



Making strides in medicine

A century ago, a diagnosis of juvenile diabetes was an almost certain death sentence. Children affected by diabetes rarely lived more than a few years. However, thanks to the discovery of insulin in the early 1920s, along with subsequent scientific breakthroughs in genetic engineering that allowed insulin to be mass-produced, that statistic has completely turned around: diabetics now live long lives.

Diabetes is just one of many diseases and health concerns for which science has helped develop treatments, preventions, or cures. Without science, we wouldn't know how to make an X-ray machine, how to build an artificial knee, how to prevent nutritional deficiencies, how to ward off cholera and malaria, or even, at the most basic level, that hand-washing can prevent the spread of germs. In many thousands of ways, science has supplied us with tools to improve human health—not the least of which has been medications to treat diseases ...

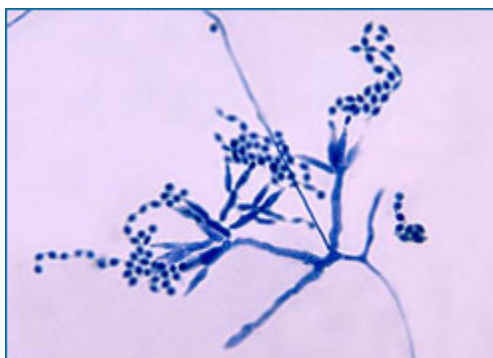
MOLDY MIRACLE DRUGS

At his lab bench in 1928, biologist Alexander Fleming found that his research had gone bad—moldy, in fact. One of his plates of bacterial colonies had picked up the tiny spores of a mold floating through the air and was now growing a fuzzy head of white fluff. Instead of tossing the contaminated plate, Fleming took a close look and noticed that the white fluff was having a surprisingly powerful effect. The mold, of course, was *Penicillium*, and it was not only slowing the bacteria—it was actually causing them to explode! Fleming immediately began experiments and soon showed that the mold was able to kill many bacterial strains, including those that cause strep throat, staph infections, pneumonia, syphilis, and gonorrhea. And unlike other bacterial treatments available at the time (like mercury and arsenic), penicillin was non-toxic, exclusively attacking bacteria and leaving the body's own cells alone. It would take another decade for scientists to develop the means of producing and purifying the drug efficiently, but when they did, it was a breakthrough, arriving just in time to treat wounded World War II soldiers.

Before long, other compounds like penicillin were discovered, ushering in the age of antibiotics and saving millions of lives. Unfortunately, it would not last long. Antibiotic-resistant bacteria rapidly evolved and were first documented just four years after penicillin became widely available. Over the last 20 years, antibiotic resistance has become an increasingly serious problem. Now, medical doctors are again looking towards scientific research with the hope that the lab bench will once more provide them with a silver bullet to fight bacterial infections.



Alexander Fleming



One species of *Penicillium* is used in the production of the antibiotic penicillin, but others are important in cheese-making. Another, like the one pictured here, causes an AIDS-related illness.