

Asked to list the most important medical contributions of the 20th century, most clinicians would include the discovery of penicillin by Sir Alexander Fleming. Although Pasteur (December 19) performed his groundbreaking work on the germ theory of disease and Lister (July 9) developed his technique of antiseptic surgical technique roughly 100 years before Fleming's work, no one before Fleming solved the problem of effectively killing bacteria that had infected living tissue. In the 100 years between Pasteur and Fleming, the world had seen many wars, including the American Civil War and World War I, where more men died of infection than any other cause. It was also a time when infectious diseases such as syphilis and bacterial meningitis were prevalent and caused significant mortality and morbidity. Surgeries, even minor amputations of a toe or finger, met with a mortality rate of up to 50% before the advent of Fleming's discovery.

Fleming was born in Scotland in 1881. He moved to London to attend Polytechnic, then entered St Mary's Medical School, London University. He graduated with distinction in 1906 and began a research career there under Sir Almroth Wright, who was a pioneer in vaccine research. He served as a captain in the British Medical Corps throughout World War I, where he was allowed to continue his research. In 1918, he returned to St Mary's.

Fleming became interested in antiseptics and the role of bacteria in disease at an early age in his career. He was most interested in solving the problem of creating a substance that could kill bacteria without harming the animal tissue that it had been infecting. In 1921, he discovered lysozyme, which is an important bacteriolytic substance.

In 1928, he made his famous discovery of penicillin while doing work on influenza (December 23), the virus that caused a worldwide epidemic 10 years earlier. He was trying to isolate the organism using plates that were grown over with *Staphylococcus* bacteria. Some of these plates had become contaminated with *Penicillium* mold, and Fleming noted that the *Staphylococcus* bacteria could not grow within a certain distance of the fungal colonies. Later work isolated the antibacterial agent that prevented bacterial growth even when diluted 800 times. He named this substance penicillin, after the mold from which it was isolated.

Fleming was elected Fellow of the Royal Society in 1943 and was knighted in 1944. In 1945, he received the Nobel Prize in Physiology or Medicine. He died an international hero in 1955 and is buried in St Paul's Cathedral in London.

Bibliography

Nobelprize.org Web site. nobelprize.org/nobel_prizes/medicine/laureates/1945/fleming-bio.html. Accessed September 3, 2008.