Neuron Structural Functional Unit Neural System

Research Report

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- A neuron is the structural and functional unit of the neural system.
- It is a microscopic, highly specialized cell designed to receive, conduct, and transmit electrical impulses.
- Each neuron has three main parts:
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- · Central part of the neuron.
- · Contains:
- Cytoplasm
- Cell organelles like nucleus, mitochondria, etc.
- Special granular structures called Nissl's granules:
- Made of rough endoplasmic reticulum and ribosomes.
- Important for protein synthesis in neurons.
- This is the **metabolic centre** of the neuron.
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- Short, branched projections coming out from the cell body.
- Contain Nissl's granules.
- **Function:** Receive nerve impulses (stimuli) from other neurons or sensory receptors and **carry them towards the cell body**.
- Think of them as antennae that pick up signals.

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⋈ 3. Axon:

- A **long, singular fibre** that arises from the cell body.
- Unlike dendrites, the axon does not contain Nissl's granules.
- Its distal (far) end branches out, and each branch ends in a bulb-like structure called the synaptic knob.

➤ Synaptic Knob:

- Present at the end of the axon branches.
- Contains **synaptic vesicles** which store **neurotransmitters** the chemicals that transmit signals to the next neuron or muscle cell.

➤ Function of Axon:

- Conducts **nerve impulses away** from the cell body.
- Transmits signals to:
- Another **neuron** through a **synapse** (neuron-to-neuron junction),
- Or to a muscle cell through a neuromuscular junction.
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Summary Table:

Part Structure Function
Cell Body (Soma) Contains nucleus, cytoplasm, Nissl's granules Controls metabolism and processes signals
Dendrites Short, branched, contain Nissl's granules Carry impulses towards cell body

| **Axon** | Long fibre, ends in synaptic knobs | Carries impulses **away** from cell body |

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⋈ Key Terms:

- NissI's granules: Unique to neurons, involved in protein synthesis.
- Synaptic knob: End of axon branch, releases neurotransmitters.
- **Neurotransmitters**: Chemicals that pass the signal to the next neuron/muscle.

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Let me know if you want a labeled diagram or a flowchart for quick revision!