

Princeton University

HONORS FACULTY MEMBERS
RECEIVING EMERITUS STATUS



May 2021

The biographical sketches were written by staff and
colleagues in the departments of those honored.

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In the Nation's Service and the Service of Humanity

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THOMAS SHENK



Thomas “Tom” E. Shenk, the James A. Elkins Jr. Professor in the Life Sciences, is transferring to emeritus status thirty-seven years after arriving at Princeton as a founding member of the Department of Molecular Biology. Tom is a distinguished virologist noted for innovative research and leadership in his field. He also served as chair of the department.

After earning a bachelor’s of science in biology from the University of Detroit, Tom received his Ph.D. in microbiology from Rutgers University, where he began his career-long fascination with the interactions of mammalian viruses with their host cells under the mentorship of Victor Stollar. In 1973, Tom moved to Stanford University for postdoctoral work with Paul Berg. At that time, Stanford was at the forefront of the revolutionary development of recombinant DNA technology; in 1972, Berg had generated the first artificial DNA molecules by joining genomic DNA sequences from a bacterial and a monkey virus *in vitro*. In Berg’s lab, Tom harnessed the power of this new technology to introduce mutations at specific sites in the genome of the monkey virus, simian virus 40 (SV40), and initiate mapping of regions of the genome required for viral DNA synthesis and other functions. Application of the molecular methods of genetic analysis has been a hallmark of Tom’s research.

In 1975, Tom joined the Department of Microbiology at the University of Connecticut, where he expanded his research focus to include human adenovirus 5 (Ad5), and in 1980, he became a professor in the Department of Microbiology at the State University of New York at Stony Brook School of Medicine. During this period, SV40 and Ad5, viruses with double-stranded DNA genomes, were important models for investigation of mechanisms of gene expression in mammalian cells. They were also of great interest because they can transform normal cells to acquire oncogenic potential. Tom’s research made many important contributions to both of these areas, including identification of sequences in the genomes of both SV40 and Ad5 that control gene expression, insights into the viral gene products required for transformation, and the first demonstration that a small viral RNA can be necessary for successful virus reproduction. In 1982, these achievements were recognized by the Eli Lilly Award in Microbiology and Immunology, which is administered by the American Society for Microbiology (ASM).

In 1984, Tom joined the new Department of Molecular Biology at Princeton as the James A. Elkins Jr. Professor in the Life Sciences. During the next decade or so, Tom's research on Ad5 illuminated just about every step in the infectious cycle of this virus and improved understanding of mechanisms of transformation and tumorigenesis. This important body of work facilitated the later development of adenoviruses as therapeutic agents to deliver vaccine antigens or to destroy tumor cells.

Tom subsequently focused his attention on the herpesvirus human cytomegalovirus (HCMV), which is associated with serious disease in immunosuppressed patients and the elderly. Some of the many highlights of Tom's studies of HCMV include development of a new method to facilitate genetic analyses of the large genomes of herpesviruses; in collaboration with his Princeton colleague Lynn Enquist, insights into the mechanisms by which HCMV establishes latent infection in specific cells types; and in collaboration with colleagues Thomas Silhavy and Ileana Cristea, identification of a class of human proteins that mount defenses against infection by a variety of viruses as well as bacterial pathogens. Tom's studies were characterized by the increasing application of the methods of systems biology, including the first application of methods of mass spectrometry to assess the impact of infection on host cell metabolism, in collaboration with colleague Josh Rabinowitz. This approach not only revealed the large-scale rewiring of central carbon and lipid metabolism induced by herpesvirus infection but also has been credited with reviving research in this field. Through the exploration of the molecular mechanisms that underlie efficient HCMV reproduction and the impact of infection on host cell metabolism and anti-viral defenses, Tom's research also identified several potential new targets for anti-viral drugs.

Throughout his career, Tom has maintained an enduring commitment to translational research, or the application of basic knowledge and techniques to address medical needs. He has been issued 16 patents in the U.S. and E.U. and served on the advisory boards of several pharmaceutical and biotech companies. Furthermore, he is a founder of two companies, one dedicated to the discovery of broadly acting anti-viral drugs and the second focused on development of personalized treatments for cancer.

Tom's achievements have been recognized by many honors, including appointment as a Howard Hughes Medical Institute Investigator and election to the National Academy of Sciences, the National Academy of Medicine, the American Academy of Arts and Sciences, the American Association for the Advancement of Science, and the National Academy of Inventors.

In teaching the gateway course “Introduction to Molecular Biology” for over two decades, Tom successfully introduced thousands of Princeton students to the fascinations of this discipline. Such commitment provided a clear example of the teaching expected from senior faculty. Tom was a founding member of the Program in Global Health and Health Policy, and subsequently taught an upper-level seminar course in that program. With his late colleague Adel Mahmoud, Tom also developed the popular course “Infection: Biology, Burden, Policy.” Tom was a sought-after mentor for both experimental and non-laboratory senior theses research.

From 1996 to 2004, Tom served three terms as chair of the Department of Molecular Biology, a period marked by consolidation of departmental teaching and research, as well as new initiatives. The innovative Lewis-Sigler Institute for Integrative Genomics was established in 1998 with the mandates to develop new approaches to the study and teaching of modern biology and to foster collaboration among faculty from different disciplines; Princeton University President Emerita Shirley M. Tilghman served as its first director. In the next few years, several faculty members whose research incorporated large-scale methods of data collection and analysis were recruited for joint appointments in the Institute and the department. Tom’s tenure as chair also saw the expansion of the core departmental research areas to include neuroscience with the recruitment of eminent senior members of this field (John Hopfield and David Tank), as well as of junior faculty, a move that laid the foundation for the subsequent establishment of the Princeton Neuroscience Institute in 2004.

Fundamental research in virology has been enriched by not only Tom’s research program, but also by his unstinted sharing of virus mutants and other reagents, as well the substantial number of his trainees who have become successful investigators in the field. Tom has also provided sterling leadership to the virology community and the field of microbiology in general. He served as the president of the ASM from 2003 to 2004 and editor in chief of the *Journal of Virology* from 1994 to 2002. During his tenure as chair of the ASM Publication Board, he oversaw the launch of two new, highly successful ASM journals. He also served as president of the American Society for Virology from 1997 to 1998 and as a member of the National Science Advisory Board for Biosecurity from 2005 to 2008.

Everyone in the field, his colleagues at Princeton, and his many former students and postdoctoral fellows wish him the best of retirements.