NSF Current
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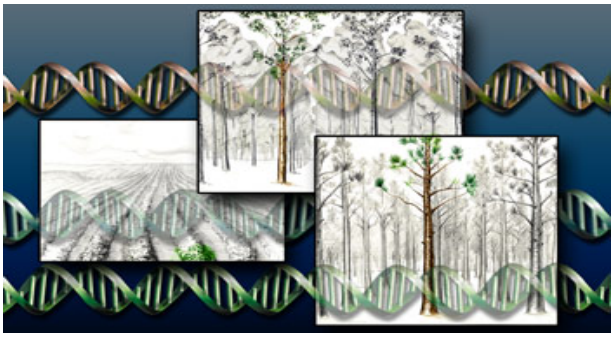
NSF Awards 19 New Plant Genome Research Projects

The genomes of economically important plants are often large and complex, but through in-depth studies scientists uncover information that can be translated into new and improved agricultural products and practices.

The National Science Foundation (NSF) made 19 new awards totaling $58.7 million in the eighth year of its Plant Genome Research Program (PGRP). The two- to five- year awards, ranging from $622,000 to $7.7 million, fund research and tools to reveal information in the genomes of economically important crop plants, such as wheat and soybean, as well as to increase understanding of the genetics underlying plant processes including disease resistance, flavor development, seed growth and wood formation.

Visit NSF's press release and the list of 2005 PGRP awards for more information.



NSF made 19 new awards in the eighth year of its Plant Genome Research Program. The awards will support genomics research in major crop plants such as soybean and also in trees including the loblolly pine and poplar. Credit: N. Rager Fuller, NSF.

Instructors from Minority-Serving Institutions Learn to Teach Microarray Technology

Undergraduate teaching faculty recently learned about microarray technology, one of biology's hottest techniques. Credit: GCAT Workshop; Dr. A. M. Campbell, GCAT Director, Davidson College.

Microarray technology, one of the hottest techniques in biological research, simultaneously measures the expression levels of tens of thousands of genes. Performing DNA microarray experiments and analyzing the mounds of resulting data are generally thought to be beyond the reach of all but a small number of undergraduates working in top research labs. However, the Genome Consortium for Active Teaching (GCAT), composed of faculty from over 120 primarily undergraduate institutions, has allowed over 4,000 undergraduates to conduct research using DNA microarrays.

Recently, 43 GCAT faculty from Historically Black Colleges and Universities, Tribal Colleges and Universities, Hispanic-Serving Institutions, and other institutions gathered at Morehouse College in Atlanta to learn microarray technology "hands-on."

When they return to their classrooms, the faculty will share their new skills with more than 800 undergraduates from diverse backgrounds, enabling the students to perform their own experiments and analyze the resulting data. NSF supports GCAT and its summer training workshops.

RNA Research Reveals Molecule's New Role

Recent research demonstrated yet another role for ribonucleic acid (RNA) beyond its traditional function in protein production. Credit: N. Rager Fuller, NSF.

For decades, the "other" genetic material, RNA (ribonucleic acid), was thought to play a supporting role to its more famous counterpart, DNA. After all, protein production requires DNA-based genetic information to be converted to transient RNA molecules, which cells use as blueprints to build proteins. This process relegated RNA to its subsidiary reputation.

More recently, scientists have realized that RNA functions as more than just a mere middleman in protein production. The molecule also mediates chemical reactions and regulates cellular processes. NSF-supported researchers used a new technique to identify more than 77,000 so-called "small RNAs" from the model plant, *Arabidopsis thaliana*, and created a publicly accessible database to hold the information. Others recently determined the structure of an RNA molecule that aids in chemical reactions and found that it had characteristics resembling proteins that perform similar reactions. For more details on this discovery, see NSF's press release "RNA Research Reveals New Responsibilities."

New Nanotechnology Awards to Inform the Public and Explore Implications

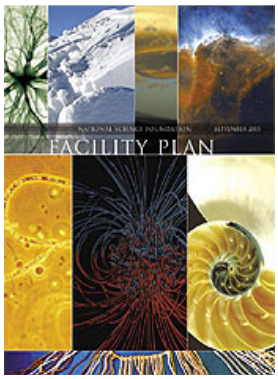
"Sun Painting," by artist Bob Miller, is shown here during its exhibition at the San Francisco Exploratorium. The Exploratorium, one of the core leaders in the Nanoscale Informal Science Education Network, is famous for giving its visitors a hands-on introduction to science. Credit: San Francisco Exploratorium.

NSF announced a series of awards that will greatly expand efforts to inform the general public about nanotechnology, and to explore the implications of this fast-moving field for society as a whole.

NSF selected the Museum of Science, Boston, along with the Science Museum of Minnesota and the Exploratorium in San Francisco, to create and lead the Nanoscale Informal Science Education Network. The $20 million, five-year effort represents the largest single award NSF has given to the science-museum community, and will be a cornerstone of the foundation's multidisciplinary Nanoscale Science and Engineering Education program. Interactive exhibits**,** visualization labs and public forums are among the desired outcomes. In addition, NSF selected the University of California, Santa Barbara and Arizona State University to create two new Centers for Nanotechnology in Society. These centers will support research and education on nanotechnology and social change.

These new efforts are funded under the Nanoscale Science and Engineering program at NSF, one of 22 federal agencies in the government-wide National Nanotechnology Initiative. See NSF's press release for more details regarding the awards.

Foundation's 2005 Facility Plan Provides Context for Major Research Investments



The National Science Foundation's Facility Plan for 2005 provides an overview of science and engineering research objectives and opportunities that collectively form the context for current and potential future investments through NSF's Major Research Equipment and Facilities Construction (MREFC) budget account.

Existing MREFC projects include radio telescopes, the EarthScope geoscience program, a scientific ocean drilling vessel, and a neutrino observatory. Potential future projects are described in the plan and extend across a wide range of science and engineering research endeavors.
