

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 it's 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

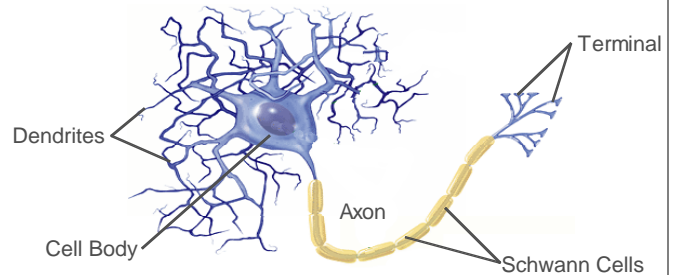
Neurons:

- 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:

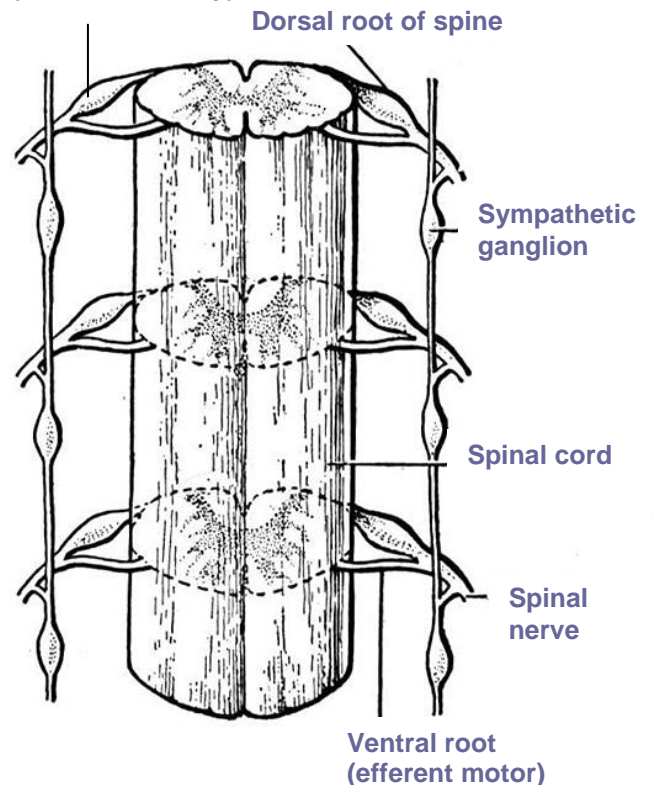
- Schwann Cells:** scavenging, structural support and source of PNS myelination
- Satellite Cells:** cells that surround the cell bodies in the dorsal root ganglia

Neurons and Glial Cells



Spinal Nerve Anatomy

Dorsal root ganglion (afferent sensory)



Peripheral Nervous System Organization

