

Assignment 5: Skeletal Muscle part 2, Chapter 9

Due: 11:59pm on Monday, February 25, 2013

Note: To understand how points are awarded, read your instructor's [Grading Policy](#).

Chapter 9 Chapter Test Question 11

Part A

A muscle that is lengthening while it produces tension is performing a(an) _____ contraction.

ANSWER:

- isometric
- concentric
- eccentric
- maximal

Correct

During isotonic, eccentric contractions muscle lengthens as it generates tension, but not enough force to overcome the load. We use eccentric contractions to lower objects (such as lowering a book from the shelf, or lowering the barbell during a bench press).

Chapter 9 Chapter Test Question 15

Part A

Slow oxidative muscle fibers are best suited for _____.

ANSWER:

- running a marathon
- lifting heavy weights at the gym
- hitting a baseball
- running a 100-yard dash

Correct

Slow oxidative muscle fibers are best suited for endurance activities, such as long distance running, cycling, or rowing.

Chapter 9 Chapter Test Question 20

Part A

Isometric contraction leads to movement of a load.

ANSWER:

- True
- False

Correct

An isometric contraction generates tension (force), but not enough to move the load. Overall muscle length does not change during iso(same)-metric(length) contractions. In contrast, isotonic contractions result in movement of the load.

Chapter 9 Reading Quiz Question 9

Part A

Which muscle fiber type is best suited for endurance activities, such as long-distance jogging?

ANSWER:

- slow glycolytic fibers
- fast oxidative fibers
- fast glycolytic fibers
- slow oxidative fibers

Correct

Slow oxidative fibers are best suited for endurance (long duration) activities because they produce ATP aerobically, and are thus, fatigue-resistant. Fast glycolytic fibers, and to a lesser extent fast oxidative fibers, rely more on anaerobic glycolysis, and thus produce more lactic acid, which is a major cause of fatigue.

Chapter 9 Matching Questions 33-35

Part A

Match the sport to the energy system primarily used to perform the activity.

Match the words in the left column to the appropriate blanks in the sentences on the right. Make certain each sentence is complete before submitting your answer.

ANSWER:

Correct

Chapter 9 Multiple Choice Question 6

Part A

Which of the following would be recruited later in muscle stimulation when contractile strength increases?

ANSWER:

- many small motor units with the ability to stimulate other motor units
- large motor units with small, highly excitable neurons
- motor units with larger, less excitable neurons
- motor units with the longest muscle fibers

Correct

Chapter 9 Multiple Choice Question 9**Part A**

Myoglobin _____.

ANSWER:

- produces the end plate potential
- stores oxygen in muscle cells
- breaks down glycogen
- is a protein involved in the direct phosphorylation of ADP

Correct

Chapter 9 Multiple Choice Question 13**Part A**

Creatine phosphate functions in the muscle cell by _____.

ANSWER:

- storing energy that will be transferred to ADP to resynthesize ATP
- forming a temporary chemical compound with myosin
- inducing a conformational change in the myofilaments
- forming a chemical compound with actin

Correct

Chapter 9 Multiple Choice Question 14**Part A**

What is the primary function of wave summation?

ANSWER:

- prevent muscle relaxation
- increase muscle tension
- produce smooth, continuous muscle contraction
- prevent muscle fatigue

Correct

Chapter 9 Multiple Choice Question 31

Part A

In an isotonic contraction, the muscle _____.

ANSWER:

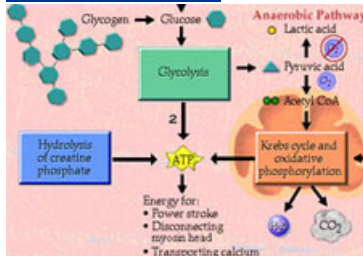
- rapidly resynthesizes creatine phosphate and ATP
- never converts pyruvate to lactate
- does not change in length but increases tension
- changes in length and moves the "load"

Correct

IP: Muscle Metabolism

Click on the link or the image below to explore muscle metabolism in Interactive Physiology (IP), then answer the questions to the right.

[IP: Muscle Metabolism](#)



Part A

What is the type of chemical reaction used to rebuild ADP into ATP?

Hint 1.

A water molecule must be removed in this process where molecules are combined.

ANSWER:

- dehydration synthesis
- hydrolysis
- rehydration synthesis

Correct

Yes, a water molecule is removed, thus it is called dehydration synthesis. Building ATP from ADP requires a synthetic enzyme plus a source of energy to rebuild the high energy bond.

Part B

Which of the following processes produces molecules of ATP and has two pyruvic acid molecules as end products?

Hint 1.

This process to produce ATP is also known as "sugar splitting" (the breakdown of glucose to produce ATP) and takes place in the cytoplasm.

ANSWER:

- Krebs cycle and oxidative phosphorylation
- hydrolysis of creatine phosphate
- glycolysis

Correct

Yes, glucose is broken down in the process called glycolysis. This process takes place in the cytoplasm and does not require oxygen – hence it is called anaerobic respiration. If oxygen is available, the pyruvic acid moves into the mitochondria and glycolysis contributes to aerobic respiration.

Part C

Which of the following processes produces 36 ATP?

Hint 1.

This process is known as aerobic respiration.

ANSWER:

- glycolysis
- Krebs cycle and oxidative phosphorylation
- hydrolysis of creatine phosphate

Correct

Yes, 36 ATPs are produced for each glucose molecule. This process, which takes place in the mitochondria, is considered aerobic respiration because oxygen is required.

Part D

The "rest and recovery" period, where the muscle restores depleted reserves, includes all of the following processes EXCEPT _____.

Hint 1.

These processes are usually referred to as repaying the oxygen debt.

ANSWER:

- ATP is used to rephosphorylate creatine into creatine phosphate.
- Oxygen rebinds to myoglobin.
- Pyruvic acid is converted back to lactic acid.
- Glycogen is synthesized from glucose molecules.

Correct

Yes, this is NOT a part of the "rest and recovery" period. When oxygen is available, lactic acid is converted back to pyruvic acid (not vice versa) that then enters the Krebs cycle. Lactic acid is the end product of the anaerobic pathway.

Part E

Which type of muscle fiber has a large quantity of glycogen and mainly uses glycolysis to synthesize ATP?

Hint 1.

These fibers also have reduced myoglobin and very few capillaries surrounding them.

ANSWER:

- red slow twitch fibers
- white fast twitch fibers

Correct

Yes, white fast twitch fibers have high glycogen content for a readily available source of glucose for glycolysis. They appear white because of the reduced amount of myoglobin and fewer capillaries surrounding them. Because these fibers have reduced myoglobin and very few capillaries surrounding them, they have very little oxygen available for the Krebs cycle and oxidative phosphorylation. They also have fewer mitochondria (where the Krebs cycle and oxidative phosphorylation would take place).

Chapter 9 Homeostatic Imbalance Question 1**Part A**

Myasthenia gravis is sometimes treated medically by a treatment that involves _____.

ANSWER:

- boosting the activity of the immune system
- suppressing the release of acetylcholine from synaptic vesicles
- suppressing the synthesis of acetylcholine
- inhibiting the action of acetylcholinesterase

Correct

This enzyme breaks down acetylcholine into acetic acid and choline.

Chapter 9 True/False Question 10**Part A**

One of the important functions of skeletal muscle contraction is production of heat.

ANSWER:

- True
- False

Correct

Score Summary:

Your score on this assignment is 91.7%.
You received 11.92 out of a possible total of 13 points.