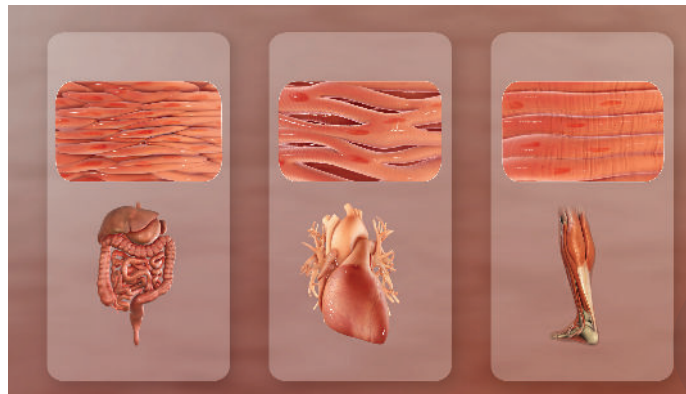


MUSCLE ANATOMY

Muscle Types



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Smooth

- Involuntary
- Innervated by Autonomic Nervous System
- Located in blood vessels, respiratory, reproductive, gastrointestinal and genitourinary tracts
- Cells are pointed and assist in propulsion of fluids

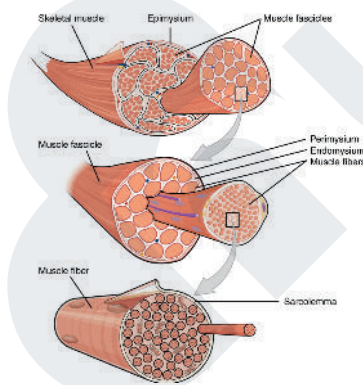
Cardiac

- Involuntary
- Innervated by Autonomic Nervous System
- Located in the heart
- Branched cells with intercalated discs
 - All muscles cells contract at once

Skeletal

- Voluntary
- Innervated by Somatic Nervous System
- Associated with bones and the diaphragm
- Associated with locomotion

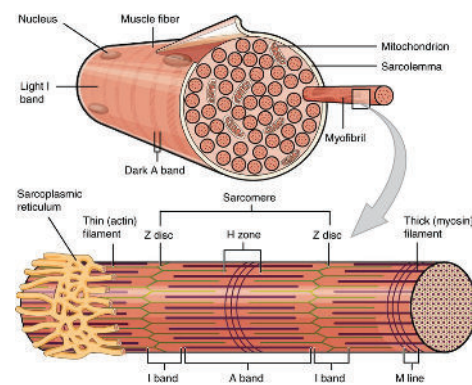
Muscle - Microanatomy



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Arrangement

- Endomysium - covering on outside of muscle fibers
- Perimysium - covering on outside of fascicles (bundles of muscle fibers)
- Epimysium - covering on outside of bundles of fascicles
 - Creates gross muscle
 - Blends with tendon



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Myofilament Arrangement

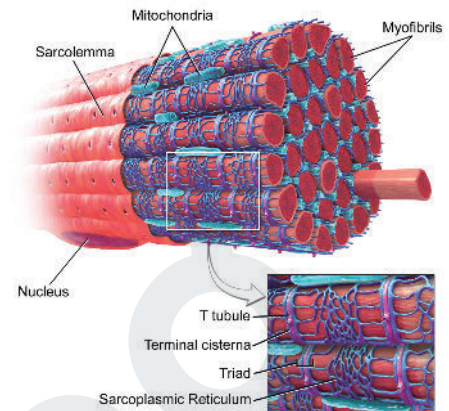
- Sarcomere - contractile unit
- I-Band (light band) - Contains thin filaments (actin, tropomyosin, and troponin)
- A-Band (dark band) - Contains thick filaments (myosin)
- H-Zone - Contains M-Line (middle line) of sarcomere; where filaments pass each other
- Z-Disc - end of each sarcomere

MUSCLE ANATOMY

Muscle - Anatomy

Transport System

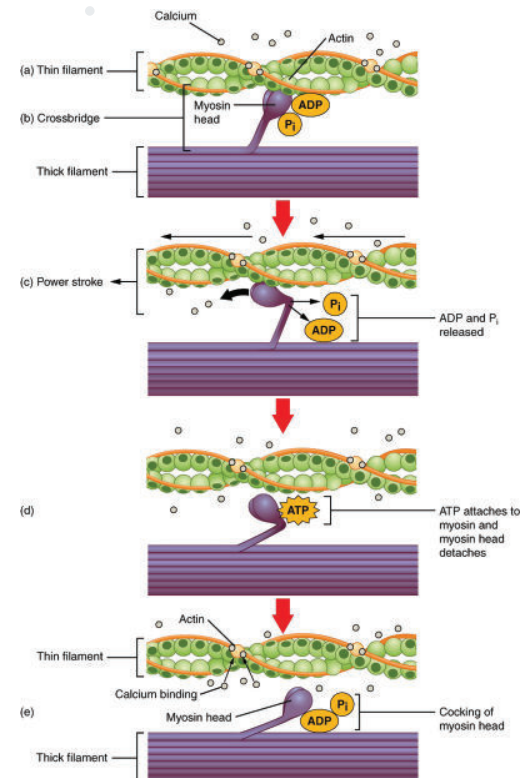
- Sarcoplasm - muscle cytoplasm
- Sarcolemma - cell membrane
 - T-System (Transverse System) - tubules that transmit action potential from cell membrane to muscle fibers
 - Sarcoplasmic reticulum
 - Store and regulate calcium into muscle fiber
 - Reticular Network (Central)
 - Sarcotubules - Extend from Reticular Network outward
 - Terminal Cisternae - Lateral sacs of Sarcoplasmic
 - Triad - Arrangement of two ends of two Sarcoplasmic reticulum and one T-Tubule



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Muscle Contraction

1. Action potential sent from neuromuscular junction down sarcolemma
2. Action potential descends T-Tubules & stimulates release of calcium into sarcoplasmic reticulum
3. **Calcium** binds to **tropomyosin**, which reveals active sites on **actin**
4. **Activated myosin** head attaches to active site on **actin**
5. Myosin *deactivates* and slides thin filament past thick filament
6. Sarcomere shortens, causing contraction
7. ATP attaches to myosin head, disconnecting myosin head from actin and returns myosin head to resting position, ready to create another contraction



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