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Muscles

Functions of Muscles

- Body movements
- Body positions
- Storing and moving substances
- Generating heat



Outside to Inside

- Fascia
- Epimysium
- Perimysium
- Fascicle
- Endomysium
- Muscle Fiber
- Myofibril





(b) Details of several myofibrils

Components of a Myofiber (Muscle Cell)

- Sarcolemma
- Sarcoplasm
- Myoglobin
- T tubules
- Multiple nuclei
- Multiple mitochondria
- Myofibrils



Components of a Myofibril

- Z disc (line) = actin attachment
- M line = myosin attachment
- A Band = overlap of actin and myosin
- I Band = actin fibers

• Actin = thin Myosin = thick







Sequence of a Contraction

- Actin and Myosin Interact
- Z to Z lines move closer together
- Sarcomere gets smaller
- Group of sarcomeres contract
- Myofibril contracts
- Muscle cell contracts
- Fascicle contracts
- Muscle contracts









(c) Binding of acetylcholine to ACh receptors in the motor end plate

Sequence of Neurological Events

- Neuron stimulates muscle fiber
- Release of Acetylcholine
- Release of Calcium
- Calcium binds to troponin and removes it
- Actin and Myosin react
- ATP used





Sequence for Muscle Metabolism

- Use available ATP
- Use Creatine Phosphate
- Break down glucose
- Take 2 pyruvic acids to Kreb's Cycle
- Take coenzymes to electron transport chain







10.14



Myogram







(a) Concentric contraction while picking up a book



(b) Eccentric contraction while lowering a book

10.17



(c) Isometric contraction while holding a book steady



Smooth Muscle



Smooth Muscle Fiber Contraction



Types of Fibers

- Slow Oxidative Fibers
 - Dark red
 - Large amounts of myoglobin and mitochondria
 - Aerobic respiration
- Fast Glycolytic Fibers
 - Low myoglobin content
 - Few mitochondria
 - Anaerobic movement

Terms to Know

- Atrophy
- Hypertrophy
- Oxygen debt
- Muscle fatigue
- Muscle tone
- Flaccid
- Rigidity

More Terms

- Myopathy
- Muscular dystrophy
- Spasm, cramp, tic, tremor, and fibrillation
- Hypertonia
- Hypotonia
- Muscle strain
- Myalgia