

Class/Lab Activity #6 Physiology

A. Questions to Consider from the Skeletal Muscle Lecture

1. What 4 **properties** do all muscle tissues have? Give a brief definition of each of these:
 - 1)
 - 2)
 - 3)
 - 4)
2. The _____ controls skeletal muscle.
3. It is primarily _____ Control that regulates cardiac muscle.
4. The muscle in the walls of the bladder are _____ muscle.
5. Do skeletal muscles cells have action potentials? ☐ Yes ☐ No
6. When ACh binds to _____ receptors at the motor end plate, what happens directly?
7. Sequentially, when muscle is **excited**, what occurs to open the “gates” on the SR to let out all that Ca^{2+} ?
8. What are the contractile proteins in skeletal muscle? _____ and _____.
9. What causes tropomyosin to move away from the active site on actin?
10. What is the role of creatine phosphate in skeletal muscle? When is it used?
11. Write a good definition for muscle fatigue. List two changes that can cause muscle fatigue?
12. Fill in the table below with brief terms regarding the comparison of slow and fast twitch skeletal muscles for the properties listed. Details found in our OER text and lecture slides

Muscle Type	Speed (onset)	Contraction Duration	Metabolism (Primary)	Myoglobin Content	Fatigue	Blood Supply	Size and Color	Purpose in Body
Slow Twitch								
Fast Twitch								

B. Questions to Consider from the Cardiovascular Lecture

1. Trace a RBC naming all structures from starting the SVC/IVC all the way back to where it started.
2. Name and describe the **valves** of the heart.
3. If a person has mitral valve stenosis, what features might you detect?
4. List the two types of **Myocardiocytes**, and how they differ.
 - 1)
 - 2)
5. Sketch and fully label the action potentials of an **1) Autorhythmic** and **2) a Contractile** myocardiocyte.

Multiple Choice Questions

1. How many different types of muscle are there in the human body?
a) 502 b) 206 c) 5 d) 3 e) 2
2. Muscle Tissue that has a striped appearance is described as being: *(What are these patterns?)*
a) elastic b) non-striated c) excitable d) smooth e) striated
3. All muscle tissue has the following properties, except for:
a) excitability b) intercalated discs c) elasticity d) contractility e) the need for ATP
4. Thin and thick filaments of skeletal muscle are organized into functional units called _____.
a) myofibrils b) myofilaments c) sarcomeres d) T-tubules e) motor units
5. What are the three type of skeletal muscle?
a) slow, intermediate and fast twitch b) smooth, striated and cardiac
c) endomysium, perimysium and epimysium d) sarcolemma, sarcoplasm and sarcoplasmic reticulum
6. What is the cell membrane of a muscle fiber called?
a) myofibril b) sarcoplasm c) myofilament d) sarcolemma e) motor end plate
7. The correct order for the largest to the smallest unit of organization in skeletal muscle tissue is:
a) muscle fascicle, myofilament, muscle fiber, myofibril
b) myoilament, myofibril, muscle fiber, muscle fascicle
c) muscle fascicle, muscle fiber, myofibril, myofilament
d) sarcomere, sarcoplasm, sarcolemma
e) muscle fiber, muscle fascicle, myofilament, myofibril
8. At the peak of the AP of contractile myocardiocytes, just before the plateau phase -
a) the Na⁺ channels open b) the Ca²⁺ channels close
c) the Na⁺ channels close, causing the membrane voltage to remain elevated
d) the K⁺ channels close causing the membrane voltage to fall slightly
e) opening of K⁺ channels, causes K⁺ efflux that drops the membrane voltage slightly
9. The absolute refractory period in contractile myocardiocytes:
a) is to prevent contractions in cardiac muscle
b) prevents temporal summation and therefore complete tetanus in cardiac muscle
c) is a time when no other stimulus can cause an action potential, regardless of the strength
d) b and c are correct e) a, b and c are correct
10. The influx of which ion accounts for the plateau phase?
a) sodium b) potassium c) chloride d) calcium
11. During atrial systole:
a) the atria depolarize b) the atria contract c) the last 20% of blood fills the ventricles
d) blood is ejected from the heart e) b and c

12. Put these events in the correct order of occurrence:

1. myosin head binds to ATP and releases actin
2. binding sites on actin covered, preventing any further crossbridge formation and tension
3. signal from motor neuron ceases
4. DHP receptors trigger release of Ca^{2+} from the sarcoplasmic reticulum
5. depolarization of sarcolemma causes Na^+ influx
6. there is a net movement of Ca^{2+} back into the sarcoplasmic reticulum

a) 5, 4, 1, 6, 3, 2 **b)** 1, 4, 2, 3, 1, 5 **c)** 5, 1, 4, 6, 2, 3 **d)** 4, 1, 6, 2, 5, 3 **e)** 5, 4, 1, 3, 6, 2

13. Rigor mortis

- a)** is when muscles stay stiff **b)** is muscle contraction when no ATP is available
c) refers to what occurs during cramping **d)** is muscle contraction after death

14. The Resting Membrane Potential in the autorhythmic myocytes of the heart is

- a)** -70 mV **b)** unstable, due to K^+ efflux **c)** unstable, drifts from -60 mV
d) -90 mV **e)** stable at -40 mV

15. In the cardiac cycle, what term describes when the ventricles are in systole and the pressure builds as volume stays the same?

- a)** systole **b)** diastole **c)** quiescent **d)** isovolumetric contraction **e)** isovolumetric relaxation

16. Normally the right pulmonary artery has ____ O_2 content and transports blood directly to the ____.

- a)** low: lungs **b)** high: heart **c)** low: heart **d)** high; lungs

17. In a normal heart at rest, what would occur if the connections between the **parasympathetic** division of the ANS and the heart were cut?

- a)** The heart rate would decrease
b) Stroke volume would decrease
c) Cardiac output would decrease
d) The heart rate would increase
e) The heart activity would remain unchanged

18. The first heart sound represents which portion of the cardiac cycle?

- a)** atrial systole **b)** ventricular systole **c)** closing of the atrioventricular valves
d) closing of the semilunar valves **e)** ventricular diastole

19. Fast-twitch muscle fibers have only one of the following features:

- a)** high mitochondrial content **b)** have a large diameter **c)** have a small diameter **d)** lots of myoglobin

20. If a person has type A blood, then their plasma antibodies are ____ and their antigens are ____.

- a)** A and A **b)** A and B **c)** B and A **d)** B and B