

Eubacteria

Bacteria consist of only a single cell, but don't let their small size and seeming simplicity fool you. They're an amazingly complex and fascinating group of creatures. Bacteria have been found that can live in temperatures above the boiling point and in cold that would freeze your blood. They "eat" everything from sugar and starch to sunlight, sulfur and iron. There's even a species of bacteria—*Deinococcus radiodurans*—that can withstand blasts of radiation 1,000 times greater than would kill a human being.

Classification



Leucothrix mucor
Appl. Environ. Microbiol.
55:1435-1446, 1989

Bacteria fall into a category of life called the Prokaryotes (*pro-carry-oats*). Prokaryotes' genetic material, or DNA, is not enclosed in a cellular compartment called the nucleus.

Bacteria and archaea are the only prokaryotes. All other life forms are Eukaryotes (*you-carry-oats*), creatures whose cells have nuclei.

(Note: viruses are not considered true cells, so they don't fit into either of these categories.)

Early Origins

Bacteria are among the earliest forms of life that appeared on Earth billions of years ago. Scientists think that they helped shape and change the young planet's environment, eventually creating atmospheric oxygen that enabled other, more complex life forms to develop. Many believe that more complex cells developed as once free-living bacteria took up residence in other cells, eventually becoming the organelles in modern complex cells. The mitochondria (*mite-oh-con-dree-uh*) that make energy for your body cells is one example of such an organelle.

What They Look Like



Ball-shaped
Streptococci
Simonson, [ASM](#)
[MicrobeLibrary](#)

There are thousands of species of bacteria, but all of them are basically one of three different shapes. Some are rod- or stick-shaped and called bacilli (*buh-sill-eye*).

Others are shaped like little balls and called cocci (*cox-eye*).

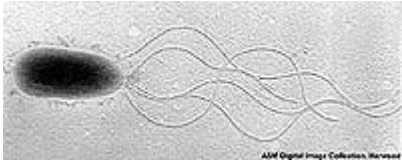
Others still are helical or spiral in shape, like the *Borrelia* pictured at the top of this page.

Some bacterial cells exist as individuals while others cluster together to form pairs, chains, squares or other groupings.

Where They're Found

Bacteria live on or in just about every material and environment on Earth from soil to water to air, and from your house to arctic ice to volcanic vents. Each square centimeter of your skin averages about 100,000 bacteria. A single teaspoon of topsoil contains more than a billion (1,000,000,000) bacteria.

How They Move



Bacterium with flagella
Harwood, [ASM MicrobeLibrary](#)

Some bacteria move about their environment by means of long, whip-like structures called flagella. They rotate their flagella like tiny outboard motors to propel themselves through liquid environments. They may also reverse the direction in which their flagella rotate so that they tumble about in one place.

Other bacteria secrete a slime layer and ooze over surfaces like slugs. Others are fairly stationary.

What They Eat

Some bacteria are photosynthetic (*foe-toe-sin-theh-tick*)—they can make their own food from sunlight, just like plants. Also like plants, they give off oxygen. Other bacteria absorb food from the material they live on or in. Some of these bacteria can live off unusual "foods" such as iron or sulfur. The microbes that live in your gut absorb nutrients from the digested food you've eaten.

Write 10 facts in complete sentences about bacteria from this reading.