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PROTOZOOLOGY - SHORT COMMUNICATION

In memorium Herbert B. Tanowitz, MD, FIDSA, FACP, FRSTMH 6 September 1941 – 17 July 2018

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Abstract
With deep regret and sadness, we report the death of Professor Herbert B. Tanowitz, Professor of Pathology, Division of Parasitology and Professor of Medicine, Division of Infectious Diseases, Albert Einstein College of Medicine, Bronx, New York. He is survived by his children Pam, Meredith, and Jill, and their families.

Keywords Memorium · Tanowitz · Chagas disease · *Trypanosoma cruzi* · Parasitology

With deep regret and sadness, we report the death of Professor Herbert B. Tanowitz, Professor of Pathology, Division of Parasitology and Professor of Medicine, Division of Infectious Diseases, Albert Einstein College of Medicine, Bronx, New York. He is survived by his children Pam, Meredith, and Jill, and their families.

Dr. Tanowitz was a world-renowned expert in Parasitology, whose seminal contributions to our understanding of *Trypanosoma cruzi* infection significantly advanced our understanding of the pathogenesis of chagasic cardiomyopathy. His interest and research on this pathogen and other aspects of parasitology stretched over several decades resulting in over 300 publications as well as numerous book chapters and monographs. In recognition of his contributions, he was elected in 2009 to the Brazilian Academy of Sciences. His generous spirit and intellect were shared freely with researchers at all levels of their careers. In addition to his research expertise, he was an excellent clinician whose opinions and judgment were sought out by both colleagues and patients. Dr. Tanowitz received numerous awards during his career including Einstein's Dominick P. Purpura Distinguished Alumnus Award, the Brazilian Society of Protozoology's Walter Colli Award, and induction into the Sigma Xi Scientific Research Honor Society. He embodied the role of the academic physician and was beloved by his patients, fellows, and students alike.

Herbert B. Tanowitz received his bachelor's degree from Brooklyn College and then attended the Albert Einstein College of Medicine from which he graduated in 1967. At that time, he was inducted into the Alpha Omega Alpha Medical Honor Society. After graduation, he did an internship at Bellevue Hospital in New York and an Internal Medicine residency at Lincoln Hospital in the Bronx. He then completed an Infectious Diseases fellowship (1971–1973), at the relatively new joint Montefiore/Einstein Infectious Disease Fellowship training program. Upon completing his fellowship, he joined the Division of Infectious Diseases at the Albert Einstein College of Medicine. Starting in 1973, the US Navy deployed him to Quantico, Virginia, where he served for 2 years as the Assistant Chief of Medicine at the Naval Hospital. After his return to civilian life, Dr. Tanowitz continued to serve in the Naval Reserve where he rose through the ranks to become a Captain, a rank that he held proudly until his retirement from the US Navy Reserve in 2008. Even after retirement from the Navy Reserve, it was not unusual for him to make a weekend trip from his apartment in Larchmont to the Armed Forces Reserve Center in Farmingdale, Long

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Island, to provide medical and administrative services for reservists. In 1975, following his service at Quantico, he returned to Einstein as an Assistant Professor of Pathology and Medicine and attending physician at both the Bronx Municipal Hospital (Jacobi Medical Center) and Montefiore Medical Center (Weiler Division). In 1980, he became an Associate Professor of Pathology and Medicine, and in 1986, a Professor of Pathology of Medicine at the Albert Einstein College of Medicine. Dr. Tanowitz also served as the Associate Director of the Parasitology Clinic and the Director of the Diagnostic Parasitology Laboratory at Jacobi Hospital.

In addition to his skills as a researcher and clinician, he was also an outstanding teacher and a frequent lecturer on pathology, parasitology, and infectious diseases at the Albert Einstein Medical School as well as a guest lecturer at numerous national and international venues. He taught in the Parasitology course at the medical school and the Microbial Pathogenesis course at the graduate school. He was also an active participant in graduate medical education, teaching medical students, residents, and fellows on medical rounds, and participated as a lecturer in numerous didactic lecture series. He served on over 30 thesis advisory committees and thesis and qualifying examination committees. Dr. Tanowitz had a commitment to training the next generation of scientists and was the director and principal investigator of a Fogarty International Training Grant aimed at training students and postdoctoral fellows from Brazil in research methods in infectious diseases and geographic medicine, as well as the Principal Investigator of a T32 Training Grant on Geographic Medicine and Emerging Infections that trained MDs and PhD in the biology of emerging infectious diseases. The success of his trainees speaks to his dedication to fostering new generations of scientists, with former post-doctoral trainees, clinical residents, fellows, Fogarty, and T32 training grant participants holding faculty positions at various universities or the Centers for Disease Control.

Dr. Tanowitz served on numerous scientific review panels and journals. He was the senior associate editor of the American Journal of Pathology, managing editor of Frontier Bioscience, and founding co-editor-in-chief of the Journal of Neuroparasitology (now called the Journal of Neuroinfectious Diseases). He was a fellow of the Infectious Disease Society of America, Royal Society of Tropical Medicine and Hygiene, and of the American College of Physicians. His service to the scientific community was widely recognized and he was an active member and Chair of several NIH review panels during his career.

The scope of Dr. Tanowitz' entire research career cannot be adequately reviewed in this obituary, and the reader is referred to volumes 75 and 76 of Advances in Parasitology (Academic Press 2011) edited by Weiss and Tanowitz for insights into his research. Dr. Tanowitz' research was focused on understanding how chronic infection with *Trypanosoma cruzi* resulted in the development of cardiomyopathy. He was a pioneer in providing insights that chronic *Trypanosoma cruzi* infection induced changes in the vascular system (resulting in a vasculopathy) as well as metabolic changes. He also demonstrated the role of adipocytes as a reservoir for latent infection and as a source of various modulators that contribute to the development of cardiomyopathy during chronic infection. He was instrumental in pioneering studies on the role of endothelin, a vasoactive peptide, in chagasic cardiomyopathy and discovered that cardiac function could be improved by the modulation of endothelin or its receptors in murine models of infection. His laboratory also discovered that *T. cruzi* produces several lipid mediators, such as thromboxane and resolvins, which have potent effects on the development of complications during chronic *T. cruzi* infection. These parasite-produced modulatory molecules are identical to those produced by the host illustrating the complex interplay between host and parasite that results in the development of a disease. A critical observation was that *T. cruzi* invades adipose tissue to avoid clearance by the immune system, in essence creating a reservoir for persistent chronic infection, with unexpected deleterious outcomes for host metabolic responses.

Professor Herbert B. Tanowitz was a rare and unusual person and spirit. His joie de vivre will continue to guide us and provide a model for the role of an engaged scholar. We will never forget his laugh, his passion, and all the ways he made us better.

An honorary lecture fund has been created by the Department of Pathology at Einstein, The Dr. Herbert B. Tanowitz Honorary Lecture Fund for Parasitology and Tropical Medicine, to support an annual lecture focusing on parasitology and tropical medicine in his honor. To donate, please visit http://www.einstein.yu.edu/donors/tanowitz-memorial-lecture-fund/.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.