Week 2 Neurons

Learning Goal: Understand how neurons receive and transmit signals.

After finishing the pre-class assignments, students will be able to…

- Describe the general structure of a neuron.

- Relate the structural features of a neuron (i.e., dendrites, axons) to their functions.

- Explain membrane potential and how it arises in both neuronal and non-neuronal cells.

- Explain the process by which an action potential is generated and propagated.

- Compare and contrast ligand-gated and voltage-gated ion channels with respect to their role in signal transduction in a neuron.

- Explain the process by which two neurons communicate at a synapse.

After this class meeting, students will be able to…

- Discuss how EPSPs and IPSPs are received and integrated by a postsynaptic neuron.

- Evaluate how multiple signals will be integrated by a postsynaptic neuron that has formed synapses with two or more pre-synaptic neurons.

- Predict how a charged molecule will move across a semipermeable membrane in the presence of an electrochemical gradient.

- Predict how addition of drugs or the introduction of mutated proteins will alter membrane potential, excitability, and/or signal transmission.

Week 2 Nervous System

Learning Goal: Appreciate the structure and function of the human nervous system.

After finishing the pre-class assignments, students will be able to…

- Describe the global organization of the human nervous system.

- Relate the major regions of the brain, including the hypothalamus, thalamus, and sensory cortex to their respective functions.

- Compare and contrast the sympathetic and parasympathetic divisions of the autonomic nervous system.

After this class meeting, students will be able to…

- Explain how the brain receives, processes, and sends information.

- Evaluate which region of the brain has been damaged in a patient based on a set of symptoms.

- Predict which branch, parasympathetic or sympathetic, will respond to different stimuli