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Muscle contraction pogil worksheet answers

Transcript Muscle Contraction Model 1 - Anatomy sarcomere A I Thick thread Thin filament H Z Check the above pattern, then answer the following questions: 1. Label thick horizontal filament BIEMS thread. 2. Mark the thin horizontal filament thin filament 3. How many sarcomeres are shown in the above model? three 4. Discuss with your team and, based on your observations on the location of thick and thin filaments, describe each of the following: □ Bar: Widens the length of the thick filament and includes part of a thin filament □ I tape: area between the ends of thick threads; contains only thin filaments □ Zone H: areas between the thin ends of the filaments; contains only part of the thick filaments □ Drive Z: vertical line at each end of the sarcomer located in the middle of band 5 I. Describe how zone H differs from band A. (Use grammatically correct sentences) Zone H is located in the middle of zone A. In zone H there are only thick threads. Group A consists of thick and thin threads. Zone H is a subset of band A. Z 6. How many sarcomeres do you think are in the muscle cell to find your quadricere? Do you think you should have more or less sarcomeres with eye muscle? Many thousands to millions; Less, eye muscles are smaller Model 2 – Comparing relaxed and contracted Sarcomeres relaxed Figure 1. Relaxed sarcomeres. Agreement Figure 2. Sarcomeres contract. 7. Paragraphs 1 and 2 above shall denote zones A, zones I and H. Measure and record the lengths (mm) of these structures and the thick and thin filaments in the diagram below: Structure Thick thread Thin thread Band A bar Zone I Zone H Zona Sarcomer length in a relaxed sarcome (mm) Length contract Sarcomere (mm) Is the length changed between Figure 1 and 2? (yes/no) N N N Y Y Y 8. Using data from the above table, discuss with your group and describe what happens to thick and thin threads when the muscles contract. Sarcomere is shortened when thin filaments and thick filaments overlap to a greater extent. The filaments shall not shorten but overlap, causing the sarcomer to be shortened in its entirety. 9. As a group, observe the diagram of the 2nd of the year and describe the possible reasons why there is a limit to the amount of shortening that can occur in sarcomere during muscle contraction. The answers may vary. Possible answer: Depending on the thin length of the filaments, there is a limitation of the extent of overlap that may occur between the thick and thin filament dimensions. Also, Z discs can flow into the ends of thick threads and no longer shorten. Model 3 – Cross Sections Through Sarcomere Diagram 3 model has cross-sections of sarcomere that show the filament in different places sarcomere. thick, thin, thin, thin, thin, thin, thin, thin, thin, . Article B 10. C picture. Denote thick and small threads in Figure A, B and C. 11. Draw three vertical lines showing locations in the chart the sarcomer cross-section indicated in A, B and C. and C. shall mark each of the rows. A B C 12. Which numbers (A, B or C) represent the cross-section in zone H? Article B 13 is to be in the states where the Which numbers (A, B or C) represent the cross-section in band I? A 14. Which numbers (A, B or C) are the cross-section at the ends of band A? Article C 15 In the picture, the shade in the area of band A. Specify the location of band I. Article I 16 By looking at skeletal muscle through a microscope, you can easily see dark and light striations of muscle fibers. Based on the shading of the figures above and below, hypothesis of what constitutes the dark and light bands of muscle fibers, as seen through the microscope. The dark bands consist of a band A with thick filaments and a thin filament part. The light bands shall consist of the thin threads of band I. Band I Band Z drive Source: LUMEN - Loyola University Medical Education Network 17. How many muscle cells are in photomicrography above? 3 18. On the image above label band and I band. Marks Z drive 19. Sliding filament theory is used to explain the physiology of skeletal muscle contraction. On your own, using what you've learned from this action, predict what sliding filament theory states. Next, discuss your predictions with your group members and develop a definition of sliding filament theory for thick and thin threads. (Use grammatically correct sentences) When the skeletal muscle contracts, thin threads slide past thick threads. In the process, the H bands and I bands get smaller; the overlap areas become larger, the Z discs move closer together, and the width of band A remains the same. This explanation is known as sliding filament theory 20. How do you think muscles increase in size? Discuss this with your team and report all options. Microtear stimulates muscle fibers to produce more myofilaments and proteins/myofilament/myofibrils. Under normal circumstances, it is not considered that we are adding more cells, although sometimes this can happen in response to injury. Thank you for your participation! Participation!