

Muscular Tissue
Chapter Eleven Study Guide - HL

1. Why is a skeletal muscle cell called a muscle fiber?
2. >What is the structure of a muscle fiber ? (Define the structure and function of these items: sarcolemma, sarcoplasm, myofibrils, glycogen, myoglobin, sarcoplasmic reticulum, transverse tubules, triad, terminal cisterns, myofilaments, actin, myosin, mitochondria, nucleus, endomysium) (See Fig 11.2)
3. What makes the striations in a muscle fiber?
4. >Define structures: actin, myosin, troponin, tropomyosin, titin, dystrophin, z-disc. (Fig 11.1)
5. >What are the skeletal muscle's regulatory proteins?
6. >What are the skeletal muscle's structural proteins?
7. >What are the skeletal muscle's linking proteins? Linking what to what? (Fig 11.4)
8. What disease occurs if a gene fails to make dystrophin? Why is this a genetic disease?
9. >What is the "triad"? Significance? (Fig 11.2)
10. >What structural protein holds the thick filament between the Z discs?
11. >What is the functional unit of a skeletal muscle?
12. Skeletal muscle fibers are in G zero. Significance? What organelles is missing?
13. >What will happen to the muscle fiber if the nerve to the skeletal fiber is cut? What is this called? How may you cause the same result without cutting a nerve? What is this called?
14. >What is the sliding filament theory? (Fig 11.10)
15. What is a neuromuscular junction? General name for this structure?
16. >What are the three components of a synapse?
17. >Describe the structure of the neuromuscular junctions: (Fig 11.7)
18. >What is a resting membrane potential?
19. >What is an action potential?
20. >What type of tissues are able to generate action potentials?
21. >How are action potential initiated at the neuromuscular junction? (Fig 11.8)
22. >Skeletal muscle contractions and relaxation occurs in four major steps. What occurs during excitation, excitation-contraction coupling, contraction, and relaxation.
23. What occurs during excitation?
24. What occurs during excitation-contraction coupling?
25. >What occurs during contraction cycle?
26. What occurs during relaxation?
27. >What is the power stroke? (Fig 11.10)
28. >What must occur to stop a muscle contraction?
29. >How do we use motor units? Explain this phenomena by picking up something or by extending your arm and holding something in your palm. (Fig 11.6)
30. What is rigor mortis? After death the corpse may sit up or roll over? How can you explain this phenomena?
31. After death the muscle stiffens but then over time relaxes. Why?
32. >What is the difference between an isotonic and isometric contractions?
33. Explain how an isometric-isotonic contraction sequentially occurs when you pick up a heavy object.
34. >What is the significance of the length-tension relationship of skeletal muscle? (Fig 11.2)
35. How does a muscle fiber's resting length affect the tension it creates?
36. Why should we "lift with our legs and not with our backs"?
37. What is a motor unit? What is the significance of recruitment? (Fig 11.6)
38. >How do cells make ATP? Requirements? Locations?
39. What is the significance of fast and slow muscle fibers?

40. How do muscle fibers of a sprinter differ than muscle fibers of a marathon runner?
41. The soleus and gastrocnemius muscles are both plantar flexion muscles. It is unusual for evolution to result in this type of redundancy. How may you explain why this?
42. >How do muscle fibers change due to endurance training, resistance training, and disuse?
43. >What is myoglobin? Location? Function?
44. Why do skeletal muscles have glycogen in their cytoplasm?
45. >How long does it take to deplete glycogen from the liver if you are running?
46. What is the phosphagen system?
47. How is the production of ATP different in anaerobic and aerobic conditions?
48. >What is the first source of ATP in a skeletal muscle when you start to run? What is the next source of ATP? The next? The next?
49. How may blood oxygen influence skeletal muscle performance?
50. What causes muscle fatigue? How do muscle fibers rid itself of this molecule? Where does it go? Once there then what happens to this molecule?
51. >What is oxygen debt? What is another name for this phenomena?
52. >What is the difference between single unit and multi-unit smooth muscle? Where will you find these smooth muscle types? (Fig 11.22)
53. Do smooth muscle always require the action of a nerve to contract?
54. What occurs if you stretch smooth muscle? (hint: calcium)