Introduction to Nervous System

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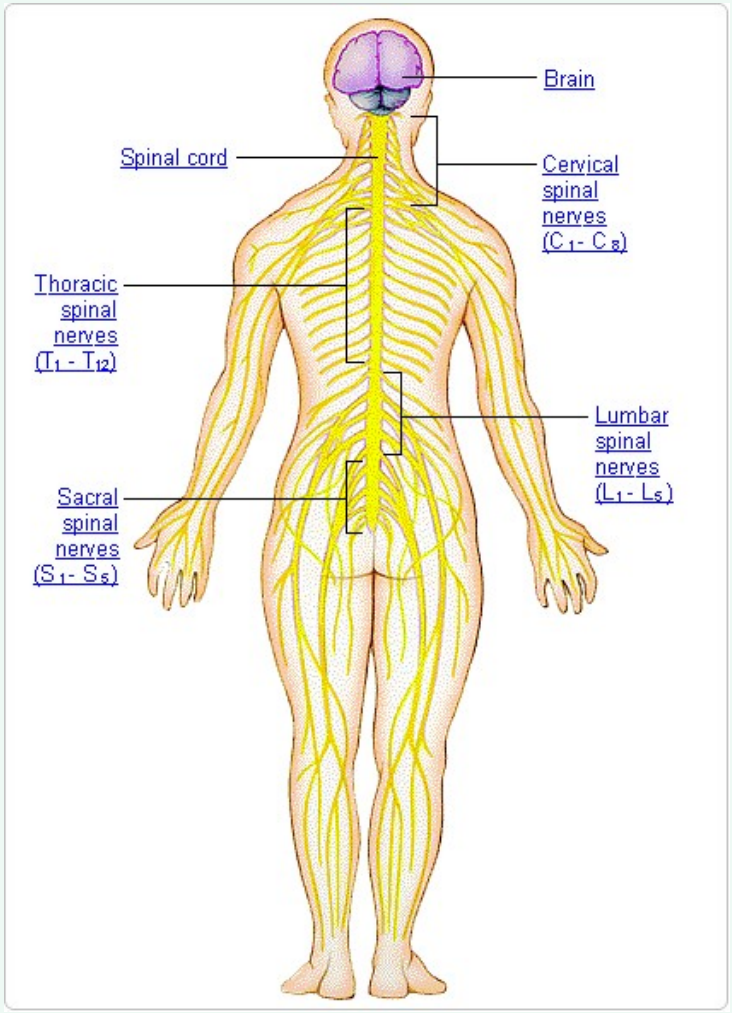
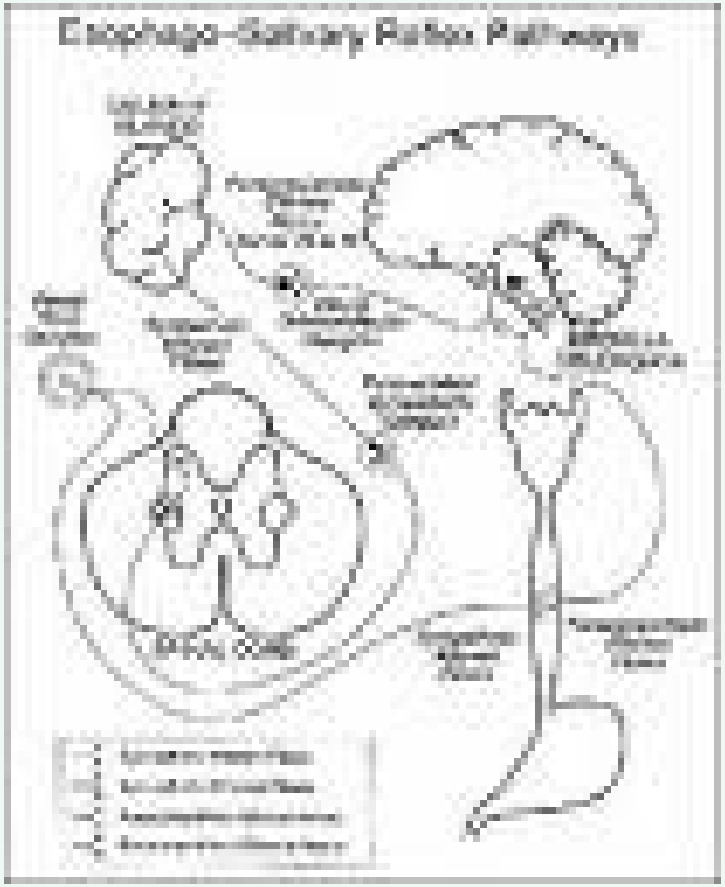
Composition of Nervous System

- Two main divisions
  - 1) Central Nervous system (CNS) brain and spinal chord
  - 2)Peripheral Nervous System (PNS) nerves



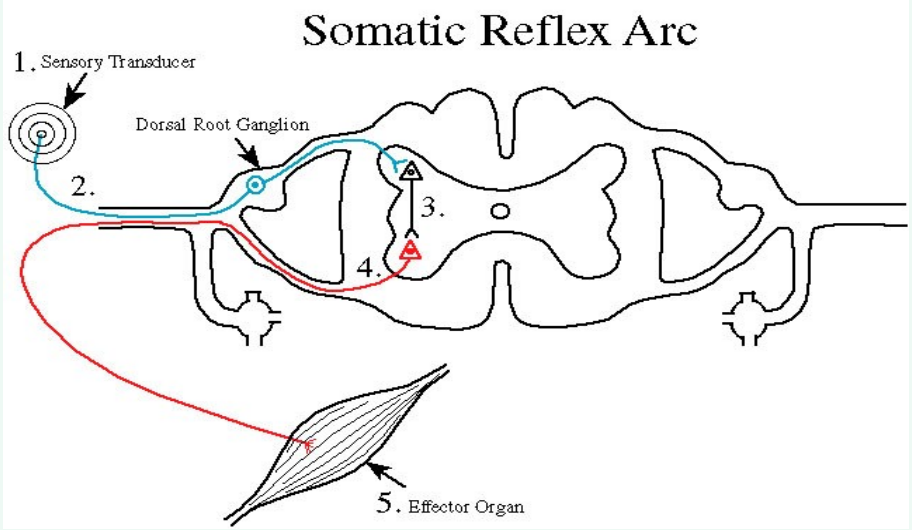
Remember from Homeostasis

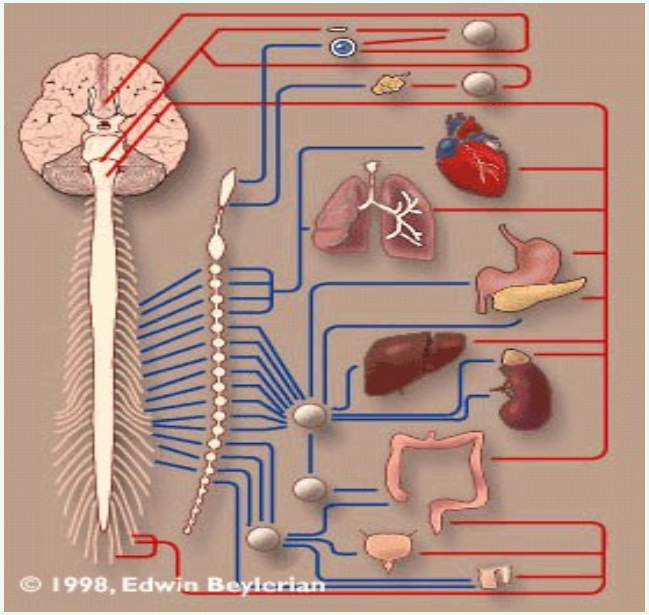
- Message is received from sensory receptor along sensory neuron (afferent pathway)
- Messages reaches brain and is integrated (control center)
- Reaction command sent down efferent pathway along motor neuron (motor output)



Types of Motor Actions

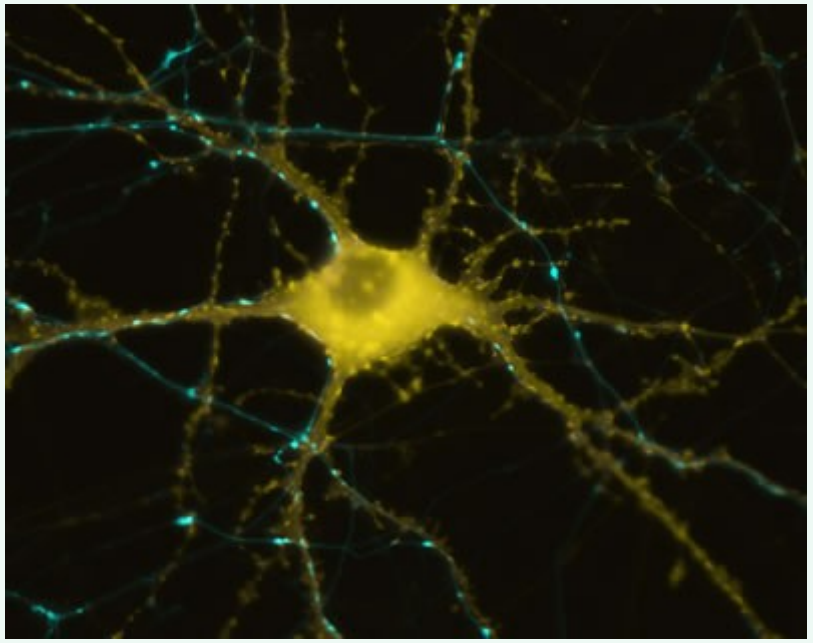
- Somatic
  - Happens in skeletal muscle
  - voluntary
- Autonomic
  - Happens in smooth and cardiac muscle
  - Involuntary
  - 2 parts
    - Sympathetic and parasympathetic





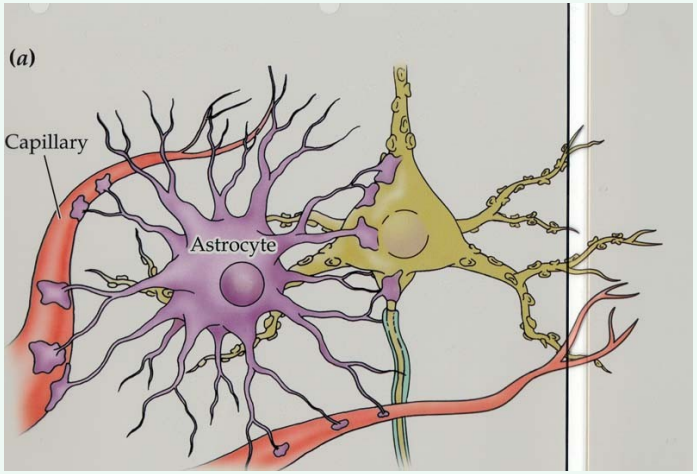
Cells of the Nervous System

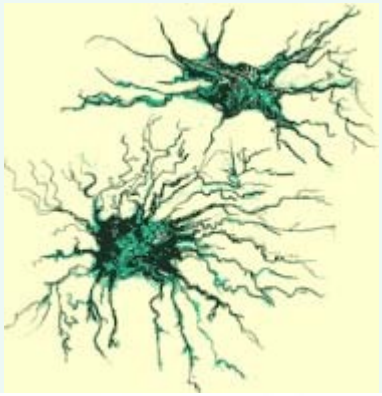
- Broken down into two groups
  - 1) supporting cells
  - 2) neurons

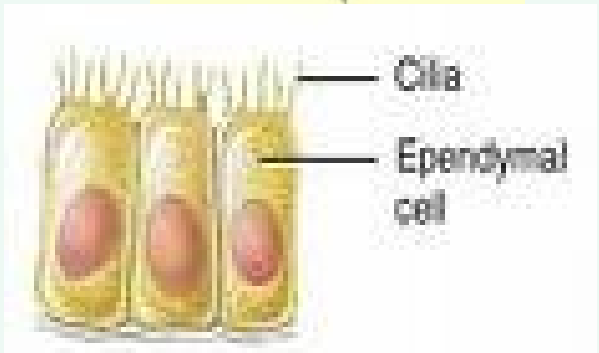


Examples of Neuroglia (supporting cells)

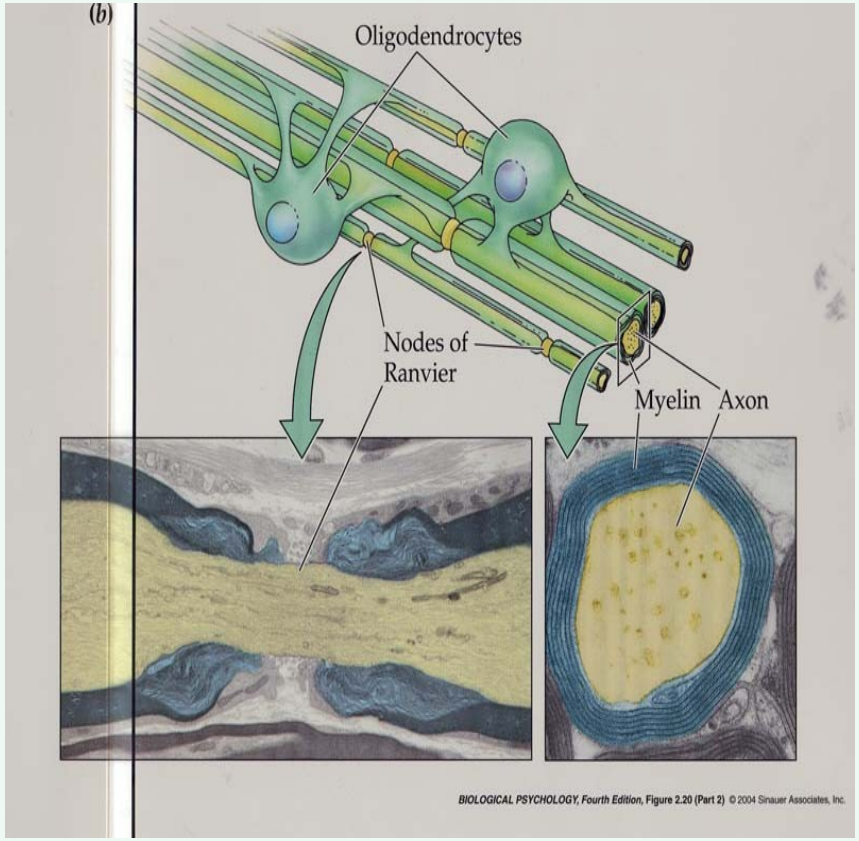
- 1) astrocytes – anchor neurons to capillaries
- 2) microglia – phagocytes (digest debris and dead cells)
- 3) Ependymal cells- ciliated; always on surface near spinal fluid; circulates fluid







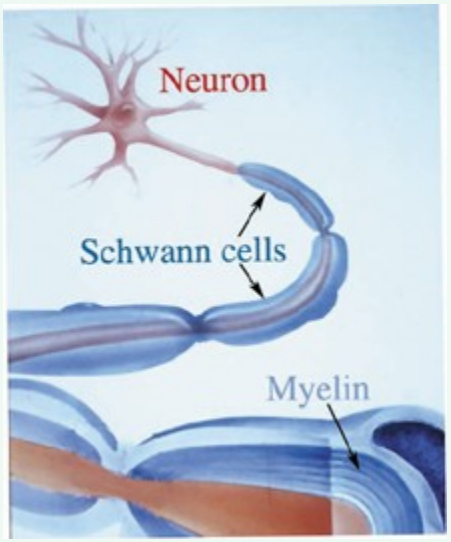
One more Neuroglial cell (in CNS)



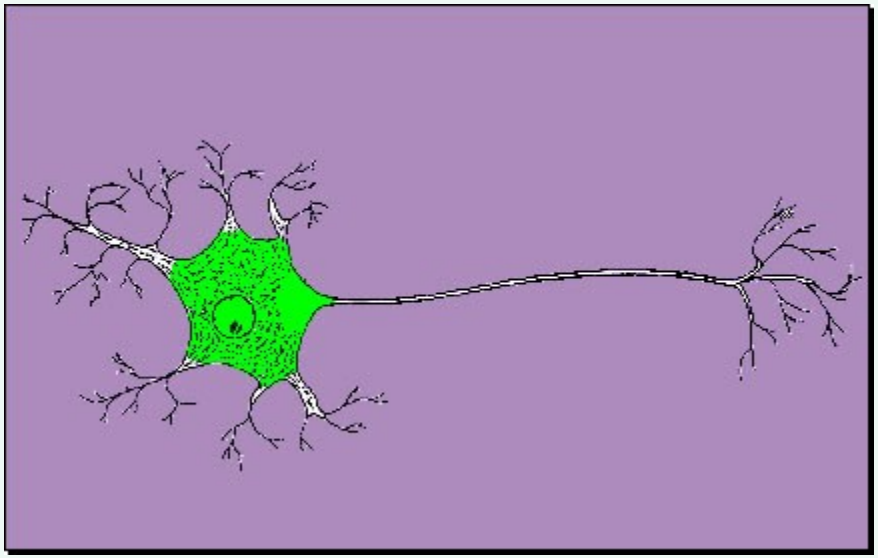
- 4)Oligodendrocytes – fatty; insulated nerve fibers
- Produce myelin sheath which surround and insulate the nerve fiber

In PNS

- Instead of oligodendrocytes, they have Schwann cells, which insulate the nerve fiber

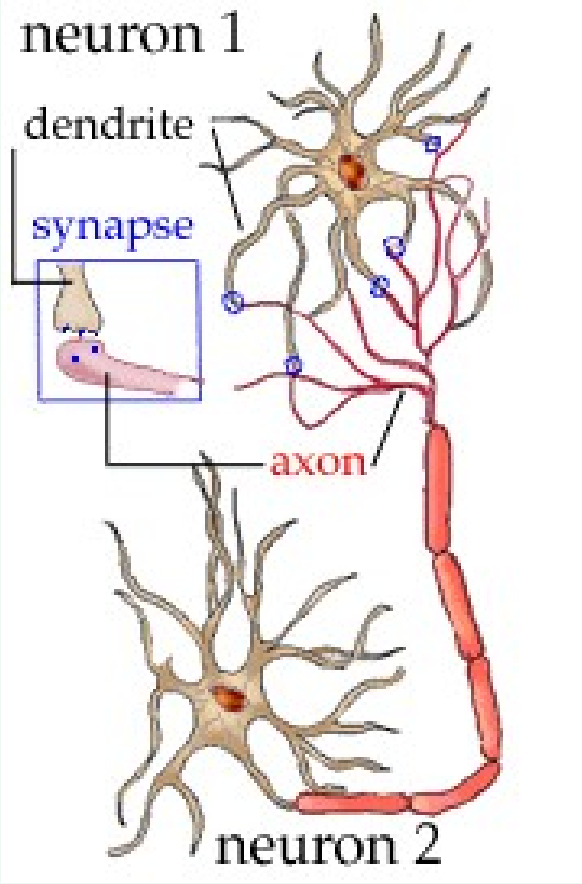


- Satellite cells – form protective layer around nerve cell body

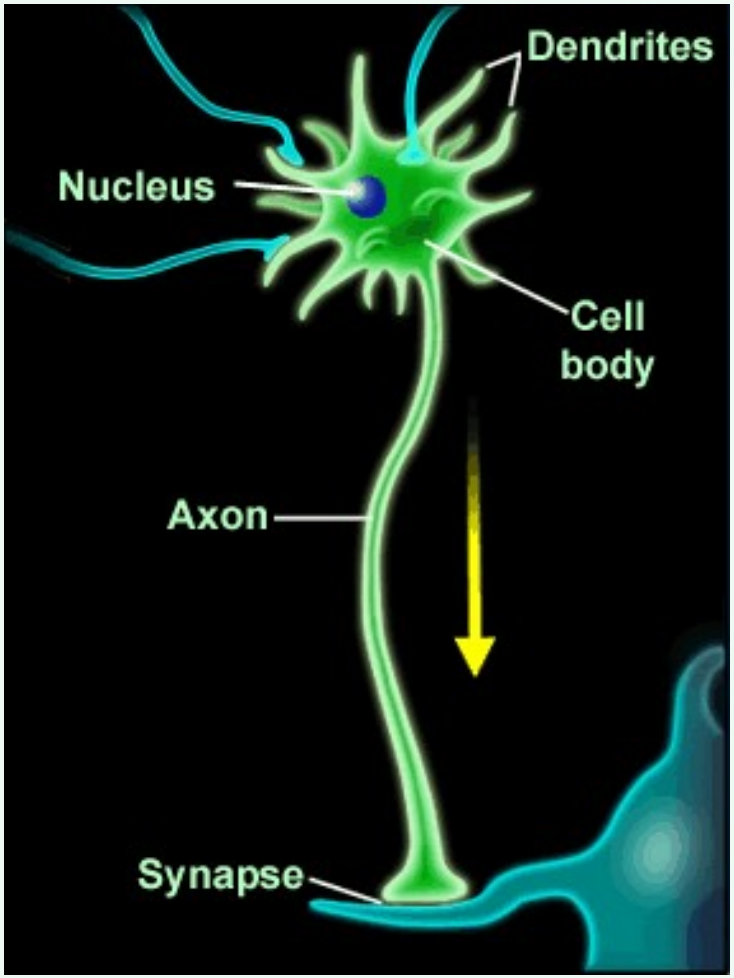


Neurons

- Specifically designed to transmit message (nerve impulse)



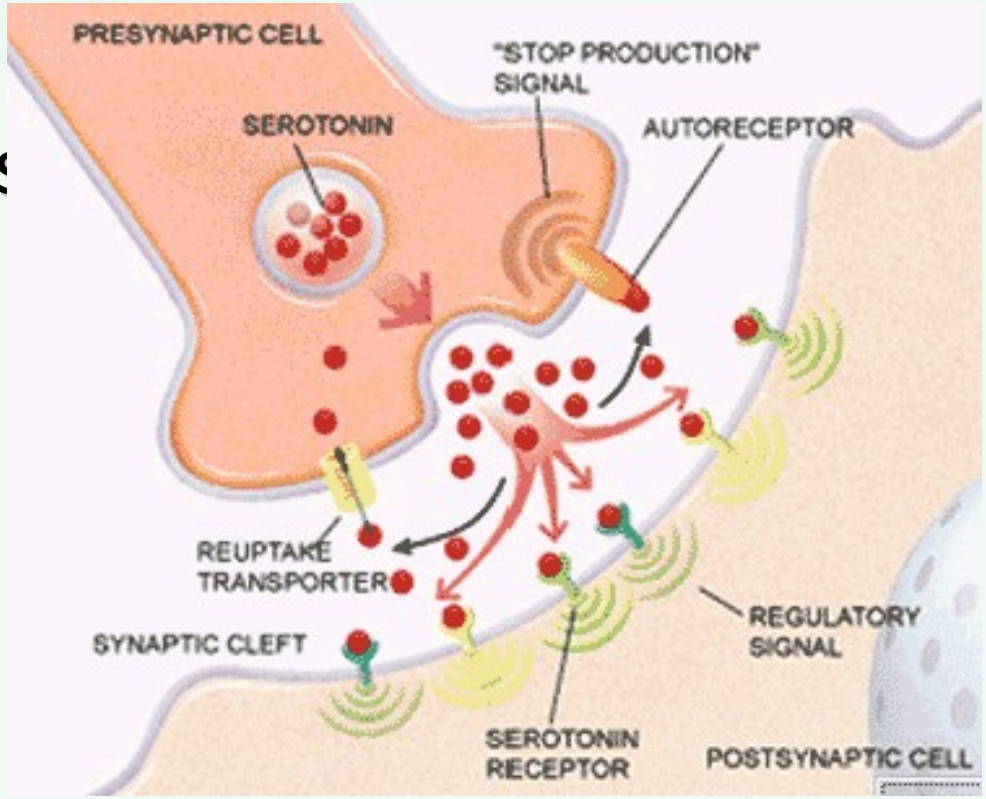
Parts of a Neuron



- 1)Cell Body- contains nucleus
- 2) fiber (process)- carries message to next neuron
  - Toward cell body = dendrites
  - Away from cell body = axon

Axonal Terminal

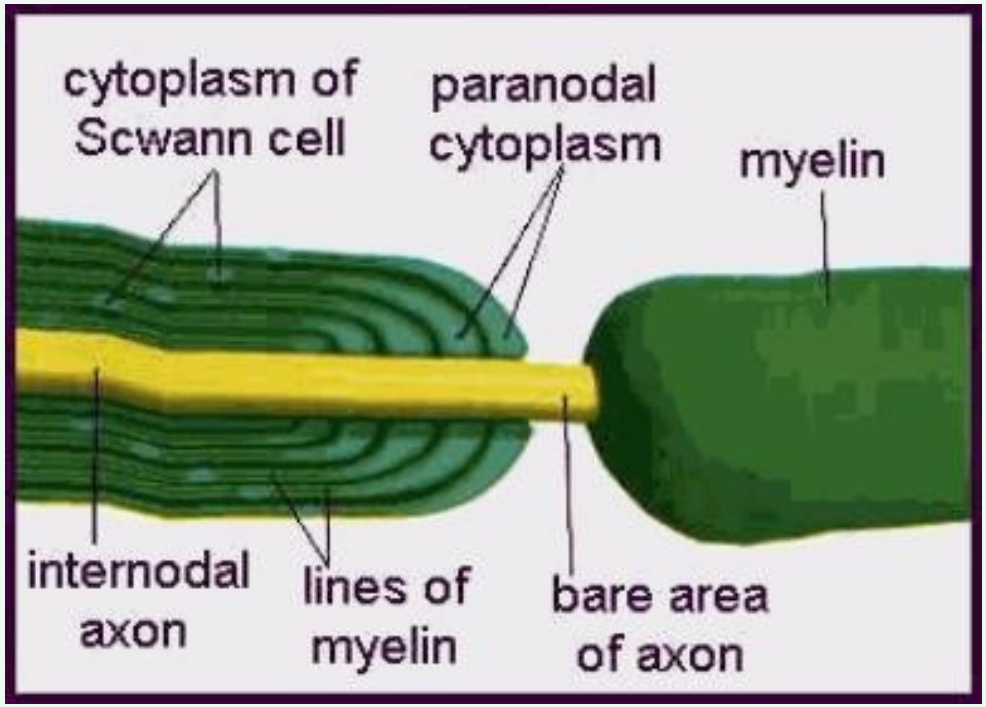
- As an axon ends, it branches into hundreds of synapses
- Releases neurotransmitters to next neuron or muscle



Myelination of Neurons

- In CNS, the fatty covering is oligodendrocyte

- In PNS, fatty myelin forms Schwann cells, which increase transmission rate.



- Gaps between Schwann cells= Nodes of Ranvier