

Muscular Tissue
Chapter Eleven Study Guide
Hot List Questions >

1. >Why are skeletal muscle cells called muscle fibers?
2. >What is the structural unit for a skeletal muscle fiber called?
3. >Define the structure and function of these structures: sarcolemma, sarcoplasm, myofibrils, glycogen, myoglobin, sarcoplasmic reticulum, transverse tubules, triad, terminal cisterns, myofilaments, actin, myosin, mitochondria, nucleus) Draw a picture and label.
4. >Define these structures: actin, myosin, troponin, tropomyosin, titin, dystrophin, z-disc. Draw a picture and label.
5. >Why do skeletal fibers look striated (i.e. striped appearance)?
6. >What are the skeletal fiber's regulatory proteins?
7. >What are the skeletal fiber's structural proteins?
8. >What are linking proteins? What is linked to what? Significance?
9. >What disease is caused because a gene fails to make the linking protein dystrophin?
10. What is a "triad"? Significance?
11. >What structural protein holds the thick filament between the Z discs?
12. Skeletal muscle fibers are in G zero. Significance? What organelle is missing?
13. >What will happen if the somatic nerve to the skeletal fiber is cut? What is this condition called? How may you cause the same result to the skeletal muscle without cutting a nerve? What is this condition called?
14. What is the sliding filament theory? When was this theory advanced and what invention made it possible to develop the sliding filament theory?
15. >What is the neuromuscular junction? Location? What is the more common name for this structure?
16. Describe the structure of the neuromuscular junctions.
17. >What are the three components of a synapse?
18. >What is a resting membrane potential? What type of cells have resting membrane potentials?
19. >What is an action potential?
20. What tissue types are able to generate action potentials?
21. How may you describe an action potential?
22. What outcomes occur because of an action potential? Explain.
23. How are action potential initiated at the neuromuscular junction?
24. >What occurs during excitation? Location?
25. >What occurs during excitation-contraction coupling? Location?
26. >What occurs during the contraction cycle (power stroke)? Location?
27. >What occurs during relaxation? Location?
28. >How are muscle contractions stopped? What must happen first?
29. >What is a motor unit?
30. How do we use motor units? Explain this phenomena when you pick up something or by extending your arm while holding something in your palm for an extended time.
31. What is recruitment? Explain this in terms of picking up a book.
32. What is rigor mortis? Explain when and why this occurs.
33. After death the corpse may sit up or roll over. How can you explain this phenomena?
34. Gradually after death skeletal muscles start to "stiffen" but then as more time passes the muscle starts to relax. Explain why this occurs?
35. >What is the difference between an isotonic and isometric contractions?
36. Explain why initially when picking up a heavy item it is an isometric contraction then once the item starts to move it becomes an isotonic contraction?

37. >What is the significance of the length-tension relationship of skeletal muscle? What is the common phrase associated with the length-tension relationship? Explain this phenomena in terms of the structure of the sarcomere.
38. >How is ATP produced by cells? What are the requirements for each metabolic pathway? Locations?
39. >What pathway is used to produce ATP in fast muscle fibers VS slow muscle fibers? How does this related to performance during competition?
40. >How do muscle fibers of a sprinter different than muscle fibers of a marathon runner?
41. The soleus and gastronemius muscles are both plantar flexion muscles. It is unusual for evolution to display this type of redundancy. How would you explain this relationship?
42. What types of changes occur to muscle fibers due to endurance training, resistance training, or 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 when you are running?
46. >What is the phosphagen system? Purpose?
47. >How is the production of ATP different in anaerobic and aerobic conditions?
48. When you start to run, what is the first source of ATP used by the skeletal muscle? What is the next source of ATP? The next? The next?
49. How will the availability of blood oxygen influence skeletal muscle performance? Explain the role of the respiratory system and cardiovascular system in in skeletal muscle performance? Is there a lag between muscle function and respiratory-cardiovascular function? Explain.
50. What may cause muscle fatigue? How do muscle fibers rid itself of this molecule? Where does it go? Once there, what happens to this molecule?
51. >What is oxygen debt? What is another name for this phenomena? When does this occur?
52. How is smooth muscle function different between single unit smooth muscle and multi-unit smooth muscle? Location where you will 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)