United States

http://www.arabidopsis.org/portals/masc/countries/United_States.jsp

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AT2010 Project

The National Science Foundation (NSF)-sponsored 2010 project, established in 2000, aims to determine a function for all genes in *Arabidopsis thaliana* by the year 2010. 119 awards have been granted between 2001 and 2006 (www.nsf.gov/bio/pubs/awards/2010awards.htm). In 2007, proposals submitted to the NSF will be reviewed jointly with proposals submitted to the *Arabidopsis* Functional Genomics Network Program (AFGN) that is supported by the German agency Deutsche Forschungsgemeinschaft (DFG). The program focus for 2007 remained unchanged from 2006 and includes: (1) projects that include genome-wide analyses for benchmarking the function of all genes in the genome; (2) projects that will develop experimental and computational methods, tools, and resources for enabling a broad community of scientists to conduct functional genomics research on *Arabidopsis*; and (3) research on exemplary networks that use high throughput methods and integrate modeling with experimental data to understand the gene circuitry underlying basic plant processes (www.nsf.gov/pubs/2006/nsf06612/nsf06612.htm). 2005 marked the midpoint of the program and the North American *Arabidopsis* Steering Committee (NAASC) organized a two-day workshop in August 2005, to evaluate the progress made and provide guidance for the second half of the program. The final report is available in its entirety at www.nsf.gov/pubs/2006/bio0601/bio0601.pdf.

Plant Science Cyberinfrastructure Collaborative (PSCIC)

In November 2006, acting on the recommendations produced from an NSF-sponsored workshop held to discuss the establishment of a Plant Cyberinfrastructure Center (complete workshop findings and recommendations can be found at www.arabidopsis.org/portals/masc/masc_docs/masc_wk_rep.jsp), the NSF initiated a new program whose goal is to create a cyberinfrastructure collaborative for plant science that will enable new conceptual advances through integrative, computational thinking. The collaborative will be fluid and dynamic, utilizing new computer, computational science and cyberinfrastructure solutions to address an evolving array of grand challenge questions in plant science. The collaborative will be community-driven, involving plant biologists, computer and information scientists and experts from other disciplines working in integrated teams. Final proposals to establish the PSCIC were accepted in April, 2007, and exploratory visits to potential sites are scheduled for June, 2007 (further information at www.nsf.gov/pubs/2006/nsf06594/nsf06594.htm).

The 17th International Conference on Arabidopsis Research

In 1992 the North American *Arabidopsis* Steering Committee (NAASC, www.arabidopsis.org/portals/masc/countries/NAASC_Info.jsp) was established to provide North American representation to the MASC and to serve as the main organizing and fundraising body for the International Conference on *Arabidopsis* Research (ICAR) held roughly 2 out of every 3 years in the United States since it became an annual meeting in 1995. Historically, the NAASC is composed primarily of U.S. researchers which represent *Arabidopsis* researchers in the United States, Canada and Mexico. The U.S. site for the annual meeting has traditionally been the University of Madison in Wisconsin and the 17th ICAR held June 27th-July 2nd, 2006 was no exception. Approximately 622 people attended the meeting which was the eighth ICAR held in Madison in the last 12 years. In 2005 the NAASC decided to change the format of the

North American meetings by including additional North American sites to alternate with Madison. In 2008, the 19th ICAR will be held in Montreal, Canada from July 23-27, while in 2009, it is expected that the meeting will be held once again in Madison.

U.S./Germany Young Researcher Exchange Program

In late 2005 a program was established to allow graduate students and post-doctoral fellows from NSF-supported U.S. labs to engage in short-term research visits to German labs. This NSF-funded program is a collaboration with the German *Arabidopsis* Functional Genomics program, AFGN, which similarly allows German students to work in U.S. labs. Since its inception, the U.S. program has funded research visits to Germany by 1 post-doctoral fellow and 8 graduate students. The program is expected to continue until mid-2008. For more information on the U.S. program including eligibility guidelines and application instructions, please see: www.arabidopsis.org/portals/masc/NSF_Arabidopsis_research_program.pdf

Grant information: www.nsf.gov/awardsearch/showAward.do?AwardNumber=0529918

For more information on the German program, please see:
www.uni-tuebingen.de/plantphys/AFGN/yrep.htm

Arabidopsis genomics tools and resources

- TAIR (The *Arabidopsis* Information Resource, www.arabidopsis.org) collects information and maintains a database of genetic and molecular biology data for *Arabidopsis thaliana*. Funding is provided by the National Science Foundation and TAIR collaborates with the *Arabidopsis* Biological Resource Center (ABRC) to allow researchers to search and order stocks via TAIR. In October 2006, TAIR introduced the ability to search for genes, germplasms and polymorphisms based on associated phenotypes. The gene, germplasm and polymorphism search pages, along with their corresponding data detail pages were updated to display the new information. The locus and stock detail pages were also updated to display phenotype information, where available. Germplasm descriptions were curated, separating phenotype data from other kinds of seed stock information that were previously combined in this description. During this month, TAIR also released the final components of a new website design including portal pages which aggregate web-wide information and links for various major topics of interest into a central webpage, left navigation bars and a main header bar with dropdown menus. This new design provides a better organized and more intuitive user interface for TAIR. On Nov. 29, 2006 the TAIR database and website moved from hardware hosted at NCGR in Santa Fe, New Mexico to new hardware hosted at Stanford University. The new hardware has provided faster response times and better overall uptime.

  In February 2007 TAIR released version 3.5 of the AraCyc biochemical pathway database with 262 *Arabidopsis* biochemical pathways, including 51 newly added and 37 significantly updated pathways. In addition, 400 compounds were added from user submissions. Of the 262 total pathways, 79% are fully curated including a pathway summary, special significance if any and comments. For the fully curated pathways all available literature associated to the pathway enzymes has been reviewed and enzyme physiochemical properties and general comments about the enzymes have been added.

  In March 2007 TAIR released a new version of the *Arabidopsis* genome annotation, TAIR7, incorporating community submissions directly to TAIR and new cDNAs and ESTs submitted to GenBank since the previous TAIR6 release. The new release includes 681 new genes bringing the total gene set to 32,041 genes, of which 26,819 are protein-coding, 3889 are pseudogenes or transposable elements and 434 are ncRNAs. The release also contains updates to 9755 genes, including 784 updates to protein sequences and addition of 1003 new splice variants as well approximately 10,700 updates to UTRs. A total of 34 gene merges and 41 gene splits were also carried out. TAIR7 has been released to GenBank and can be accessed from the NCBI Plant Genomes section as well as through TAIR. Over the past year (3/1/06-2/28/07) TAIR has curated 556 research articles, adding 4005 Gene Ontology and 2210 Plant Ontology annotations from the literature to 2181 genes and also updating gene summaries, aliases, phenotypes, alleles and germplasm information.

- The Arabidopsis Biological Resource Center (ABRC) distributes, collects and preserves seed and DNA resources of *Arabidopsis* and related species. Emphasis in 2007 is being placed on serving various post-genomic efforts, particularly phenomics. Distribution and organization of the homozygous insertions lines for various phenotypic investigations is proceeding. The Ecker laboratory (Salk Institute,

http://signal.salk.edu/gabout.html) is genetically purifying to homozygosity 50,000 T-DNA insertion knockout lines. To date, 8,755 of these lines have been received, and the remainder will be arriving as they are generated. The stocks being utilized for this project include the Ecker (SALK) population plus lines from Syngenta (SAIL), B. Weisshaar (GABI-Kat) and P. Krysan/R. Amasino/M. Sussman (Wisconsin Ds-Lox). Receipt and distribution of Entry and Expression ORFeome clones is also a priority. Entry clones are being received from the Ecker (SSP and SALK) and the C. Town projects as well several individuals in the research community. The extensive Expression ORF collections from S. P. Dinesh Kumar and S. Clouse are also being received, with 3,026 of these currently in-house.

Present ABRC seed stock holdings include insertion lines covering 25,000 genes, the 10,000+ lines of the Arabidopsis TILLING service, 850 distinct natural accessions (now being genetically fingerprinted so that this entire collection will be marker-validated), 15 recombinant inbred populations, related species and RNAi lines including the AGRIKOLA lines (www.agrikola.org). In regards to DNA resources, ABRC presently houses full-length ORF and cDNA clones for 13,500 genes, BACs covering the entire genome, BACS of four related species, the AGRIKOLA RNAi Entry clones and various sets of Expression and Destination clones. The present collection of vector constructs represents a rich and diverse set of resources for investigation of gene expression. It should be emphasized that donation of published mutants and clones, including purified insertion mutants and expression clones, are very welcome. The annual distribution of seed and DNA stocks exceeded 85,000 orders in 2006.

Major funding sources for Arabidopsis functional genomics

- NSF: National Science Foundation (www.nsf.gov/)
- USDA: U.S.Department of Agriculture (www.usda.gov/wps/portal/usdahome)
- DOE: U.S. Department of Energy (www.energy.gov/)
- NIH: National Institutes of Health (www.nih.gov/)