

Viruses and Bacteria

Multiple Choice Write the letter of the correct answer on the line at the left.

- A 1. Bacteria reproduce asexually through
a. binary fission. b. endospores. c. capsids. d. conjugation.
- A 2. Viruses reproduce by
a. invading living cells. c. forming toxins.
b. losing their nucleic acid. d. using their protein coat.
- B 3. A virus is changed from the lysogenic to the lytic state when
a. prophage DNA becomes inactive.
b. viral DNA separates from host DNA.
c. host DNA becomes inactive.
d. prophage DNA destroys host DNA.
- C 4. A substance that contains weakened or killed disease-causing viruses is a (an)
a. antibiotic. b. oncogene. c. vaccine. d. interferon.
- B 5. Viruses contain
a. cell walls. b. protein coats. c. nuclei. d. cell membranes.
- D 6. The blue-green bacteria, once known as blue-green algae, are
a. eubacteria. b. prochlorobacteria. c. archaebacteria. d. cyanobacteria.
- B 7. Rod-shaped bacteria are called
a. cocci. b. bacilli. c. spirilla. d. diplococci.
- D 8. Organisms that can survive with or without oxygen are
a. obligate aerobes. c. facultative aerobes.
b. obligate anaerobes. d. facultative anaerobes.
- C 9. Bacteria that recycle and break down dead trees are
a. parasites. b. methanogens. c. saprophytes. d. symbionts.
- D 10. In soybean plants, nitrogen fixation is brought about by *Rhizobium* bacteria that grow in
a. knobs on their stems.
b. chloroplasts in their leaves.
c. mosaics on their leaves.
d. nodules on their roots.

Completion Complete each statement on the line at the left.

- BACTERIOPHAGE** 1. A virus that infects bacteria is a (an) _____
 VIRUS
2. The common cold, unlike tuberculosis, is caused by a (an) _____

CELL WALLS

BOTULISM

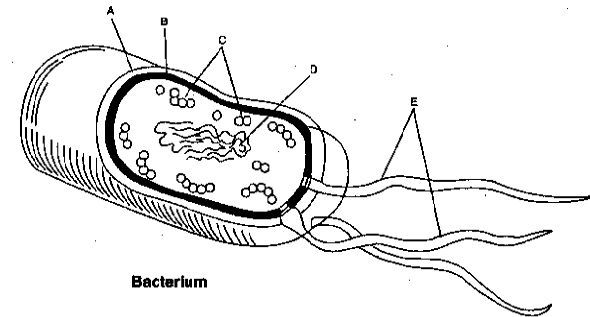
CONJUGATION

3. Gram's stain is used to identify bacteria on the basis of differences in _____.
4. An extremely serious disease that is a danger when food is canned at home is _____.
5. Genetic information is transferred from a donor to a recipient bacterium by a protein bridge in the process of _____.

True or False Determine whether each statement is true or false. If it is true, write T. If it is false, change the underlined word or words to make it true.

- T 1. Bacteria that use energy from the sun, as green plants do, are phototrophic autotrophs.
- F - ANTIBIOTICS** 2. Substances that can attack and destroy bacteria are retroviruses.
- F - PROKARYOTE** 3. If an organism is a bacterium, it is a eukaryote.
- F - FERMENTATION** 4. The process by which cells produce energy in the absence of oxygen is respiration.
- T 5. Cattle cannot break down cellulose without the presence of symbiotic bacteria in their intestine.

Using Science Skills: Interpreting a diagram



1. The chromatin nuclear material is usually concentrated in an irregular mass called the nucleoid. What is the nucleoid labeled? D
2. What are the structures labeled by C? RIBOSOMES
3. In many bacteria the capsule is a sticky, slimy coating. Which label represents the capsule? A

4. Identify the structures labeled E and give their function. The Flagella are used to move the bacterium

Essay Discuss each of the following.

1. How do vaccines and interferons differ in their effect on viral diseases?

A Vaccine contains the weakened virus and provides an immunity to the disease. Vaccines can only provide protection if they are used before an infection begins. Interferons are proteins that are released from virus-infected cells. Interferons make it difficult for the virus to spread to other cells.

2. How does a lytic infection cycle differ from a lysogenic infection cycle of a virus?

In the lytic infection cycle, the virus injects its own DNA in the cell. The viral DNA then reproduces itself until the infected cell bursts, releasing hundreds of virus particles to infect other cells. In the lysogenic infection cycle, viral DNA is inserted into the host cell's DNA and is known as prophage. The prophage may have no effect or can even be helpful as the bacteria divides repeatedly. Eventually, the prophage will become active, remove itself from the bacterial DNA, and direct the synthesis of new virus particles.

3. In what way are rickettsias, a type of bacteria, similar to viruses?

Rickettsiae can reproduce only inside a living host cell.

4. Why are Prochlorobacteria sometimes called Prochlorophyta?

Prochlorobacteria are photosynthetic organisms that contain chlorophyll a and b. These pigments make them similar to green plants. Hence, they are called 'Prochlorophyta', because 'phyta' means plants.

5. Food that is pressure cooked and then refrigerated is usually safe to eat even after several days. Explain why this is true even though the food is exposed to air while cooking.

Pressure cooking sterilizes food and thus kills any existing bacteria. Although the food is exposed to new bacteria present in the air while cooking quick reffridgeration greatly slows down the growth of these new bacteria.