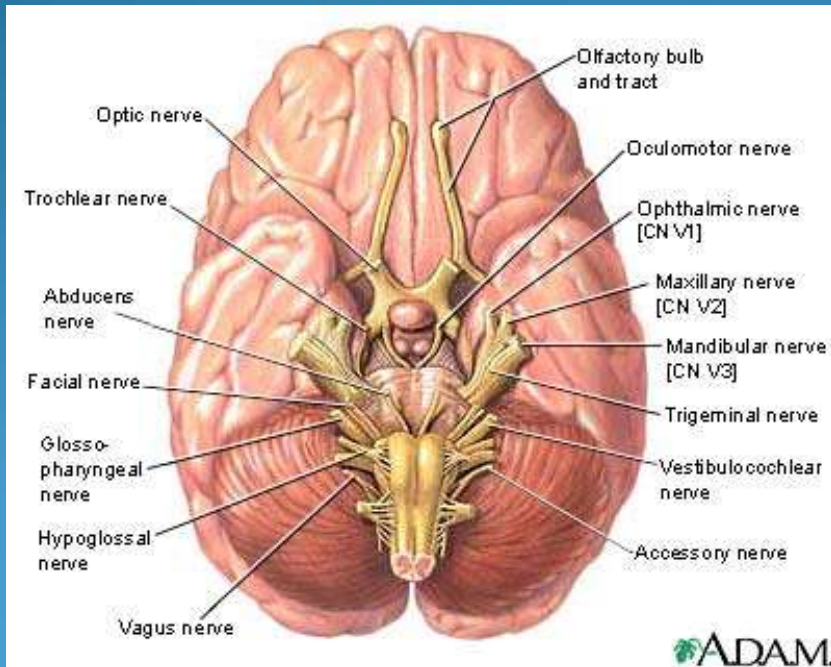


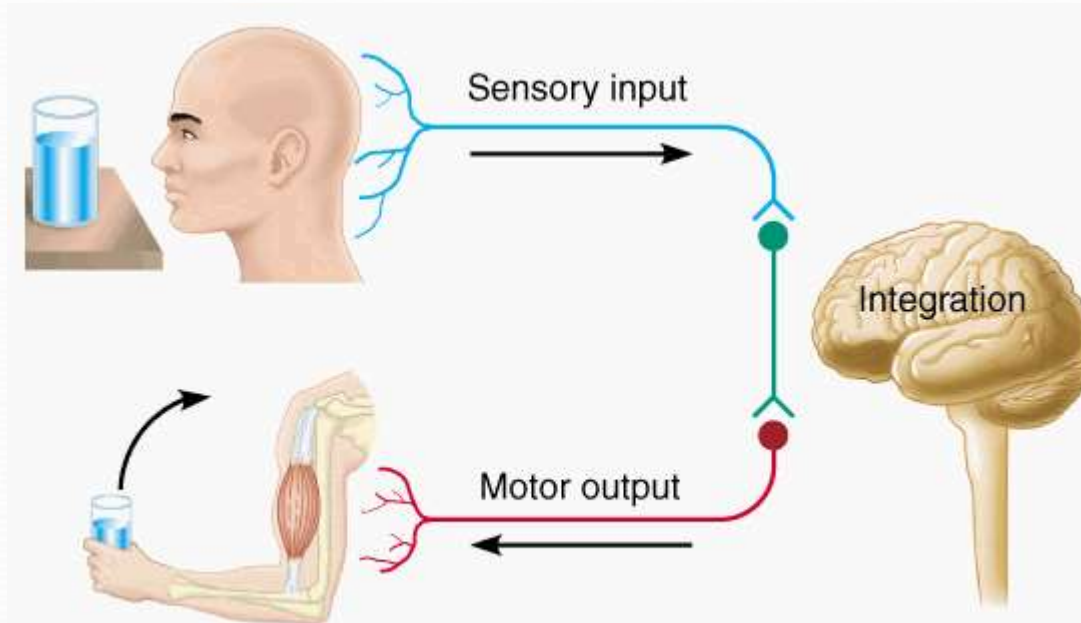
# The Nervous System

EQ: Compare and contrast the functions of the different support cells in the nervous system.



# Three Basic Functions of the Nervous system

1. Sensory - gathers info
2. Integration - information is brought together
3. Motor - responds to signals, homeostasis

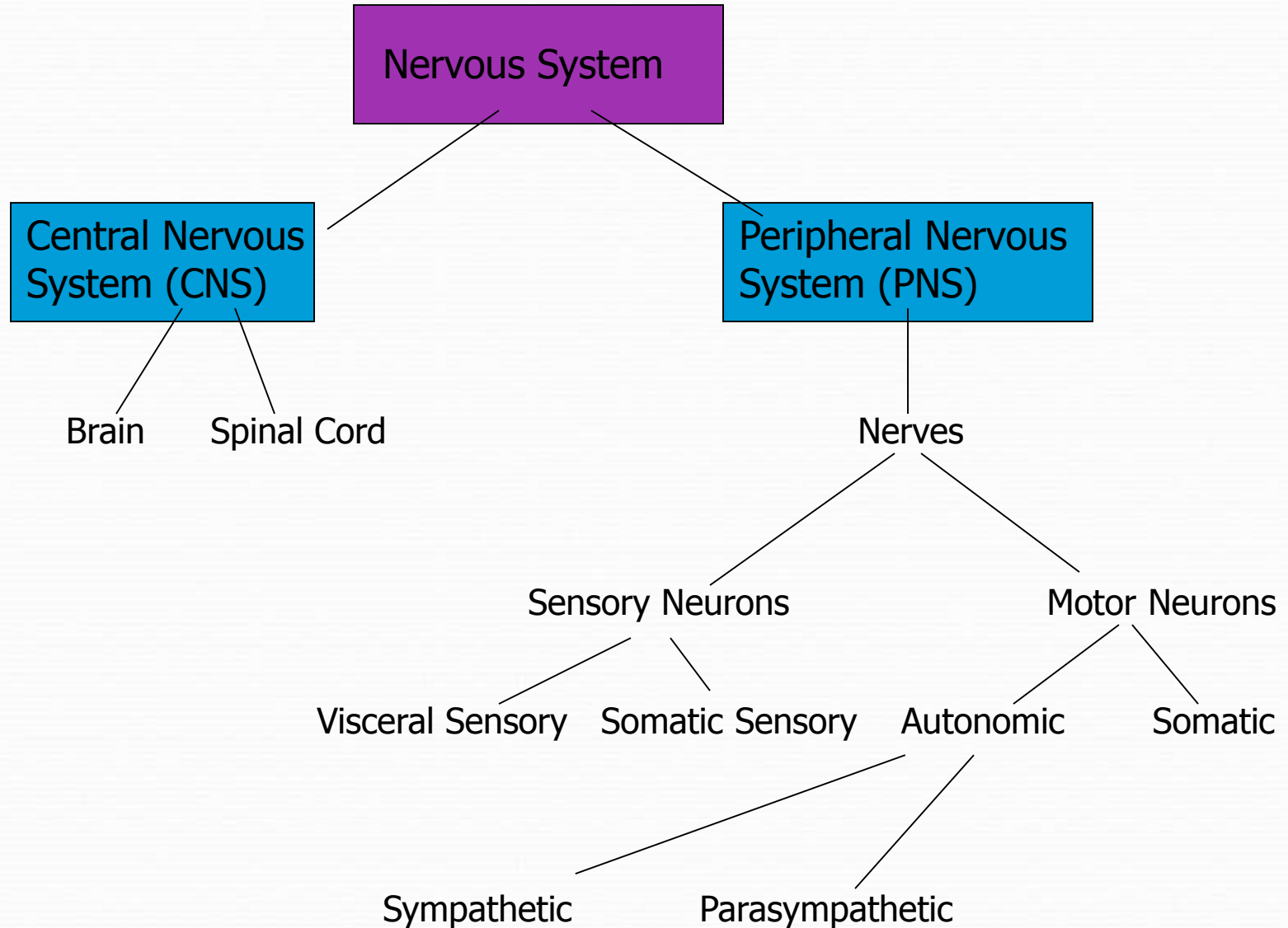


# Interesting Facts about the Neuron

- Longevity – can live and function for a lifetime
- Do not divide – fetal neurons lose their ability to undergo mitosis; neural stem cells are an exception
- High metabolic rate – require abundant oxygen and glucose

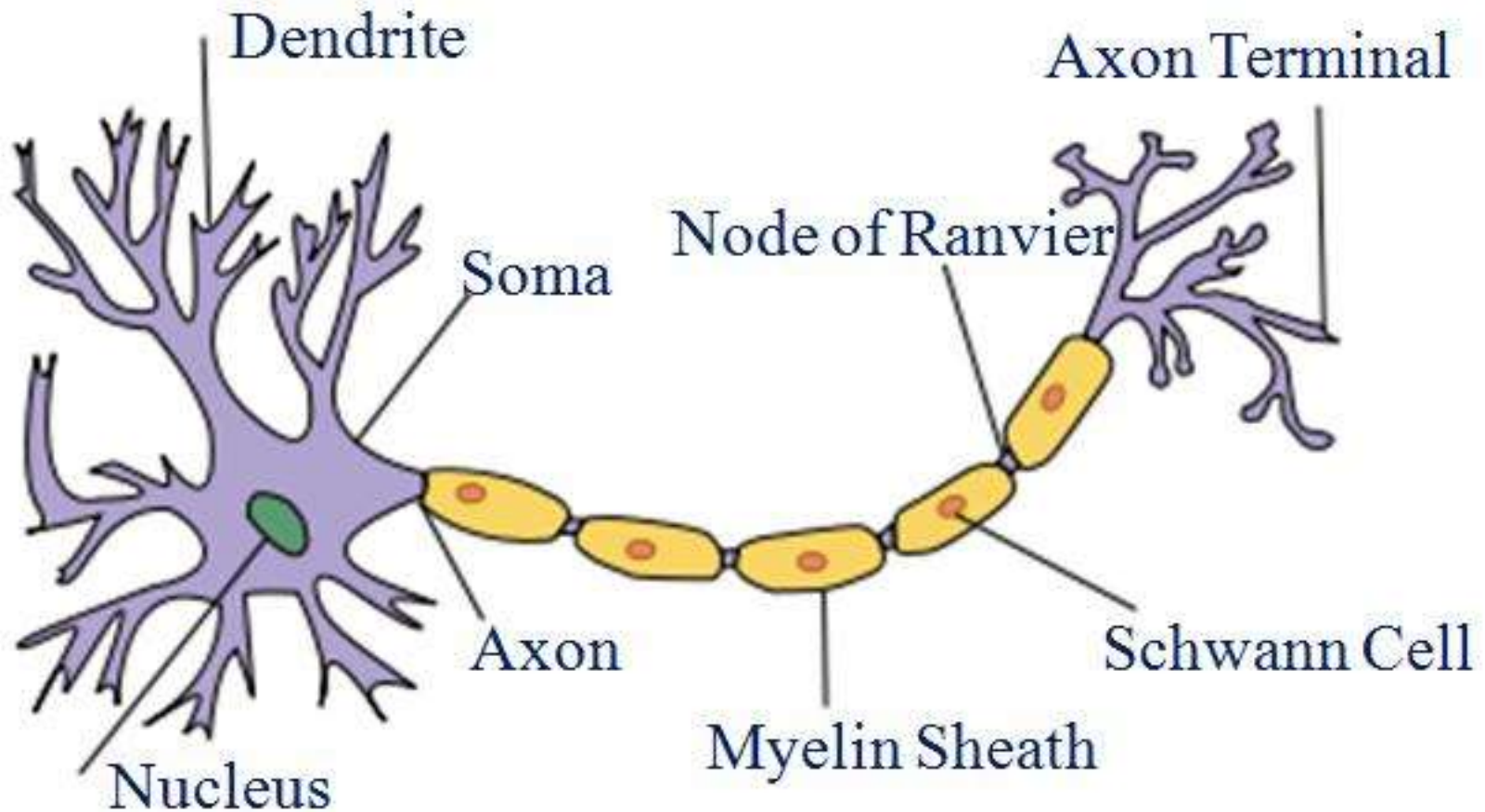


# Organization of the Nervous System

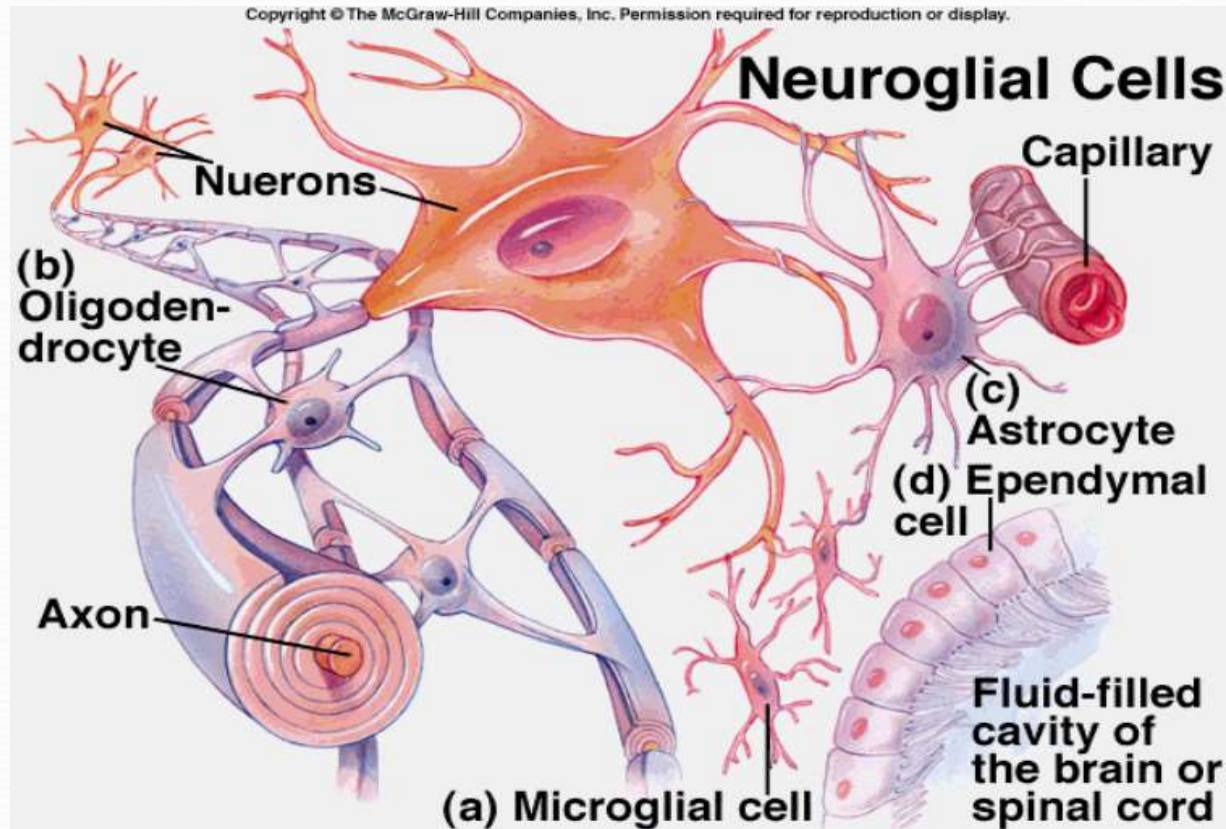


Nervous Tissue is Just two cells...

# The Functional Unit of the NS – The Neuron

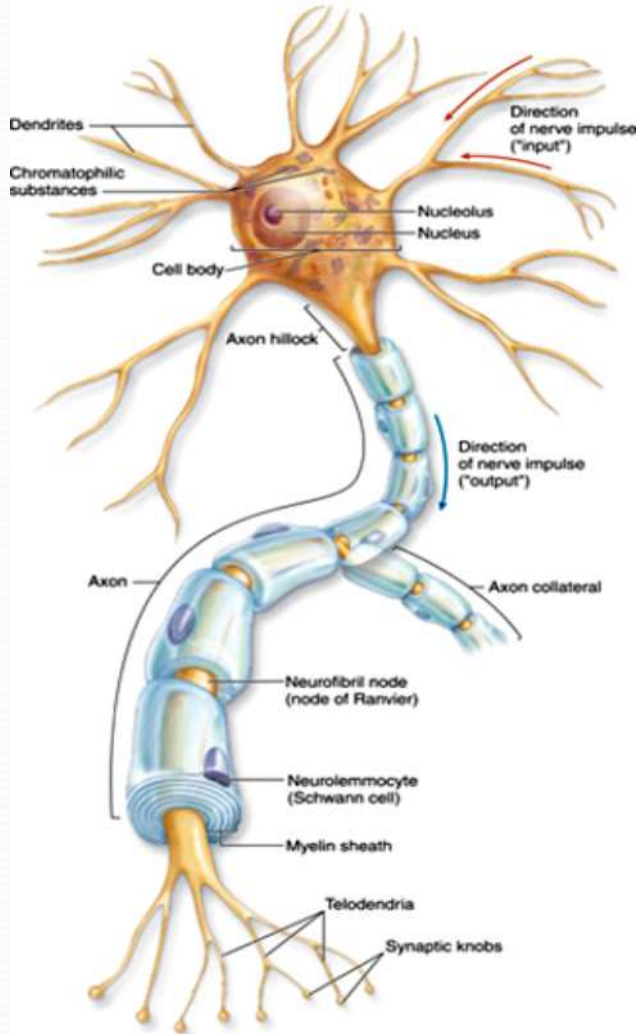


# And Supporting Cells – The Neuroglia



# Anatomy of a Neuron

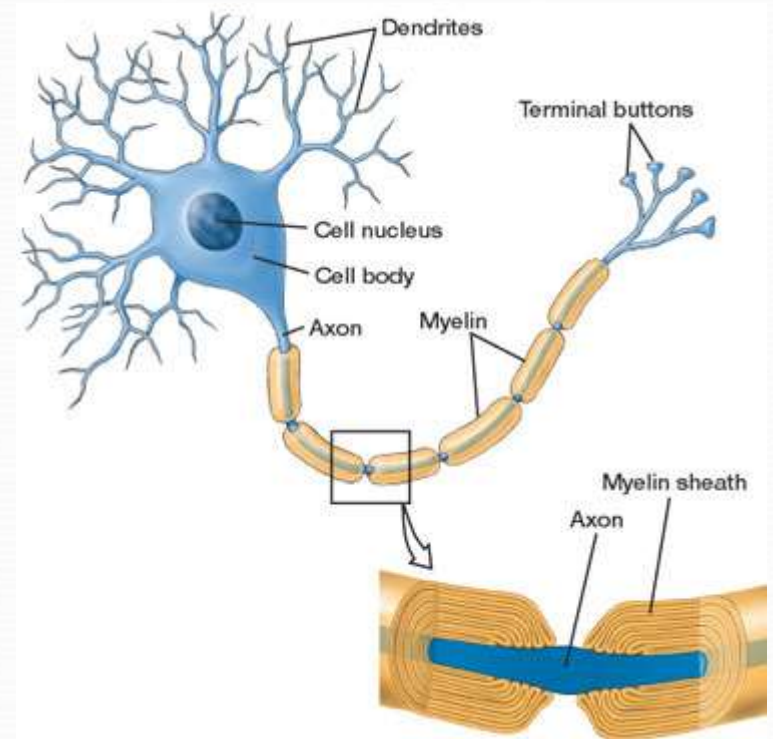
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1. **Cell body:** enlarged part of the neuron – contains the nucleus & other organelles.
2. **Dendrites:** They receive impulses and pass them to the cell body.
3. **Axon:** move impulses down the neuron (can be very long, from < 1mm to > 1 meter.)
4. **Axon terminals:** the end of the axon and neuron.

# Myelin Sheaths

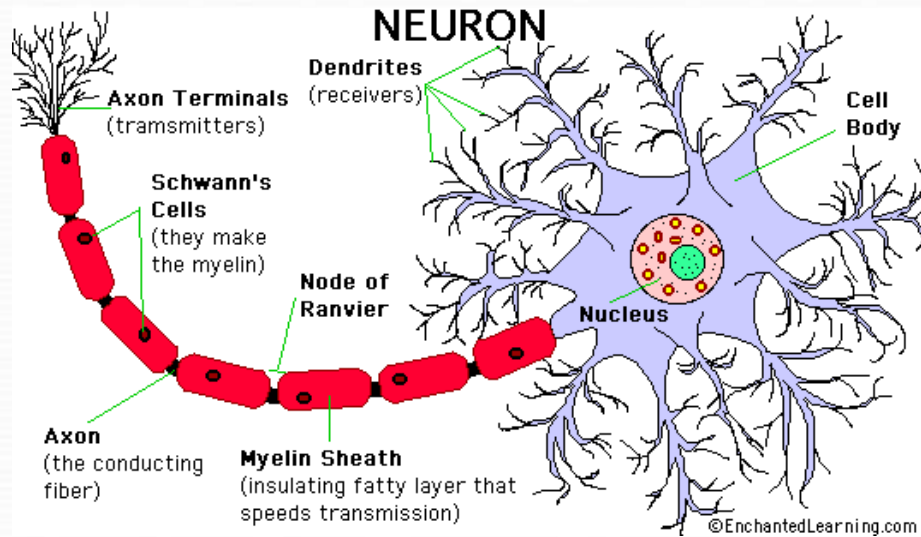
- Many axons are covered with a white, fatty material called **myelin**
- Outside the CNS the myelin sheath is created by **Schwann cells**
- Inside the CNS the MS is created by **oligodendrocytes**





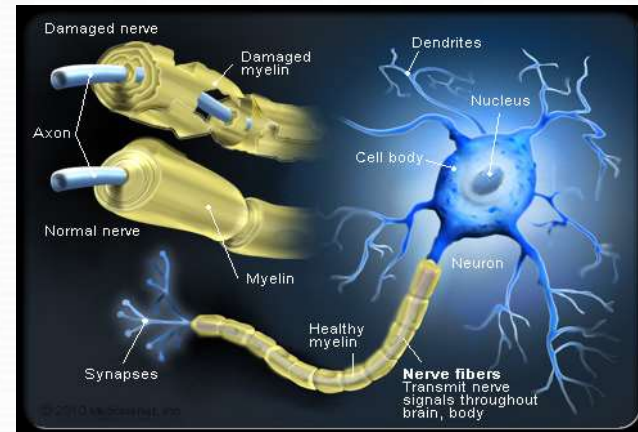
# Myelin Sheaths

- Note the **Nodes of Ranvier** or the gaps between the Schwann cells

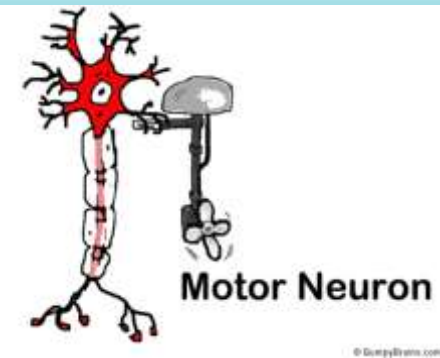


# Multiple Sclerosis (MS)

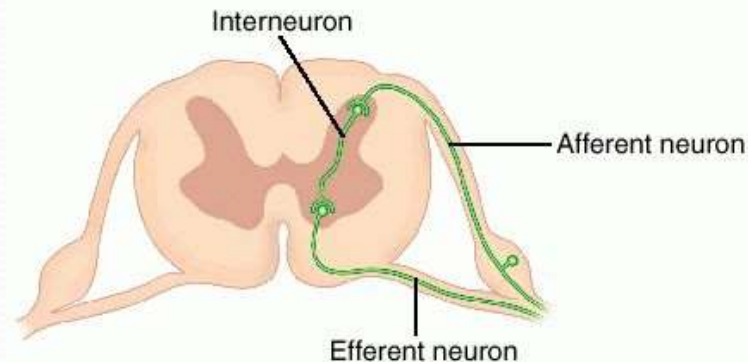
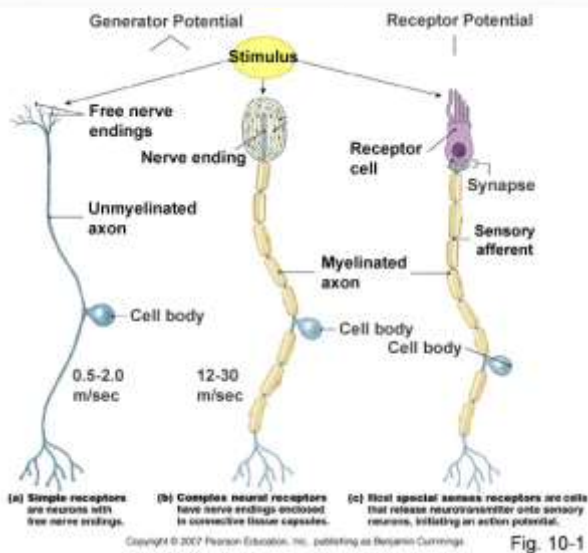
- In MS the myelin sheath is **destroyed**
- This slows nerve impulses down and causes...
  - Visual/speech disturbance
  - No muscle control leading to paralysis
- Is an **autoimmune disease**



# 3 Types of Neurons

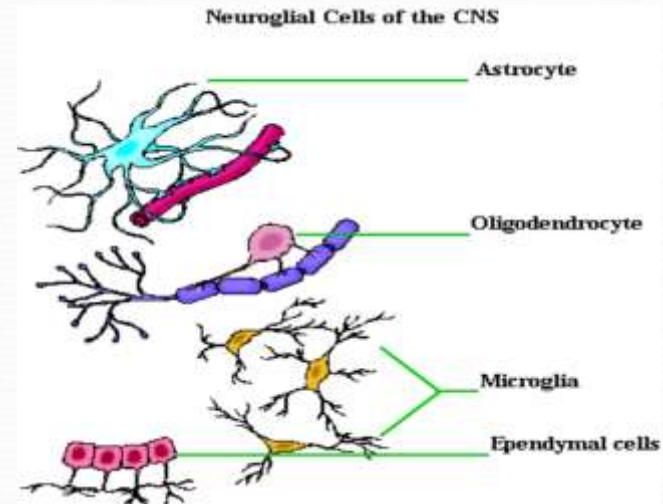
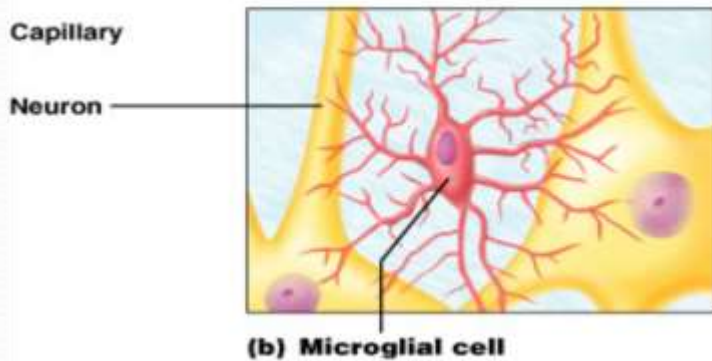


1. **Sensory neurons: (afferent)** move impulses from sensory receptors (like your ears) to the CNS
2. **Motor neurons: (efferent)** move impulses from the CNS to effector organs like your muscles or glands.
3. **Interneuron or Association Neuron:** processing



# Neuroglia – 5 Main Types

1. **Schwann cells:** forms the myelin sheath of PNS
2. **Oligodendrocytes:** myelin sheath of CNS
3. **Microglia:** attack foreign material in the CNS
4. **Astrocytes:** connect blood vessels to neurons
5. **Ependymal cells:** forms membranes over brain structures



## White vs Grey Matter

Myelinated (white matter) – myelinated axons

Unmyelinated (grey matter) - unmyelinated

