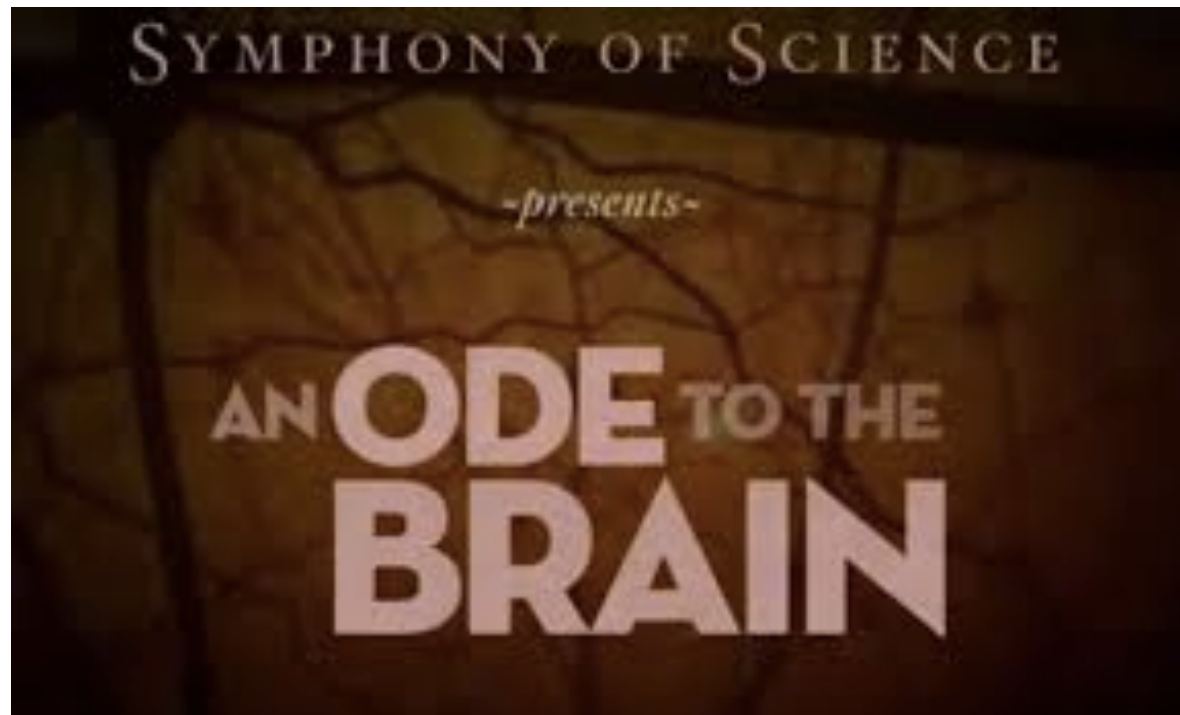


The Brain Symphony of Science

<https://www.youtube.com/watch?t=2&v=JB7jSFeVz1U>



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Jill Bolte Taylor - My Stroke of Insight

<http://mystrokeofinsight.com>



Chapter 8

The Nervous System

Introduction

1. Two systems control all cells of the body:
 - a. **Nervous** System (Chap. 8)
 - Rapid by nerve **impulses**
 - b. **Endocrine** System (Chap. 10)
 - Slower by **chemicals** secreted by ductless glands into the **bloodstream**

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3. **Homeostasis** – balanced and controlled internal environment

ORGANS AND DIVISIONS OF THE NERVOUS SYSTEM

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2. Peripheral nervous system (PNS)

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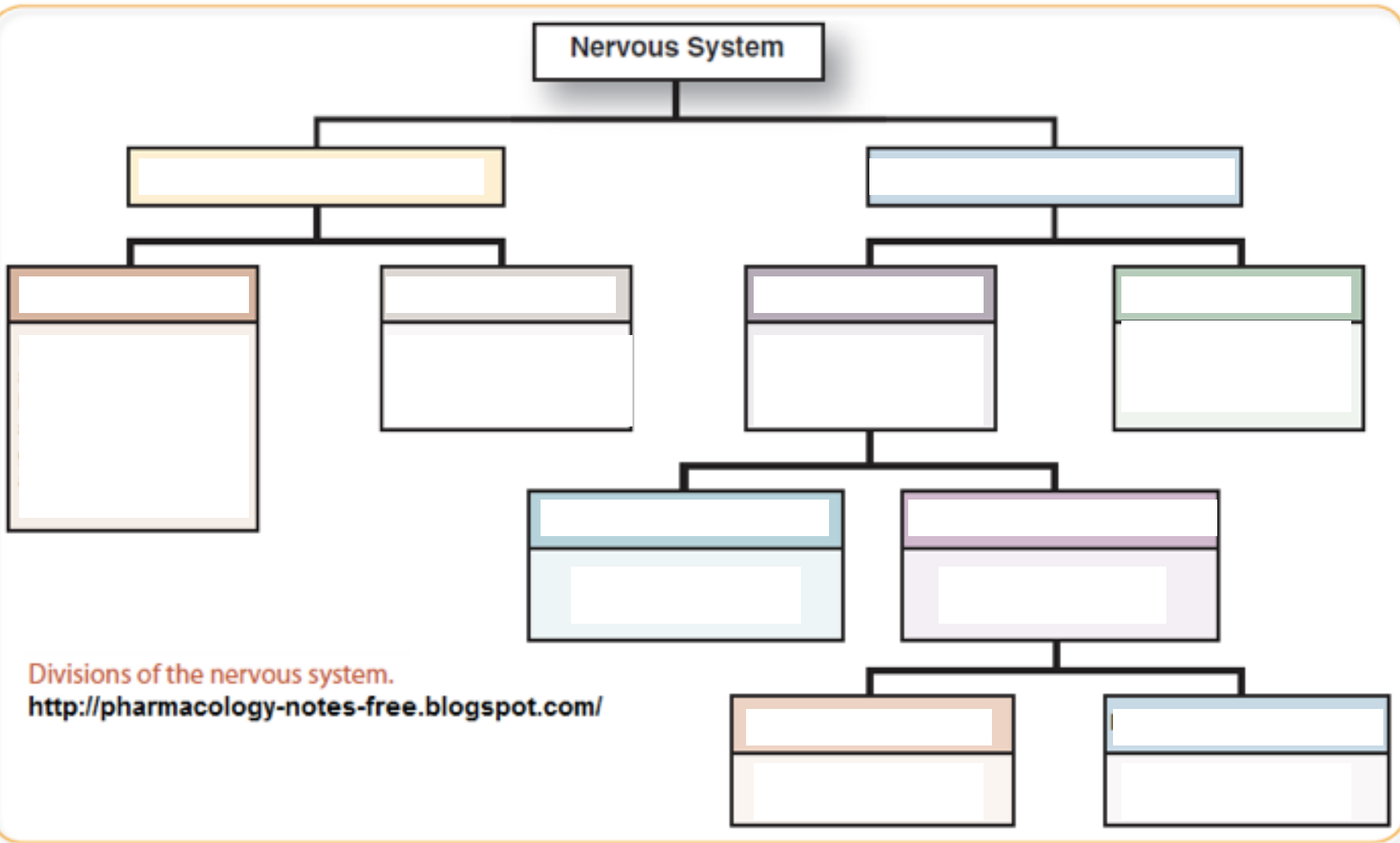
Before we go further....
draw what I draw onto dry erase boards (deb)

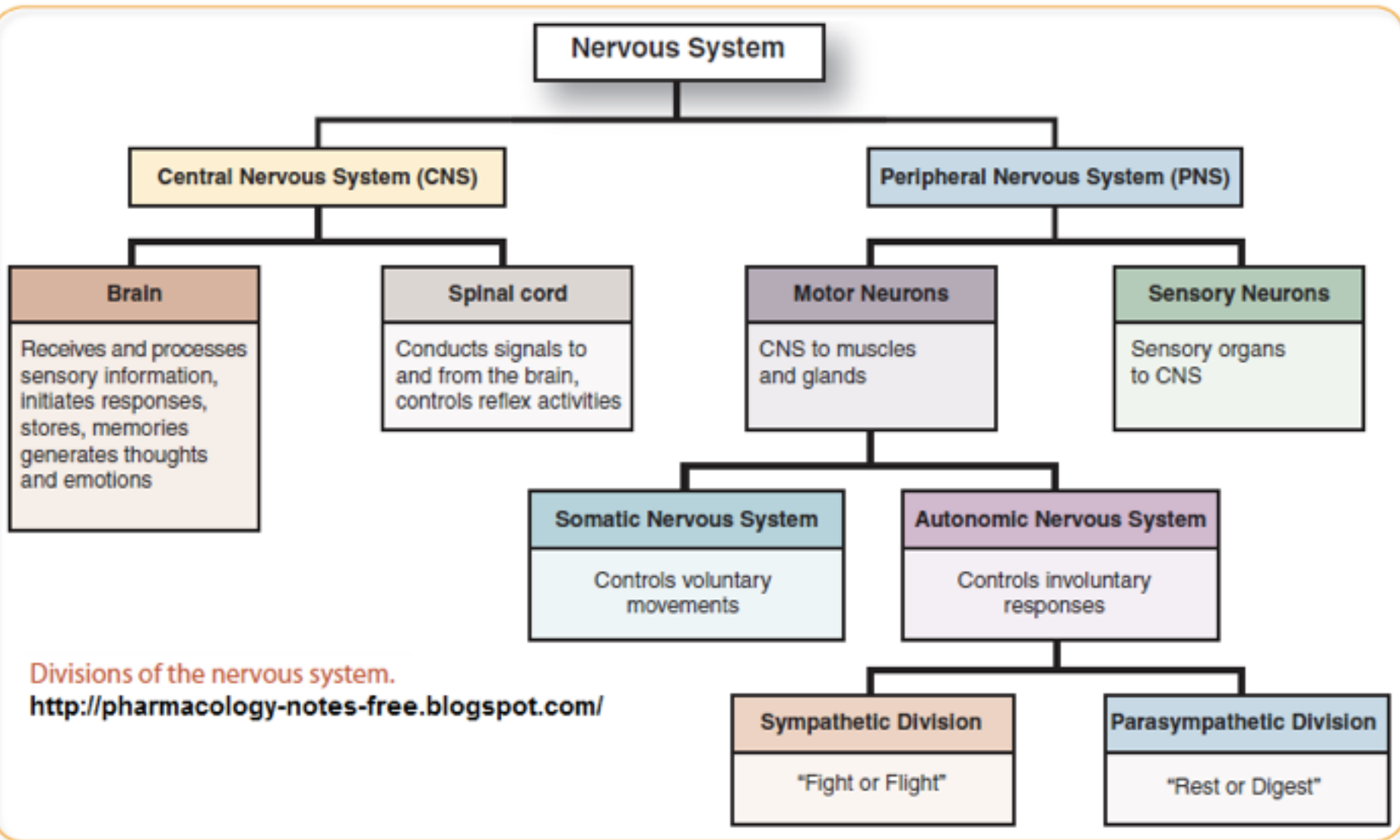
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 - **Sympathetic** - “fight or flight”
 - **Parasympathetic** - “rest or digest”

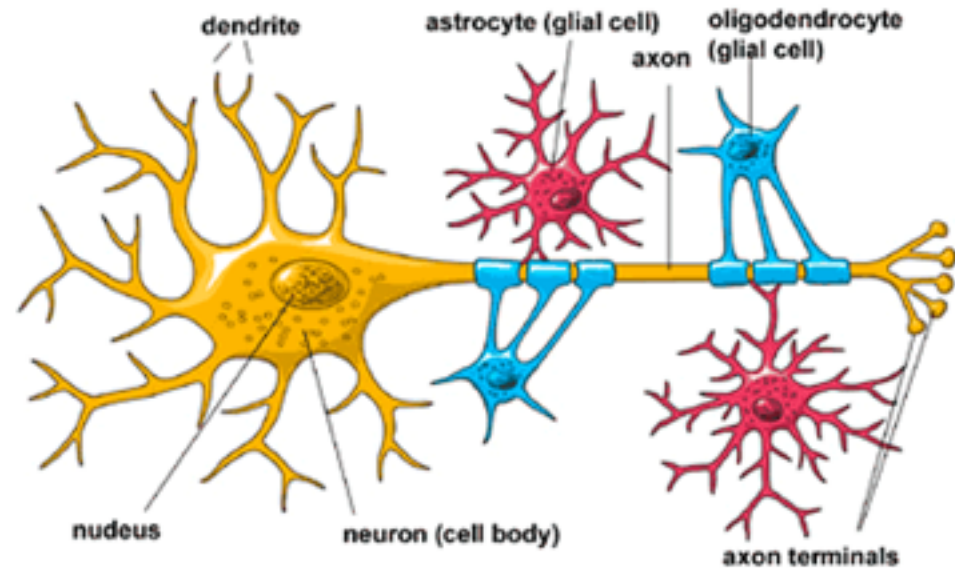
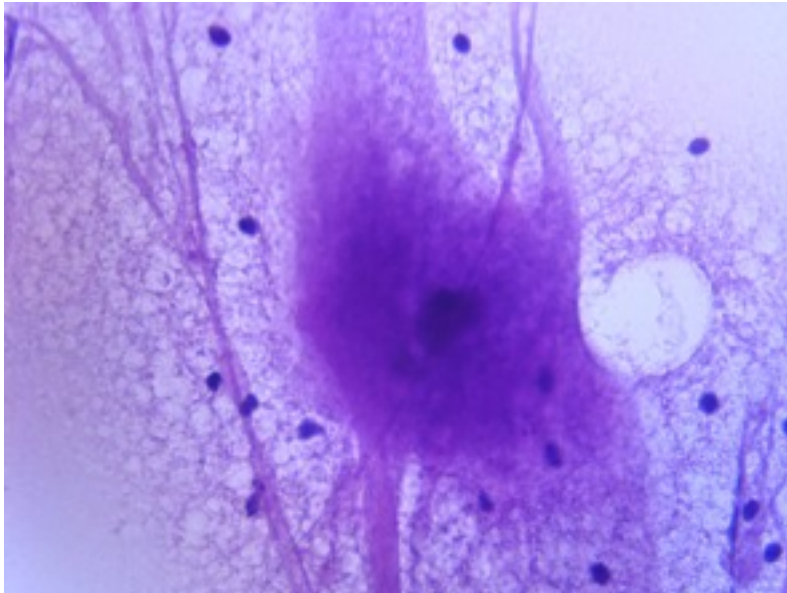




CELLS OF THE NERVOUS SYSTEM

Two types of cells found in nervous system

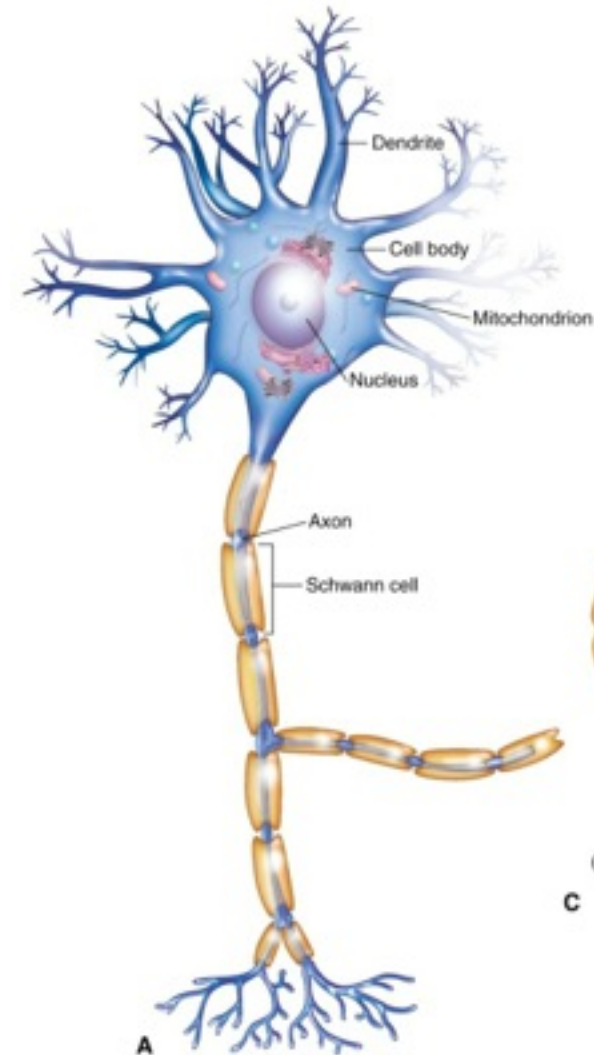
- A. **Neurons** – *conduct impulses*
- B. **Glia** – *support neurons*



CELLS OF THE NERVOUS SYSTEM

A. Neurons

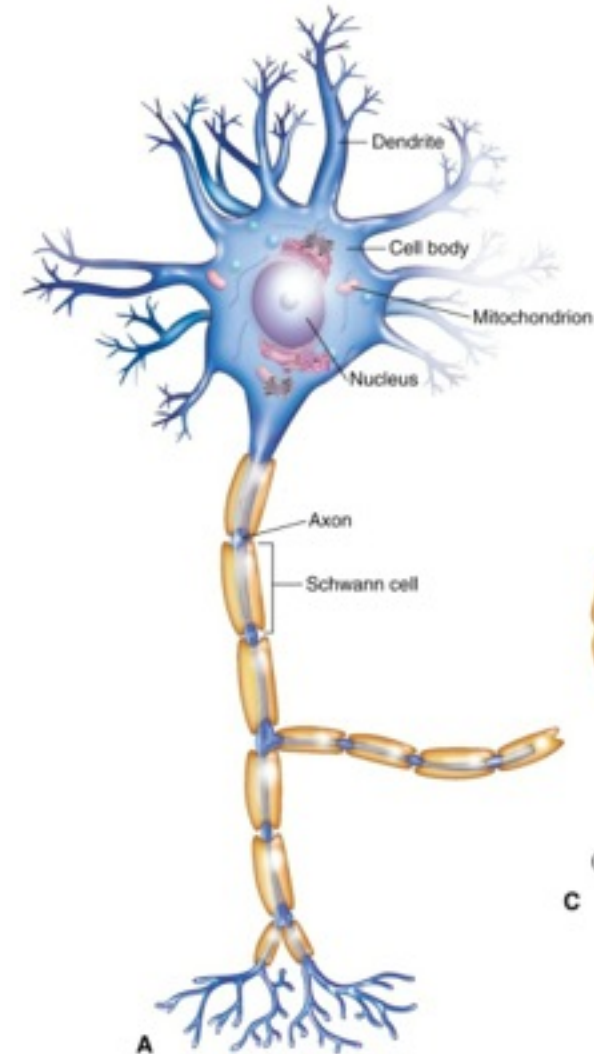
1. Consist of three main parts — dendrites; cell body of neuron; axon



CELLS OF THE NERVOUS SYSTEM

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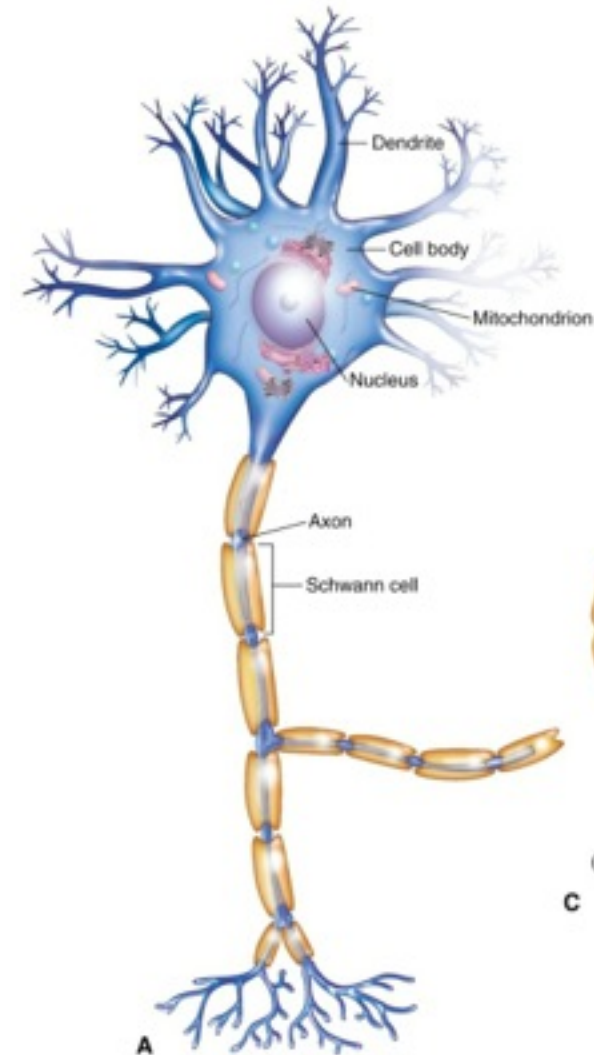
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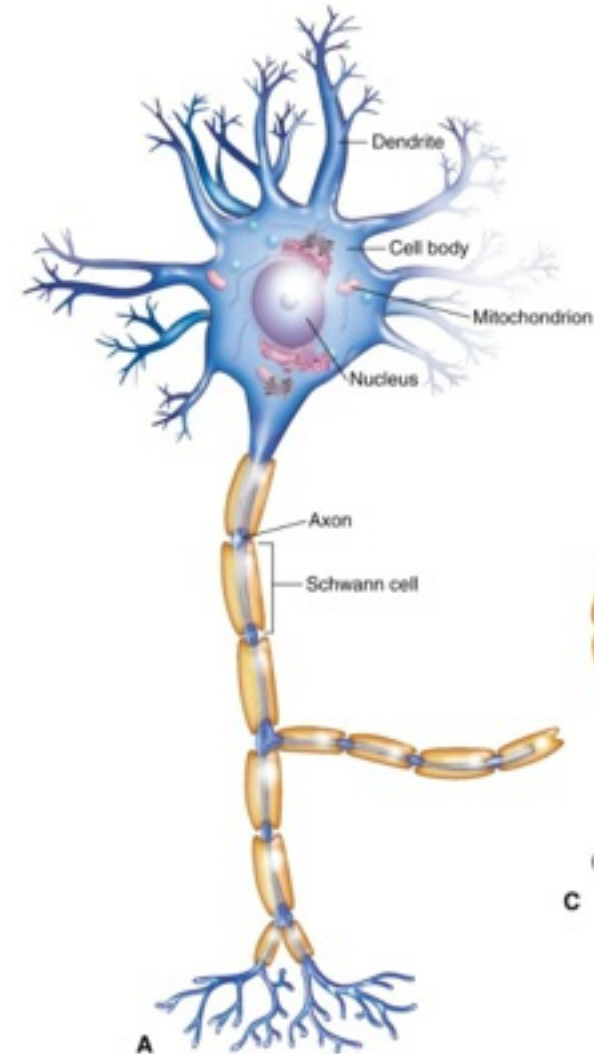
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 - a. Cell body — main part with nucleus
 - b. Dendrites—branching **projections** that conduct **impulses** to cell body of neuron
 - c. Axon—elongated projection that conducts impulses away from cell body of neuron

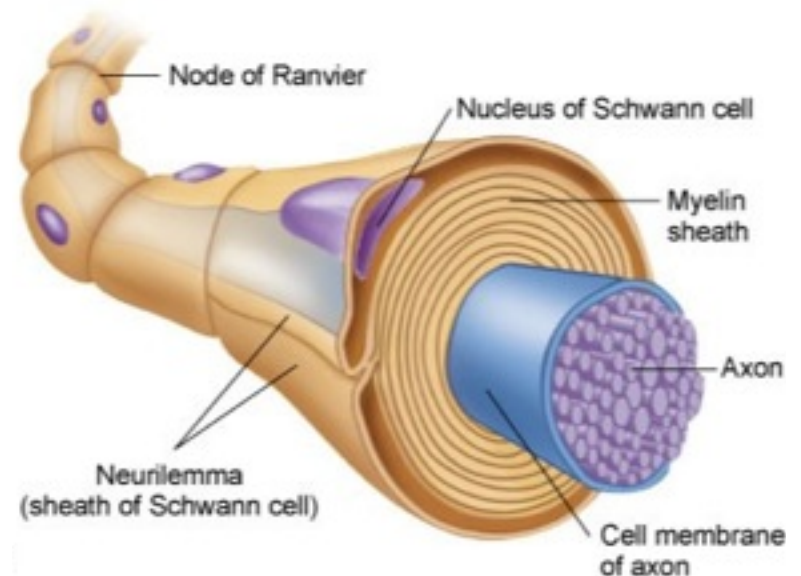


CELLS OF THE NERVOUS SYSTEM

A. Neurons

2. Additional structures—

- a. **Myelin** – segmented white wrapping material around axon

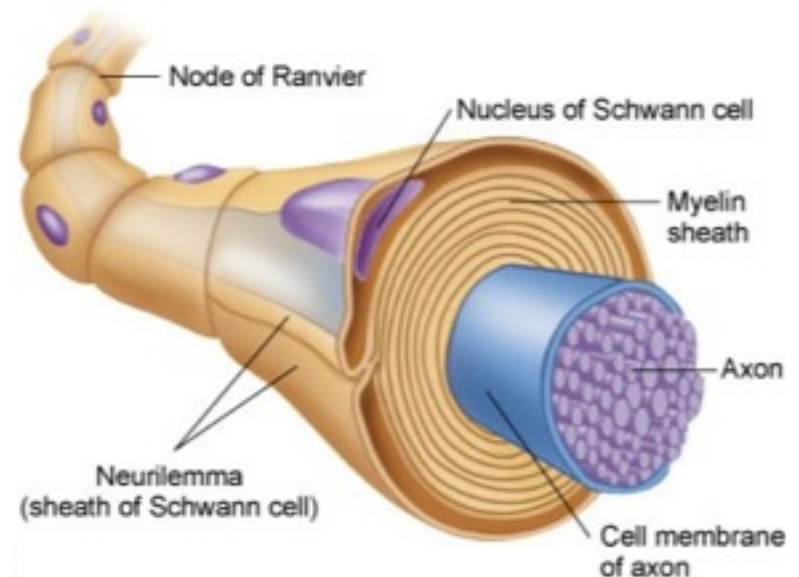


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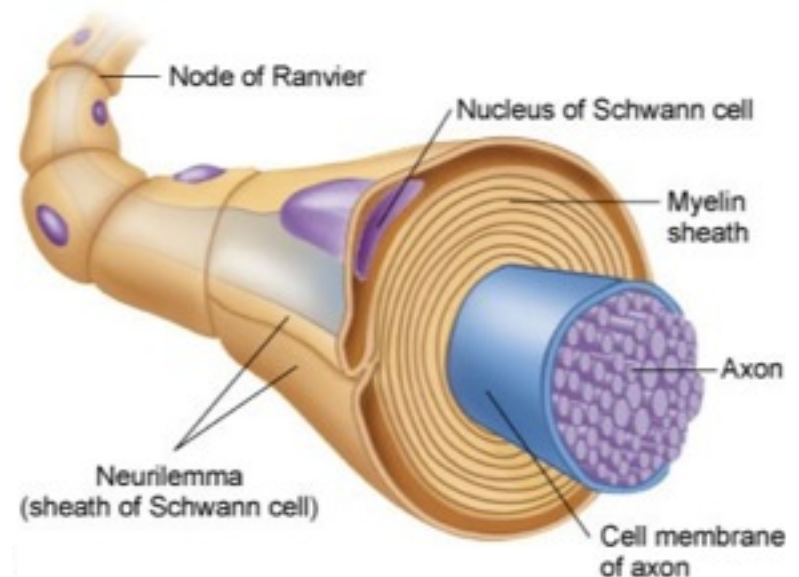


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- c. Nodes of **Ranveir** (**rahn-vee-AY**)—indentations between Schwann cells

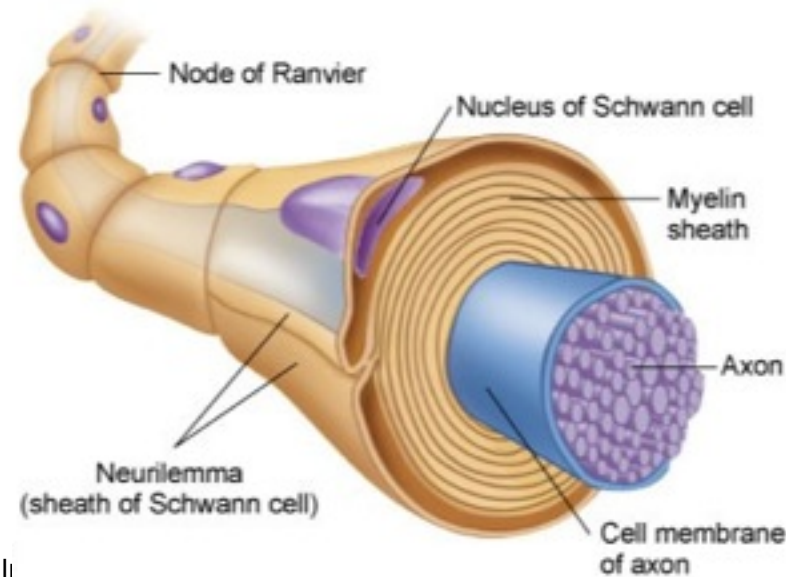


CELLS OF THE NERVOUS SYSTEM

A. Neurons

2. Additional structures—

- d. **Neurilemma** – outer membrane of a Schwann cell



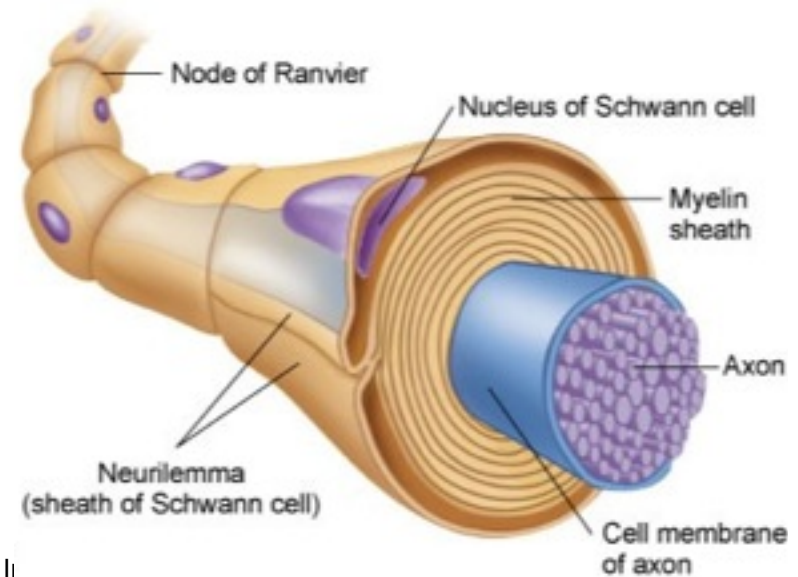
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2. Additional structures—

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- Play an important role in the regeneration of cut or injured axons.



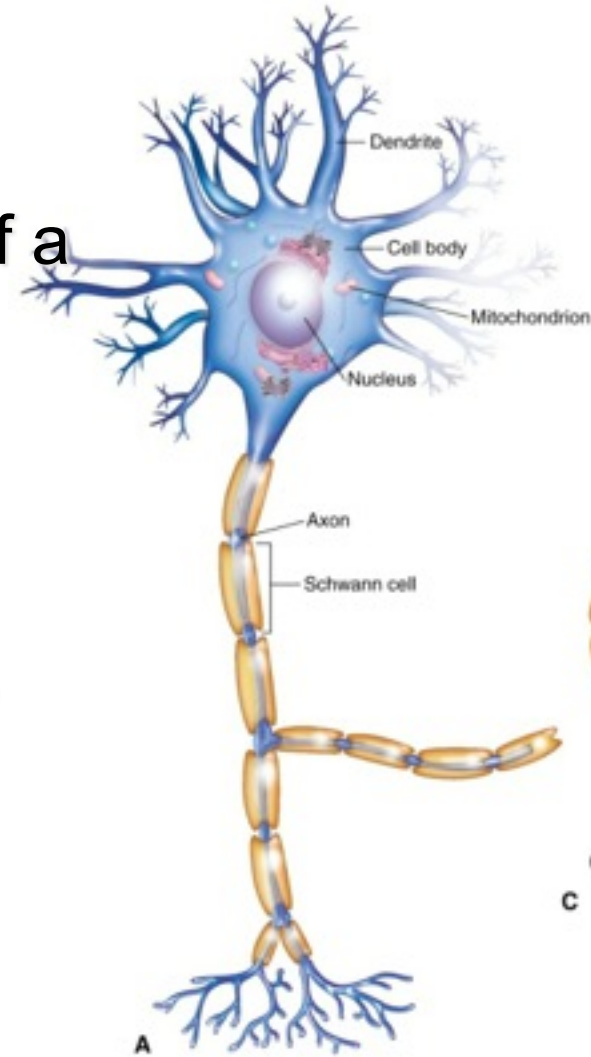
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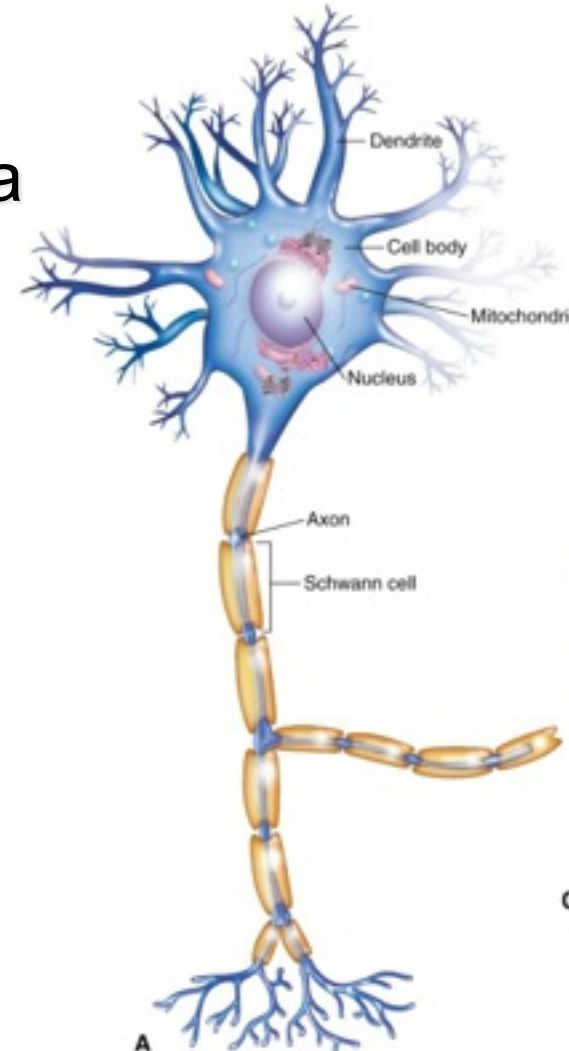
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- Play an important role in the regeneration of cut or injured axons.
- Brain and spinal cord have no neurilemma
- Myelinated fibers – axons with Schwann cells; increases speed



CELLS OF THE NERVOUS SYSTEM

A. Neurons

3. Neurons classified according to function (direction they send impulses)

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a. **Sensory (afferent) neurons** — conduct impulses **to** the spinal cord and brain

CELLS OF THE NERVOUS SYSTEM

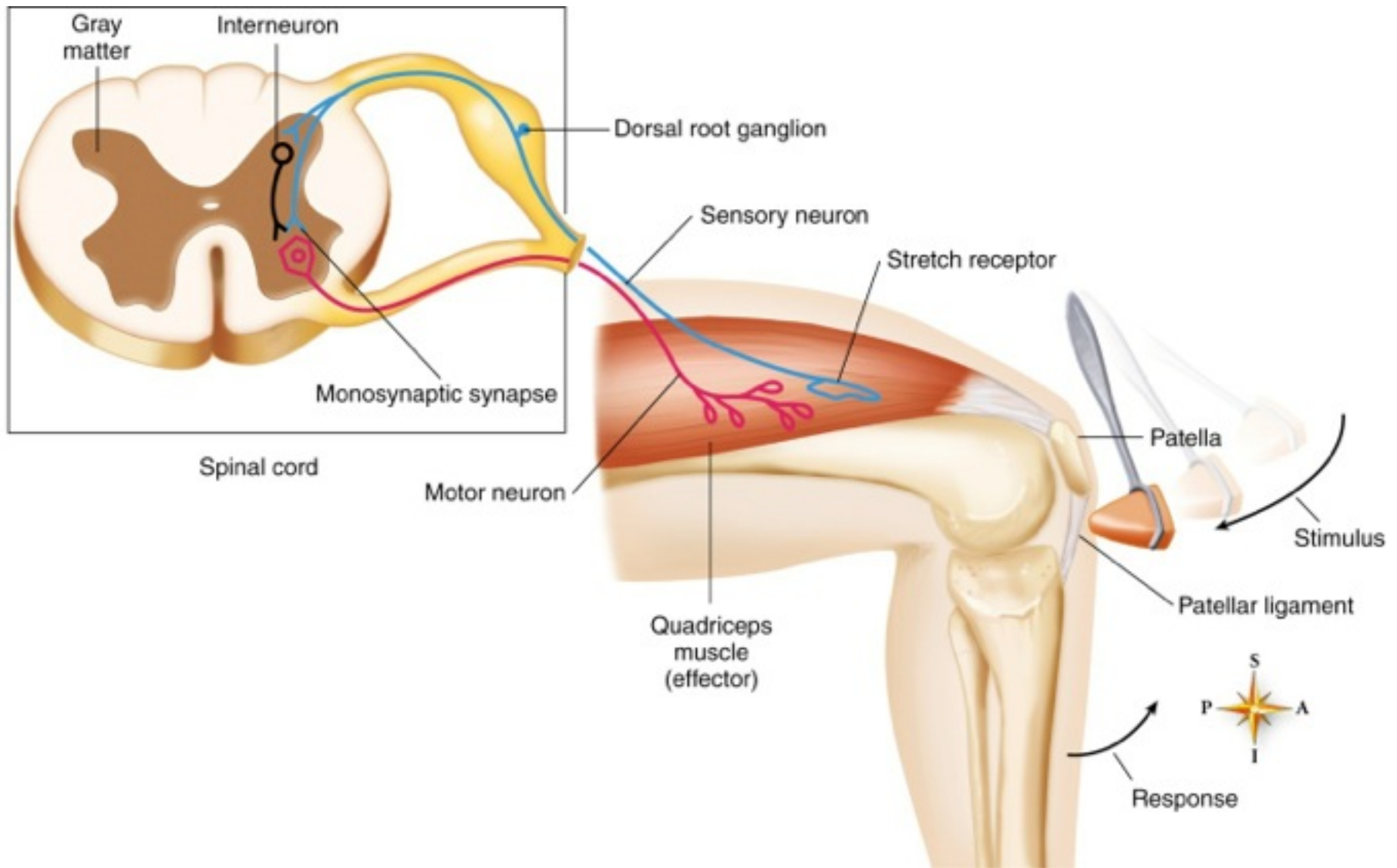
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 - c. **Interneurons** — conduct impulses from sensory neurons to motor neurons or among a network of interneurons; also known as central or connecting neurons



CELLS OF THE NERVOUS SYSTEM

B. Glia (neuroglia)

1. **Support** cells, bringing the cells of nervous tissue together **structurally** and **functionally**

CELLS OF THE NERVOUS SYSTEM

c. Glia (neuroglia)

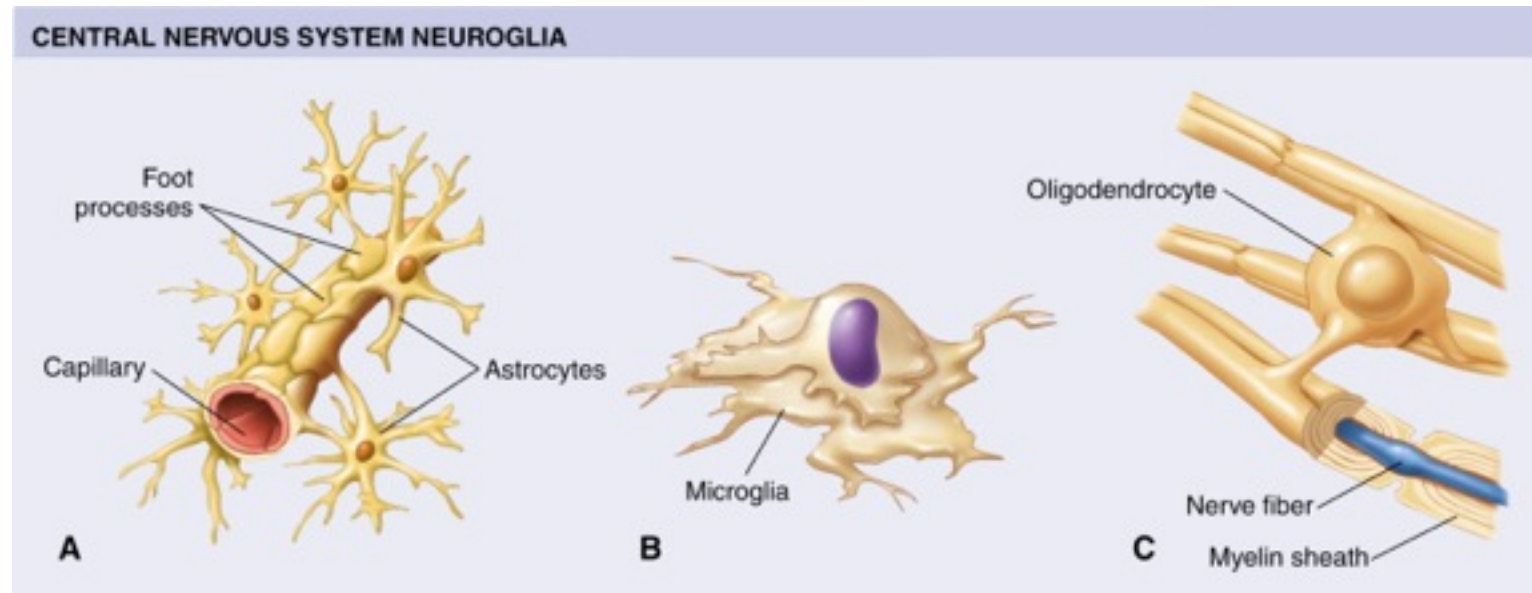
1. **Support** cells, bringing the cells of nervous tissue together **structurally** and **functionally**
2. **Glioma-** most common types of brain tumors

CELLS OF THE NERVOUS SYSTEM

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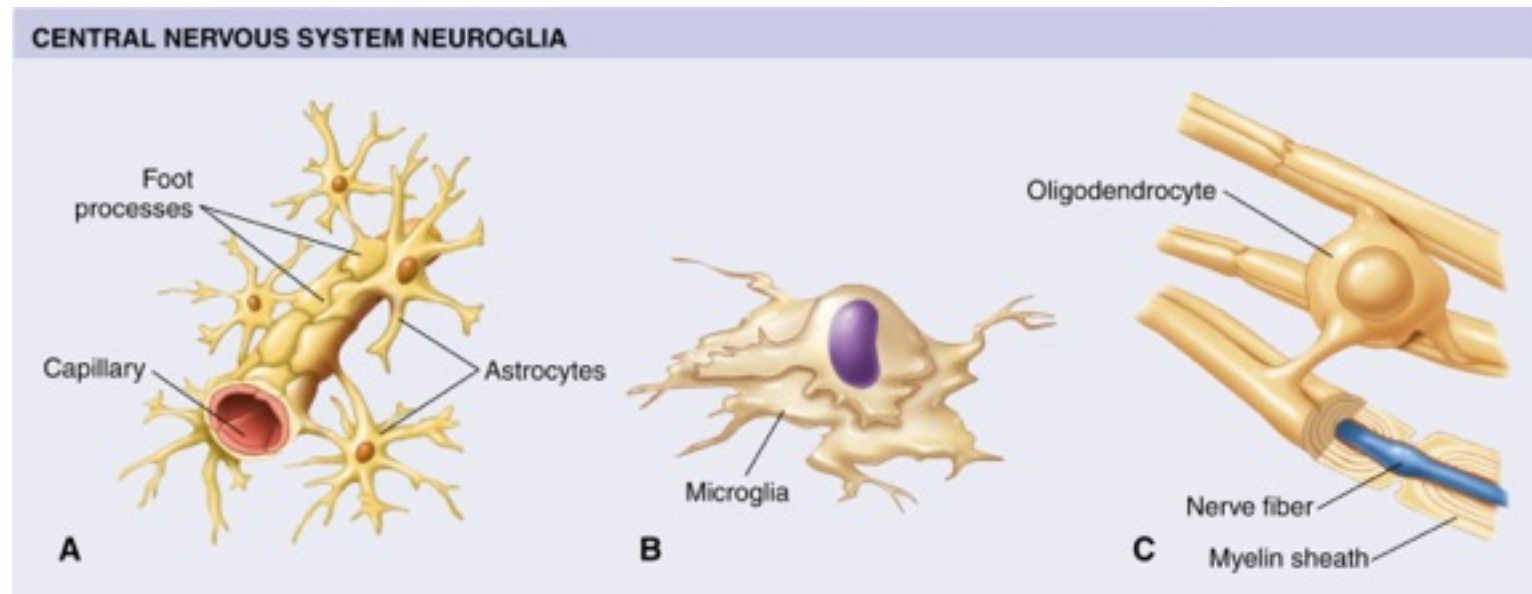
3. Three main types of glial cells of the CNS

- a. **Astrocytes** —star-shaped cells that anchor small blood vessels to neurons
 - Blood-brain barrier – a two-layer structure that protects brain tissue from harmful chemicals in blood



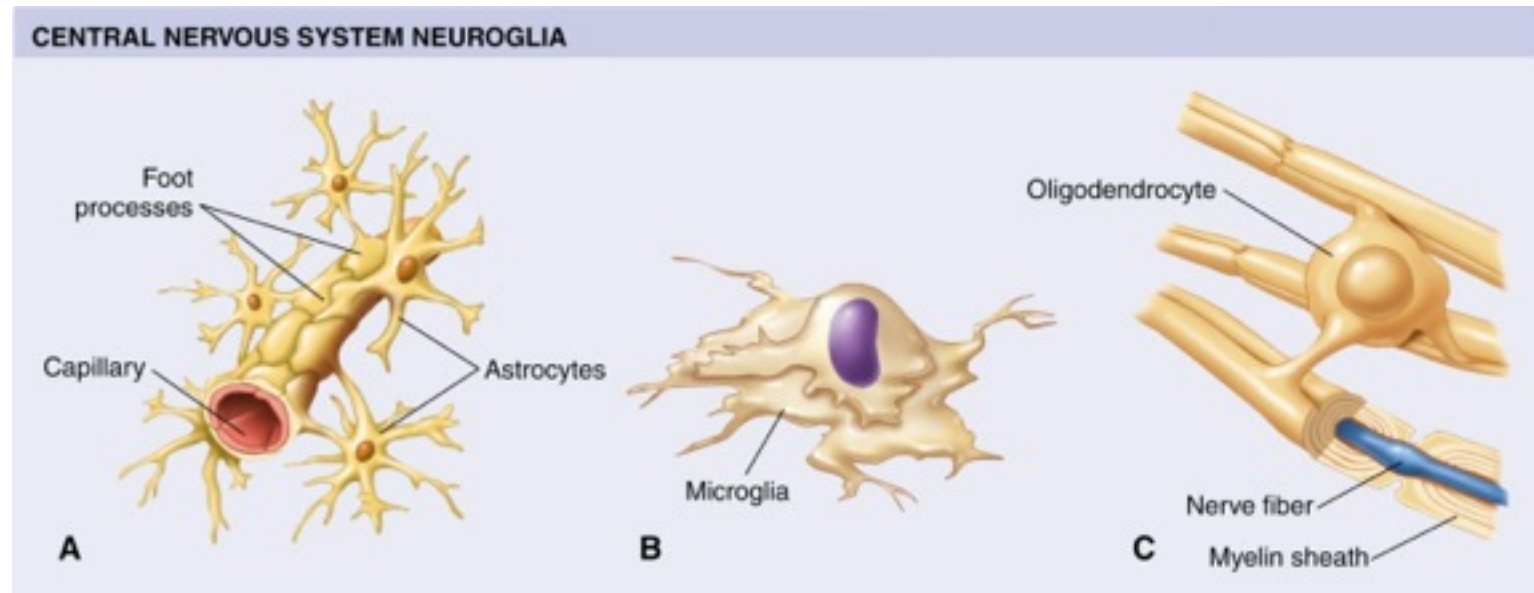
CELLS OF THE NERVOUS SYSTEM

- c. Glia (neuroglia)
 - 3. Three main types of glial cells of the CNS
 - b. **Microglia** —small cells that move in inflamed brain tissue carrying on phagocytosis



CELLS OF THE NERVOUS SYSTEM

- c. Glia (neuroglia)
 - 3. Three main types of glial cells of the CNS
 - c. Oligodendrocytes —form myelin sheaths on axons in the CNS



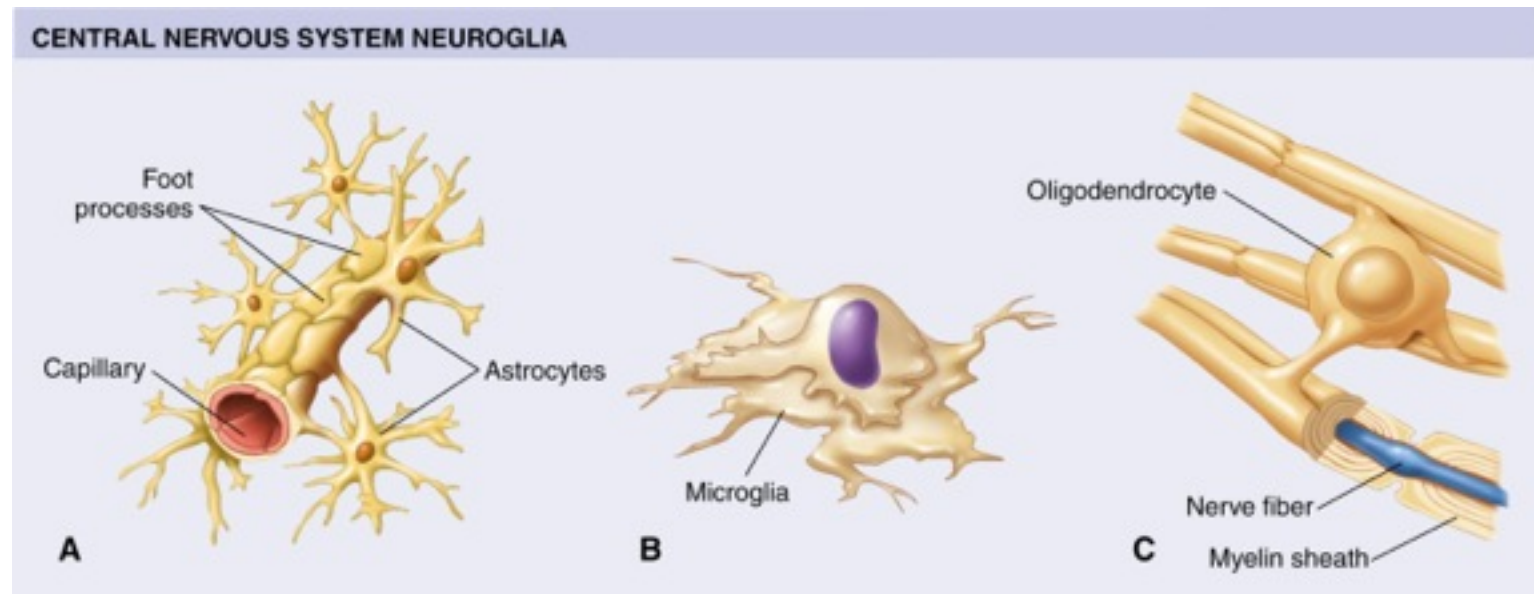
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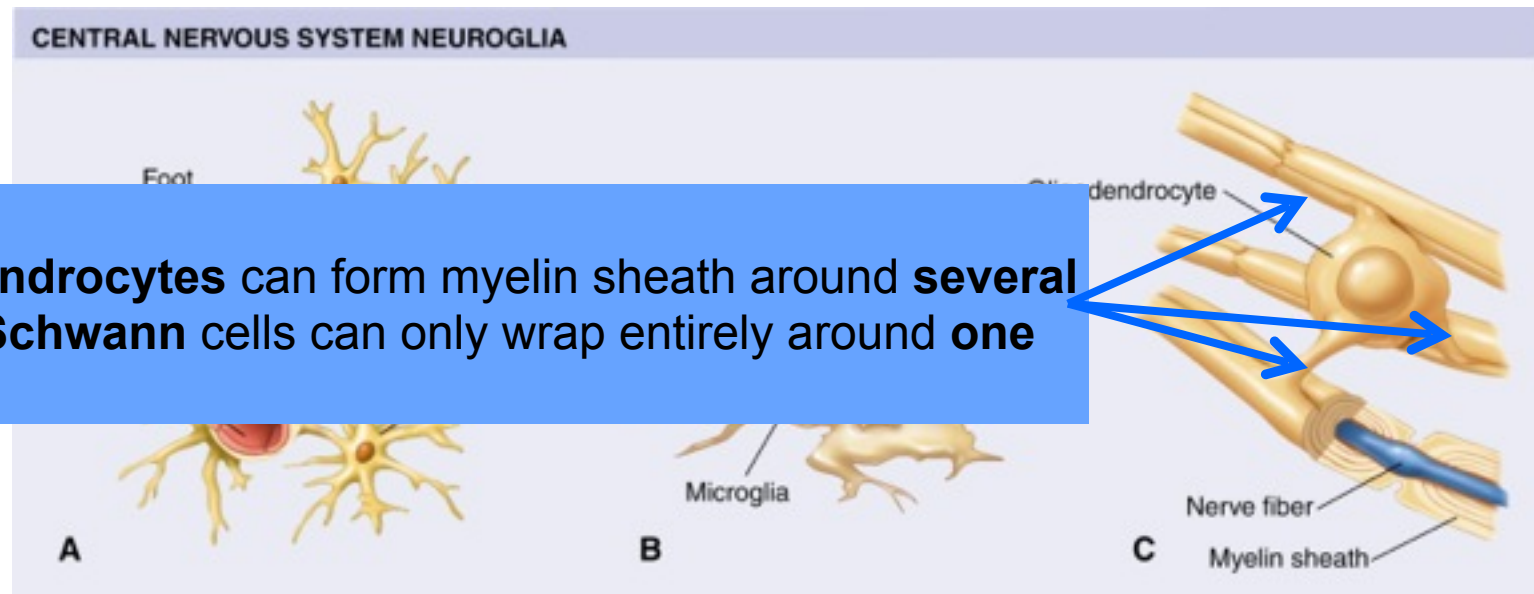
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FYI -
Oligodendrocytes can form myelin sheath around **several** axons; **Schwann** cells can only wrap entirely around **one** axon.