

ANTIBIOTIC RESISTANCE

BIOLOGY FACT

Bacteria have been on Earth for more than three billion years.

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Bacteria are all around us. They're perfectly normal and usually nothing to worry about. We've even got loads of them living inside us, but our bodies are pretty good at keeping them under control. Some actually do us good – they help digest food, make vitamins and absorb medicines, for example.

But sometimes bacteria evade our defences and multiply to unhealthy levels. We feel ill. It's called a bacterial infection. And that's when we need a course of antibiotics.

Antibiotics are medicines that kill bacteria, or stop them from growing. We rely on antibiotic cures a lot – from cholera to chest infections, they've hugely improved human health.

MEET THE SCIENTIST

Dr Laura McCaughey is a microbiologist. Laura's research looks at finding new ways to kill bacteria. Laura says: "I have discovered a new antibiotic. It kills a bacterium called *Pseudomonas aeruginosa* extremely well, but I need to do more research to find out how it works. I think it operates in a different way to all the antibiotics that we can get from our doctor – which is very exciting." Laura uses microscopes to watch bacteria change shape and die when they are exposed to her new antibiotic. She says: "I also change the bacteria's DNA and see if this means that I can kill it more easily, or if changing its DNA makes it more difficult for my new antibiotic to destroy it. This information gives me clues as to what parts of the bacteria my new antibiotic attacks, which will help me figure out how it works."



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What is antibiotic resistance?

Millions of years of natural selection means some bacteria have ‘learned’ to evade antibiotics; many drugs don’t work anymore. It’s a big problem – we need to work out how to control evolved bacteria.

What are scientists doing about it?

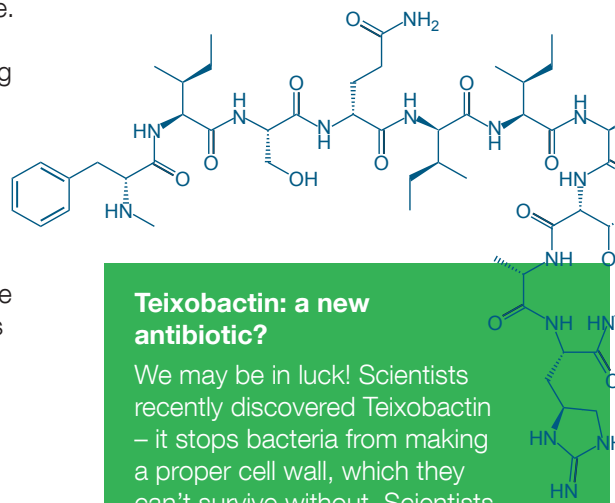
We need new, smarter antibiotics: drugs that bacteria can’t adapt to for a long time. Bacteria themselves are a good place to start looking. They have ways of out-doing each other, and understanding these can help scientists develop new drugs.

What can we do about it?

Making medicines can take years. In the meantime, we can all do our bit to limit antibiotic resistance. You should only take antibiotics if it’s a bacterial infection that’s making you ill. They won’t work if you have a virus, such as the ‘flu.

If we need antibiotics, we should take all the tablets we’re given. Some people stop taking them when they feel better – most of the problem bacteria are gone, but some are still lurking. Those remaining can mutate, and grow back resistant to treatment. To prevent this, it’s important to take the full course of antibiotics.

By regularly washing our hands, eating a balanced diet and getting plenty of exercise, we can help to minimise bacterial infections, keeping ourselves and other people healthy.



Teixobactin: a new antibiotic?

We may be in luck! Scientists recently discovered Teixobactin – it stops bacteria from making a proper cell wall, which they can’t survive without. Scientists came across the chemical when looking at types of soil bacteria which don’t grow in the lab. It’s not been tested on humans yet but it has cured bacterial infections in mice. Because of the way it works, some scientists think we’ll have up to 30 years before resistance becomes a problem.