

CHAPTER

21

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Viruses and Bacteria

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

- _____ 1. In biologist Wendell Stanley's 1935 investigation of the tobacco mosaic virus, he found that the purified virus
- consisted of living organisms that did not retain the ability to infect healthy tobacco plants.
 - was a crystal that could infect healthy tobacco plants.
 - was a crystal that could not infect healthy tobacco plants.
 - consisted of bacteria that could infect healthy tobacco plants.
- _____ 2. Each particle of TMV is made of
- RNA and proteins.
 - DNA and proteins.
 - RNA and lipids.
 - proteins and lipids.
- _____ 3. Viruses are not considered to be living because they do not
- maintain homeostasis.
 - replicate.
 - metabolize.
 - All of the above
- _____ 4. *Polyhedral virus* refers to the structure of a virus's
- nucleic acid.
 - phage.
 - capsid.
 - lipid layer.
- _____ 5. HIV can be transmitted
- through sexual contact.
 - through the sharing of nonsterile needles.
 - to infants during pregnancy or through breast milk.
 - All of the above
- _____ 6. One difference between bacteria and eukaryotes is that
- bacterial flagella are more complex than eukaryotic flagella.
 - bacterial chromosomes are circular, while eukaryotic chromosomes are linear.
 - bacterial cells are much larger than eukaryotic cells.
 - many bacteria are multicellular, while all eukaryotes are unicellular.
- _____ 7. Bacterial cells lack
- chromosomes.
 - reproductive capability.
 - flagella.
 - a cell nucleus.
- _____ 8. Which of the following does NOT characterize the structure of *Escherichia coli*?
- rigid cell wall
 - flagella
 - organelles
 - pili

- _____ 9. In a process called nitrification, chemoautotrophic bacteria that live in the soil play an important role in oxidizing ammonia into
- a. nitrate.
 - b. nitrogen gas.
 - c. nitrous oxide.
 - d. sulfur.
- _____ 10. Tuberculosis is a disease of the
- a. brain.
 - b. heart.
 - c. liver.
 - d. lungs.
- _____ 11. One way bacteria cause disease is
- a. by metabolizing their hosts.
 - b. by producing antibiotics.
 - c. through the lysogenic cycle.
 - d. None of the above
- _____ 12. Which of the following bacterial diseases is NOT transmitted through contaminated water?
- a. cholera
 - b. dysentery
 - c. bubonic plague
 - d. typhoid fever
- _____ 13. Mining companies harvest copper or uranium by using
- a. photosynthetic bacteria.
 - b. heterotrophic bacteria.
 - c. cyanobacteria.
 - d. chemoautotrophic bacteria.

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

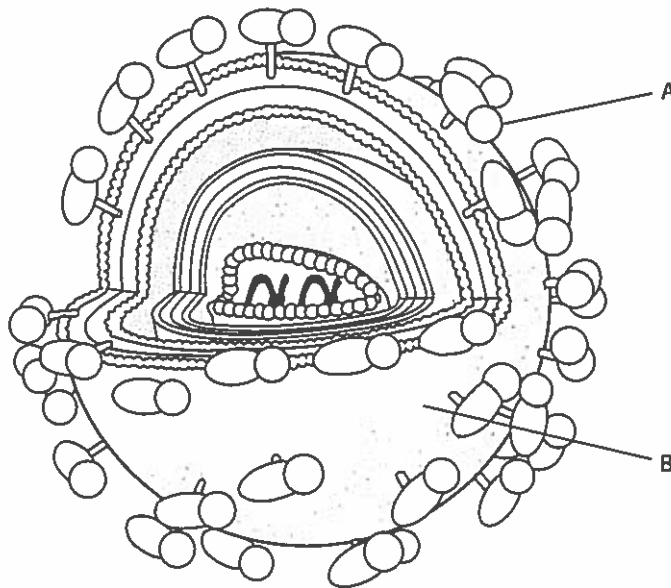
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|----------------------------------|---|
| _____ 14. capsid | a. a host chromosome with a viral gene inserted into it |
| _____ 15. envelope | b. proteins with carbohydrate molecules attached |
| _____ 16. glycoproteins | c. a drug that interferes with the life processes in bacteria |
| _____ 17. bacteriophage | d. a rod-shaped bacterial cell |
| _____ 18. pathogen | e. bacteria that feed on organic material formed by other organisms |
| _____ 19. lytic cycle | f. a spiral-shaped bacterial cell |
| _____ 20. provirus | g. a thick wall formed around the chromosomes of some bacteria in times of environmental stress |
| _____ 21. lysogenic cycle | h. a virus's protein coat |
| _____ 22. bacillus | i. a cycle in which the viral genome replicates without destroying the host cell |
| _____ 23. coccus | j. a bacteria-infecting virus |
| _____ 24. spirillum | k. a cycle of viral infection, replication, and cell destruction |
| _____ 25. capsule | l. a process in which two organisms exchange genetic material |
| _____ 26. antibiotic | m. a round bacterial cell |
| _____ 27. conjugation | n. an agent that causes disease |
| _____ 28. endospore | o. surrounds the capsid of many viruses and helps them enter cells |
| _____ 29. heterotrophic bacteria | p. the gel-like layer outside of the cell wall of many bacteria |

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

30. A(n) _____ is a segment of nucleic acids contained in a protein coat.
31. Viruses must rely on _____ for replication.
32. The capsid of viruses may enclose either the nucleic acid _____ or the nucleic acid _____.
33. Infectious particles called _____ are composed of proteins and have no nucleic acid.
34. HIV gradually infects and destroys so many _____ cells that people with AIDS often die of infections that a healthy immune system would normally resist.
35. The _____ of *E. coli* have two main functions: to adhere to surfaces and to join bacterial cells prior to conjugation.

Questions 36 and 37 refer to the figure below, which shows the human immunodeficiency virus (HIV).



36. The structure labeled A is derived from the membrane of the _____.
37. The structure labeled B is a(n) _____.
38. In the presence of hydrogen-rich chemicals, _____ bacteria can manufacture all of their own amino acids and proteins.
39. _____, such as penicillin, work by interfering with different cellular processes of bacteria.

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

40. Describe how HIV reproduces.

41. Name and describe each of the four groups of photosynthetic bacteria.

42. How does *E. coli* reproduce?

43. How was penicillin discovered?

44. List five diseases caused by bacteria.

45. List five viral diseases that are transmitted through person-to-person contact.

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