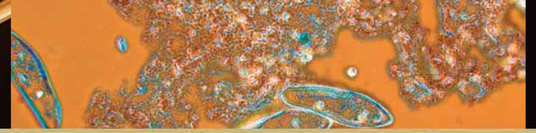
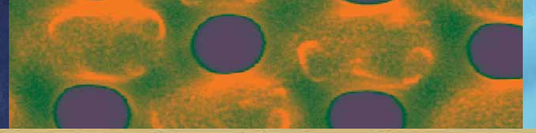
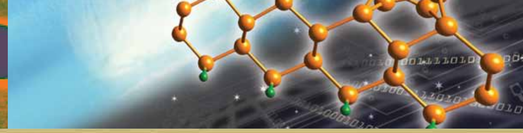


Pitt Attracts Significant Recovery Act Funding

One of the purposes of the American Recovery and Reinvestment Act (ARRA) of 2009 was to promote economic recovery by spurring advances in science and health. Through its grant proposals, the University of Pittsburgh has been able to demonstrate effectively that it is well poised to use the nation's economic stimulus funds to contribute to regional economic development. As a result, Pitt has attracted a significant number of awards from the ARRA stimulus package, receiving money for approximately one-third of the total projects funded in the Commonwealth of Pennsylvania alone.

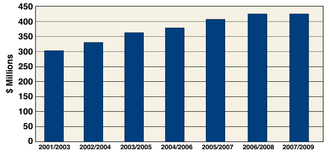
As of April 2010, the University of Pittsburgh had been awarded more than $171 million in ARRA funds channeled through federal agencies such as the National Institutes of Health (NIH) and National Science Foundation (NSF)* to support research across a broad spectrum of disciplines, including medicine, public health, biological sciences, engineering, neuroscience, pharmacy, dental medicine, physics, psychiatry, geology, chemistry, nursing, and many others.

Stimulus contributions are enabling Pitt to construct state-of-the-art nanoscience and technology laboratories to cover a spectrum of activities, from creating new electronic and telecommunications devices to seeking a better understanding of large storms and hurricanes. Construction of these laboratories provides one immediate example of using stimulus funds to create regional jobs.

In this report, a cross section of Pitt research aided by ARRA funding is highlighted. For more information on ARRA funds supporting Pitt research, visit www.pitt.edu/~offres/proposal/Stimulus/PittStimulusAwds.html.

Because of the timing of reporting, these funds are not yet reflected in the NIH and NSF charts represented in this publication.

Federal Science and Engineering Research and Development Obligations at Pitt



(Source: National Science Foundation; data year/release date)

Pitt Faculty Honors

- Five Pitt faculty members were recently named fellows of the **American Association for the Advancement of Science**: Graham Hatfull, Eberly Family Professor, HHMI Professor, and chair of the Department of Biological Sciences; Michael Zigmond, professor of neurology; Bernie Devlin, associate professor of psychiatry; George Michalopoulos, Maud L. Menten Professor and chair of the Department of Pathology; and Herbert Needleman, emeritus professor of psychiatry.
- Donald Burke, dean of the Graduate School of Public Health and UPMC-Jonas Salk Chair of Global Health, was elected to the **Institute of Medicine (IOM)** for his work on preventing and lessening the impact of epidemics. Burke joins 18 other Pitt faculty members who have been elected to IOM.
- Nicholas Rescher, Distinguished University Professor of Philosophy, was elected to the **American Academy of Arts and Sciences**, the fourth consecutive year that a Pitt philosopher received this honor.
- Catherine Bender, associate professor of health and community systems; Sandra Engberg, associate professor and chair of the Department of Health Promotion and Development; and Richard Henker, professor and vice chair of the Department of Acute and Tertiary Care, were selected for fellowship in the **American Academy of Nursing** for achievements in nursing.
- Terry Smith, Andrew W. Mellon Professor of Contemporary Art History and Theory, received the inaugural **Georgia O'Keeffe Museum Research Center Book Prize** for a work in American modernism and the prestigious **Frank Jewett Mather Award** for his work on art criticism.
- Gonzalo Torres, assistant professor of neurobiology, received a **Presidential Early Career Award for Scientists and Engineers**, the highest honor bestowed by the U.S. government upon professionals in the early stages of their research careers.
- Brent Doiron, assistant professor of mathematics, and Michael Grabe, assistant professor of biological sciences, were recipients of **2009 Sloan Research Fellowships** for their potential to contribute substantially to their fields.
- Six Pitt faculty members received **National Science Foundation Faculty Early Career Development (CAREER) Program awards**. Recipients were Lillian Chong, assistant professor of chemistry; Gurudev Dutt, assistant professor of physics and astronomy; Michael Grabe, assistant professor of biological sciences; Megan Spence, assistant professor of chemistry; Lance Davidson, assistant professor of bioengineering; and Jung-Kun Lee, assistant professor of mechanical engineering and materials science.

Major and Multiyear Grants

- Pitt, part of a national research team that includes four other universities, was awarded a contract with a maximum value of $322 million from the U.S. Department of Energy to provide the National Energy Technology Laboratory with **basic and applied energy research** in renewable energy, carbon management, gas hydrates, petroleum recovery, and systems modeling.
- The Graduate School of Public Health (GSPH) received a grant from the National Institutes of Health (NIH) for $13.4 million to establish a center of excellence in **modeling of infectious diseases to gain insight into real-world epidemics**; the National Institute of Diabetes and Digestive and Kidney Diseases awarded GSPH a seven-year, $11 million grant to coordinate the **Hepatitis B Clinical Research Network**, a consortium of 15 centers; and NIH awarded GSPH $7.2 million for the investigation of microbicides—agents that **prevent HIV transmission**.
- The School of Arts and Sciences was the recipient of a $15 million ARRA grant from the National Institute of Standards and Technology for **expansion and construction of 13 state-of-the-art nanoscience and experimental physics laboratories**. A part of a $27.8 million expansion of the University's midcampus complex, the renovation—to which Pitt will contribute $12.8 million—encompasses four buildings and will provide the Department of Physics and Astronomy with enhanced research facilities.
- Developmental biologists in the School of Medicine have been chosen to participate in a $100 million "Bench to Bassinet" network funded by the National Heart, Lung, and Blood Institute to create new **diagnostic and intervention strategies for congenital heart disease**. Pitt researchers in the School of Medicine also received two NIH grants totaling $17.5 million to develop new preventive medications to **avert the spread of HIV**.
- Researchers at Pitt's School of Dental Medicine will codirect a $9 million initiative funded by NIH to study the causes of **facial birth defects**.
- McGowan Institute for Regenerative Medicine researchers received grants totaling more than $5.1 million from NIH to explore new methods for **growing cells from existing tissues and organs**. Researchers also were awarded $5.6 million to develop a heart-assist pump for **infants and toddlers with heart disease**, part of a $23.6 million effort sponsored by NIH's National Heart, Lung, and Blood Institute.
- School of Nursing researchers received $1.24 million from the American Cancer Society to investigate intervention strategies for **reducing disparities in access to breast cancer treatments**.

Recovery Act Funds in Action

ARRA-supported projects include work on the search for effective vaccine strategies, more efficient and cheaper solar panels, understanding the Earth's development, strategies to combat the obesity epidemic, climate change, social influences on child development, and continued work on cancer prevention and treatments. Below is a small sampling of ARRA funds in action at Pitt.

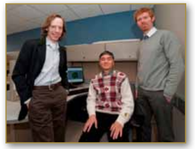
Using magnetic resonance imaging technology and imaging tools, Professor Jane Cauley (seated); Yahtyng Sheu, PhD (standing, back); and Francesca Amati, MD (standing, front), are investigating the relationship between bone marrow fat and bone density as a means of further understanding and ultimately ***treating the debilitating disease osteoporosis.***

Assistant Professor Ipsita Banerjee (seated) and graduate students Keith Task and Maria Jaramillo are investigating the differentiation of stem cells into mature cells and techniques to influence what sort of tissue they become. Stem cell research could lead to new understandings of disease progression and the creation of ***innovative medical treatments to cure disease, heal injuries, or ease symptoms.***

Pitt's School of Medicine received approximately $14 million in an ARRA grant through the National Institutes of Health for the renovation of the 12th floor of the Thomas E. Starzl Biomedical Science Tower to accommodate the research of the Vascular Medicine Institute and the Division of Pulmonary, Allergy, and Critical Care Medicine.

The research team of Professor Connie A. Tompkins (front, seated) is developing and testing new therapeutic interventions for people who have language deficits after damage to the right side of the brain. The team, including Kayla Underwood (center, seated) and April Scott (standing), uses magnetic resonance imaging, affording it a ***direct view of damaged brain areas.***

Professor Angus W. Thomson (left, standing), Professor David A. Geller (middle, standing), Associate Professor Chandrashekhar Gandhi (right, standing), and Associate Professor Noriko Murase (seated) are leading a team of School of Medicine researchers working ***to better understand regulation of liver transplant outcome.***



Using computational methods to understand biological phenomena, Assistant Professor Michael Grabe (standing, left), postdoctoral researcher Seungho Choe (seated), and graduate student Keith Callenberg (standing, right) are developing models for calculating the stability of membrane proteins in the cell membrane. Such basic research is critical to understanding disease development and could lead to the ***creation of new therapeutic treatments for a host of diseases.***

Research Initiatives Update

- Pitt has established the new **Center for Global Health** to promote multidisciplinary approaches to international health problems. Recognizing that global health challenges are created from a combination of social, legal, political, economic, and environmental factors, the center relies on partnerships across the University and around the world to find solutions to pressing worldwide health problems. The Center for Global Health recently received $2.8 million from NIH's John E. Fogarty International Center for Advanced Study in the Health Sciences for the training of researchers in regions of the world most hard-hit by the HIV/AIDS epidemic. Visit www.globalhealth.pitt.edu for more information.
- In fall 2009, when international leaders gathered in Pittsburgh for the G-20 Summit, Pitt's **Center for Energy** was a featured tour site for attending media. Seven center faculty members gave presentations to local, European, and Asian journalists on their innovative research in renewable energy technologies, energy diversification, and energy efficiency as well as their work in training the next generation of nuclear engineers. The Center for Energy developed short videos of the work being carried out by these researchers. To view these films, visit www.energy.pitt.edu.
- Pitt's **Mascaro Center for Sustainable Innovation** recently completed a $16.8 million physical expansion. The Mascaro Center's new space allows for innovative research to be accomplished in a way that uses the building itself as a vehicle for research. The Mascaro Center continues to pursue its goal of translating the fundamental science of sustainability into real-world solutions for our region and world and contributing to Pittsburgh's leadership position in the international green building movement. Visit www.mascarocenter.pitt.edu to learn more.

The Swanson School of Engineering's new building addition houses the Mascaro Center for Sustainable Innovation, which includes inventive open laboratories that encourage collaboration among Pitt researchers working on sustainable building and clean energy solutions.

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Commercialization

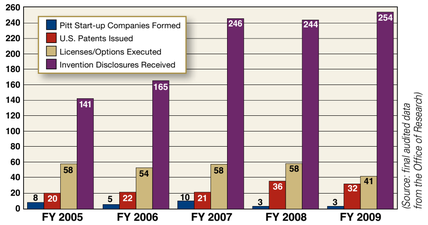
Robotic surgical probes. Wheelchair containment stations. Polymer wraps for vein grafts. Inhibitors for cancer-causing genes. These are just some of the new innovations with significant commercial potential that Pitt Innovators, from a diversity of disciplines, are working to develop with the University's Office of Technology Management (OTM) and Office of Enterprise Development (OED).

Engaging innovators in transforming their research into commercial products and processes continues to be a high priority for the University. In addition, through an extensive outreach program, OTM and OED work to foster meaningful, long-term relationships with investors, entrepreneurs, and others in industry and the economic development community who support Pitt Innovators in their research and commercialization efforts.

The engagement of more faculty, staff, and students than ever before is evidence of a growing entrepreneurial culture of innovation and commercialization at Pitt. And while this past year proved to be a tough economic climate in which to do business, we are confident in the strong foundation we are building for our commercialization endeavors.

Economic Impact

University of Pittsburgh Office of Technology Management: www.otm.pitt.edu



(Source: final audited data from the Office of Research)

Research Expenditures

Over the course of the past decade, Pitt's research expenditures have totaled an unparalleled **$5.33 billion**. In Fiscal Year 2009 alone, Pitt accrued approximately $654 million in research expenditures from all sources, including the federal government, companies and foundations, state and local governments, and other agencies.

NIH Funding FY 2008

Source: NIH Web site
(Grant Awards Data for Individual Organizations)

Educational Institutions and Affiliates	Dollars in Thousands
1 Harvard University	$1,273,442
2 Johns Hopkins University	581,949
3 University of Pennsylvania	510,254
4 University of California, San Francisco	483,210
5 University of Pittsburgh	**432,222**
6 University of Michigan	430,312
7 University of Washington	417,634
8 University of California, Los Angeles	403,086
9 Washington University in St. Louis	381,858
10 Duke University	363,960
11 Yale University	363,206
12 University of North Carolina	342,903
13 University of California, San Diego	338,171
14 Columbia University	324,484
15 Vanderbilt University	295,027
16 Stanford University	287,648

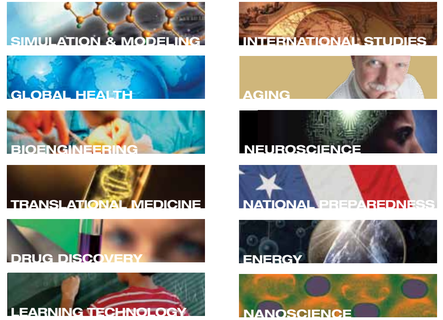
Federal Science and Engineering R&D Obligations FY 2007

(Source: National Science Foundation)

Institution	Dollars in Thousands
1 Johns Hopkins University	$1,186,768
2 University of Washington	612,498
3 University of Michigan	501,837
4 University of Pennsylvania	498,549
5 University of California, Los Angeles	480,679
6 Duke University	470,842
7 University of California, San Diego	433,801
8 University of California, San Francisco	433,388
9 Harvard University	429,693
10 University of Pittsburgh	**426,764**
11 Columbia University	426,399
12 Stanford University	425,931
13 Washington University in St. Louis	407,809
14 Yale University	387,298
15 Massachusetts Institute of Technology	381,753
16 University of Minnesota	371,293

Multidisciplinary Areas of Research

Understanding some of the really critical challenges in science and technology and other fields more often than not involves collaboration among experts from different disciplines. At the University of Pittsburgh, many researchers work together in the following 12 areas of multidisciplinary research to try to address the complex societal and global problems we face.



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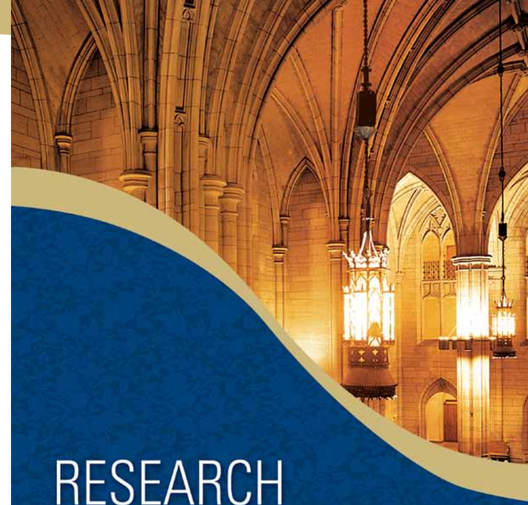

RESEARCH PROFILE 2010

UNIVERSITY OF PITTSBURGH