Megan Arney

Nervous System LAB Report

This lab report is about action potentials and the electric activity found in a normal cell membrane environment, environments modified by various toxins, and action potentials observed in human reflexes. In response to a stimulus, the excitable cell membrane of a neuron cell goes from a resting state to depolarization, followed by repolarization to that resting state again. This is process is called action potential. Depolarization occurs within a neuron where sodium ions enter the cell and raise the charge from a negative to a positive level; reversing the state of the resting potential. Repolarization occurs when the membrane of a neuron becomes more permeable, which allows potassium ions to diffuse out of the neuron, causing the membrane to return to the resting state. The period when axons can't be stimulated to generate a new action potential is called the refractory period.The following figures will address the action potential data collected from specific cranial and peripheral data collected from specific cranial and peripheral nerves.Some toxins can cause neuronal membranes to cause the action potentials to function properly.

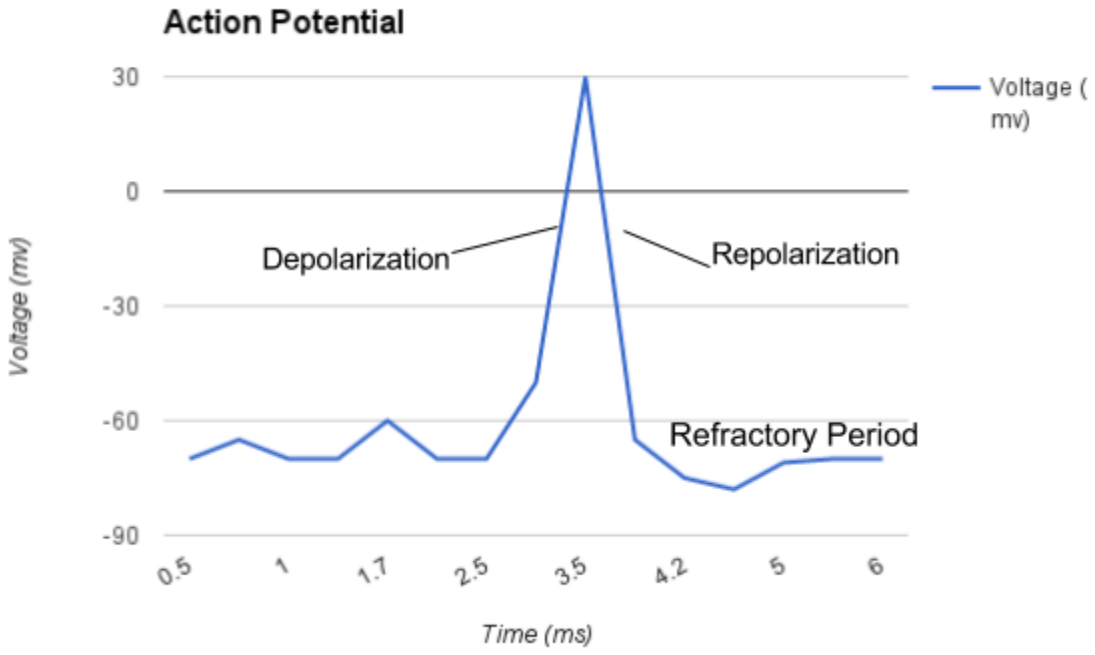

Figure 1, shows how action potential acts on a graph. The graph shows when depolarization, repolarization and when the refractory period take place in action potential.

Toxins & their effects on Action Potential

Toxin	Effects
Maculotoxin	Blocks Sodium Channels
Latrotoxin	Enhances acetylcholine release
α-bungarotoxin	Blocks acetylcholine (nicotinic) receptor
Tetrodotoxin	Blocks sodium channels
Apamin	Blocks potassium channels
Charybdotoxin	Blocks potassium receptors
Conotoxin	One type blocks voltage-sensitive calcium channels; one blocks voltage sensitive sodium channels: one blocks ACh receptors
Batrachotoxin	This toxin causes voltage-gated sodium channels to open at a more negative membrane potential and also prevents their inactivation.
Dendrotoxin K	it blocks your voltage -gated potassium channels in time
General anesthetic	Opens more potassium channels in neurons of the reticular formation in the brainstem. It's not those high voltage gated potassium channels that are affected
Potassium	When you flood the brain tissue with potassium causes cell damage and can block natural sugar blood flow to the brain
mutant gene	For a voltage-gated sodium channel in nociceptive neurons; injection of the gene will produce channels that are nonfunctional, with disastrous consequences.
Synthetic Toxin	Destroys the myelin covering your optic nerves and motor neurons
Mutated Sodium channel	Alters the voltage of the sodium channel so that it only opens at more positive membrane potentials.

Figure 2, is a chart representing different toxins and how they affect the neuron action potential. Since some toxins can cause neuronal membranes to cause the action potentials not to function properly

12 Cranial Nerves

Cranial Nerve	Function
Olfactory	Sensory fibers conduct impulses associated with the sense of smell
Optic	Sensory fibers conduct impulses associated with the sense of vision
Oculomotor	Motor fibers conduct impulses to muscles that raise the eyelids, move the eyes, adjust the amount of light entering the eyes and focus the lense
Trochlear	Motor fibers conduct impulses that move the eyes
Trigeminal	Mixed Sensory and Motor fibers that move various actions of the muscles face
Abducens	Motor fibers conducts impulses to muscles that move the eyes
Facial	Sensory fibers conduct impulses associated with the taste receptors of the anterior tongue
Vagus	Sensory Fibers conduct impulses from the pharynx, larynx, esophagus, and viscera of the the thorax and abdomen
Accessory	Primary Motor
Cranial	Motor Fibers conduct impulses to muscles of the soft palate, pharynx, and larynx
Spinal	Motor Fibers conduct impulses to muscles of the neck and back; proprioceptor input
Hypoglossal	Motor Fibers conduct impulses to muscles that move the tongue; proprioceptor input

Figure 3, is a table displaying the 12 Cranial nerves and their functions.

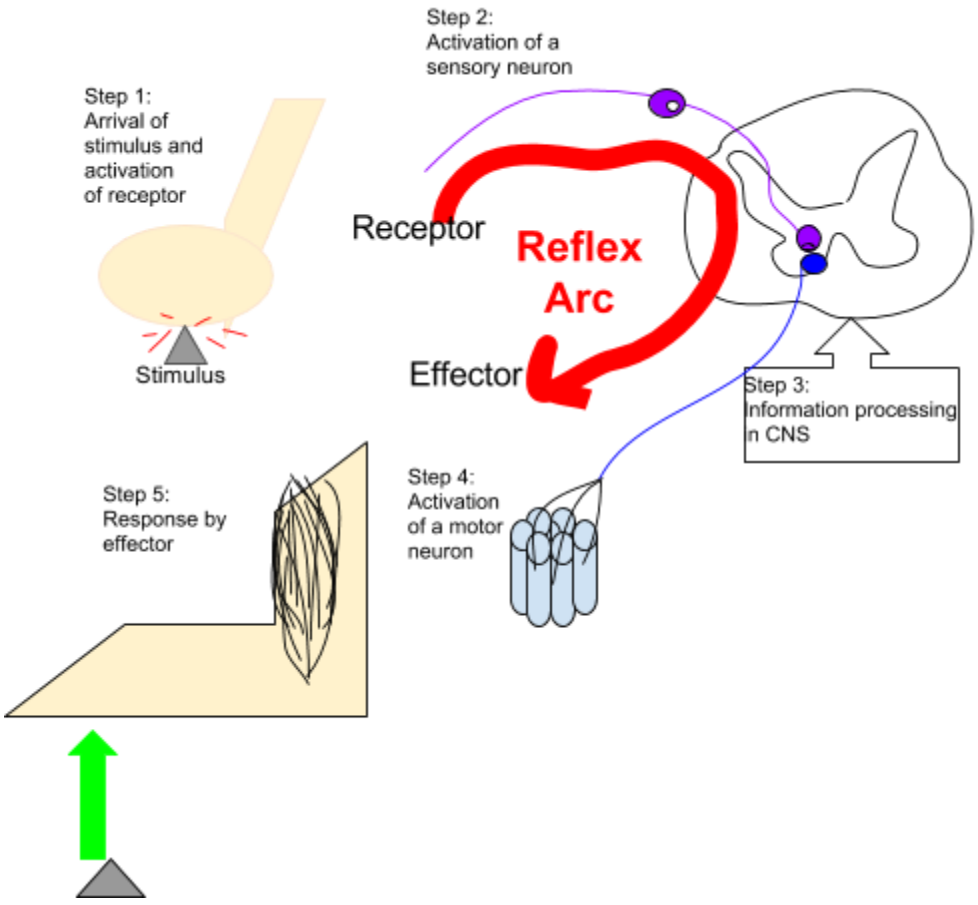

Figure 4. A reflex is an involuntary response to a stimulus, which begins with a sensory input, continues through one or more neuronal synapses, and terminates in a motor reaction. This is known as the Reflex Arc.

Reflex LAB data / observations

Test	Results (resting) Left	Right	Results	Comments
Biceps	+++	+++	Strong	Was easier to locate if you flexed
Triceps	+	+	Slightly felt	Could feel the tendon but couldn't apply enough force
Brachioradialis	+	+	Couldn’t find	Couldn't strike the hammer right
Hoffmann’s	++	++	Got a reaction	Wasn't a strong reaction but got a flinch
Patellar	+++	+++	Strong Reaction	Easiest to find
Achilles	++	++	Slight Reaction	Large Tendon
Babinski	++	++	Strong Negative Reaction	It tickled
Crossed Extensor	+++	+++	Strong Reaction	Never Realized that
Glabellar	+++	+++	Strong Reaction	Funny
Other				

We tested our biceps reflex, by testing the functions of cervical C5 and C6.WE located our partners tendon of the bicep brachii. we striked the tendon with our reflex mallet, the arm should contract. The tricep reflex tested the functions of C7 and C8. We located the biceps brachii muscle on our partners posterior arm. Though the patellar reflex test was my favorite. It is known as the knee jerk reflex. That was my most sensitive reflex. The patellar reflex tests the function of the L3, L4, and L2.