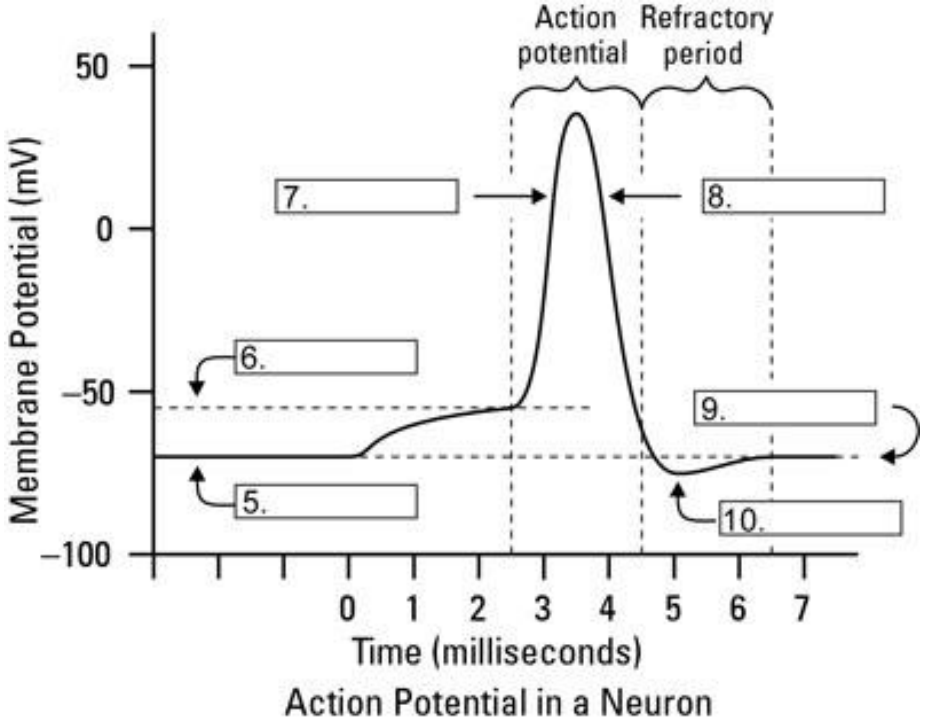
Physiology Review

Use the following figures to answer the questions.

1. During resting membrane potential, is the concentration of sodium ions higher inside the cell or outside the cell?
2. During resting membrane potential, is the concentration of potassium ions higher inside the cell or outside the cell?
3. Why is the inside of the cell slightly more negative than the outside of the cell?
4. What is the electrical potential across the membrane of a neuron at rest in mV?
5. What is the minimum amount of stimulus called to start an action potential?
6. What do scientists call it when a neuron becomes less negative? What event causes the cell to become less negative on the inside?
7. What causes the movement of the action potential down a neuron? What part of the neuron is this occurring in?
8. What is it called when a neuron returns to the resting membrane potential? What two events occur in the neuron to achieve this? (Describe the second event in detail)
    a. What type of transport is each of the two events?
9. What is it called when a neuron overshoots the resting membrane potential?
10. Fill in the following numbers on the diagram.



Action Potential in a Neuron

11. When two neurons communication with each other, what is the next step after the action potential reaches the axon terminal?
12. What is the role of Ca2+ in cell communication?
13. What is the role of neurotransmitters in cell communication? Where will the neurotransmitters attach to on the post-synaptic neuron once it is released?
14. What is the space called between the two cells?
15. What is the end result that occurs on the post-synaptic cell?

Figure 1

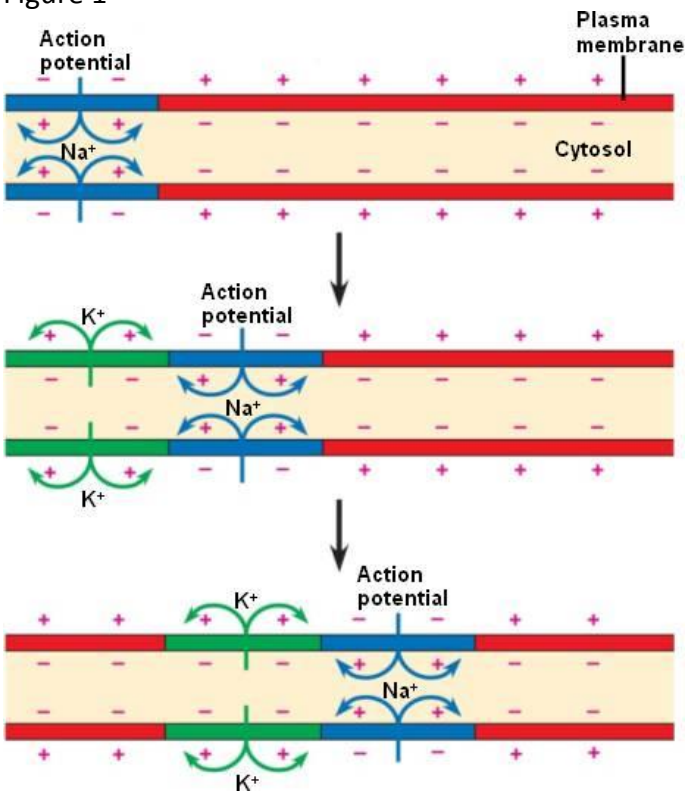
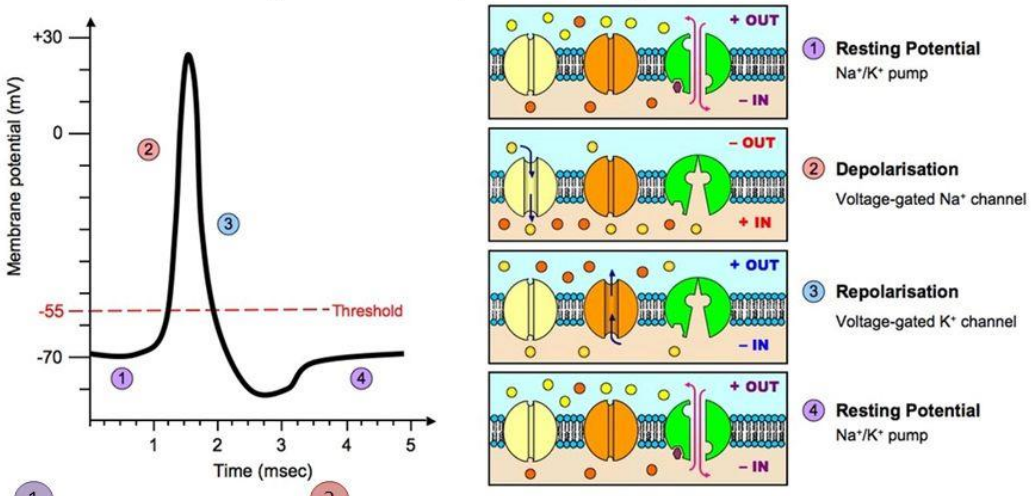


Figure 2

6.5.U4 An action potential consists of depolarization and repolarization of the neuron.

Action potential is the reversal (**depolarization**) and restoration (**repolarization**) of the membrane potential as an impulse travels along it.



1 The sodium-potassium pump (Na+/K+ pump) maintains the electrochemical gradient of the **resting potential**. Some K+ leaks out of the neuron (making the membrane potential negative, -70mv).

2 In response to a stimulus (e.g. change in membrane potential) in an adjacent section of the neuron some voltage gated Na^+ channels open and sodium enters the neuron by diffusion. If a sufficient change in membrane potential is achieved (threshold potential) all the voltage gated Na^+ channels open. The entry of Na^+ causes the membrane potential to become positive (**depolarisation**)

http://www.ib.bioninja.com.au/_Media/action_potential_med.jpeg

Figure 3

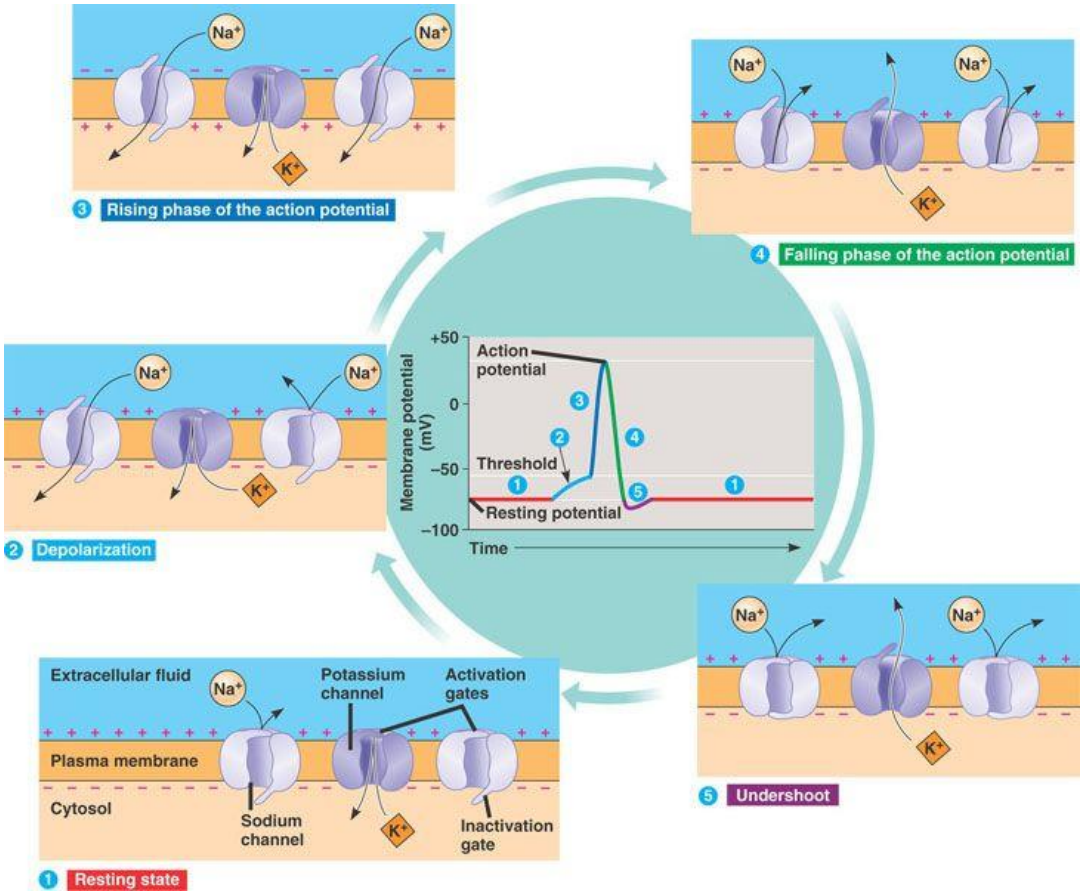


Figure 4

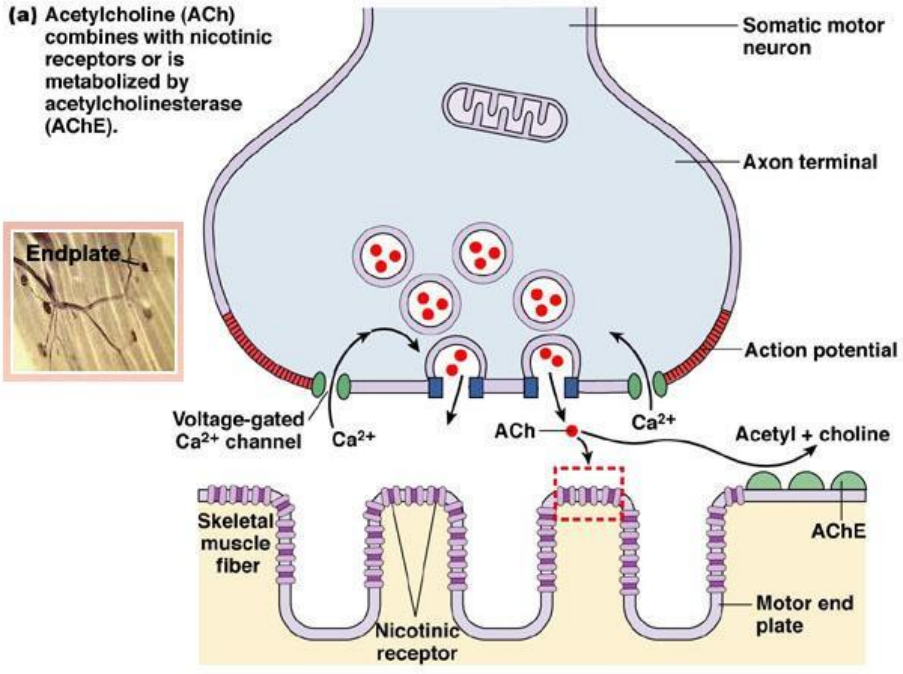
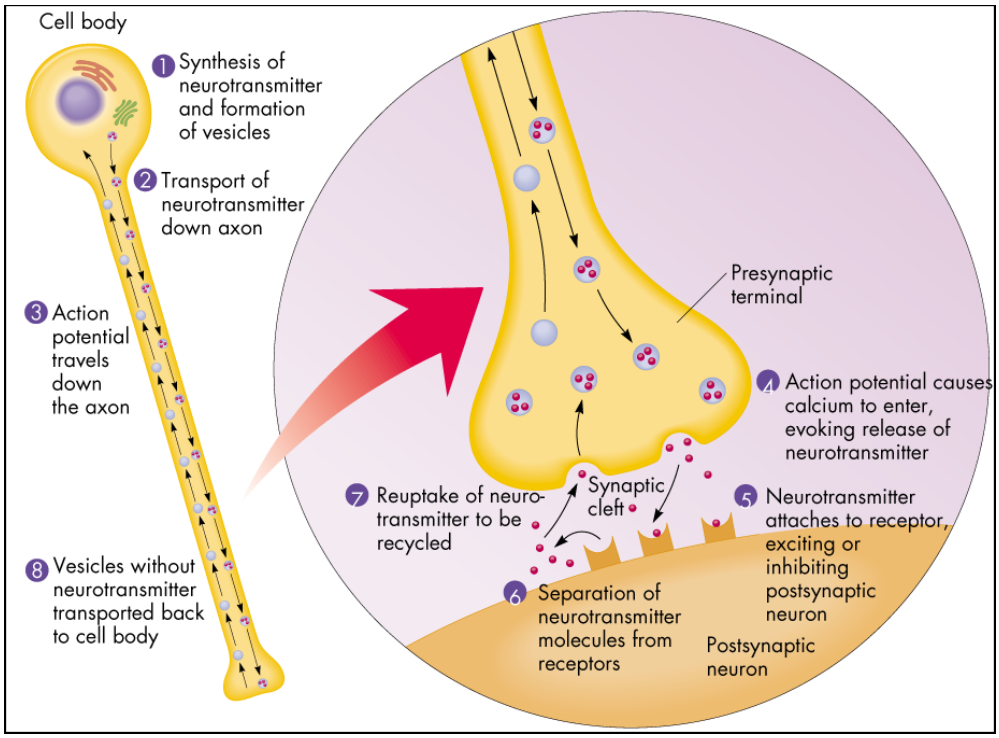


Figure 11-13

Figure 5


Cell body
1 Synthesis of neurotransmitter and formation of vesicles
2 Transport of neurotransmitter down axon
3 Action potential travels down the axon
8 Vesicles without neurotransmitter transported back to cell body
Presynaptic terminal
4 Action potential causes calcium to enter, evoking release of neurotransmitter
Synaptic cleft
5 Neurotransmitter attaches to receptor, exciting or inhibiting postsynaptic neuron
6 Separation of neurotransmitter molecules from receptors
7 Reuptake of neurotransmitter to be recycled
Postsynaptic neuron