

Module 5

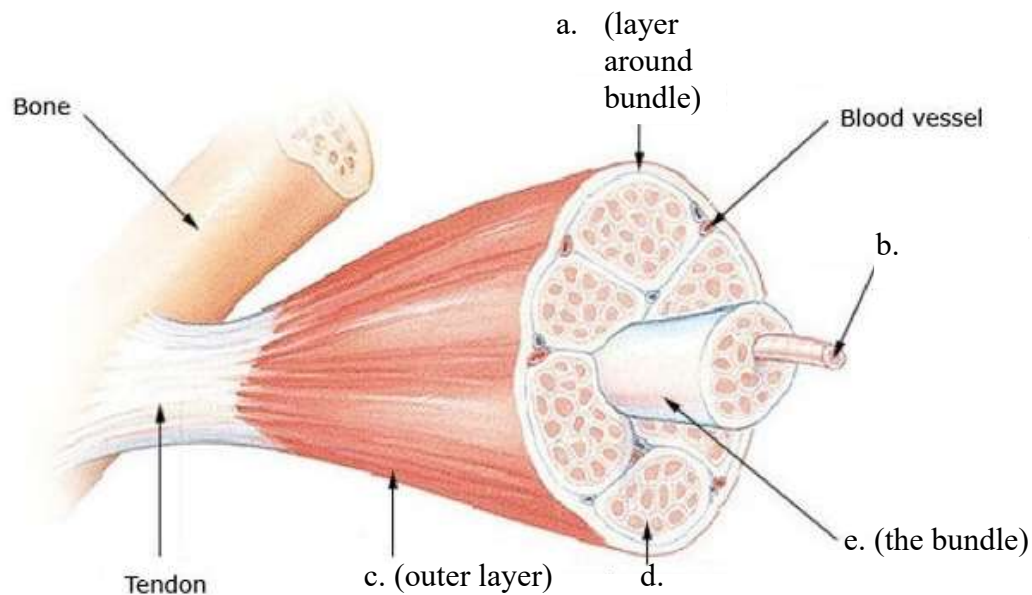
A & P

Assignment #1

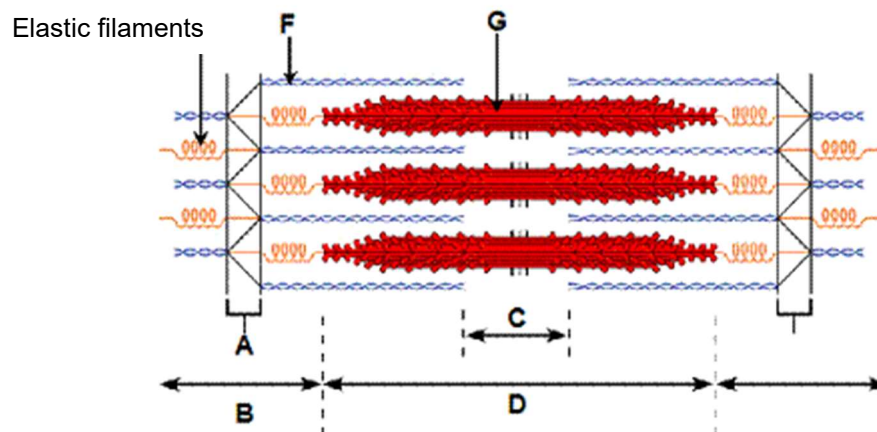
Read pages 125 – 136.

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

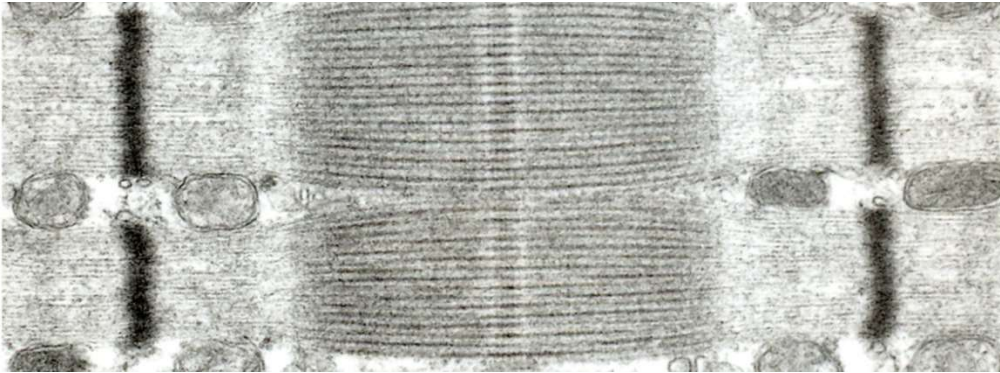
1. List the four major characteristics of muscle tissue.
2. What are the three basic functions of the muscle system?
3. List the three kinds of muscle tissue. For each type of tissue, indicate:
 - a. Whether it is striated or non-striated,
 - b. Whether it has a single nucleus or is multi-nucleate, and
 - c. Where it can be found in the body.
4. Label the structures of the whole muscle:



5. A muscle fiber is a muscle cell. What is the term for the plasma membrane of a muscle cell?
6. What is the term for the endoplasmic reticulum of a muscle cell?
7. Where are T-tubules and what do they do?
8. Label the parts of a sarcomere:



9. On this sheet on the figure below, indicate where the following are:
- A bands
 - I bands
 - Z disks
 - H zone



10. When a muscle fiber contracts, what happens to:
- The distance between the Z disks?
 - The length of the A band?
 - The length of the I band?
 - The length of the H zone?
 - The length of the myosin myofilament?
 - The length of the actin myofilament?

Bonus:

+1 point: Find out why they are called Z-discs.

+1 point: Find out why it is called an H zone.

Honors: Read the article at <https://www.unm.edu/~lkravitz/Article%20folder/musclesgrowLK.html>

- How do muscle fibers change on a cellular level after intense exercise?
- How do gender, age, and heredity affect the development of muscle tissue?

13. Define the terms:
- | | |
|---------------------------|------------------------|
| a. Sarcomere | g. Threshold stimulus |
| b. Neuron | h. Submaximal stimulus |
| c. Synapse | i. Maximal stimulus |
| d. Neurotransmitter | j. Muscle tone |
| e. Motor unit | k. Atrophy |
| f. Sub-threshold stimulus | l. Oxygen debt |
14. Fill in the blanks to describe how a muscle fiber contracts.
- A(n) _____ travels down the axon of a motor neuron.
 - _____ is released from the presynaptic terminal of the neuron.
 - ACh travels across the _____.
 - ACh interacts with the muscle fiber membrane to create a muscle _____.
 - The action potential travels down the _____.
 - _____ ions are released from the _____.
 - _____ ions bind to the troponin in an actin myofilament which exposes _____.
 - The _____ bind to the active sites, and a _____ ion is ejected.
 - Then they bend, pulling on the actin myofilament, which causes the _____ to be ejected.
 - _____ molecules bind to the heads, causing them to _____ the active sites.
15. The myosin heads of a sarcomere have just received a boost of energy. Is the power stroke or the return stroke about to happen?
16. If you could look at muscle fibers while they are in action, how could you determine if two fibers were part of the same motor unit?
17. What is the difference between acetylcholine and acetylcholinesterase?
18. What three things must occur for a contracted muscle to return to its relaxed state?
19. A motor unit has just been recruited. What has just happened to its motor neuron?
20. All of the motor units in a muscle have been recruited. If more stimulus is applied, what happens to the muscle? What kind of stimulus is this?
21. Some of the motor units in a muscle have been recruited. If more stimulus is applied, what happens to the muscle? What kind of stimulus is this?
22. A muscle is expending energy faster than it can be replaced by aerobic respiration. This is also no creatine phosphate left. What can the cell do? What will build up in the cell when this happens?
23. When we breathe hard after exercising, what two things is the increased oxygen supply doing for the muscle fibers?
24. Honors: Describe the diseases listed below. Describe its symptoms, cause, treatment.
- Muscular dystrophy
 - Myasthenia gravis