

Key Words

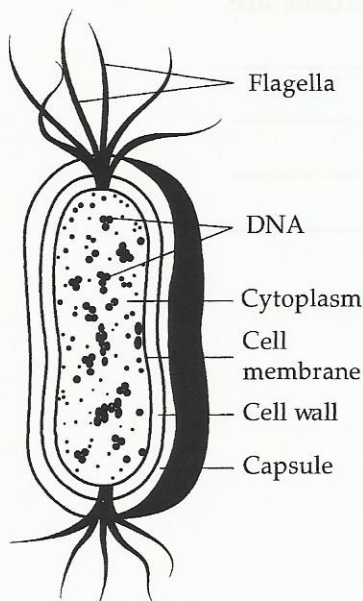
bacteria:	single-celled living things that do not have a nucleus
nucleus:	cell structure that controls most cells and that is not present in bacteria
capsule:	layer outside the cell wall that protects the bacteria
flagella:	long, whiplike fibers that help some types of cells move
microbes:	organisms that can be seen only through a microscope
hosts:	organisms that contain other organisms inside them
blue-green bacteria:	bacteria that make their own food by photosynthesis

KEY IDEAS

Bacteria are the simplest types of living things. All bacteria are made up of a single cell. Bacteria do not have structures that are found in other types of cells. For example, a bacterial cell does not have a nucleus.

Bacteria were the first types of cells to evolve billions of years ago. Today, there are more bacteria on the earth than any other types of living things. Bacteria live almost everywhere: in water, in air, and in soil. In fact, a tiny speck of soil can hold billions of bacteria. Bacteria also live in your mouth, on your hands, and on other parts of your body.

Fig. 18-1



Structure of Bacteria. Bacteria (bak-TIR-ee-uh) are single-celled living things. Unlike other types of cells, a bacterium has no **nucleus** (NOO-klee-uhs), the structure that controls a cell. In most cells, DNA is located inside the nucleus. In bacteria, DNA is scattered throughout the cell.

Most bacteria have the same structure. Their cytoplasm is surrounded by a cell membrane. The cell membrane is surrounded on the outside by a cell wall that holds the bacterium together and gives it shape. The cell wall is made up of amino acids and sugars. Some bacteria have another layer outside their cell wall. This layer is called the **capsule** (KAP-suhl) protects the bacteria. Usually made up of a thick jelly-like material, the **capsule** (KAP-suhl) protects the bacteria. Many bacteria also have long, whiplike fibers called **flagella** (fla-JEHL-uh) that help them move. Find each of these structures in Fig. 18-1.

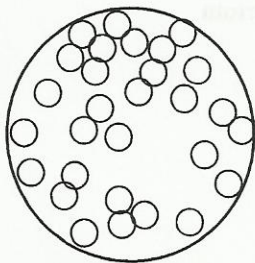


1. What are bacteria? _____

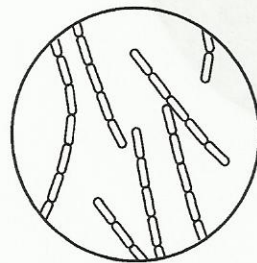
Size and Shape of Bacteria. Bacteria are so small that more than 300,000 of them would fit on the period at the end of this sentence. Very small organisms, like bacteria, are called **microbes** because they can be seen only through a microscope. The bacterium in Fig. 18-1 is about 15,000 times its actual size.

Bacteria have three basic shapes: ball, rod, and spiral. The three shapes are shown in Fig. 18-2.

Fig. 18-2



Ball-shaped bacteria



Rod-shaped bacteria



Spiral-shaped bacteria

Sometimes bacterial cells group together. Ball-shaped bacteria often form pairs or clumps. Rod-shaped bacteria usually link up end-to-end, forming long chains. Spiral-shaped bacteria may be hundreds of times larger than other types of bacteria. They do not usually group together.



2. What are the three shapes of bacteria? _____

Kinds of Bacteria. There are many different species of bacteria. Bacteria may be classified by their shape and by the way they get energy. Most bacteria cannot make their own food. They must break down other matter to get food. Bacteria that break down dead organisms are one type of bacteria that cannot make their own food. Many of these kinds of bacteria live in soil. Other bacteria live inside animals and plants and get their food from their hosts. **Hosts** (hohsts) are organisms that contain other organisms inside them.

Some kinds of bacteria can make their own food. Like plants, **blue-green bacteria** (BLOO-GREEN bak-TIR-ee-uh) make their own food by a process called photosynthesis. Blue-green bacteria grow almost anywhere there is water: in ponds, in the ocean, and in moist soil. You may have seen blue-green bacteria floating at the top of a still pond.

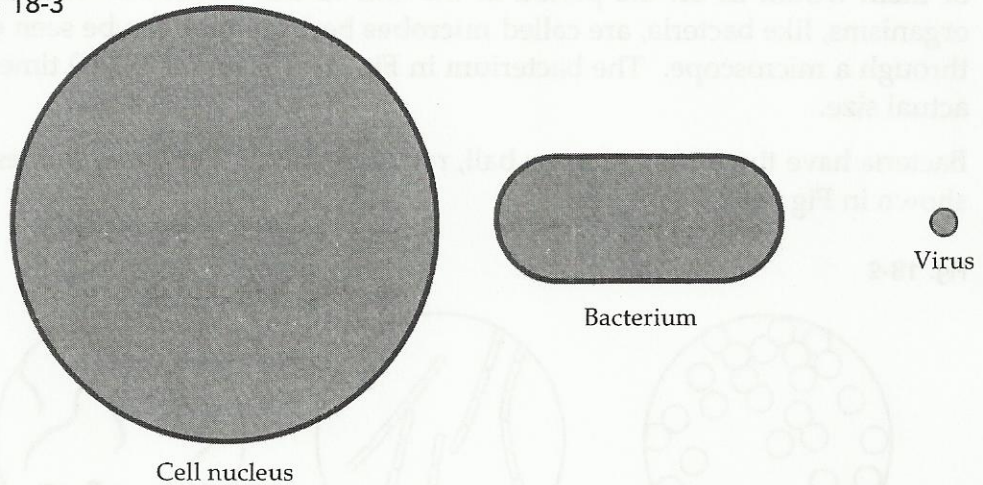


3. How do blue-green bacteria differ from other types of bacteria?

TAKE ANOTHER LOOK

Bacteria are very small single-celled living things, but viruses are even smaller. Fig. 18-3 shows the size difference between a cell nucleus, a bacterium, and a virus. Each of these structures is really much smaller than shown.

Fig. 18-3



Check Your Understanding

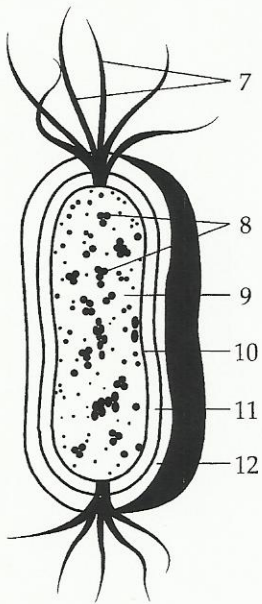
Write a sentence explaining the connection between each pair of words.

4. bacteria, nucleus _____

5. cell wall, capsule _____

6. blue-green bacteria, plants _____

Fig. 18-4



On the lines provided write the names of the bacterial cell structures shown in Fig. 18-4.

- | | |
|----------|-----------|
| 7. _____ | 10. _____ |
| 8. _____ | 11. _____ |
| 9. _____ | 12. _____ |

13. In the space below, draw and label the three main shapes of bacterial cells.

14. How is a bacterial cell different from other types of cells?

15. What are two ways in which bacteria are classified?

16. What is one way in which bacteria get energy?

17. Bacteria were the first living things on the earth. Today, there are more bacteria on the earth than any other type of living thing. Why do you think there are so many bacteria?

