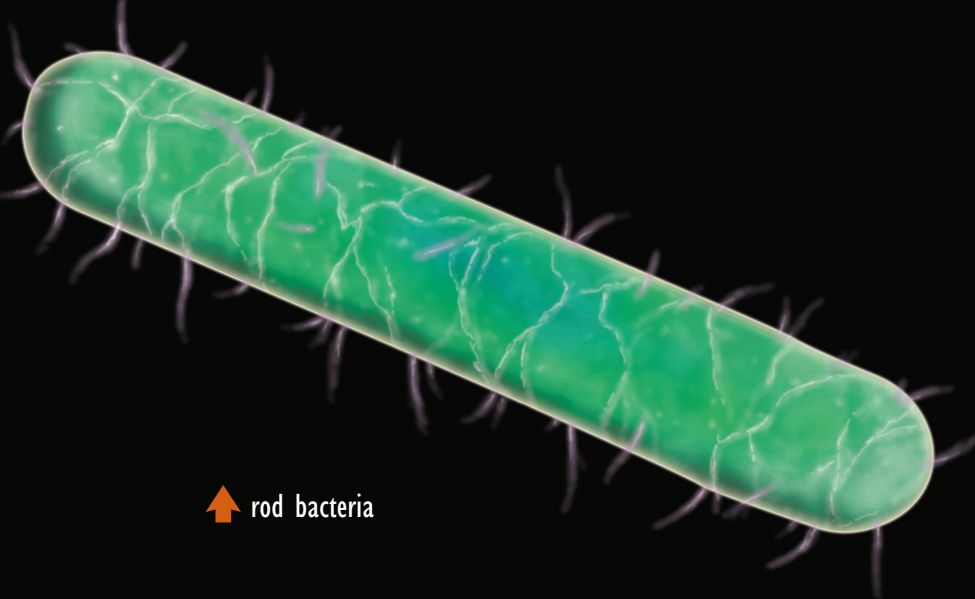


Bacteria and Archaea Kingdoms

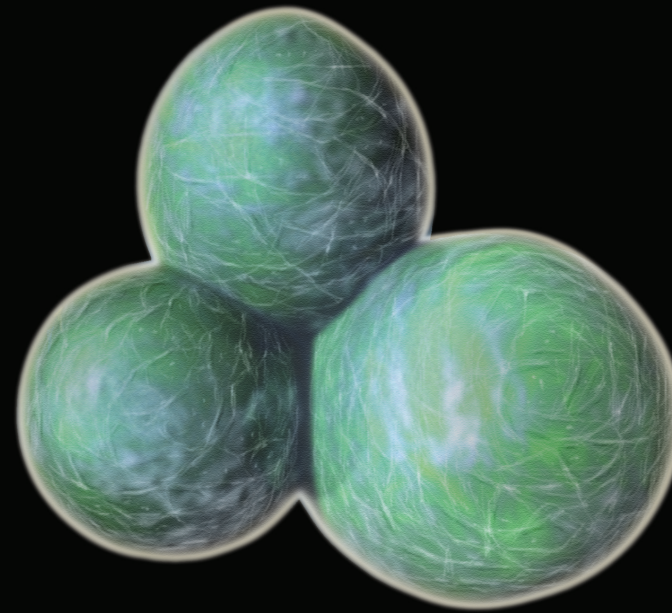
Scientists think that the first life forms were single cells. They were tiny prokaryotes. They had no cell membranes.

There are two kinds of prokaryotes. They are bacteria (bak-TEER-ee-uh) and archaea (AR-kee-uh). Both kinds can live in places that are very hot. They can also live in places that are freezing. There are thousands of **species** of prokaryotes in the world.

Bacteria come in one of three shapes. The first group is the largest. The bacteria in the group are shaped like rods. These rods often have hairs on them. The hairs are called **flagella** (fluh-JEL-uh). Flagella help the bacteria move from one place to another. Other bacteria are shaped like balls. They grow together in bunches, as grapes do. The third bacteria are spiral in shape. They look like corkscrews. They also have flagella that help them move from place to place.



↑ rod bacteria



↑ globe bacteria



spiral bacteria →

Big Bacteria

The largest bacterium ever found was the size of the period at the end of this sentence.

Why don't bacteria get big? They take food in and let waste out. They do it with **diffusion**. Diffusion makes particles move from areas where they are close together to where they are spread out. There is less food outside a cell than within it. So the food will move into the cell. As a cell gets bigger, nutrients get used up before they reach the center. If a bacterium gets too big, its insides starve!