

ALBERT EINSTEIN COLLEGE OF MEDICINE



TENTH ANNUAL
**MARSHALL S. HORWITZ, M.D., FACULTY PRIZE
FOR RESEARCH EXCELLENCE**

PRESENTED TO

SCOTT W. EMMONS, PH.D.

**FEBRUARY 29, 2016
4:00 P.M.**

**ROBBINS AUDITORIUM
LEO FORCHHEIMER MEDICAL SCIENCE BUILDING**



Albert Einstein College of Medicine



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PROGRAM

WELCOME

Allen M. Spiegel, M.D.

The Marilyn and Stanley M. Katz Dean

REMARKS FROM THE CHAIR OF THE SELECTION COMMITTEE

Richard N. Kitsis, M.D.

Professor, Medicine

Professor, Cell Biology

The Dr. Gerald and Myra Dorros Chair in Cardiovascular Disease

Director, Wilf Family Cardiovascular Research Institute

REMEMBERING MARSHALL S. HORWITZ, M.D.

Jonathan R. Warner, Ph.D.

Professor Emeritus, Cell Biology

INTRODUCTION OF SCOTT W. EMMONS, PH.D.

Allen M. Spiegel, M.D.

THE MARSHALL S. HORWITZ, M.D., FACULTY PRIZE LECTURE

“Adventures in Biology with a Worm”

Scott W. Emmons, Ph.D.

Professor, Genetics

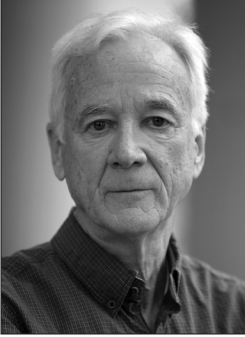
Professor, Dominick P. Purpura Department of Neuroscience

Siegfried Ullmann Chair in Molecular Genetics

PRESENTATION OF THE MARSHALL S. HORWITZ, M.D., FACULTY PRIZE FOR RESEARCH EXCELLENCE

RECEPTION

SCOTT W. EMMONS, PH.D.



SCOTT W. EMMONS, PH.D., is recognized for his groundbreaking research in the field of connectomics, the study of synaptic connectivity in the nervous system.

Throughout his career, Dr. Emmons has been fascinated by the idea that “life is written and transmitted as a code that geneticists seek to read and understand”—or, using genetic terms, “How does genotype determine phenotype?”

As a graduate student, he studied the bacteriophage lambda, a powerful early model for investigating genetic regulation. He began exploring development in higher animals as a postdoctoral fellow and decided to focus on the genetic model nematode *Caenorhabditis elegans*, now commonly known as “the worm.”

Since joining the Einstein faculty in 1979, Dr. Emmons has studied the *C. elegans* genome. He was among the first to identify *C. elegans* genes—research that led to the discovery of the Tc1 transposon, a DNA element found in all animal genomes that is currently being exploited as a possible vector for gene therapy. While on sabbatical in the mid-1980s, he began to focus on the *C. elegans* male for research on the developmental genetics and evolution of morphology. This research resulted in the identification of a number of key regulatory genes and led to his current interest in connectomics.

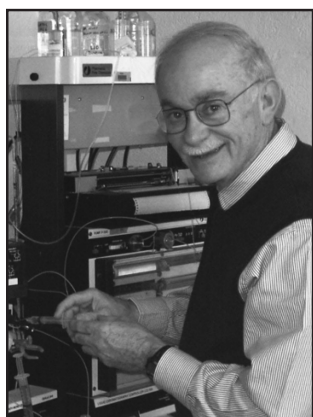
In 2012, the Emmons laboratory reported the first connectomics data of any kind since the wiring diagram of the *C. elegans* nervous system was published in 1986. That 2012 paper, which appeared in *Science*, the journal of the American Association for the Advancement of Science (AAAS), revealed the complete map of the wiring for the part of the nervous system governing mating behavior in the adult male worm, a region not covered in the prior work. The AAAS awarded the paper its prestigious Newcomb Cleveland Prize as the most outstanding research article published in *Science* that year.

How genes specify the connections in the brain is perhaps the most critical problem that remains in deciphering the genetic code. In October 2015, a study coauthored by Dr. Emmons and his team with scientists at University College London, U.K., was published in *Nature*. The study identified a pair of neurons in the brains of male worms that allow them to remember and seek sex even at the expense of food. These neurons, which are male-specific, are required for sex-based differences in learning, suggesting that sex differences in cognitive abilities can be genetically hardwired.

Insights into basic mechanisms, which often come from studies of model animals such as those provided by the Emmons laboratory, continue to shed new light on the nervous system's function and development—knowledge that is necessary for understanding and ultimately treating medical conditions such as schizophrenia, autism and Alzheimer's disease.

Among his other honors and awards, Dr. Emmons has been a recipient of the American Cancer Society's Faculty Research Award and of the American Heart Association's Harry Winston Established Fellowship for Research. The Society for Neuroscience invited him to present a Presidential Special Lecture at its annual meeting in 2013. He has served as a member of study sections of the National Institutes of Health, the National Science Foundation and the American Cancer Society, as well as of funding agencies internationally.

Dr. Emmons earned his bachelor's degree in biology and graduated magna cum laude from Harvard University; he received his Ph.D. in biochemistry from Stanford University. He then completed a postdoctoral fellowship in the department of embryology at the Carnegie Institution of Washington, in Baltimore, followed by a second fellowship in the department of molecular, cellular and developmental biology at the University of Colorado in Boulder. He has been the Siegfried Ullmann Professor of Genetics at Einstein since 1995 and was named a professor in the Dominick P. Purpura Department of Neuroscience in 2009.



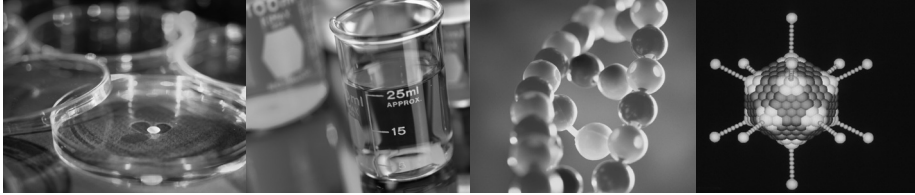
MARSHALL S. HORWITZ, M.D.
1937–2005

Dr. Marshall Horwitz was a physician-scientist who was instrumental in advancing the understanding of the biology of the adenovirus, first by describing the outer protein of the virus and then by developing a method for replicating its DNA. These findings have proven crucial in offering researchers a system for studying adenovirus biology and using it in gene therapy.

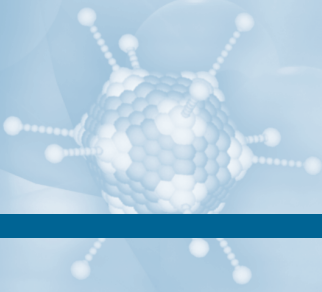
He explored how adenovirus genes help the virus evade the body's immune surveillance system and how those viral genes could be used to "turn off" the autoimmune reaction that leads to type 1 diabetes. In a paper published in 2008 in *Gene Therapy*, Einstein scientists used Dr. Horwitz' strategy (and honored him as a co-author) in transplanting insulin-producing (beta) pancreatic cells into diabetic mice; the transplanted cells normalized glucose control while causing only a minimal immune response in the recipients.

Whether in the laboratory or in a clinical setting, Dr. Horwitz led by an example that conveyed integrity, compassion and scholarship. His leadership was apparent in many facets of the medical school. He was instrumental in establishing the research program for the department of pediatrics, played a major role in Einstein's Medical Scientist Training Program, was an associate director of the Albert Einstein Cancer Center and, as chair since 1991, led the department of microbiology & immunology into the 21st century.

Through his nearly four decades of service to Einstein, his commitment to students went well beyond mentoring, and he was recognized by students and house staff with numerous awards and honors throughout the years. These included election to the Leo Davidoff Society, designation as an honorary alumnus of the College of Medicine's Alumni Association, honorary membership in Alpha Omega Alpha and receipt of the Lewis M. Fraad House Staff Teaching Award. His extraordinary kindness and warmth, generosity, gentle spirit and scientific curiosity are all part of his treasured legacy.



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