

United States

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

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North American Arabidopsis Steering Committee (NAASC)

NAASC (www.arabidopsis.org/portals/masc/countries/NAASC_Info.jsp) is composed primarily of US researchers and represents Arabidopsis researchers in the United States, Canada and Mexico. NAASC provides North American representation to the MASC and serves as the main organizing and fundraising body for the ICAR when it is held in North America and raises funds to support young North American scientists to participate in foreign ICARs.

1. Annual elections replace two members that rotate off the committee each year. Julian Schroeder and Caren Chang conclude their four year term at the 2010 International Conference on Arabidopsis Research.
2. Continuing committee members include George Haughn, Scott Poethig, Mark Estelle, Jane Glazebrook, Xinnian Dong and Blake Meyers. Newly elected committee members in 2010 are Dominique Bergmann (Stanford University) and Wolf Frommer (Carnegie Institution for Science).
3. Following four years as MASC Coordinator, Joanna Friesner assumed the role of NAASC Coordinator in 2010.
4. Scott Poethig received NSF funding to support participants of the 2009 ICAR in Scotland. Those funds, combined with remaining NSF funds from 2008, supported full funding for 9 participants including under-represented minority undergraduate/graduate students, postdoctoral scholars, and faculty at minority serving institutions or historically black colleges/universities. Also supported were travel grants to 14 graduate students, postdocs, and young faculty, and 12 invited U.S. speakers.
5. Committee service: Caren Chang and Scott Poethig continue to serve on the ABRC advisory committee while Julian Schroeder serves on both the ABRC and TAIR advisory committees

The International Conference on Arabidopsis Research (ICAR) Returns to Madison

The ICAR is currently on a 3 year conference site rotation: North America, Europe, and Asia/Pacific Rim. The 22nd ICAR will be held back in the US at the University of Wisconsin, Madison, from June 22-25, 2011. The lead organizers from NAASC are Mark Estelle (UC San Diego) and Jane Glazebrook (University of Minnesota) with assistance from the NAASC Coordinator, Joanna Friesner.

Reduction in TAIR Funding and Workshops to Address Bioinformatics in the Arabidopsis Community

1. The Arabidopsis Information Resource (TAIR) is a vital resource to the Arabidopsis Community. It maintains the Arabidopsis genome sequence and updates gene annotations regularly. It is also the portal to ordering stocks from ABRC and it acts as a central information point for the worldwide community including functional genomics projects, the Multinational Arabidopsis Steering Committee, and the annual Arabidopsis conference. TAIR's previous 5 year NSF grant ended in 2009 and its recent renewal was for reduced funding that will severely affect its existence. The renewal provides level funding for one year (September 2009 - August 2010) followed by steeply decreasing budgets (75%, 50% and 25% of the current year) for the remaining three years. A Nature article, with community comments, was published last fall entitled 'Plant genetics database at risk as funds run dry.' Published online 18 November 2009, Nature (462): 258-259. In order to address the bioinformatics needs of the community and discuss approaches for long-term funding of databases, including TAIR, two community workshops are scheduled for the first half of 2010 (see below).
2. In recent years, international projects have generated vast volume of data and resources, contributing to our understanding of the fundamental processes in plant biology. As sequencing technologies continue to improve and the cost decreases, genomics is generating massive amounts of new data in the public domain in a wide variety of data formats. An international, coordinated effort is needed to manage the vast datasets and infrastructure and effectively leverage these data and resources. NAASC is organizing one of a pair of workshops on the long-term informatics and database needs of the Arabidopsis community. The first workshop, organized by MASC in the UK in April, 2010, will provide a forum for open discussions about the current and future informatics needs of the community. The second workshop, organized by NAASC in the US in May, 2010, will discuss informatics, databases and infrastructure technologies as well as examples of approaches used from other model communities. One goal of the US workshop is to discuss long-term bioinformatics storage including sustaining support for TAIR. Outcomes of the workshops will be presented to the community at the Arabidopsis conference in Japan (June 6-10, 2010). Reports from the workshop will be posted at the MASC pages publicly online at TAIR.
US and UK organizers of the Bioinformatics workshops plan to present their findings as part of a larger community discussion during a workshop at the 2010 ICAR in Japan.

New Online AT2010 Project Resource at TAIR

http://arabidopsis.org/portals/masc/2010_resources.jsp

Cataloging of publicly-available data and resources generated by NSF-funded AT2010 projects began in 2006 by the MASC Coordinator (Joanna Friesner). The goal was to provide a service to the community by developing a centralized resource listing project websites, databases, investigator contact information, and most importantly, the availability to the community of data and physical resources. The desired outcomes of this resource are increased sharing of knowledge and resources and leveraging of the gains achieved through 2010 project funding.

The Coordinator, assisted by other Arabidopsis resource experts, culled information from public sources and followed-up with investigators by email and phone conversations as needed. Responses, if received, were used to update the table. Those involved diligently tried to ensure the accuracy of their information. However, there are bound to be omissions and inaccuracies, which we hope to correct through community input. Information on corrections and additions to the online resource can be found at the TAIR URL above. Information to populate the table came from these sources:

- NSF award abstract pages
- Project websites
- TAIR
- ABRC
- Feedback from project PIs obtained through contacts by TAIR and the MASC Coordinator

AT2010 Project Update and Special Session at 2010 ICAR

1. January 12, 2010 was the final call for proposals to the National Science Foundation (NSF)-sponsored 2010 project which aims to determine a function for all genes in *Arabidopsis thaliana*. Since its inception the project has funded proposals in two main areas: proposals that address gene function directly and proposals that develop enabling tools and resources for functional genomics research. Since the first awards were granted in 2001, 150 awards encompassing 120 diverse projects have been funded (through fiscal year 2009). During the project, two U.S. and one European community workshops were held to evaluate the success and course of the project and to strategize for future Arabidopsis genomics funding. The results of these workshops (2020 Vision for Biology: The Role of Plants in Addressing Grand Challenges in Biology; EU 2020 European Vision for Plant Science, and Mid-course Evaluation of 2010 Program) can be found at TAIR (http://arabidopsis.org/portals/masc/masc_docs/masc_wk_rep.jsp).
2. Special 2010 Session: The 21st ICAR will include a session to honor the NSF AT2010 and related genome-oriented projects. This session will feature speakers who have been funded by the 2010 project as well as representatives of GARNet (UK), RIKEN (Japan) and AFGN (Germany). Invited speakers for

this session will be Mary Lou Guerinot (US), Rick Vierstra (US), Andrew Millar (UK), Kazuo Shinozaki (Japan), and Klaus Harter (Germany).

Several Notable Research Breakthroughs Involving United States Researchers

The Human Epigenome- Decoded- a Time Magazine 'top scientific discovery'

Humans and plants share many things, including a propensity to methylate their DNA. Changes in DNA methylation have been associated with a variety of heritable "epimutations" in Arabidopsis, and are common cause of cancer in humans. The first comprehensive pictures of genomic patterns of DNA methylation in any organism were provided for Arabidopsis by the Jacobsen and Ecker labs. This year, the Ecker lab used the approach they developed for Arabidopsis to catalogue genome-wide DNA methylation in a human embryonic stem cell and a fetal fibroblast cell line. Remarkably, DNA methylation profiles differed significantly between these cell lines; furthermore, the embryonic stem cell line had a significant amount of non-CG methylation--a type previously thought to be extremely rare in humans (1). This study was the first of its kind for humans and was cited at the one of the "top ten scientific discoveries" of 2009 by Time magazine (2).

References:

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- (2) www.time.com/time/specials/packages/article/0,28804,1945379_1944416_1944418,00.html

ABA Receptors- a Science Magazine 'scientific breakthrough of the year (2009)'

Receptors for the plant hormone abscisic acid (ABA) have long been sought. In 2009 international groups of researchers from the US and Europe led by Sean Cutler and Erwin Grill identified a new class of ABA receptors that encode START domain proteins, presently named "PYR/RCAR" proteins (1,2). Functional biochemical, genetic, proteomic and structural analyses together provide strong evidence that this family of PYR/RCAR proteins encode the long sought major ABA receptors that control ABA-induced abiotic stress resistance and developmental responses (1-7). The discovery of this ABA receptor family was named as one of the top 'scientific breakthroughs of the year' by Science magazine (December 18, 2009, Vol 326, p. 1600.) For more information on this breakthrough, please see the research highlights section of the MASC report.

References:

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- (3) Miyazono K, Miyakawa T, Sawano Y, Kubota K, Kang HJ, et al. (2009) Structural basis of abscisic acid signalling. *Nature* (462): 609-14
- (4) Nishimura N, Hitomi K, Arvai AS, Rambo RP, Hitomi C, et al. (2009). Structural mechanism of abscisic acid binding and signaling by dimeric PYR1. *Science* (326): 1373-9
- (5) Melcher K, Ng LM, Zhou XE, Soon FF, Xu Y, et al. (2009) A gate-latch-lock mechanism for hormone signalling by abscisic acid receptors. *Nature* (462): 602-8
- (6) Santiago J, Dupeux F, Round A, Antoni R, Park SY, et al. (2009) The abscisic acid receptor PYR1 in complex with abscisic acid. *Nature* (462): 665-8
- (7) Yin P, Fan H, Hao Q, Yuan X, Wu D, et al. (2009) Structural insights into the mechanism of abscisic acid signaling by PYL proteins. *Nat. Struct. Mol. Biol.* (16): 1230-6

National Academy of Science Newly elected members

Philip Benfey (Duke University) and Jian-Kang Zhu (UC Irvine) were recently elected to the National Academy of Science