

# Difference Between Neurons and Neurotransmitters

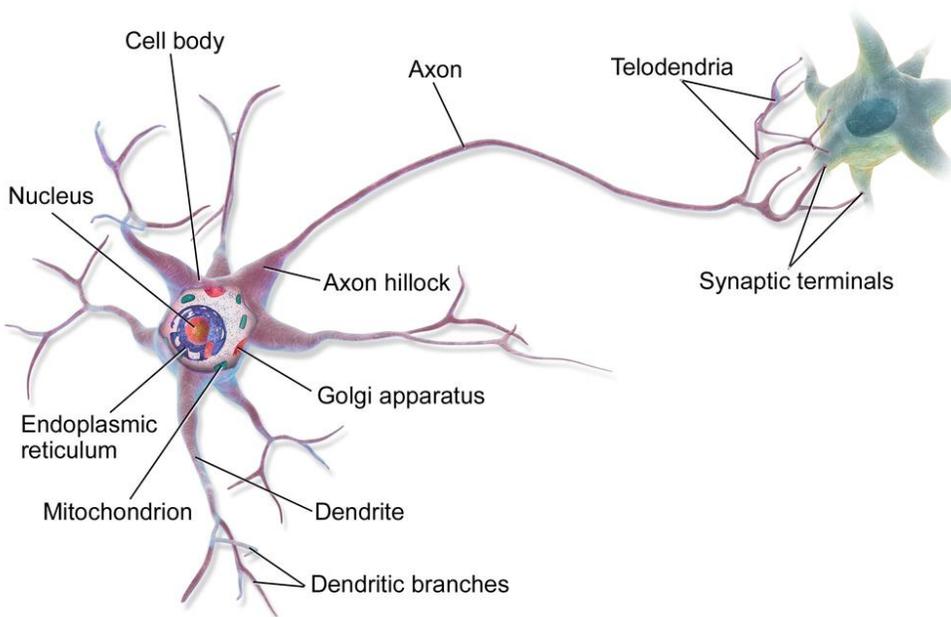
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## Key Difference - Neurons vs Neurotransmitters

The [nervous system](#) is the main system which records and distributes information within a person to communicate with the outside the body and control the mechanisms within the body. It is composed of a complex network of [neurons and glia](#) which transmits messages to and from the [brain](#) and [spinal cord](#). The nervous system can be divided mainly into two main components such as [central nervous system and peripheral nervous system](#). The peripheral nervous system consists primarily of specialized nerve cells called neurons. Neurons are the cells that transmit signals between different parts of the body with the connection of central nervous system (brain and spinal code). Neurons do not touch with each other. They use small biochemical molecules known as [neurotransmitters](#). Neurotransmitters are the chemical messengers which facilitate the signal transmission from one neuron to target neuron through the gap between neurons known as [synapse or synaptic cleft](#). The **key difference** between neurons and neurotransmitters is that **neurons are cells which transmits signal within the body while neurotransmitters are the chemical messengers which help neurons to transmit the signal through gaps between neurons**.

## What are Neurons?

A neuron is the basic functional unit of our nervous system. Neurons are specialized nerve cells which receive, processes and transmit information from the body to brain and back to the body. There are 10 to 100 billion neurons in our nervous system. Neurons do not regenerate. Approximately 10000 neurons die daily from our body.



## Figure 01: Neuron

A neuron is composed of three main components; cell body, [dendrites](#), and [axon](#). Dendrites receive messages from other neurons and pass via cell body to axons. Axons convert an electrical signal into chemical signal and transmit into the next neuron through the synapse using chemical messengers called neurotransmitters. Dendrites of the subsequent neuron convert chemical signal again into an electrical signal and pass along its axon to terminal buttons. Likewise, information is transmitted through neurons throughout the body into target [organs](#), [glands](#), [muscles](#) and into other neurons.

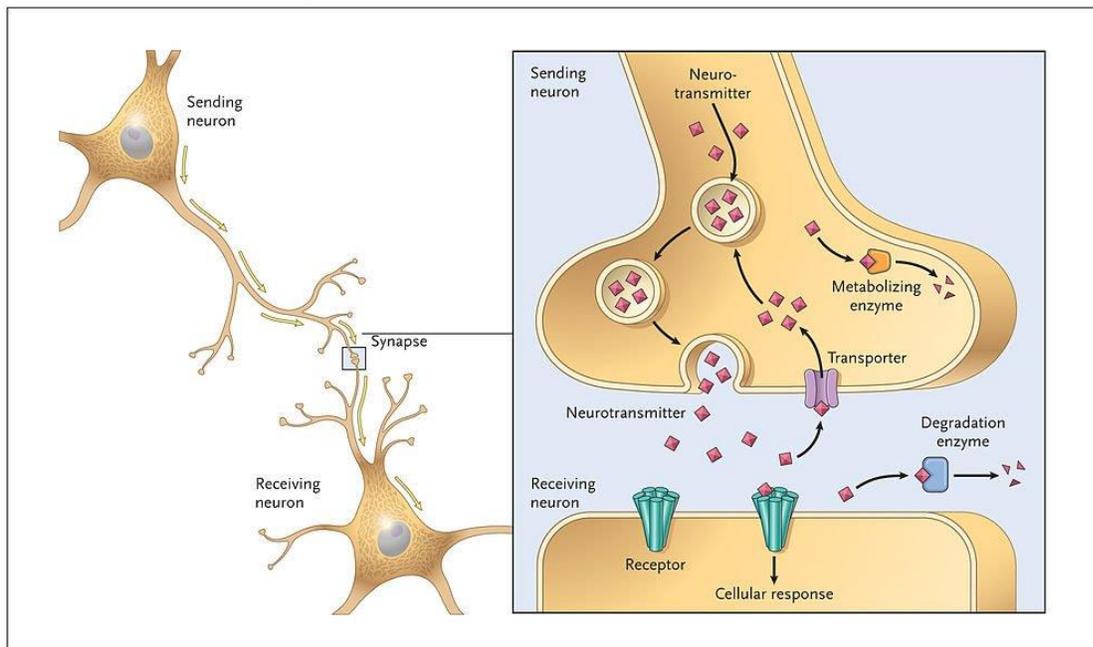
## What are Neurotransmitters?

Neurons are not connected to each other. Several neurons are involved in sending a signal to the target organ in our body. The message which is carried by the neurons passes correctly to the target neuron through the gap between neurons which is done by the special molecules called as chemical messengers in the nervous system. They are the neurotransmitters. The neurotransmitters are the chemical messengers of our nervous system which facilitate the signal transmission through the synapse or synaptic clefts. They are also the chemical messengers used by our brain. Enzymes synthesize them. Neurotransmitters are stored inside the [vesicles](#) near the presynaptic membranes (terminal buttons of the axon).

When the action potential reaches the presynaptic membrane, it stimulates the vesicles filled with neurotransmitters to fuse with the presynaptic membrane and release neurotransmitters into the synaptic cleft. Neurotransmitters bear the information which should be passed by the neurons. These neurotransmitters bind with the receptors in the postsynaptic membrane of the target neuron (most probably the postsynaptic end is a dendrite of another neuron). When neurotransmitters bind with postsynaptic receptors, it will create an effect or inhibit the effect in the postsynaptic neuron based on the type of the signal.

There are three destinations of released neurotransmitters. They can bind to postsynaptic receptors and create an effect, or they can bind with auto receptors and inhibit subsequent neurotransmitter release, or they can be reuptake by the presynaptic membrane and degraded by [enzymes](#).

## Generic Neurotransmitter System



**Figure 01: Neurotransmitters**

Neurotransmitters can be an [amino acid](#), [peptide](#) or monoamine. [Serotonin](#), Acetylcholine, [Dopamine](#), Norepinephrine, [Adrenaline](#), [Glutamate](#), Noradrenaline, [Epinephrine](#), [Endorphins](#), Gamma-Amino Butyric Acid (GABA) are several such neurotransmitters. Adrenaline is known as fight or flight neurotransmitter. Noradrenaline is known as concentration neurotransmitter. Dopamine is known as pleasure neurotransmitter. Serotonin is known as mood neurotransmitter. GABA is known as a calming neurotransmitter. Acetylcholine is known as learning neurotransmitter. Glutamate is known as memory neurotransmitter. Endorphins are euphoria neurotransmitters.

## What is the Similarity Between Neurons and Neurotransmitters?

- Neurons and neurotransmitters are involved in transmitting information within the body.

## What is the Difference Between Neurons and Neurotransmitters?

Neurons vs Neurotransmitters	
Neurons are the specialized cells of the nervous system that carry messages through an electro-chemical process called an action potential.	Neurotransmitters are the chemical messengers which send signals from one neuron to target neuron through the synapse or synaptic cleft.

Nature	
Neurons are cells.	Neurotransmitters are small biochemical molecules.
Structure	
Neurons are composed of dendrites, cell body with organelles and axon.	Neurotransmitters are molecules stored inside vesicles.
Main Function	
Neurons are designed to transmit information within the body.	Neurotransmitters are mainly involved in transmitting the chemical signal through the synapse (gaps between neurons).

### Summary - Neurons vs Neurotransmitters

Neurons are the basic functional units of the nervous system. They are the specialized cells which generate electrical signals and transmit information within the body. Neurons connect with the brain and spinal cord. Neurons do not touch with each other. There are gaps between neurons. These gaps are known as a synapse. Small biochemical molecules known as neurotransmitters facilitate the signal transmitted through the synapse. Neurotransmitters work as chemical messengers between neurons. Different types of neurotransmitters can be found in our body. The enzymes synthesize them, and they are stored within small vesicles. When the action potential reaches the presynaptic region, neurotransmitters are released from the vesicles into the synaptic cleft and mediate the passing of the information from one neuron to the other neuron. Both neurons and neurotransmitters are very important with concern to the signal transmission within our body. This can be described as the difference between neurons and neurotransmitters.

### Reference:

- 1.“Chapter 2: Section 2: Neurotransmitters.” AllPsych. [Available here](#)
- 2.“Neurons - National Library of Medicine - PubMed Health.” National Center for Biotechnology Information, U.S. National Library of Medicine. [Available here](#)
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APA: Difference Between Neurons and Neurotransmitters.(2017 December 11). Retrieved (date), from <http://differencebetween.com/difference-between-neurons-and-vs-neurotransmitters/>

MLA: "Difference Between Neurons and Neurotransmitters" Difference Between.Com. 11 December 2017. Web.

Chicago: "Difference Between Neurons and Neurotransmitters." Difference Between.Com. <http://differencebetween.com/difference-between-neurons-and-vs-neurotransmitters/> accessed (accessed [date]).



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