SOCIETY FOR NEUROSCIENCE

Recovery Act

The historic investment in research through the American Recovery and Reinvestment Act is funding promising science that is improving health, while contributing to the economy. View more stories at www.sfn.org/recovery.

NSF Neuroscience Research

The bold investment in the National Science Foundation (NSF) though the American Recovery and Reinvestment Act (ARRA) is setting a path for a stronger and more competitive economy, while creating high-wage jobs and improving the health and life expectancy of Americans. The nation must prioritize scientific research and innovation by making permanent NSF's new capacity, sustaining the economic momentum created by ARRA, and leveraging the scientific potential to improve health and innovation.

Advances in the Physical Sciences are Essential to Study and Treat the Brain

The field of neuroscience is deeply interdisciplinary and relies on crucial advances in physics, computer science, mathematics, chemistry, engineering, and basic biology to develop new tools and techniques for studying brain cell activity. For example, NSF-funded physics creates the tools that neuroscientists use to peer deeper into the brain. These include wonders like 11 Tesla functional Magnetic Resonance Imaging and advanced microscopy.

Bioengineering — Creating New Interventions for Health

In return, many in the physical sciences are applying neuroscience discoveries to their own fields to create new treatments and health interventions. For example, brain-controlled prosthetics like cochlear implants are technical engineering marvels, making it possible for thousands of individuals who are profoundly deaf or hard-of-hearing to understand the speech of others. Recent discoveries in the neuroscience of hearing, coupled with more advanced technologies, are helping scientists design increasingly sophisticated cochlear implants as well as other devices that restore or enhance hearing.

Fostering the Next Generation of Scientists is Crucial to Long-term Economic Competitiveness

NSF not only fosters these important collaborations among scientists, engineers, physicists, and biologists, but also is a leading force in the development of the next generation of scientists. NSF often provides the initial grant mechanism supporting early career scientists before they transition to their first NIH grant.

With continued robust increases, NSF will be able to seize the momentum created by ARRA and build a science-driven economy, while continuing to fund high-quality, interdisciplinary, and basic research. Stable funding will allow the NSF to undertake high-risk, high-reward projects that push the boundaries to ensure groundbreaking, life-enhancing discoveries, and keep the U.S. internationally competitive in the 21st century and beyond.

See the reverse for examples of neuroscience-related NSF research funded by the Recovery Act.

For more information:
NSF and ARRA: nsf.gov/recovery

The Society for Neuroscience (SfN) is the world's largest organization of scientists and physicians devoted to advancing understanding of the brain and nervous system. Since its inception in 1969, the Society has grown from 500 members to more than 40,000.

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Following are examples of ARRA-funded, neuroscience-related research supported by divisions of NSF.

Division of Behavioral and Cognitive Sciences

- **ARRA Dollars:** $1.94 million
- **Program:** Major Research Instrumentation
- **Grant Description:** *MRI: Acquisition of a 3-Tesla Magnetic Resonance Imaging (MRI)*

This grant provides MRI technology to the University of Maryland College Park community for studying human brain activity. The MRI scanner serves as the centerpiece of the Brain Imaging Center at Maryland and transforms the research and educational environment at the University. The scanner provides a foundation for research in cognitive and affective neuroscience, while also fostering an intensive learning environment through the integration of research and education within the University of Maryland and through its partnerships in the local community.

Division of Industrial Innovation and Partnerships

- **ARRA Dollars Awarded to Date:** $500,000
- **Program:** Small Business Phase II, STTR Phase II
- **Grant Description:** *STTR Phase II: In-Home Rehabilitation System for Post Stroke Patients*

This grant proposes to create an in-home gait training device that allows stroke patients to undergo rehabilitation with little or no assistance. Most stroke survivors are able to relearn skills such as walking if they are aided in making the correct motions by a machine or a physical therapist. Unfortunately, this aided training is expensive and requires the patient to make regular clinical visits. This grant proposes to create a lightweight robotic exoskeleton that cradles a patient's lower extremities and torso, and maneuvers their rehabilitating limbs, both reducing costs and allowing patients to maneuver in the real world.

Division of Integrative Organismal Systems

- **ARRA Dollars Awarded to Date:** $450,000
- **Program:** Modulation
- **Grant Description:** *Neurobiology of Simple Forms of Learning in the Zebrafish*

This grant aims to answer the major unsolved question of how the brain stores and recalls information. Because the vast complexity of the mammalian brain is a significant impediment, this grant proposes using a simpler model, the zebrafish, to carry out behavioral and electrophysiological investigations of simple forms of learning. The underlying motivation of these investigations is that an understanding of the neural basis of learning in the zebrafish will provide important insights into learning and memory in more complex organisms, including humans.

Division of Social and Economic Sciences

- **ARRA Dollars Awarded to Date:** $527,244
- **Program:** Decision Risk & Management Science
- **Grant Description:** *The Neuroeconomics of Self-Control in Dieting Populations*

This grant focuses on the self-control problems that are at the core of many public policy challenges facing the United States, including obesity, addiction, and low levels of savings. The project uses new neuroeconomics tools and techniques to address what aspects of the brain's decision making circuitry leads to temptation and self-control. In particular, the research involves studying the brains of dieters while they make food choices, comparing the brain patterns of successful and unsuccessful dieters to indicate the regions of the brain responsible for temptation and for self control.