

**Nervous tissue**, also called **neural tissue** or **nerve tissue**, is the main [tissue](#) component of the [nervous system](#). The nervous system regulates and controls bodily functions and activity and consists of two parts: the [central nervous system](#) (CNS) comprising the [brain](#) and [spinal cord](#), and the [peripheral nervous system](#) (PNS) comprising the branching peripheral [nerves](#). It is composed of [neurons](#), or nerve [cells](#), which receive and transmit impulses, and [neuroglia](#), also known as glial cells or glia, which assist the propagation of the [nerve impulse](#) as well as provide [nutrients](#) to the neurons.

Nervous tissue is made up of different types of nerve cells, all of which have an [axon](#). An axon is the long stem-like part of the cell that sends [action potential](#) signals to the next cell. [Bundles of axons](#) make up the [nerves](#) in the PNS and [tracts](#) in the CNS.

Functions of the nervous system are [sensory input](#) integration, control of [muscles](#) and [glands](#), [homeostasis](#), and [mental activity](#).



## Structure

Nervous tissue is composed of [neurons](#), also called nerve cells, and [neuroglial cells](#). Four types of neuroglia found in the CNS are astrocytes, microglial cells, ependymal cells, and oligodendrocytes. Two types of neuroglia found in the PNS are satellite cells and Schwann cells. In the [central nervous system](#) (CNS), the tissue types found are [grey matter](#) and [white matter](#). The tissue is categorized by its neuronal and neuroglial components.

## Components]

Neurons are cells with specialized features that allow them to receive and facilitate nerve impulses, or [action potentials](#), across their membrane to the next neuron.<sup>[2]</sup> They possess a large cell body ([soma](#)), with cell projections called [dendrites](#) and an [axon](#). Dendrites are thin, branching projections that receive [electrochemical](#) signaling ([neurotransmitters](#)) to create a change in voltage in the cell. Axons are long projections that carry the action potential away from the cell body toward the next neuron. The bulb-like end of the axon, called the [axon terminal](#), is separated from the dendrite of the following neuron by a small gap called a [synaptic cleft](#). When the action potential travels to the axon terminal, neurotransmitters are released across the synapse and bind to the [post-synaptic receptors](#), continuing the nerve impulse. Neurons are classified both functionally and structurally.

Functional classification [Sensory neurons \(afferent\)](#): Relay sensory information in the form of an [action potential](#) (nerve impulse) from the PNS to the CNS

- [Motor neurons \(efferent\)](#): Relay an action potential out of the CNS to the proper effector (muscles, glands)
- [Interneurons](#): Cells that form connections between neurons and whose processes are limited to a single local area in the brain or spinal cord

Structural classification

- [Multipolar neurons](#): Have 3 or more processes coming off the [soma](#) (cell body). They are the major neuron type in the CNS and include interneurons and motor neurons.
- [Bipolar neurons](#): Sensory neurons that have two processes coming off the soma, one dendrite and one axon
- [Pseudounipolar neurons](#): Sensory neurons that have one process that splits into two branches, forming the axon and dendrite
- [Unipolar brush cells](#): Are [excitatory glutamatergic interneurons](#) that have a single short dendrite terminating in a brush-like tuft of dendrioles. These are found in the granular layer of the [cerebellum](#).

Neuroglia encompasses the non-neural cells in nervous tissue that provide various crucial supportive functions for neurons. They are smaller than neurons, and vary in structure according to their function

Neuroglial cells are classified as follows

- **Microglial cells:** Microglia are **macrophage** cells that make up the primary immune system for the CNS.<sup>[6]</sup> They are the smallest neuroglial cell.
- **Astrocytes:** Star-shaped **macroglial** cells with many processes found in the CNS. They are the most abundant cell type in the brain, and are intrinsic to a healthy CNS
- **Oligodendrocytes:** CNS cells with very few processes. They form **myelin sheaths** on the axons of a neuron, which are lipid-based insulation that increases the speed at which the action potential, can travel down the axon
- **NG2 glia:** CNS cells that are distinct from astrocytes, oligodendrocytes, and microglia, and serve as the developmental precursors of oligodendrocytes<sup>1</sup>
- **Schwann cells:** The PNS equivalent of oligodendrocytes, they help maintain axons and form myelin sheaths in the PNS
- **Satellite glial cell:** Line the surface of neuron cell bodies in **ganglia** (groups of nerve body cells bundled or connected together in the PNS)
- Enteric glia: Found in the **enteric nervous system**, within the gastrointestinal tract

## Classification of tissue]

In the **central nervous system**

- **Grey matter** is composed of cell bodies, dendrites, unmyelinated axons, protoplasmic astrocytes (astrocyte subtype), satellite oligodendrocytes (non-myelinating oligodendrocyte subtype), microglia, and very few myelinated axons.
- **White matter** is composed of myelinated axons, fibrous astrocytes, myelinating oligodendrocytes, and microglia.

In the **peripheral nervous system** **Ganglion** tissue is composed of cell bodies, dendrites, and satellite glial cells.

- **Nerves** are composed of myelinated and unmyelinated axons, Schwann cells surrounded by **connective tissue**.

The three layers of connective tissue surrounding each nerve are **Nervous tissue**, also called **neural tissue** or **nerve tissue**, is the main **tissue** component of the **nervous system**. The nervous system regulates and controls bodily functions and activity and consists of two parts: the **central nervous system** (CNS) comprising the **brain** and **spinal cord**, and the **peripheral nervous system** (PNS) comprising the branching peripheral **nerves**. It is composed of **neurons**, or nerve **cells**, which receive and transmit impulses, and **neuroglia**, also known as glial cells or glia, which assist the propagation of the **nerve impulse** as well as provide **nutrients** to the neurons.

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