

## Skeletal Muscle Anatomy

Skeletal muscles are used for motion and movement, defined by their origin, insertion and action. Not all skeletal muscles are created equal, with variance between each individual in regard to shape (=function) and the quantity of fibers. Skeletal muscles are separated by connective tissue into three definitive layers; the epimysium, perimysium and endomysium.

## Sliding Filament Theory/Cross-Bridge Theory Word Bank

	<b>Function</b>
Actin (Thin)	Muscle contraction
Myosin (Thick)	Muscle contraction
Tropomyosin	Blocks myosin binding sites
Troponin T	Binds to Tropomyosin
Troponin I	Binds to Actin
Troponin C	Binds to Calcium
Titin	Stabilizes Myosin and provides elasticity to myosiums (Z to M)
Nebulin	Assembly of Actin, Stability
ATPase	Catalyze hydrolysis (essential energy)

## Sliding Filament Theory/Cross-Bridge Theory Process

1. Nerve impulse reaches muscle
2. Calcium is released from the Sarcoplasmic Reticulum
3. Calcium binds to Troponin C, which sits on the surface of Actin, and moves tropomyosin off the myosin binding site. (Note: Troponin T binds to tropomyosin)
4. ATP is hydrolyzed by ATPase to create ADP, Pi, and H<sup>+</sup>, and binds to Troponin I
5. Myosin is attached, but the bond is weak and releases the phosphate group to attach with only ADP (strong bond) before the power stroke

6. Filaments slide in a 'powerstroke' motion while releasing ADP
7. Movement is halted when ATP binds to myosin heads and the filaments are released
8. ATP is hydrolyzed by ATPase to create ADP, Pi, and H<sup>+</sup>, and binds to Troponin I
9. Repeat