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Contacts:
[Ann Dieffenbach](#), NIGMS
301-496-7301

[Karen Silver](#), NIH OPASI
301-435-2435

NIH Extends Its Commitment to Transformative Research with \$138 Million for Director's Pioneer and New Innovator Awards in 2008

The National Institutes of Health announced today that it has increased its support of high-impact research with 2008 NIH Director's Pioneer and New Innovator Awards to 47 scientists, many of whom are in the early stages of their careers. The grants, estimated to be up to \$138 million over five years, enable recipients to pursue exceptionally innovative approaches that could transform biomedical and behavioral science.

"Nothing is more important to me than stimulating and sustaining deep innovation, especially for early career investigators and despite challenging budgetary times. These highly creative researchers are tackling important scientific challenges with bold ideas and inventive technologies that promise to break through barriers and radically shift our understanding," said NIH Director Elias A. Zerhouni, M.D.

While scientists at any career level can receive Pioneer Awards, only early career investigators who have not held an NIH regular research (R01) or similar NIH grant are eligible for New Innovator Awards. Both programs are key components of the NIH Roadmap for Medical Research.

Now in its fifth year, the Pioneer Award program has made 63 awards, 16 of them in 2008. The New Innovator Award program, launched in 2007, supports 61 investigators — 30 selected last year and 31 more this year.

Each Pioneer Award provides \$2.5 million in direct costs over five years. New Innovator Awards are for \$1.5 million in direct costs over the same time period.

"These programs are central elements of NIH efforts to encourage and fund especially novel investigator-initiated research, even if it might carry a greater-than-usual degree of risk of not succeeding. The awards also reflect our goal of supporting more investigators in the early stages of their careers," Zerhouni noted.

Zerhouni will announce the 2008 award recipients today at the start of the NIH Director's Pioneer Award Symposium on the NIH's Bethesda, Md., campus.

The recipients' names, institutions, and research plans are listed below.

For both programs, NIH selects the recipients through special application and evaluation processes. Distinguished outside experts identify the most highly competitive applicants. The Advisory Committee to the Director, NIH, performs the second level of review and Zerhouni makes final decisions based on the outside evaluations and programmatic considerations.

"These nontraditional application and review processes are serving as models in our efforts to enhance the NIH peer review system so that we can fund the best science, by the best scientists, while reducing the administrative burden for both applicants and reviewers," Zerhouni said.

Biographical sketches of the new Pioneer Award recipients are at <http://nihroadmap.nih.gov/pioneer/Recipients08.aspx>. The symposium agenda is at <http://nihroadmap.nih.gov/pioneer/symposium2008>. More information on the Pioneer Award, including details on the 47 scientists who received awards in the first four years of the program, is at <http://nihroadmap.nih.gov/pioneer>.

Information on the New Innovator Award is at <http://nihroadmap.nih.gov/newinnovator>. Details on the research plans of the new recipients are at <http://nihroadmap.nih.gov/newinnovator/Recipients08.asp>.

The NIH Roadmap for Medical Research, launched in 2004, is a series of initiatives designed to address fundamental knowledge gaps, develop transformative tools and technologies, and/or foster innovative approaches to complex problems. Funded through the NIH Common Fund, these programs cut across the missions of individual NIH Institutes and Centers (ICs) and are intended to accelerate the translation of research to improvements in public health. The Office of Portfolio Analysis and Strategic Initiatives (OPASI), in collaboration with all NIH ICs, oversees programs funded by the Common Fund. Additional information about the NIH Roadmap and Common Fund can be found at <http://nihroadmap.nih.gov>. Additional information about OPASI can be found at <http://opasi.nih.gov>.

The Office of the Director, the central office at NIH, is responsible for setting policy for NIH, which includes 27 Institutes and Centers. This involves planning, managing, and coordinating the programs and activities of all NIH components. The Office of the Director also includes program offices which are responsible for stimulating specific areas of research throughout NIH. Additional information is available at <http://www.nih.gov/icd/od/>.

The National Institutes of Health (NIH) — *The Nation's Medical Research Agency* — includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. It is the primary federal agency for conducting and supporting basic, clinical and translational medical research, and it investigates the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit www.nih.gov.

2008 NIH Director's Pioneer Award Recipients

- **James K. Chen, Ph.D., Stanford University** assistant professor of chemical and systems biology, who will develop and use synthetic probes to examine the regulation of embryonic development at the molecular level.
- **Ricardo Dolmetsch, Ph.D., Stanford University** assistant professor of neurobiology, who will study the development and function of neurons from children with autism.
- **James Eberwine, Ph.D., University of Pennsylvania** Elmer Bobst Professor of Pharmacology and co-director of the Penn Genome Frontiers Institute, who will use groups of RNA molecules to modify cellular properties.
- **Joshua M. Epstein, Ph.D., Brookings Institution Center on Social and Economic Dynamics** director and Santa Fe Institute external professor, who will integrate behavioral factors into models of the development and progression of infectious and chronic diseases.
- **Bruce A. Hay, Ph.D., California Institute of Technology** associate professor of biology, who will

pursue a strategy for preventing malaria in humans by introducing disease transmission-blocking genes into mosquito populations.

- **Ann Hochschild, Ph.D., Harvard Medical School** professor of microbiology and molecular genetics, who will use bacterial systems to study infectious particles called prions.
- **Charles M. Lieber, Ph.D., Harvard University** professor of chemistry, who will develop interfaces between nanoelectronic devices and cells to create new biomaterials and tools for studying the brain.
- **Barry London, M.D., Ph.D., University of Pittsburgh** professor of medicine, who will develop new techniques to image electrical activity of the heart and identify those at risk of sudden cardiac death.
- **Teri W. Odom, Ph.D., Northwestern University** associate professor of chemistry and materials science and engineering, who will create metallic nanomaterials to improve the ability to study subcellular structure in three dimensions.
- **Hongkun Park, Ph.D., Harvard University** professor of chemistry and of physics, who will develop new nano- and microelectronic tools that enable the meticulous study of the design principles of the brain.
- **Aviv Regev, Ph.D., Massachusetts Institute of Technology and Broad Institute** assistant professor of biology, who will examine how the regulatory networks that control cell function change over time in development, disease, and evolution.
- **Aravinthan D.T. Samuel, Ph.D., Harvard University** associate professor of physics, who will develop new biophysical and imaging techniques to link behavioral responses with neuronal activity.
- **Saeed Tavazoie, Ph.D., Princeton University** associate professor of molecular biology, who will explore how intracellular networks allow microbes to carry out cognitive behavior.
- **Alice Y. Ting, Ph.D., Massachusetts Institute of Technology** associate professor of chemistry, who will develop new technologies to image and study proteins in living cells.
- **Alexander van Oudenaarden, Ph.D., Massachusetts Institute of Technology** professor of physics, who will explore the role of random variables in gene expression during cellular development and specialization.

2008 NIH Director's New Innovator Award Recipients

- **Zev Bryant, Ph.D., Stanford University** assistant professor of bioengineering, who will study biological energy consumption and force generation by re-engineering the mechanical functions of molecular machines found in cells.
- **Ronald J. Buckanovich, M.D., Ph.D., University of Michigan** Comprehensive Cancer Center assistant professor of internal medicine and gynecologic oncology, who will develop a mouse model of cancer that expresses human tumor vessels and can be used to develop new treatments targeting these structures.
- **Timothy Cardozo, M.D., Ph.D., New York University School of Medicine** assistant professor of pharmacology, who will design novel molecules intended to slow or kill malaria parasites.

- **Karen L. Christman, Ph.D., University of California, San Diego**, assistant professor of bioengineering, who will develop patterned surfaces that will provide step-by-step cues for directing cell fate and behavior.
- **Brian A. Cobb, Ph.D., Case Western Reserve University School of Medicine** assistant professor of pathology, who will develop new tools to study how the immune system recognizes carbohydrate molecules and how they may be used in vaccine development.
- **Ronald D. Cohn, M.D., Johns Hopkins University School of Medicine** assistant professor of pediatrics and neurology at the McKusick-Nathans Institute of Genetic Medicine, who will study the mechanisms underlying the ability of hibernating mammals to maintain skeletal muscle mass despite prolonged periods of immobility.
- **Xiangfeng Duan, Ph.D., University of California, Los Angeles**, assistant professor of chemistry and biochemistry, who will develop a new generation of integrated nanoprobe for monitoring, mapping, and manipulating neural activities with unprecedented speed and sensitivity.
- **Seth J. Field, M.D., Ph.D., University of California, San Diego**, assistant professor of medicine, who will develop a multipronged, systematic approach to understand the function of lipid molecules that transmit signals within cells.
- **Zemer Gitai, Ph.D., Princeton University** assistant professor of molecular biology, who will use novel imaging methods to identify new classes of antibiotic drugs and drug targets.
- **Aaron D. Gitler, Ph.D., University of Pennsylvania School of Medicine** assistant professor of cell and developmental biology, who will use novel genetic screening and cell biological approaches to define the mechanisms of human neurodegenerative diseases, such as Parkinson's and amyotrophic lateral sclerosis.
- **David H. Gracias, Ph.D., Johns Hopkins University** assistant professor of chemical and biomolecular engineering, who will develop mobile, micro- to nanoscale tools and devices for medicine.
- **Christy L. Haynes, Ph.D., University of Minnesota McKnight Land-Grant Assistant Professor of Chemistry**, who will build an immune system-on-a-chip to illuminate the mechanisms of, and possible therapeutic approaches to, allergic conditions.
- **Shelli Kesler, Ph.D., Stanford University School of Medicine** assistant professor of psychiatry and behavioral sciences, who will develop and test intervention programs for preventing and treating cognitive impairments related to chemotherapy in women with breast cancer.
- **Yuriy Kirichok, Ph.D., University of California, San Francisco**, assistant professor of physiology, who will study molecular mechanisms of cell energy production and cell death to open new avenues in the treatment of age-related metabolic and degenerative diseases.
- **Sanjay Kumar, M.D., Ph.D., University of California, Berkeley**, assistant professor of bioengineering, who will combine approaches from biophysics, systems biology, and oncology to study how cells sense and process mechanical forces in human health and disease.
- **Chay T. Kuo, M.D., Ph.D., Duke University Medical Center** assistant professor of cell biology and pediatrics, who will develop new genetic and chemical screening approaches in mice to identify signals regulating repair and remodeling after brain injuries.
- **Lara K. Mahal, Ph.D., University of Texas at Austin** assistant professor of chemistry and

biochemistry, who will develop a systems-based approach to decode how sugar molecules on cell surfaces encode information such as cell type and health.

- **Coleen T. Murphy, Ph.D., Princeton University/Lewis-Sigler Institute** assistant professor of molecular biology and genomics, who will study the causes of reproductive aging and help identify candidates for the treatment and prevention of age-related reproductive decline and maternal age-related birth defects.
- **Ken-ichi Noma, Ph.D., Wistar Institute** assistant professor in gene expression and regulation, who will develop a new methodology to map the three-dimensional structure of the human genome as a means of identifying the molecular basis for many diseases, including various cancers.
- **Melanie D. Ohi, Ph.D., Vanderbilt University Medical Center** assistant professor of cell and developmental biology, who will take a multidisciplinary approach toward understanding the structure and function of large molecular complexes called spliceosomes.
- **Karin S. Pfennig, Ph.D., University of North Carolina, Chapel Hill**, assistant professor of biology, who will use an experimental approach to understand how an individual's health status and external environment influence his or her behavior.
- **Miguel Ramalho-Santos, Ph.D., University of California, San Francisco**, assistant professor of obstetrics, gynecology and reproductive sciences and researcher in the Institute for Regeneration Medicine, who will study the control and function of stem cell pluripotency, which has implications for regenerative medicine and cancer biology.
- **Samara Reck-Peterson, Ph.D., Harvard Medical School** assistant professor of cell biology, who will couple genetics with biophysics to discover biomedically important molecules that control how molecular motors deliver diverse cargo to the right place at the right time within cells.
- **Erik M. Shapiro, Ph.D., Yale University School of Medicine** assistant professor of diagnostic radiology and biomedical engineering, who will use cellular and functional magnetic resonance imaging to aid in the development of novel strategies for manipulating stem and progenitor cell migration in the brain, particularly in response to injury and disease.
- **William M. Shih, Ph.D., Dana-Farber Cancer Institute** assistant professor of biological chemistry and molecular pharmacology, who will develop tools for atomic-resolution imaging of membrane proteins to enable structure-based drug design.
- **Amy J. Wagers, Ph.D., Joslin Diabetes Center and Harvard University** assistant professor of stem cell and regenerative biology, who will study the mechanisms by which aging impairs blood cell function and develop strategies to prevent or reverse these age-acquired defects.
- **Jue D. Wang, Ph.D., Baylor College of Medicine** assistant professor of molecular and human genetics, who will identify new ways that the cell controls how DNA is copied, which will give insights into many diseases.
- **Lei Wang, Ph.D., Salk Institute for Biological Studies** assistant professor of chemical biology and proteomics, who will design and incorporate novel amino acids in roundworms to study how a class of proteins transmits signals regulating development and cancer.
- **Joseph C. Wu, M.D., Ph.D., Stanford University School of Medicine** assistant professor of medicine and radiology, who will develop a microRNA-based approach for reprogramming induced pluripotent stem cells.

- **Sean M. Wu, M.D., Ph.D., Massachusetts General Hospital and Harvard Medical School** assistant professor of medicine, who will employ mechanisms of embryonic development to engineer functional tissues for organ regeneration using pluripotent stem cells from different species.
 - **Julia Zeitlinger, Ph.D., Stowers Institute for Medical Research** assistant investigator, who will analyze the relationship between the DNA-packaging state of a cell and its developmental potential.
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