

Outline the physiology of excitation and conduction in nerve axons (60% of marks). List the factors which delay axonal conduction (40% of the marks).

### Neurons

Demonstrate excitability

is the ability to generate a large rapid potential change from a small stimulus

Has a resting membrane potential

based on a semi permeable membrane

maintained by the Na.K.ATPase pump

measured by the Nernst potential

Has threshold characteristics

upon reaching a defined threshold there is all or none behaviour exhibited

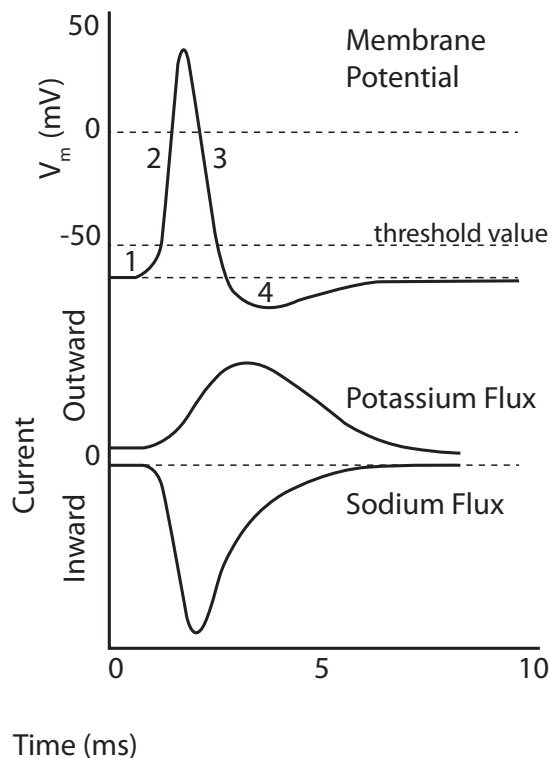
Have a refractory period

### Action potentials

rapid stereotyped event caused by a trigger

threshold value is met, there is a rapid opening of sodium channels and depolarisation

after a brief delay potassium channels also open repolarising the neuron



### Axonal conduction

characterised by a propagation of action potentials

there is no decrement, the AP maintains size and shape

conduction is delayed by

axon diameter - thinner axons delay conduction (age, pathology)

absence of myelination - will slow conduction (MS)

nodes of ranvier - absence will slow conduction

temperature - hypothermia delays conduction

ECF composition - increased magnesium, hyponatraemia