

The Nervous System

Part I - The Neuron

Functions:

- when stimulated, sends impulses to designated receptors

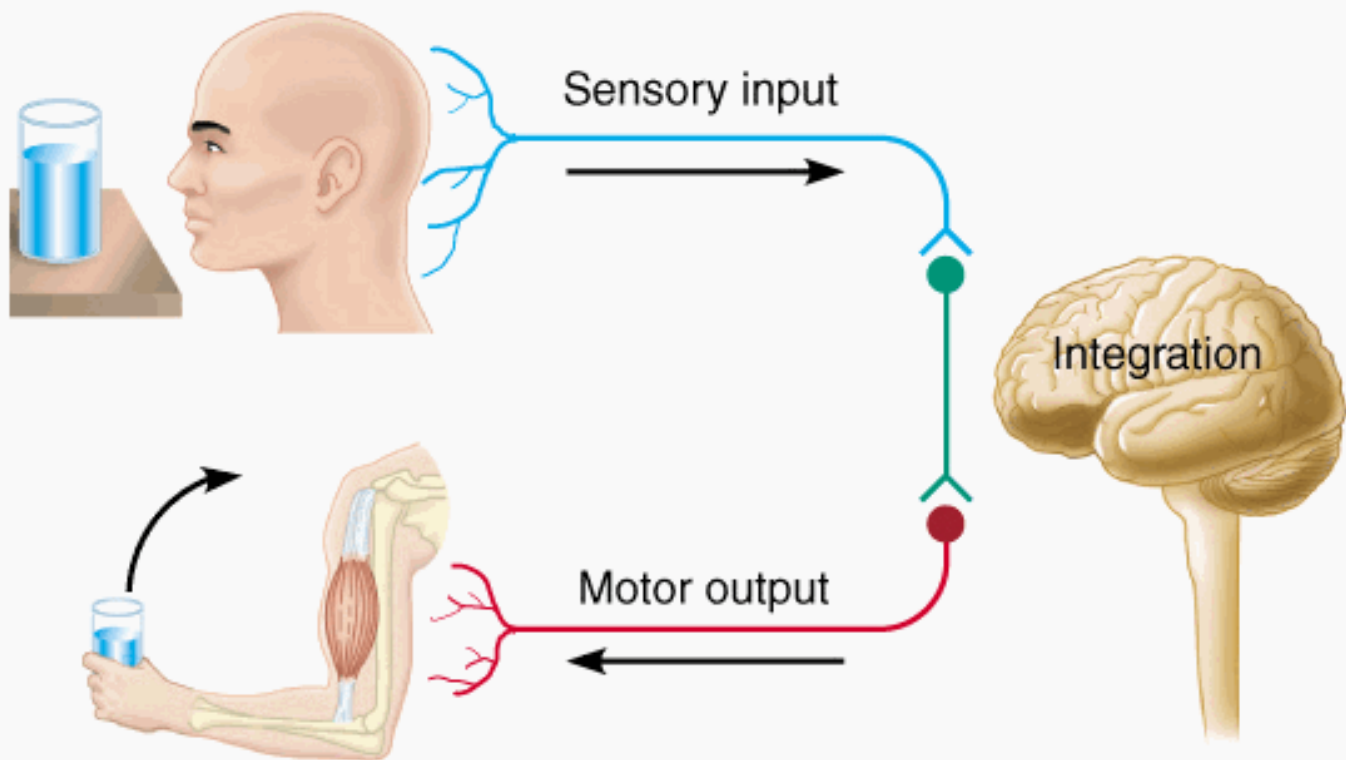


Divisions:

- The nervous system is separated into two divisions
- Central Nervous System
 - spinal cord & brain
- Peripheral Nervous System
 - all neural tissue outside of the nervous system

PNS Divisions:

- The peripheral nervous system is divided into two divisions
- Afferent Division (sensory)
 - brings information to the CNS
- Efferent Division (motor)
 - carries information from the CNS to the designated receptor (glands, muscles, etc.)



Copyright © 2001 Benjamin Cummings, an imprint of Addison Wesley Longman, Inc.

Efferent Division

- The efferent division is divided into two divisions
- Somatic Nervous System (SNS)
 - skeletal muscle contractions
 - reflex
- Autonomic Nervous System (ANS)
 - smooth & cardiac muscle contractions and glandular secretions
 - sympathetic & parasympathetic divisions

Neuron vs. Neuroglia

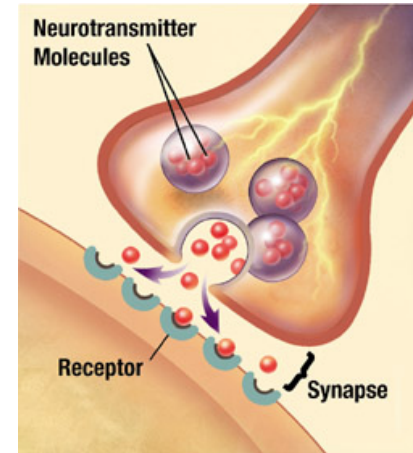
- **Neuron**
 - individual functional cell
- **Neuroglia**
 - supporting cell
 - protect neurons, support neural tissue, phagocytize, & help compose the neural interstitial fluid
- **Neuroglia > neurons**

The Neuron

- There are four types of neurons
- Each neuron has:
 - Cell Body (soma)
 - nucleus, cytoplasm, & lots of mitochondria
 - Dendrites
 - sensitive processes that branch from the cell body
 - receives information
 - Axon
 - long process that transmits an impulse/signal

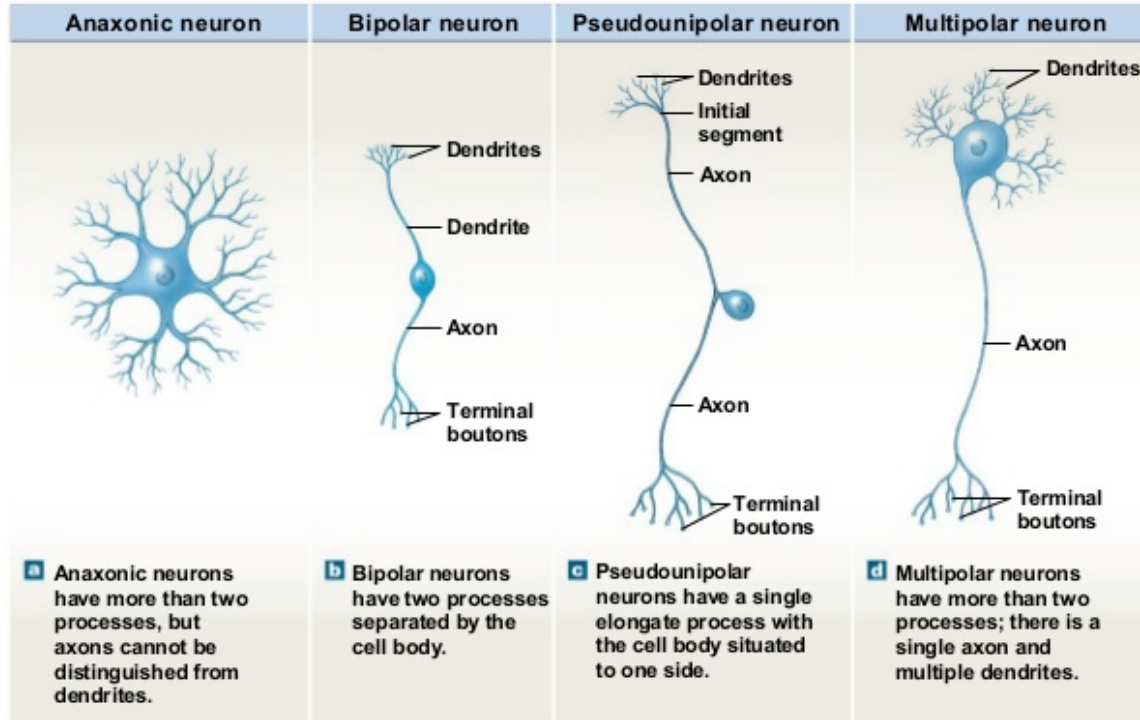
Neural Synapse

- Each neuron's axon ends with synaptic terminals
- Each synaptic terminal is a part of a synapse
 - Communication with another cell
 - Neurotransmitters
 - Presynaptic membrane → Synaptic Cleft → Postsynaptic membrane



Neurons

Figure 13.10 A Structural Classification of Neurons

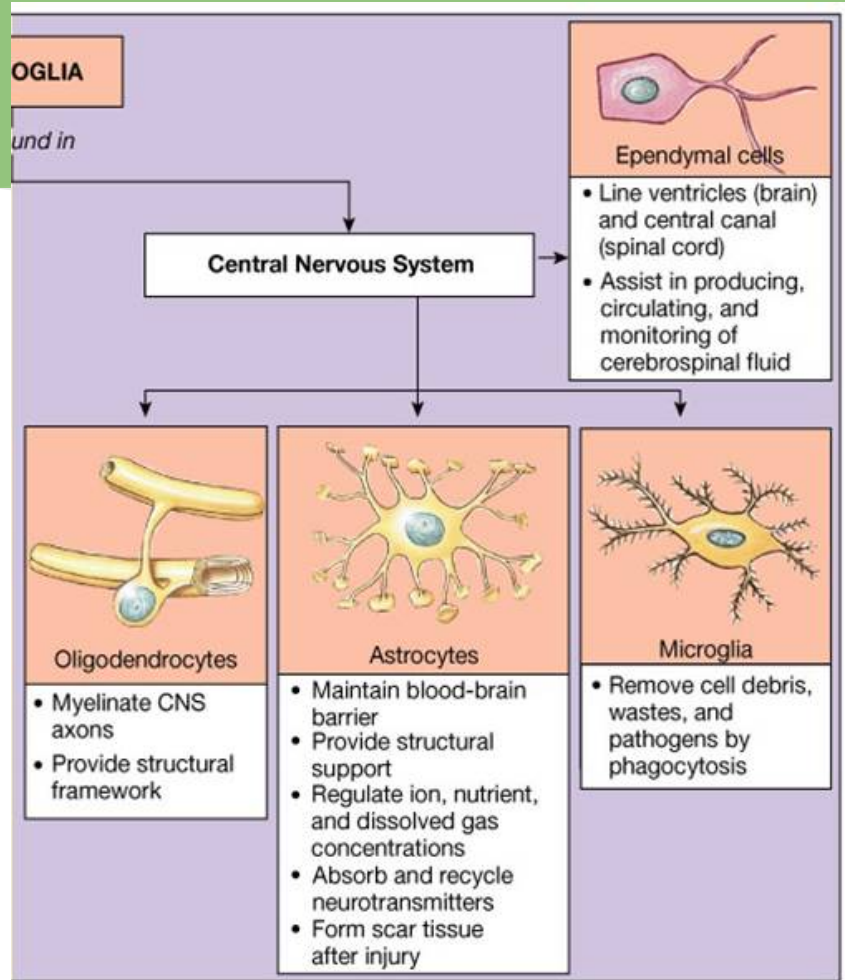


CNS Neuroglia

- **Ependymal Cells**
 - line brain ventricles & spinal cord canal (central canal)
 - help produce cerebrospinal fluid
- **Astrocytes**
 - largest, most numerous
 - maintain brain-blood barrier, support, repair, & guide neuron development

CNS Neuroglia

- Oligodendrocytes
 - myelinate CNS axons
- Microglia
 - migrating macrophage



PNS Neuroglia

- Schwann Cells
 - myelinate PNS axons
 - repair
- Satellite Cells
 - homeostasis with the surrounding environment

