

Anatomy and Physiology

FOR ENGLISH LANGUAGE LEARNERS

Chapter 5: The Nervous System Part 1

Structures of the Nervous System

The nervous system is comprised of the central nervous system (CNS) and the peripheral nervous system (PNS). The brain and the spinal cords are part of the CNS. The nerves and sensory receptors, such as eyes, ears, touch, smell, and taste are part of the PNS.

The Neuron

The major cell of the nervous system is the neuron. A neuron has three basic parts: the dendrites, which receive messages from other neurons; the cell body, which makes decisions; and the axon, which carries messages to the next neuron or to muscles.

Sending a Message

To send a message, two molecules, sodium and potassium, move in and out a neuron, and an electrical current forms between the cell's body and axon. When the electrical current reaches the end of an axon, it is in an area called the synaptic end bulb. There the electrical current stimulates small sacs, called vesicles, to release a neurotransmitter. This neurotransmitter jumps from the end of that axon to the dendrites of the next neuron. The space between the axon of one neuron and the dendrites of another neuron is called the synapse.

Nerve Organization

Nerves are comprised of bundles of neurons. Some neurons are myelinated. This means that they have fatty insulation on them. Messages travel faster on myelinated neurons because the electrical message skips over the myelination and lands on the non-myelinated parts.

Types of Nerves

There are two kinds of nerves: cranial (12 pairs) and spinal (31 pairs). There are three kinds of cranial nerves. 1. Sensory nerves travel from a sensory receptor to the brain. They are also known as afferent nerves. (**A**fferent nerves **a**pproach the CNS.) 2. Motor neurons travel from the CNS to the muscles. These are also called efferent nerves. (**E**fferent nerves **e**xit the CNS). Efferent and afferent nerves travel one way only. 3. Finally, there are mixed nerves. Mixed nerves carry messages both from the CNS to muscles and from the sensory receptors to the CNS. Spinal nerves are always mixed nerves.



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