

Muscular System Review KEY

1. Cardiac, Skeletal, & Smooth Muscle Tissues
2. Movement, posture & position, support, guards entrances & exits, maintains body temp, and stores nutrients.
3. Endomysium - around individual muscle fibers, perimysium - around fascicles, & epimysium - around the entire muscle
4. myofilaments → sarcomeres → myofibrils → muscle fibers → fascicles → muscle
5. Ability to receive and respond to a stimulus
6. Ability to shorten when stimulated
7. Direct - direct attachment to the skeleton (i.e. muscles on the skull); Indirect - tendon attaches the muscle to the skeleton (i.e. sternocleidomastoid and biceps/triceps)
8. sarcolemma = muscle cell's plasma membrane
9. sarcoplasm = muscle cell's cytoplasm
10. Skeletal muscle fibers can have multiple nuclei located right beneath the sarcolemma
11. Mitochondria is found between the myofibrils (Myofibrils contain myofilaments, so they need a lot of energy for contraction)
12. One sarcomere is the length from one Z-Disc to the next Z-Disc
13. Label the A-Band, H-zone, I-Band, Z-Disc, M- Line, Thick Fil., Thin Fil., and titin
13. Thick Filaments are made of myosin
14. Thin filaments are made of actin
15. Troponin holds tropomyosin in place of blocking the active G-Actin spots. It is located on thin filaments.
16. Tropomyosin wraps around the thin filament and blocks the active G-Actin spots from the globular thick myosin heads.
17. The thick myosin heads must attach to the G-Actin active spots on the thin filament.
18. Crossbridging is when the thick myosin heads are able to attach to the thin filaments active site; the heads will then propel the thin filament in toward the M Line by flicking it. This action re-occurs until the sarcomere is contracted.
19. The Sliding Filament Theory is that the thin filaments slide past the thick filaments during contraction.
20. Where a neuron meets a muscle cell (muscle fiber).
21. A chemical that transmits a signal. Acetylcholine (ACh) is the neurotransmitter used at the NMJ.
22. Acetylcholinesterase(AchE) degrades ACh.
23. ACh will bind to the sodium-potassium channels in the sarcolemma.
24. The fluid filled space between the neuron's axon and the sarcolemma.
25. Synaptic Vesicles are small sacs that contain a fluid (neurotransmitter). They are found in the axon and they contain ACh.
26. When ACh binds to the sodium-potassium channels (sarcolemma) the channels open, allowing sodium to rush in and cause a depolarization leading to an action potential being sent throughout the muscle cell.

27. Depolarization is when the inside of the cell membrane is more positive than it is negative (i.e. due to the rush of positive sodium ions into the cell and the inability for the positive potassium ions to escape the cell quick enough).
28. T-Tubules are branched throughout the muscle fiber.
29. the Sarcoplasmic Reticulum wraps around the myofibrils.
30. Calcium ions are released.
31. Calcium binds to troponin, allowing it to shift the tropomyosin for myosin head attachment.
32. Muscle contraction stops when the AChE has degraded the ACh, meaning the channels no longer have a key keeping them open.
33. sarcolemma → t-tubules → sarcoplasmic reticulum
34. Force exerted by contracting a muscle on an object
35. The opposing force on the muscle that causes contraction
36. The muscle shortens - lifting weights toward your shoulder
37. The muscle lengthens - your calf muscles when walking up a steep hill
38. Muscle doesn't shorten or lengthen - used to hold positions (yoga pose, squat, etc.).
39. A Neuron and all of the muscle cells it is able to stimulate. Small motor units(wiggling fingers) and large motor units(moving arms and legs).
40. Stimulation, Latent Phase, Contraction Period (hits peak then..) and Relaxation Period.
41. Skeletal muscles only use ATP - yes it is the only form
42. Direct Phosphorylation - uses creatine molecules to make 1 ATP.
Anaerobic - uses glucose to make 2 ATP and pyruvic acid (or lactic acid).
Aerobic - REQUIRES OXYGEN; one glucose makes 32 ATP, a CO₂ and H₂O molecule.
43. The ability for your muscles to constantly sustain a small amount of contractility. Useful for posture and stabilization.
44. When a force is continuously exerted on a muscle but the muscle is unable to continue contraction due to lack of ATP.
45. only 20-25% of energy released is useful, the other 75-80% is released as heat. You sweat and radiate heat to prevent from overheating.