

### 13: The Peripheral Nervous System

#### Key Terms

**Nervous System:** The system of cells, tissues, and organs that regulates the body's responses to internal and external stimuli.

**Impulse:** The electrochemical signal transmitted down a neuron.

**Neuron:** The basic functional unit of the nervous system, consisting of a cell body, and its processes: the dendrites, axon, and terminal branches.

**Neurotransmitter:** Biological molecules released from the terminal branches in response to a propagating action potential.

**Axon:** The major process that conducts impulses from the dendrites to the terminal branches.

**Myelin Sheath:** The fatty membranes that cover the axon, allowing for faster electrical conduction.

**Nodes of Ranvier:** Gaps in the myelin sheath. The electrical impulses jump from one node to the next on an axon.

**Electrical Potential:** A separation of charge, which gives the ability to send electricity.

**Ions:** Charged atoms, which give the neuron its potential.

**Resting Potential:** The potential of an inactive neuron.

**Action Potential:** The propagated impulse of an excited neuron.

**Threshold Potential:** The potential at which an action potential can be initiated.

**Afferent Neuron:** Brings sensory information to the CNS.

**Efferent Neuron:** Brings motor information from the CNS.

**Dorsal Root:** contains sensory neurons.

**Dorsal Root Ganglia:** Bundle of sensory neuron cell bodies outside the spinal cord.

**Ventral Root:** contains motor neurons.

**Mixed Nerves:** Nerves that contain both sensory and motor neurons.

**Reflex Arc:** A simple neural circuit that includes an afferent sensory neuron, an interneuron, and an efferent motor neuron that does not rely on any input from the brain.

**Somatic Nervous System:** Voluntary motor system

**Autonomic System:** Involuntary nervous system

**Parasympathetic Nervous System:** The part of the Autonomic system that inhibits function

**Sympathetic Nervous System:** The part of the Autonomic system that inhibits function

**Sympathetic Ganglion:** sympathetic synapses between spinal neurons and efferent neurons

#### Cell Types

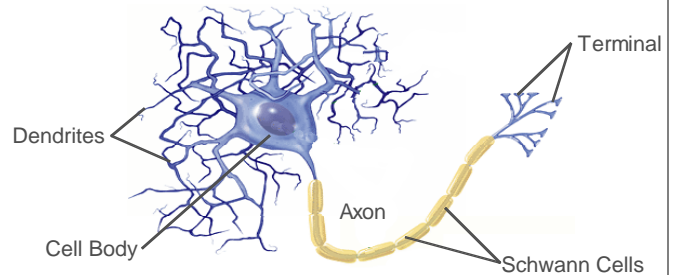
**Neurons:**

- Anaxonic** – small neurons with no identifiable axon (interneurons)
- Bipolar** – small neurons with two processes, one axon and one dendritic (specialized sensory neurons)
- Unipolar** – large myelinated neurons with a single dendro-axonic process with the cell body off to the side (afferent sensory)
- Multipolar** – large myelinated neurons with many dendritic processes and an axonal process that can branch (efferent motor neuron)

**Glial Cells:**

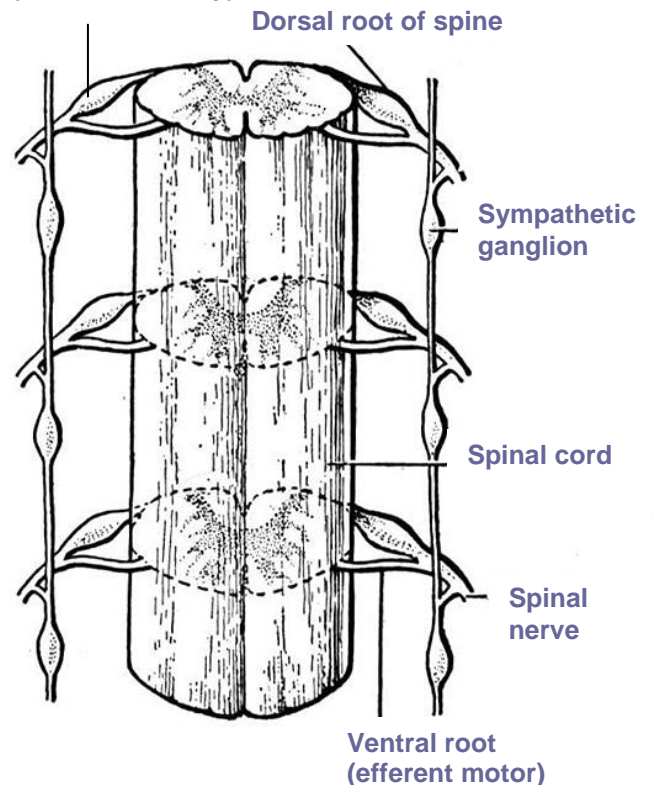
- Schwann Cells:** scavenging, structural support and source of PNS myelination
- Satellite Cells:** cells that surround the cell bodies in the dorsal root ganglia

#### Neurons and Glial Cells



#### Spinal Nerve Anatomy

Dorsal root ganglion (afferent sensory)



#### Peripheral Nervous System Organization

