

Chapter

7

A View of the Cell

Reinforcement and Study Guide

Section 7.1 The Discovery of Cells

In your textbook, read about the history of the cell theory.

For each statement in Column A, write the letter of the matching item in Column B.

Column A

Column B

- | | | |
|-------|---|------------------------------|
| _____ | 1. The first scientist to describe living cells as seen through a simple microscope | a. Schleiden |
| _____ | 2. Uses two or more glass lenses to magnify either living cells or prepared slides | b. compound light microscope |
| _____ | 3. A scientist who observed that cork was composed of tiny, hollow boxes that he called cells | c. electron microscope |
| _____ | 4. A scientist who concluded that all plants are composed of cells | d. Schwann |
| _____ | 5. A scientist who concluded that all animals are composed of cells | e. Hooke |
| _____ | 6. The microscope that allowed scientists to view molecules | f. van Leeuwenhoek |

In your textbook, read about the two basic cell types.

Complete the table by checking the correct column for each statement.

Statement	Prokaryotes	Eukaryotes
7. Organisms that have cells lacking internal membrane-bound structures		
8. Do not have a nucleus		
9. Are either single-celled or made up of many cells		
10. Generally are single-celled organisms		
11. Organisms that have cells containing organelles		

Section 7.2 The Plasma Membrane

In your textbook, read about maintaining a balance.

Use each of the terms below just once to complete the passage.

glucose	plasma membrane	homeostasis
organism	balance	selective permeability

Living cells maintain a **(1)** _____ by controlling materials that enter and leave. Without this ability, the cell cannot maintain **(2)** _____ and will die. The cell must regulate internal concentrations of water, **(3)** _____, and other nutrients and must eliminate waste products. Homeostasis in a cell is maintained by the **(4)** _____, which allows only certain particles to pass through and keeps other particles out. This property of a membrane is known as **(5)** _____. It allows different cells to carry on different activities within the same **(6)** _____.

In your textbook, read about the structure of the plasma membrane.

For each statement below, write true or false.

- _____ 7. The structure and properties of the cell wall allow it to be selective and maintain homeostasis.
- _____ 8. The plasma membrane is a bilayer of lipid molecules with protein molecules embedded in it.
- _____ 9. A phospholipid molecule has a nonpolar, water-insoluble head attached to a long polar, soluble tail.
- _____ 10. The fluid mosaic model describes the plasma membrane as a structure that is liquid and very rigid.
- _____ 11. Eukaryotic plasma membranes can contain cholesterol, which tends to make the membrane more stable.
- _____ 12. Transport proteins span the cell membrane, allowing the selectively permeable membrane to regulate which molecules enter and leave a cell.
- _____ 13. Proteins at the inner surface of the plasma membrane attach the membrane to the cell's support structure, making the cell rigid.

Section 7.3 Eukaryotic Cell Structure

In your textbook, read about cellular boundaries; nucleus and cell control; assembly, transport, and storage in the cell; and energy transformers.

Complete the table by writing the name of the cell part beside its structure/function. A cell part may be used more than once.

Structure/Function	Cell Part
1. A membrane-bound, fluid-filled sac	
2. Closely stacked, flattened membrane sacs	
3. The sites of protein synthesis	
4. A folded membrane that forms a network of interconnected compartments in the cytoplasm	
5. The clear fluid inside the cell	
6. Organelle that manages cell functions in eukaryotic cell	
7. Contains chlorophyll, a green pigment that traps energy from sunlight and gives plants their green color	
8. Digest excess or worn-out cell parts, food particles, and invading viruses or bacteria	
9. Small bumps located on the endoplasmic reticulum	
10. Provides temporary storage of food, enzymes, and waste products	
11. Firm, protective structure that gives the cell its shape in plants, fungi, most bacteria, and some protists	
12. Produce a usable form of energy for the cell	
13. Modifies proteins chemically, then repackages them	
14. Contains inner membranes arranged in stacks of membranous sacs called grana	
15. Plant organelles that store starches or lipids or that contain pigments	

Chapter
7

A View of the Cell, continued

Reinforcement and Study Guide

Section 7.3 Eukaryotic Cell Structure

In your textbook, read about structures for support and locomotion.

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

- 16. Cells have a support structure within the *cytoplasm* called the cytoskeleton.

- 17. The *exoskeleton* is composed of thin, fibrous elements that form a framework for the cell.

- 18. *Microtubules* of the cytoskeleton are thin, hollow cylinders made of protein.

- 19. Cilia and flagella are cell surface structures that are adapted for *respiration*.

- 20. *Flagella* are short, numerous, hairlike projections from the plasma membrane.

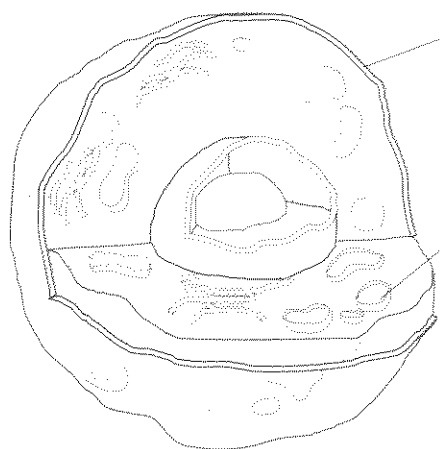
- 21. Flagella are longer and *more* numerous than cilia.

- 22. In *multicellular* organisms, cilia and flagella are the major means of locomotion.

- 23. In *prokaryotic* cells, both cilia and flagella are composed of microtubules.

Write titles for each of the generalized diagrams and then label the parts. Use these choices: plant cell, animal cell, plasma membrane, chloroplast, lysosome, large vacuole, cell wall.

24. _____



26. _____

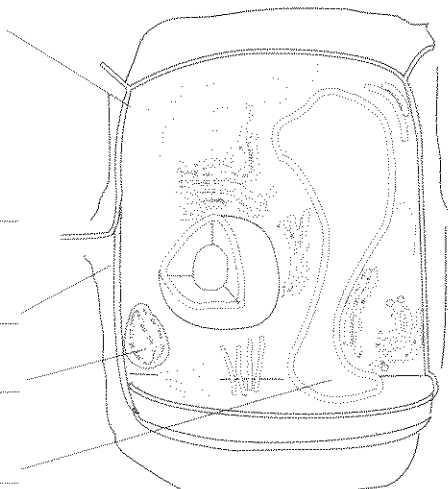
27. _____

28. _____

29. _____

30. _____

25. _____



Chapter

7

A View of the Cell

Chapter Assessment

Reviewing Vocabulary

Write the word or phrase that best completes the statement.

1. A structure outside the plasma membrane in some cells is the _____.
2. The functions of a eukaryotic cell are managed by the _____.
3. In a cell, the tangles of long strands of DNA form the _____.
4. The folded system of membranes that forms a network of interconnected compartments inside the cell is called the _____.
5. The pigment that gives plants their green color is _____.
6. The network of tiny rods and filaments that forms a framework for the cell is called the _____.
7. In plants, the structures that transform light energy into chemical energy are called _____.

In the space at the left, write the term in parentheses that makes each statement correct.

- _____ 8. (*Phospholipids, Transport proteins*) make up the selectively permeable membrane that controls which molecules enter and leave the cell.
- _____ 9. Short projections used for oarlike locomotion are (*cilia, flagella*).
- _____ 10. In a cell, the breakdown of molecules in order to release energy occurs in the (*mitochondria, Golgi apparatus*).
- _____ 11. An organism with a cell that lacks a true nucleus is a(n) (*prokaryote, eukaryote*).
- _____ 12. The movement of materials into and out of the cells is controlled by the (*cytoplasm, plasma membrane*).
- _____ 13. The small, membrane-bound structures inside a cell are (*chromatin, organelles*).
- _____ 14. In a cell, the sites of protein synthesis are the (*ribosomes, nucleolus*).
- _____ 15. Cell structures that contain digestive enzymes are (*plastids, lysosomes*).

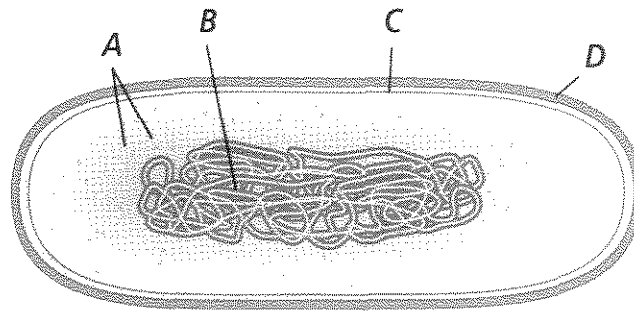
Understanding Concepts (Part A)

In the space at the left, write the letter of the word or phrase that best completes the statement.

- _____ 1. Cell walls of multicellular plants are composed mainly of
 a. cellulose. b. chitin. c. pectin. d. vacuoles.
- _____ 2. The term *least* closely related to the others is
 a. cytoskeleton. b. microfilament.
 c. microtubule. d. cell juncture.
- _____ 3. In a chloroplast, the stacks of membranous sacs are called
 a. stroma. b. grana.
 c. plastids. d. thylakoid membrane.
- _____ 4. The structure most responsible for maintaining cell homeostasis is the
 a. cytoplasm. b. mitochondrion. c. cell wall. d. plasma membrane.
- _____ 5. If a cell contains a nucleus, it must be a(n)
 a. plant cell. b. eukaryotic cell.
 c. animal cell. d. prokaryotic cell.
- _____ 6. One advantage of electron microscopes over light microscopes is their
 a. size. b. higher magnification.
 c. two-dimensional image. d. use of live specimens.
- _____ 7. When a cell is ready to reproduce, its DNA is packed into
 a. chromosomes. b. chromatin. c. nucleoli. d. nucleoids.
- _____ 8. The scientist who first described living cells as seen through a simple microscope was
 a. van Leeuwenhoek. b. Schleiden.
 c. Hooke. d. Schwann.
- _____ 9. Each of the following is a main idea of the cell theory *except*
 a. all organisms are composed of cells.
 b. the cell is the basic unit of organization of organisms.
 c. all cells are similar in structure and function.
 d. all cells come from preexisting cells.
- _____ 10. A plasma membrane is made up of a(n)
 a. cholesterol layer. b. enzyme bilayer.
 c. phospholipid bilayer. d. protein layer.

Understanding Concepts (Part B)

The diagram below of a bacterium shows a light area with no surrounding membrane in the center of the cell. This area contains a single large DNA molecule. Use the diagram to answer questions 1 and 2.



1. Identify the structures labeled A, B, C, and D.

2. Based on the diagram, would scientists classify this cell as a prokaryote or a eukaryote? Explain.

Answer the following questions.

3. In plants, cells that transport water against the force of gravity are found to contain many more mitochondria than do some other plant cells. What is the reason for this?

4. Why did it take almost 200 years after Hooke discovered cells for the cell theory to be developed?

Thinking Critically

Answer the following questions.

1. Many types of animal cells have a thin, flexible cell covering outside the plasma membrane. This cell covering, called a glycocalyx, consists of complex carbohydrates bonded to the proteins and lipids in the plasma membrane. How is the glycocalyx similar to the cell wall of a green plant? How is it different?

2. The stomach lining contains mucus, which helps prevent the digestion of the stomach lining. If this mechanism fails, digestive enzymes in the stomach cause the stomach to digest itself, producing an ulcer. Compare this process with the way lysosomes prevent destruction of the cell's proteins.

3. Between which cell types is the difference greater—plant and animal cells or prokaryotic and eukaryotic cells? Give reasons for your answer.
