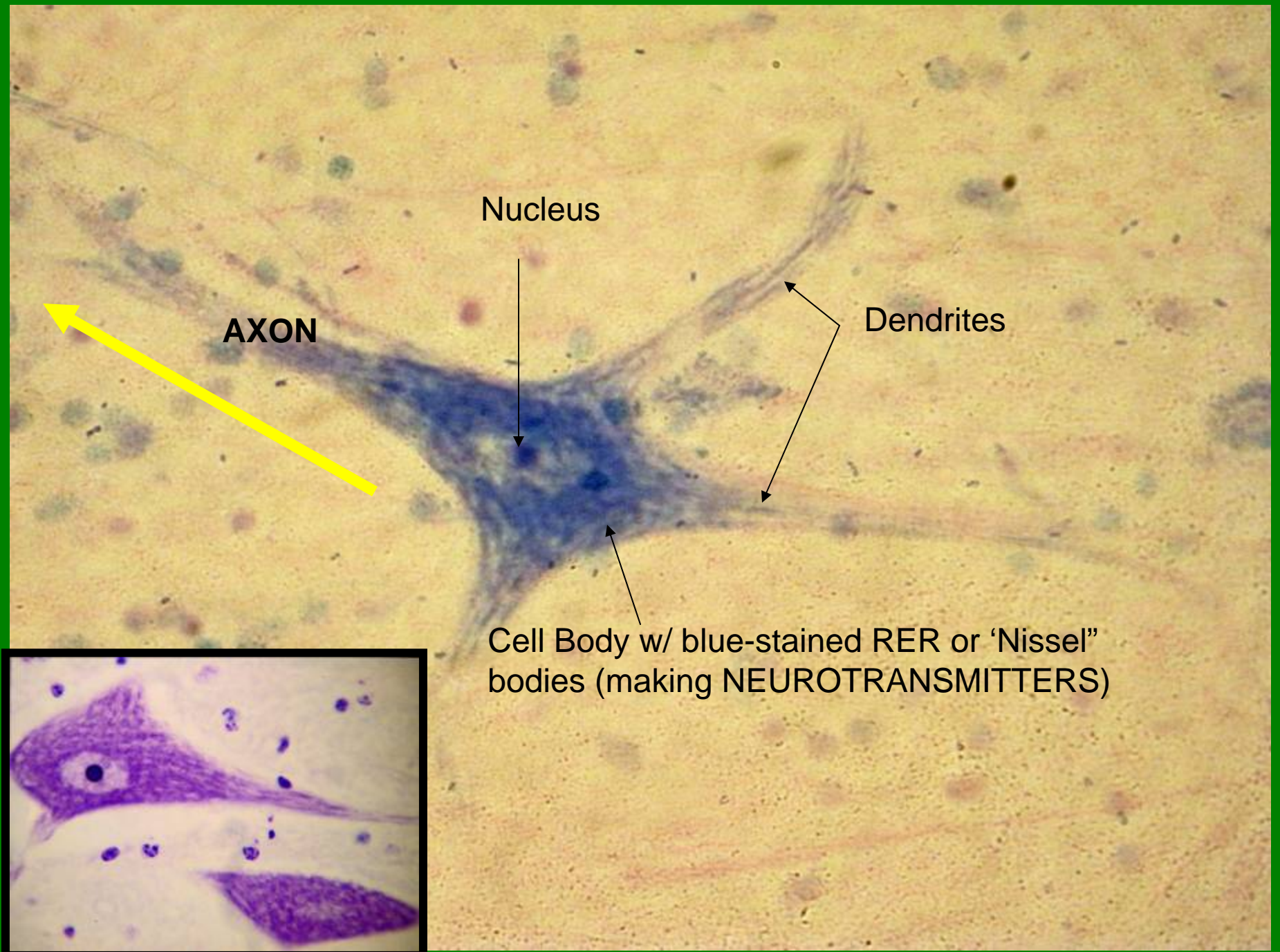
Histology of Nerves and Central Nervous System



John E.B. Baker, *mikrogeo*



Neuron – basic cell type of the peripheral and central Nervous system

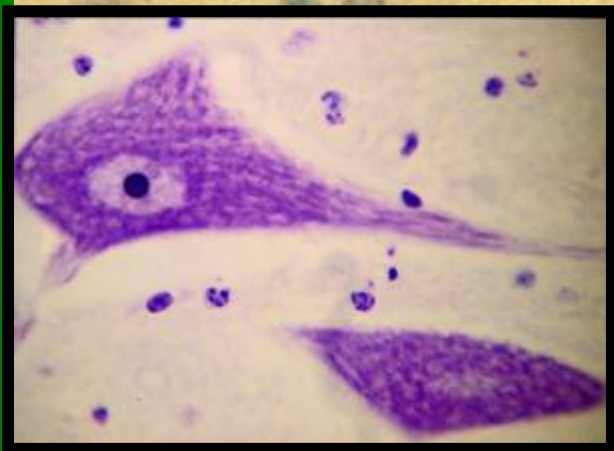


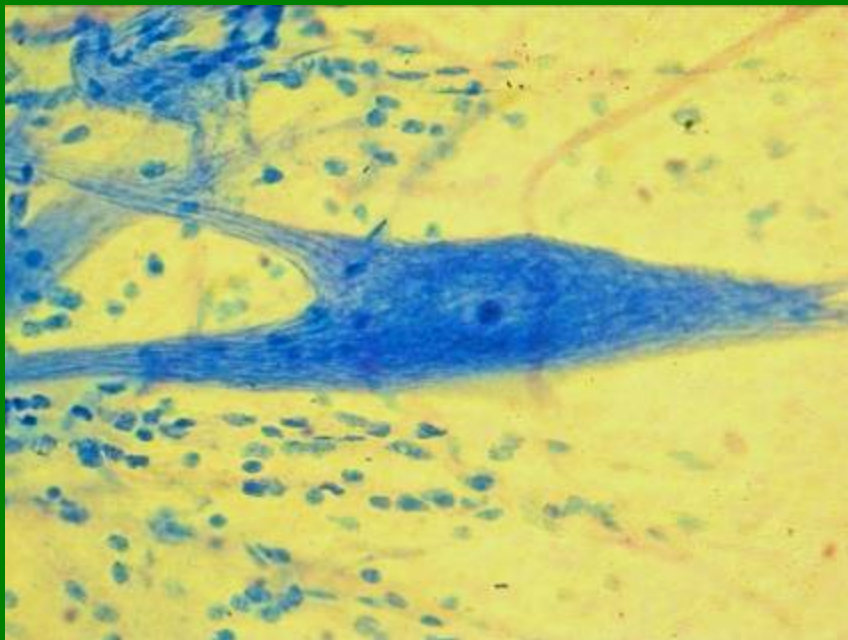
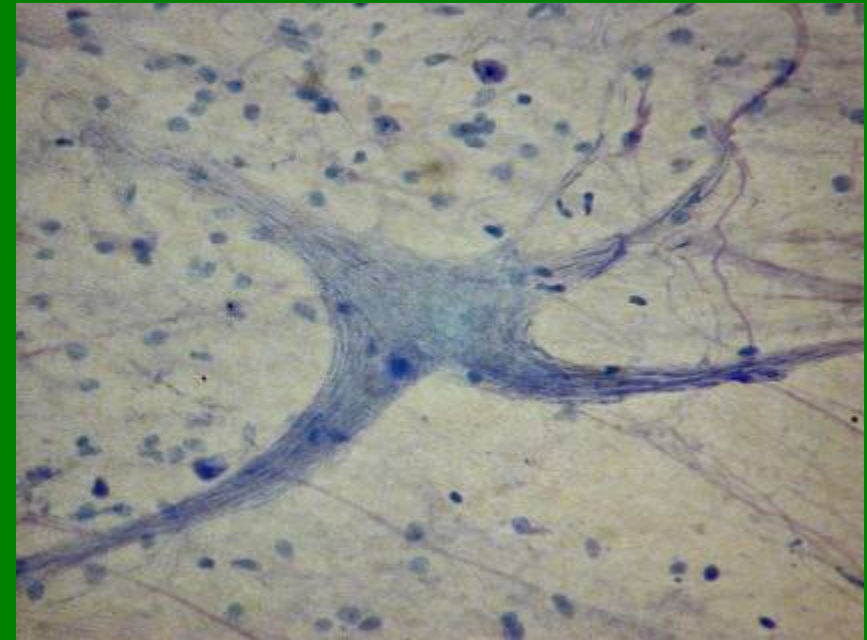
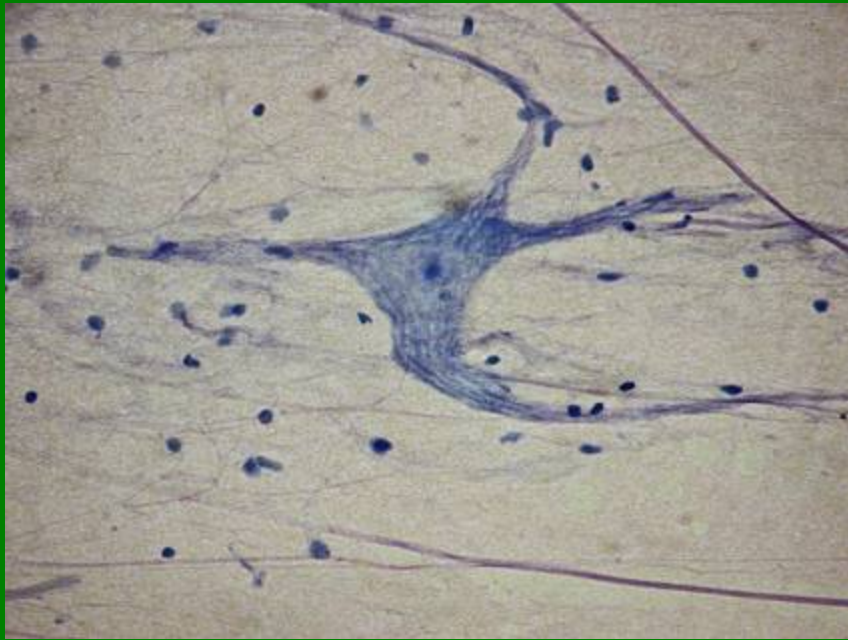
Nucleus

Dendrites

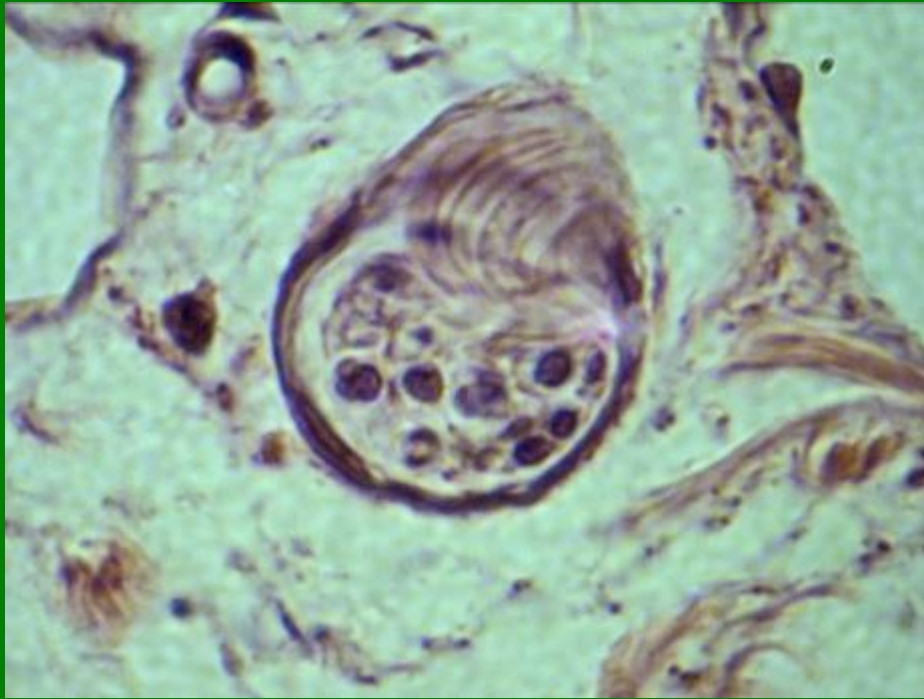
AXON

Cell Body w/ blue-stained RER or 'Nissel' bodies (making NEUROTRANSMITTERS)

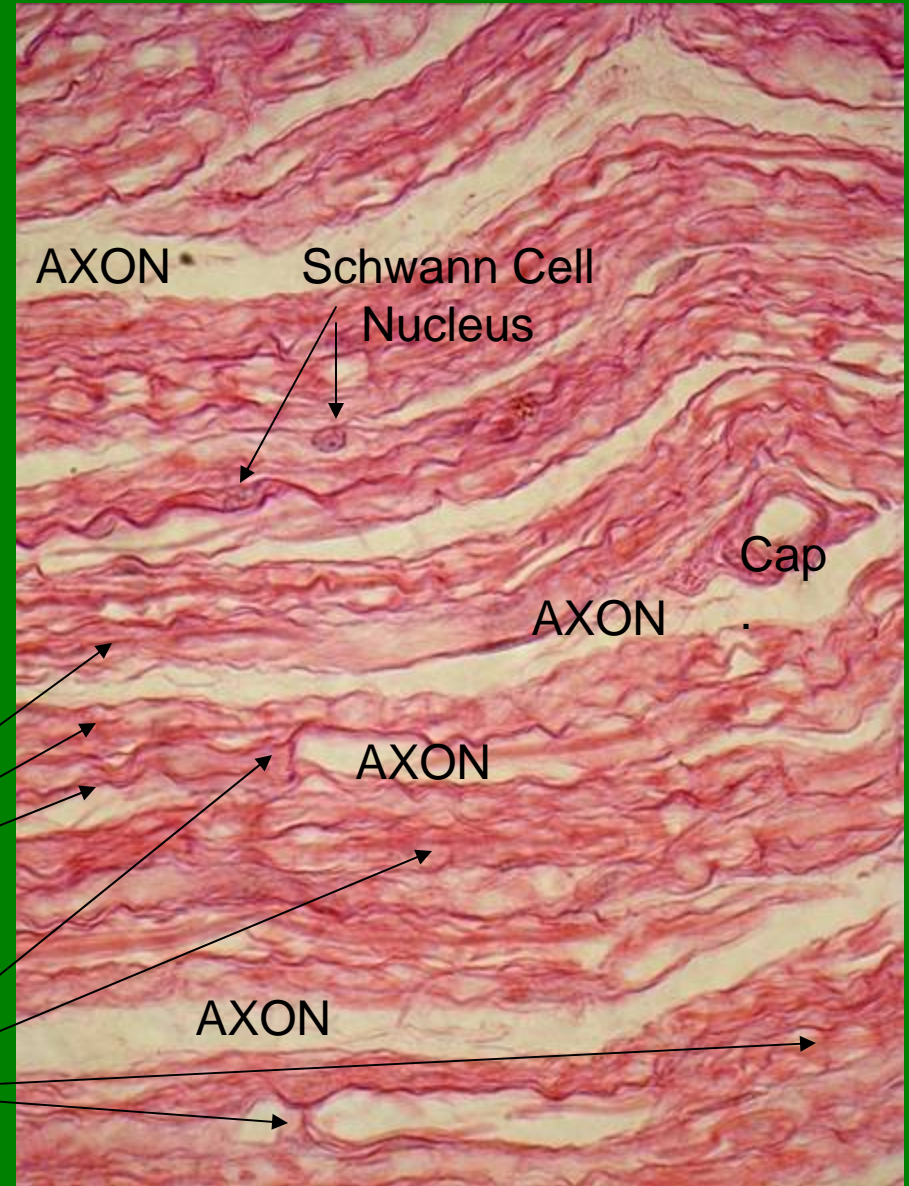




Spinal cord smears to show NEURON Cell bodies (Multipolar)



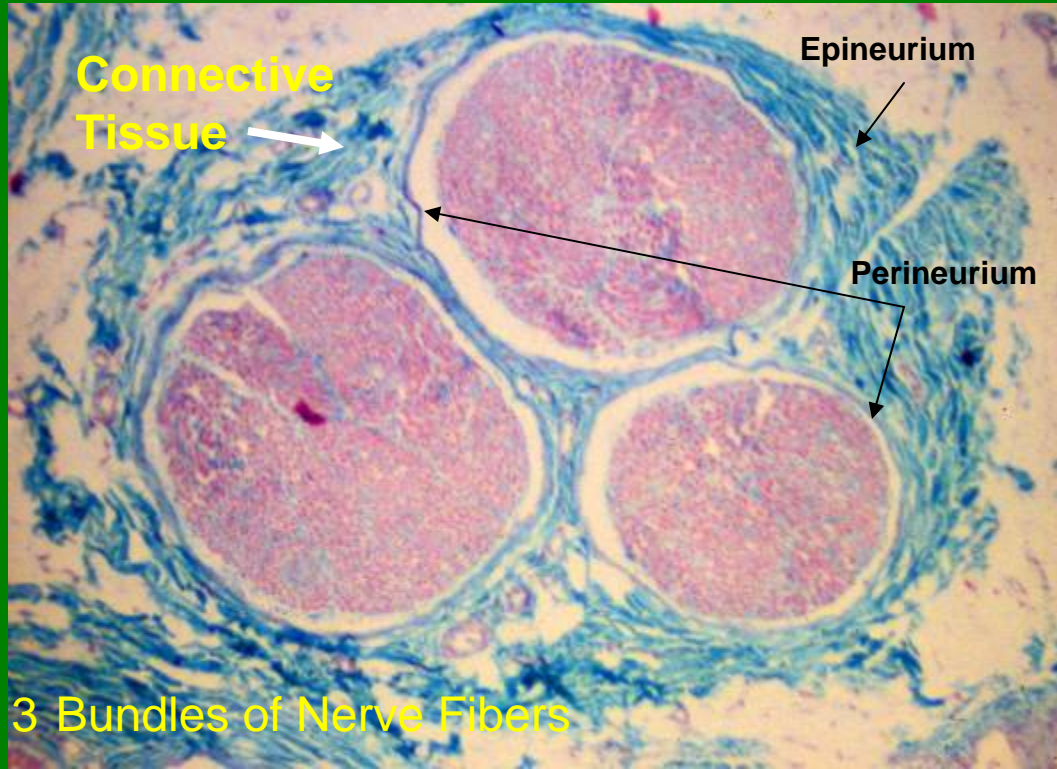
Small peripheral nerve in gut tissue



Myelinated Sheaths

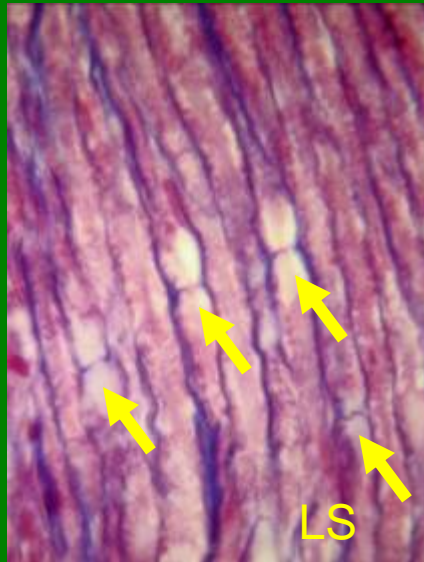
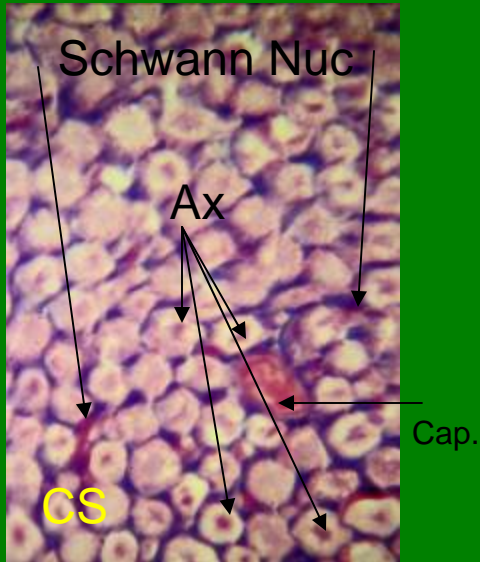
Nodes of Ranvier

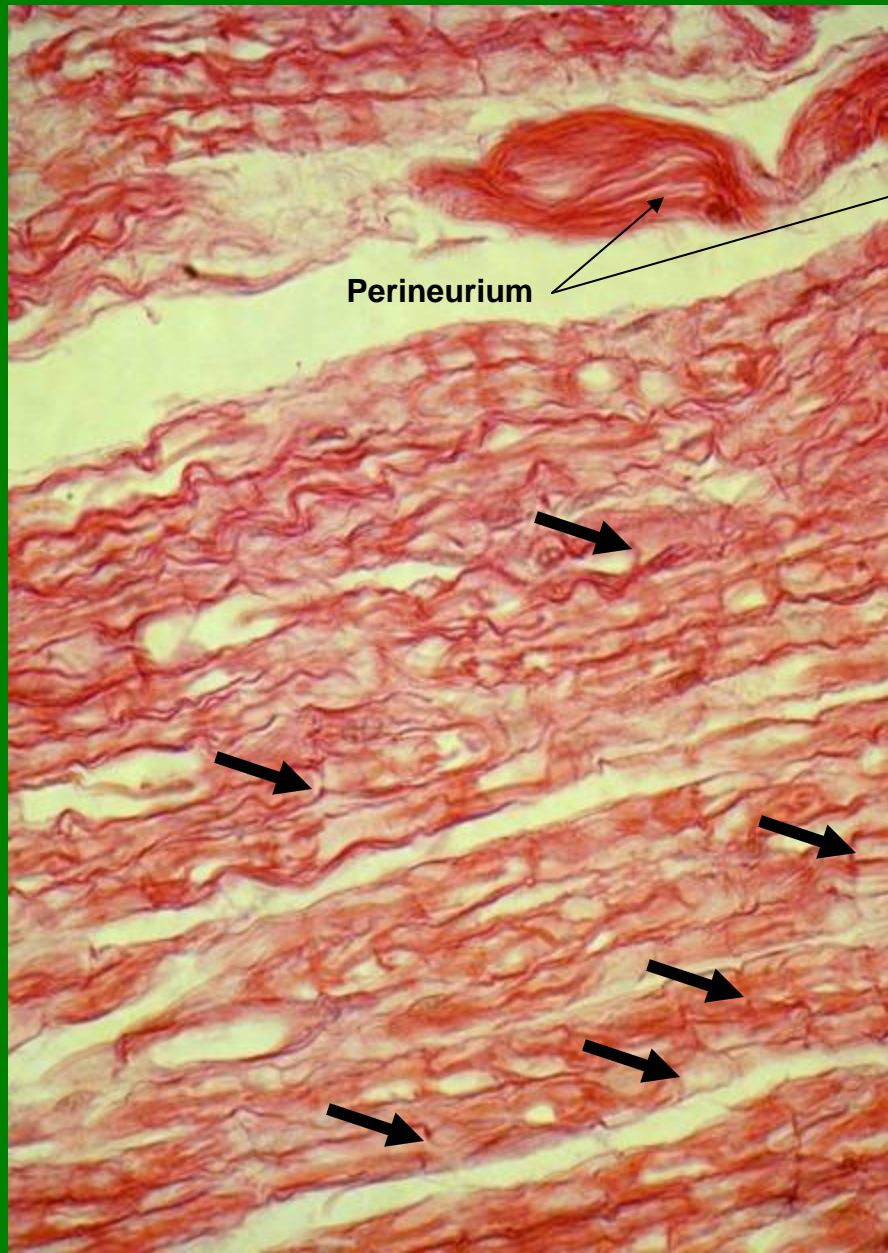
peripheral nerve: long. section



Fish backbone-pattern = Schmidt-Lantermann clefts

Nodes of Ranvier =





Perineurium

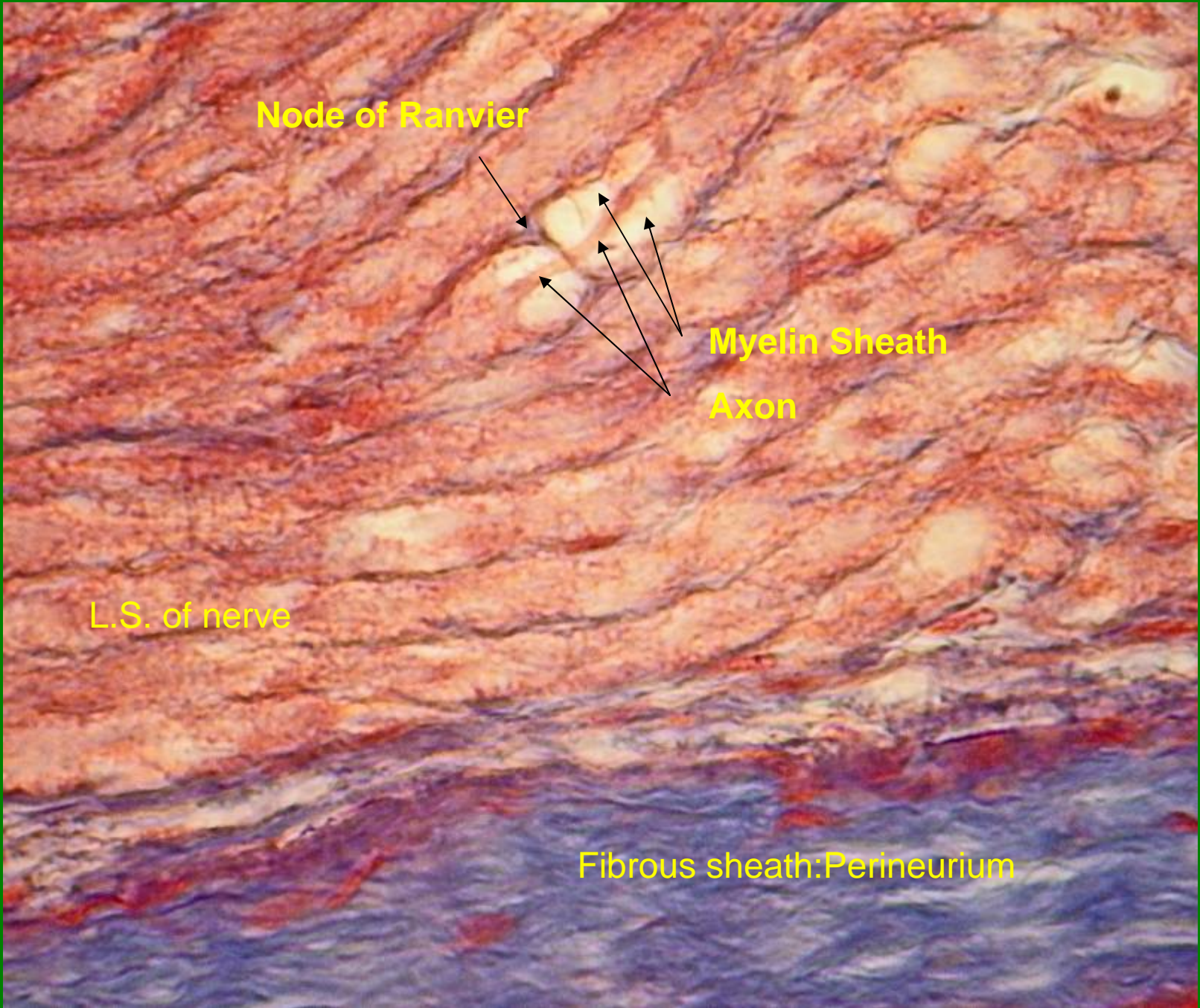
Longitudinal Section

Arrows are N.of Ranvier



Scrolled MYELIN SHEATH

Cross Section



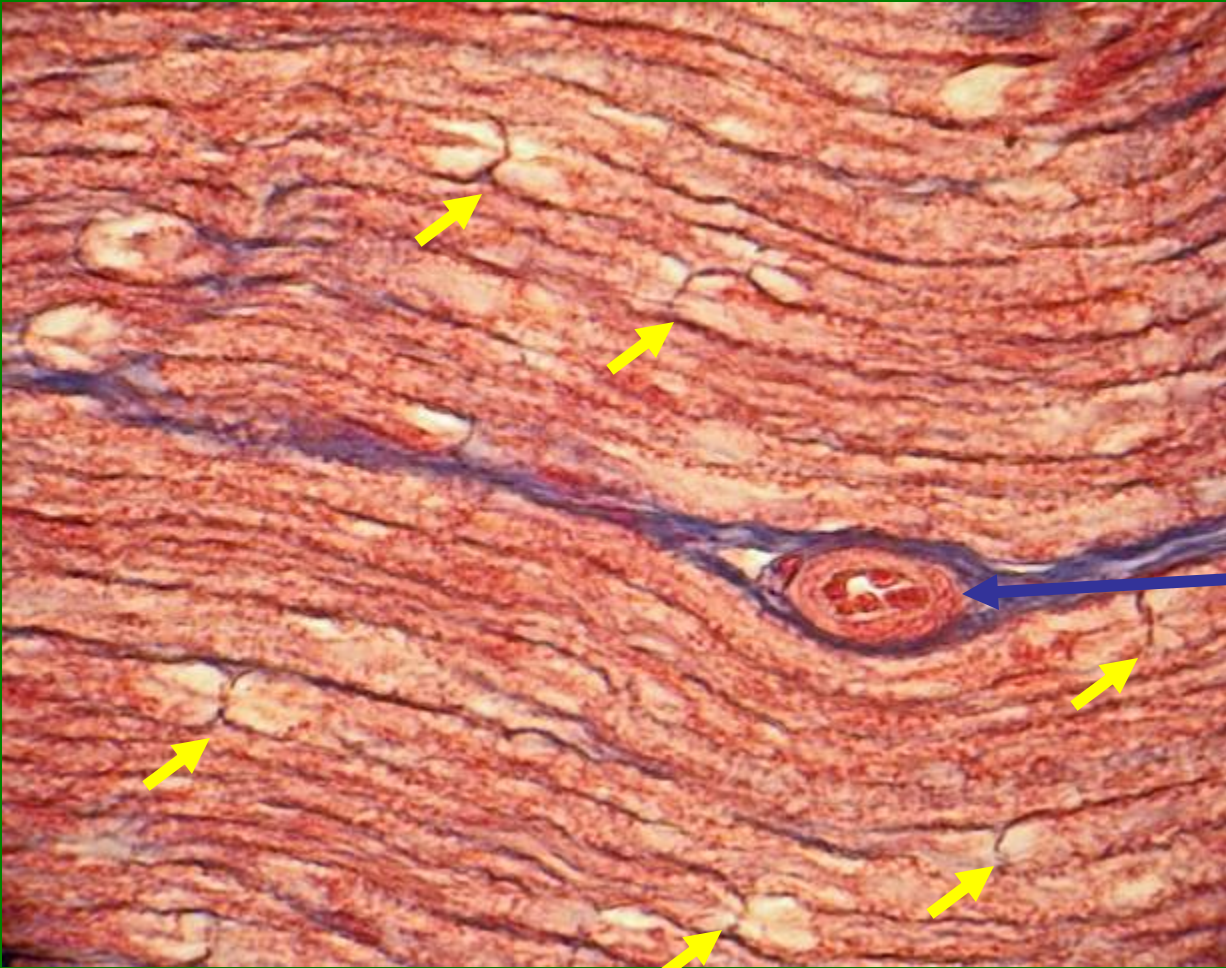
Node of Ranvier


Myelin Sheath

Axon

L.S. of nerve

Fibrous sheath: Perineurium

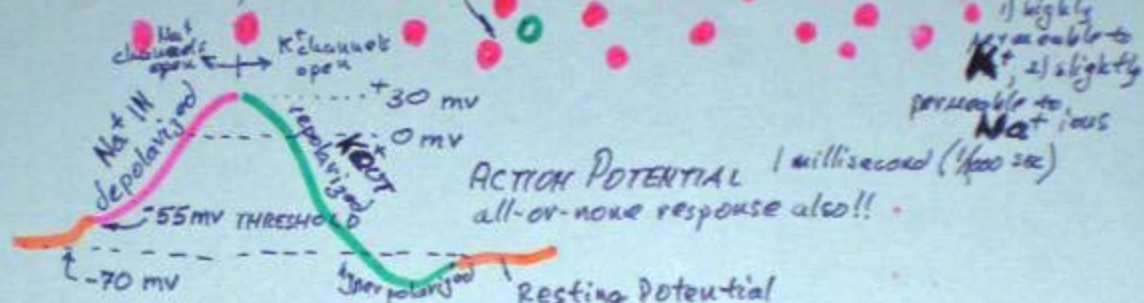
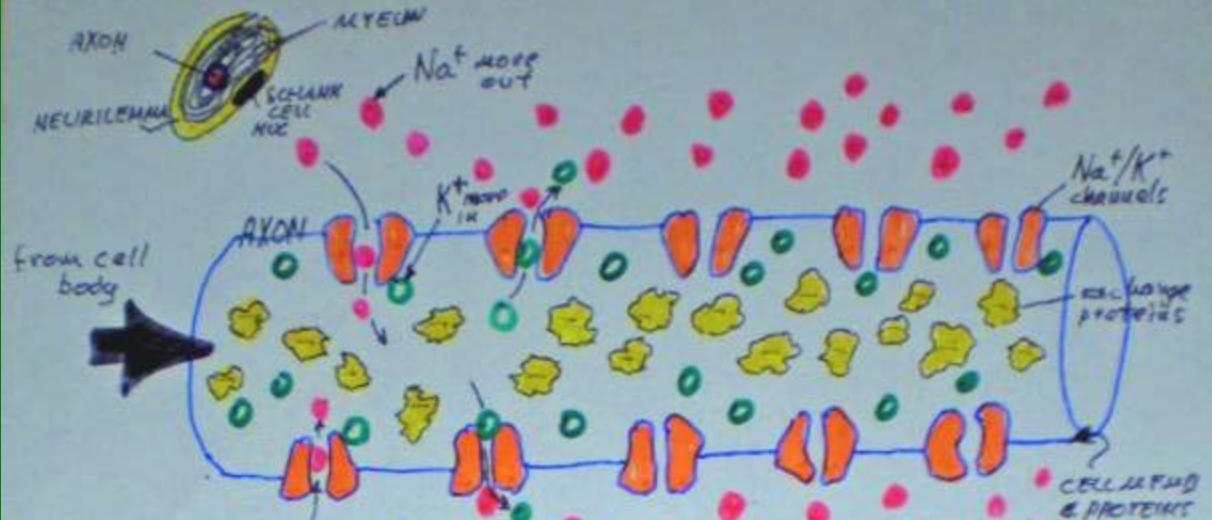


Nodes of
Ranvier = 

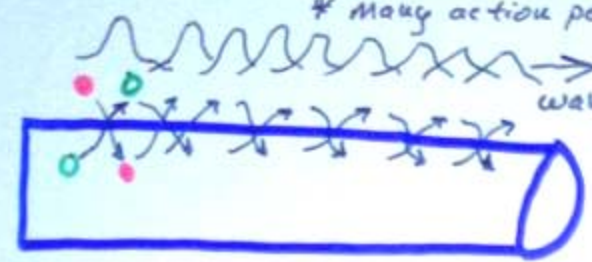
 Arteriole in fibrous sheath



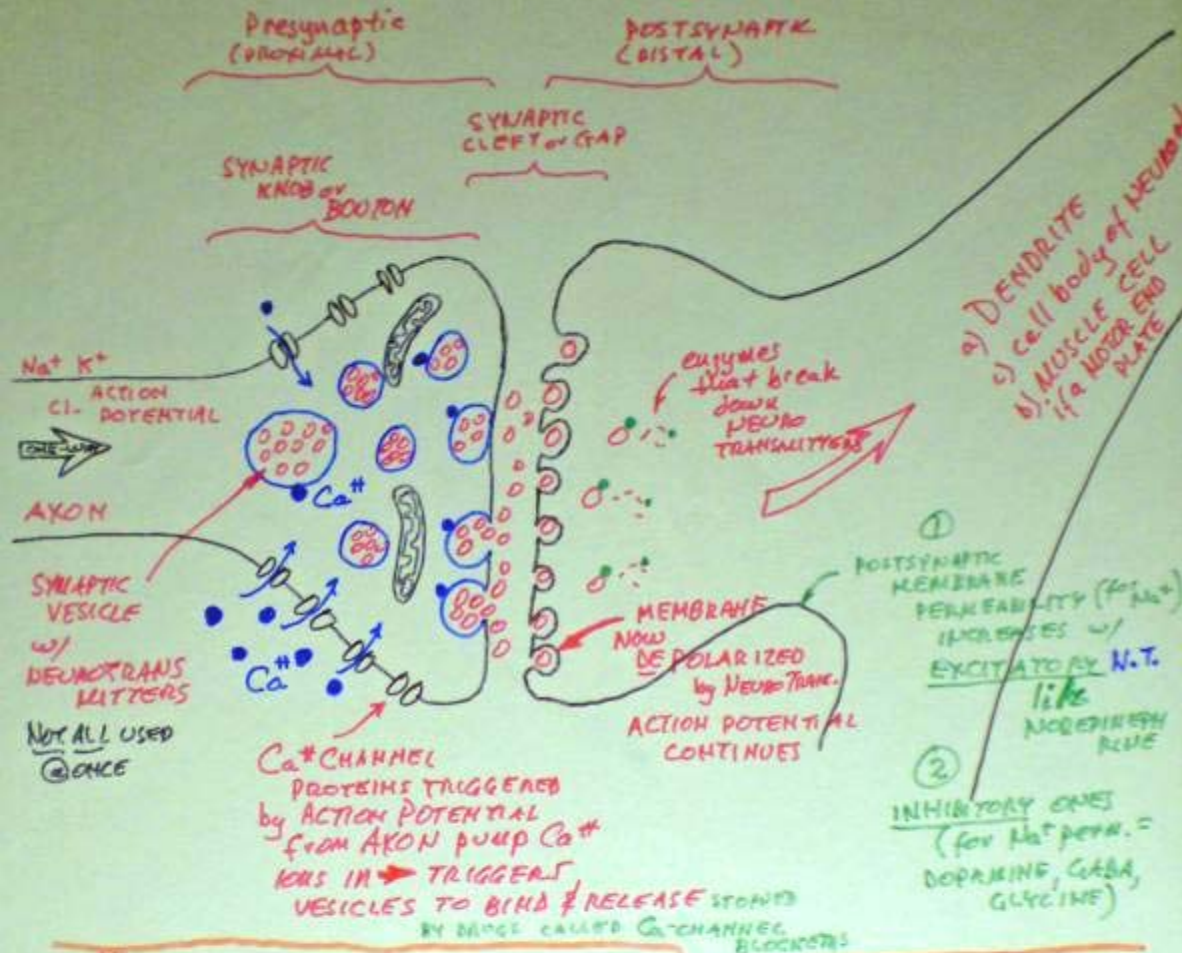
4 fascicles of nerve fibers - C.S.



- * graded = more stimulation / more change in potential
 - * summation also occurs until threshold reached (subthreshold potential changes can be "added" until threshold,)
 - * Many action potentials = NERVE IMPULSE (or a WAVE)
- wave of impulse

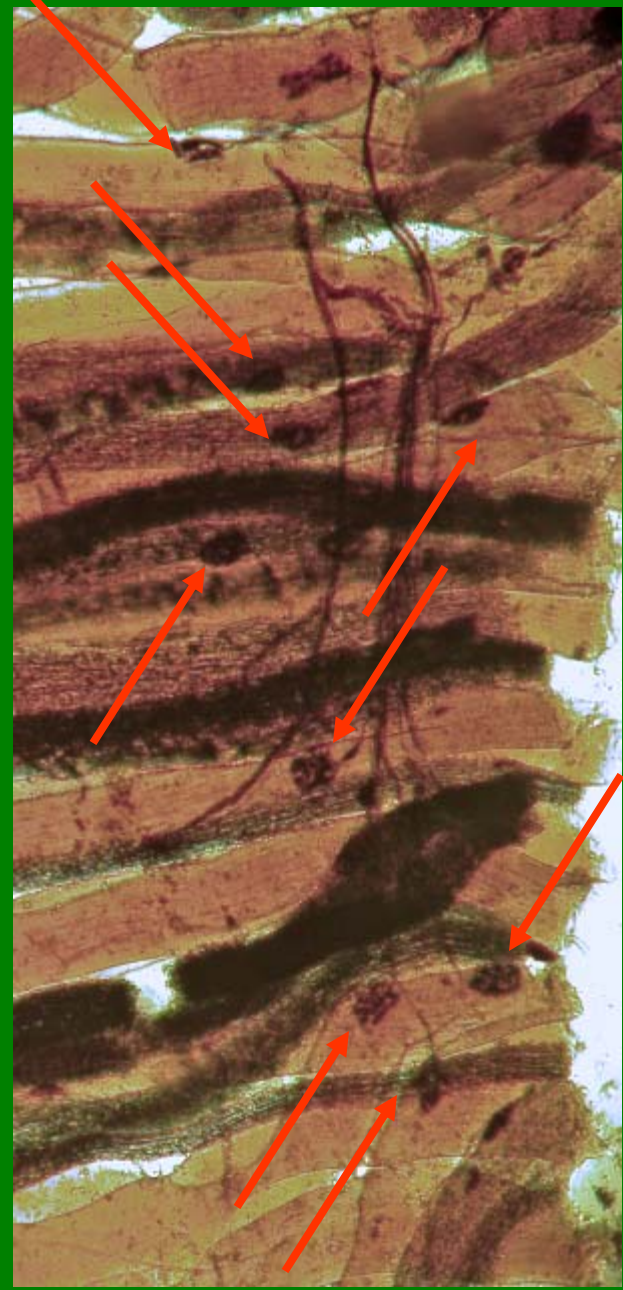
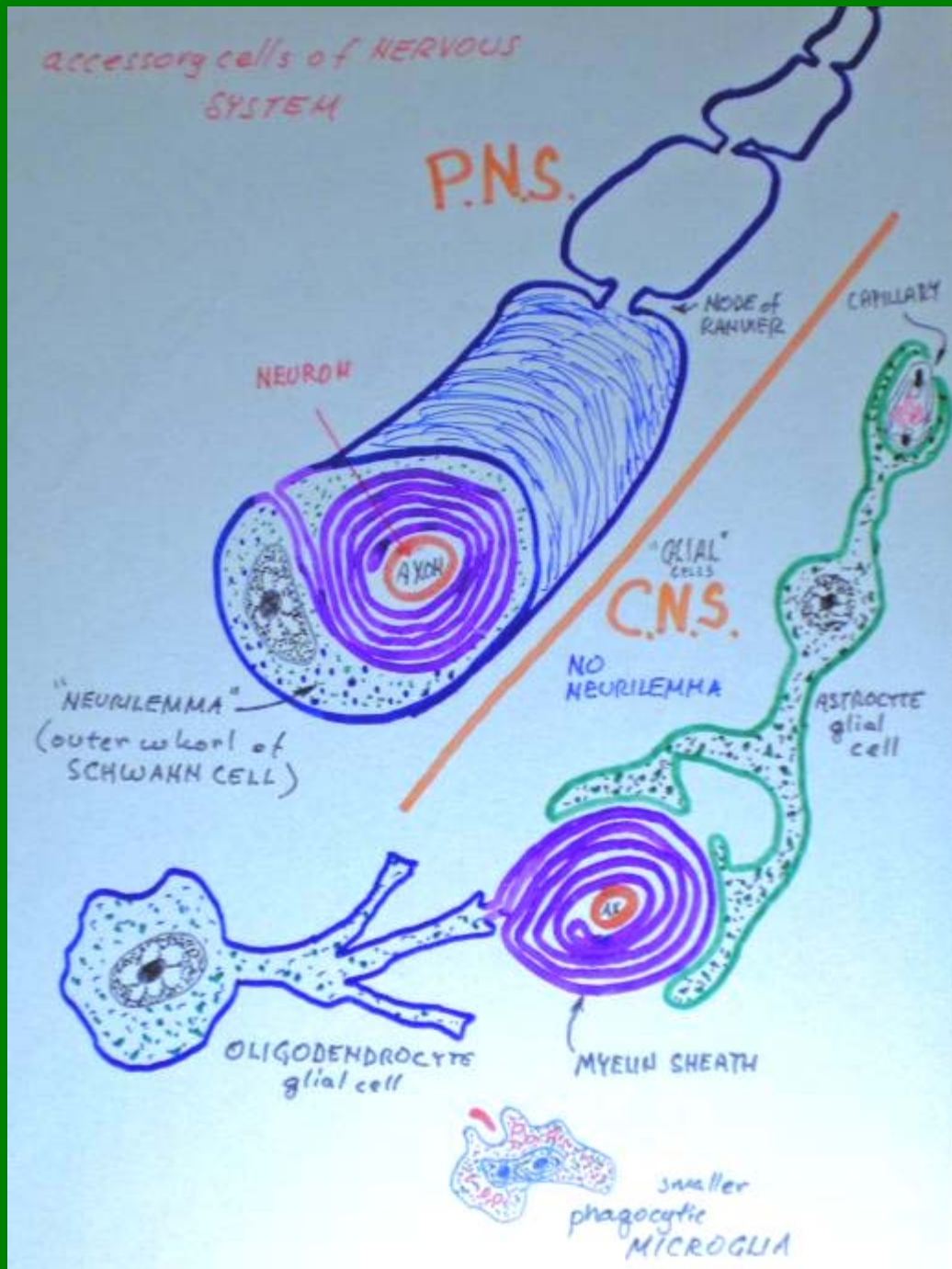


@ SYNAPSE

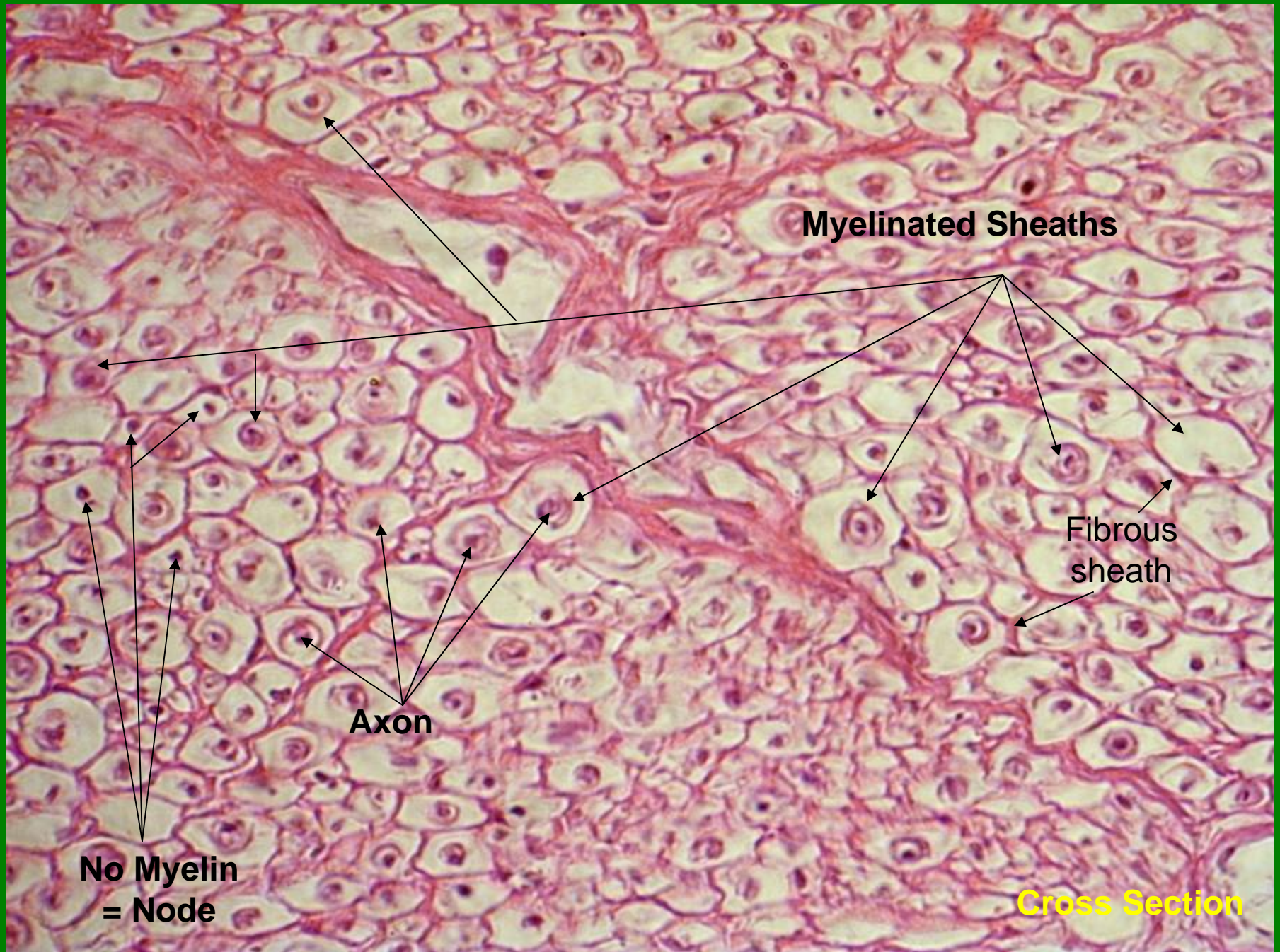


NEUROTRANSMITTERS - all proteins

- 1) AMINO ACIDS - GLYCINE, GLUTAMIC ACID, ASPARTIC ACID, gamma-amino-butyric acid = GABA.
- 2) PEPTIDES -
- * 3) MONOAMINES - EPINEPHRINE (ADRENALINE) BROKEN DOWN, POSTSYNAPTICALLY, BY CHOLINESTERASE* OR MONOAMINE OXIDASE* which is stopped by M.A.O. INHIBITOR*
 NOREPINEPHRINE
 SEROTONIN
 DOPAMINE
 ENDORPHIN
- * 4) ACETYLCHOLINE - if postsynaptic ('distal cell') is a MUSCLE INHIBITOR* DROC.



Motor nerve endings on Sk. Musc.



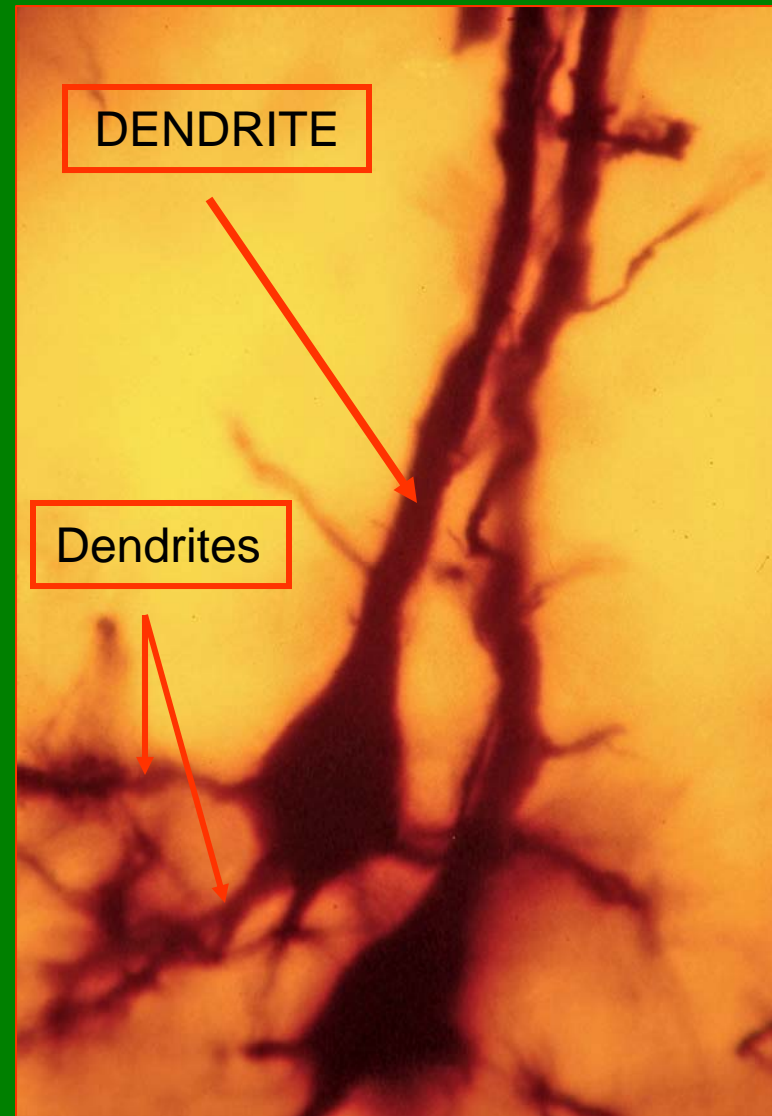
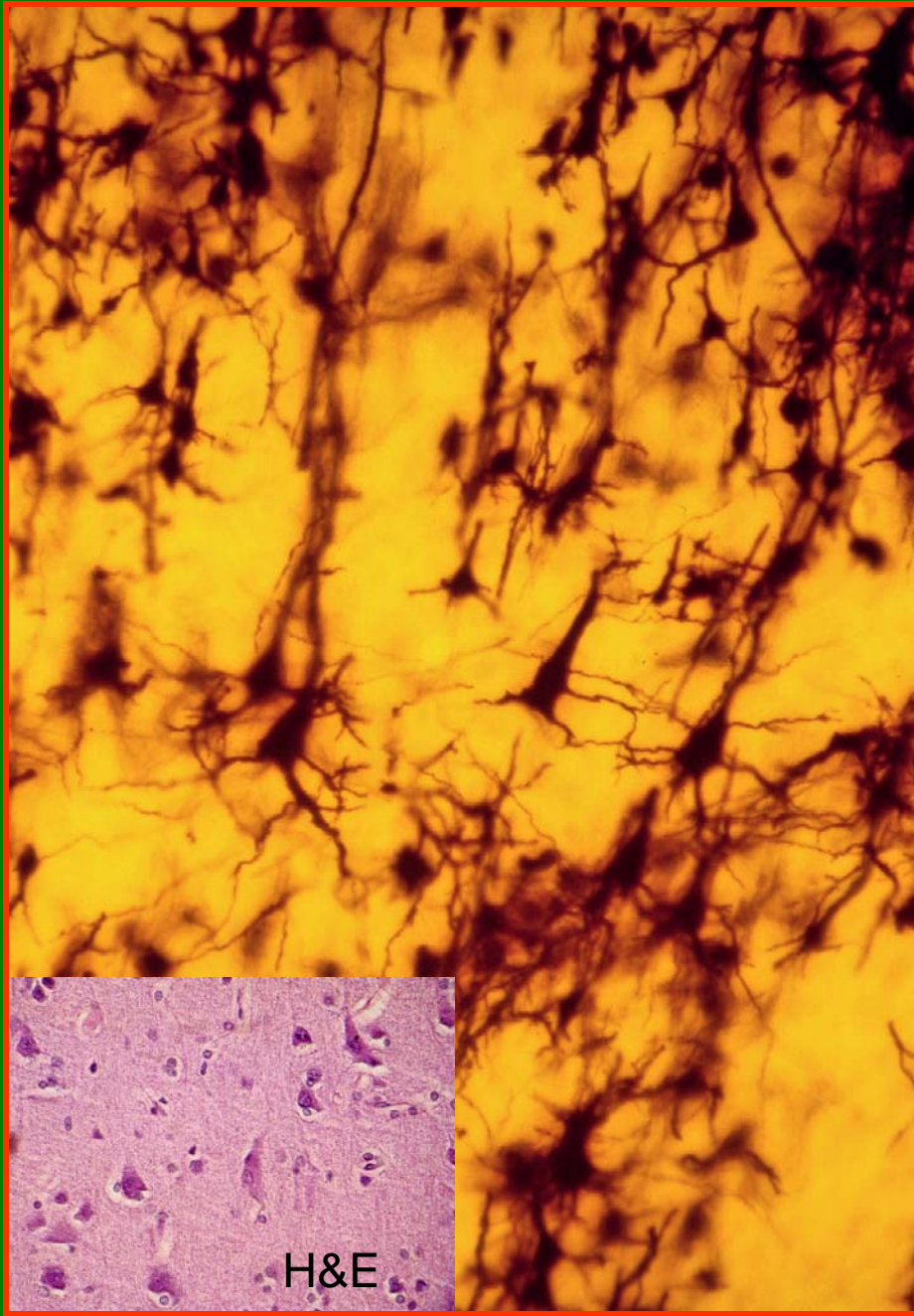
Myelinated Sheaths

Fibrous sheath

Axon

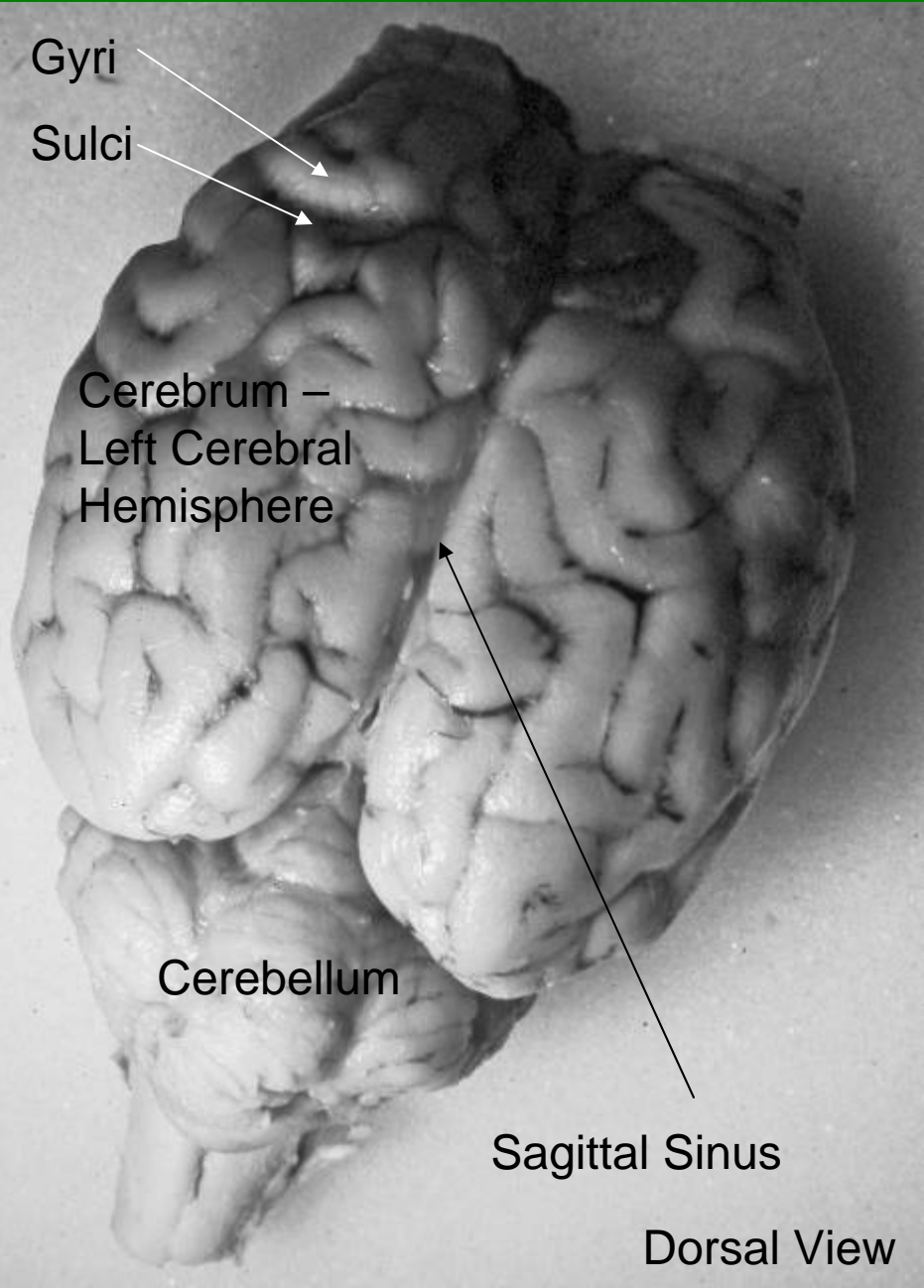
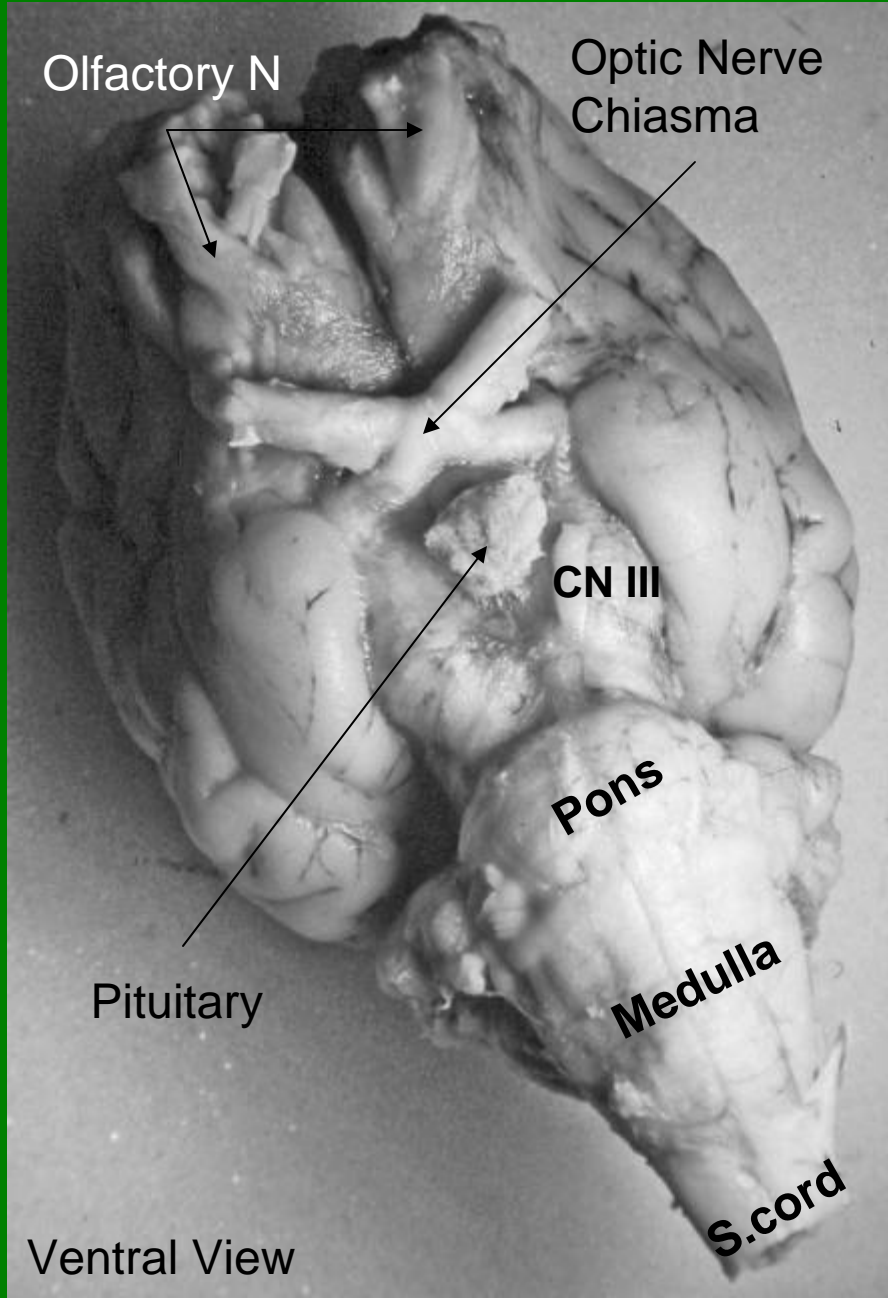
**No Myelin
= Node**

Cross Section

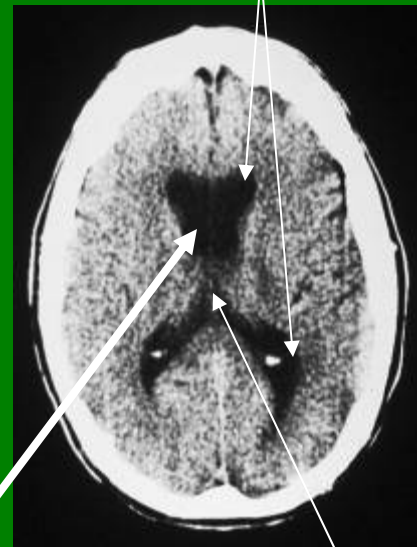
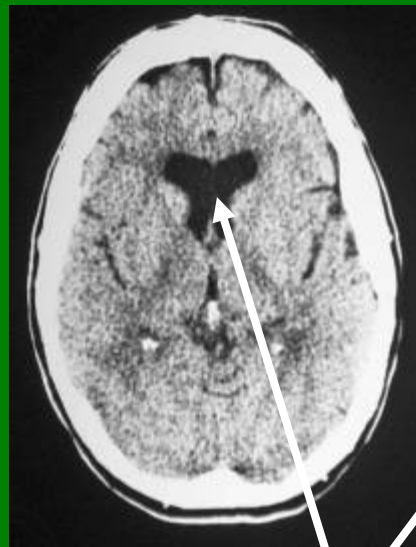
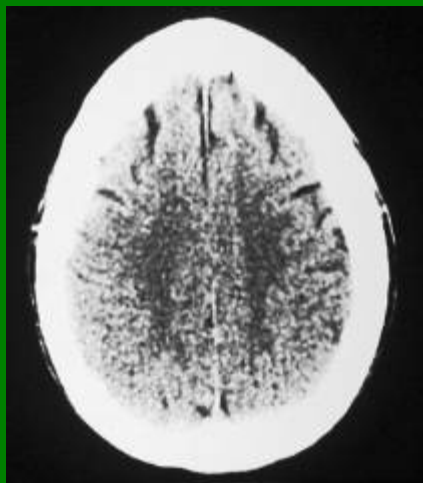
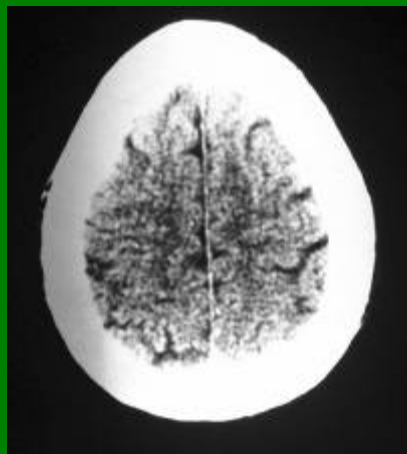


**Neuron Cell Bodies in Brain
(‘Pyramid Cells’ of Cerebrum)
Golgi silver stain**

Central Nervous System:



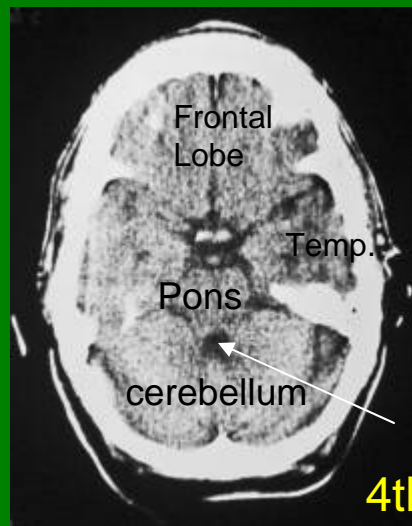
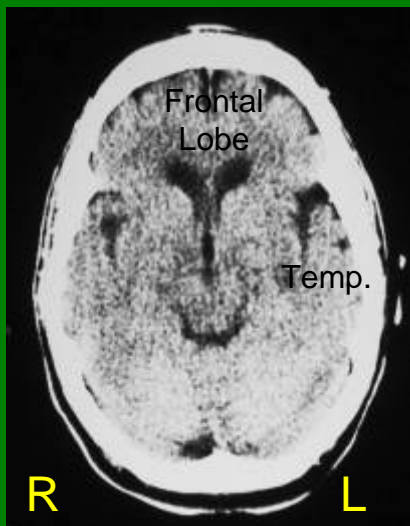
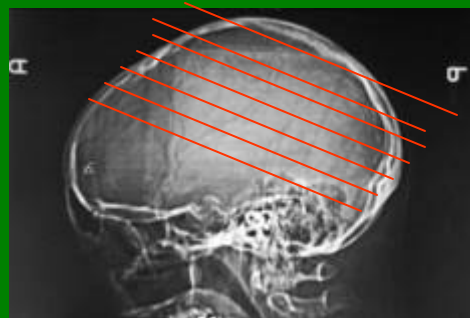
Sheep Brain



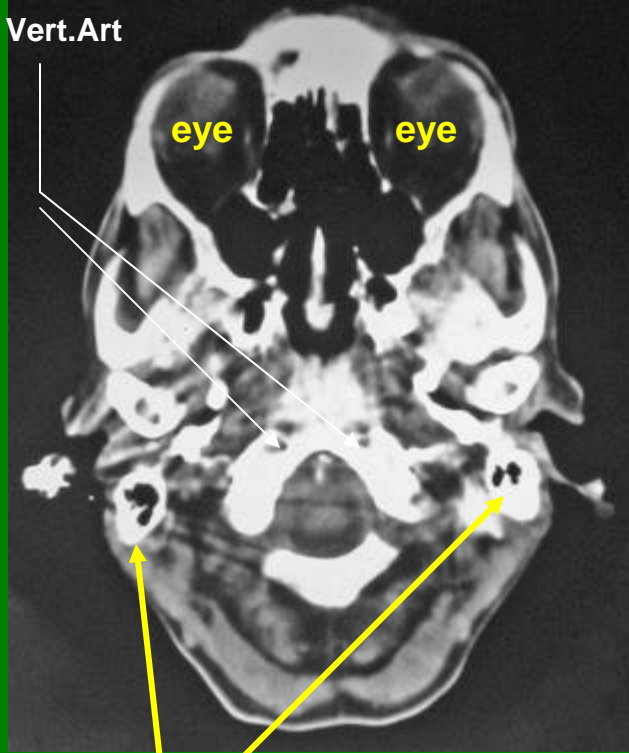
Brain CT Scans

'Ventricles'

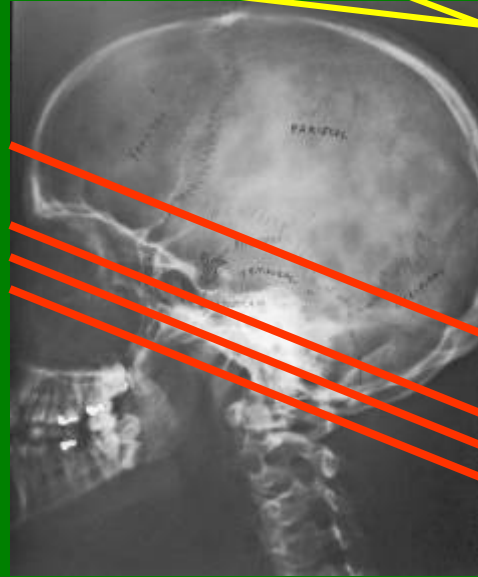
3rd



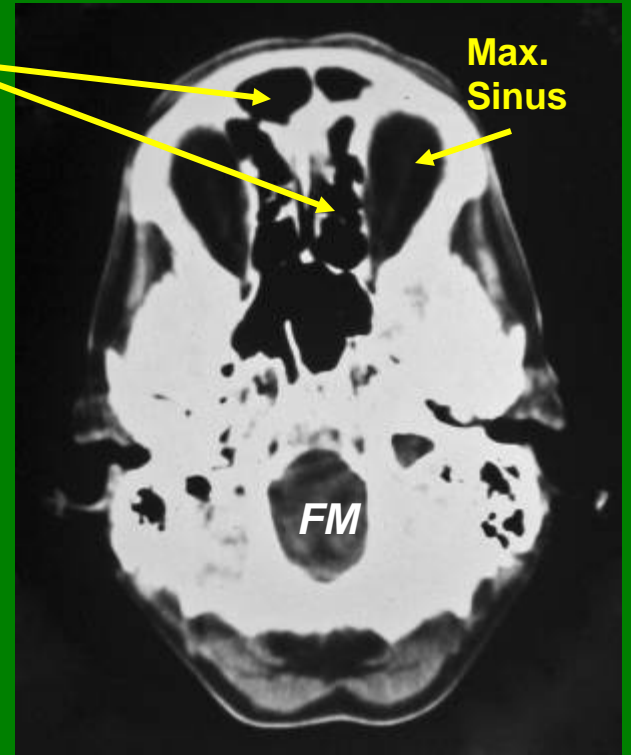
Vert.Art



Frontal & Ethmoid Sin.

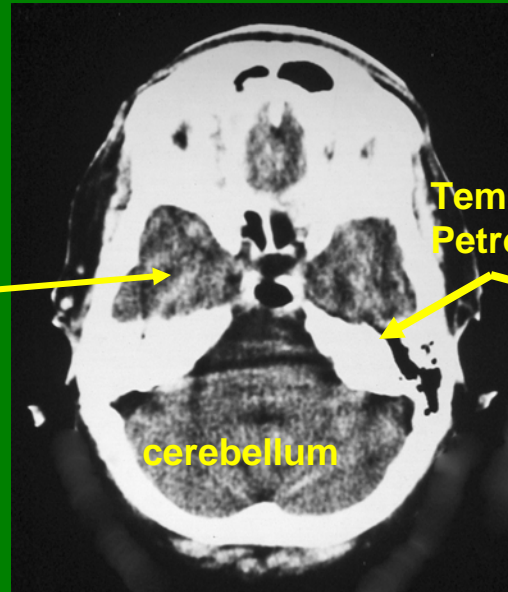


Max. Sinus

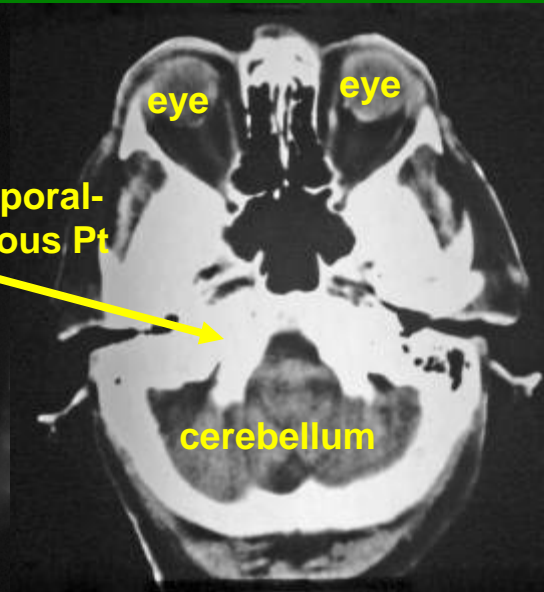


Mastoid

Temporal Lobe



Temporal-Petrous Pt

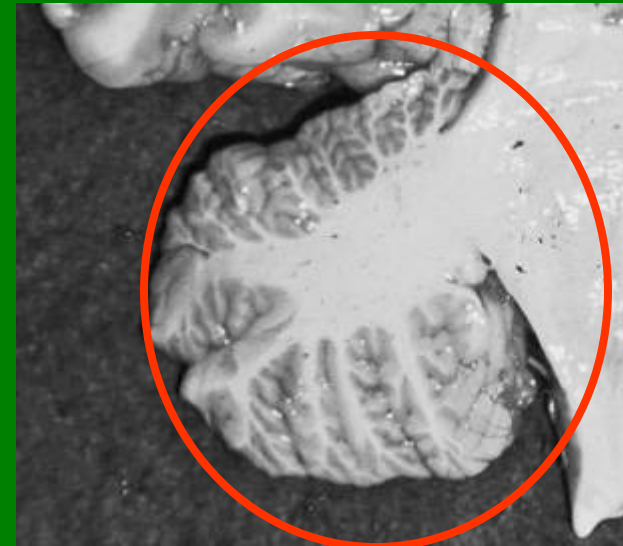


CT Scan

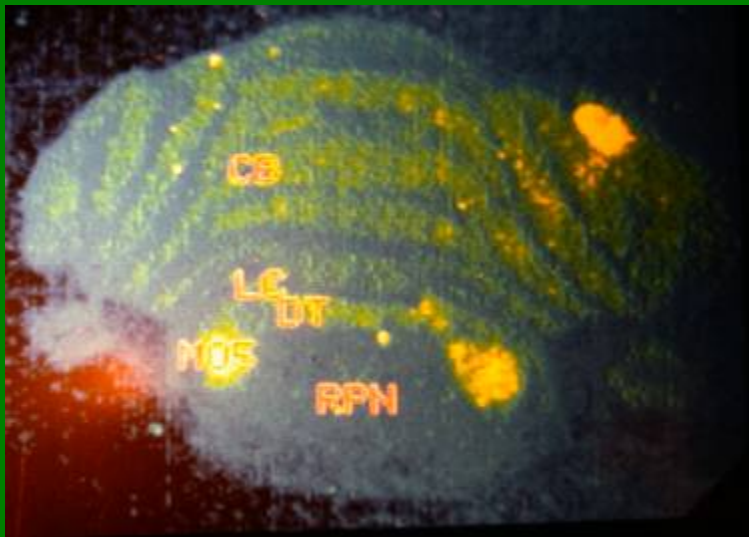
CEREBELLUM



Cerebellum: Mid-sagittal Section



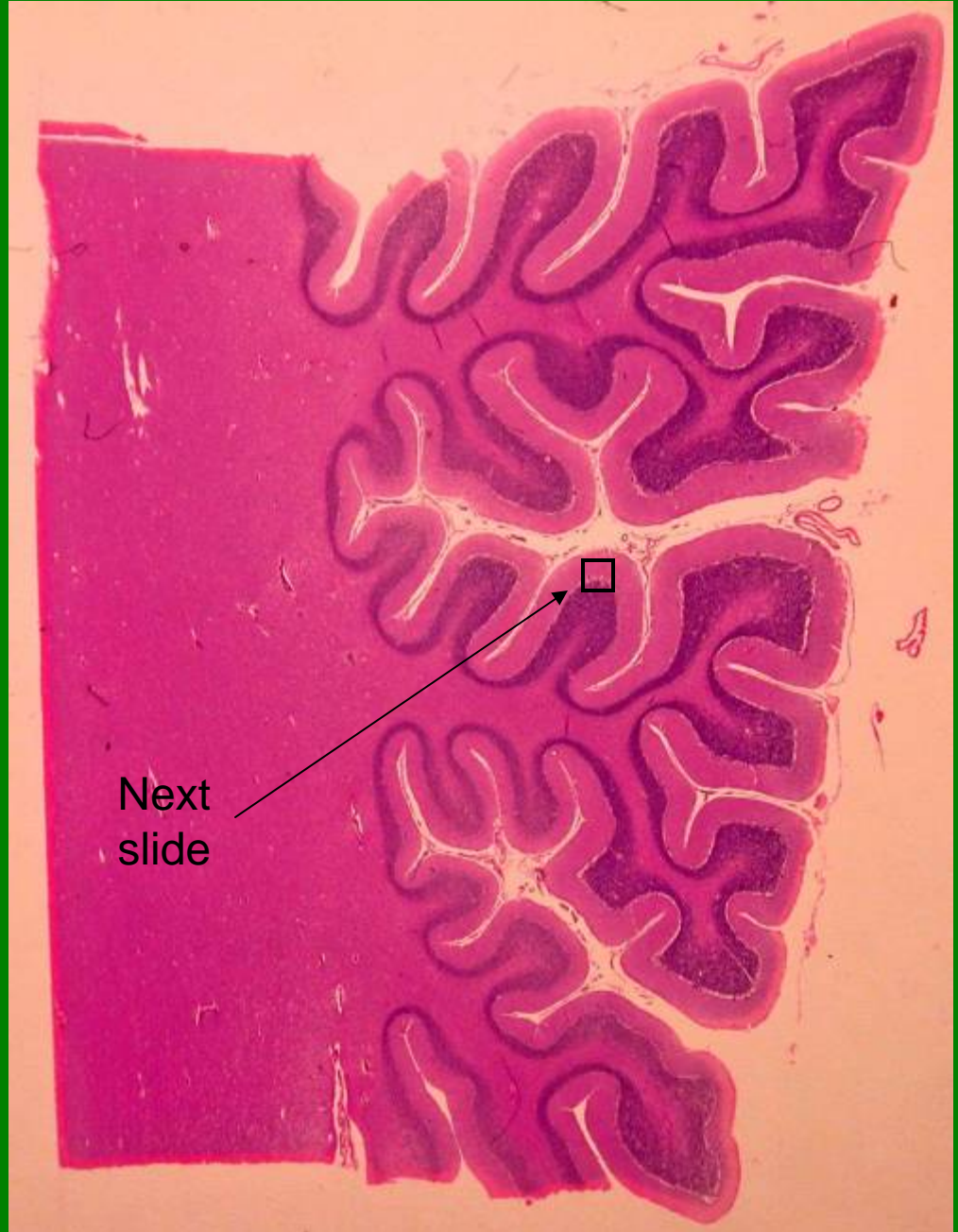
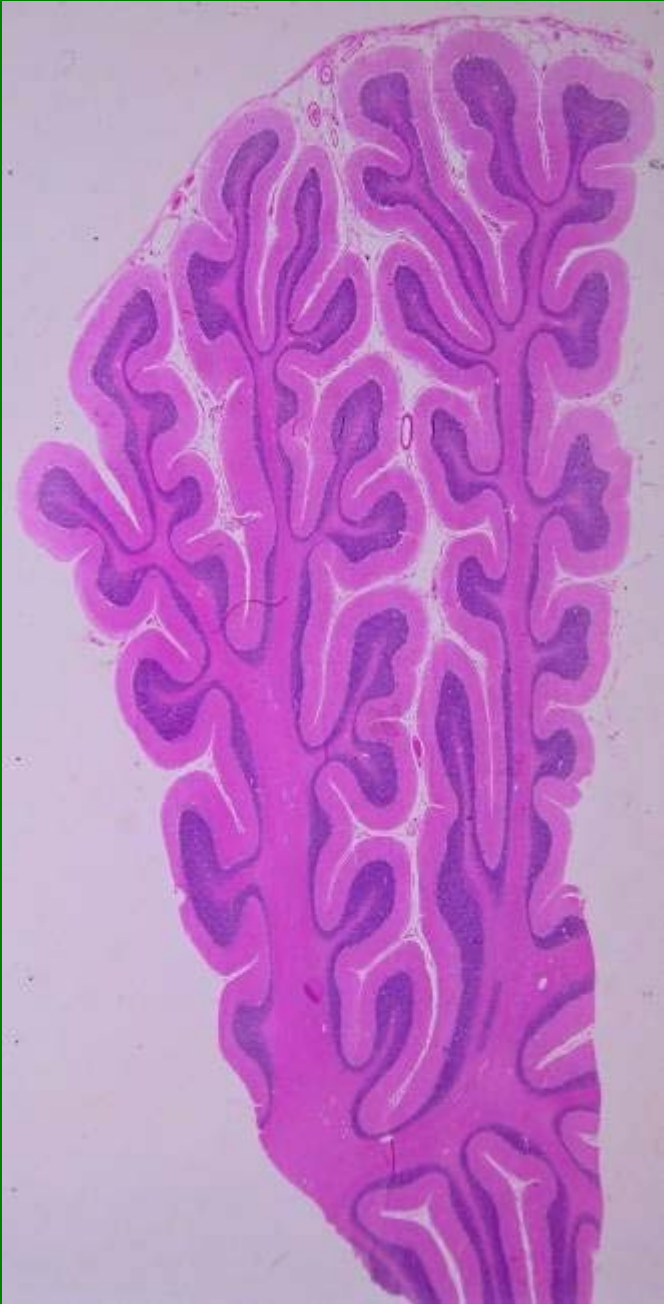
Cerebellum: Coronal Section



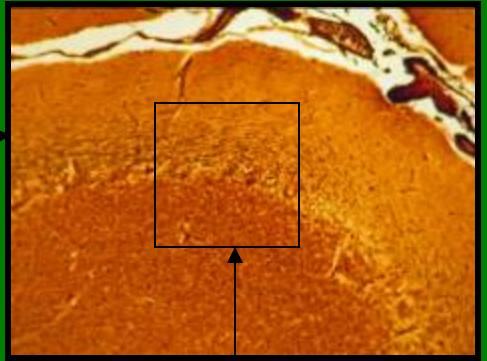
Rat Cerebellum Autoradiograph



CT Scan

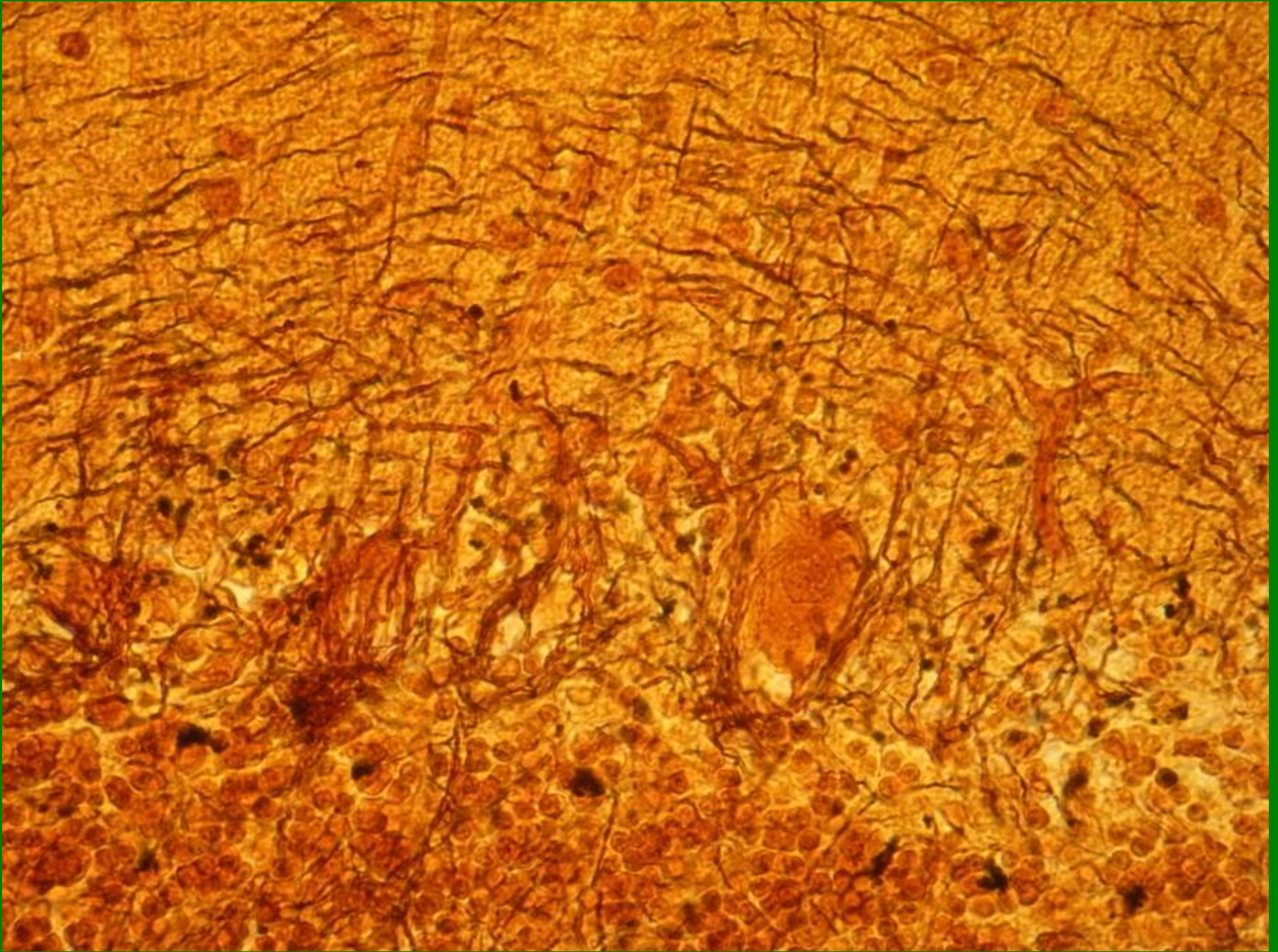


Next
slide

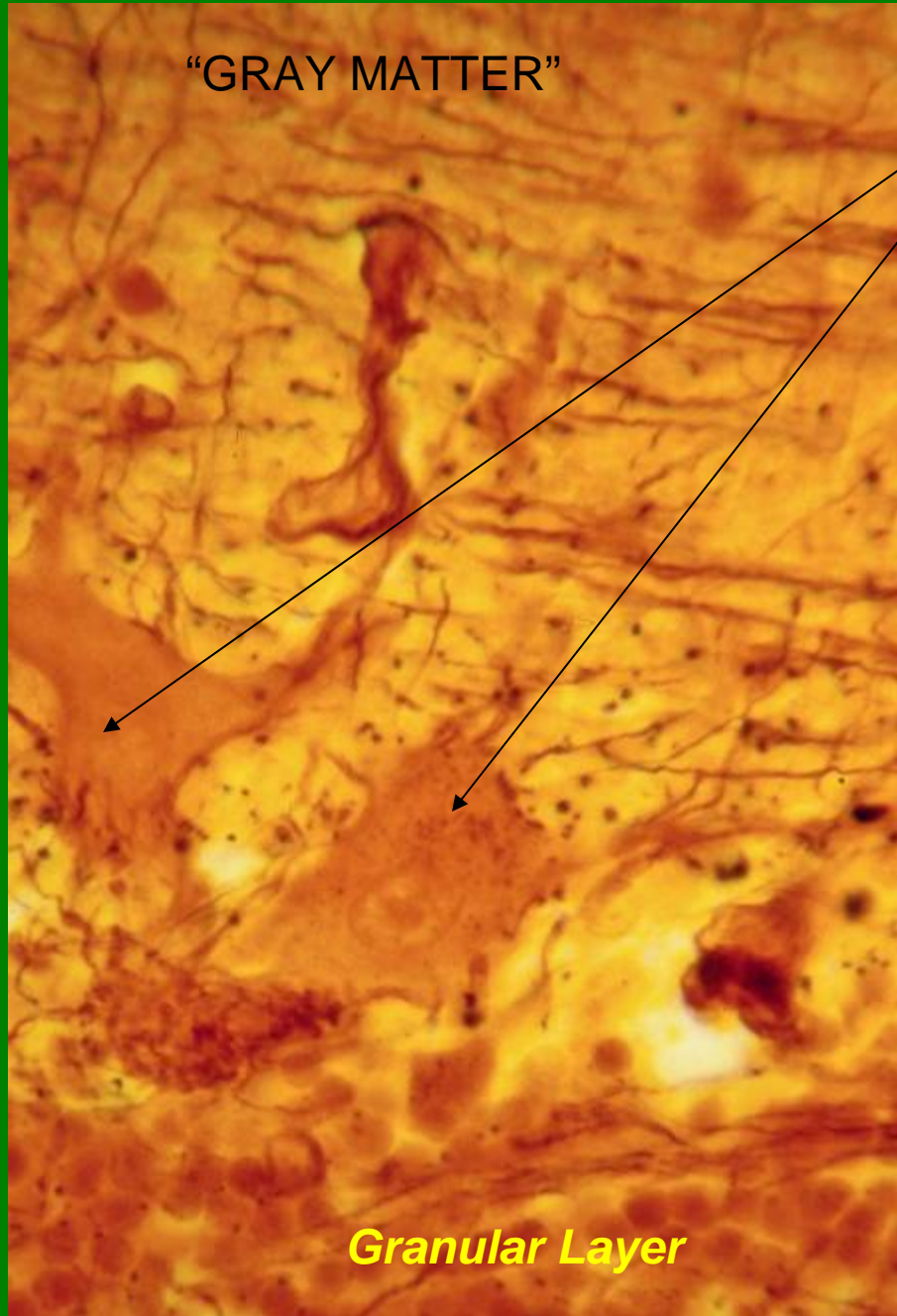


Next
slide

Silver stain

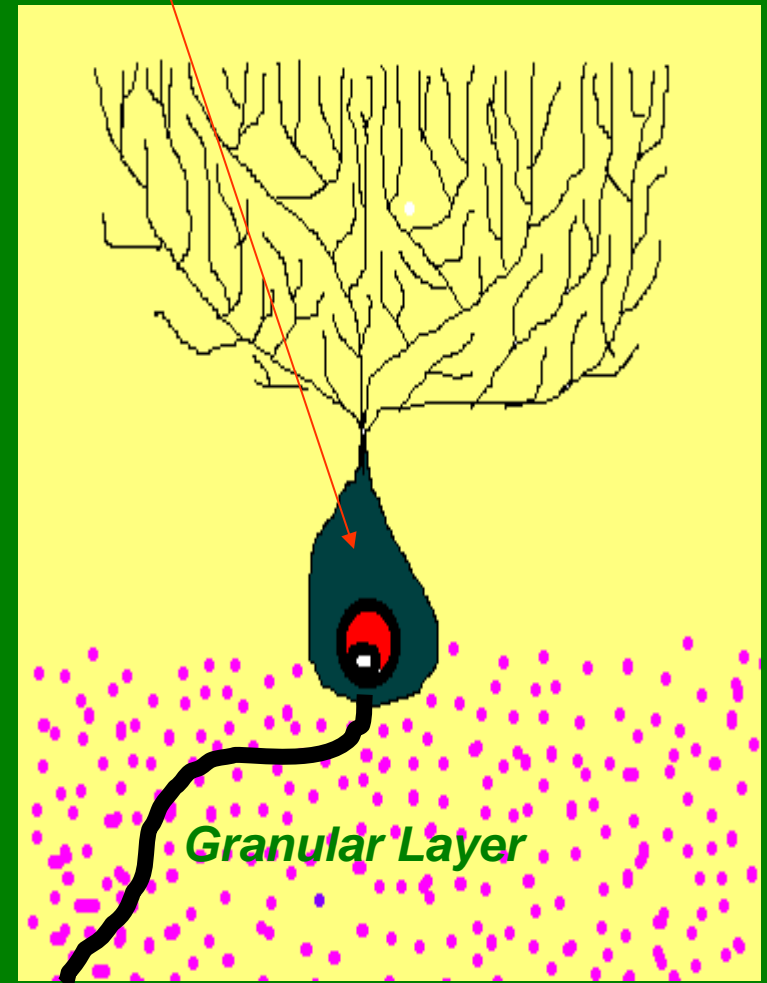


“GRAY MATTER”



Granular Layer

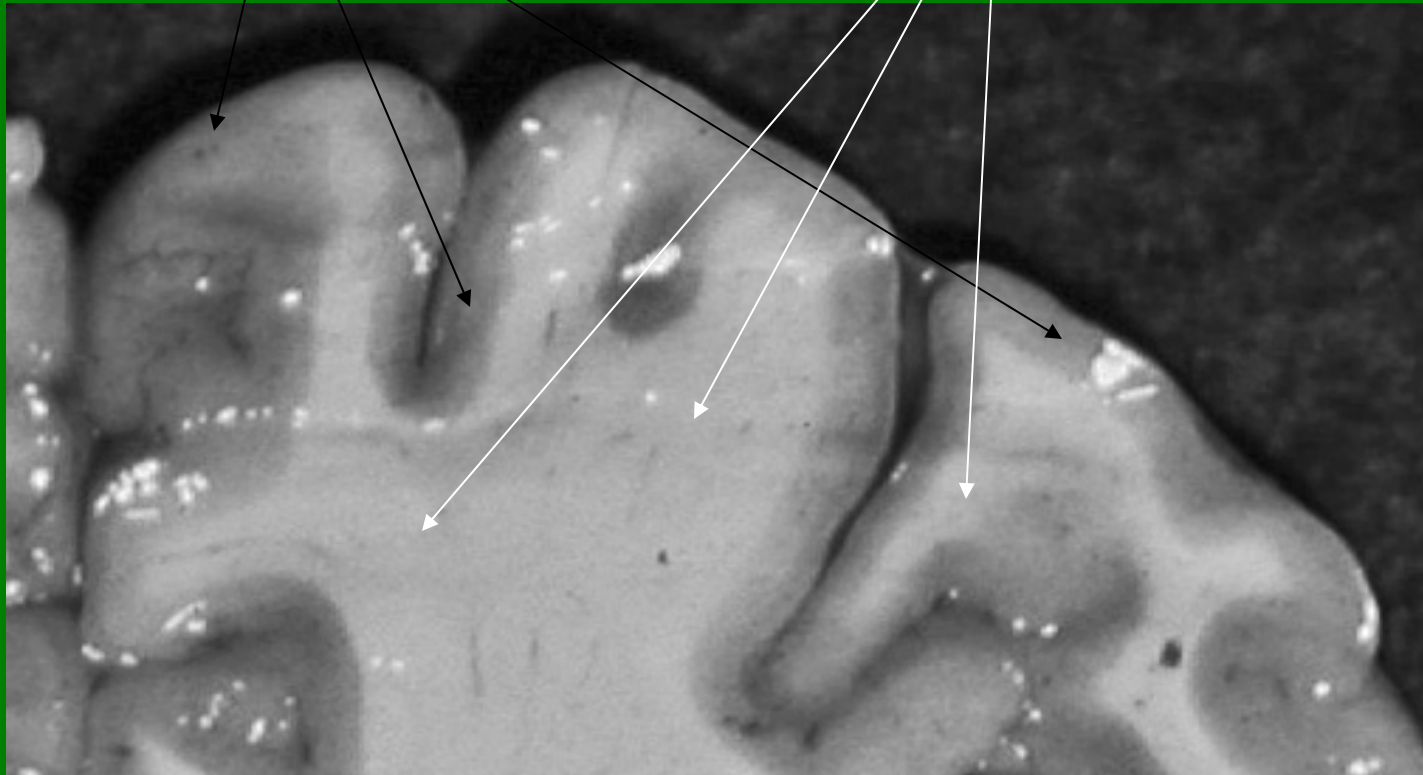
*Purkinje Cells of
Cerebellum 'sitting' on
Granular Layer*



Granular Layer

CEREBRUM

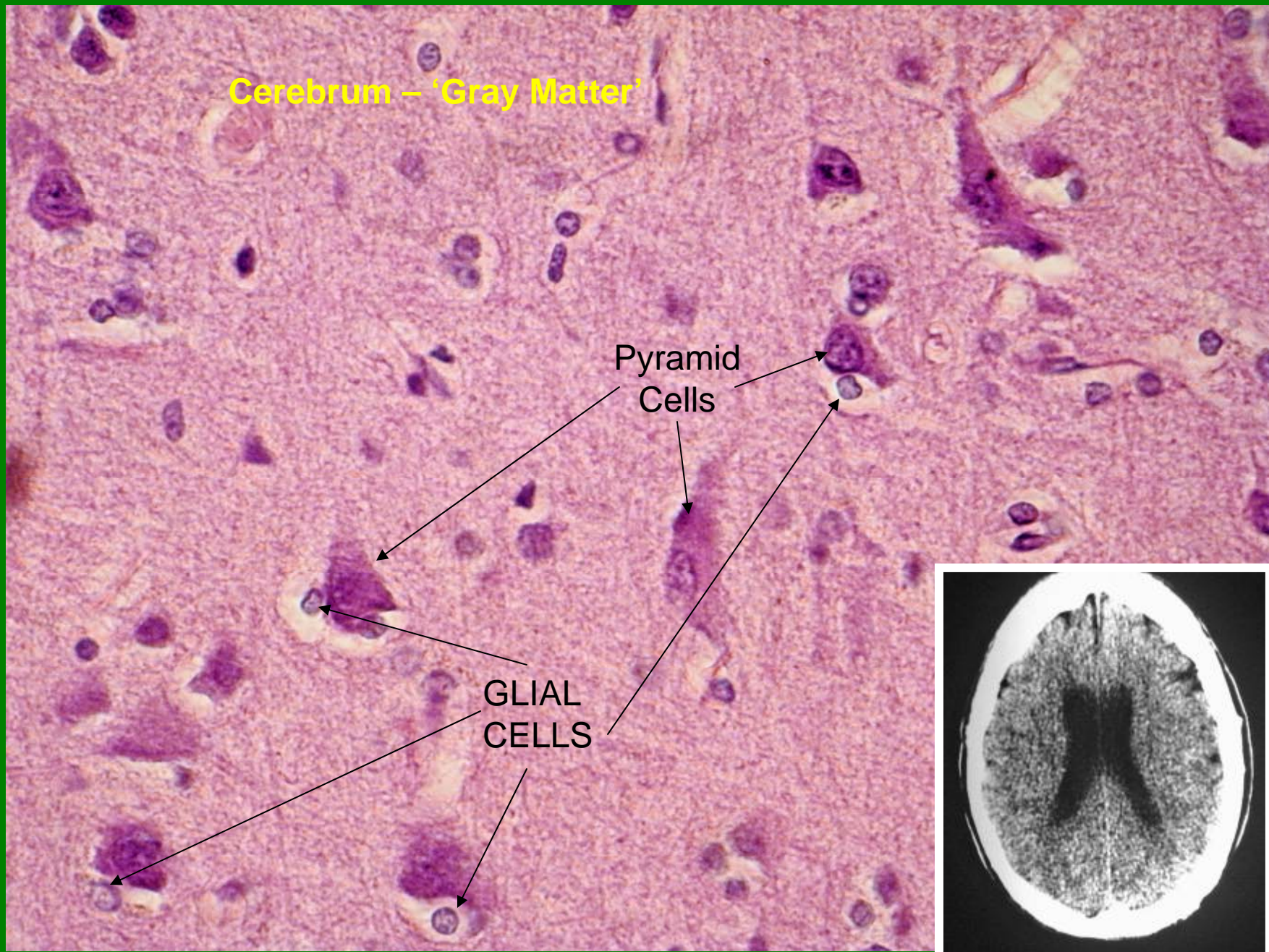
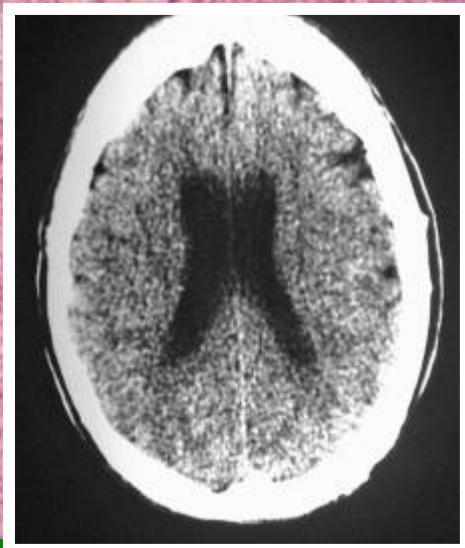
Cerebrum: Gray Matter (Neuron Cell Bodies) and White Matter (Myelinated Axons)



Cerebrum – 'Gray Matter'

Pyramid
Cells

GLIAL
CELLS



GYRI

Cerebrum – ‘Gray Matter’

SULCI

GYRI

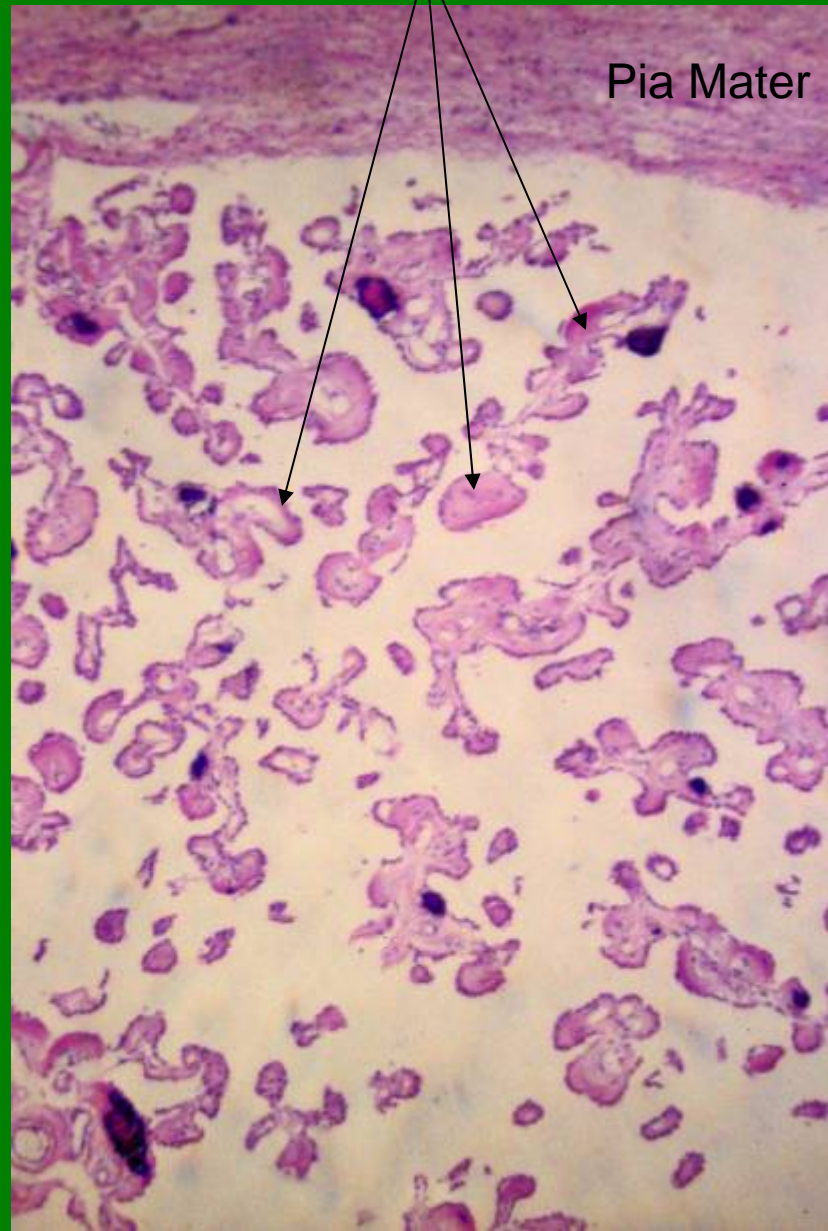
ARACHNOID

BV

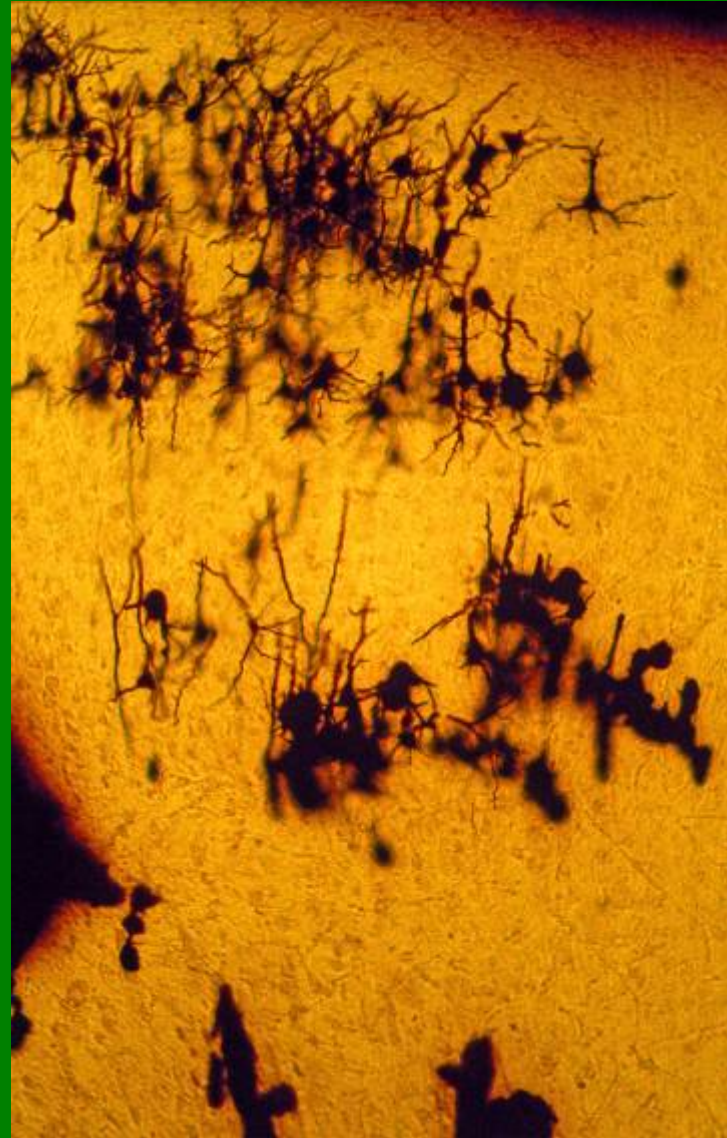
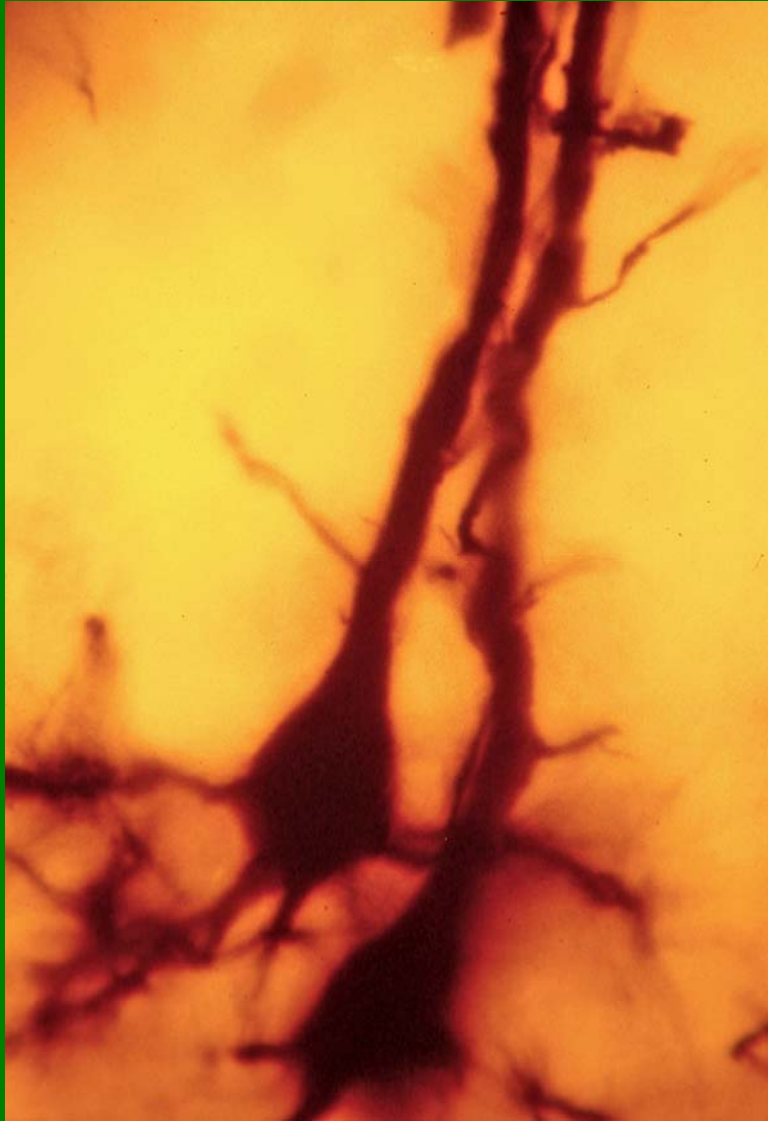
Cerebrum – ‘Gray Matter’

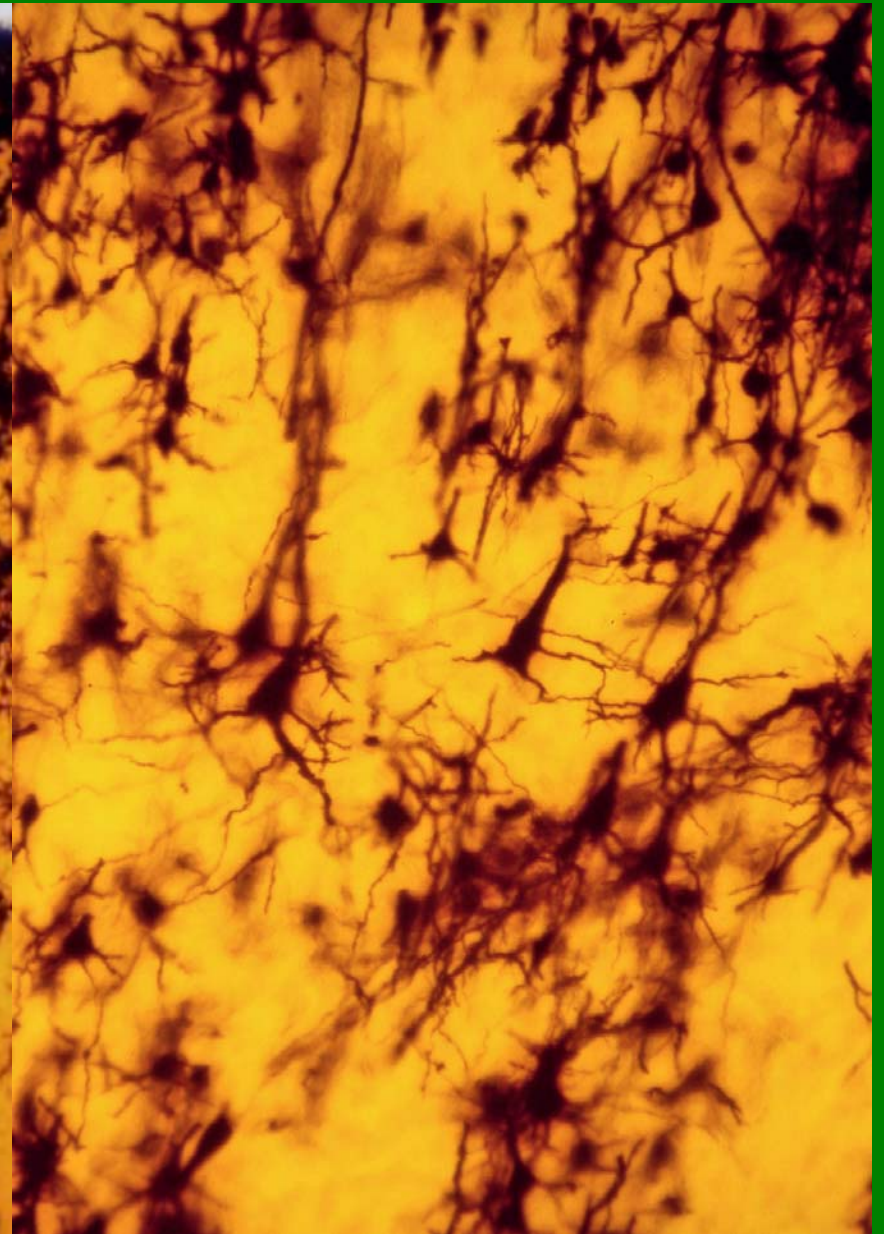
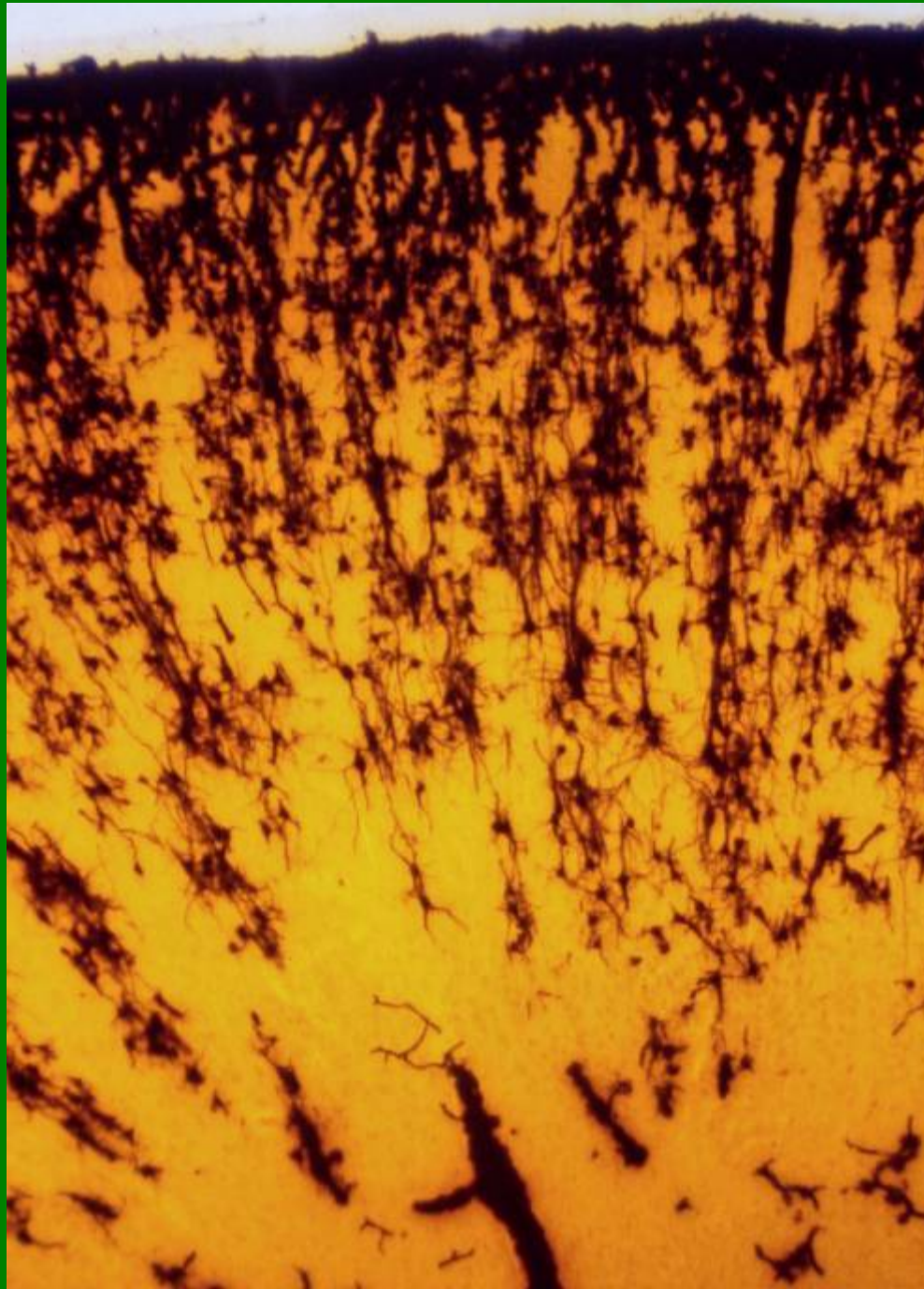


ARACHNOID Granulations in Dural Sinus



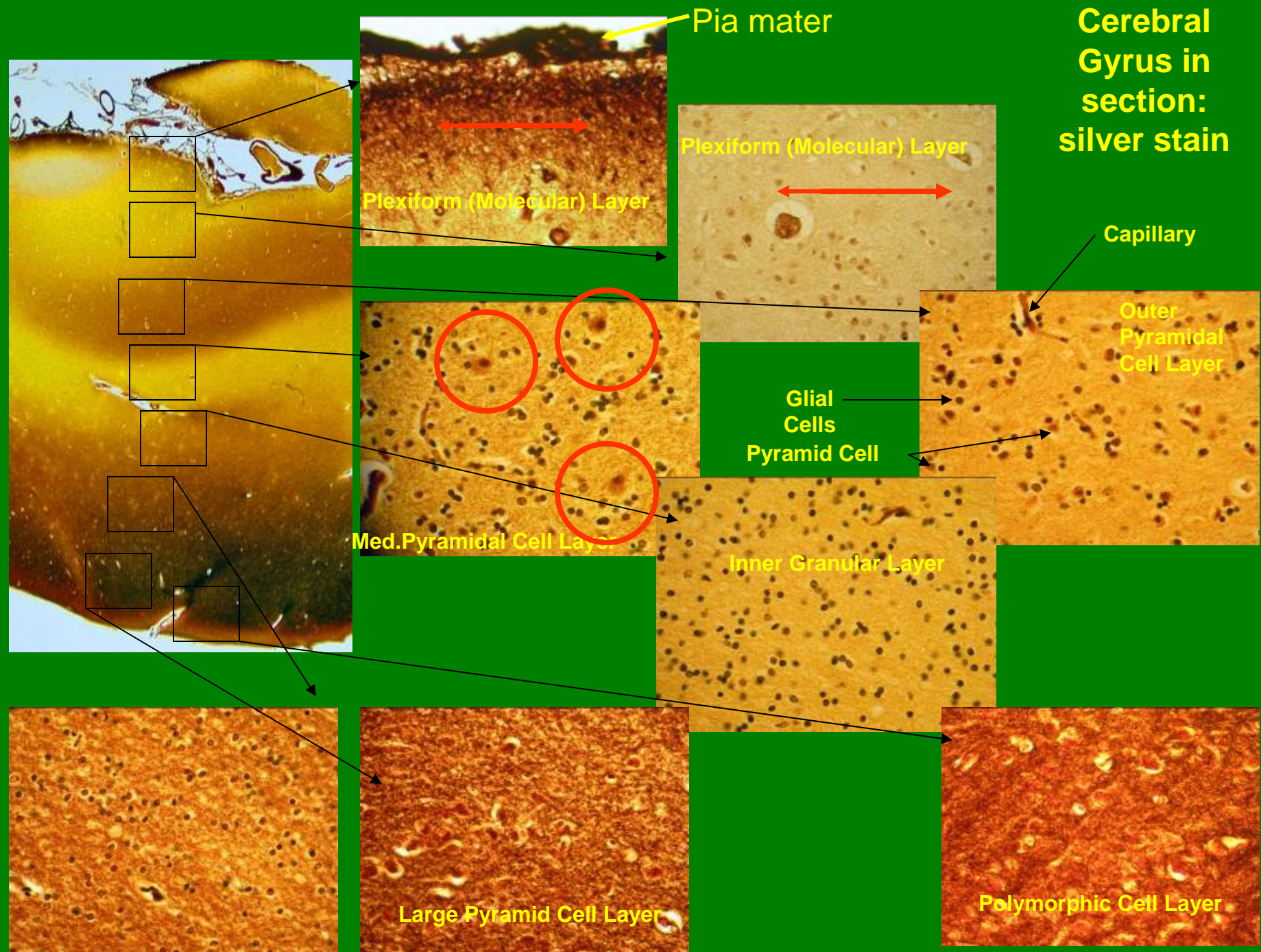
Cerebrum – Pyramid Cells in Gray Matter





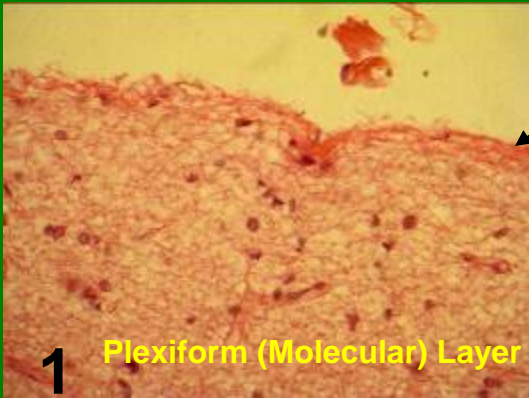
Pyramid Cells – Golgi silver

Cerebral Gyrus in section: silver stain



1-4 = Gray Matter: Neuron Cell Bodies

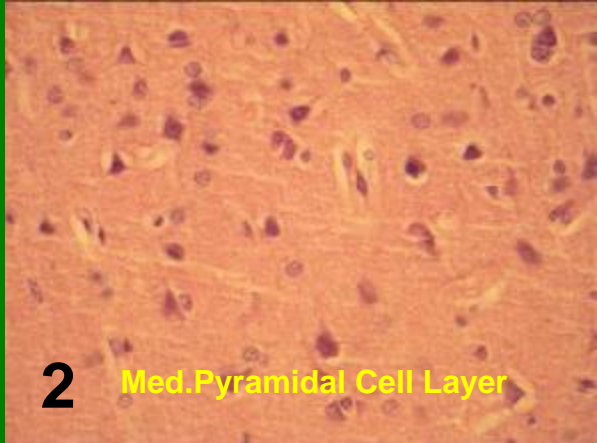
CEREBRUM H&E Stain



1

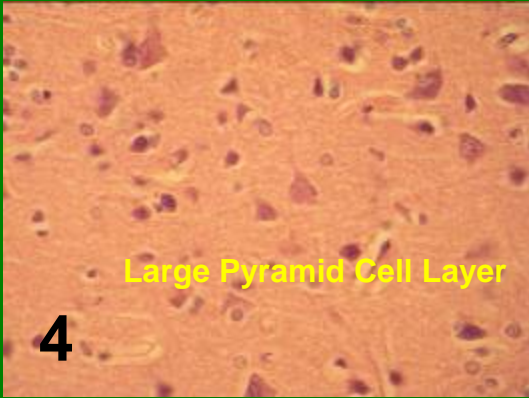
Plexiform (Molecular) Layer

Pia mater



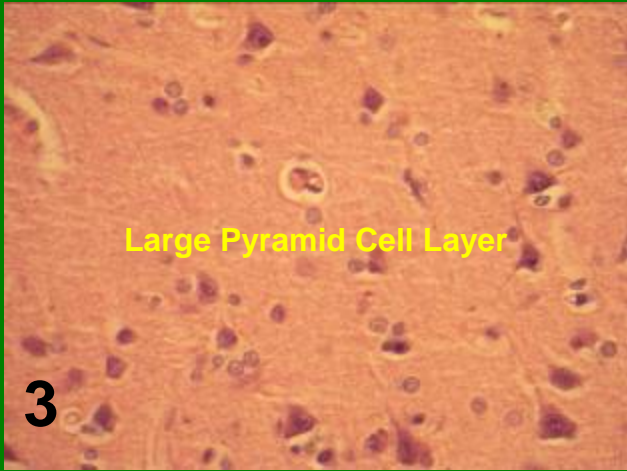
2

Med. Pyramidal Cell Layer



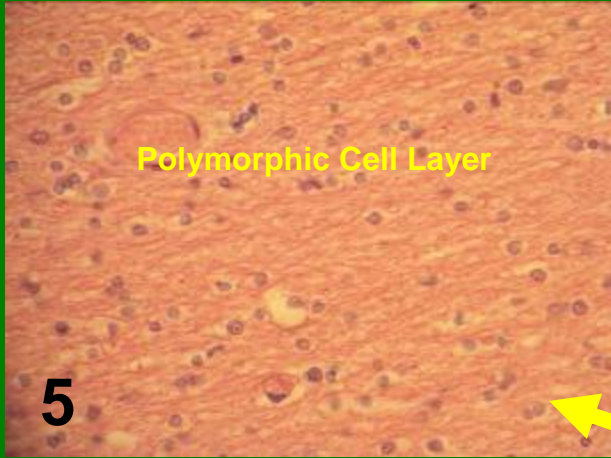
4

Large Pyramid Cell Layer



3

Large Pyramid Cell Layer

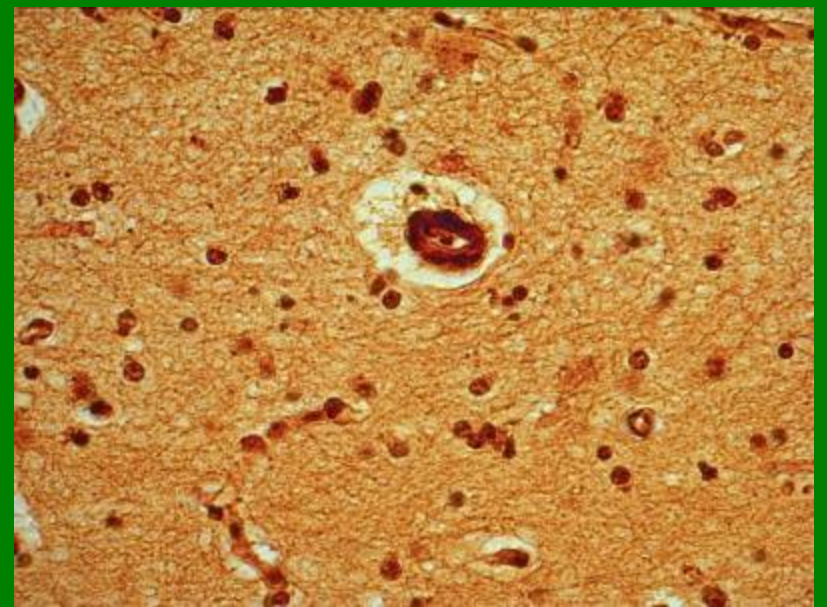
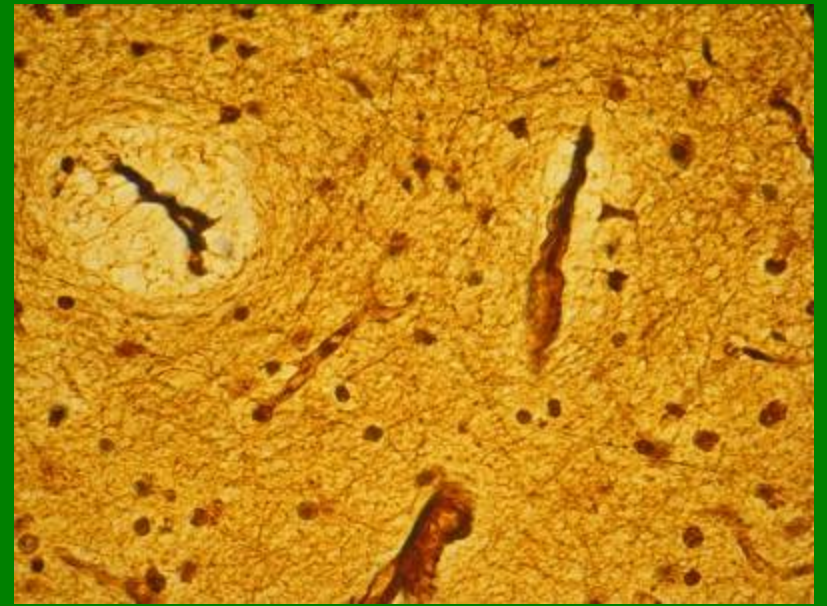
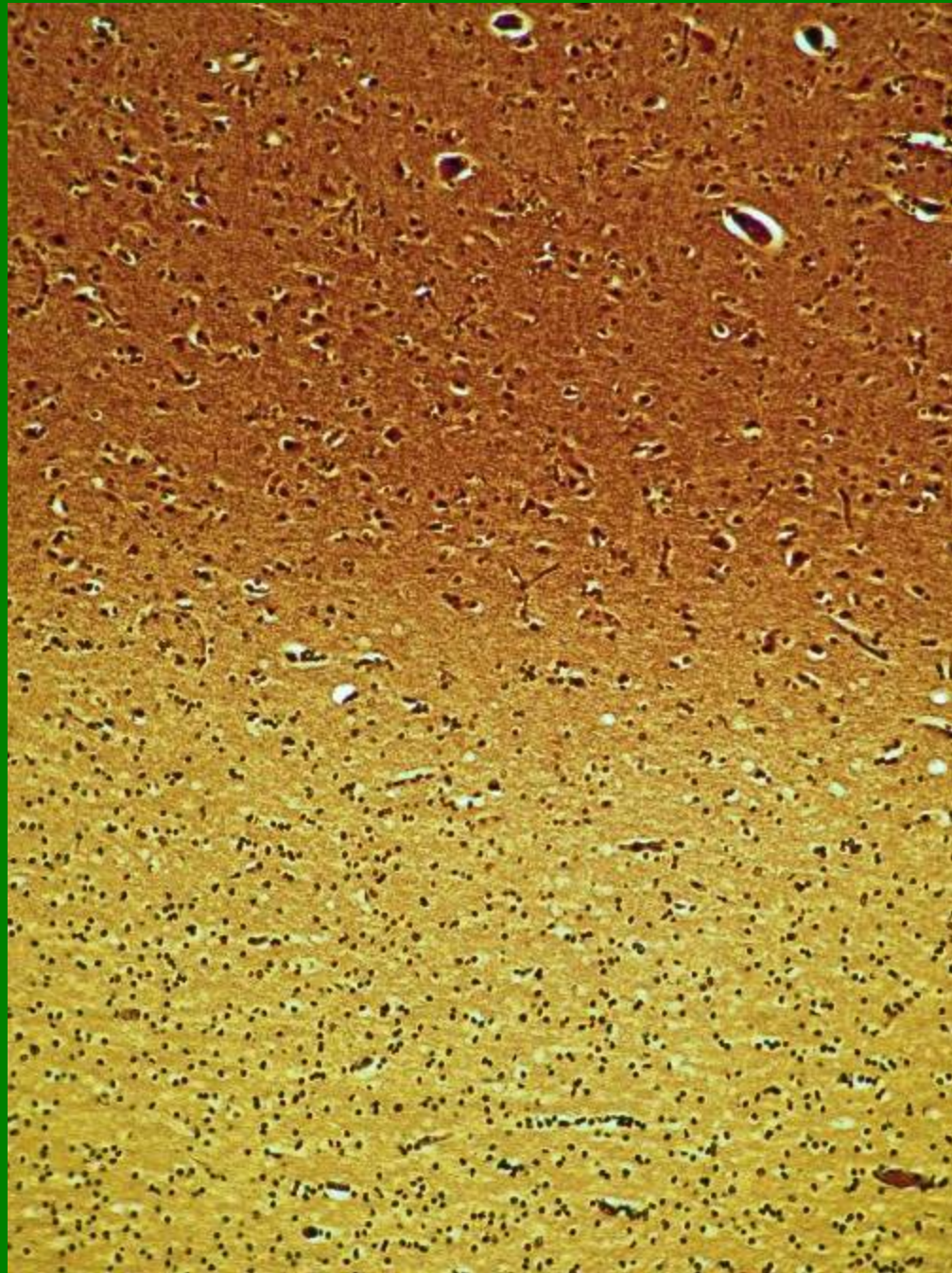


5

Polymorphic Cell Layer

WHITE MATTER : AXONS





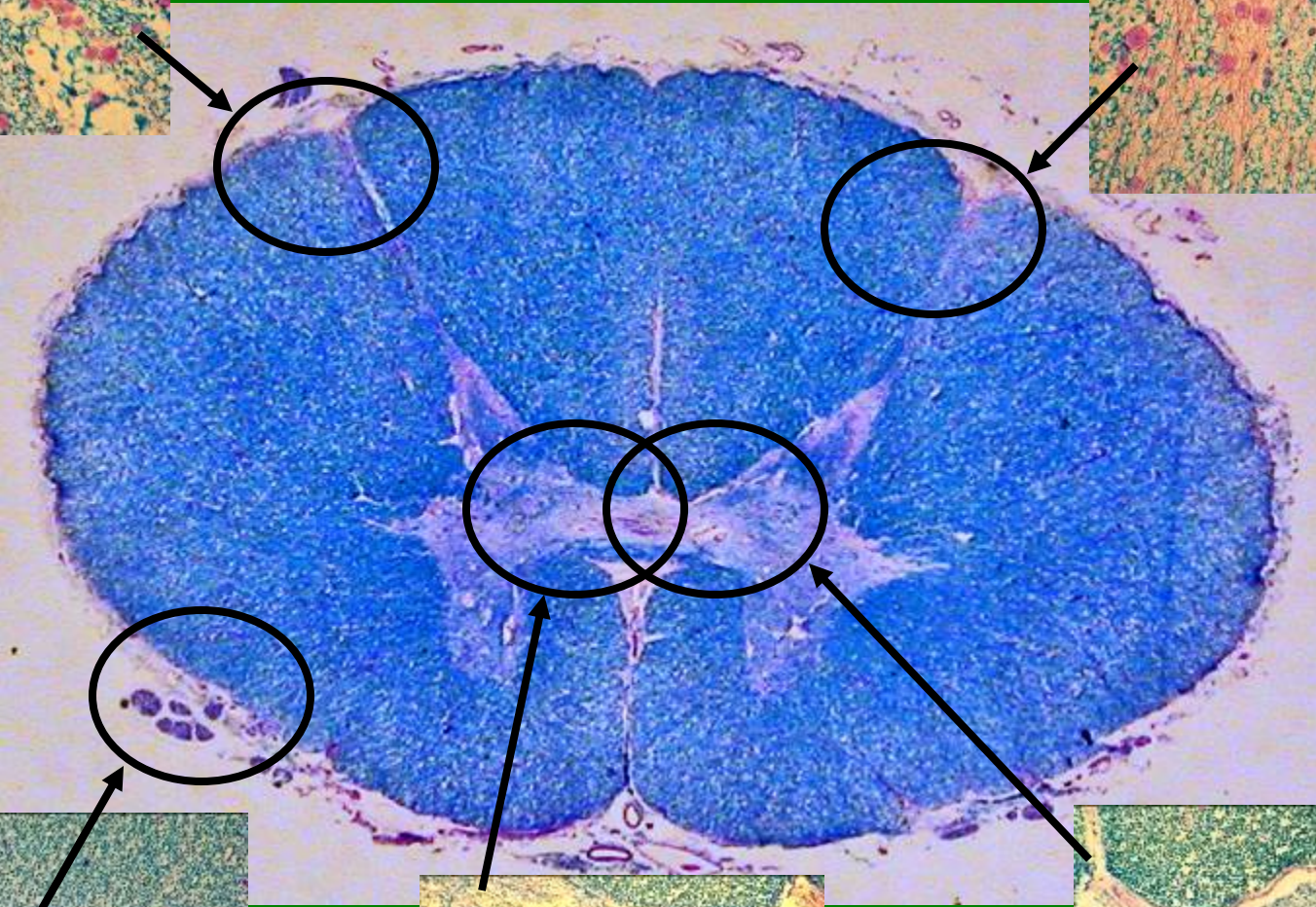
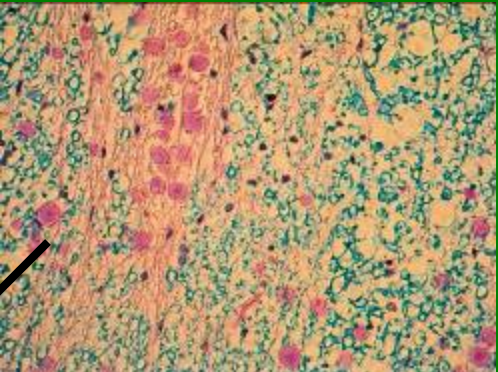
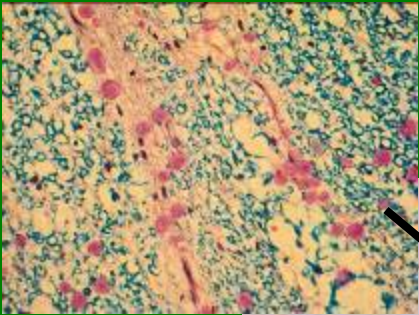
Other views of Cerebrum

MEDULLA & SPINAL CORD

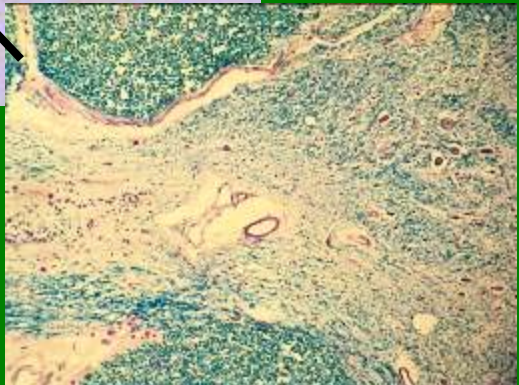
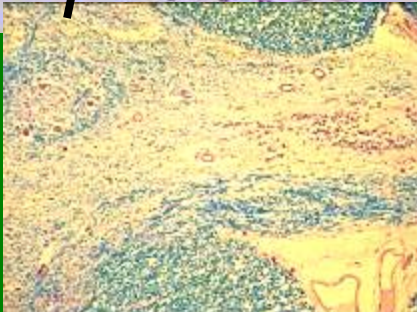
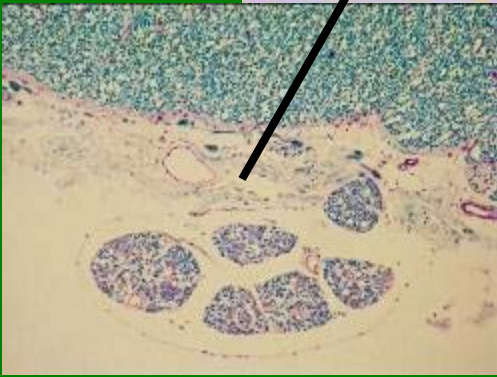
Medulla Oblongata



Human Spinal Cord : Cervical Region



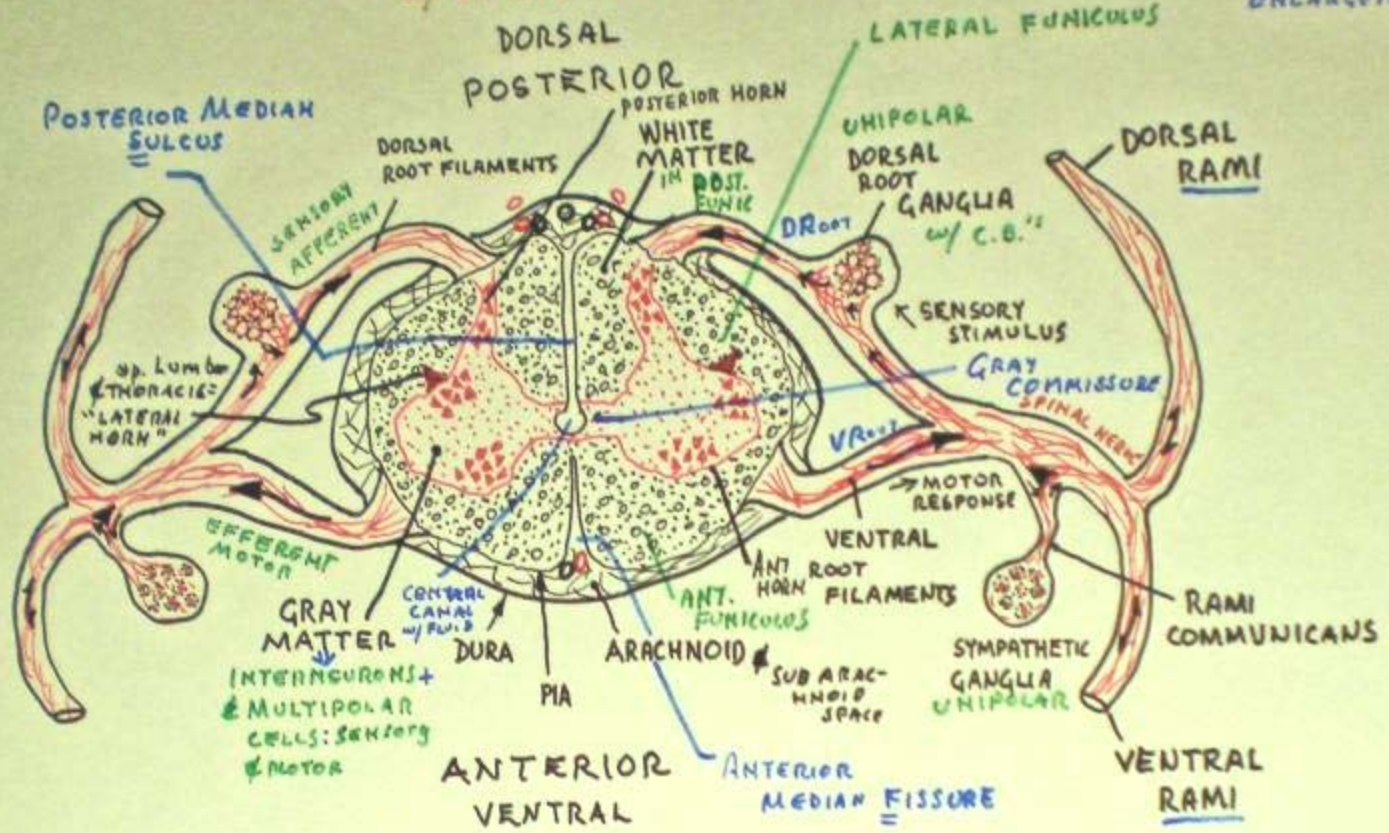
Anterior



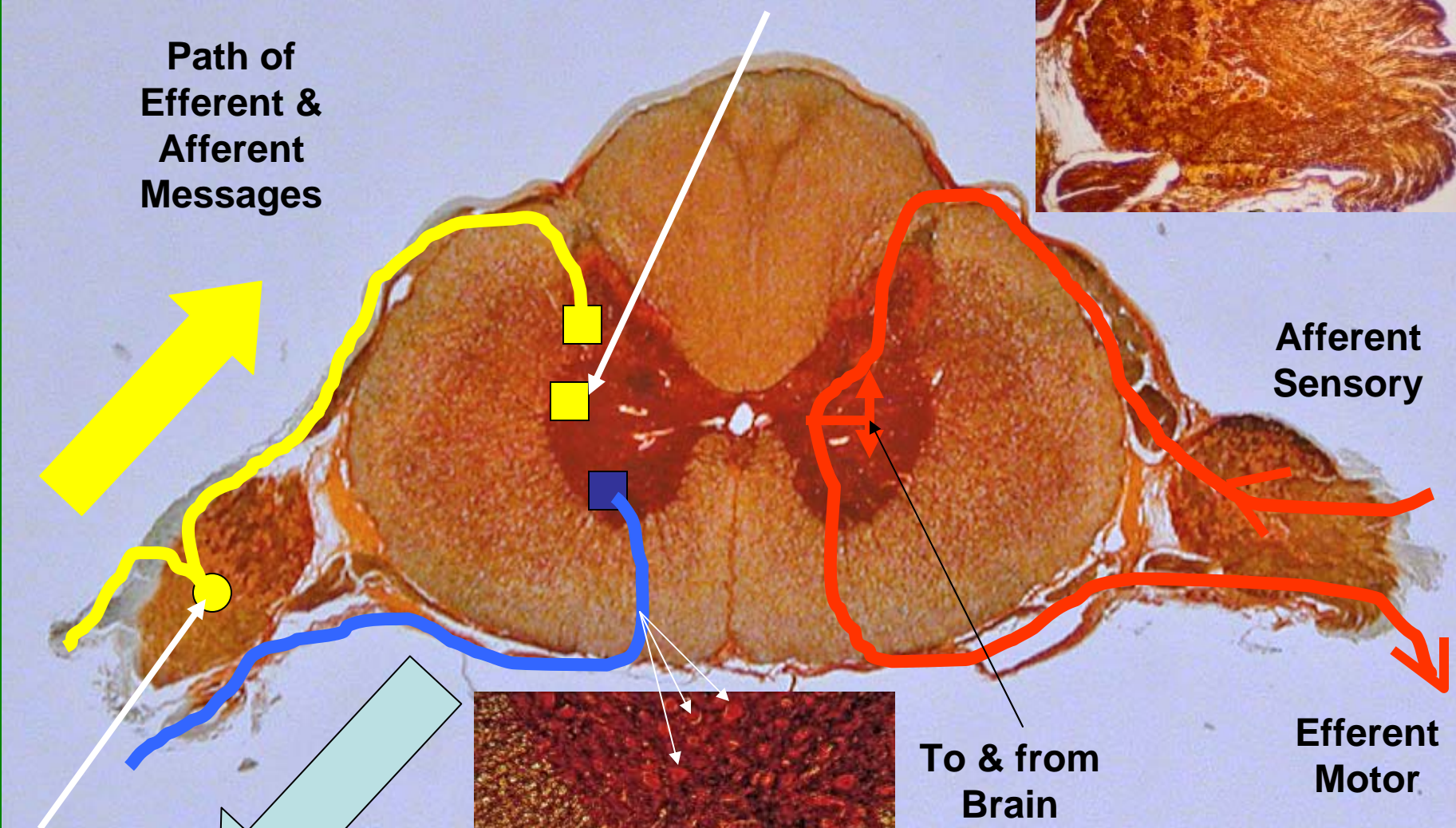
THE SPINAL CORD

6/31 SEGMENTS

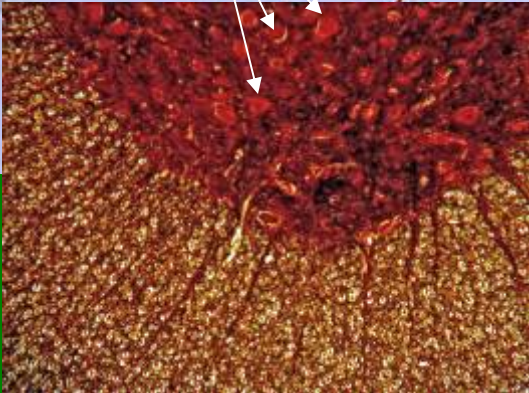
@ FORAMEN MAGNUM to Intervertebr. Dis.
of 1st/2nd L.V. w/ CERVICAL
& LUMBAR ENLARGEMENTS

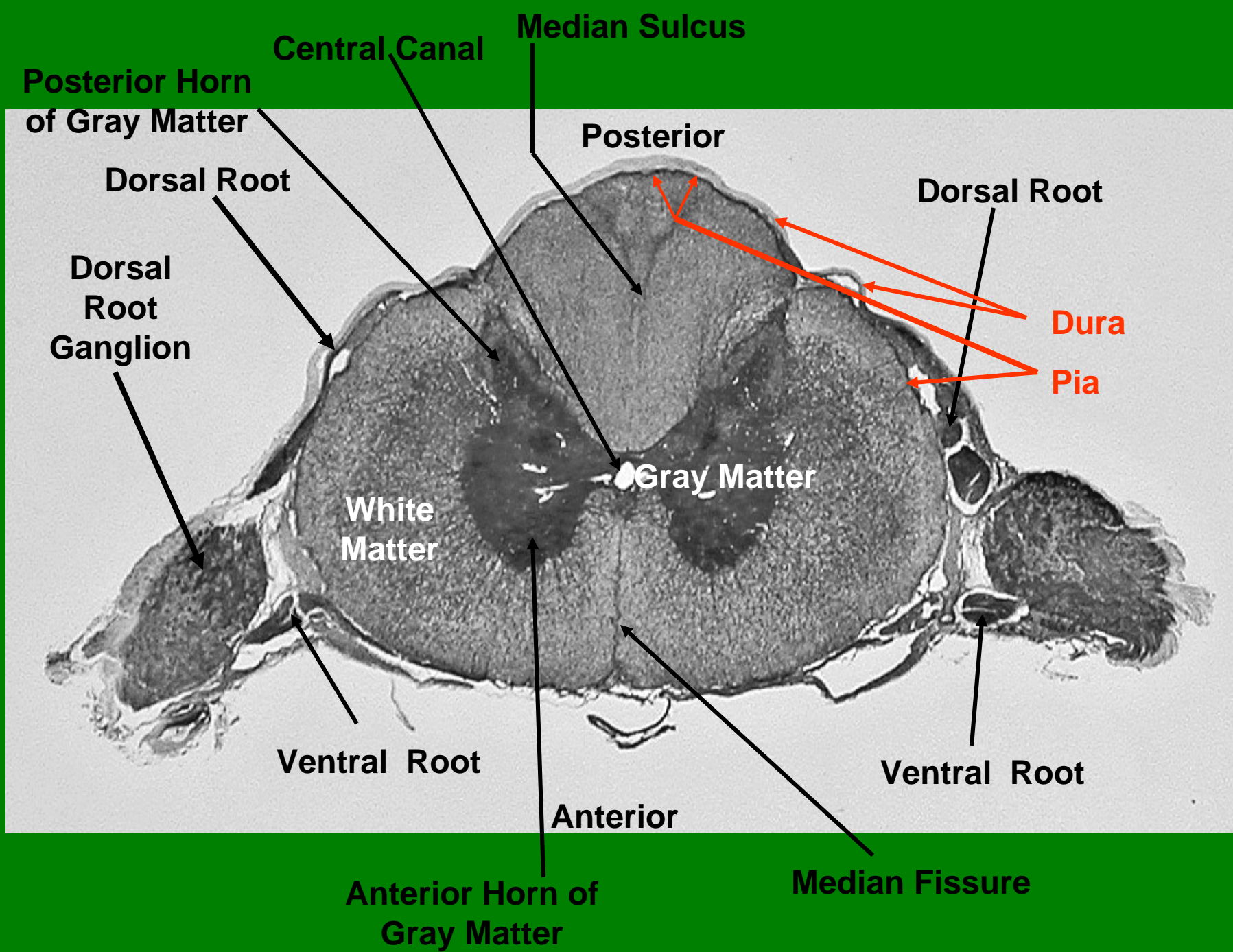


Multipolar 'Interneurons in Horn



Unipolar
Neurons in
Gang.







Dura

Cauda equina

coral reef photographers

