Axon

An axon or nerve fiber; is a long, slender projection of a neuron, that typically conducts electrical impulses away from the neuron's cell body. The function of the axon is to transmit information to different neurons, muscles and glands. In certain sensory neurons (pseudounipolar neurons), such as those for touch and warmth, the electrical impulse travels along an axon from the periphery to the cell body, and from the cell body to the spinal cord along another branch of the same axon. Axon dysfunction causes many inherited and acquired neurological disorders which can affect both the peripheral and central neurons.

An axon is one of two types of protoplasmic protrusions that extrude from the cell body of a neuron, the other type being dendrites. Axons are distinguished from dendrites by several features, including shape (dendrites often taper while axons usually maintain a constant radius), length (dendrites are restricted to a small region around the cell body while axons can be much longer), and function (dendrites usually receive signals while axons usually transmit them). All of these rules have exceptions, however. Some types of neurons have no axon and transmit signals from their dendrites. No neuron ever has more than one axon; however in invertebrates such as insects or leeches the axon sometimes consists of several regions that function more or less independently of each other.

Most axons branch, in some cases very profusely.

Axons make contact with other cells—usually other neurons but sometimes muscle or gland cells—at junctions called synapses. At a synapse, the membrane of the axon closely adjoins the membrane of the target cell, and special molecular structures serve to transmit electrical or electrochemical signals across the gap. Some synaptic junctions appear partway along an axon as it extends—these are called en passant (“in passing”) synapses. Other synapses appear as terminals at the ends of axonal branches. A single axon, with all its branches taken together, can innervate multiple parts of the brain and generate thousands of synaptic terminals.

Axonal growth

Axonal growth