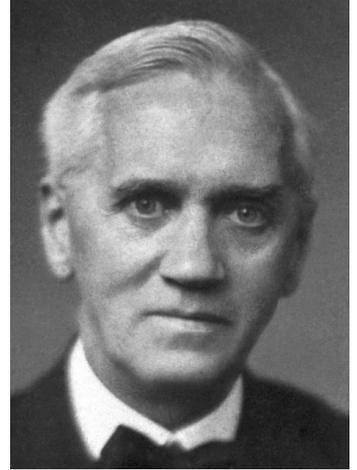


## How Do Antibiotics Work?

In 1929, Alexander Fleming discovered the first antibiotic. He was a scientist devoted to finding methods for treating infections. During his research, he noticed that a mold had accidentally contaminated his plates of bacteria. The mold seemed to inhibit (slow down or interfere with) bacterial growth on the plate. He hypothesized that the mold was making something that could kill bacteria. He tried to purify the substance, but it was too unstable and would break down easily.



Sir Alexander Fleming  
Source: <https://www.nobelprize.org/prizes/medicine/1945/fleming/facts/>

During World War II, two British scientists, Sir Howard Florey and Ernest Chain, picked up where Fleming left off. They succeeded in purifying and producing this new substance for treating bacterial infections. They referred to it as an antibiotic, "anti" meaning against and "biotic" meaning life, or living things. Antibiotics kill living bacteria. The mold that contaminated Fleming's plates was *Penicillium*. Can you guess what they named the first antibiotic? It was called Penicillin.

All three scientists won the Nobel Prize for their work in developing this new "wonder drug" that saved millions of lives.

Different antibiotics destroy bacteria in different ways. The two antibiotics you will be using are Ampicillin and Kanamycin.

**Ampicillin** interferes with the formation of new cell membranes. Without a proper cell membrane, the cell cannot live. Ampicillin only affects dividing cells; it does not affect cells that already have a cell membrane.

**Kanamycin** blocks the formation of new proteins in a bacterial cell. Proteins are very important to a cell, without them the cell dies. Kanamycin kills newly made cells as well as older cells.

What kinds of antibiotics have you taken?

## Bacteria & Antibiotics

### Exploring How Antibiotics Kill Bacteria

The discovery of antibiotics had an enormous effect upon human health. Before antibiotics were available, people often died of what are now considered easily treated infections, such as strep throat and bacterial pneumonia. Now we take antibiotics for these infections and usually feel much better after only a few days.

In this experiment you will observe the effect of two separate antibiotics, **ampicillin** and **kanamycin**, on two different kinds of bacteria

#### PROCEDURE

1. Label one Petri plate #1 and the other #2. Draw a line down the middle of each plate, label one side "A" for Ampicillin and the other side "K" for Kanamycin. Be sure to label both Petri plates with your initials and your partners initials.
2. Using sterile glass beads, spread the tube of bacteria #1 on plate #1.
3. Using sterile glass beads, spread the tube of bacteria #2 on plate #2.
4. Using a sterile toothpick, carefully remove the Ampicillin pill from the "A" tube and place in the "A" area of plate #1.
5. Using a second sterile toothpick, carefully remove the Kanamycin pill from the "K" tube and place in the "K" area of plate #1.
6. Place an "A" pill and a "K" pill on plate #2. Be sure to use a separate sterile toothpick for each pill.
7. Allow the plates to grow at 37°C (98.6°F) overnight.

How do you predict the results will look?

