The iPlant Collaborative: what potential does it have for advancing plant research?

I'm writing to introduce members of the plant biology research community to the iPlant Collaborative (www.iplantcollaborative.org) and to encourage you to think about how iPlant can help your research. iPlant is a community endeavour, funded by the US National Science Foundation, to build a cyberinfrastructure for plant biology. It's prime directive is that it is a service provided *by, for and of the community*, meaning that everything we do is driven by community needs and priorities. A second guiding principle is that the cyberinfrastructure designs must be driven by specific, compelling, and tractable Grand Challenges in the plant sciences. Finally, the Collaborative must serve the entire breadth of plant sciences, including ecology, evolution and organismic biology as much as the molecular, cellular and developmental disciplines. In order to ensure Collaborative resources are dedicated to the most compelling Grand Challenges in the Plant Sciences, we are inviting all members of the plant biology research community, as well as interested members of the math, statistics, computer science and MIS communities, to submit Grand Challenge proposals to iPlant's external Board of Directors. The BoD will select project proposals that are tractable, scientifically excellent, and of broad utility to the greatest numbers of stakeholders. The Collaborative will then work with Grand Challenge team members to develop the infrastructure (number crunching, data storage and management, ontology development, visualization engines, algorithm development) needed by the project. New Grand Challenge projects will be initiated each year.

To jumpstart your thinking about potential Grand Challenge projects, you might want to consider participating in the iPlant Collaborative's April 7-9 kickoff conference at Cold Spring Harbor Lab, either in person or via our free, live, interactive webcast. Participation in the conference is NOT necessary for participation in the Collaborative, but may be helpful in understanding how best to participate. International participation is both welcome and encouraged. Details about the conference and its webcast are available at the iPC portal (www.iplantcollaborative.org).

To avoid misunderstandings, I'd like to address some common misconceptions about the Collaborative's mission.

Most importantly, ***the project is NOT based on the idea that "if we build it, they will come."*** Rather, all projects are community-initiated. A group of motivated community researchers must come together to propose a project that will benefit from infrastructure development before we commence work. However, we do expect that components of the infrastructure that are developed for one project will be reused for other projects, and in fact, that all the components that we build will be of general utility

to plant science. Indeed, all aspects of the cyberinfrastructure will be open to all members of the research and lay communities. So, the first challenge we face is to build an inclusive community dialog to identify the most compelling and tractable plant science Grand Challenges that will benefit from computational approaches and cyberinfrastructure development. You can join the dialog right now by signing into the iPlant community WIKI at iplantcollaborative.org/resources/community-wiki.

Community-organized Grand Challenge Teams are the most direct way to participate in the iPlant Collaborative. Any group of researchers, of any size, can start a Grand Challenge Team, or propose a Grand Challenge Workshop to develop one. As discussed earlier, a broadly-representative external Board of Directors (iplantcollaborative.org/about-ipc/board-of-directors) will select 2-4 high priority projects for the initial round of cyberinfrastructure development, scheduled to begin in late 2008, early 2009. The iPC's Integrated Solutions Team, led by Lincoln Stein (CSHL) and Sudha Ram (UA), will work with each GCT to design prototypic "Discovery Environments," consisting of analytic tools, visualization engines, collaborative interfaces, and data storage, to address its needs. Successful development of these prototype environments will require close interaction between IS Team and the GC Team members.

Potential Grand Challenge Teams are not required to participate in the kickoff conference in April in order to take part in the iPlant Collaborative. The conference is primarily informational, as well as an opportunity for plant researchers, MIS researchers and computer scientists to get to know one another. Attendance at the April conference is **not** obligatory for participation in the project.

You do not need to come to Long Island, NY to attend the kickoff conference. The conference will be webcast free in its entirety, and virtual attendees will be able to ask questions, make comments and otherwise interact with speakers and other participants. For those who cannot attend the live webcast, we will archive the conference for later viewing. Another suggestion I would offer would be for interested organizations to arrange a webcast location (requiring only a computer, web access and a projector) where local researchers could come together to participate in and discuss the conference - we will have facilitators to ensure all persons can participate in discussion. Some institutions are also holding pre-meetings to discuss the project.

For those who wish to attend in person, but who have financial restrictions, we will be able to waive the registration and housing fees for a limited number of individuals. Please don't hesitate to ask if you feel you need this assistance.

In order to plan the webcast capacity, we do ask that both physical and virtual attendees pre-register for the meeting at the iPlant Collaborative web portal.

The conference is NOT a bioinformatics meeting -- it is a biology conference aimed at defining which are the most compelling and tractable grand challenges in the plant sciences that might benefit from cyberinfrastructure development. We have designed a program that we hope will be

broadly interesting to all members of the plant research community. The draft program is available at iplantcollaborative.org/images/documents/ipc_gc_draft.pdf

The iPlant Board of Directors has been selected by an independent body. It is not beholden in any way to the iPlant Collaborative's principal investigators or staff. To ensure that the BoD reflects community priorities, and not the research interests of the iPC PI's or staff, the Board of Directors was appointed through a bootstrapping process, via an independent Nominating Committee. One third of the Board will refresh each year.

The composition of both the Board of Directors and the Nominating Committee can be found at the project's web portal, www.iplantcollaborative.org. To date, the Board includes biologists Rob Last (chair), Sabeeha Merchant, Jim Birchler, Toby Kellogg, Jose Arguello, Susan Singer, Russ Monson, David Rand, Jean-Philippe Vielle, and Mark Westoby. An equal number of Board members represents the computing research community, from bioinformatics to computational biology to computer science, information science, and computing infrastructure (Eric Mjolsness, Steve Mayo, Fran Berman, Gwen Jacobs, Laurie Kirsch, Mohan Tanniru).

iPlant is a Major Opportunity to Enhance the Information-Management Resources Available to the Broad Plant Science Community. Lastly, let me emphasize the great opportunity that iPlant presents for the entire plant sciences community. The iPlant Collaborative is funded by NSF's Plant Sciences Cyberinfrastructure Collaborative program in the Emerging Frontiers division of BIO, as a $50M grant over 5 years to develop a cyberinfrastructure for the plant sciences, from molecules, genes, and cells to organisms, ecosystems and evolution. As plant biologists, we are quite fortunate that our community has been given this unique opportunity to lead biology cyberinfrastructure development in the service of trying to solve biology's major, unanswered questions. The reason the plant biology community has been entrusted with this opportunity and responsibility is, I believe, because we have shown exceptional openness, creativity and leadership across disciplines and experimental organisms over many years. Had the plant sciences not been chosen for this project, these funds would have gone instead to another area of the biological or physical sciences. This is an extraordinary opportunity for the whole community, and one that we can all feel proud to have earned.

Feel free to pass this letter along to your colleagues. I look forward to seeing many of you at CSHL, either online or in person, for what I believe promises to be a pivotal event for plant biology. More information about the project is available at the iPlant web portal, and I am always available to discuss the project with you person to person.

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