



# Heartland Science

Ohio's Legacy of Discovery & Innovation



## Medicine, Health & Science

From the Heimlich Maneuver  
to the Speed of Light

### Polio Vaccine Production

Frederick C. Robbins (1916-2003), of Case Western Reserve University School of Medicine in Cleveland, shared the 1954 Nobel Prize in Physiology or Medicine for discovering a method of growing poliovirus in a test tube. Until that discovery by Robbins and fellow laureates John F. Enders and Thomas H. Weller, poliovirus had to be studied in monkeys, which were expensive to use in research and difficult to handle. Their achievement led to development of the first effective vaccines to prevent polio. The viral disease then occurred in great epidemics, which threatened children with paralysis and death. In addition, the first effective vaccines paved the way for making vaccines given today to prevent childhood diseases including common measles and German measles. Before a vaccine was developed, German measles was a major cause of birth defects.



Scientists had been trying to make a polio vaccine since 1900. Robbins joined Enders and Weller at Children's Hospital in Boston in 1948, where researchers were trying to break through a major barrier hindering vaccine development. Scientists then thought that the poliovirus would grow only in nerve tissue in living mammals, warm-blood animals that include people. That made it seem almost impossible to develop a vaccine. Nerve tissue then could not be grown in test tubes in the ways needed to make a vaccine. By 1952, Robbins and his associates proved those beliefs wrong. They discovered how to grow poliovirus in laboratory cell culture dishes containing human embryonic skin and muscle tissue.



Jonas Salk, of the University of Pittsburgh, immediately used the discovery to develop the first polio vaccine, which became known as the "Salk vaccine." Given by injection, it used an inactivated form of poliovirus to produce immunity. The Salk vaccine went into general use in 1955. In 1957, Albert B. Sabin developed an oral vaccine that used live poliovirus with the infectious part inactivated. It went into use in 1963, and today is the main vaccine used in the United States. The vaccines quickly controlled polio in the United States. In the late 1950s, more than 2,500 cases of paralytic polio, the most serious kind, occurred each year. By 1965, there were only about 60 cases. The last naturally transmitted case of polio occurred in the United States in 1979. Health officials in 1994 declared that polio had been eradicated in North and South America. Polio, however, continues to occur in other parts of the world. The World Health Organization hopes to wipe out the disease in the near future. Its Global Polio Eradication Initiative involves government agencies as well as private groups like Rotary International and the Bill & Melinda Gates Foundation.

### Find out more...

- Centers for Disease Control National Immunization Program ([www.cdc.gov/nip](http://www.cdc.gov/nip))

HEARTLAND SCIENCE – ([www.heartlandscience.org](http://www.heartlandscience.org))

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