



*“We are proposing a fundamentally different way to control breast cancer by providing healthy, cancer-free women with preemptive immunity against the more virulent forms of the disease.”*

— Vincent K. Tuohy, PhD

Staff,  
Lerner Research Institute  
Department of Immunology

The Mort and Iris November  
Distinguished Chair in Innovative Breast  
Cancer Research

*“We have known for more than a century that our immune system can protect us from developing cancer, but we cannot rely on this happening spontaneously. We must assist in directing our immune system to do its job.”*

Vincent K. Tuohy, PhD, is an immunologist at the Lerner Research Institute of Cleveland Clinic. A native of Flatbush, Brooklyn, NY, Dr. Tuohy received his PhD in pathology from the State University of New York, Downstate Medical Center, Brooklyn, and completed postgraduate training at the Eunice Kennedy Shriver Center and Harvard Medical School. While in Boston, Dr. Tuohy studied a protein called myelin proteolipid protein (PLP) and showed how an immune response to PLP could induce severe autoimmune demyelination of the central nervous system, similar to what occurs in human multiple sclerosis. For these research efforts, Dr. Tuohy received the Harry Weaver Award from the National Multiple Sclerosis Society, the Peter W. Lampert Prize from the Society for Experimental Neuropathology and the FIRST Award from the National Institute of Neurological Disorders and Stroke at the National Institutes of Health.

Dr. Tuohy was recruited to the Cleveland Clinic in 1989, extending his initial work on multiple sclerosis by developing and characterizing autoimmune rodent models for several other human diseases, including autoimmune inner ear disease, dilated cardiomyopathy, interstitial cystitis, prostatitis, primary ovarian insufficiency and autoimmune mastitis. These studies ultimately led Dr. Tuohy to focus the immune response against self-proteins that are overexpressed in adult-onset tumors but are no longer expressed with age in normal tissues. He proposed that such “retired” tissue-specific proteins may be useful vaccine targets for preventing diseases like breast cancer and ovarian cancer that typically occur in aging women.

To test his hypothesis, Dr. Tuohy used established mouse models for breast cancer to vaccinate against breast-specific proteins that are no longer expressed in normal aging breast tissues but are expressed in many breast tumors. The results were staggering. As published in *Nature Medicine*, 100 percent of vaccinated mice were protected from breast cancer. Vaccination not only inhibited the growth of preexisting tumors, it safely and effectively prevented new tumors from forming.

“This vaccine approach represents a new way to control breast cancer,” Dr. Tuohy said. “We could feasibly program the immune system in cancer-free adult women to protect against breast cancer in much the same way that childhood vaccination protects children from infectious diseases like polio and measles.”

Since the publication of this landmark study, Dr. Tuohy has been generating additional preclinical data and seeking funds to test his vaccine strategy in human trials. Media attention and a large grassroots effort are helping him get closer to this goal.

In addition to his research on breast cancer, Dr. Tuohy serves as a consultant for the National Institutes of Health and the National Multiple Sclerosis Society, serves on the editorial boards of several scientific journals, has trained more than 20 postdoctoral fellows and graduate students, and has published over 95 manuscripts, review articles and book chapters. However, he says his greatest accomplishments are his three children and five beautiful grandchildren.