

Updates from the IAIC- what's been happening, what's planned, how to get involved

June 16 2013- In This Newsletter

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In the past year, the focus of the [International Arabidopsis Informatics Consortium](#) has been to facilitate progress on the effort to secure funding for a new Arabidopsis Information Portal (AIP). The intent is to produce a novel, integrated, distributive, international framework with which to address the informatics needs of the Arabidopsis community now and in the future, while providing a smooth transition from the current TAIR-based central database structure to this stable, sustainable, long-term structure.

Current Status of AIP Funding Efforts:

The AIP PIs, led by Chris Town, were asked by NSF to develop a detailed "Project Execution Plan (PEP)" in preparation for reverse site visit that then took place in late April 2013. Since that time the PIs are continuing to refine the PEP in response to the site visit team's concerns and NSF's desire for a fully detailed PEP. It is hoped that a mutually acceptable PEP will be achieved in the next 1-2 months.

Progress on maintaining the Arabidopsis community database: TAIR to AIP

The IAIC was initiated in 2010 by members of the Arabidopsis community in response to the rapid growth in the size and complexity of Arabidopsis data combined with an expected reduction in funding for TAIR, the community's primary Arabidopsis information database. A major IAIC goal is to facilitate development of a novel, integrated, distributive, international framework with which to address the informatics needs of the Arabidopsis community now and into the future, while providing a smooth transition from the current TAIR-based central database structure to this stable, sustainable, long-term structure.

A "Design Workshop" was convened in December 2011 with the goal to develop both the user functionalities and the technical requirements for the future Arabidopsis Information Portal (AIP). The workshop included wet-lab plant biologists, computer programmers, and infrastructure experts.

In short, their mission was to consider how to build the AIP, how to fund it, how to involve the broader community, and how to develop an effective action plan to implement workshop recommendations. Meeting outcomes included a white paper that was published in *The Plant Cell* in June 2012 and a draft of the AIP technical requirements document. [Link to Publications.](#)

In the months following the Design Workshop, IAIC leaders and others from the North American and Multinational Arabidopsis Steering Committees facilitated the formation of an expert team to develop a funding proposal to establish the AIP. Chris Town of the J. Craig Venter Institute and Matt Vaughn of the iPlant Collaborative emerged as leaders in the

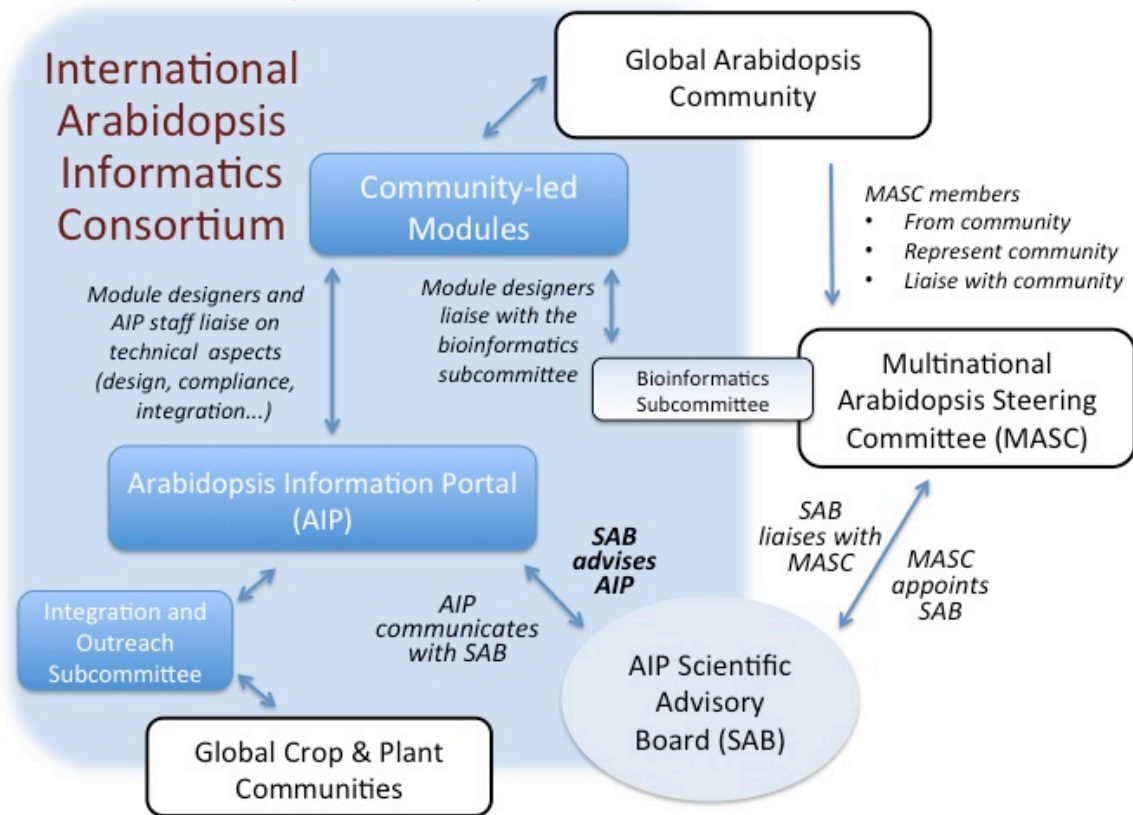
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proposal effort, along with several colleagues. In close consultation with community leaders, Town et al. submitted a proposal to the U.S. National Science Foundation in September 2012. A funding decision has not yet been issued.

Some key points about the AIP and updates on progress.

- (1) Once implemented, AIP will provide a long-term replacement resource for TAIR users.
- (2) The AIP, largely via a network of modules provided by individual PIs, will provide access to, plus consolidate and keep current the large and diverse data sets generated by, and relevant to, research on Arabidopsis and other plant species.
- (3) Where appropriate, the AIP project expects to make use of the existing iPlant infrastructure and code base.
- (4) The AIP will proactively seek out, aggregate, integrate and present data.
- (5) TAIR staff will assist in migrating the TAIR 'legacy data' into the AIP (data are already being moved to iPlant).
- (6) A community-elected Scientific Advisory Board (SAB), described below, will provide direction and oversight for the AIP.
- (7) Stock center integration is included in a proposal submitted by Sean May to the UK BBSRC.

The Arabidopsis and plant communities & the IAIC



TAIR transition, IAIC Steering Committee, and the Scientific Advisory Board

1. TAIR-to-iPlant Collaborative (iPC) transition: As of March 15, 2013, most TAIR software has been migrated to run on iPC hardware. The TAIR interface will continue to be available at the same URL (<http://arabidopsis.org>) after the migration is complete, but the URL will direct traffic to the TAIR software running on iPC servers.
2. July 2013: The Steering Committee (SC), established in June 2010, concludes their formal service at ICAR 2013. SC members: Blake Meyers (Interim IAIC Director), Ruth Bastow, Jim Beynon, Volker Brendel, Rion Dooley, Erich Grotewold, Nick Provart, Dan Stanzione, and Doreen Ware. Dr. Meyers will continue supporting the IAIC in his role for the duration of the NSF grant that supports IAIC activities (NSF Award #1062348).
3. The inaugural Scientific Advisory Board (SAB), appointed in 2012, includes both wet-lab biologists and bioinformaticians. Inaugural members appointed February 2012:
 - Gloria Coruzzi- USA- Areas of interest in plant systems biology: A systems approach to nitrogen networks and the Virtual Plant; Comparative genomics of seed evolution.
 - Kazuki Saito- Japan- Area of interest in plant metabolites: Mechanism and regulation of the production of useful metabolites in plants through genomics and post-genomics approaches.
 - Magnus Nordborg- Austria- Area of interest in population genetics: Genetic basis of adaptation in diverse organisms with a focus on Arabidopsis.
 - Mark Estelle- USA, Committee Chair- Area of interest in plant development: Plant auxin response pathways.
 - Mark Forster- UK- Areas of interest in informatics: Data and information standards, software tools, and bioinformatics.
 - Paul Kersey- UK- Areas of interest in bioinformatics: Non-vertebrate Ensembl genomes resource development; Programmatic and interactive interfaces.
 - Xuemei Chen- USA- Areas of interest in plant development: Floral patterning; Small RNA biology.

IAIC Activities and Priorities

Upcoming IAIC Community Workshop:

International Arabidopsis Informatics Consortium: The transition from TAIR to the AIP at the International Conference on Arabidopsis Research (ICAR) June 2013: Sydney, Australia.

This workshop will present the IAIC's efforts to enable an access point for stable data and resources to serve the global plant research community for Arabidopsis bioinformatics. An additional aim is to engage meeting participants in a discussion that will (1) allow input into the development of this new informatics resource (the Arabidopsis Information Portal, AIP) and (2) provide concrete examples of how the community can contribute to and benefit from it. The workshop will include a progress report on the transition process from TAIR to the AIP including the impacts to the global research community in regards to data and resource continuity. The core of the workshop's content will be forward-looking and include updates on initial AIP planning and development, and presentations by researchers and experts that have designed,

or are proposing to design, resources that may be integrated into the AIP. The workshop will conclude with an open forum on the AIP development process, global coordination of efforts, and implications to basic research in Arabidopsis and other plants. [Workshop Program Link](#)

Upcoming Areas of Focus for the IAIC

(1) Module development:

Following initiation of the AIP, top IAIC priorities will be (1) to facilitate integration of existing community modules into the portal and (2) to work with community members that are interested in developing modules for integration into the AIP. Goals include: identifying within the community the need for different modules; seeing which of those have no identified leaders/buildings; recruiting community members to build new modules; engaging in discussions about how to build them; identifying functional commonalities among diverse datasets; and clarifying or facilitating interactions with the AIP. Plans for module-related events are underway including a meeting held in conjunction with the International Conference on Arabidopsis Research at the University of British Columbia in Vancouver, Canada (July 28-August 1, 2014).

(2) Outreach to other plant communities:

In order to leverage the resources of the Arabidopsis community and maximize the efficiency of developments across plant communities, a key next step is to begin engaging more fully in outreach and integration with other plant communities including crop researchers. Plans for international efforts will be augmented by interactions with the Multinational Arabidopsis Steering Committee (MASC) and other plant networks such as the American Society of Plant Biologists (ASPB).

Recent IAIC Community Workshop:

The IAIC and the development of the AIP at the Plant and Animal Genome meeting January 2013, San Diego.

This workshop presented (1) outcomes of the 2012 Design Workshop whose primary goal was to assemble plant biologists and computational experts to productively tackle the challenge of building the AIP in a sustainable, internationally-driven manner, (2) a community update on TAIR and its transition as the current primary data repository, (3) future funding needs and current opportunities to support all aspects of the Consortium, from the core portal to future and existing modules/projects that can link to the core portal (4) and what this all means to the community for data and resource continuity in support of basic research in Arabidopsis and other plants. Additional presentations from community members highlighted examples of resources that could be integrated and linked with a future (AIP). [Workshop Program Link](#)

Several Highlights

- Eric Lyons, University of Arizona, presented progress on the EPIC-CoGe Browser project to develop an easy-to-use system for visualizing plant epigenetic data. The need for the project is clear; while vast amounts of epigenetic data exist, they aren't easily accessible in one location, and most researchers lack the computational resources to manage such

large datasets. The project is a partnership between three NSF-supported projects: the iPlant Collaborative (iPC), Comparative Genomics (CoGe), and the Epigenomics of Plants International Consortium (EPIC), with additional start-up support provided by the Gordon and Betty Moore Foundation. The project's key synergies stem from leveraging iPC's significant computational resources which provide needed scalability, CoGe's data management and visualization systems, and the increasing number of epigenetic datasets produced by the Arabidopsis community, which is represented through the EPIC Research Coordination Network. The project's main objectives are to store, and allow access to, all public plant epigenetic datasets; and provide the capability for users to selectively visualize datasets, including their own. The Browser will present a number of interconnected tools that will allow users to manage, analyze, and view datasets, all in a user-friendly 'dashboard'. While Arabidopsis datasets are the first to be incorporated, the goal is to eventually include data from all plant species. More information can be found at: <http://genomevolution.org/wiki/index.php/EPIC-CoGe>

- Sylva Donaldson, University of Toronto, talked about informatics modules from the Bio-Array Resource (BAR). The BAR resource contains a number of web-based tools that are mostly focused on viewing, organizing, and analyzing Arabidopsis datasets. For example, the eFP Browser allows users to visualize expression of user-selected Arabidopsis genes of interest, drawing from a number of community-generated. Users can see a gene's expression level and location within Arabidopsis organs, tissues, and cells, and the browser provides links to the available data sources and relevant literature. Another BAR tool facilitates cross-species homolog expression comparisons, such as between Arabidopsis, soybean, and rice. This tool could facilitate transfer of knowledge derived from using Arabidopsis, a model plant, to crops with economic value. BAR has, or is developing a number of other useful tools that will enable plant science. These tools, currently available at BAR, could be similarly integrated into the future Arabidopsis Information Portal (AIP). Funding to assist in this endeavor has recently been secured through a grant from Genome Canada. More information can be found at: <http://bar.utoronto.ca>

The IAIC was formed from the ground up- by the Arabidopsis community, for the Arabidopsis community. Key next steps will be to involve more plant researchers from around the world that use and provide informatics resources for Arabidopsis and other plants used for research.

If you would like to get involved, please visit the IAIC Website or join an upcoming IAIC event. Feedback is welcome!

Sincerely,
Blake Meyers, IAIC Interim Director
University of Delaware
Member of the North American Arabidopsis Steering Committee