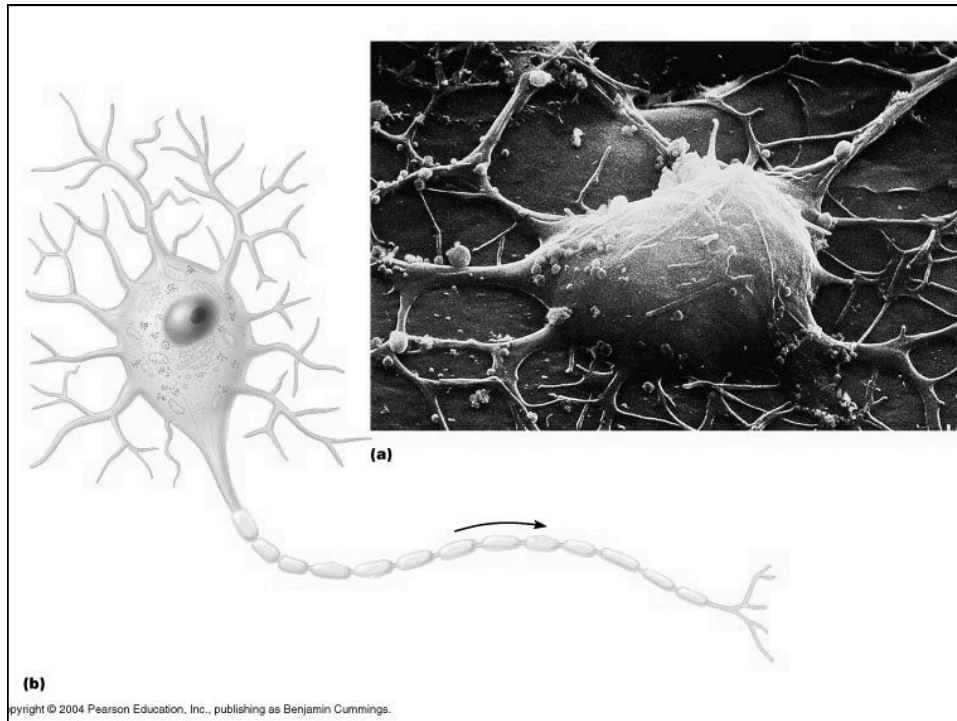


Neurons!

Neurons

- **Huge telephone network**
- **Uses electricity and chemicals**
- **Building blocks of the brain and nervous system**
- **Can regenerate, just not easily...**
 - **Nerve damage**
- **Requires stimulation to strengthen connections**
 - **Hand-eye coordination**



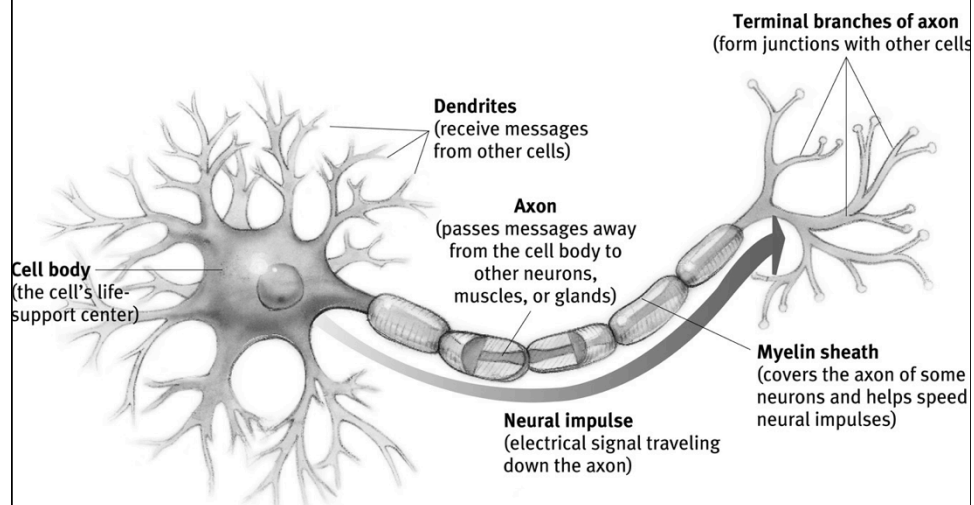
Cells of the Nervous System

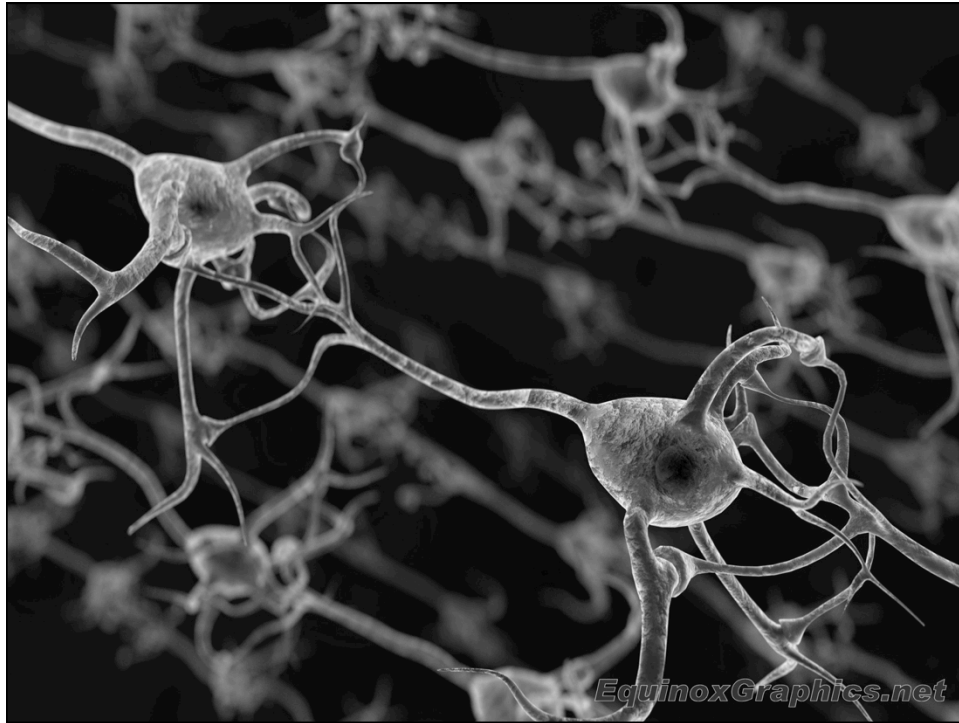
- **Neuroglia - (Glia, the “glue”): non-neuronal cells that support, protect, and aid neurons of the PNS and CNS**
- **Neurons (nerve cells) - receive stimuli and transmit action potentials (signals, in and out)**
- **Three components:**
 - **Cell body**
 - **Dendrites: input**
 - **Axons or nerve fibers: output**

Neuron Parts

- **Cell body** – nucleus – genetic info, regulatory functions “life support”
- **Dendrite** – receives info from other neurons
- **Axon** – carries info to other neurons
- **Axon terminals** – form junctions with other cells – synapse takes place here
- **Not part of the neuron...but around**
 - **Myelin (sheath)** – fatty tissue, insulates axon, speeds up transmission of impulse

Neurons

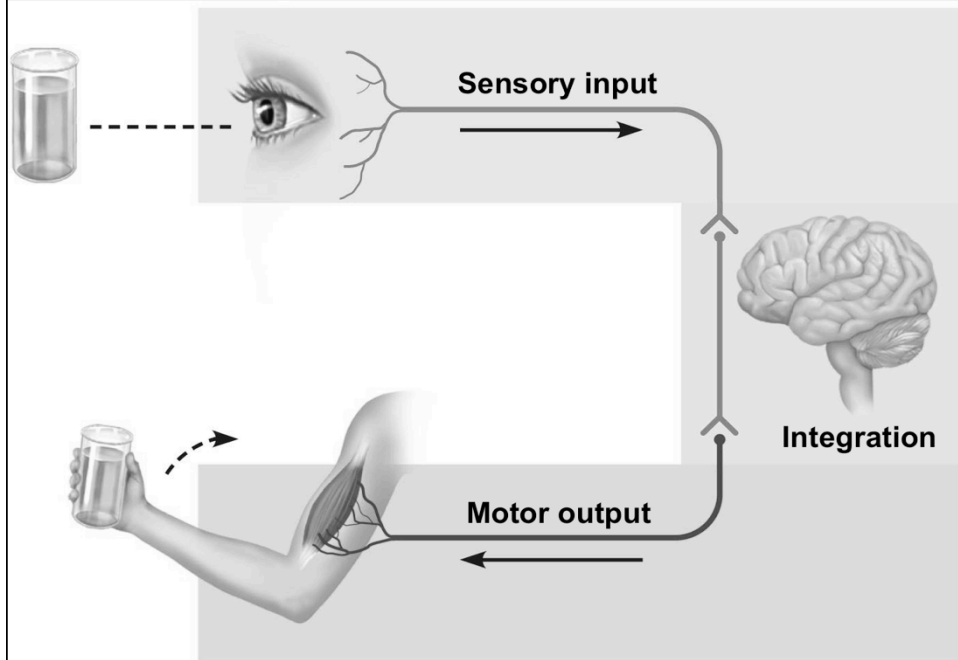




Functions of the Nervous System

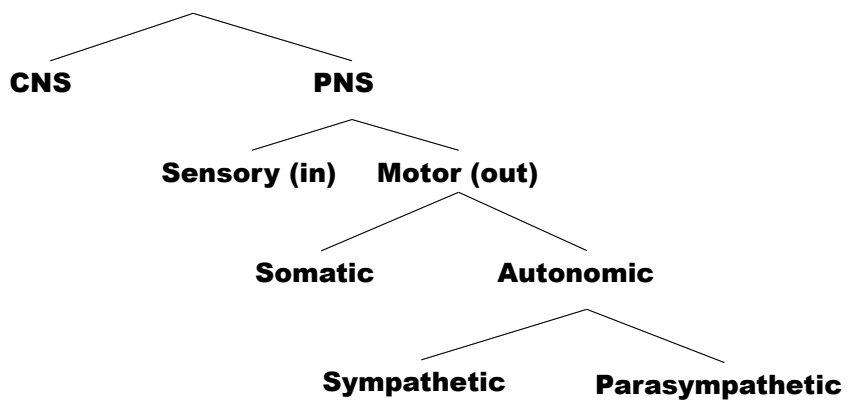
- **Sensory input**
 - Information gathered by sensory receptors about internal and external changes
- **Integration**
 - Processing and interpretation of sensory input
- **Motor output**
 - Activation of effector organs (muscles and glands) produces a response

Figure 11.1 The nervous system's functions.



Divisions of Nervous System

Nervous system divisions



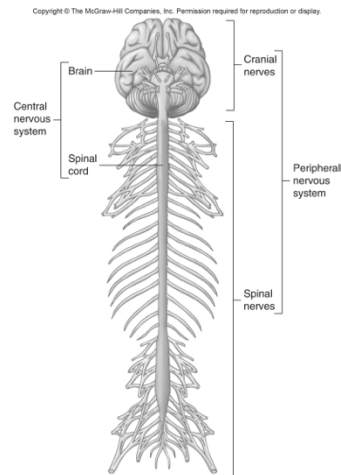
Divisions of Nervous System

1. Central nervous system (CNS)

- **Brain and spinal cord**
- **Processes information from the PNS**

2. Peripheral nervous system (PNS)

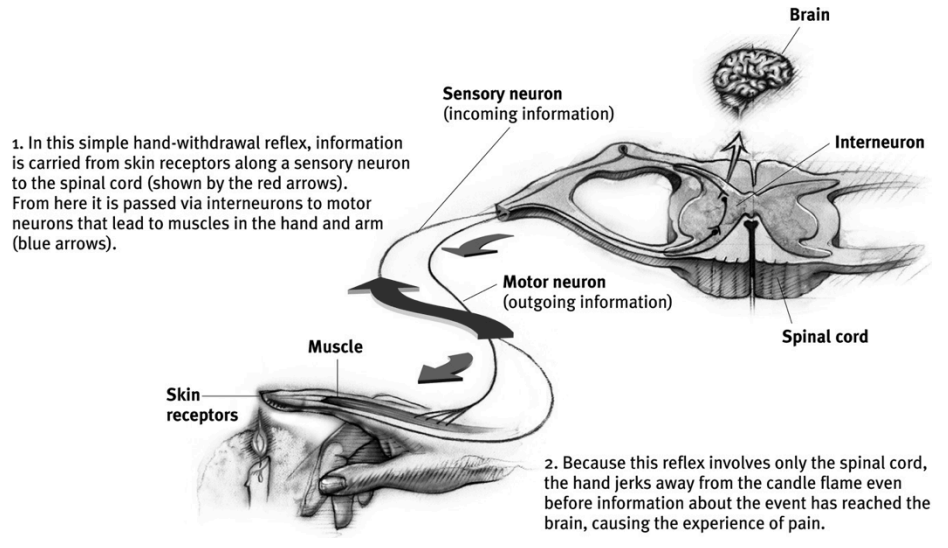
- **Consists mainly of nerves that extend from brain and spinal cord**
- **Detects stimuli, transmits info to and receives info from the CNS**



Divisions of the PNS

- **Sensory**
 - **Transmits action potentials from receptors to CNS**
- **Motor**
 - **Transmits action potentials from CNS to effectors (muscles, glands)**

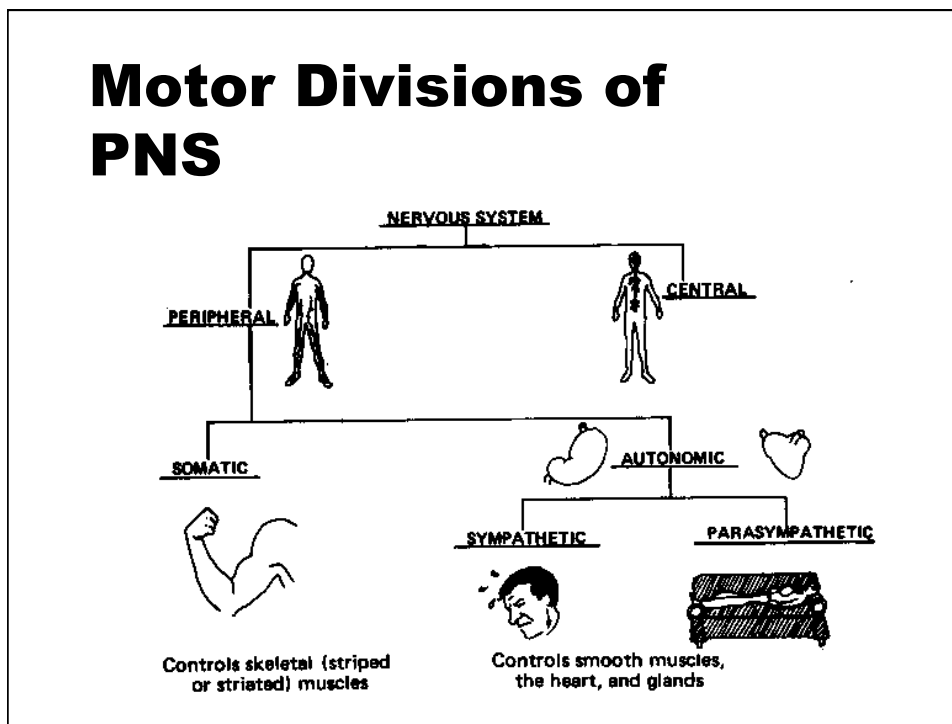
Sensory and Motor - PNS



Motor Division of PNS

1. **Somatic nervous system: from CNS to skeletal muscles.**
 - Voluntary.
2. **Autonomic nervous system (ANS): from CNS to smooth muscle, cardiac muscle and certain glands.**
 - Involuntary control.

Motor Divisions of PNS



Divisions of the ANS

1. Sympathetic

- ✦ Active during physical activity
- ✦ Ex. Sweating, heart rate increase.

2. Parasympathetic

- ✦ Regulates resting or vegetative functions
- ✦ Ex. digesting food.

Autonomic Nervous System
Sympathetic - "Fight or Flight"



Parasympathetic - "Rest and Digest"



