# Explain how Neurons Carry an Electrical Charge: Neurotransmitters

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Anatomy and Physiology

Steam project

Neurotransmitters are the chemical messengers in the body that are released at the end of a nerve fiber and travel across the synapse and cause the transfer of the electrical charge to a target cell. They communicate between nerves and muscles, glands, or other nerves. They help regulate things such as muscle contraction, heart rate, appetite, breathing, along with a plethora of other things. According to Encyclopedia of Neurological Sciences, “Characteristics of a neurotransmitter include its synthesis in the neuron, concentration in membrane enclosed vesicles at presynaptic terminals, release by neuron terminal depolarization, induced activity at the postsynaptic terminal as a consequence of receptor binding, and remove from the synapse to terminate the effect.” According to Medical News Today, “Neurotransmitters have three main types of actions they cause: Excitatory neurotransmitters encourage a target cell to take action, Inhibitory neurotransmitters decrease the chance of a target cell taking action, and Modulatory neurotransmitters can send messages to many neurons at the same time.

In my drawing the ship in the top portion represents the Axon terminal. The axon terminal is responsible for receiving the action potent and sending out the neurotransmitters into the synaptic cleft. According to Medical News Today, there are more than 100 types of neurotransmitters. I am going to talk about eight of the most common ones. Endorphins are your bodies natural pain relievers. They inhibit pain signals and also create an energetic state. Some activities can stimulate a release of this neurotransmitter. For example, a runner’s high is created when the body releases endorphins due to running long distances. Acetylcholine triggers muscle contractions, stimulates memory, and the brain, and releases hormones. Too much acetylcholine can cause seizures and muscle spasms. Too little of this neurotransmitter can cause memory loss and even lead to dementia. Dopamine is your feel-good neurotransmitter and is released during pleasurable activities. Noradrenaline is your concentration neurotransmitter. It enhances attention and action in the brain. Adrenaline is produced in stressful or exciting situations. It is also released when a person is scared and causes the fight or flight response. GABA is a calming neurotransmitter. It calms the firing of nerves and also contributes to motor control and vision, according to compoundchem.com. Glutamine is the main memory neurotransmitter. It is also the most common neurotransmitter. It is involved in learning and memory and creation of nerve contacts. The last neurotransmitter I will cover is Serotonin. Serotonin contributes to well being and happiness. It also helps regulate the sleep and digestive cycle.

The last part of my project and the nerve impulse process is the postsynaptic cell. This is the cell that receives the neurotransmitters sent from the axon. There are several types of cells that could receive signals. Muscles, glands, and even other nerves could be the target cells for the neurotransmitters. In my sketch the sea monster in the bottom portion of the picture is representing a postsynaptic cell about to receive the neurotransmitters.

**Bibliography**

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