

MIE-3

Topic - propagation of nerve impulse

propagation of a nerve impulse is the process by which an electrical signal i.e. action potential travels along a neuron from the point of stimulation to the axon terminals.

(1) Resting potential

- At rest, a neuron has a negative charge inside (-70 mV) compared to outside.
- This is due to more Na^+ ion outside and more K^+ ion inside.
- This is maintained by the sodium-potassium pump i.e. 3Na^+ out 2K^+ in.

(2) Action potential

When a stimulus is strong enough there are three events occur

(a) Depolarization: -

- Na^+ channels open
- Na^+ rushes inside the neuron
- Inside becomes positively charged ($+30\text{ mV}$)

Teacher's Signature: _____

(b) Repolarisation

- 7 Na⁺ channels close
- 7 K⁺ channels close
- 7 K⁺ moves out of the neuron
- 7 Membrane returns to negative charge.

(c) Hyper polarization

- 7 Excess K⁺ exits

7 Membrane becomes slightly more negative than resting potential

propagation along the Axon

7 Depolarization at one point triggers depolarize in the next segment

7 This continues along the axon like a wave

7 The impulse moves in one direction only due to the refractory period.

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Conduction of Nerve Impulse

S#11

