

HSS 307: Human Physiology

Quiz 3

Name _____

Please circle the correct response(s). There may be 0-4 correct responses for each item.

1. During excitation-contraction coupling, ATP provides the energy for:
 - a. Summing of action potentials (ACTION POTENTIALS ARE NEVER SUMMED!)
 - b. Active transport of neurotransmitter to the plasma membrane of the muscle fiber (P.329; NEUROTRANSMITTER DIFFUSES ACROSS THE SYNAPTIC CLEFT – DIFFUSION IS PASSIVE AND TAKES NO ENERGY)
 - c. Active transport of Ca^{++} ions into the sarcoplasmic reticulum (FIG.12.8 STEP 6)
 - d. Diffusion of Ca^{++} ions into the cytosol of the muscle cell from the sarcolemma (DIFFUSION TAKES NO ENERGY)

2. During muscle fiber summation:
 - a. There is a net accumulation of Ca^{++} ions in the muscle fiber's intracellular fluid (P.338; INTRACELLULAR FLUID AND CYTOSOL ARE THE SAME THING IN MUSCLE CELLS)
 - b. Action potentials from the motor neuron overlap in time (P.337; ONLY OCCURS WHEN MUSCLE TWITCHES OVERLAP IN TIME; ACTION POTENTIALS ARE ALL-OR-NONE AND CANNOT OVERLAP)
 - c. Binding sites on troponin are more saturated with Ca^{++} than in treppe (P.337, 338)
 - d. Fiber length is optimal to maximize participation of myosin crossbridges in force generation (P.340; FIBER LENGTH IS INDEPENDENT OF SUMMATION; BOTH ARE FACTORS THAT AFFECT FORCE GENERATED)

3. The following only occur(s) during diastole (assume left side of the heart) (ALL FIG 13.18):
 - a. Ventricular pressure is lower than aortic pressure (TRUE, EXCEPT IN PHASE 2 SYSTOLE)
 - b. Atrial pressure is higher than ventricular pressure (ONLY DURING PHASE 1 WHICH IS ONLY IN DIASTOLE)
 - c. AV and semi-lunar valves are open at the same time (NEVER HAPPENS)
 - d. Atrium contracts (FIG.13.18 AND FIG.13.19)