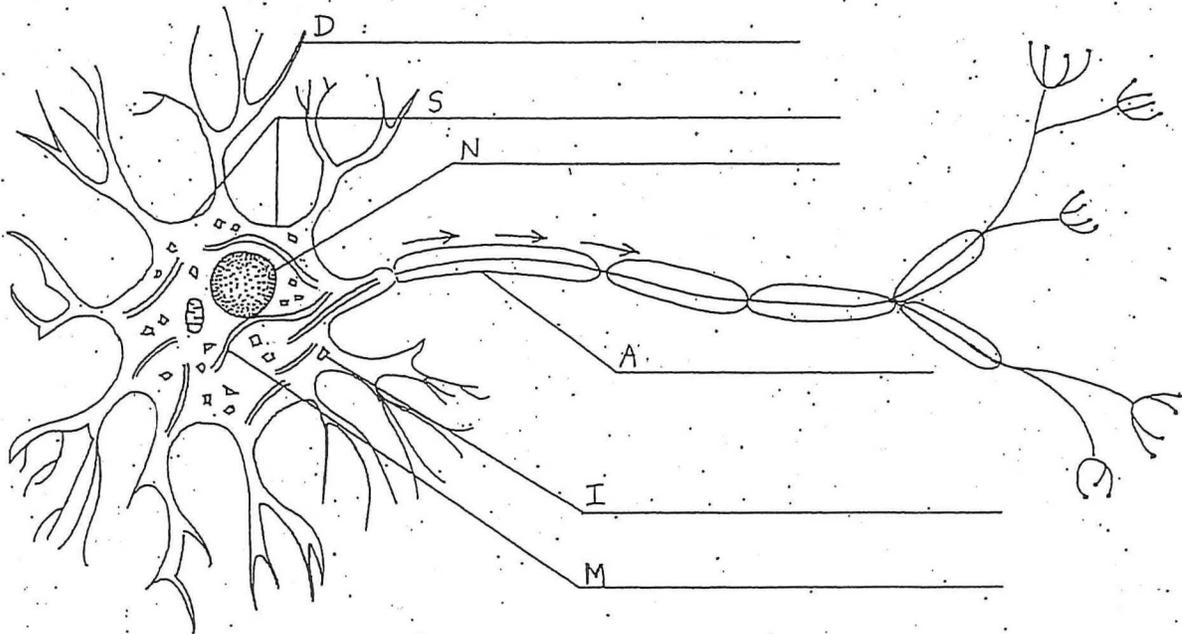


5-4. THE ANATOMY OF THE NEURON

Instructions: (1.) Carefully read the text. (2.) Use the descriptions to help you to label the diagram. (3.) Use the text and the descriptions to help you to answer the questions.



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Neurons are long, threadlike cells that carry electrochemical signals. Signals from the sensory organs may be perceived by the brain as sound, sight, smell, taste, touch, or pain; signals sent by the brain to the body may cause the skeletal muscles to contract, the internal organs to operate, or the glands to release their chemicals.

In many ways, a neuron is like an electric wire. Although electric wires and neurons carry signals in different ways, their basic jobs are the same; to carry electricity. An electric wire in a radio, for example, may carry signals from a transistor to a speaker, where the signals are changed into sound. Similarly, the neurons leaving your ears send electrochemical signals to a specific area of your brain so that you can hear the sound.

While completing this project, you will learn how to name the parts of a typical neuron.

Descriptions

1. The main part of the neuron is the cell body or soma. Like other cells, the soma contains cytoplasm, mitochondria, a nucleus, and other organelles. Arrow S points to the soma, and arrow N points to the nucleus. Locate these arrows on the diagram and label them.
2. Floating in the cytoplasm are irregularly shaped particles called "Nissl bodies"; scientists think that they are responsible for assembling proteins. Arrow I points to a Nissl body. Label arrow I "Nissl body."
3. The cytoplasm is filled with small tubes called "microtubules." Scientists think that these tubes carry proteins and other substances through the cell. Arrow M points to a microtubule. Label arrow M "microtubule."
4. The treelike structures on the soma are called "dendrites"; the term comes from a Greek word meaning "tree." Dendrites direct incoming electrochemical signals toward the soma. Arrow D points to a dendrite. Label arrow D "dendrite."
5. Incoming electrochemical impulses pass through the soma and leave the neuron through a long threadlike structure called the "axon." Although axons are microscopically thin, many can reach lengths of up to three feet or more. Arrow A points

Level One Questions:

1. Neurons are long threadlike cells that carry _____ signals.
2. When electrochemical signals are sent from the brain to a muscle, what might be the response?

3. The cell body of the neuron is also called the _____.
4. What do the Nissl bodies look like?

5. Scientists think that Nissl bodies are responsible for _____.
6. In what part of the soma are the microtubules located?

7. What do scientists think the microtubules do?

8. Where on the neurons are the dendrites located?

9. What is the job of the dendrite?

10. What is the job of the axon?

Level Two Questions:

11. The axon can reach lengths of three feet or more. In what way might this be important?

12. How is a neuron similar to an electric wire?

Level Three Questions:

13. If you look carefully, you will notice that the soma has a mitochondrion in it. What does the presence of mitochondria indicate?

14. There are three arrows on the diagram. What do you think these arrows show?

