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Patton: Anatomy and Physiology, 8th Edition

Chapter 03-A: Anatomy of Cells

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TRUE/FALSE

1. The longest extension of a nerve cell can be almost a foot long.

   ANS: F DIF: Application REF: Page 67
   TOP: Functional Anatomy of Cells

2. An important function of the cell membrane is the maintenance of cell integrity.

   ANS: T DIF: Synthesis REF: Page 69 (Table 3-3)
   TOP: Cell Membrane

3. Peroxisomes contain enzymes that detoxify harmful substances.

   ANS: T DIF: Memorization REF: Page 77
   TOP: Peroxisomes

4. The outer portion of the cell membrane is hydrophobic, or water-loving.

   ANS: F DIF: Memorization REF: Page 70
   TOP: Cell Membrane

5. Ribosomes attached to the endoplasmic reticulum are responsible for making proteins to be exported out of the cell.

   ANS: T DIF: Memorization REF: Page 73
   TOP: Endoplasmic Reticulum

6. The functions of the nucleus are regulated by RNA.

   ANS: F DIF: Memorization REF: Page 78
   TOP: Nucleus

7. The major direct cell connections are tight junctions, gap junctions, and desmosomes.

   ANS: T DIF: Memorization REF: Page 83|Page 84
   TOP: Cell Connections

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8. Tight junctions do not allow molecules to spread through the cracks between cells.

ANS: T DIF: Memorization REF: Page 84
TOP: Cell Connections

9. Gap junctions are found in the small intestine. They allow molecules to flow between cells.

ANS: F DIF: Memorization REF: Page 84
TOP: Cell Connections

10. The number of mitochondria in a cell is basically related to its degree of cell activity.

ANS: T DIF: Memorization REF: Page 77
TOP: Mitochondria

11. The cell's internal supporting framework is called the *cytoskeleton*.

ANS: T DIF: Memorization REF: Page 79
TOP: Cytoskeleton

12. The size of a cell's nucleolus is indirectly related to the amount of protein the cell produces.

ANS: T DIF: Memorization REF: Page 79
TOP: Nucleus

13. Heart muscle cells are joined by gap junctions to facilitate the movement of electrical impulses.

ANS: T DIF: Memorization REF: Page 84
TOP: Cell Connections

14. Cell connections called *desmosomes* are like Velcro holding cells together.

ANS: T DIF: Memorization REF: Page 83
TOP: Cell Connections

15. Cilia are longer and more numerous than flagella.

ANS: F DIF: Memorization REF: Page 83
TOP: Cell Extensions

16. The nucleolus is made up of tightly coiled DNA.

ANS: F DIF: Memorization REF: Page 78

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TOP: Nucleus

17. The thinnest cell fibers are tiny, hollow tubes called *microtubules*.

ANS: F DIF: Memorization REF: Page 80
TOP: Cell Fibers

18. The plasma membrane can be described as a double layer of phospholipid molecules.

ANS: T DIF: Synthesis REF: Page 70|Page 71
TOP: Cell Membrane

19. Generally, the more active a cell is, the fewer mitochondria it will contain.

ANS: F DIF: Application REF: Page 77 TOP: Mitochondria

20. Cell fibers that are composed of twisted protein strands describes microtubules.

ANS: F DIF: Memorization REF: Page 80
TOP: Cell Fibers

21. The "typical" cell described in this chapter is very similar to most of the cells in the human body.

ANS: F DIF: Memorization REF: Page 68
TOP: The Typical Cell

22. The watery fluid in the cell is called *cytosol*.

ANS: T DIF: Memorization REF: Page 69
TOP: Cell Structure

23. Water-soluble substances easily pass through the cell membrane.

ANS: F DIF: Memorization REF: Page 71
TOP: Cell Membrane

24. Glycoproteins on the cell membrane identify the cell as "self."

ANS: T DIF: Application REF: Page 72 TOP: Cell Membrane

25. Rough endoplasmic reticulum looks rough because there are mitochondria attached to it.

ANS: F DIF: Memorization REF: Page 73
TOP: Endoplasmic Reticulum

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26. Proteins in the cell membrane can control the movement of material through the cell membrane.

ANS: T DIF: Memorization REF: Page 72
TOP: Cell Membrane

27. Smooth endoplasmic reticulum is the organelle that supplies membrane material for use throughout the cell.

ANS: T DIF: Memorization REF: Page 73|Page 74
TOP: Endoplasmic Reticulum

28. Ribosomes are only found attached to endoplasmic reticulum.

ANS: F DIF: Memorization REF: Page 74
TOP: Ribosomes

29. The main function of the ribosome is to provide energy to the cell.

ANS: F DIF: Memorization REF: Page 74
TOP: Ribosomes

30. The Golgi apparatus helps to prepare material for export from the cell.

ANS: T DIF: Memorization REF: Page 74
TOP: Golgi Apparatus

31. The protein-processing units of the Golgi apparatus are called *cisterna*.

ANS: T DIF: Memorization REF: Page 74
TOP: Golgi Apparatus

32. Lysosomes can be called the “garbage disposals” of the cell.

ANS: T DIF: Memorization REF: Page 76
TOP: Lysosomes

33. The catalase in the peroxisomes reacts to detoxify carbon dioxide.

ANS: F DIF: Memorization REF: Page 77
TOP: Peroxisomes

34. The inner folds of the mitochondria are called *cisterna*.

ANS: F DIF: Memorization REF: Page 77

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TOP: Mitochondria

35. It is likely that a muscle cell would have more mitochondria than a fat cell.

ANS: T DIF: Application REF: Page 77 TOP: Mitochondria

36. One of the main functions of the mitochondria is to supply the cell with ATP.

ANS: T DIF: Memorization REF: Page 77
TOP: Mitochondria

37. The name *nucleus* comes from the Greek word for color.

ANS: F DIF: Memorization REF: Page 78
TOP: Nucleus

38. Chromosomes and chromatin are both forms of DNA.

ANS: T DIF: Application REF: Page 78 TOP: Nucleus

39. Microtubules are sometimes called the engines of the cell.

ANS: T DIF: Memorization REF: Page 80
TOP: Cell Fibers

40. The body of a female does not produce cells with flagella.

ANS: T DIF: Application REF: Page 83 TOP: Cell Extensions

41. Schleiden and Schwann were the first scientists to see cells.

ANS: F DIF: Memorization REF: Page 67
TOP: Introduction

42. The largest human cell is the female ovum or egg cell.

ANS: T DIF: Memorization REF: Page 67
TOP: Functional Anatomy of Cells

43. Another term for cytosol is intracellular fluid.

ANS: T DIF: Memorization REF: Page 69
TOP: Cell Structure

44. The fluid mosaic model describes the chromatin material found in the nucleus.

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ANS: F DIF: Memorization REF: Page 70
TOP: Cell Membrane

45. One function of the smooth endoplasmic reticulum is to help maintain a low Ca^{++} concentration in the cell's interior.

ANS: T DIF: Memorization REF: Page 74
TOP: Endoplasmic Reticulum

46. A major part of ribosomes is deoxyribonucleic acid.

ANS: F DIF: Memorization REF: Page 74
TOP: Ribosomes

47. The proteasomes contain enzymes that assist in protein synthesis.

ANS: F DIF: Memorization REF: Page 76
TOP: Proteasomes

48. Proteasomes only destroy abnormal or misfolded proteins in the cell.

ANS: F DIF: Memorization REF: Page 76
TOP: Proteasomes

49. Small proteins called *ubiquitins* assist the proteasomes in accomplishing their function.

ANS: T DIF: Memorization REF: Page 76
TOP: Proteasomes

50. An organelle called a *vault,* composed of RNA and protein, functions to shuttle molecules to and from the nucleus.

ANS: T DIF: Memorization REF: Page 79 (Box 3-2)
TOP: Vaults

51. An angstrom is larger than a nanometer.

ANS: F DIF: Memorization
REF: Page 67 (Table 3-1) TOP: Units of Size

52. Two types of lipids, phospholipids and cholesterol, are important molecules in the cell membrane.

ANS: T DIF: Memorization REF: Page 71

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TOP: Cell Membrane

53. Rafts are stiff groupings of membrane molecules that are rich in cholesterol.

ANS: T DIF: Memorization REF: Page 71
TOP: Membrane Structure

54. Hormones attach to special cholesterol molecules in the cell membrane.

ANS: F DIF: Memorization REF: Page 72
TOP: Membrane Function

55. Three ribosomal subunits must come together to form a functioning ribosome.

ANS: F DIF: Memorization REF: Page 74
TOP: Ribosomes

56. Many ribosomes can work on the same mRNA strand at the same time; when this occurs, the structure is called a *polyribosome*.

ANS: T DIF: Memorization REF: Page 74
TOP: Ribosomes

57. A complete ribosome only exists when it is making a protein.

ANS: T DIF: Application REF: Page 74 TOP: Ribosomes

58. In order for the Golgi apparatus to function correctly, both the ribosomes and the rough endoplasmic reticulum must be functioning also.

ANS: T DIF: Application REF: Page 74 TOP: Golgi Apparatus

59. Muscular dystrophy is a disease condition that can be linked to the malfunctioning of proteasomes.

ANS: F DIF: Memorization REF: Page 76
TOP: Proteasomes

60. The nucleus is the only structure in the cell that contains DNA.

ANS: F DIF: Memorization REF: Page 77
TOP: Mitochondria

61. Another name for the centrosome is the microtubule organizing center.

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ANS: T DIF: Memorization REF: Page 81
TOP: Centrosomes

62. The centriole is a single cylindrical structure at the boundary of the centrosome.

ANS: F DIF: Memorization REF: Page 81
TOP: Centrosomes

63. Small protein structures called *molecular motors* pull loads form one part of the cell to another along the cytoskeleton.

ANS: T DIF: Memorization REF: Page 81
TOP: Molecular Motors

64. All of the cell extensions—microvilli, cilia, and flagella—have basically the same structure. They only differ in number per cell and length.

ANS: F DIF: Memorization REF: Page 82|Page 83
TOP: Cell Extensions

65. Primary cilia are unable to move because they lack the central pair of microtubules and motor molecules.

ANS: T DIF: Memorization REF: Page 83
TOP: Cell Extensions

66. Cytoplasm is another term for cytosol.

ANS: F DIF: Memorization REF: Page 69
TOP: Cell Structure

67. One important function of integral membrane proteins is signal transduction or carrying messages across the cell membrane.

ANS: T DIF: Memorization REF: Page 72
TOP: Membrane Function

68. Integral membrane proteins play an important role in pinching off the cell membrane so two new cells can form during cell division.

ANS: F DIF: Memorization REF: Page 72
TOP: Membrane Function

69. Organelles can be divided into two groups, hydrophobic (water fearing) and hydrophilic (water loving).

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ANS: F DIF: Memorization REF: Page 73
TOP: Cytoplasm and Organelles

70. The only structural difference between the rough and smooth endoplasmic reticulum (ER) is that the rough ER has ribosomes attached.

ANS: F DIF: Memorization REF: Page 73|Page 74
TOP: Endoplasmic Reticulum

71. The ribosome is an example of a membranous organelle.

ANS: F DIF: Memorization REF: Page 74
TOP: Ribosomes

72. When vesicles from the Golgi apparatus reach the cell membrane, the contents are secreted to outside the cell.

ANS: T DIF: Memorization REF: Page 74
TOP: Golgi Apparatus

73. The usual destination for vesicles released by the Golgi apparatus is the nucleus of the cell.

ANS: F DIF: Memorization REF: Page 74
TOP: Golgi Apparatus

74. Lysosomes are vesicles that have been pinched off from the smooth endoplasmic reticulum.

ANS: F DIF: Memorization REF: Page 76
TOP: Lysosomes

75. Nuclear pore complexes regulate what can enter and leave the nucleus.

ANS: T DIF: Memorization REF: Page 78
TOP: Nucleus

76. Centrioles are made up of cylinders of nine bundles of microtubules with two tubules in each bundle.

ANS: F DIF: Memorization REF: Page 81
TOP: Centrosomes

77. Centrosomes play an important role in cell division.

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ANS: T DIF: Memorization REF: Page 81
TOP: Centrosomes

78. Primary cilia can act as sensory organelles.

ANS: T DIF: Memorization REF: Page 83
TOP: Cell Extensions

79. One function of the microvilli is to increase the surface area of a membrane to provide for more efficient absorption.

ANS: T DIF: Memorization REF: Page 82
TOP: Cell Extensions

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