

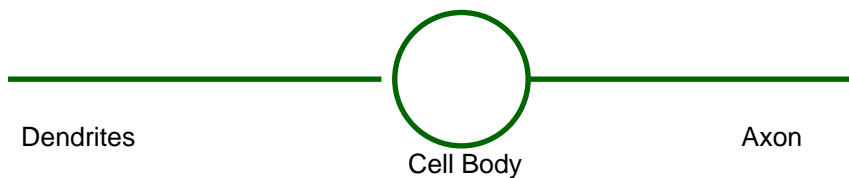
5.1.2 Neurons and Their Functions

Neurons are the basic structural and functional units of the nervous system. They are specialized cells that transmit electrical impulses throughout the body. Neurons help the body receive information, process signals, and respond to stimuli. Without neurons, communication within the body would not be possible.

1. Structure of a Neuron

A neuron has three main parts: **Dendrites**: Receive messages from other neurons or sensory organs. **Cell Body**: Contains the nucleus and controls neuron activities. **Axon**: Carries electrical impulses away from the cell body. Some neurons are covered with a fatty layer called the myelin sheath. The myelin sheath increases the speed of impulse transmission.

Figure 1: Structure of a Neuron



2. Functions of Neurons

Neurons perform important functions in the human body: They carry information from sense organs to the brain. They transmit commands from the brain to muscles and glands. They help the body react quickly to changes in the environment. They support learning, memory, and thinking processes.

3. Types of Neurons

There are three main types of neurons: **Sensory Neurons**: Carry messages from sensory receptors to the central nervous system. **Motor Neurons**: Carry commands from the brain and spinal cord to muscles and glands. **Relay Neurons**: Connect sensory and motor neurons inside the central nervous system.

4. Transmission of Nerve Impulses

Neurons communicate through electrical signals called nerve impulses. The impulse travels along the neuron from dendrites to the axon. At the end of the axon, chemicals called neurotransmitters pass the message to another neuron across a synapse. This process allows the nervous system to coordinate body activities quickly.

5. Importance of Neurons

Neurons are very important because they: Help humans think and remember information. Control movement and body coordination. Allow communication between different body parts. Enable reflex actions and quick responses. Damage to neurons can affect body movement, memory, and sensation.

6. Examples of Neuron Activities

Feeling pain after touching a hot object. Moving the hand after receiving a signal from the brain. Blinking the eyes automatically. Remembering information during examinations.

7. Summary

Neurons are specialized nerve cells. They carry electrical impulses throughout the body. The main parts of a neuron are dendrites, cell body, and axon. There are sensory, motor, and relay neurons. Neurons are important for communication and coordination.

8. Questions and Answers

1. What is a neuron?

A neuron is a specialized nerve cell that carries electrical impulses.

2. What are dendrites?

Dendrites are parts of neurons that receive messages.

3. What is the function of the axon?

The axon carries impulses away from the cell body.

4. Name the three types of neurons.

Sensory neurons, motor neurons, and relay neurons.

5. What is a nerve impulse?

A nerve impulse is an electrical signal transmitted through neurons.

6. What is the role of neurotransmitters?

They transfer messages across synapses.

7. Why are neurons important?

They help communication, coordination, memory, and body responses.

Conclusion

Neurons are essential cells of the nervous system. They help the body receive information, process signals, and respond to stimuli. Understanding neurons helps students learn how the nervous system controls the human body.