

PENICILLIN



Sir Alexander Fleming



Sir Howard Walter Florey



Ernst Boris Chain

KEY FACTS

What is Penicillin?	Penicillins are a group of antibacterial drugs (antibiotics) that attack a wide range of bacteria. They were the first drugs of this type that doctors used. The discovery and manufacture of penicillins have changed the face of medicine, as these drugs have saved millions of lives. <i>Penicillium</i> fungi are the source of penicillin, which people can take by swallowing or via injection. Doctors across the globe now widely use penicillins to treat infections and diseases.
When was it discovered?	Penicillin was first discovered in 1928, by Sir Alexander Fleming. Further research was continued by Sir Howard Walter Florey and Ernst Boris Chain.
How was it discovered?	The most important part of the discovery happened while Fleming was away on holiday. A blob of mould had grown on a dirty dish in his lab. All around the mouldy blob, there were no bacteria growing. He reasoned that something in the mould was killing the bacteria. After growing this mould separately in a petri dish, he found that it produced a substance which killed a number of bacteria – a substance which he originally called ‘mould juice’ and then named ‘penicillin’, in 1929, after the fungus on the petri dish. This discovery led to a group of medicines called antibiotics, which have saved countless lives. It is now the most widely used antibiotic in the world.

DEVELOPMENT	Over the next 12 years, Fleming grew, studied and distributed the original mould and found that the substance had clear antibacterial effects on many organisms. In particular, it affected bacteria which cause diseases such as scarlet fever, pneumonia, meningitis and diphtheria. Fleming found the Penicillium mould to be difficult to grow and that it was even more difficult to isolate the antibiotic agent. He concluded that, due to the slow speed of its effects, penicillin could not be overly significant as a substance to treat infections. With his clinical trials in the 1930s mainly producing inconclusive results, Fleming largely abandoned his work on penicillin.
FURTHER RESEARCH	Thankfully, his work was picked up by a large team of scientists which included Howard Florey and Ernst Boris Chain at the Radcliffe Infirmary in Oxford. They took up the research to isolate and mass produce penicillin. Funding was provided by both the British and US governments. By 1944, enough penicillin had been produced to treat all of the wounded in the Allied Forces of World War 2.
TODAY	<p>Fleming was modest about his contribution to the development of penicillin, calling his fame "the Fleming Myth" and attributing the success to Florey and Chain for the work creating the penicillin drugs.</p> <p>However, Fleming's chance discovery, and the subsequent isolation of penicillin in September 1928, marked the start of modern antibiotics.</p> <p>Penicillin antibiotics are still widely used today, however many types of bacteria have developed resistance following extensive use so research and scientific studies continue to develop new antibiotics. This is why modern doctors recommend only using penicillin in limited doses and only when strictly necessary.</p>
MAIN ACHIEVEMENT	The Nobel Prize in Physiology or Medicine 1945 was awarded jointly to Sir Alexander Fleming, Ernst Boris Chain and Sir Howard Walter Florey "for the discovery of penicillin and its curative effect in various infectious diseases."

GLOSSARY

- **Antibiotics** - a medicine (such as penicillin) that inhibits the growth of or destroys microorganisms
- **Petri Dish** - a shallow, circular, transparent dish with a flat lid, used for the growing of microorganisms
- **Organisms** - an individual animal, plant, or single-celled life form.
- **Microorganism** - a microscopic organism, especially a bacterium, virus, or fungus.
- **Clinical Trials** - are a type of research that studies new tests and treatments and evaluates their effects on human health outcomes.
- **Nobel Prize** - A series of prizes, named after scientist Alfred Nobel which are awarded annually for outstanding work in a variety of different areas (including Science).

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