

NERVE TISSUE:

Nervous Tissue

Nervous tissue is the primary tissue that composes the central nervous system and the peripheral nervous system. Neurons are the basic unit of nervous tissue. They are responsible for sensing stimuli and transmitting signals to and from different parts of an organism. In addition to neurons, specialized cells known as glial cells serve to support nerve cells. As structure and function are very much intertwined within biology, the structure of a neuron is uniquely suited to its function within nervous tissue.

Nervous Tissue: Neurons

A neuron consists of two major parts:

Cell Body

The central cell body contains the neuron's nucleus, associated cytoplasm, and other organelles.

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Nerve Processes

Nerve processes are "finger-like" projections from the cell body that are able to conduct and transmit signals. There are two types:

Axons - typically carry signals away from the cell body.

Dendrites - typically carry signals toward the cell body.

Neurons usually have one axon (can be branched however). Axons usually terminate at a synapse through which the signal is sent to the next cell, most often through a dendrite. Unlike axons, dendrites are usually more numerous, shorter and more branched. As with other structures in organisms, there are exceptions. There are three types of neurons: sensory, motor, and interneurons. Sensory neurons transmit impulses from sensory organs (eyes, skin, etc.) to the central nervous system. These neurons are responsible for your five senses. Motor neurons transmit impulses from the brain or spinal cord toward muscles

or glands. Interneurons relay impulses within the central nervous system and act as a link between sensory and motor neurons.

Bundles of fibers composed of neurons form nerves. Nerves are sensory if they consist of dendrites only, motor if they consist of axons only, and mixed if they consist of both.

Nervous Tissue: Glial Cells

Glial cells, sometimes called neuroglia, do not conduct nerve impulses but perform a number of support functions for nervous tissue.

Some glial cells, known as astrocytes, are found in the brain and spinal cord and form the blood-brain barrier. Oligodendrocytes found in the central nervous system and Schwann cells of the peripheral nervous system wrap around some neuronal axons to form an insulating coat known as the myelin sheath. The myelin sheath aids in the faster conduction of nerve impulses. Other functions of glial cells include nervous system repair and protection against microorganisms.



