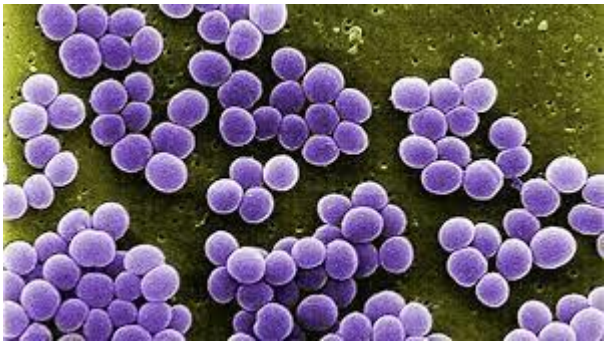
Microbes and Mucus Science Show Resource – Understanding Antibiotic Resistance

Bacteria are microscopic (1 million times smaller than us!) single-celled organisms, which are found everywhere (even in space!). Bacteria are thought to be the first lifeform to have appeared on Earth and are crucial to our planets eco-systems. There are helpful bacteria, such as those that are found in our guts and aid in digestion, and there are harmful bacteria such as those which make you ill. When you go to the doctors with an infection, you will often be prescribed antibiotics to fight the infection and help you to get better.

Antibiotics are medicines which kill or reduce the growth of bacteria.

The discovery of antibiotics is accredited to the Scottish researcher Dr Alexander Fleming, who in 1928 returned from a holiday to find mould (like you find on your old bread!) growing on a Petri dish of Staphylococcus bacteria. He noticed that the mould was stopping the bacteria around it from growing. After some exploration Dr Fleming found that the mould produced a self-defence chemical that could kill bacteria. He named the substance **penicillin**.

Penicillin mould growing on a Petri dish



Staphylococcus Bacteria

What is antibiotic resistance?

When antibiotics no longer stop bacterial growth, it is because that type of bacteria has become **antibiotic resistant**. The bacteria **mutates**, meaning that its DNA (the instructions for life) changes and adapts to no longer be effected by the antibiotics.

Why is antibiotic resistance dangerous?

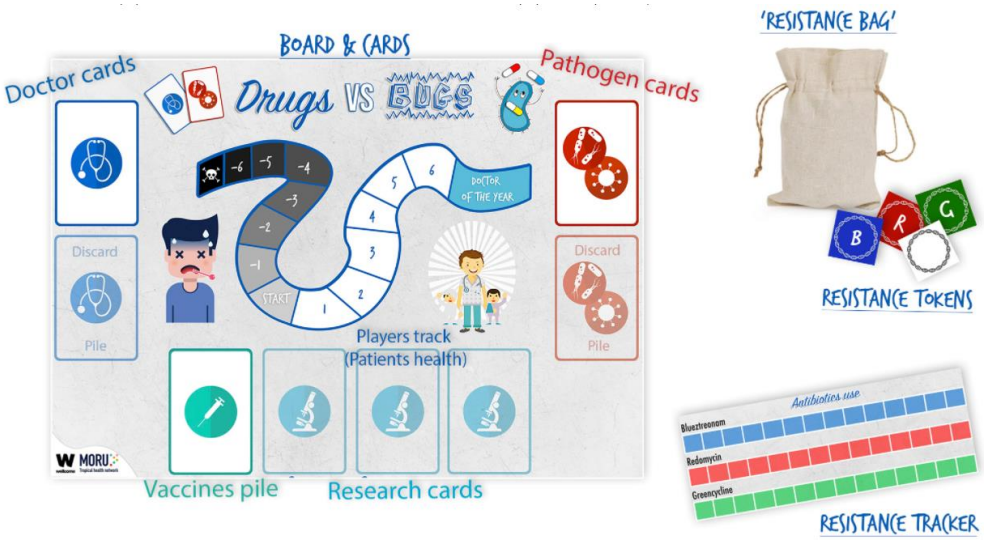
Bacteria naturally become antibiotic resistant, however the **overuse of antibiotics** to treat people and animals is increasing the rate at which bacteria evolve (change).

Increase in antibiotic resistant bacteria is reducing doctors' ability to treat common infectious diseases and leading to the evolution of **"Superbugs"**. Superbugs are resistant to all types of antibiotics that doctors use, meaning they can't be treated.

With this in mind, Oxford Brookes researcher Dr Hee-Jeon Hong is conducting research into understanding how bacteria responds and adapts to antibiotics. Understanding this is key to developing effective antibiotics!

Bugs vs Drugs game!

Have a go at this fun game to learn more about antibiotic resistance.



You can download, print and find out how to play at https://drugs-vs-bugs.com/#/

How can we prevent the spread of antibiotic resistance?

- Only take antibiotics which are prescribed.
- Prevent infections by washing hands.
- Prepare food hygienically.
- Increase awareness of the issue.
- Increase the support from governing bodies i.e. legislation.

To find out more about antibiotic resistance visit
https://www.nhs.uk/conditions/antibiotics/antibiotic-antimicrobial-resistance/