The Story of Penicillin

The Story of Penicillin and Sir Alexander Fleming is one of the most significant and transformative in the history of medicine. It's a tale of accidental discovery, scientific persistence, and ultimately, a revolution in how we combat bacterial infections.

Sir Alexander Fleming FRS FRSE FRCS - The Accidental Discoverer:

Alexander Fleming was a Scottish bacteriologist working at St. Mary's Hospital in London. He had a keen eye for observation and a bit of a messy lab. In September 1928, after returning from a summer vacation, Fleming was tidying up his lab. He noticed something peculiar on a Petri dish that had been left uncovered and accidentally contaminated with mould.

The dish contained a culture of Staphylococcus bacteria, which cause boils, sore throats, and abscesses. Around a blob of green mould, he observed a clear zone where the bacteria had failed to grow. It was as if something secreted by the mould was inhibiting the bacterial growth.

Fleming, always curious, isolated the mould and identified it as a species of Penicillium. He then grew the mould in a liquid medium and found that the "mould juice" produced a substance that could kill a wide range of harmful bacteria. He named this active substance penicillin.

Early Challenges and Lack of Interest:

Fleming published his findings in 1929, but to his surprise, his peers showed little interest in his discovery. He also faced significant challenges in purifying and stabilizing penicillin. The crude substance he extracted was highly unstable and difficult to produce in large quantities. While he recognized its potential as an antibacterial agent, he primarily saw its use for isolating penicillin-insensitive bacteria in laboratory cultures, and as a topical antiseptic for wounds. For about a decade, penicillin remained largely a "laboratory curiosity."

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The Oxford Team and the Development of a "Wonder Drug":

The true therapeutic potential of penicillin was later realized by a team of scientists at the University of Oxford, led by Howard Florey, Ernst Chain, and with significant contributions from Norman Heatley, starting in 1938. They were investigating micro-organisms and the substances they produced. When Chain came across Fleming's paper, he suggested they examine penicillin.

This team faced immense scientific challenges in purifying penicillin from its mould source. They experimented with various methods, even resorting to using bedpans and milk churns to hold the mould broth due to the large quantities needed. After three years of dedicated work, they developed a successful, albeit inefficient, process to produce pure penicillin.

In 1940, they conducted groundbreaking animal trials. They infected eight mice with deadly streptococci bacteria; the four mice treated with penicillin survived, while the control group died. This clear demonstration of penicillin's effectiveness sparked immediate interest.

Mass Production and Impact on Medicine:

The outbreak of World War II provided a strong impetus for the large-scale production of penicillin. The British scientists, facing limited resources due to the war, turned to the United States for help. American scientists, particularly at the USDA Northern Regional Research Laboratory in Peoria, Illinois, made crucial advancements in fermentation methods, significantly increasing the yield of penicillin. They even discovered a more potent strain of Penicillium on a mouldy cantaloupe from a Peoria market.

By 1943, with unprecedented cooperation between the US and UK, penicillin was being produced in significant quantities. Its impact was immediate and profound, especially on the battlefield. It drastically reduced the death rate from bacterial pneumonia in soldiers and saved countless lives by treating infected wounds.

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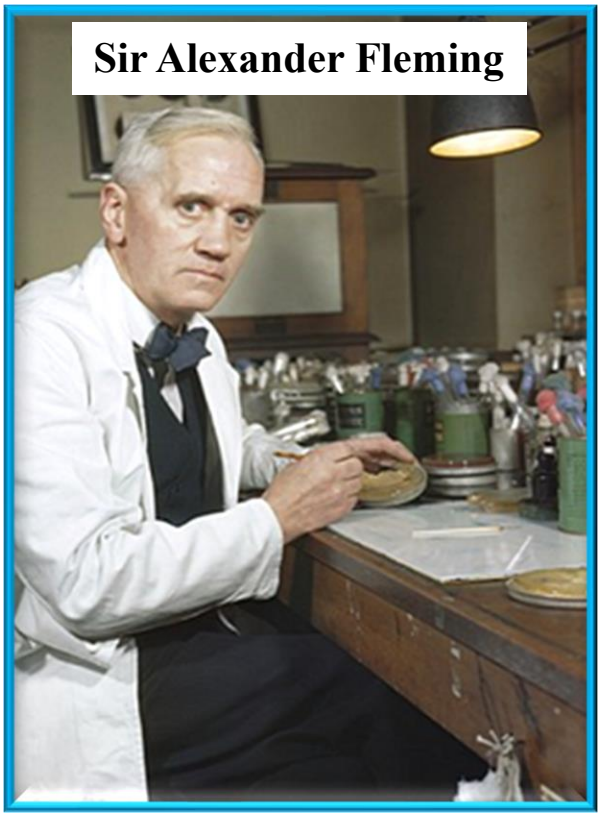
The Legacy of Penicillin:

Penicillin heralded the dawn of the antibiotic age. Before its introduction, seemingly minor infections could be fatal. Diseases like pneumonia, gonorrhoea, and rheumatic fever, which were once untreatable, became curable. Hospitals, once filled with people dying from blood poisoning, saw a dramatic shift in patient outcomes.

In 1945, Sir Alexander Fleming, Howard Florey, and Ernst Chain were jointly awarded the Nobel Prize in Physiology or Medicine for their work on penicillin.

The discovery of penicillin not only saved millions of lives but also laid the foundation for the development of countless other antibiotics, forever changing the landscape of modern medicine and public health. It stands as a testament to the power of scientific observation, persistence, and collaborative effort.



The discovery of Penicillin cemented Alexander Fleming's place as one of the world's most famous scientists.

In 1944, Fleming was Knighted by King George VI and won the Nobel Prize a year later.

In 1909 at the age of 27, Fleming was initiated into Sancta Maria Lodge No. 2682, London; he served as Senior Warden in 1922 and Master in 1924.

He became a joining member of London Scottish Rifles Lodge No.2310 in London in 1911 and Misericordia Lodge No.3288 London in 1925, where he served as Master.