The Cell Body

Cell body) or *soma*, contains a large, round nucleus with a prominent nucleolus.

Perikaryon) the cytoplasm surrounding the nucleus. The cytoskeleton contains **neurofilaments** and **neurotubules**, which are similar to intermediate filaments and microtubules of other types of cells.

Neurofibrils) bundles of neurofilaments that extend into the dendrites and axon, providing internal support.

Dendrites and Axons

Dendrites) slender, sensitive processes, that extend out from the cell body. They play key roles in intercellular communication. **Dendritic spines** are the finger-like studs at the ends of dendrites.

Axon) a long cytoplasmic process capable of propagating an electrical impulse known as *action potential*.

Axoplasm) or cytoplasm of the axon, contains neurofibril prarultubules, small vesicles, lysosomes, mitochondria, and variou or veres.

Axolemma) special and portion of the place a nombrane, that surrounds the axoplasm. In the CNS is may be exposed in the constitution of the place are restitual fluid or, as we'll see, it may be covered by the cellular processes of neuroglia.

Interstitial segment) the base. Of the axon in a multipolar neuron, that joins the cell body to a...

Axon hillock) thickened region joined by the interstitial fluid.

Collaterals) branches along the length of the axon. They enable a single neuron to communicate with several other cells.

Telodendria (*terminal branches*)) fine extensions at the ends of axons. They in term end at the axon terminals.

Axon terminal) (synaptic terminals, synaptic knobs, and synaptic boutons) play a role in communication with another cell

The Synapse

Synapse) a specialized site where the neuron communicates with another cell.

Every synapse involves 2 cells:

- 1. *Presynaptic cell:* which sends a message and contains the axon terminal
- 2. *Postsynaptic cell:* which receives the message

The synaptic cleft separates the two cells

Neurotransmitters) chemicals released into the synaptic cleft. Inside the axon terminal, neurotransmitters are contained in *synaptic vesicles*.

Neuromuscular junction) a synapse between a neuron and a muscle cell

Neuroglandular junction) where a neuron controls of requires the activity of a sectory (gland) cell

Innervation) the distribution of se specific region or organ. m tor ne

Presyneptic nembrane) otransmitters are released

Postsynaptic membrane) where receptor for neurotransmitters are.

Kinesin and dynein) proteins "molecular motors" that pull materials along the length of the axon on neurotubules. They run on ATP

Axoplasmic transport) what the movement of material between the cell body (soma) and the axon terminal is called. This transport occurs in both directions.

Antergrade flow) the flow of materials from the cell body to the axon terminal, carried by kinesin \uparrow at the same time \downarrow

Retrograde flow) other substances are transported from the axon terminal *toward* the cell body, carried by dynein.

The Classification of Neurons

We can group neurons by structure or by function:

Neurons are classified as *anaonic*, *unipolar*, or *multipolar* on the basis of the relationship of the dendrites to the cell body and the axon.

- * Anaxonic: are small and have numerous dendrites, but no axons. Ananxonic neurons are located in the brain and special sense organs.
- Bipolar neurons: have 2 distinct processes 1 dendrite that branches exclusively into dendritic branches at its distal tip, and 1 axon---with cell body between the two. They are rare. They occur in special sense organs. They are small.
- ✤ Unipolar neurons: the dendrites and axon are continuous—basically, fused---and the cell body lies of to one side. The initial segment lies where the dendrites converge. Most sensory neurons of the PNS are unipolar. Their axon may extend a meter or more encircle at synapses in the CNS. The longest are from the toe tips to the spinal cord.
- Multipolar neurons: have 2 or more reactives and a single axon. They are most common neurons in the CNS. All mater reactions that control ckeletal deuscles, for example are multipolar neurons. Length is similar to that of unipolar neurons.

Functional Classification of Neurons

Neurons are categorized as:

- 1. Sensory neurons (10million or so)
- 2. Motor neurons
- 3. Interneurons

Sensory neurons) or *afferent neurons* form the afferent division of the PNS, deliver info from sensory receptors to the CNS. Their cell bodies are located in the peripheral *sensory ganglia*.

(Ganglion) a collection of neuron cell bodies in the PNS). Sensory neurons are unipolar neurons whose processes, known as afferent fibers, extend between a sensory receptor and the CNS, collect info about the external and internal environment. Sensory neurons are either processes of specialized sensory neurons or cells monitored by sensory neurons.

Chapter 12:

Facilitation

Facilitated) a neuron whose membrane potential shifts closer to threshold.

Summation of EPSPs and IPSPs

The antagonism between IPSPs and EPSPs is important in cellular information processing. EPSPs=info in, IPSPs = info out.

Presynaptic Inhibition and Presynaptic Facilitation

Axoaxonic synapse) axon-to-axon. A synapse occurs between the axons of 2 neurons.



The Rate of Generation of Action Potentials

In the nervous system, complex information is translated into action potentials that are propagated along axons.