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Section 19–2 Viruses (pages 478–483)

Key Concepts

- What is the structure of a virus?
- How do viruses cause infection?

What Is a Virus? (pages 478–479)

1. What are viruses? _____

_____

2. What do all viruses have in common? _____

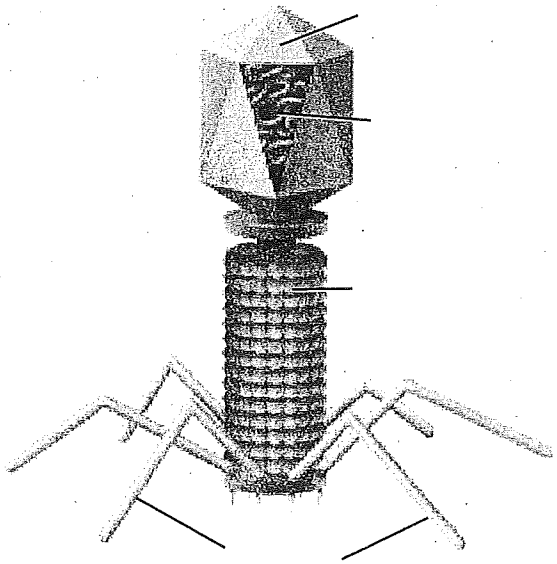
_____

_____

3. Is the following sentence true or false? Most viruses are so small that they can be seen only with the aid of a powerful electron microscope. _____
4. What is the structure of a typical virus? _____

_____

5. Complete the illustration of a T4 bacteriophage by labeling the parts.



6. A virus's protein coat is called a(an) _____.
7. How does a typical virus get inside a cell? _____

_____

_____

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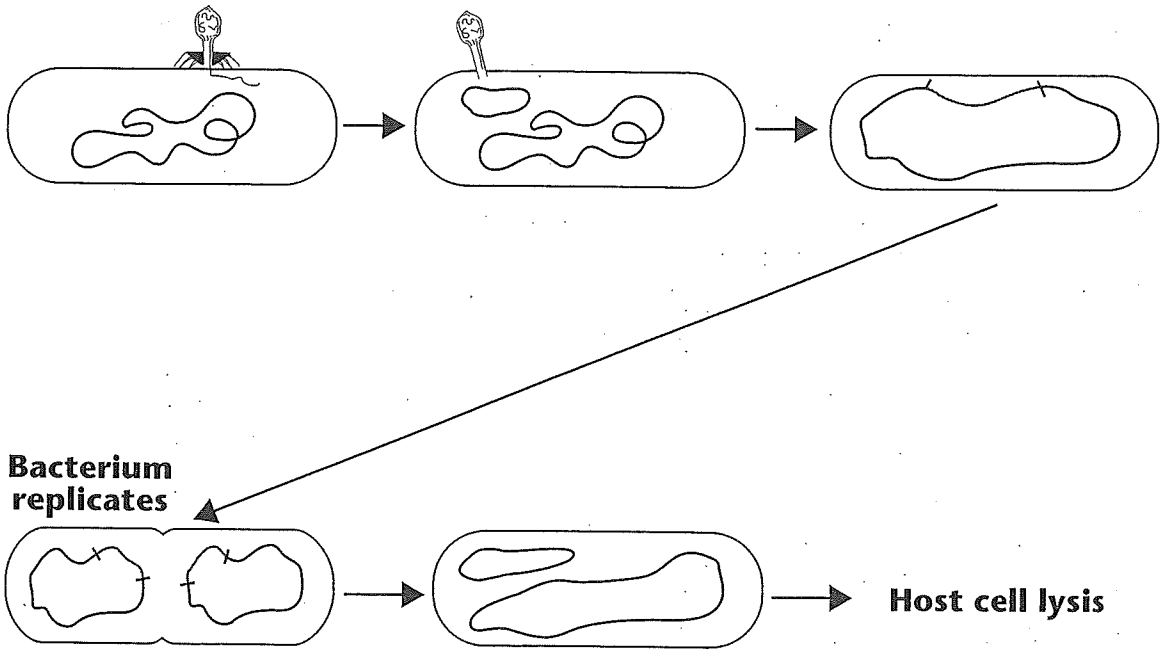
Lysogenic Infections

A lysogenic infection occurs when viral DNA inserts itself into the DNA of the host cell. The viral DNA is replicated along with the host cell DNA. Eventually, the viral DNA will separate out of the host DNA and direct the construction of new virus particles. The diagram shows how a bacteriophage causes a lysogenic infection in a bacterium.

Circle the viral DNA in each diagram of the bacterium.



Use the diagram to answer the questions.

1. What happens after the viral DNA is inserted into the bacterial DNA?

_____

_____

2. How does a lysogenic infection help a virus spread?

_____

_____

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8. What occurs when viruses get inside cells? _____

9. Why are most viruses highly specific to the cells they infect? _____

10. What are bacteriophages? _____

Viral Infection (pages 480–481)

11. Why is a lytic infection given that name? _____

12. Circle the letter of each sentence that is true about a lysogenic infection.
    a. The virus lyses the host cell immediately.
    b. The virus embeds its DNA into the host's DNA.
    c. The virus's DNA is replicated along with the host cell's DNA.
    d. A host cell makes copies of the virus indefinitely.

13. Complete the flowchart about a lytic infection.

The bacteriophage attaches to the bacterium's _____

↓

The bacteriophage injects its _____ into the cell.

↓

The cell makes mRNA from the bacteriophage's _____.

↓

The virus wrecks the cell, causing it to _____.

↓

The bursting of the cell releases new bacteriophage _____.

14. What is a prophage? _____

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Retroviruses (page 482)

15. What are retroviruses? _____

_____

16. What happens when retroviruses infect a cell? _____

_____

_____

Viruses and Living Cells (pages 482–483)

17. Circle the letter of each reason why some biologists do not consider viruses to be alive.
    a. They can't infect living cells.
    b. They can't evolve.
    c. They can't regulate gene expression.
    d. They can't reproduce independently.
18. Complete the table comparing viruses and cells.

Virus and Cells

Characteristic	Virus	Cell
Structure	DNA or RNA core, capsid	Cell membrane, cytoplasm; eukaryotes also contain nucleus and organelles
Reproduction		Independent cell division either asexually or sexually
Genetic Code		DNA
Growth and Development	No	
Obtain and Use Energy		Yes
Response to the Environment	No	
Change Over Time		

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Vocabulary Review

Matching *In the space provided, write the letter of the definition that best matches each term.*

____ 1. endospore
____ 2. virus
____ 3. coccus
____ 4. prokaryote
____ 5. bacillus
____ 6. vaccine
____ 7. spirillum
____ 8. bacteriophage
____ 9. retrovirus
____ 10. prion
____ 11. capsid
____ 12. lytic
____ 13. binary fission
____ 14. conjugation

a. bacterium with a rod shape
b. exchange of genetic material in bacteria
c. infectious protein particle
d. bacterium with a corkscrew shape
e. particle of nucleic acid, protein, and possibly lipids that can reproduce only by infecting living cells
f. unicellular organism that lacks a nucleus
g. type of viral infection that causes the cell to burst
h. preparation of weakened or killed pathogen that, when injected, may prompt the body to develop an immunity to the disease
i. protein coat of a virus
j. virus that infects bacteria
k. bacterium with a sphere shape
l. asexual form of reproduction carried out by bacteria
m. thick internal wall produced by a bacterium when growth conditions become unfavorable
n. virus having RNA as its genetic material

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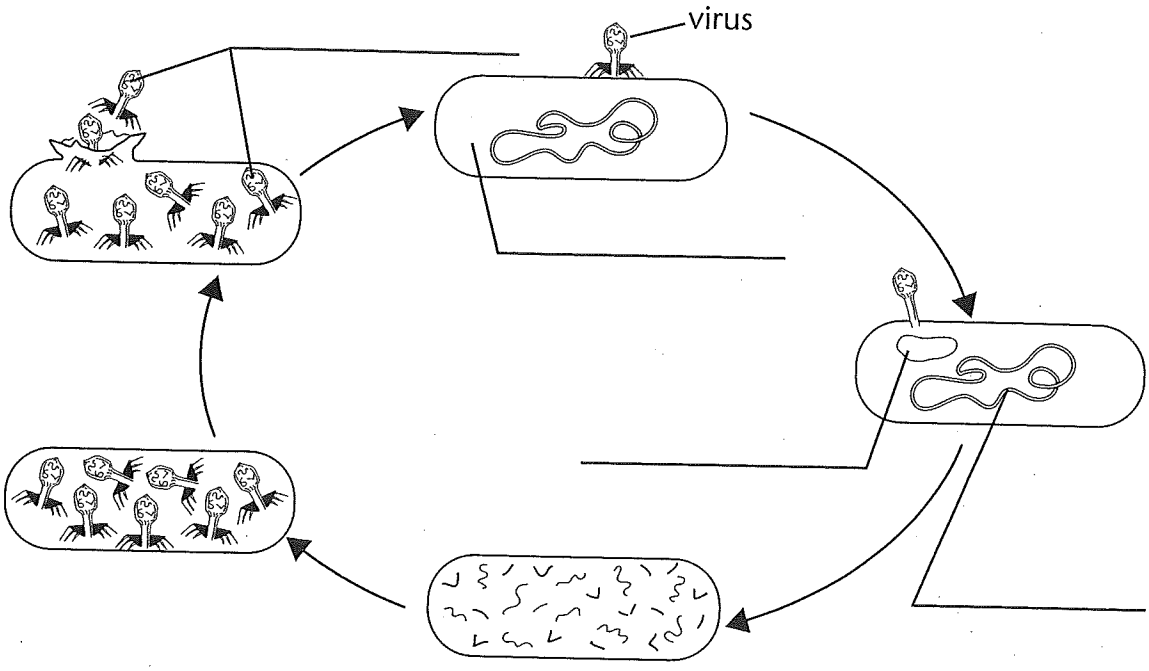
Lytic Infections

A bacteriophage is a virus that can infect bacteria. A lytic infection is one kind of viral infection. It results in lysis, or bursting of the host cell. The diagram shows how a bacteriophage causes a lytic infection in a bacterium.

Label the bacterial DNA, host bacterium, viral DNA, *and* virus. *Then circle the step that shows lysis of the host cell.*



Use the diagram to answer the questions.

1. Summarize what happens in a lytic infection.

_____

_____

_____

2. What is one result of a lytic infection? Circle the correct answer.

lysis of the virus lysis of the host cell

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