



Types of Neurons

Neurons are the specialized cells in the central nervous system. Neurons are classified according to structure, shape and function. Each type of neuron has a specific role for the proper functioning of the brain and the spinal cord.

According to Shape

There are four major types of neurons based on their shape. Unipolar neurons are the most common neurons in invertebrates. These neurons are characterized by one primary projection that serves as both the axon and the dendrites.

Another type of neurons is the bipolar neurons, each having an axon that transmits signals from the cell body going to the brain and the spinal cord, and dendrites that send signals from the body organs to the cell body. These bipolar neurons are usually found in sensory organs such as the eyes, nose and ears.

Pseudo-unipolar neurons resemble unipolar neurons because each of them has an axon, but no true dendrites. However, pseudo-unipolar neurons are actually variants of bipolar neurons. The reason for this is that the single axon attached to the cell body proceeds to two opposite “poles” or directions – one towards the muscle, joints and skin, and the other towards the spinal cord. Pseudo-unipolar neurons are responsible for the sense of touch, pain and pressure.

Multipolar neurons are the dominating neurons in vertebrates in terms of number. These neurons are the ones that are the closest to the model neuron that we usually see in neuron structure diagrams. Each of them has a cell body, a long axon, and short dendrites.

According to Function

Neurons can also be classified based on their specific function. Sensory neurons are the neurons that harness information from the different sensory organs such as the eyes, nose, ears, tongue and skin. On the other hand, motor neurons transmit signals from the brain to the spinal cord to the muscles to initiate action or response to stimuli. Interneurons serves as connectors of neurons. Projection interneurons have long axons that join brain regions that are far from one another. Local interneurons feature shorter axons that create small circuits between near brain cells or regions.

Researchers also categorize neurons by function. Sensory neurons collect information from sensory organs—from the eyes, nose, tongue and skin, for example. Motor neurons carry signals from the brain and spinal cord to muscles. Interneurons connect one neuron to another: the long axons of projection interneurons link distant brain regions; the shorter axons

of local interneurons form smaller circuits between neighboring cells.

Unique Cells

There are dozens of neurons that possess very unique structures. Thus, researchers explain that there could be a hundred or more types of neurons ^[1] in the central nervous system. These unique brain cells include the pyramidal neuron that has a cell body featuring a triangular pyramid shape. Pyramidal neurons are found in the prefrontal cortex. Some other unique neurons include basket cells (cortical interneurons), double bouquet cells (inhibitory interneurons), spiny neurons (found in the striatum and cortex input receivers), chandelier neurons (inhibitory interneuron). and Purkinje cells (tree-like neurons located in the cerebellum).

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