Margaret Pittman (1901-1995, USA)

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Margaret Pittman

Claim to fame: vaccine developer

Background: description of the problem faced

Margaret Pittman was a pioneering bacteriologist who made significant contributions to the study of infectious diseases. Her research on *Haemophilus influenzae*, a pathogen responsible for most cases of childhood meningitis, helped address a disease that often resulted in death. During World War II, Pittman addressed the issue of high fevers caused by blood transfusions, developing methods to enhance transfusion safety and reduce complications. One of her most notable achievements, however, was her work on the pertussis vaccine. Pertussis, or whooping cough, is a highly contagious respiratory disease, itypically mild in older children and adults but can be fatal in infants. Although a vaccine against pertussis was already available at the time, it caused severe side effects, and Pittman's work aimed to make it safer and more effective.

The Approach taken

Pittman isolated strains of *Haemophilus influenzae* from infected patients and identified six distinct serotypes, discovering that some were encapsulated. Her work led to the development of

an antiserum and later a vaccine for the harmful strain of *Haemophilus influenzae* that primarily affected children. During World War II, Pittman tackled the challenges of blood transfusions by developing methods to ensure proper conditions for maintaining and testing blood plasma before it was transfused to patients. In relation to pertussis, Pittman and her colleagues developed a method to test the safety and efficacy of the vaccine. Additionally, she discovered that pertussis was caused by an exotoxin— a toxin produced by bacteria. This insight into the toxin-mediated nature of the disease facilitated the development of a safer, more effective vaccine.

The Breakthrough/Discovery solution to the problem

Margaret Pittman worked on the production, testing and standardization of vaccines for diseases, such as typhoid, cholera and pertussis, among others. She advocated that the effectiveness of a vaccine was directly linked to its potency, which could be measured in the laboratory. Pittman developed methods to assess this potency, and her pioneering work laid the foundation for establishing international standards and potency requirements for vaccines.

Its Application

Margaret Pittman's research on *H. influenzae* has had a profound and lasting impact on the medical field. Her groundbreaking contributions to the development of vaccines against infectious diseases revolutionized immunization programs worldwide. Her work played a key role in reducing morbidity and mortality, particularly among children. Today, the pertussis vaccine is a core component of immunization schedules, drastically reducing infant deaths in developed countries—a legacy that owes much to Margaret Pittman's dedication and scientific achievements.

Its Significance and how it changed microbiology, humanity

Margaret Pittman dedicated her life's work to the study of microbiology, immunology, and the development of groundbreaking vaccines that have had a lasting impact on public health globally. Her research was critical to understanding infectious diseases and the advancement of vaccine technology.

The MicroDiscoverer Hero – the person

Margaret Pittman was a pioneering microbiologist born in Arkansas, USA. Her early exposure to medicine came from accompanying her father, a rural physician, on his visits. In 1923, Margaret graduated in mathematics and biology. She later attended the University of Chicago with savings from teaching at the Girl's Academy in Arkansas. At the University of Chicago, Margaret received a master's degree in bacteriology and, in 1928, completed her Ph.D. Following positions at the Rockefeller Institute and the New York State Department of Health, she came to the National Institute of Health (NIH) in 1936. At the NIH, she achieved a historic milestone in 1957 by becoming the first woman to serve as Laboratory Chief, leading the Laboratory of Bacterial Products in the Division of Biologics and Standards until 1971. This achievement challenged long-standing gender stereotypes in STEM (Science, Technology, Engineering, and Mathematics) fields and highlighted her exceptional qualifications and leadership.

Even after her official retirement in 1971, Margaret continued to work at the NIH as a consultant on vaccine standards, extending her contributions to public health and microbiology until 1993.