

# JACOB H GABBAY IN BIOTECHNOLOGY AND MEDICINE

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Brandeis University

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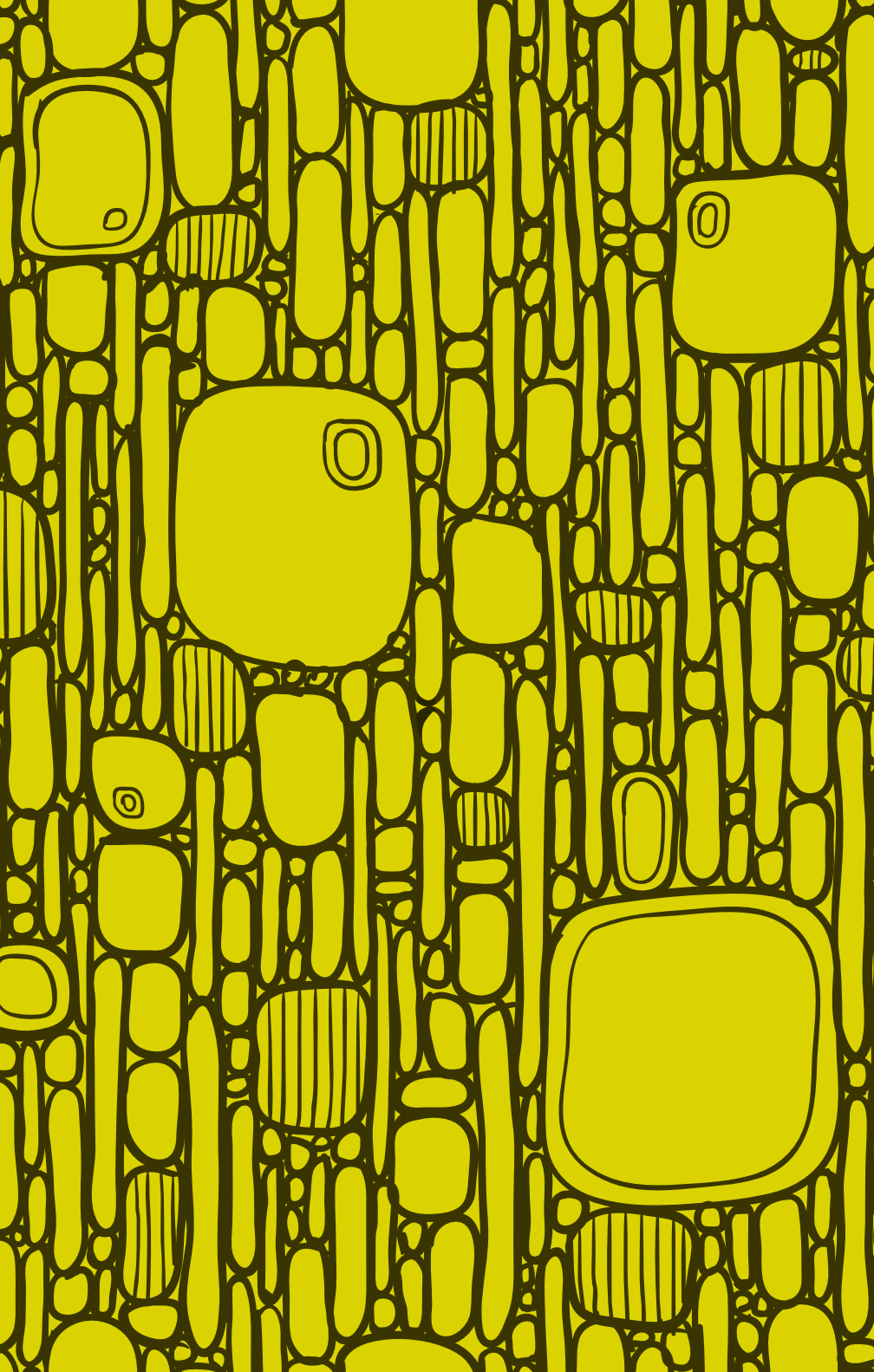
ESKEL  
AWARD  
JACOB HESKEL  
GABBAY AWARD  
IN BIOTECHNOLOGY  
AND MEDICINE



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PRESENTATION CEREMONY  
OCTOBER 10, 2013  
WALTHAM, MASS.  
BRANDEIS UNIVERSITY

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*Early in 1998, the trustees of the Jacob and Louise Gabbay Foundation decided to establish a major new award in basic and applied biomedical sciences. The foundation felt that existing scientific awards tended to honor people who were already well-recognized or to focus on work that had its primary impact in traditional basic research fields. Yet the history of science suggests that most scientific revolutions are sparked by advances in practical areas such as instrumentation and techniques or through entrepreneurial endeavors. The foundation therefore created the Jacob Heskell Gabbay Award in Biotechnology and Medicine to recognize, as early as possible in their careers, scientists in academia, medicine or industry whose work had both outstanding scientific content and significant practical consequences in the biomedical sciences. Because of their long association with Brandeis University, the trustees of the foundation asked the Rosenstiel Basic Medical Sciences Research Center at Brandeis to administer the award.*

*The award, given annually, consists of a \$15,000 cash prize (to be shared in the case of multiple winners) and a medallion. The honorees travel to Brandeis University each fall to present lectures on their work and attend a dinner at which the formal commendation takes place. This year, a committee of distinguished scientists selected Edward S. Boyden of the Massachusetts Institute of Technology, Karl Deisseroth of Stanford University and Gero Miesenböck of the University of Oxford for their contributions to the discovery and applications of a method called optogenetics. Optogenetics is a technology that allows scientists to control the brain's activity by genetically engineering neurons to fire in response to light. Hundreds of labs have started using the technique to manipulate brain activity in experimental animals, exploring the neurobiology of underlying behaviors — such as decision-making*

*— and neurodegenerative diseases. The technique is expected to have a significant impact on the BRAIN Initiative that President Obama announced in April.*

*The Jacob and Louise Gabbay Foundation was founded by its namesakes in 1969. The late Jacob Gabbay, a physician, moved his family from Baghdad to the United States in 1952, maintaining a medical practice in New York City until 1982. The foundation, originally intended to help students of Iraqi descent pursue higher education in Israel, has subsequently funded computer education for Israeli high schoolers and various medical projects. Louise Gabbay established the Gabbay Award, the foundation's first American endeavor, in honor of her husband, who passed away in 1995.*

# PRESENTATION CEREMONY



## PRESIDING

### **Dagmar Ringe**

Professor of Biochemistry, Chemistry and  
Rosenstiel Basic Medical Sciences Research Center

## WELCOME

### **Steve A.N. Goldstein '78, MA'78, MD, PhD, FAAP**

Provost and Chief Academic Officer

## ADDRESS

### **Eve Marder**

Head, Division of Science  
Victor and Gwendolyn Beinfeld Professor  
of Neuroscience

**PRESENTATION OF MEDALLIONS AND AWARDS**

**Dagmar Ringe**

**RESPONSE**

**Karl Deisseroth**

**Edward Boyden**

**Gero Miesenböck**



# 2013 WINNER



## *Karl Deisseroth*

Karl Deisseroth is the D.H. Chen Professor of Bioengineering and Psychiatry at Stanford University. He earned an A.B. from Harvard and an M.D./Ph.D. from Stanford.

Deisseroth serves as director of undergraduate education in bioengineering at Stanford and is a practicing psychiatrist board-certified by the American Board of Psychiatry and Neurology. He has developed and applied novel technologies for controlling (optogenetics) and imaging (CLARITY) specific elements within intact biological systems, and he continues to develop and apply new technologies to study physiology and behavior in health and disease as well as train researchers around the world.

He has received the National Institutes of Health's Pioneer Award (2005), the Schuetze Prize (2008), the Society for Neuroscience's Young Investigator Award (2009), the Koetser Prize (2010), the Nakasone Award (2010), the Spencer Award (2011), the Perl/UNC Prize (2012), the Zuelch Prize (2012), the Pasarow Award (2013), the Brain Prize (2013) and the Lounsbery Award (2013). Deisseroth is a member of the Institute of Medicine and the National Academy of Sciences.

# 2013 WINNER

## *Edward Boyden*

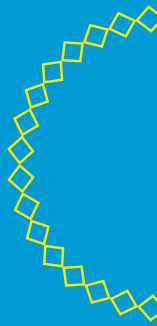
Edward Boyden is associate professor of biological engineering and brain and cognitive sciences at the MIT Media Lab and the MIT McGovern Institute. He leads the Synthetic Neurobiology Group, which develops tools for analyzing and engineering the circuits of the brain.

In 2000, Boyden and Karl Deisseroth began to discuss using opsins to manipulate neural activity, and in early 2004, they established a collaboration with Georg Nagel and Ernst Bamberg that led to a successful demonstration of opsin-mediated neural activation using the light-gated cation channel channel-rhodopsin-2 (ChR2). Boyden's group has introduced novel optogenetic tool classes into neuroscience, including halorhodopsins (2007) and bacteriorhodopsins (2010) for optical neural silencing. They have optimized these opsins for novel neuroscientific appli-

cations and developed complementary technologies, such as scalable integrative cell analysis and neural recording technologies, often through interdisciplinary collaborations.

Boyden has received the Brain Prize, the Society for Neuroscience's Research Award for Innovation in Neuroscience, the Perl/UNC Prize, the A.F. Harvey Prize, the Paul Allen Distinguished Investigator Award and the National Institutes of Health's Director's New Innovator Award, and his work was featured by the journal *Nature Methods* as 2010 "Method of the Year," among other recognitions. He has contributed to more than 300 peer-reviewed papers, articles and current or pending patents, and he has given more than 200 invited talks on his work.

# 2013 WINNER



## *Gero Miesenböck*

Gero Miesenböck is the Waynflete Professor of Physiology and director of the Centre for Neural Circuits and Behaviour at the University of Oxford. A native of Austria, he received an MD from the University of Innsbruck in 1993 and was a postdoctoral fellow at Memorial Sloan-Kettering Cancer Center until 1998. Before coming to Oxford in 2007, he held faculty appointments at Memorial Sloan-Kettering Cancer Center and Yale University.

# GUEST SPEAKER

## *Eve Marder*

Eve Marder earned a PhD at the University of California, San Diego, and did postdoctoral work at Paris' École Normale Supérieure. She is head of the science division and the Beinfeld Professor of Neuroscience at Brandeis and past-president of the Society for Neuroscience. She is a member of the National Academy of Sciences and the American Academy of Arts & Sciences. She received the Salpeter Award from Women in Neuroscience, the Gerard Prize from the Society for Neuroscience, the George A. Miller Award from the Cognitive Neuroscience Society, the Karl Spencer Lashley Award from the American Philosophical Society, an honorary doctorate from Bowdoin College, and the 2013 Gruber Prize in Neuroscience. She serves on the Director's BRAIN Working Group of the NIH.

Marder studies the dynamics of small neural circuits and was instrumental in demonstrating that neuronal circuits are not "hardwired" but can be reconfigured by neuromodulatory neurons and substances. Her lab pioneered studies of homeostatic regulation of intrinsic membrane properties, and stimulated work on the mechanisms by which brains remain stable while allowing for change during development and learning. Marder now studies how similar network performances can arise from different sets of underlying network parameters, opening up rigorous studies of the variations in individual brains of normal healthy animals.



# PREVIOUS WINNERS OF THE JACOB HESKEL GABBAY AWARD IN BIOTECHNOLOGY AND MEDICINE

1999

*for their entrepreneurial roles in the creation of  
some of the most successful biotechnology firms*

**David V. Goeddel**

Chief Executive Officer  
Tularik Inc.  
San Francisco, Calif.

**Thomas P. Maniatis**

Thomas H. Lee Professor of Molecular and  
Cellular Biology  
Harvard University  
Cambridge, Mass.

**William J. Rutter**

Chairman Emeritus  
Chiron Corporation  
Emeryville, Calif.

2000

*for his leadership in genome sequencing*

**J. Craig Venter**

Founder and Chief Scientific Officer  
Celera Genomics Corporation  
Rockville, Md.

## 2001

*for his pioneering achievements in miniaturization of fundamental biochemical experiments*

### **J. Michael Ramsey**

Chemical and Analytical Sciences Division  
Oak Ridge National Laboratory  
Oak Ridge, Tenn.

## 2002

*Dr. Rastetter for his pioneering contributions in the development of antibody-based drugs; Dr. Slamon for his role in the development of the HER-2 immunotherapy against certain types of breast cancer, a pioneering contribution to medicine; and Dr. Winter for his pioneering role in the development of humanized monoclonal antibodies, and for the founding of the company Cambridge Antibody Technology (CAT) in the United Kingdom*

### **William H. Rastetter, PhD**

Chairman, and Chief Executive Officer  
IDEC Pharmaceuticals Corp.  
San Diego, Calif.

### **Dennis J. Slamon, MD, PhD**

Executive. Vice Chair for Research and  
Professor of Medicine  
UCLA School of Medicine  
Los Angeles, Calif.

### **Gregory P. Winter, CBE, FRS**

Joint Head of Division of Protein & Nucleic  
Acid Chemistry  
MRC Laboratory of Molecular Biology  
Cambridge, England



## 2003

*for their development of yeast two-hybrid and yeast mating interaction traps*

### **Roger Brent**

President and Research Director  
The Molecular Sciences Institute  
Berkeley, Calif.

### **Stanley Fields**

Howard Hughes Medical Institute  
Department of Genome Sciences and Medicine  
University of Washington  
Seattle, Wash.

## 2004

*for his many contributions to the biotechnology industry*

### **George M. Whitesides**

Woodford L. and Ann A. Flowers  
University Professor  
Harvard University  
Cambridge, Mass.

## 2005

*for their roles in the development and use of molecular beacons as a diagnostic tool in vivo, and in the detection of RNA in living cells*

### **Fred R. Kramer**

Professor of Microbiology and Molecular Genetics  
New Jersey Medical School; and Member,  
Public Health Research Institute  
Newark, N.J.

### **Sanjay Tyagi**

Professor, Department of Medicine,  
New Jersey Medical School; and Member,  
Public Health Research Institute  
Newark, N.J.

## 2006

*for their role in the development of contrast agents used in cardiodiagnostic procedures*

### **Dr. Alan Davison**

Professor Emeritus of Chemistry  
Massachusetts Institute of Technology  
Cambridge, Mass.

### **Dr. Alun Gareth Jones**

Professor of Radiology  
Harvard Medical School &  
Brigham and Women's Hospital  
Boston, Mass.

## 2007

*for pioneering the technology of gene targeting in mouse embryo-derived stem (ES) cells that allows scientists to create mice with mutations in any desired gene by choosing which gene to mutate and how to mutate it*

### **Dr. Mario Capecchi**

Howard Hughes Medical Institute  
Professor of Human Genetics  
University of Utah, School of Medicine  
Salt Lake City, Utah

## 2008

*for his seminal basic-science discoveries, including regulated protein turnover in bacteria and mitochondria and, most importantly, the development of proteasome inhibitors as a treatment for cancer*

### **Dr. Alfred Goldberg**

Professor of Cell Biology  
Harvard Medical School  
Boston, Mass.

## 2009

*for their significant contributions in the field of  
assisted human reproduction*

### **Dr. Alan H. Handyside**

Visiting Professor  
University of Leeds, and  
Director of the London Bridge Fertility,  
Gynaecology and Genetics Centre  
London, England

### **Dr. Ann A. Kiessling**

Associate Professor  
Harvard Medical School, and  
Director of the Bedford Stem Cell  
Research Foundation  
Bedford, Mass.

### **Dr. Gianpiero D. Palermo**

Professor  
New York Presbyterian Hospital,  
Weill Medical College of Cornell University, and  
Director of Assisted Fertilization and  
Andrology at the Center for  
Reproductive Medicine and Infertility  
New York, N.Y.

## 2010

*for her work on aromatase inhibitors for  
breast cancer*

### **Dr. Angela Hartley Brodie**

Professor of Pharmacology  
University of Maryland  
Marlene and Stewart  
Greenebaum Cancer Center  
Baltimore, Md.

## 2011

*for his work on the immune responses by T cells,  
a type of lymphocyte*

### **James P. Allison**

Howard Hughes Medical Institute Investigator  
and Chair of the Immunology Program  
Memorial Sloan-Kettering Cancer Center  
New York, N.Y.

## 2012

*for their work in identifying the negative cellular  
effects of bisphenol in plastics, and for alerting the  
commercial sector in order to prevent its further use*

### **Patricia Hunt**

Professor, School of Molecular Biosciences  
Washington State University  
Pullman Wash.

### **Ana M. Soto**

Professor, Department of Anatomy and  
Cellular Biology  
Tufts University School of Medicine  
Boston, Mass.

### **Carlos Sonnenschein**

Professor, Department of Anatomy  
and Cellular Biology  
Tufts University School of Medicine  
Boston, Mass.