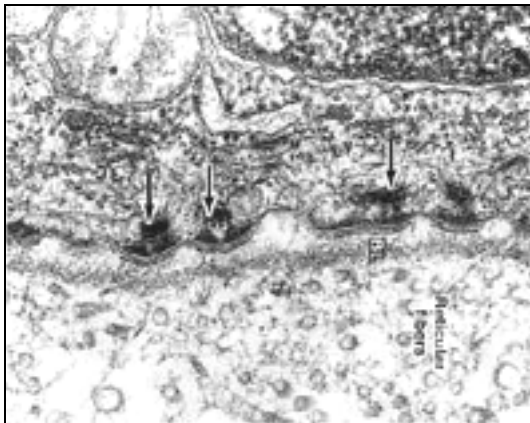


BMD 415 Microscopic Anatomy, Exam 1, Fall 2003

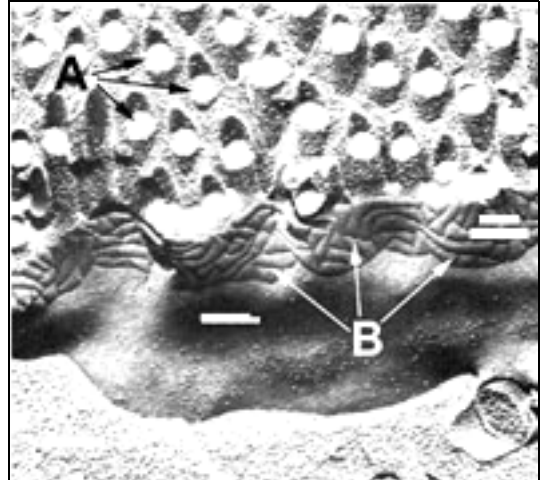
Write your name on the back of the answer sheet and fill in your answers in the blank lines on the front. Answers do not need to be in complete sentences but should provide the best response to the question. There are 26 questions worth 2 points each for a total of 52 points (2 bonus points). Related figures are located below the question.

1. What is the objective of tissue fixation?
2. Name two cell structures that are stained by hematoxylin.
3. Why does electron microscopy have a smaller field of view than light microscopy? Is this an advantage or a disadvantage?
4. In indirect immunohistochemistry, what molecules are used to localize and visualize the antigen?
5. Describe a situation (e.g., plane of section), if possible, where simple columnar, simple cuboidal, and simple squamous epithelia could all look alike in the light microscope.
6. This is a cross section of the basal surface of an epithelial cell and the underlying basal lamina. The arrows indicate hemidesmosomes. Based on what you know about the desmosome, speculate about the function and structure of hemidesmosomes.

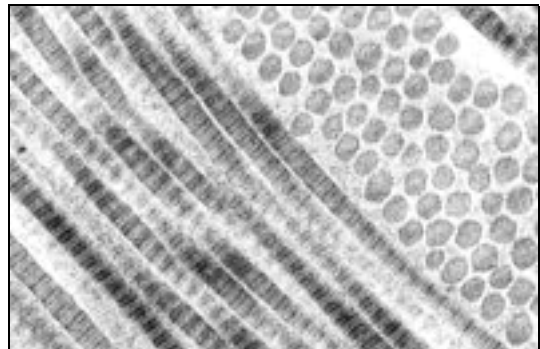


7. This is a freeze fracture image of the surface epithelium from the small intestine. Identify

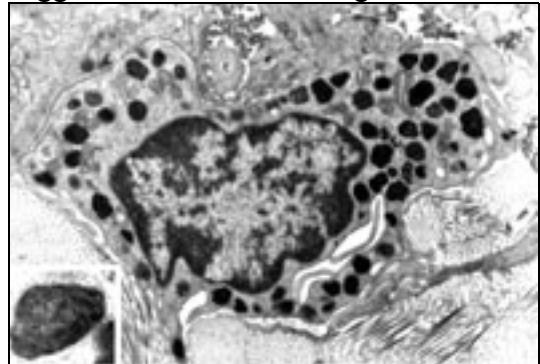
the labeled structures.



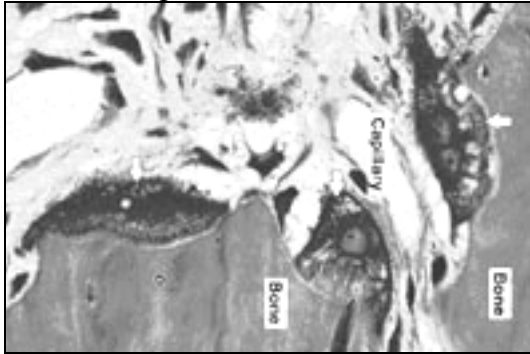
8. In what way(s) are gap junctions and desmosomes alike?
9. What causes the striations in these extracellular fibers?



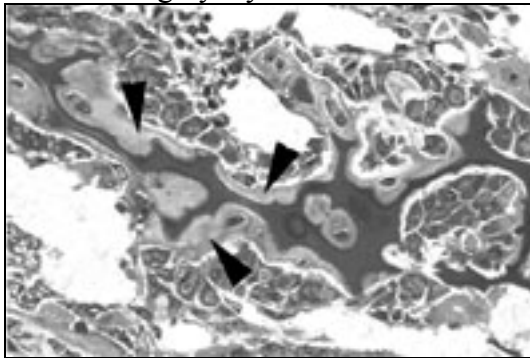
10. Why is it not surprising to see lipofuscin granules in macrophages in the lung and in neurons?
11. Name the contents in the secretory vesicles of this connective tissue cell. Allergens trigger the release of these granules.



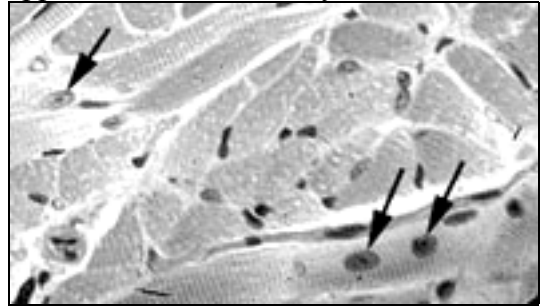
12. To show an example of loose (areolar) connective tissue, which slide in our collection would you choose and where on the slide would you look?
13. How is the structure of dense irregular connective tissue related to its function?
14. How are chondrocytes like fibroblasts?
15. Compared to living bone tissue, what is missing in a ground bone section and what is missing in a decalcified preparation?
16. Identify the cells at the white arrows and name their specific location.



17. Describe a structural feature shared by spongy and compact bone, and describe a structural difference between the two.
18. This is an example of ___ ossification. What is the grey layer at the arrowhead?



19. Describe two artifacts that occur with routine preparation of paraffin sections.
20. Describe two ways to differentiate neurons from glia with a light microscope.
21. What is the main molecular component of myelin?
22. Compare and contrast the hematoxylin and eosin staining of nerve cell bodies and skeletal muscle fibers.
23. Which membrane specializations of skeletal muscle fibers would you guess are smaller than 0.2 μm ? Explain your reasoning.
24. Under what circumstances would a longitudinal view of skeletal muscle fibers appear to have a centrally located nucleus?



25. How is the neuromuscular junction on cardiac muscle both different and similar to the neuromuscular junction on skeletal muscle?
26. How does the role of Ca^{++} differ in cardiac vs. skeletal muscle contraction?

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