

Basic Notes

Excitation-Contraction:

- Action potential travel down the T-tubules and reaches the dihydropyridine receptor
 - >Depolarizes and changes shape
- Ryanodine receptor opens & releases calcium from sarcoplasmic reticulum
 - *DICR: Depolarized-induced calcium release
 - >Calcium binds to Troponin C—*Sliding Filament Theory*
 - >Not all ryanodine receptors are attached to dihydropyridine receptors
 - >Efflux of calcium triggers an efflux of calcium (Positive Feedback Loop)
 - *CICR: Calcium-induced calcium release

Transverse Tubules typically dive into the sarcolemma at the junctions of the A & I bands

Inactivation of contraction requires calcium to be pumped back into the sarcoplasmic reticulum. This requires an immense amount of ATP due to actively transporting against the concentration gradient

Reflex Arcs:

Extrafusel fiber: Voluntary (alpha)
Intrafusel fibers: Involuntary (gamma)

Reflex arcs don't go to the brain— only the spinal cord.

Afferent (sensory): In via dorsal root *from* muscle

Efferent (Motor): Out via ventral root *to* muscle

1. Receptor
2. Afferent
3. Integrator
4. Efferent
5. Effector

Muscle sensors:

>Muscle spindles: (Gamma)(Length) Type of sensory receptor in the skeletal muscle

*Stretch response of Titin

>Golgi Tendon Organ: (Alpha)(Tension) Sensory receptor that senses tension and sends afferent signal to spinal cord to activate inhibitory (glycine) interneuron that reduces force.

1. Neuron Golgi Tendon Organ fires
2. Neuron inhibited
3. Muscle relaxed
4. Load release