Human Physiology From Cells to Systems 9th edition Sherwood Test Bank

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Chapter 02 – Cell Physiology

1. A cell's cytoplasm consists of ____.
   a. cytosol, plasma membrane, and mitochondria
   b. plasma membrane, organelles, and ribosomes
   c. cellular plasma, organelles, and exoskeleton
   d. osmotic fluid, DNA, and cytoskeleton
   e. cytosol, organelles, and cytoskeleton

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: Homeostasis Highlights
LEARNING OBJECTIVES: HUPH.SHER.16.2.2 - Discuss the three major subdivisions of human cells

2. An organism's structure and function ultimately depend on what two factors within its cells?
   a. size and shape
   b. structural appearance and ability to produce energy
   c. collective functional capabilities and location
   d. collective structural characteristics and functional capabilities
   e. location within the body and overall number

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

3. What is the smallest structural/functional unit capable of carrying out life processes?
   a. an atom
   b. a molecule
   c. a cell
   d. an organ
   e. a specialized tissue

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

4. What is the average size (in diameter) of a typical human cell?
   a. about 100 micrometers
   b. about 10 to 20 micrometers
   c. about 1 micrometer
   d. about 10 millimeters
   e. about 1 millimeter

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

5. How much more powerful are modern electron microscopes compared to light microscopes?

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a. 100x
b. 50x
c. 25x
d. 10x
e. 5x

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

6. What are the two major parts of a cell's interior?
a. the intracellular fluid and matrix
b. the nucleus and plasma membrane
c. the nucleus and cytoplasm
d. the DNA and cytoplasm
e. the DNA and RNA

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

7. What is the genetic material in a cell's nucleus called?
a. ribosomal acid (RNA)
b. chromosomal proteins
c. ribonucleic acid (RNA)
d. diatomic nucleic acid (DNA)
e. deoxyribonucleic acid (DNA)

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

8. How many chromosomes do regular human cells contain?
a. 46
b. 43
c. 36
d. 23
e. 18

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

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9. How many primary types of RNA play roles in protein synthesis within cells?
   a. two
   b. three
   c. four
   d. five
   e. six

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

10. What is the type of RNA called that delivers the appropriate amino acids within the cytoplasm to their designated site at the ribosome?
   a. messenger RNA
   b. deliver RNA
   c. ribosomal RNA
   d. transfer RNA
   e. cytoplasm RNA

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.3 - Explain the structure and functions of the two types of endoplasmic reticulum

11. In addition to the main types of RNA, what are the newly discovered regulatory RNA types called?
   a. small RNA and regulatory RNA
   b. intracellular RNA and extracellular RNA
   c. microRNA and small interfering RNA
   d. microRNA and regulatory RNA
   e. cytoplasm RNA and interfering RNA

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.3 - Explain the structure and functions of the two types of endoplasmic reticulum

12. What emerging science studies environmentally induced modifications of a gene's activity that do not involve a change in the gene's DNA code?
   a. gene modification theory
   b. epigenetics
   c. geneticology
   d. modified genetics
   e. intragenetics

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ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

13. The endoplasmic reticulum can be thought of as a cellular factory that produces what two compounds?
    a. DNA and RNA
    b. organelles and protein
    c. ATP molecules and lipids
    d. ribosomes and ATP molecules
    e. proteins and lipids

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3 - Explain the structure and functions of the two types of endoplasmic reticulum

14. What are the two types of endoplasmic reticulum called?
    a. smooth and rough
    b. intracellular and extracellular
    c. ribbed and non-ribbed
    d. long and short
    e. rounded and flat

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3 - Explain the structure and functions of the two types of endoplasmic reticulum

15. Rough endoplasmic reticulum (ER) is most abundant in what kind of cells?
    a. cells specialized for protein secretion
    b. nerve cells
    c. cells that require minimal membrane synthesis
    d. cardiac muscle cells
    e. slowly growing cells

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3.1 - Outline the role of the rough ER in protein synthesis

16. What type of endoplasmic reticulum (ER) is made of tubules and lumens?
    a. long ER
    b. smooth ER
    c. rough ER

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d. Golgi complex
e. short ER

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3.2 - Contrast three functions of smooth ER in specialized cells with those present in ordinary cells

17. The endoplasmic reticulum has a quality control system to remove misfolded proteins by tagging them with what small protein?
a. proteasome
b. A-protease
c. ubiquitin
d. B-protease
e. co-enzyme Q-10

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3.1 - Outline the role of the rough ER in protein synthesis

18. Vesicular transport from one Golgi sac to the next is accomplished through the action of what compound?
a. proteasome
b. B-protease
c. ubiquitin
d. membrane-curving coat protein I (COPI)
e. plasma coated protein I (PCPI)

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4.1 - Describe the structure of the Golgi complex

19. What is the main action of lysosomes?
a. promote cellular division
b. repair the plasma membrane
c. destroy free radicals
d. produce energy for cells
e. break down organic molecules

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5 - Explain the two main functions of lysosomes

20. On average, how many lysosomes do cells contain?
a. about 10
b. about 50

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c. about 100
d. about 300
e. about 1,000

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5 - Explain the two main functions of lysosomes

21. What form of endocytosis do white blood cells use in order to engulf bacteria?
a. phagocytosis
b. pinocytosis
c. bactocytosis
d. bacteriophage
e. lymphocytosis

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5.1 - Describe the three forms of endocytosis

22. Pseudopods are characteristic of what form of endocytosis?
a. pinocytosis
b. phagocytosis
c. autophagy
d. lymphocytosis
e. ingestion

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5.1 - Describe the three forms of endocytosis

23. Peroxisomes are membranous organelles that produce and decompose what compound?
a. protein
b. lysosomes
c. hydrogen peroxide
d. iron
e. ozone

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 Peroxisomes and Detoxification
LEARNING OBJECTIVES: HUPH.SHER.16.2.6 - Describe how peroxisomes use oxidative enzymes and catalase for detoxification

24. What is the main role of the mitochondria within cells?
a. detoxification
b. recycling

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c. free radical scavenging
d. power plant
e. gene protecting

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7 - Explain why mitochondria are the energy organelles of the cell

25. What are the three stages of cellular respiration?
a. glycolysis, citric acid cycle, aerobic and detoxification
b. citric acid cycle, aerobic detoxification, and antioxidation
c. glycolysis, oxidative phosphorylation, and lactic acid cycle
d. oxidative phosphorylation, lactic acid cycle, and glycogen production
e. glycolysis, citric acid cycle, and oxidative phosphorylation

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.2 - Specify the three stages of cellular respiration and the location where each is accomplished

26. How many enzymes are used for the process of glycolysis?
a. 4
b. 6
c. 8
d. 10
e. 12

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.2 - Specify the three stages of cellular respiration and the location where each is accomplished

27. What is an alternative name for the citric acid cycle?
a. lactic acid cycle
b. dicarboxylic acid cycle
c. Krebs cycle
d. glycolysis
e. vitamin C cycle

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.2 - Specify the three stages of cellular respiration and the location where each is accomplished

28. How many net molecules of ATP are produced from the complete oxidation of one molecule of glucose?

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a. 36
b. 32
c. 16
d. 12
e. 2

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

29. How many molecules of ATP are generated for each molecule of acetyl-CoA that enters the citric acid cycle?
a. one
b. two
c. three
d. four
e. five

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

30. In what process does the flow of H^+ ions activate ATP synthase and power ATP synthesis by its headpiece?
a. chemosynthesis
b. photosynthesis
c. synthase reduction
d. synthase activation
e. chemiosmosis

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

31. What two compounds link the citric acid cycle and the electron transport system?
a. NAD_2 and FAD_2
b. H_2O and O_2
c. hydrogen peroxide and ATP synthase
d. NAD^+ and FAD
e. H^+ ions and glucose

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

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32. Cells use the energy stored in ATP primarily for ____.
    a. detoxification, division, and genetic improvement
    b. synthesis, transport, and mechanical work
    c. synthesis, detoxification, and waste removal
    d. transport, phagocytosis, and exocytosis
    e. mechanical work, genetic improvement, and phagocytosis

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.4 - Describe the three types of activities which use the energy stored in ATP

33. Vaults are non-membranous organelles shaped as ____.
    a. hexagons
    b. pentagons
    c. octagons
    d. decagons
    e. dodecagons

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.8 Vaults as Cellular Trucks
LEARNING OBJECTIVES: HUPH.SHER.16.2.9 - Describe the structure of vaults and their speculated functions

34. What is the storage form of glucose?
    a. glycogen
    b. adipose tissue
    c. lipids
    d. inclusion
    e. insulin

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Cytosol: Cell Gel
LEARNING OBJECTIVES: HUPH.SHER.16.2.11 - Describe the three categories of activities associated with the cytosol

35. What three distinct elements comprise the cytoskeleton?
    a. microtubules, microfilaments, and intermediate filaments
    b. tubules, filaments, and lumens
    c. small tubules, small filaments, and big filaments
    d. microtubules, minitubules, and macrotubules
    e. microfilaments, minifilaments, and macrofilaments

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12 - Describe the structure and functions of the three cytoskeletal elements

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36. Which cytoskeletal element is the largest?
    a. microtubules
    b. macrotubules
    c. small filaments
    d. macrofilaments
    e. microfilaments

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.1 - Describe the structure and three main functions of microtubules

37. From what structures do microtubules arise?
    a. lysosomes
    b. macrotubules
    c. centrosomes
    d. mitochondria
    e. microfilaments

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.1 - Describe the structure and three main functions of microtubules

38. What motor protein carries secretory vesicles to the end of axons?
    a. enzyme K
    b. kinesin
    c. dynein
    d. enzyme D
    e. axonein

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.1 - Describe the structure and three main functions of microtubules

39. Which elements of the cytoskeleton are the smallest?
    a. microtubules
    b. macrotubules
    c. small filaments
    d. macrofilaments
    e. microfilaments

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.2 - Describe the structure and two main functions of microfilaments

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40. What term refers to the intermediate filaments found in nerve cell axons?
    a. axonalfilaments
    b. electrical filaments
    c. excitatory filaments
    d. neurofilaments
    e. dendrites

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle" "
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.3 - Describe the structure and function of intermediate filaments

41. A cell has three major parts: the plasma membrane, the nucleus, and the cytoplasm.
    a. True
    b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: Homeostasis Highlights
LEARNING OBJECTIVES: HUPH.SHER.16.2.2 - Discuss the three major subdivisions of human cells

42. The cytoskeleton is the protein scaffolding of the cell and serves as its "bones and muscles."
    a. True
    b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: Homeostasis Highlights
LEARNING OBJECTIVES: HUPH.SHER.16.2.2 - Discuss the three major subdivisions of human cells

43. All new cells and new life arise only from preexisting cells.
    a. True
    b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

44. The functional activities of each cell depend on the ability to divide.
    a. True
    b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

45. The nucleus is typically the largest single organized cell component.
    a. True

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b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

46. The nucleus houses the cell's genetic material, ribonucleic acid (RNA).
a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

47. Gene expression refers to the multi-stepped process by which information encoded in a gene is used to direct the synthesis of a protein molecule.
a. True
b. False

ANSWER: True
DIFFICULTY: 2.2 An Overview of Cell Structure
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

48. Proteins are the main functional component of cells, and protein-based enzymes govern the rate of cellular division.
a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.3 - Categorize the three components of the cytoplasm based on their structure and function

49. Only 25% of DNA codes for protein synthesis.
a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.3 - Categorize the three components of the cytoplasm based on their structure and function

50. Ribosomes bring together all components that participate in protein synthesis and provide the enzymes and energy required for linking the amino acids together.

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a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3.1 - Outline the role of the rough ER in protein synthesis

51. About one-third of the proteome is typically synthesized in the endoplasmic reticulum.
a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3.1 - Outline the role of the rough ER in protein synthesis

52. Smooth endoplasmic reticulum is abundant in cells that specialize in protein synthesis.
a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3.2 - Contrast three functions of smooth ER in specialized cells with those present in ordinary cells

53. The sacs within each Golgi stack are in close physical contact with each other.
a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4.1 - Describe the structure of the Golgi complex

54. A vesicle can "dock" lock-and-key fashion and "unload" its selected cargo only at the appropriate docking-marker acceptor in the Golgi complex.
a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4.1 - Describe the structure of the Golgi complex

55. A lysosome contains about 500 different powerful hydrolytic enzymes that are synthesized in the ER.
a. True
b. False

ANSWER: False

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DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5 - Explain the two main functions of lysosomes

56. Lysosomal enzymes degrade dysfunctional organelles by selective self-digestion known as autophagy.
    a. True
    b. False
ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5.1 - Describe the three forms of endocytosis

57. As part of their separate heritage, mitochondria possess their own DNA.
    a. True
    b. False
ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.1 - Illustrate the structure and organization of mitochondria

58. In skeletal muscle and many other cell types, mitochondria exist separately.
    a. True
    b. False
ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.1 - Illustrate the structure and organization of mitochondria

59. Cellular respiration refers collectively to the intracellular reactions in which energy-rich molecules are broken down to form O_2.
    a. True
    b. False
ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

60. Cells with a high rate of secretion use up to 75% of the ATP they generate just to synthesize new chemical compounds.
    a. True
    b. False
ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.4 - Describe the three types of activities which use the energy stored in

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ATP

61. Every cell has a built-in biochemical pathway that, if triggered, causes the cell to execute itself as a result of mitochondrial leakage of hydrogen peroxide.

a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.5 - Discuss the role of mitochondria in apoptosis

62. Ongoing research supports the role of vaults in nucleus-to-cytoplasm transport, but their cargo has not been determined.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.8 Vaults as Cellular Trucks
LEARNING OBJECTIVES: HUPH.SHER.16.2.9 - Describe the structure of vaults and their speculated functions

63. Occupying about 85% of the total cell volume, the cytosol is the semi-liquid portion of the cytoplasm that surrounds the organelles.

a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Cytosol: Cell Gel
LEARNING OBJECTIVES: HUPH.SHER.16.2.11 - Describe the three categories of activities associated with the cytosol

64. Centrioles are pairs of cylindrical structures at right angles to each other.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.10 - Discuss the structure and functions of the centrosome and centrioles

65. Cilia are short, tiny, hair-like protrusions usually found in large numbers on the surface of some cells.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.1 - Describe the structure and three main functions of microtubules

66. Cells are the highly _____, living building blocks of the body.

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ANSWER: organized
DIFFICULTY: Bloom's: Remember
REFERENCES: Homeostasis Highlights
LEARNING OBJECTIVES: HUPH.SHER.16.2.2 - Discuss the three major subdivisions of human cells

67. The _____ is a gel-like liquid that suspends the cellular organelles and cytoskeleton.
ANSWER: cytosol
DIFFICULTY: Bloom's: Remember
REFERENCES: Homeostasis Highlights
LEARNING OBJECTIVES: HUPH.SHER.16.2.2 - Discuss the three major subdivisions of human cells

68. Larger species have more cells, not _____ cells.
ANSWER: larger
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

69. The trillions of cells in a human body are classified into about _____ types based on specific variations in structure and function.
ANSWER: 200
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

70. The _____ is a thin membranous structure that encloses each cell and is composed mostly of lipid molecules and studded with proteins.
ANSWER: plasma membrane
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.1 - Describe the structure and two functions of the plasma membrane

71. The plasma membrane keeps the _____ fluid within the cells from mingling with the extracellular fluid.
ANSWER: intracellular
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.1 - Describe the structure and two functions of the plasma membrane

72. DNA and associated nuclear proteins are organized into _____.
ANSWER: chromosomes
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

73. _____ delivers the appropriate amino acids within the cytoplasm to their designated site in the

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protein under construction at the ribosome.
ANSWER: Transfer RNA; tRNA
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.3.1 - Outline the role of the rough ER in protein synthesis

74. On average, nearly half of the total cell volume is occupied by two categories of organelles: _____ organelles and _____ organelles.
ANSWER: membranous; non-membranous
non-membranous; membranous
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.3 - Categorize the three components of the cytoplasm based on their structure and function

75. The _____ endoplasmic reticulum (ER) consists of stacks of relatively flattened interconnected sacs, while the _____ ER is a meshwork of tiny interconnected tubules.
ANSWER: rough; smooth
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.3 - Explain the structure and functions of the two types of endoplasmic reticulum

76. Secretory vesicles containing the finished protein products bud off the _____ and remain in the cytosol, storing the products until signaled to empty.
ANSWER: Golgi complex
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Endoplasmic Reticulum and Segregated Synthesis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4 - Discuss how the Golgi complex modifies, packages, and distributes newly synthesized proteins

77. Releasing to the exterior of substances originating within the cell is referred to as _____.
ANSWER: exocytosis
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4.3 - Describe the two functions that take place during the transit of proteins through the Golgi complex

78. The v-SNAREs bind only with the _____ docking-marker acceptors of the targeted plasma membrane.
ANSWER: t-SNARE
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4.4 - Describe the role of the Golgi complex in delivering finished proteins to their destinations

79. Lysosomes fuse with aged or damaged _____ to remove them from the cell.

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ANSWER: organelles
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5 - Explain the two main functions of lysosomes

80. Tay-Sachs disease is an example of a(n) _____ storage disease.
ANSWER: lysosomal
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Lysosomes and Endocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.5.1 - Describe the three forms of endocytosis

81. Mitochondria generate about _____% of the energy that cells need to survive and function.
ANSWER: 90, ninety
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7 - Explain why mitochondria are the energy organelles of the cell

82. The cell generates more energy in _____ than in _____ conditions.
ANSWER: aerobic; anaerobic
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

83. Fatty acids are sequentially broken down in the mitochondrial matrix through the process of _____.
ANSWER: beta (ß) oxidation
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

84. High demands for ATP make _____ alone an insufficient and inefficient supplier of power for most cells.
ANSWER: glycolysis
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.4 - Describe the three types of activities which use the energy stored in ATP

85. Mitochondria play a key role in deliberate cell suicide, a process called _____.
ANSWER: apoptosis
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Mitochondria and ATP Production
LEARNING OBJECTIVES: HUPH.SHER.16.2.7.5 - Discuss the role of mitochondria in apoptosis

86. The cytosol is important in intermediary metabolism, _____ protein synthesis and nutrient storage.
ANSWER: ribosomal
DIFFICULTY: Bloom's: Remember

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REFERENCES: 2.9 Cytosol: Cell Gel
LEARNING OBJECTIVES: HUPH.SHER.16.2.11 - Describe the three categories of activities associated with the cytosol

87. Peroxisomes are membranous sacs containing _____ enzymes.
ANSWER: oxidative
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12 - Describe the structure and functions of the three cytoskeletal elements

88. _____ are long, slender, hollow tubes composed of tubulin molecules.
ANSWER: Microtubules
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.1 - Describe the structure and three main functions of microtubules

89. _____ are intertwined helical chains of actin or myosin molecules.
ANSWER: Microfilaments
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.2 - Describe the structure and two main functions of microfilaments

90. _____ are irregular, threadlike proteins.
ANSWER: Intermediate filaments
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"
LEARNING OBJECTIVES: HUPH.SHER.16.2.12.3 - Describe the structure and function of intermediate filaments

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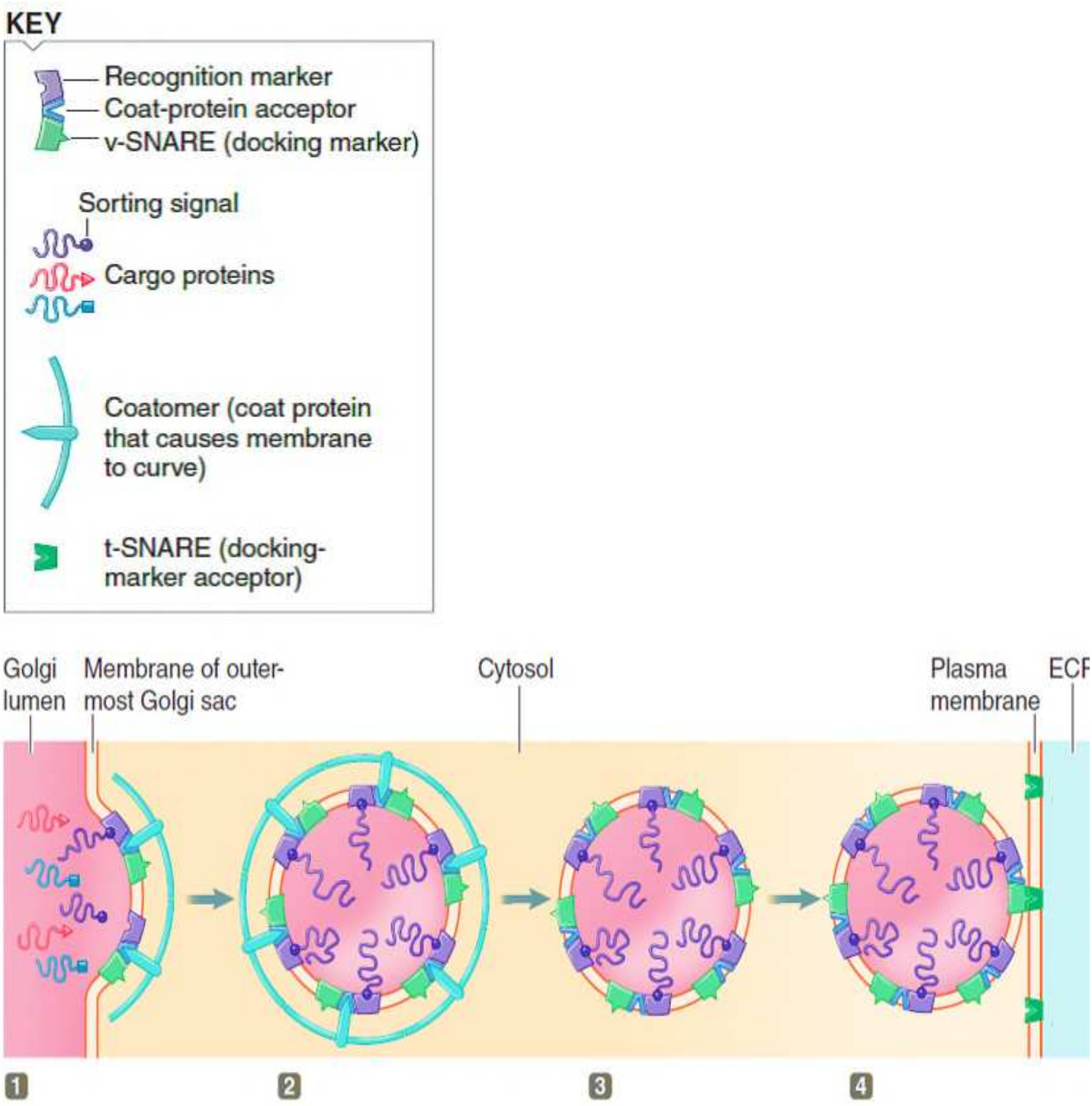


Figure 2-7
Answer the corresponding questions using the accompanying figure.

91. At what numbered stage in the accompanying figure does the vesicle lose its coating, which exposes v-SNARE docking markers on the vesicle surface?

a. 1
b. 2
c. 3
d. 4

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e. 5

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4 - Discuss how the Golgi complex modifies, packages, and distributes newly synthesized proteins

92. At what numbered stage in the accompanying figure do v-SNAREs bind only with the t-SNARE docking-marker acceptors?

a. 1
b. 2
c. 3
d. 4
e. 5

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4 - Discuss how the Golgi complex modifies, packages, and distributes newly synthesized proteins

93. At what numbered stage in the accompanying figure does the membrane close beneath the bud and pinch off the secretory vesicle?

a. 1
b. 2
c. 3
d. 4
e. 5

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4 - Discuss how the Golgi complex modifies, packages, and distributes newly synthesized proteins

94. At what numbered stage in the accompanying figure do the secretory vesicles get released?

a. 1
b. 2
c. 3
d. 4
e. 5

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4 - Discuss how the Golgi complex modifies, packages, and distributes newly synthesized proteins

95. At what numbered stage in the accompanying figure does the Golgi complex membrane curve and form a bud?

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a. 1
b. 2
c. 3
d. 4
e. 5

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Golgi Complex and Exocytosis
LEARNING OBJECTIVES: HUPH.SHER.16.2.4 - Discuss how the Golgi complex modifies, packages, and distributes newly synthesized proteins

96. Outline the six main principles of cell theory.
ANSWER: 1) The cell is the smallest structural and functional unit capable of carrying out life processes.
2) The functional activities of each cell depend on the specific structural properties of the cell.
3) Cells are the living building blocks of all multicellular organisms.
4) An organism's structure and function ultimately depend on the collective structural characteristics and functional capabilities of its cells.
5) All new cells and new life arise only from preexisting cells.
6) Because of this continuity of life, the cells of all organisms are fundamentally similar in structure and function.
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 Cell Theory and Discovery
LEARNING OBJECTIVES: HUPH.SHER.16.2.1 - List the six principles of the cell theory

97. Describe the human genome.
ANSWER: The human genome is all of the genetic information coded in a complete single set of DNA in a typical body cell. The Human Genome Project identified and sequenced the entire genetic code through an international collaborative effort among public and private researchers that began in 1990 and was completed in 2003. The human genome mapped the composition and sequence of the 3.2 billion chemical units organized into about 20,000 protein-coding genes (representing only 1.5% of the genome), along with extensive intervening stretches of DNA that are involved in various ways with gene regulation. Non-coding regions also affect how DNA is folded and packaged into chromosomes and carry out yet-to-be determined actions. With this complete genetic map in hand, scientists are now scrambling to identify the functions and regulation of the genes and other parts of the genome.
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.2 An Overview of Cell Structure
LEARNING OBJECTIVES: HUPH.SHER.16.2.2.2 - Describe the structure and functions of the nucleus with reference to its components

98. Describe the use of ATP molecules for energy.
ANSWER: The source of energy for the body is the chemical energy stored in the carbon bonds of ingested food, but cells are not equipped to use this energy directly. Instead, the cells must extract energy from food nutrients and convert it into a form they can use, namely, the high-energy phosphate bonds of adenosine triphosphate (ATP), which consists of adenosine with three phosphate groups attached. When the high-energy bond that binds the terminal phosphate to adenosine is split, a substantial amount of energy is released. ATP is the

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universal energy carrier -- the common energy "currency" of the body. Cells can "cash in" ATP to pay the energy "price" for running the cell machinery.

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.7 Mitochondria and ATP Production

LEARNING OBJECTIVES: HUPH.SHER.16.2.7 - Explain why mitochondria are the energy organelles of the cell

99. Compare and contrast aerobic exercise and anaerobic exercise in terms of energy production.

ANSWER: Aerobic ("with O_2") exercise involves large muscle groups and is performed at a low-enough intensity and for a long enough period that fuel sources can be converted to adenosine triphosphate (ATP) by using the citric acid cycle and oxidative phosphorylation as the predominant metabolic pathway. Aerobic exercise can be sustained from 15 to 20 minutes to several hours at a time. Significant benefits can be derived from aerobic exercise performed between 70% and 80% of maximal heart rate. In contrast, short-duration, high-intensity activities, such as weight training and the 100-meter dash, which last for a matter of seconds and rely solely on energy stored in the muscles and on glycolysis, are forms of anaerobic ("without O_2") exercise.

DIFFICULTY: Bloom's: Apply

REFERENCES: 2.7 Mitochondria and ATP Production

LEARNING OBJECTIVES: HUPH.SHER.16.2.7.3 - Compare aerobic and anaerobic respiration

100. Discuss the three components of the cytoskeleton.

ANSWER: 1) Microtubules, the largest of the cytoskeletal elements, are long, hollow tubes formed by two slightly different variants of globular-shaped tubulin molecules.
2) Most microfilaments, the smallest of the cytoskeletal elements, consist of two chains of actin molecules wrapped around each other.
3) The intermediate filament keratin, found in skin, is made of four keratin protofibrils twisted together. A protofibril consists of two strands, each made up of two staggered rows of keratin subunits. The composition of intermediate filaments, which are intermediate in size between the microtubules and microfilaments, varies among different cell types.

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.10 Cytoskeleton: Cell "Bone and Muscle"

LEARNING OBJECTIVES: HUPH.SHER.16.2.12 - Describe the structure and functions of the three cytoskeletal elements

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