

**Functions, Characteristics, Types, and Anatomy of Muscle
Honors Anatomy**

1. The ability to shorten in length, or _____, when stimulated by an electrical impulse, is a unique characteristic for muscles.
2. The contractile cells of muscle tissue are elongated and therefore are called _____.

Match the 3 types of muscles, smooth, cardiac, or skeletal, to their descriptions or functions.

A. Smooth

B. Cardiac

C. Skeletal

- _____ 3. Forms the wall of the heart.
- _____ 4. Striated, long cylindrical, and multinucleated.
- _____ 5. Located in the walls of hollow internal organs and passageways.
- _____ 6. Voluntary control; always stimulated by the nervous system.
- _____ 7. Involuntary control; branched, intercalated disks, striated, uninucleated.
- _____ 8. Spindle-shaped, uninucleated; involuntary control.
9. List the 7 functions of skeletal muscles.

Match the functional characteristic of muscle with its description and/or definition.

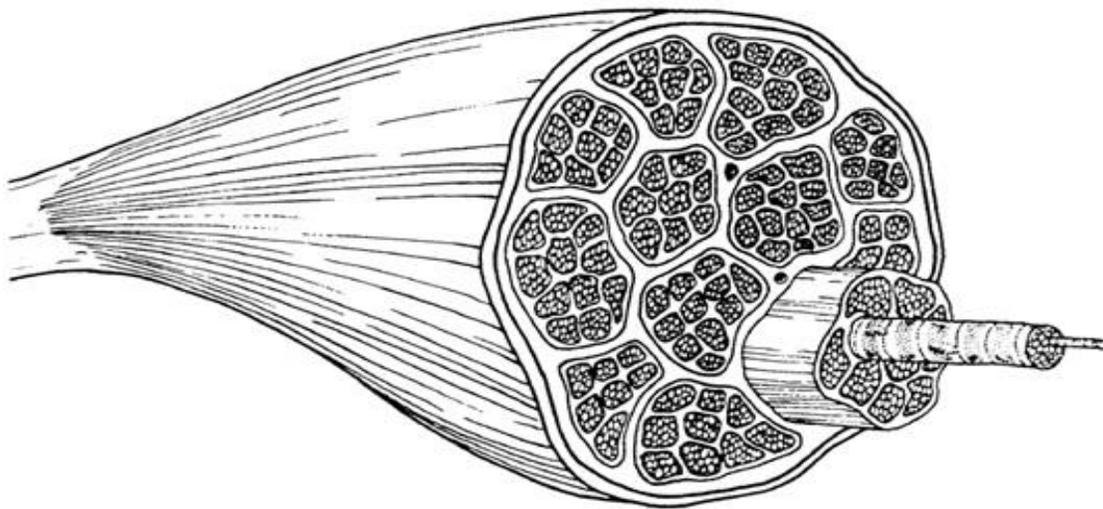
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|-------------------------|--|
| _____ 10. Contractility | a. skeletal muscles can be stretched |
| _____ 11. Excitability | b. skeletal muscles have the ability to shorten in length |
| _____ 12. Extensibility | c. skeletal muscles have the ability to recoil to their original length after they have been stretched |
| _____ 13. Elasticity | d. skeletal muscle has the capacity to respond to a stimulus |

Match the macro structures of skeletal muscle to its description or function.

- _____ 1. Endomysium
- _____ 2. Epimysium
- _____ 3. Fascia
- _____ 4. Fascicle
- _____ 5. Muscle fiber
- _____ 6. Myofibril
- _____ 7. Perimysium
- _____ 8. Tendon

- a. long cylindrical contractile cells of skeletal muscle; covered by endomysium; contains sarcolemma, T-tubules, sarcoplasmic reticulum, and myofilaments; bundle of myofibrils
- b. dense fibrous connective tissue that connects muscle to bone
- c. connective tissue covering that surrounds a muscle fiber
- d. cylindrical structures found within the muscle fiber that contains the myofilaments
- e. the inner connective tissue below the fascia that surrounds a muscle
- f. a bundle of muscle fibers that is covered by the perimysium
- g. connective tissue covering that surrounds a fascicle
- h. the outer connective tissue covering on top of the epimysium that surrounds a muscle

Using different colors and the list below, color and label the macrostructures and microstructures of skeletal muscle and its connective tissue coverings.



- Endomysium
- Epimysium

- Fascia
- Fascicle

- Muscle
- Muscle fiber

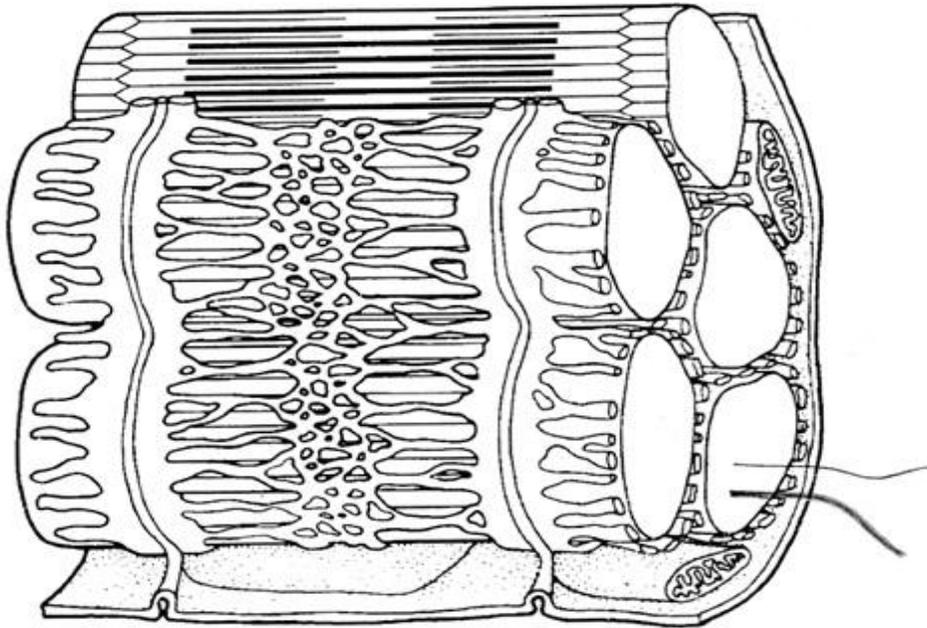
- Myofibril
- Perimysium
- Tendon

Using the list above create a flow map of the order of the structures of skeletal muscle and its connective tissue coverings. Begin the flow map with fascia and end with myofibril. (DO NOT USE TENDON)

Match the structures of a muscle fiber to its description or function.

- | | | | |
|----------|------------------------|----|---|
| _____ 1. | Actin | a. | membrane of the muscle fiber |
| _____ 2. | Mitochondria | b. | invagination (inward extension) of the sarcolemma that surrounds the myofibril |
| _____ 3. | Myofibril | c. | structures associated with T-tubules that stores calcium ions |
| _____ 4. | Myosin | d. | the thin myofilament |
| _____ 5. | Sarcolemma | e. | cylindrical structures found within the muscle fiber that contains the myofilaments |
| _____ 6. | Sarcomere | f. | the basic, structural, contractile unit of a muscle |
| _____ 7. | Sarcoplasmic reticulum | g. | the thick myofilament |
| _____ 8. | T-tubule | h. | the organelle that creates energy for the muscle fiber |

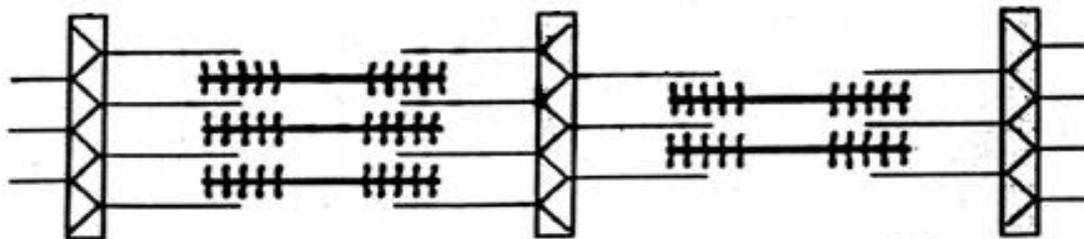
Using different colors and the list below, color and label the parts of a muscle fiber.



- | | | | |
|------------------------------------|---------------------------------|----------------------------------|--|
| <input type="radio"/> Actin | <input type="radio"/> Myofibril | <input type="radio"/> Sarcolemma | <input type="radio"/> Sarcoplasmic reticulum |
| <input type="radio"/> Mitochondria | <input type="radio"/> Myosin | <input type="radio"/> Sarcomere | <input type="radio"/> Transverse (T) tubules |

- The cytoplasm of a muscle is called the _____.
- The mitochondria breaks down the molecule _____ to produce the energy molecule _____.

Using the list below, label the parts of a myofibril.



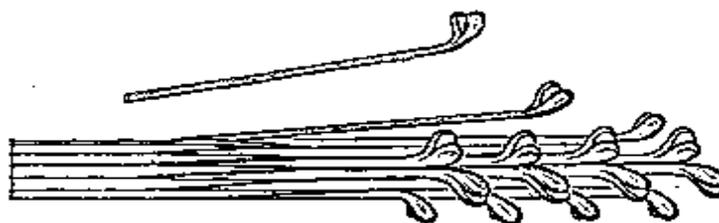
- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="radio"/> A - band | <input type="radio"/> I - band | <input type="radio"/> Sarcomere |
| <input type="radio"/> Actin | <input type="radio"/> Myosin | <input type="radio"/> Z-line |
| <input type="radio"/> H - zone | | |

5. The two myofilaments are _____, the thick myofilament, and _____, the thin filament.

a. List the 2 parts of a myosin myofilament.

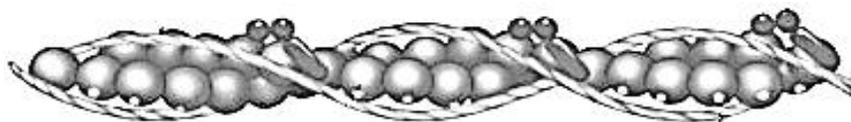
b. List the 3 parts of an actin myofilament.

Using different colors and the list below, color and label the different parts of the myosin myofilament.



- | | |
|-----------------------------------|---------------------------|
| <input type="radio"/> Myosin head | <input type="radio"/> Rod |
|-----------------------------------|---------------------------|

Using different colors and the list below, color and label the different parts of the actin myofilament.



- | | |
|---|-----------------------------------|
| <input type="radio"/> Active binding site | <input type="radio"/> Tropomyosin |
| <input type="radio"/> G-actin | <input type="radio"/> Troponin |

6. List the structure of the myosin myofilament and the structure of the actin myofilament that perform a cross-bridge.