

## Final Study Guide

### Exam 7

1. The flexing or power stroke of the crossbridge is caused by the release of the Pi from the crossbridge.
3. The initial source of ATP for skeletal muscle is creatine phosphate then from glycolysis, if prolonged activity continues.
5. Before entering his latest patient's room in the Emergency Department, Dr. Brutus Buckeye held out his hand for his assistant to give him (add to his hand) the patient's chart. As soon as the chart was placed in his hand, his hand started moving toward the floor. He immediately and correctly remarked to his assistant that he was doing an eccentric contraction because he was generating too little tension.
7. After working out, Carmen recalled the correct statements about how her muscles function that, with the myosin site on actin exposed, a crossbridge can only form if ADP and Pi are bound to myosin, energy is required for the primary active transport that removes the calcium from the cytosol, tropomyosin resuming its blocking position does not cause calcium to unbind from troponin, and, while crossbridge cycling is occurring, the muscle is generating tension but not always shortening.
9. The I band and H zone will remain the same during an isometric contraction because the load is greater than the tension. The I band and H zone will decrease during an isotonic contraction because the load is less than the tension. The I band and H zone will increase during an eccentric contraction because the load is greater than the tension.
11. All isotonic contractions are preceded by a period of isometric contraction.
13. A decrease in the frequency and intensity of the stimuli will increase the return of calcium and lead to unfused tetanus.
15. At the RPAC, you watch another student unsuccessfully attempt to lift a 200-lb weight. You correctly tell her that she experienced a smaller response than when lifting the 100-lb weight earlier and she was doing more fused than unfused tetanus during that lift.
17. With increased aerobic exercise, we expect to see increased mitochondria. With increased anaerobic exercise, we expect to see increased glycolytic enzymes.
19. Correct pairings of an ATP source in muscles and a trait of that source are Krebs cycle – allows for conversion of

proteins, creatine phosphate - creates 1 ATP per creatine, and glycolysis - possible when anaerobic.

21. Buckeye Chuck will spend Spring Break in Africa literally running around with wildebeest (long distance migrating mammals) and springboks (fast sprinters). He correctly expects that, compared to the springbok, the wildebeest will have more oxidative components and more typically the slow working form of the hydrolyzing enzyme in its leg muscles.

23. Womp rats (on Tatooine) are about 2 meters long and follow their prey over long distances before womping their now exhausted prey. Since they have similar muscles to Earth animals, correct features that should exist in womp rat's leg muscles are low activity ATPase for the crossbridge and a high density of blood vessels.

25. Alex, preparing to explore Tatooine, invented a gun-type device that interferes with the calcium ATPase pumps in the plasma membrane of the victim's muscle cells. Correct consequences to the human-like victims of this gun-type device would be no impact on crossbridge cycling or ability to change the sarcomere.

27. Not to be outdone by Alex, Professor Farnsworth took a break from making doomsday devices to create his own guntype device that would remove all the calcium from an individual. If he focused its discharge solely on your calf muscle, we would expect that muscle not to contract because there would be no acetylcholine to bind to the myofiber and not to contract because the myosin crossbridge could not bind to the actin.

29. As a break from studying at Thompson library, you decide to try to lift the extremely large and heavy wooden table at which you have been seated. Considering this process physiologically, you correctly realize that you were mainly going to be doing an isometric contraction and you were primarily going to be activating your fast-glycolytic myofibers.

31. While walking around at last weekend's Arnold Fitness EXPO, you overheard numerous erroneous comments about the benefits of using creatine. You correctly tell people that, while on creatine phosphate, your muscles will appear larger due to an increased osmotic gradient and it will provide the power at the start of a workout but not at the end.

33. Recently at Hang Over Easy, Jake yelled for the waitress to turn on SportCenter's Top 10. While watching, the TAs made correct statements about the muscles of various athletes such as baseball players (typically run in sprints) will tend to use up their ATP at a quick rate and injured athletes will experience muscle

atrophy that results from a decrease in sarcomere numbers.

35. The defeated duck fan decided to eliminate his cycle of regrets by crossing the bridge over to thinking about next season and motivating his team for next year. Because his team needs to improve their muscles, he focused his motivational talk on explaining crossbridge cycling. Correct statements from his speech about crossbridge cycling are that the addition of ATP to the myosin causes it to detach from the actin and the hydrolysis of ATP is not mainly driven by a conformation change.

### Exam 8

1. The anterior pituitary gland contains receptors for the endocrines that travel through the infundibulum.

3. Smooth muscle does not line the heart.

5. If someone wanted to reduce the effects of epinephrine, he could trigger the endocytosis of its receptors, increase of its excretion via the liver, and increase of its catabolism in the plasma.

7. A paracrine is most likely to not be involved in the regulation of an endocrine's secretion.

9. The anterior pituitary gland receives endocrines that traveled via the infundibulum. The posterior pituitary gland receives endocrines that traveled via the infundibulum.

11. Epinephrine in the plasma is to dopamine as epinephrine in the interstitial fluid is to acetylcholine.

13. Taking a break from watching March Madness, Buckeye Chuck walks from his living room to his kitchen to grab a box of buckeyes (the chocolate and peanut butter candies). Unfortunately, along the way, one of his back paws (like our feet) steps on a buckeye (nut to create a new buckeye tree). The intense, sharp pain in his paw causes the muscular response in his hind/back limbs of stimulation of his contralateral extensor muscle.

15. From a classic sitting position (i.e., what you should be doing right now), the devastated duck fan decides to raise just his right hand to touch his nose. Since his shoulder hurts (from the large "loser" chip that has been sitting on it), he touches his nose without moving his shoulder. Therefore, he will stimulate his flexor muscle in his right arm.

17. Correct statements about peptide endocrines are that they are called prohormones when synthesized, are