

CHAPTER

21

DIRECTED READING

Viruses and Bacteria

► Section 21-1: Viruses

Is a Virus a Living Organism?

Read each question, and write your answer in the space provided.

1. What properties of life does a virus lack?

2. How did scientists studying the tobacco mosaic disease know that the infectious agent must be smaller than a bacterium?

3. What property of the infectious agent showed that it was a chemical?

A Virus's Shape Is Determined by Its Parts

In the space provided, write the letter of the description that best matches the term or phrase.

- | | |
|------------------------|---|
| _____ 4. capsid | a. a protein with an attached carbohydrate molecule |
| _____ 5. envelope | b. the protein coat of a virus |
| _____ 6. glycoprotein | c. a virus that infects bacteria |
| _____ 7. bacteriophage | d. a membrane that surrounds the capsid of some viruses |

Viruses Replicate Inside Living Cells

In the space provided, explain how the terms in each pair are related to each other.

8. lytic cycle, lysogenic cycle

9. provirus, pathogen

10. HIV, AIDS

Viruses Cause Many Diseases

Mark each statement below T if it is true or F if it is false.

- _____ 11. Some viruses can cause cancer.
- _____ 12. Emerging viruses are not a threat to public health.
- _____ 13. Prions are infectious particles made of RNA, and they do not contain protein.

► Section 21-2: Bacteria

Bacteria Have a Simpler Structure than Eukaryotes

In the space provided, write whether the following characteristics describe eukaryotes or bacteria.

- _____ 1. have no internal compartments
- _____ 2. cell size is usually about 1 μm in diameter
- _____ 3. can exist in the form of multicellular organisms
- _____ 4. chromosomes are linear pieces of DNA associated with proteins

- _____ 5. reproduce by binary fission
- _____ 6. flagella are composed of a single fiber of protein that spins like a corkscrew
- _____ 7. can perform various types of metabolic activities

Complete each statement by underlining the correct term or phrase in the brackets.

- 8. *Escherichia coli* are [Gram-negative / Gram-positive] eubacteria.
- 9. Conjugation is a process carried out by [bacteria and eukaryotes / eukaryotes only].
- 10. *Escherichia coli* have [pili and flagella / only flagella] as appendages.
- 11. Chemicals that interfere with the life processes of bacteria are called [antibiotics / toxins].

Bacteria Are Grouped According to How They Obtain Energy

In the space provided, write the name of the group—photosynthetic, chemoautotrophic, or heterotrophic—to which each of the following types of bacteria belongs:

- _____ 12. cyanobacteria
- _____ 13. purple sulfur bacteria
- _____ 14. bacteria that perform nitrification
- _____ 15. *Rhizobium*

Bacteria Cause Disease in Two Basic Ways

Read each question, and write your answer in the space provided.

- 16. What resources in your body do bacteria on or in your body compete for?

- 17. What is the name of the bacterium that causes Lyme disease? How is Lyme disease transmitted?

18. What causes tooth cavities?

19. What are the two basic ways that bacteria cause disease?

Bacterial Disease Can Be Fought

Complete each statement by writing the correct term or phrase in the space provided.

20. Alexander Fleming noticed that a certain fungus secreted a substance,

called _____, that was toxic to bacteria.

21. Antibiotics cannot be used to cure diseases caused by _____.

Bacteria Are Important

Mark each statement below T if it is true or F if it is false.

_____ 22. Many fermented foods, such as cheese and buttermilk, are made with the assistance of bacteria.

_____ 23. Chemoautotrophic bacteria can be used to increase the mineral content of ores.

_____ 24. Scientists have not yet learned how to modify bacteria genetically to yield characteristics that are useful to humans.