




## NIH Director's Pioneer Award

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## NIH Director's Pioneer Award

### 2005 PIONEER AWARD RECIPIENTS

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**Vicki L. Chandler, Ph.D.**

University of Arizona  
Tucson, AZ

Vicki L. Chandler, Ph.D., is Regents' Professor of Plant Sciences and Molecular and Cellular Biology at the University of Arizona in Tucson. She also directs the university's interdisciplinary biomedical research institute, BIO5. Chandler received a Ph.D. in biochemistry in 1983 from the University of California, San Francisco. She has done groundbreaking research on the control of gene expression in plants, making important contributions to explain why particular DNA sequences become silent or active depending on their position within a genome. She plans to use her Pioneer Award to search for similar mechanisms in humans, as these mechanisms could be associated with certain human diseases. A member of the National Academy of Sciences, Chandler's other honors include a Presidential Young Investigator Award and a Searle Scholarship.



**Hollis T. Cline, Ph.D.**

Cold Spring Harbor Laboratory  
Cold Spring Harbor, NY

Hollis T. Cline, Ph.D., is a professor and director of research at Cold Spring Harbor Laboratory in Cold Spring Harbor, NY. She received a Ph.D. in neurobiology from the University of California, Berkeley, in 1985. Using time-lapse imaging, electrophysiology, and molecular genetic techniques, Cline developed an experimental system to assess cellular and molecular mechanisms underlying plasticity in response to visual stimulation in living animals. She plans to use her Pioneer Award to launch a large-scale project to understand the architecture, development, and plasticity of brain circuits. Cline sits on the Board of Scientific Counselors of the National Institute of Neurological Disorders and Stroke and is a Council member of the Society for Neuroscience.



**Leda Cosmides, Ph.D.**

University of California  
Santa Barbara, CA

Leda Cosmides, Ph.D., is professor of psychology and co-director of the Center for Evolutionary Psychology at the University of California, Santa Barbara. She received her doctorate in psychology from Harvard University in 1985. Cosmides and her lifelong collaborator, John Tooby, Ph.D., are best known for their role in co-founding the field of evolutionary psychology, introduced in the landmark book, *The Adapted Mind*. This new approach weaves together evolutionary biology,

cognitive science, human evolution, anthropology, neuroscience, and psychology to discover previously unknown mechanisms of the human mind and brain. Cosmides and Tooby co-developed the ideas that formed the basis of the Pioneer Award proposal and will use the award to develop evolutionary and computational approaches to the study of motivation and developmental neuroscience. Cosmides' awards include the American Association for the Advancement of Science Prize for Behavioral Science Research for her research on evolution and reasoning as well as the American Psychological Association's Early Career Contribution Award.



**Titia de Lange, Ph.D.**

The Rockefeller University  
New York, NY

Titia de Lange, Ph.D., is the Leon Hess professor and head of the Laboratory of Cell Biology and Genetics at The Rockefeller University in New York City. She received a Ph.D. in biochemistry from the Dutch Cancer Institute, University of Amsterdam, in 1985. She is a leader in the study of telomeres, the specialized protein-DNA complexes that cap the ends of chromosomes and that have been implicated in cancer and cellular aging. She plans to use her Pioneer Award to develop a new system for studying the biological response to DNA damage. A member of the Dutch Royal Academy of Sciences, de Lange is the recipient of numerous awards, including an inaugural Paul Marks Prize for Cancer Research from the Memorial Sloan-Kettering Cancer Center.



**Karl Deisseroth, M.D., Ph.D.**

Stanford University  
Stanford, CA

Karl Deisseroth, M.D., Ph.D., is an assistant professor in the Department of Bioengineering and the Department of Psychiatry at Stanford University in Stanford, CA. He received a Ph.D. in neuroscience in 1998 and an M.D. in 2000, both from Stanford. Deisseroth combines bioengineering and psychiatry in studying intact neural circuits in the mammalian brain. He plans to use his Pioneer Award to launch a large-scale, systematic effort to map key neural circuit dynamics on the millisecond timescale. This will enable him to test the hypothesis that impairments in high-speed circuit dynamics are the source of severe psychiatric symptoms like anxiety and hopelessness. Deisseroth's honors include the Coulter Foundation Early Career Translational Research Award in Biomedical Engineering, the McKnight Foundation Technological Innovations in Neuroscience Award, and the American Psychiatric Institute for Research and Education Young Faculty Award.



**Pehr A.B. Harbury, Ph.D.**

Stanford University School of Medicine  
Stanford, CA

Pehr A.B. Harbury is an associate professor in the Department of Biochemistry at Stanford University School of Medicine in Stanford, CA. He received a Ph.D. in biological chemistry from Harvard University in 1994. Harbury is a chemist whose research focuses on protein structure, folding, and design. He plans to use his Pioneer Award to develop an approach called DNA Display as a means of engineering drugs significantly more quickly and cheaply than is currently possible. His

honors include a 2005 MacArthur Foundation Fellowship, a Burroughs Wellcome Young Investigator Award in the Pharmacological Sciences, and selection by *Technology Review* magazine as one of the top 100 young innovators with the greatest potential to have an impact on technology in the 21st century.



**Erich D. Jarvis, Ph.D.**

Duke University Medical Center  
Durham, NC

Erich D. Jarvis, Ph.D., is an associate professor in the Department of Neurobiology at Duke University Medical Center in Durham, NC. He received a Ph.D. in molecular neurobiology and animal behavior from The Rockefeller University in 1995. Jarvis combines molecular, behavioral, electrophysiological, and computational tools to decipher vocal learning, using songbirds as a model system. He plans to use his Pioneer Award to test a hypothesis about the genetic machinery underlying vocal learning that could pave the way for repairing vocalization disorders in humans. During his undergraduate training at Hunter College and his graduate education, Jarvis received support from two programs of the National Institute of General Medical Sciences: the Minority Biomedical Research Support program and the Minority Access to Research Careers program. In 2002, he received the Alan T. Waterman Award, the National Science Foundation's highest honor for a young researcher. Jarvis is the subject of a profile on the television program "NOVA scienceNOW" that is scheduled to air on October 18, 2005.



**Thomas A. Rando, M.D., Ph.D.**

Stanford University School of Medicine  
Stanford, CA

Thomas A. Rando, M.D., Ph.D., is an associate professor in the Department of Neurology and Neurological Sciences at Stanford University School of Medicine in Stanford, CA. He is also director of the Geriatric Research, Education, and Clinical Center at the Veterans Affairs Medical Center in Palo Alto, CA. Rando received both an M.D. and a Ph.D. in cell biology from Harvard University in 1987. His research draws on the fields of stem cell biology, the biology of aging, and bioengineering to understand the molecular basis for the age-related decline in the body's ability to repair its tissues. He plans to use his Pioneer Award to apply knowledge of adult stem cell biology to enhance tissue repair and regeneration due to aging, injury, or disease. An elected member of the American Neurological Association, Rando has also received the Ellison Medical Foundation Senior Scholar Award in Aging.



**Derek J. Smith, Ph.D.**

University of Cambridge  
Cambridge, England  
Erasmus Medical Center  
Rotterdam, The Netherlands

Derek J. Smith, Ph.D., is a research associate in the Department of Zoology at the University of Cambridge in Cambridge, England, and a research scientist in the Department of Virology at Erasmus Medical Center in Rotterdam, The Netherlands. He was a graduate fellow at the

Santa Fe Institute and received a Ph.D. in computer science from the University of New Mexico in 1997. Smith is using a new mathematical method called antigenic cartography to study the phenotypic evolution of influenza viruses and other rapidly evolving pathogens. This work has direct application to basic questions in evolution as well as immediate application in, for example, the selection of viral strains for use in vaccines. Smith plans to use his Pioneer Award to further understand pathogen evolution and to use this understanding to significantly advance our options to control rapidly evolving pathogens. He is a member of the World Health Organization committee that chooses the composition of the influenza vaccine.



**Giulio Tononi, M.D., Ph.D.**

University of Wisconsin-Madison Medical School  
Madison, WI

Giulio Tononi, M.D., Ph.D., is a professor in the Department of Psychiatry at the University of Wisconsin-Madison Medical School. He received an M.D. in 1985 and a Ph.D. in neuroscience in 1989 from the University of Pisa, Italy. Tononi studies consciousness and its disorders as well as the mechanisms and functions of sleep. He plans to use his Pioneer Award to test the hypothesis that sleep is needed for a process called synaptic homeostasis. According to the hypothesis, learning during wakefulness increases the strength of brain synapses, and sleep returns their strength to a baseline level that is energetically sustainable. The results of this research have clear implications for the prevention and treatment of sleep disorders.



**Clare M. Waterman-Storer, Ph.D.**

The Scripps Research Institute  
La Jolla, CA

Clare M. Waterman-Storer, Ph.D., is an associate professor in the Department of Cell Biology at The Scripps Research Institute in La Jolla, CA. She is also a faculty member in the Physiology Course at the Marine Biological Laboratory in Woods Hole, MA. Waterman-Storer received a Ph.D. in cell biology from the University of Pennsylvania in 1995. She has developed fluorescence imaging techniques and analytical methods to study dynamic processes in living cells. She plans to use her Pioneer Award to apply these tools to correlate the interactions of multiple cellular components with biophysical outputs involved in cellular movement. Waterman-Storer is an associate editor of the journals *Molecular Biology of the Cell* and *Journal of Microscopy*. She was the 2002 recipient of the Women in Cell Biology Career Recognition Award from the American Society for Cell Biology.



**Nathan D. Wolfe, D.Sc.**

Johns Hopkins University  
Bloomberg School of Public Health  
Baltimore, MD

Nathan D. Wolfe, D.Sc., is an assistant professor in the Department of Epidemiology and the Department of Molecular Microbiology and Immunology at the Johns Hopkins University Bloomberg School of Public Health in Baltimore, MD. He received his doctorate in immunology and infectious diseases from Harvard University in 1998. Wolfe combines methods from molecular virology, ecology, evolutionary

biology, and anthropology to study the biology of viral emergence. He plans to use his Pioneer Award to work in regions of high biodiversity with subsistence hunters, who will collaborate in the establishment of a sentinel surveillance system to monitor the entry of novel viruses into the human species. Such viruses pose a significant threat to global public health. He will also utilize new technologies for detecting unknown microorganisms. The recipient of a Fulbright fellowship, Wolfe was named one of the “Brilliant 10” by *Popular Science* magazine in 2005.



**Junying Yuan, Ph.D.**

Harvard Medical School  
Boston, MA

Junying Yuan, Ph.D., is a professor of cell biology at Harvard Medical School in Boston, MA. She received a Ph.D. in neuroscience from Harvard University in 1989. Yuan is a leader in research on apoptosis, a genetically encoded cellular mechanism controlling cell death that plays a critical role in many human diseases. She plans to use the Pioneer Award to move her research in an entirely new direction—exploring the possible existence of a novel cellular mechanism that specifically detects and removes misfolded, neurotoxic proteins. If successful, this work could lead to new ways of enhancing the cell’s ability to detect and degrade such misfolded proteins, which may have important implications for the prevention and treatment of neurodegenerative diseases such as Alzheimer’s and Huntington’s. Yuan’s awards include the Wilson S. Stone Memorial Award from the University of Texas M.D. Anderson Cancer Center and the Innovator Award for Breast Cancer Research from the U.S. Department of Defense. In addition, she has served as an editor or editorial board member for a number of journals, including as a senior editor for the *Journal of Cell Biology*.

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