

Canada's Polio Vaccine Pioneers

50th Anniversary Celebration

*Publications Representing the Essential Scientific Contributions Made by  
Canadian Scientists of the Connaught Medical Research Laboratories (now sanofi pasteur)  
to the Development of the Salk Polio Vaccine*





This publication was produced by sanofi pasteur limited (formerly Connaught Laboratories Ltd.) in recognition of the contribution of its past employees to the development of the Salk polio vaccine.

Sanofi pasteur, the vaccines business of the sanofi-aventis Group, sold nearly a billion doses of vaccines in 2004, making it possible to protect more than 500 million people across the globe, which is about 1.4 million per day. The company offers the broadest range of vaccines, providing protection against 20 bacterial and viral diseases. For more information, please visit [www.sanofipasteur.com](http://www.sanofipasteur.com).

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**Canadian Public Health Association (CPHA)  
Certificate of Merit, September 2005**

The CPHA Certificate of Merit recognizes individuals, groups or associations who have given especially noteworthy services to public health and whose contribution furthers CPHA in achieving its objectives.

The 2005 Certificate of Merit is awarded to the Connaught Medical Research Laboratories' twelve-member team of vaccine researchers who, in 1949, developed "Medium 199," the first synthetic nutrient base that enabled Dr. Jonas Salk to produce an inactivated polio vaccine safe for humans. In addition, Connaught's "Toronto Technique" made it possible to cultivate enough poliovirus to produce vaccine on a large scale by gently rocking large bottles in specially designed machines. In 1955, a brave decision by Paul Martin Sr., Minister of National Health and Welfare at the time, initiated a national immunization program using Connaught's new vaccine that put an end to the epidemic that was sweeping across Canada paralyzing children and adults in their prime. Fifty years later, we celebrate the continued success of this vaccine around the world.

Congratulations to the researchers and all the staff of Connaught Medical Research Laboratories, originally part of the University of Toronto, as well as those who are continuing this life-saving work at what is today known as the Connaught Campus of the global sanofi pasteur organization.

Immunization remains a cornerstone of public health. Canada's continuing contribution to this most important and effective means of preventing disease is a legacy we can all celebrate.

*This publication was produced by sanofi pasteur limited in honour of the 50th anniversary of the discovery of Salk polio vaccine and in support of public health education through the Canadian Public Health Association (CPHA).*

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**ANDREW J. RHODES**

A pioneer in virology, Dr. Rhodes arrived at Connaught Medical Research Laboratories in 1947 to lead a comprehensive poliovirus research program. His most important work involved overseeing the development of large-scale methods for the production of poliovirus fluids utilizing "Medium 199" and the "Toronto Technique" that proved so essential to Jonas Salk and the massive field trial of his polio vaccine in 1954-55.

**JOSEPH F. MORGAN**

A biochemist by training, Dr. Morgan pioneered the development at Connaught of the world's first purely synthetic cell nutrient medium for tissue cultures, known as "Medium 199." Working closely with Dr. R.C. Parker and H.J. Morton, "199" was originally developed in 1949 for cancer research, but later proved critical to the cultivation of the poliovirus and the development of the Salk vaccine.

**HELEN J. MORTON**

A senior technician at Connaught through the late 1940s, Helen Morton worked closely with Dr. J.F. Morgan in the laboratory of Dr. R.C. Parker on the original development of "Medium 199." Through the 1950s she continued to assist in the further refinement of "199" and the development of other synthetic media at Connaught for use in a variety of vaccines.

**RAYMOND C. PARKER**

A leading experimental cytologist by training and pioneer in the development of tissue culture techniques, Dr. Parker oversaw the work of Dr. J.F. Morgan and H.J. Morton that led to the discovery of "Medium 199" at Connaught in 1949.

**ARTHUR E. FRANKLIN**

A biochemist in Connaught's polio research team, Dr. Franklin was the first to utilize "Medium 199" for the cultivation of polioviruses in 1951. "Medium 199" was originally discovered at Connaught in 1949 for cancer research, but was tried for poliovirus work through Franklin's friendship with "199's" co-discoverer, Dr. J.F. Morgan.

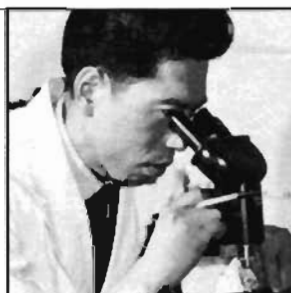
**LEONE N. FARRELL**

A senior researcher at Connaught since the 1930s, in 1952-53, Dr. Farrell pioneered the development of the "Toronto Technique" of large-scale cultivation of poliovirus fluids. Her work made it possible to produce enough of Salk's inactivated polio vaccine for the 1954 field trial and beyond.



**FRANK T. SHIMADA**

Originally hired at Connaught in 1948 as an animal attendant, Frank Shimada quickly rose to a senior technician's position. His considerable laboratory skills were employed in several of Dr. A.J. Rhodes' poliovirus research projects, and particularly in preparing and testing poliovirus fluids for the 1954 Salk vaccine field trial.

**HILDA G. MACMORINE**

A chemist by training, beginning in 1953, Hilda Macmorine assumed responsibility at Connaught for the preparation of "Medium 199" utilized in the large-scale production of poliovirus fluids for the 1954 Salk vaccine field trial. Her skills were soon utilized in many aspects of polio vaccine production and, by August 1955, she supervised the entire Salk vaccine production process at Connaught.

**WILLIAM J. WOOD**

A physician and medical virologist by training, from 1952-54, Dr. Wood oversaw the inspection and testing of monkeys involved in poliovirus production. He was also involved in the preparation of tissue cultures and testing of the bulk poliovirus fluids used to make Salk vaccine for the 1954 field trial.

**CHARLES W.J. ARMSTRONG**

A senior research member at Connaught from 1954 until his untimely death in 1958, Dr. Armstrong specialized in potency testing of Salk polio vaccine and in the early development of the first combined antigen products that included polio vaccine (DPT-Polio).

**DONALD R.E. MACLEOD**

A senior research member at Connaught, in 1954 Dr. MacLeod assumed responsibility for several aspects of polio vaccine production, including the inspection and testing of monkeys, tissue culture preparation, and testing and virus inactivation and filtration.

**ROBERT D. DEFRIES**

While Director of Connaught Medical Research Laboratories (1940-55), Dr. Defries personally oversaw the "Herculean task" of large-scale production of poliovirus fluids that were the basis of all the inactivated Salk vaccine used in the 1954 mass field trial in the U.S. and parts of Canada and Finland. Dr. Defries also served as Director of the University of Toronto's School of Hygiene (1940-55) and as Editor of the *Canadian Journal of Public Health* (1928-64).

