Ruth Nussenzweig, Who Pursued Malaria Vaccine, Dies at 89

By NEIL GENZLINGER  APRIL 11, 2018

Ruth Nussenzweig, who for a half-century pursued one of medical science’s most elusive goals, a vaccine for malaria, helping to bring the research from the seems-impossible stage to the brink of a breakthrough, died on April 1 in Manhattan. She was 89.

Her son Michel said the cause was a pulmonary embolism.

Dr. Nussenzweig (pronounced NU-sen-schwige), working at the Langone Medical Center at New York University, did groundbreaking work on malaria beginning in the 1960s, a time when many thought the complexities of that killer disease prevented it from being thwarted through vaccination.

At her death, pilot programs on a malaria vaccine, based in part on Dr. Nussenzweig’s work, were to begin in Africa.

Getting to that point required more than just hard work in the lab by Dr. Nussenzweig, who sometimes collaborated with her husband, Victor Nussenzweig, another eminent researcher. It required her to emigrate, and then emigrate again, to escape oppression: She left Austria during the Nazi occupation, then Brazil when it came under a military dictatorship.

“All this was a lesson of survival that strengthened my resources and hardened my will to be a scientist,” she told Science magazine in 2013.

Ruth Sonntag was born on June 20, 1928, in Vienna. Her parents, Barouch and Eugenia, were physicians. The family, although not particularly religious, was of Jewish lineage, which left them vulnerable after the Anschluss, the annexation of Austria by Nazi Germany in 1938.

“My mother told the story of how her family were relatively wealthy Jews who were assimilated with many non-Jewish friends and connections,” Michel Nussenzweig said by email. “They did not believe that they would be targeted by the Nazis. However, Barouch, her father, was arrested immediately after the Anschluss. They were able to leave only because a prominent Austrian Nazi friend found my grandmother on line to visit Barouch in prison and recognized her. He was let go, and they fled immediately.”
In Brazil, Ruth enrolled in medical school at the University of São Paulo.

"I was interested in research," she explained, "and the only way of doing research was to go to medical school."

There she met Victor Nussenzweig, a fellow medical student.

"At the time, I was more interested in doing leftist politics than science," Victor told Science magazine, "but I started dating Ruth, and she convinced me that research would benefit people much more than politics."

They married in 1952. Ruth Nussenzweig received her medical degree in 1953. She and Victor became assistant professors at the university and from 1958 to 1960 worked in Paris on a research fellowship. He survives her.

Another research fellowship, in 1963, sent them to N.Y.U. Intended to be a temporary relocation, it became a permanent one after a military coup in Brazil in 1964 made it too uncomfortable for them to remain in that country. Dr. Nussenzweig, however, did complete her Ph.D. work at the São Paulo university in 1968, and the couple continued to maintain ties there until her death.

Though their research sometimes coincided, the Nussenzweigs had separate labs at N.Y.U. several blocks apart. Ruth was early to focus on malaria, which is caused by a parasite that is spread to humans by mosquito bites. The disease kills hundreds of thousands of people every year, mostly in sub-Saharan Africa.

One of Dr. Nussenzweig’s first big advances in her research came in 1967, when she discovered that irradiating infected mosquitoes weakened the parasites, or sporozoites, enough that they might trigger an immune response when transmitted to humans rather than cause the disease itself. This suggested the possibility of a vaccine.

Her work later focused on a protein on the sporozoites.

The quest for a vaccine has proved exceedingly difficult because, among other factors, the parasite goes through various stages in an infection, and there are multiple strains of malaria. Several times over the years a vaccine seemed imminent, only to have trials fail or deliver disappointing results.

Yet the work by Dr. Nussenzweig, her husband and other scientists helped clarify how the parasite does its damage and at what stage it might be stopped, and it has helped draw funding to the cause from well-heeled sources, including the Bill and Melinda Gates Foundation.

Jeffrey Weiser, chairman of the department of microbiology at the N.Y.U. School of Medicine, said by email that the Nussenzweigs "discovered the major target for a malaria vaccine: a protein on the surface of malaria sporozoites called circumsporozoite, or CSP."

"Their unrelenting perseverance and dedication to this topic," he added, "laid the groundwork for the first licensed vaccine against malaria in 2015 based on CSP."

This year, a pilot vaccination program, drawing on Dr. Nussenzweig’s work and endorsed by the World Health Organization, will give the vaccine to children in Ghana, Kenya and Malawi. It has been shown to be partly effective.

Besides her husband and her son Michel, a professor of medicine, Dr. Nussenzweig is survived by another son, André, a cancer researcher; a daughter, Sonia Nussenzweig Hotimsky, a professor of anthropology; and six grandchildren.

In the 2013 interview, Dr. Nussenzweig acknowledged encountering obstacles as a woman in
“It was just not accepted that women could achieve something more,” she said. She added, “It’s a hard career, but if you persist, it gives a lot of satisfaction.”

A version of this article appears in print on April 12, 2018, on Page A29 of the New York edition with the headline: Ruth Nussenzweig, 89, Malaria Sleuth.

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