

I. Muscular System (ADAM download username: BHSdownload password: catfight)

A. A. Intro

1. 600+ muscles in the human body (most tiny, in face, vertebrae, forearms/hands)
2. Heaviest system (40% of mass)

B. B. Functions

1. Voluntary - body movement
 - a) Locomotion, eye movement, blinking, tongue movement, speech, facial expressions.
 - b) Maintain posture
 - c) Reflexes (auditory and visual)
2. Involuntary -
 - a) Circulation of blood
 - b) Digestive movements
 - (1) Peristalsis - move from one end to the other.
 - c) Breathing
 - d) Regulation of lumen size (diameter of hollow tubes)
 - e) Reg. Of pupil size, focus of eye
 - f) Somatic (touch) reflexes

❖ Explain how you could determine if a particular physical motion was voluntary or involuntary?

C. Types of Muscle

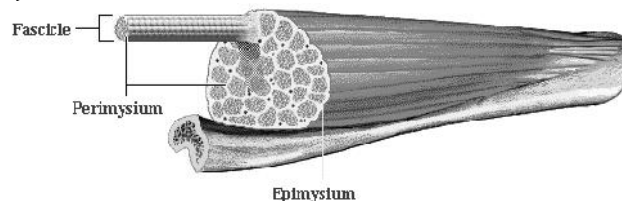
1. * SEE TISSUE LAB

❖ What are the three types of muscle tissue (tissue lab) and the functions of each?

D. Skeletal Muscle Anatomy

1. Macrostructure

a) The Muscle



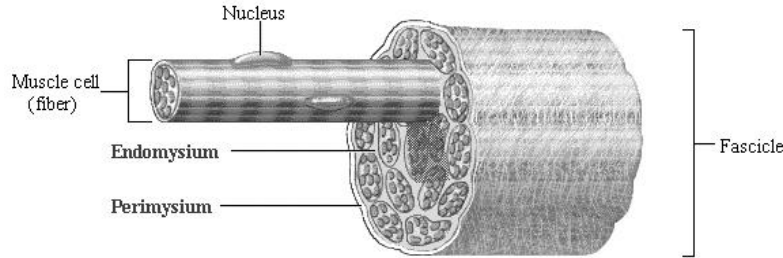
b) Tendons

- 1) Origin - the tendon on the unaffected bone
- 2) Insertion - the tendon on the affected bone

❖ Skeleton muscles are joined to bone by tough connective tissue called _____ which are made of _____ tissue (yes, tissue lab again).

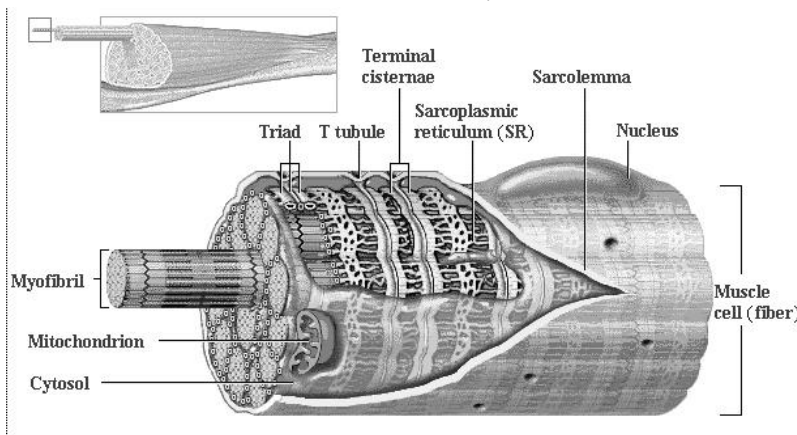
❖ How do you tell the origin of a muscle from its insertion?

2. Microstructure of a Fascicle



❖ What is the collective function of the "mesiums", the perimesium, epimysium, and endomysium in the belly of the muscle?

3. Microstructure of a Muscle Fiber



❖ Explain the association of a Myofibril, a muscle fiber, a fascicle and a muscle.

4.

a) Cellular Specializations

- (1) Electrical conductivity - muscle fibers conduct electricity through their sarcolemma (cell membrane), sarcoplasmic reticulum (ER) and T tubules.
- (2) Energy production - have huge numbers of mitochondria to produce ATP.
- (3) Protein synthesis - have many nuclei to provide a lot of RNA for protein synthesis demands.

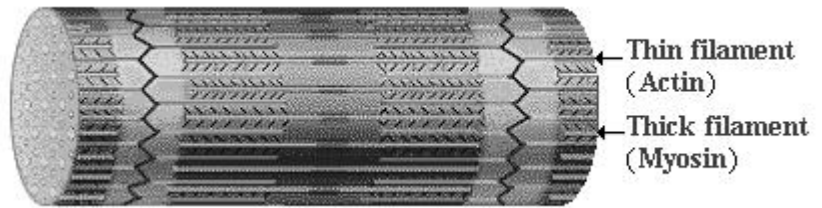
❖ What common function do the Sarcolemma, Sarcoplasmic reticulum and T tubules perform in a muscle cell?

b) Myofibril Protein arrangement

- (1) Packed with protein, virtually no typical cytoplasm
- (2) Overlapping Actin and Myosin create striations.

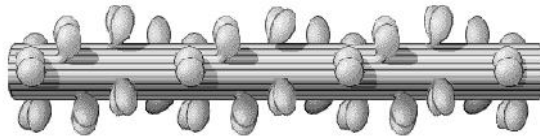


Primary Proteins - do the pulling

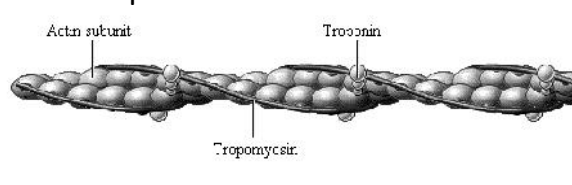


❖ What are the names of the thick and thin filaments and how do they create the striped or "striated" pattern of skeletal muscle?

(3) The Myosin Molecule



(4) The Actin Complex



Accessory Proteins - control contraction, but don't cause it. (troponin, tropomyosin)

❖ Where are Troponin and Tropomyosin located in relation to the Actin fibers?
