What's the difference between a virus and a bacterium?

KS2 KS3 Ages 7-14 ⏰ 3 min read

When you're ill, someone usually asks: "Is it a virus or a bacterial infection?" Your doctor seems to care a lot about the answer. That's because these two types of germ are so different from each other that the treatments are almost completely separate.

What is a bacterium?

A **bacterium** is a tiny living cell. It has its own machinery to eat, grow, and reproduce. Most bacteria are completely harmless to humans — many are actively helpful, like the ones in your gut that help you digest food. But some bacteria cause infections by multiplying inside your body and releasing toxic chemicals.

Bacterial infections include things like strep throat, urinary tract infections, and food poisoning from *Salmonella*. The good news: because bacteria are living cells with their own biology, you can kill them with **antibiotics** — medicines that target the specific machinery that bacteria use, without harming your own cells.

What is a virus?

A **virus** is something stranger altogether. It's not really alive in the same way — it has no cells, no metabolism, and it can't do anything at all on its own. It's basically just a tiny bundle of genetic instructions wrapped in a protein coat.

To do any damage, a virus has to hijack one of your cells. It breaks in, injects its genetic code, and forces your cell to make thousands of copies of the virus. Eventually the cell bursts, releasing all those copies to infect more cells.

Think of a bacterium as a burglar who breaks into your house, helps themselves to your food, and makes a mess. A virus is more like a photocopier instruction leaflet that somehow gets into your printer and forces it to print millions of copies of itself until the printer breaks.

Why can't antibiotics kill viruses?

Antibiotics work by attacking specific parts of bacterial cells — like their cell walls or their protein-making machinery. Viruses don't have any of that. There's nothing for the antibiotic to grab onto. This is why taking antibiotics for a cold (which is a virus) does absolutely nothing to help you get better faster — but it does risk making antibiotics less effective over time by contributing to **antibiotic resistance**.

So what treats viruses?

Some viruses can be treated with **antiviral drugs** — for example, Tamiflu for flu, or antiretrovirals for HIV. But many viruses (like the common cold) don't have a specific treatment. Your immune system just has to fight it off while you rest, drink fluids, and feel sorry for yourself.