

Electrical Signals within the Nervous System

Electrical Signals within the NS

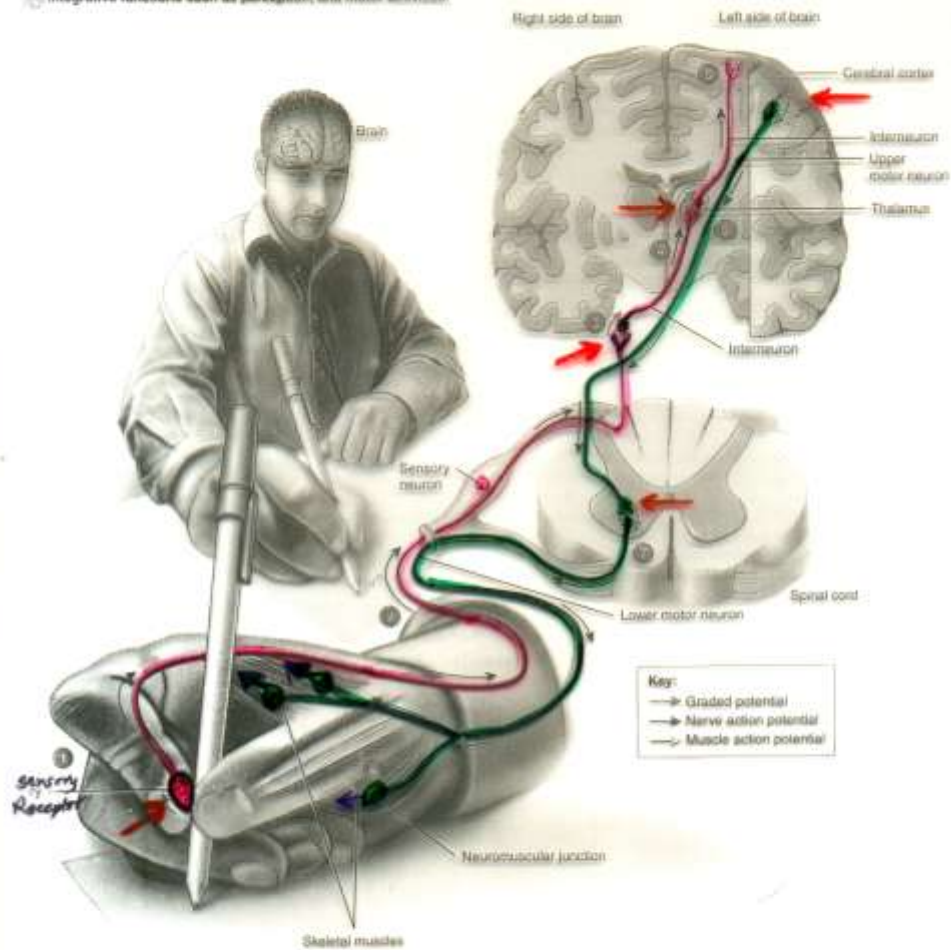
1-Action potential

2-Electrotonic(graded) potential

12.10 Overview of nervous system functions.

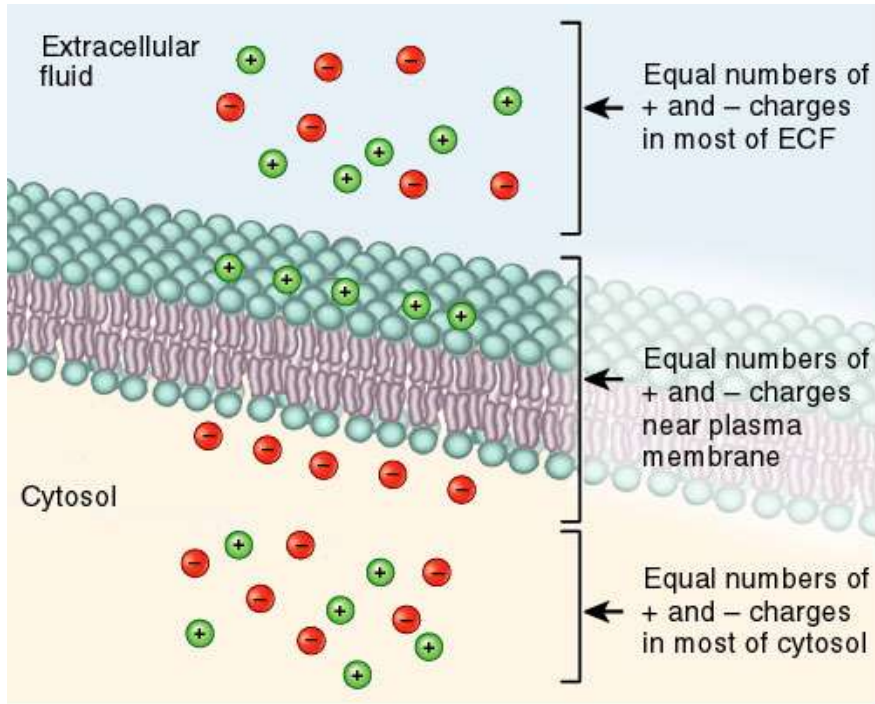
Included potentials and nerve and muscle action potentials are involved in the relay of sensory stimuli.

Integrative functions such as perception, and motor activities.

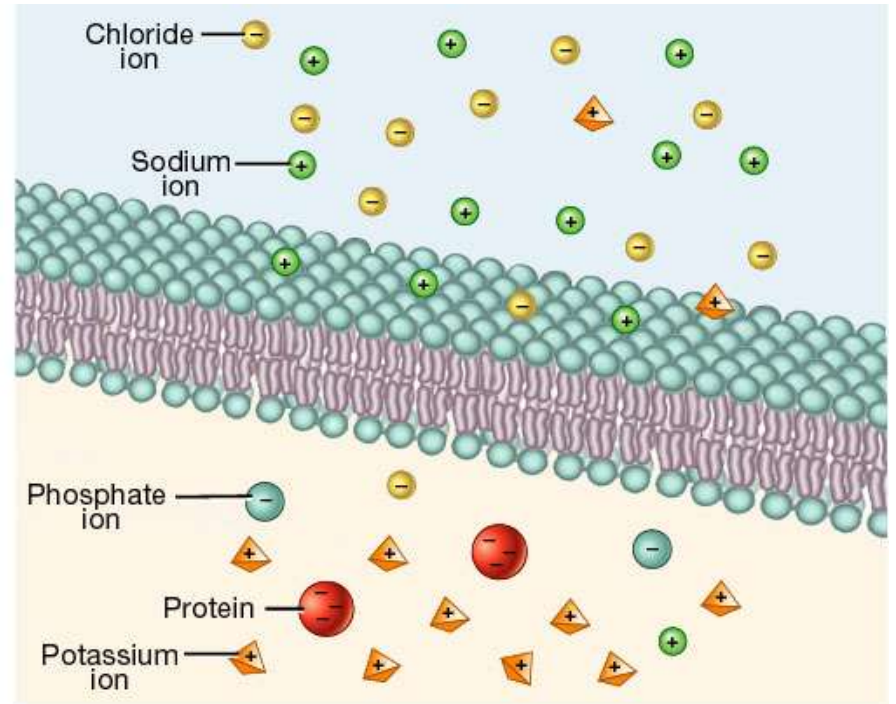


In which region of the brain does perception primarily occur?

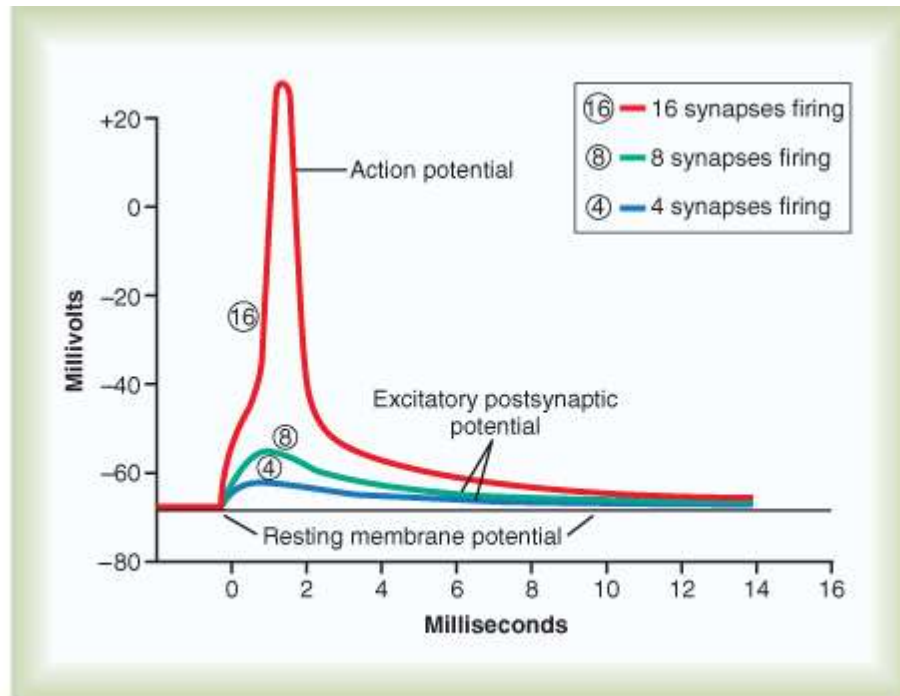
Fig. 12.09a,b

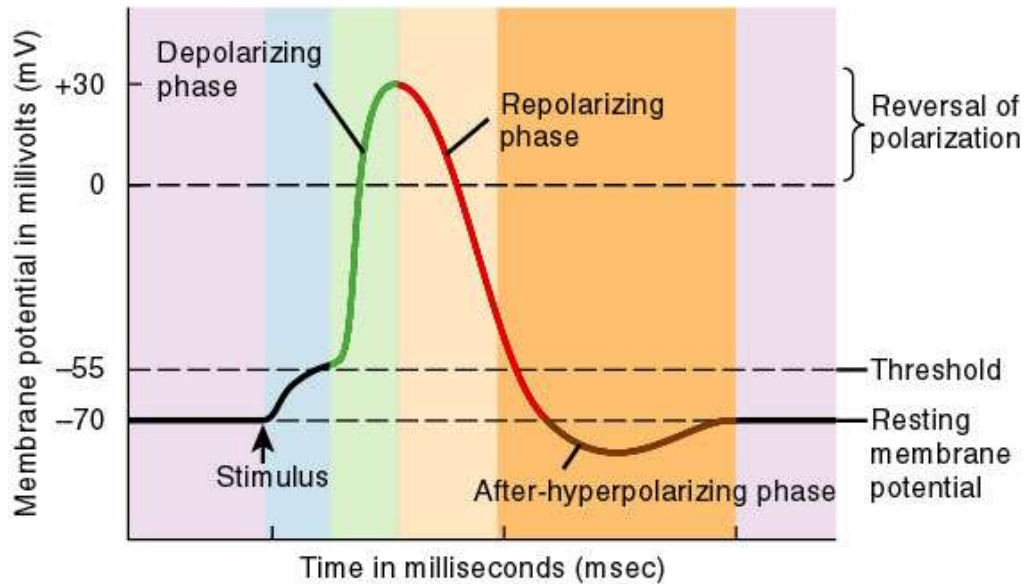
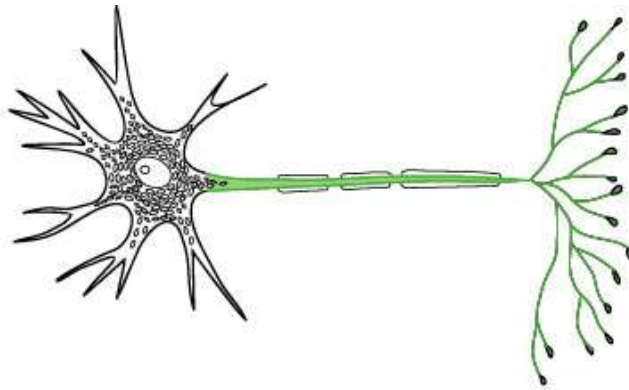


(a) Distribution of charges



(b) Distribution of ions

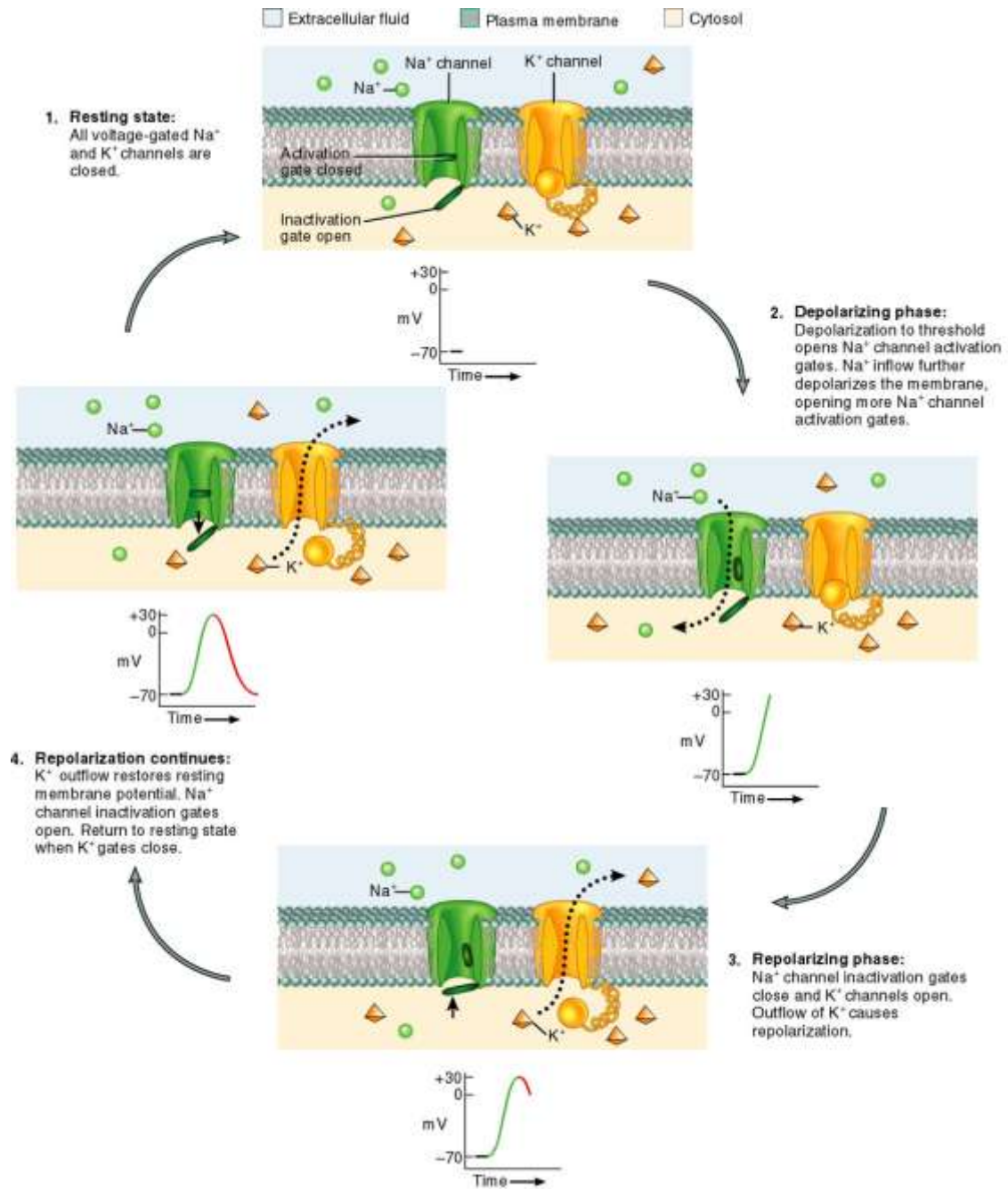


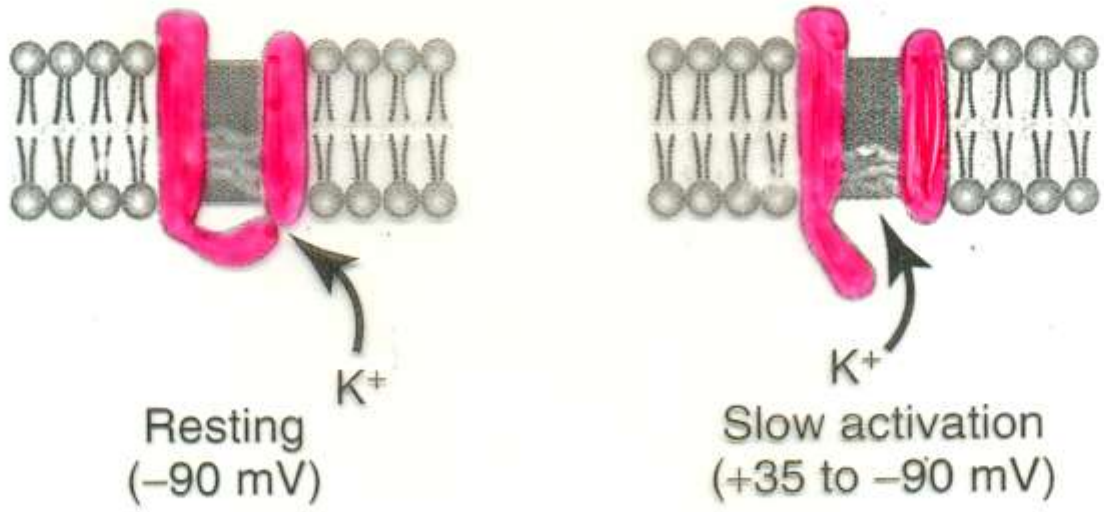
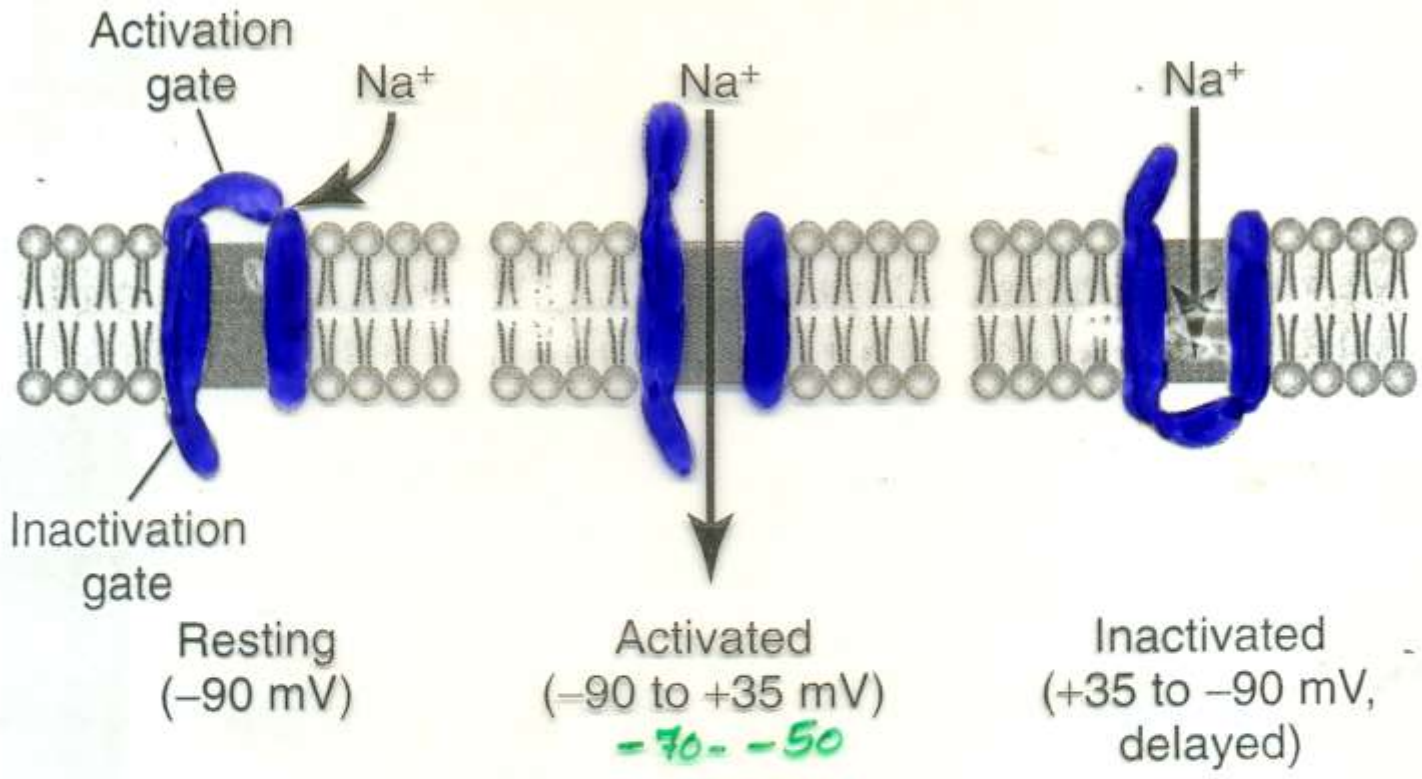


Key:

- Resting membrane potential: Voltage-gated Na^+ channels are in the resting state and voltage-gated K^+ channels are closed
 - Stimulus causes depolarization to threshold
 - Voltage-gated Na^+ channel activation gates are open
 - Voltage-gated K^+ channels are open; Na^+ channels are inactivating
 - Voltage-gated K^+ channels are still open; Na^+ channels are in the resting state
- } Absolute refractory period
- } Relative refractory period

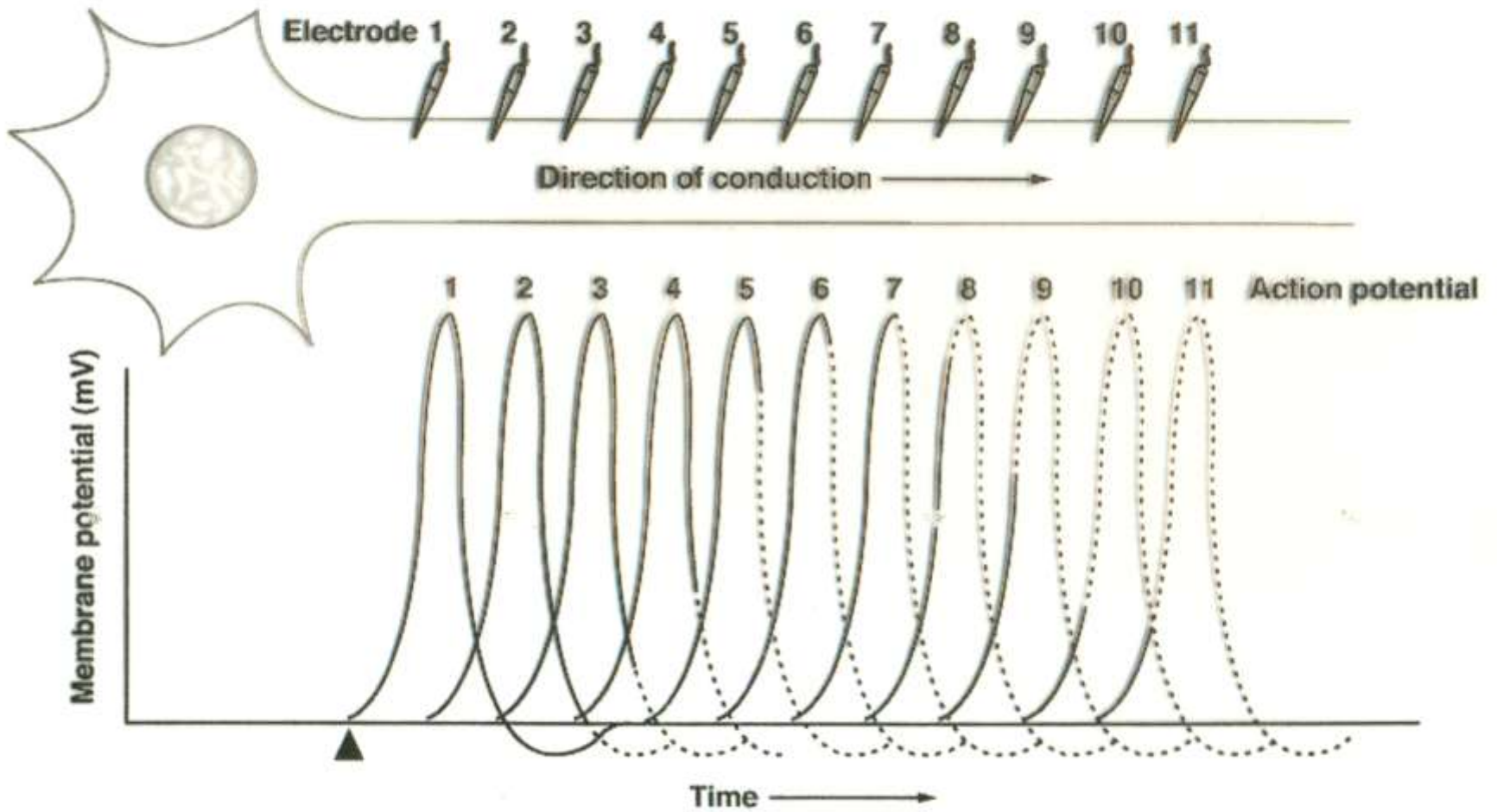
Fig. 12.12



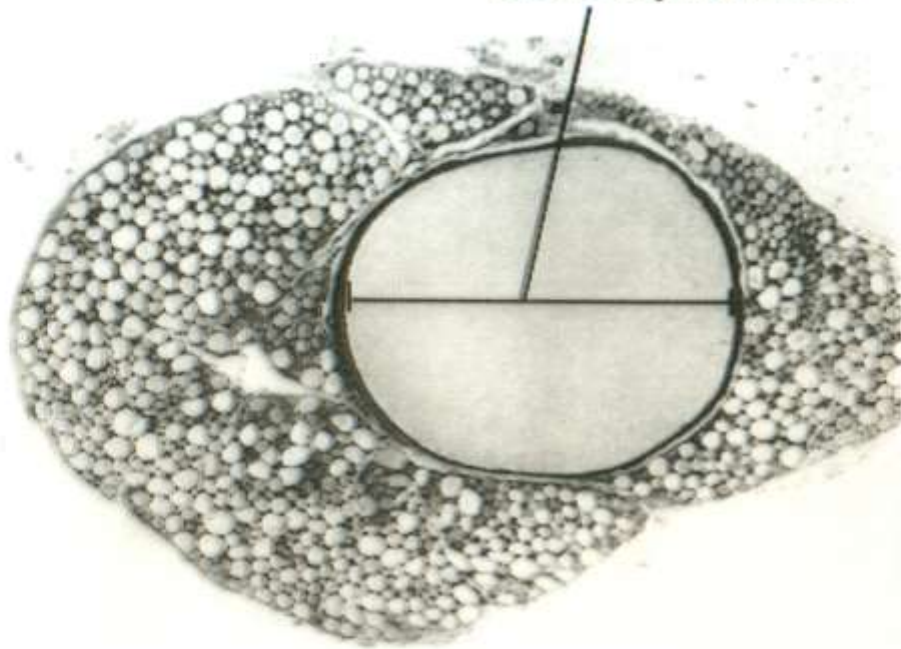


Inside

propagate



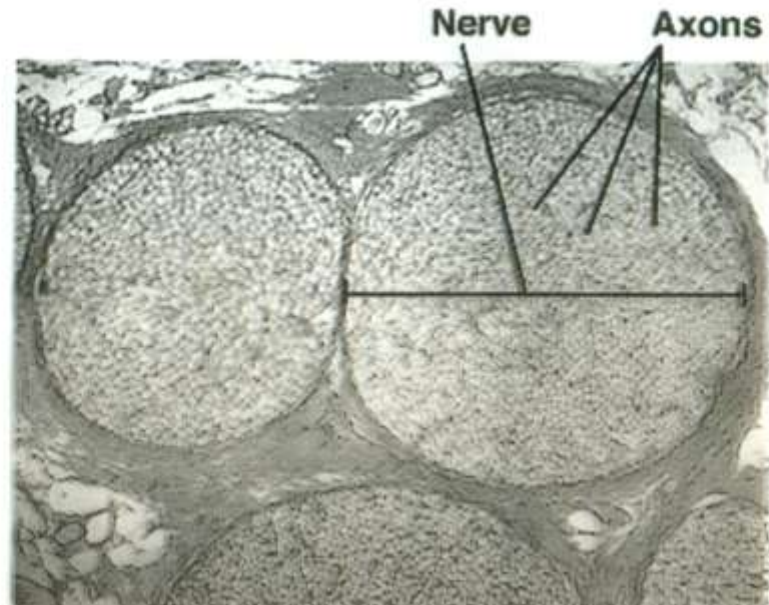
Giant squid axon



**One giant
axon from
a squid**



0.8 mm diameter

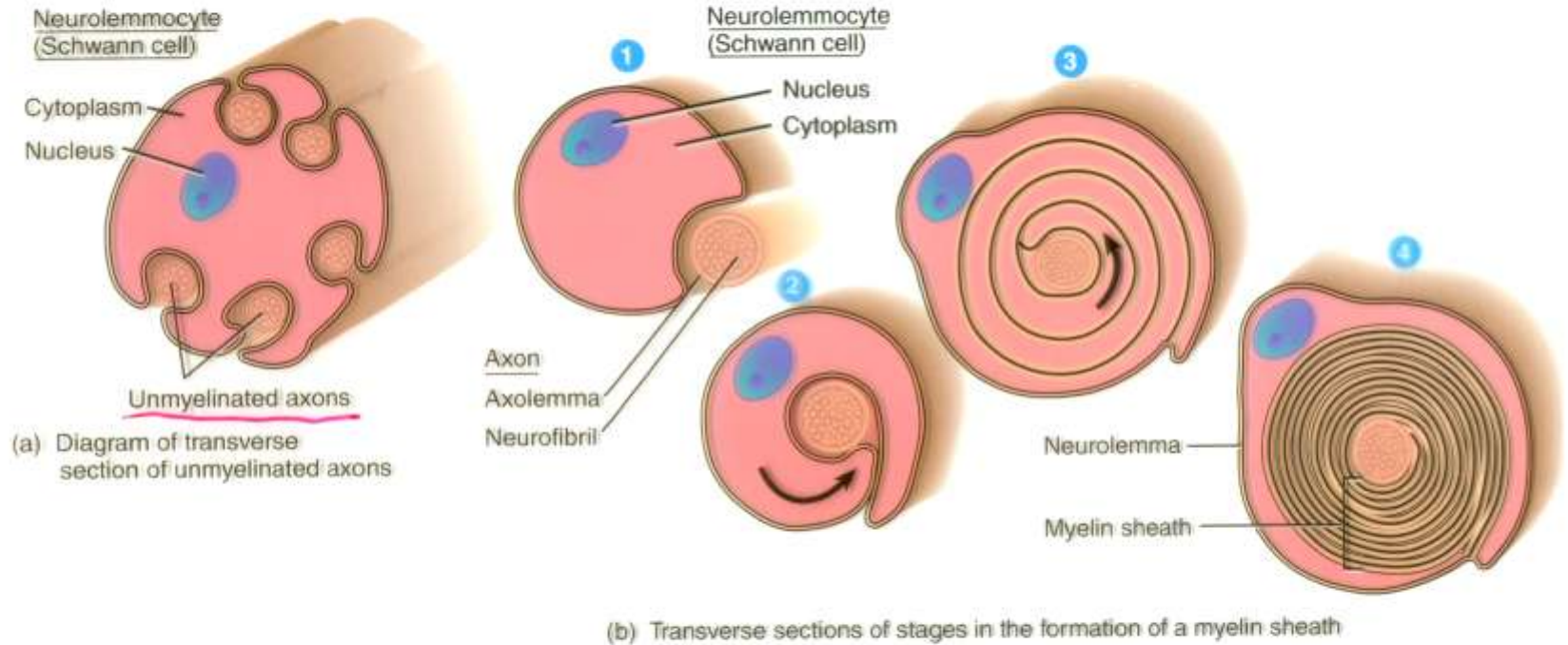


400 myelinated
mammalian axons

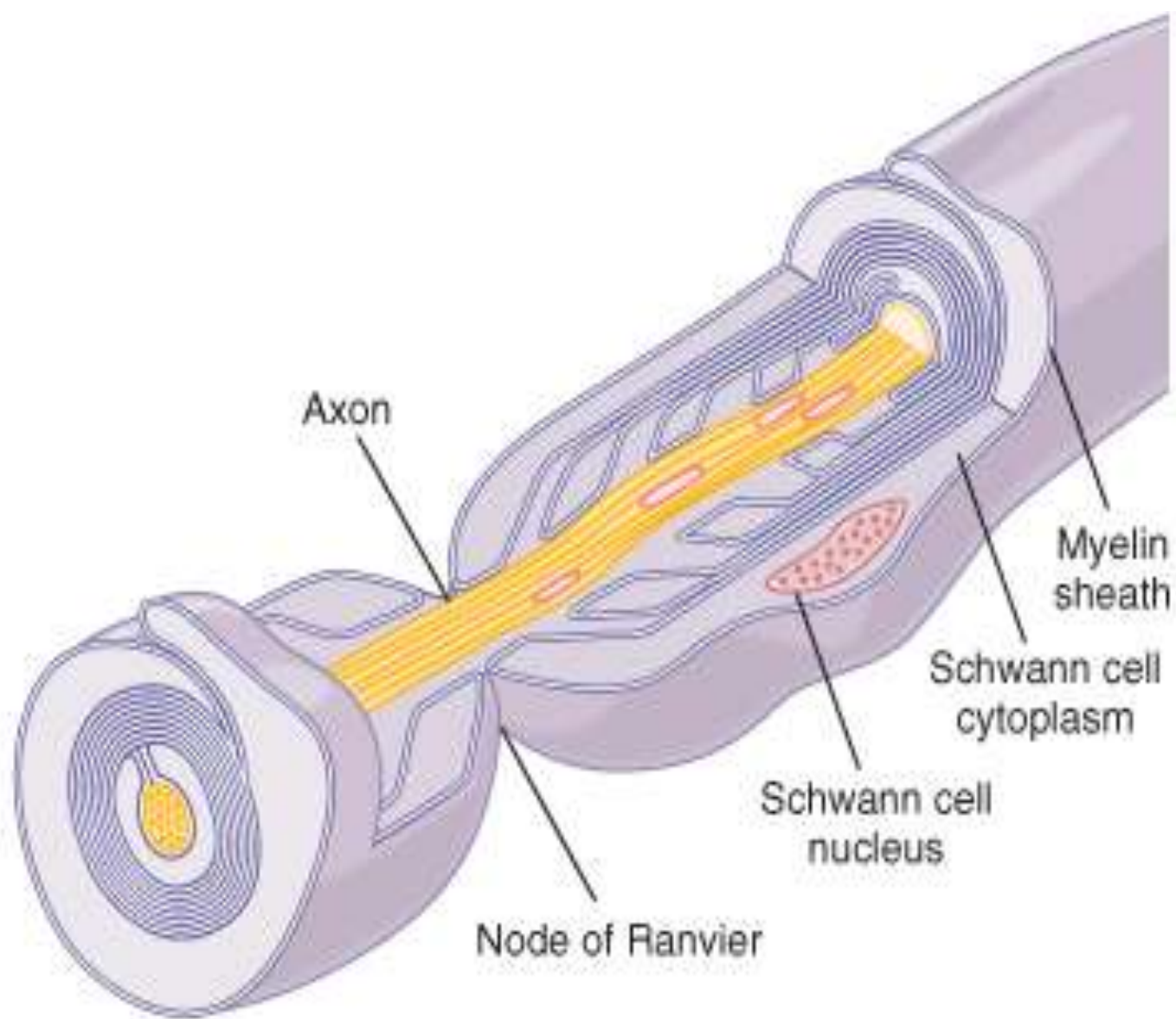


16 mm

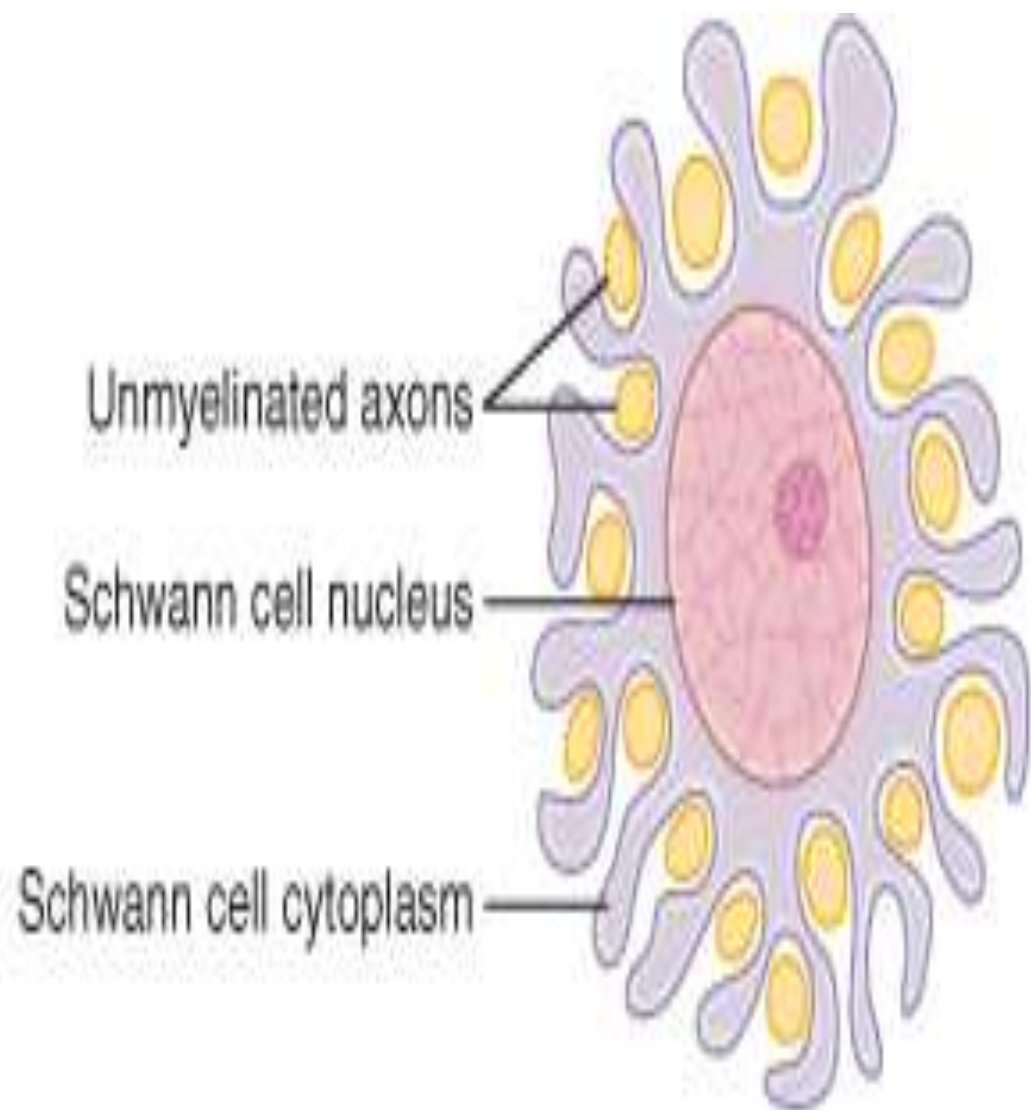
would require a nerve this size
if each mammalian axon were
the size of a squid giant axon



myelinated



A



B