

Bacteria vs. Virus

Bacteria are single-celled, prokaryotic microorganisms that exist in abundance in both living hosts and in all areas of the planet (e.g., soil, water). By their nature, they can be either "good" (beneficial) or "bad" (harmful) for the health of plants, humans, and other animals that come into contact with them. A **virus** is acellular (has no cell structure) and requires a living host to survive; it causes illness in its host, which causes an immune response. Bacteria are alive, while scientists are not yet sure if viruses are living or nonliving; in general, they are considered to be nonliving.

Infections caused by harmful bacteria can almost always be cured with antibiotics. While some viruses can be vaccinated against, most, such as HIV and the viruses which cause the common cold, are incurable, even if their symptoms can be treated, meaning the living host must have a strong enough immune system to survive the infection.

Comparison chart showing differences and similarities between bacteria and viruses

	Bacteria	Virus
Ribosomes	Present	Absent
Cell wall	Peptidoglycan / Lipopolysaccharide	No cell wall. Protein coat present instead.
Living attributes	Living organism	Opinions differ on whether viruses are a form of life or organic molecular structures that interact with living organisms.
Introduction (from Wikipedia)	Bacteria constitute a large domain of prokaryotic microorganisms. Typically a few micrometres in length, bacteria have a number of shapes, ranging from spheres to rods and spirals.	A virus is a small infectious agent that replicates only inside the living cells of other organisms.
Nucleus	No	No
Number of cells	Unicellular; one cell	No cells; not living
Structures	DNA and RNA floating freely in cytoplasm. Has cell wall and cell membrane.	DNA or RNA enclosed inside a coat of protein.
Treatment	Antibiotics	Vaccines prevent the spread and antiviral medications help to slow reproduction but cannot stop it completely.
Enzymes	Yes	Yes, in some

	Bacteria	Virus
Virulence	Yes	Yes
Infection	Localized	Systemic
Benefits	Some bacteria are beneficial (e.g. certain bacteria are required in the gut)	Viruses are not beneficial. However, a particular virus may be able to destroy brain tumors (see references). Viruses can be useful in genetic engineering.
Reproduction	Fission- a form of asexual reproduction	Invades a host cell and takes over the cell causing it to make copies of the viral DNA/RNA. Destroys the host cell releasing new viruses.
Size	Larger (1000nm)	Smaller (20 - 400nm)