

Module 7

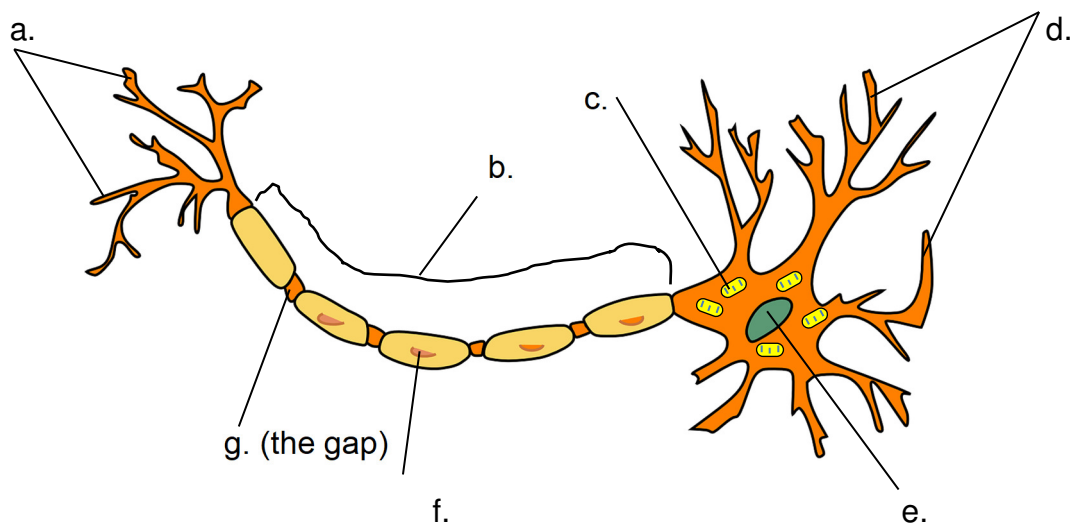
A & P

Assignment #1

Read pages 181 – 198.

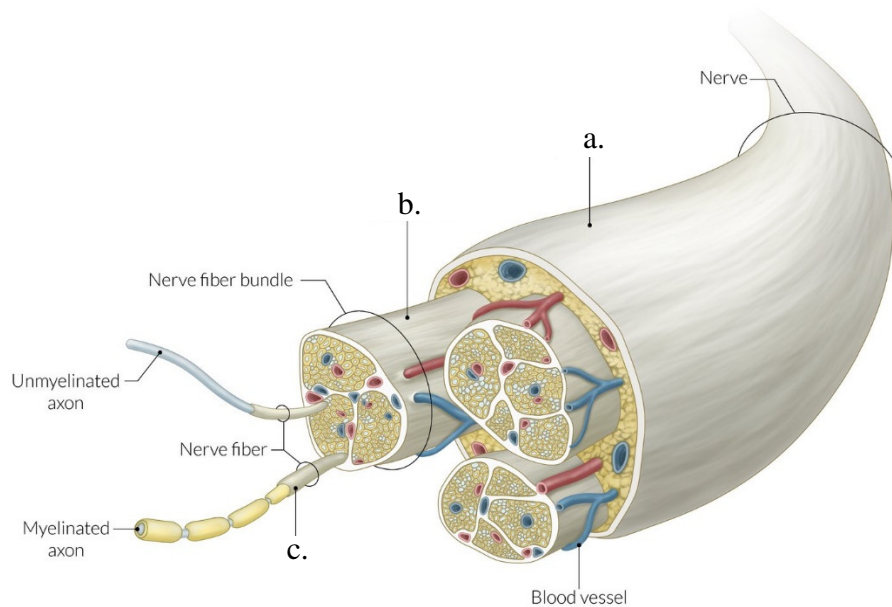
Write the answers on your own paper, not on this sheet.

1. Define the following terms:
 - a. Nerves
 - b. Ganglia
 - c. Spinal nerves
 - d. Cranial nerves
 - e. Afferent nerves
 - f. Efferent nerves
 - g. Somatic motor nervous system
 - h. Autonomic nervous system
 - i. Sympathetic division
 - j. Parasympathetic division
 - k. Association neuron
 - l. Excitability
 - m. Potential difference
2. What is the difference between afferent and efferent nerves?
3. When you digest food, smooth muscles churn your stomach. Is this being controlled by:
 - a. The afferent or efferent division of the PNS?
 - b. The somatic motor nervous system or autonomic nervous system?
 - c. The sympathetic or parasympathetic division?
4. Identify the parts of the neuron below:



5. Name the six types of neuroglia AND their functions.

6. Identify the structures in the nerve below:



7. What are the differences between a sensory nerve, a motor nerve, and a mixed nerve? What is the most common type of nerve?
8. An axon is covered by an oligodendrocyte. Is it part of the CNS or the PNS? Will the axon regenerate if severed?
9. An axon is covered by several Schwann cells. Is it part of the CNS or the PNS? Will the axon regenerate if severed?
10. At one point in an axon, there is a high concentration of potassium ions outside of the cell and a high concentration of sodium ions inside the cell. Is the neuron at rest?
11. At one point in an axon, there is a high concentration of sodium ions outside of the cell and a high concentration of potassium ions inside the cell. Is the neuron at rest?
12. A stimulus creates a change in the potential difference between the inside and outside of the cell, but no action potential is created. What is this called?
13. The following steps occur in creating an action potential. Put them in the correct order.
 - a. Sodium gates open, and sodium ions rush into the cell because of diffusion.
 - b. Sodium and potassium gates are closed. Sodium-potassium exchange pumps bring the system back to its original state.
 - c. Sodium and potassium gates are closed. Sodium ions are concentrated outside the cell, potassium ions are concentrated inside the cell.
 - d. Sodium gates close and potassium gates open. Potassium rushes out of the cell by diffusion.

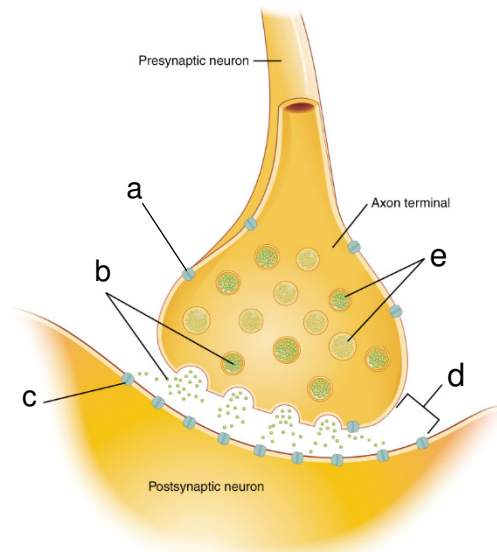
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Assignment #2

Read pages 199 – 210.

14. What keeps an action potential on an axon from stimulating another action potential which will travel back towards the cell body?
15. Why do myelinated axon carry action potentials faster than unmyelinated axons? What is this process called?
16. When you cut yourself, you feel an instant, sharp pain followed later by a dull ache. Why do you get these two different pains, and why do they come in that order?
17. If you press your fingers lightly against an object, you feel a certain amount of pressure. Pressing harder against that same object causes you to feel more pressure. What is the difference between the action potentials in these two situations?
18. Identify the structures in the excitatory synapse below:



19. A signal needs to travel a long, long way in the body. It needs to have exactly the same properties at its destination as it did when it started. Should the signal be sent along a very long axon or a few shorter axons which are connected by synapses?
20. The potential difference in a postsynaptic neuron changes from -85 mV to -95 mV at the point of a synapse. What has happened? What can you say about the relative amounts of potassium and sodium ions outside of the membrane?
21. Twelve action potentials are traveling down an axon in a very short period of time. They reach a synapse, and the postsynaptic neuron sends only two action potentials down its axon. Is this an excitatory synapse or an inhibitory synapse?
22. List the three kinds of circuit arrangements which can be formed by neurons and tell what each one is used for.

Honors:

23. Read the article "Stem Cell Treatment for ALS" in the Mayo Clinic booklet about nerve regeneration (page 11). Describe the research that is being done to treat ALS.
24. Read the article "Peripheral Nerve Repair" in the Mayo Clinic booklet about nerve regeneration (page 13). Describe the technique that is being used to repair peripheral nerve damage.