

Muscles PRINCIPLES:

- . The motor unit consists of:
 - a. A myofiber and all the axons that innervate it
 - b. An axon and all the myofibers it innervates
 - c. All the myofibers in a single fascicle
 - d. The myofilaments comprising a single sarcomere

- . The anatomic contractile unit of a muscle is the:
 - a. Myofibril
 - b. A band
 - c. Z band
 - d. Sarcomere

- . The **intermyofibrillary** network of a myofiber consists of all the following EXCEPT:
 - a. The “structural cables” consisting of actin and myosin myofilaments
 - b. Glycogen
 - c. Mitochondria
 - d. The sarcoplasmic reticulum and t-tubules

- . In the process of muscle contraction, which statement is false?
 - a. Nerve action potentials travel faster than muscle potentials (50 M/sec vs. 5 M/sec)
 - b. Muscle action potentials travel along the sarcolemma to the T-tubule
 - c. Calcium is released into the T-tubules
 - d. Calcium allows release of the troponin/tropomyosin inhibition of the contractile elements

An average adult myofiber diameter (in microns) is:

- a. 6
- b. 60
- c. 600

Histochemical analysis of muscle specimen is performed best on:

- a. Flash-frozen tissue
- b. Formalin-fixed tissue in plastic
- c. Formalin-fixed tissue in paraffin

Muscle cells are specialized for contractility, and they can be classified according to their microscopic appearance into 3 categories:

1. **Smooth muscle** which is found primarily in tubular organs.
2. **Skeletal muscle** which is generally attached to bones.
3. **Cardiac muscle** which is found in the wall of the heart.

Skeletal Muscle

Longitudinal

- Peripheral Nuclei
- Striations
- No Branching

Cross Section

- Peripheral Nuclei
 - Massive Cytoplasm
-

Cardiac Muscle

Longitudinal

- Central Nuclei (often football-shaped)
- Striations
- Branching
- Intercalated Discs

Cross Section

- Central Nuclei
 - High Cytoplasm : Nucleus Ratio
-

Smooth Muscle

Longitudinal

- Central Nuclei (often fusiform-shaped)
- Meshwork appearance
- No Striations

Cross Section

- Central Nuclei
- Low Cytoplasm : Nucleus Ratio