

**Key Words**

- protist:** single-celled living thing that is more complex than a bacteria
- chloroplast:** structure in which a plant or protist cell uses light energy and matter to make food
- euglena:** plantlike protist that moves with a flagellum
- paramecium:** animal-like protist that moves with cilia
- cilia:** tiny "hairs" on the outside of some cells that push the cell through water
- amoeba:** animal-like protist that moves by changing its shape

**KEY IDEAS**

Like bacteria, most protists are microbes that are made up of only one cell. The cells of protists are more complex and varied than bacterial cells.

Bacteria and viruses are not the only causes of disease. Diseases are also caused by some protists.

**Protists.** A **protist** (PROH-tist) is a single-celled living thing that is more complex than a bacterium. The first protists evolved from bacteria more than one billion years ago. Long ago, some bacterial cells may have taken in other bacteria. These bacteria eventually became structures within the larger bacterial cell. Over time, this bacterial cell and its structures evolved into a protist.

For example, a bacterium may have surrounded the cell of a blue-green bacterium. The blue-green bacterium, in turn, evolved into a chloroplast. A **chloroplast** (KLAWR-oh-plast) is a cell structure in which light energy and matter are used to make food. Chloroplasts are found in food-making protists and plant cells. Chloroplasts and other cell structures make protists more complex than bacteria.



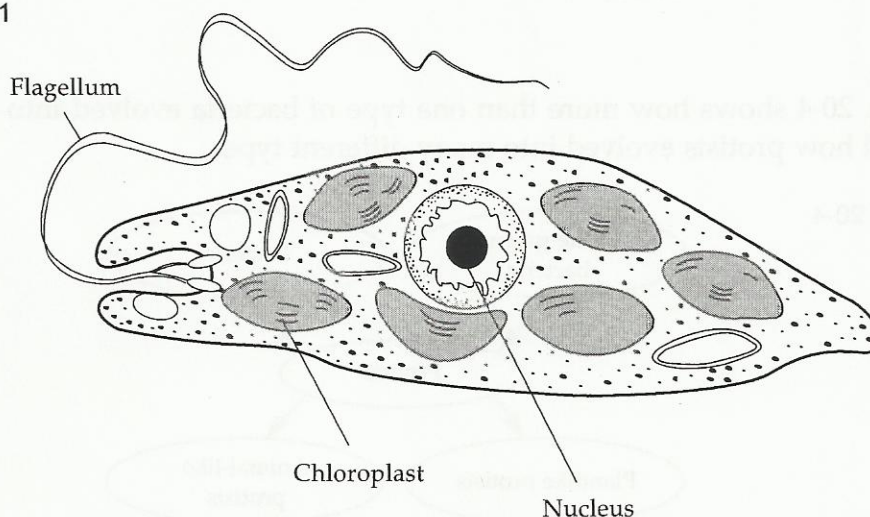
1. What is a chloroplast? \_\_\_\_\_

Protists can be divided into two main groups. One group makes its own food, while the other group does not. These two groups are sometimes called plantlike protists and animal-like protists.

**Plantlike Protists.** The **euglena** (yoo-GLEH-nah) is a plantlike protist. See Fig. 20-1. The nucleus of the euglena directs the cell. Chloroplasts make food, which is stored in starch granules.

The euglena is called a plantlike protist because it can make food. However, it also has animal traits. It can move from place to place. The flagellum is a long, whiplike structure that helps the euglena move. The euglena has a sense organ called an eye-spot. An eye-spot senses light and dark. Light is needed to make food, so it is important for the euglena to be in an area with light. It also lacks the cell wall found in plant cells.

Fig. 20-1



2. How does a euglena find and move into an area with light?

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**Animal-like protists.** Animal-like protists do not have chloroplasts. Therefore, they cannot make their own food. One type of animal-like protist is the **paramecium** (pa-ruh-MEE-see-uhm), shown in Fig. 20-2. Notice the tiny "hairs" on the outside of the paramecium. Like oars on a rowboat, these tiny hairs, or **cilia** (SIL-ee-uh), push the cell through water.

The paramecium moves from place to place and takes in food as it goes. Food enters an oral groove and is carried through the cell in bubbles called food vacuoles. Food moves out of the cell through an anal pore.



One type of animal-like protist that does not have a flagellum nor cilia is an **amoeba** (uh-MEE-buh), shown in Fig 20-3. This protist moves by changing its shape and flowing from place to place.

Fig. 20-2

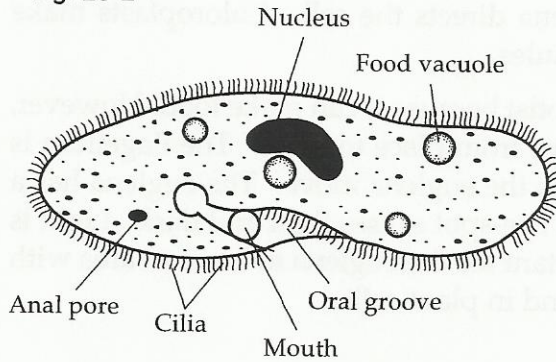
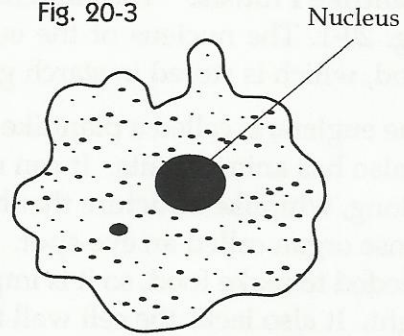


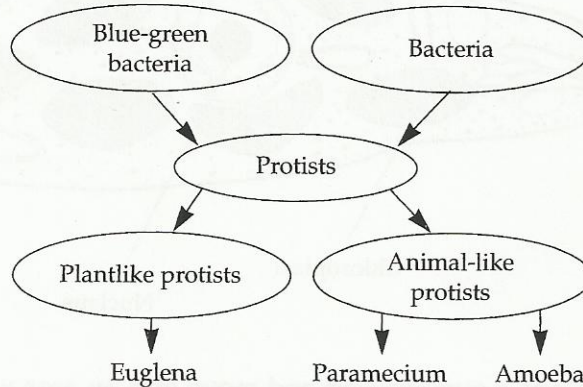
Fig. 20-3



**TAKE  
ANOTHER  
LOOK**

Fig. 20-4 shows how more than one type of bacteria evolved into protists, and how protists evolved into many different types.

Fig. 20-4



**Check Your  
Understanding**

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

3. protist, complex \_\_\_\_\_  
\_\_\_\_\_

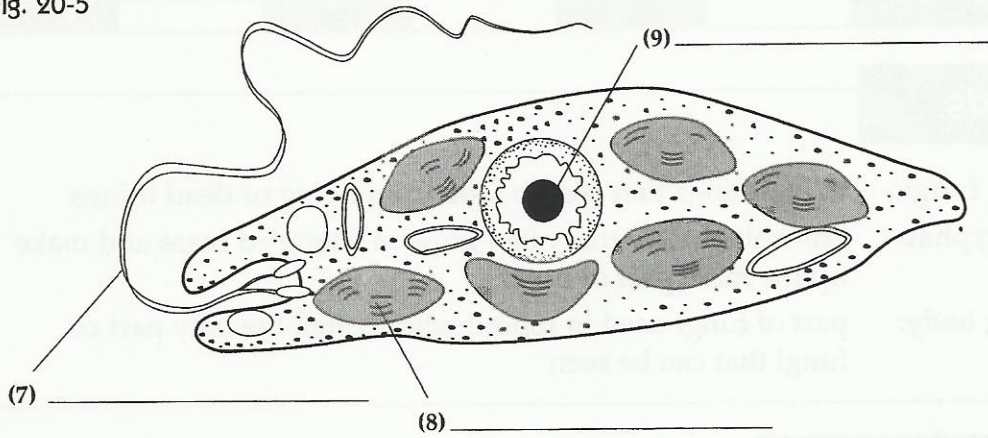
4. chloroplast, food \_\_\_\_\_  
\_\_\_\_\_

5. cilia, flagellum \_\_\_\_\_  
\_\_\_\_\_

6. paramecium, euglena, amoeba \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Label the structures of the euglena shown in Fig. 20-5.

Fig. 20-5



10. In your own words, describe a protist. How do protists differ from bacteria? \_\_\_\_\_

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11. What is one way plantlike protists differ from animal-like protists?

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12. In what ways is a euglena both plantlike and animal-like?

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13. How does a paramecium differ from a euglena?

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