43rd Annual Presentation Ceremony

THURSDAY / APRIL 10, 2014

Award for Distinguished Work in Basic Medical Science

Lewis S. Rosenstiel

BRANDEIS UNIVERSITY
In 1971, the Lewis S. Rosenstiel Award for Distinguished Work in Basic Medical Science was established as an expression of the belief that educational institutions have an important role to play in the encouragement and development of basic science as it applies to medicine.

Since its inception, Brandeis University has placed great emphasis on basic science and its relationship to medicine. With the establishment of the Rosenstiel Basic Medical Sciences Research Center, made possible by the generosity of Lewis S. Rosenstiel in 1968, research in basic medical science at Brandeis has been expanded significantly. The Rosenstiel award provides a way to extend the center’s support beyond the campus community.
The award is presented annually at Brandeis based on recommendations from a panel of outstanding scientists selected by the Rosenstiel Basic Medical Sciences Research Center. Medals are given to scientists for recent discoveries of particular originality and importance to basic medical science research. A $30,000 prize (to be shared in the event of multiple winners) accompanies the award.

The winners of the 2014 Lewis S. Rosenstiel Award for Distinguished Work in Basic Medical Science are Winfried Denk, director of the Department of Biomedical Optics at the Max Planck Institute for Medical Research and professor of physics at the University of Heidelberg; David Tank, Henry L. Hillman Professor in Molecular Biology and co-director of the Princeton Neuroscience Institute at Princeton University; and Watt Webb, Samuel B. Eckert Professor of Materials Science and Engineering Emeritus at Cornell University.

They were chosen for their invention of multiphoton fluorescence microscopy and its application to illuminating the function of brain microcircuits.
Presentation Ceremony

PRESIDING

James E. Haber
Abraham and Etta Goodman Professor of Biology
Director, Rosenstiel Basic Medical Sciences Research Center
Brandeis University

WELCOME REMARKS

Steve A.N. Goldstein
Provost, Chief Academic Officer and Professor of Biochemistry
Brandeis University

ADDRESS

Richard Axel
University Professor and Investigator, Howard Hughes Medical Institute
College of Physicians and Surgeons of Columbia University
2004 NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE
PRESENTATION OF MEDALLIONS AND AWARDS

James E. Haber

RESPONSE

Winfried Denk
Director, Department of Biomedical Optics
Max Planck Institute for Medical Research
Professor of Physics
University of Heidelberg

David Tank
Henry L. Hillman Professor in Molecular Biology
Co-Director, Princeton Neuroscience Institute
Princeton University

Watt Webb
Samuel B. Eckert Professor of Materials Science and Engineering Emeritus
Cornell University
Winfried Denk

Winfried Denk holds a PhD in physics from Cornell University and has been the director of the Department of Biomedical Optics at the Max Planck Institute for Medical Research since 2000. Before that, he spent nine years at Bell Laboratories in Murray Hill, N.J., after a brief postdoc at the IBM Research Laboratory in Rüschlikon, Switzerland. He has worked on multidimensional NMR spectroscopy, near-field optical microscopy, auditory hair cells, two-photon microscopy, retina and, most recently, 3D EM imaging for the reconstruction of neural circuits.

David Tank

David Tank is the Henry L. Hillman Professor in Molecular Biology at Princeton University and co-director of the Princeton Neuroscience Institute. He also directs the Bezos Center for Neural Circuit Dynamics.

Tank earned a BS in physics and mathematics at Case Western Reserve University in 1976 and a PhD in physics from Cornell University in 1983. From 1983 to 2001, he was a research scientist at Bell Laboratories in Murray Hill, N.J., becoming a Bell Laboratories Fellow in 1999. From 1991 to 2001, he served as department head of the Biological Computation Research Department. In 2001, he moved to Princeton University, becoming a founding co-director of the Princeton Neuroscience Institute in 2005.
Tank’s research interests include the measurement, analysis and modeling of neural circuit dynamics. At Bell Laboratories, he contributed to the development of attractor network models of neural decision-making, the development of functional MRI imaging and the development of cellular resolution optical imaging of neural dynamics. More recently, his work has focused on the mechanisms of persistent neural activity and the development and application of rodent virtual reality systems combined with optical imaging and electrophysiology to study neural circuit dynamics during navigation.

Tank has received several awards and honors for his research, including election to the National Academy of Sciences and the American Academy of Arts and Sciences. He is a fellow of the American Physical Society (APS) and a recipient of the W. Alden Spencer Award from Columbia University and the Lawrence C. Katz Memorial Prize from Duke University.

**Watt Webb**

Watt Webb is a professor emeritus of applied physics and the Samuel B. Eckert Professor of Materials Science and Engineering Emeritus at Cornell University. He joined the Cornell faculty in 1961 as associate professor of engineering physics and was named Samuel B. Eckert Professor of Materials Science and Engineering in 1998. He served as the director of Cornell’s School of Applied and Engineering Physics from 1983 to 1988.
He began his career at Union Carbide Research Laboratories as a research engineer in 1947. He received a PhD in 1955 and continued at Union Carbide, rising to assistant director of research. As a Cornell faculty member, he supervised more than 75 PhD theses, published more than 360 papers and acquired 22 U.S. patents.

Watt sees his research interests as the solution of seemingly impossible experimental problems by the creation of new experimental technologies. For 30 years, he focused primarily on observing the dynamics of the biomolecular processes of life, developing noninvasive methods that push the physical limits of resolution in space, time and sensitivity.

Webb pioneered the techniques of fluorescence correlation spectroscopy (FCS) in 1972 and multiphoton microscopy (MPM) in 1990. FCS enables single-molecule detection in solutions at nanomolar concentrations and provides temporal resolution of the dynamic processes of individual molecules signaled by their fluorescence. FCS reveals molecular mobility, conformational fluctuations and chemical reactions in solutions and allows the detection of extremely sparse molecules and particles. MPM provides for high resolution, detailed imaging in living cells and deep in turbid tissues with low photodamage and scattering and autofluorescence image degradation.

Webb’s laboratory and collaborators at Cornell University continue to extend the frontiers of these technolo-
gies to imaging molecular processes within the cellular nucleus for gene expression in vivo. Development of technology for introduction of MPM into medical endoscopy for in-vivo in-situ real-time diagnostics continues under Professor Chris Xu.

Webb’s many awards include the National Lecture-ship of the Biophysical Society (2002), the Rank Prize in Optoelectronics (2000), the Jablonski Prize of the Biophysical Society (2000), the Michelson-Morley Award (1999), the Ernst Abbe Lecture Award from the Royal Microscopical Society (U.K.) and Carl Zeiss Inc. (Germany) in 1997, and the Biological Physics Prize of the American Physical Society (1991). He was the Leonardo Lecturer for the Universita Vita-Salute San Raffaele in Milano, Italy, in 2006, the Rohm and Haas Lecturer in 2005 and the MIT Lord Lecturer in 2004. He is a Fellow of the American Physical Society, the Biophysical Society, the American Association for the Advancement of Science, the National Academy of Engineering, the National Academy of Sciences and the American Academy of Arts and Science. He is a Founding Fellow of the American Institute of Biological and Medical Engineers.
Richard Axel

Richard Axel is a university professor and investigator at the Howard Hughes Medical Institute, College of Physicians and Surgeons at Columbia University. Axel earned an AB from Columbia College and an MD from Johns Hopkins Medical School. In earlier studies, Axel and his colleagues, Michael Wigler and Saul Silverstein, developed gene transfer techniques that permit the introduction of virtually any gene into any cell. These studies not only allowed for a novel approach to isolate genes but also provided a detailed analysis of how they worked. At the same time, these experiments allowed for the production of an increasingly large number of clinically important proteins. These studies also led to the isolation and functional analysis of a gene for the lymphocyte surface protein, CD4, the cellular receptor for the AIDS virus, HIV.

Axel then began to apply molecular biology to problems in neuroscience with the expectation that genetics could interface with neuroscience to approach the tenuous relationship between genes, behavior and perception. His studies on the logic of the sense of smell revealed more than a thousand genes involved in the recognition of odors and provided insight into how genes shape our perception of the sensory environment. Axel’s current work centers on how the recognition of odors is translated into an internal representation of sensory quality in the brain and how this representation leads to meaningful thoughts and behavior.
Recent Recipients of the Lewis S. Rosenstiel Award for Distinguished Work in Basic Medical Science

2013: For his role in explaining how eukaryotic cells sense and respond to DNA damage.

Stephen J. Elledge
Howard Hughes Medical Institute Investigator
Professor of Genetics
Harvard Medical School
Boston, Massachusetts

2012: For his discoveries of the mechanisms by which translational control regulates gene expression and plays roles in cancer, development, memory, innate immunity and virus infections.

Nahum Sonenberg
Professor
Department of Biochemistry
McGill University
Montreal, Quebec
2011: For their pioneering work in molecular connections among histones, histone modifications and chromatin structure and their effects on the regulation of gene transcription.

C. David Allis
Tri-Institutional Professor
Joy and Jack Fishman Professor
Laboratory of Chromatin Biology and Epigenetics
The Rockefeller University
New York, N.Y.

Michael Grunstein
Distinguished Professor, Biological Chemistry
Department of Biological Chemistry
University of California, Los Angeles
Los Angeles, Calif.

2010: For their pioneering work in the field of innate immunity.

Ruslan Medzhitov
David W. Wallace Professor of Immunobiology
Howard Hughes Medical Institute
Yale School of Medicine
New Haven, Conn.

Jules Hoffmann
Professor and Distinguished Class Research Director, Institute of Molecular and Cellular Biology, CNRS
University Louis Pasteur
Strasbourg, France

2009: For their pioneering work in the field of stem cell research.

John Gurdon
Professor, Department of Zoology
Gurdon Institute
University of Cambridge
Cambridge, England
Irving Weissman  
Professor of Pathology and Developmental Biology  
Director, Stem Cell Biology and Regenerative Medicine Institute  
Stanford School of Medicine  
Stanford, Calif.

Shinya Yamanaka  
Professor, Kyoto University, Japan  
Senior Investigator, Gladstone Institute of Cardiovascular Disease  
L.K. Whittier Foundation Investigator in Stem Cell Biology  
Professor of Anatomy  
University of California, San Francisco

2012 NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE

2008: For their elucidation of the molecular machinery that guides proteins into their proper functional shape, thereby preventing the accumulation of protein aggregates that underlie many diseases, such as Alzheimer’s and Parkinson’s.

F. Ulrich Hartl  
Director, Max Planck Institute of Biochemistry  
Martinsried, Germany

Arthur L. Horwich  
Investigator, Howard Hughes Medical Institute  
Yale School of Medicine  
New Haven, Conn.

2007: For their pioneering work in understanding the mechanisms of gene silencing by epigenetic chromosome modifications.

Mary F. Lyon  
Mammalian Genetics Unit  
MRC Harwell  
Oxfordshire, England

Davor Solter  
Max Planck Institute of Immunobiology  
Freiburg, Germany
Azim Surani
Gurdon Institute
University of Cambridge
Cambridge, England

2006: For their pioneering development of powerful new tools that allow the direct visualization of molecules in living cells.

Martin Chalfie
William R. Kenan Jr. Professor of Biological Sciences
Columbia University
New York, N.Y.

2008 Nobel Prize in Chemistry

Roger Y. Tsien
Investigator, Howard Hughes Medical Institute
Professor of Pharmacology and Chemistry & Biochemistry
University of California, San Diego
La Jolla, Calif.

2008 Nobel Prize in Chemistry

A complete list of awardees may be viewed at www.rose.brandeis.edu/Center/rose_past.html.