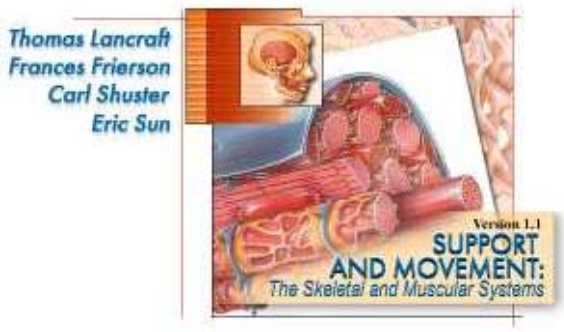
Neuromuscular Junctions



Directions:
a. Click the *"Contents"* button,
b. Open the *Muscular System* File,
c. Click *Animations,*
d. Click *Neuromuscular Junctions*

Introduction

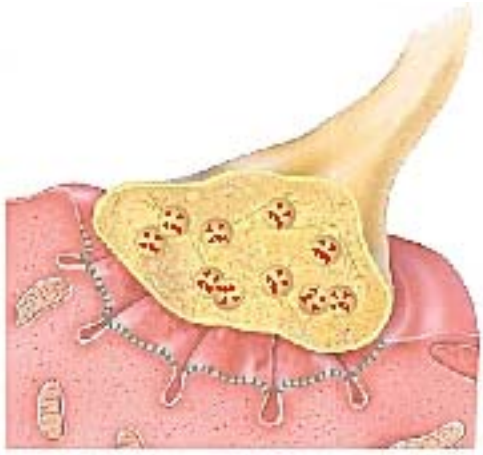
1. Voluntary muscles are controlled by the brain. Describe this neural connection.

_____

_____

Components of the NMJ

2. Identify each of the following:



- Motor neuron
- Synaptic end bulb
- Sarcolemma
- Skeletal Muscle Cell
- Synaptic Cleft

3. a. Define a *neuromuscular junction*. _____

_____

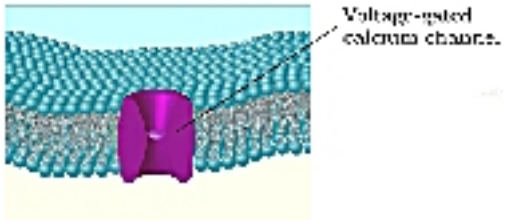
b. Define a *synaptic cleft*. _____

c. What is the function of *acetylcholine*? _____

_____

Neurotransmission and the NMJ

4. What affect does *depolarization* have on the motor end plate once action potentials arrive at the synaptic end bulb?



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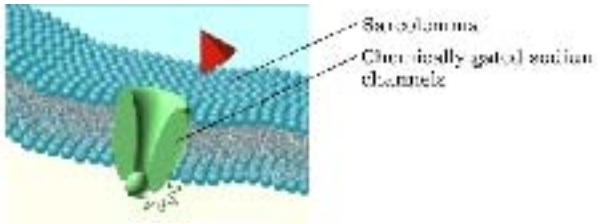
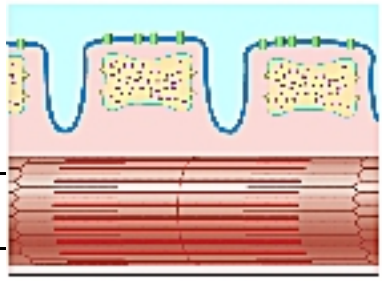
5. What is the affect of increased *calcium* within the neuron?



6. What affect does *acetylcholine* have on the sarcolemma? _____

7. What affect do increased sodium ions have on the muscle cell? _____

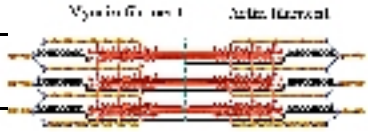
Initiation of Contraction



8. Once an action potential goes down a T-tubule, what affect does it have on the *terminal cisterns* of the sarcoplasmic reticulum? _____

9. What is the function of the ligand-gates calcium channels? _____

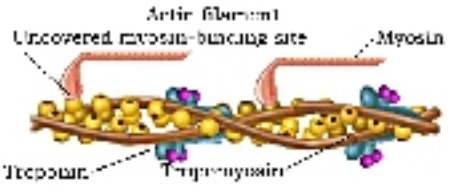
10. a. Define a *sarcomere*. _____



b. Identify the *actin* and *myosin* filaments.

c. What is the role of troponin and tropomyosin? _____

d. What affect does calcium have on troponin and tropomyosin? How does this affect the muscle? _____



Relaxation

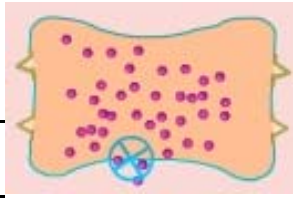
11. a. What is the function of *acetylcholinesterase*? _____

_____

b. How does declining acetylcholine levels affect the muscle? _____

_____

c. What happens to the calcium ions that were released from the terminal cisterns?



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d. How does removal of the calcium ions affect the filaments? _____

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