

## 2008 Systems Biology Subcommittee Report

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The field of systems biology has advanced rapidly over the past year. Although there is no universally accepted definition of systems biology, most would agree that it encompasses efforts to find the interconnections among cellular components, emergent properties and network dynamics. The MASC Systems Biology and Bioinformatics Subcommittees are planning a joint workshop on "Frontiers in Plant Systems Biology" for the upcoming Arabidopsis conference in Montreal, 2008. The goal is to bring together groups that produce, integrate and model data from a systems perspective. There will be talks that address the new frontiers in genomic data collection for systems biology and the challenges in data storage, analysis and integration. There will be contributions from biologists performing cutting-edge systems research. Contributors are requested to discuss the state-of-the-art as well as provide a vision for systems research in plants. The hope is that this workshop will stimulate discussion on the role of systems biology research in addressing the grand challenges in plant biology. The workshop will discuss interactions with the new NSF-funded iPlant Collaborative initiative. The workshop will provide a means to communicate the goals of the iPlant initiative as well as to discuss how best to use iPlant to advance systems biology research in Arabidopsis. The workshop has invited four leaders in the field of systems biology. The draft program includes: [1] Introduction including a brief discussion of the 2020 workshop report, [2] Data generation for systems biology (Xing Wang Deng, Yale University), (3) Data integration (speaker: Chris Town, J. Craig Venter Institute), [4] Data modeling (speaker: Gloria Coruzzi, New York University), [5] The iPlant initiative (speaker: Steve Rounsley, The University of Arizona ), [6] Open discussion.

- (1) As applied to Arabidopsis research there were several notable publications, of which a few examples are listed below. Baerenfaller K, Grossmann J, Grobei MA, Hull R, Hirsch-Hoffmann M, Yalovsky S, Zimmermann P, Grossniklaus U, Gruissem W, Baginsky S. Genome-Scale Proteomics Reveals Arabidopsis thaliana Gene Models and Proteome Dynamics. Science. 2008 Apr 24 [Epub ahead of print]
- (2) Lu Y, Savage LJ, Ajjawi I, Imre KM, Yoder DW, Benning C, Dellapenna D, Ohlrogge JB, Osteryoung KW, Weber AP, Wilkerson CG, Last RL. New Connections across Pathways and Cellular Processes: Industrialized Mutant Screening Reveals Novel Associations between Diverse Phenotypes in Arabidopsis. Plant Physiol. 2008 Apr;146(4):1482-500.
- (3) Brady SM, Orlando DA, Lee JY, Wang JY, Koch J, Dinneny JR, Mace D, Ohler U, Benfey PN. A high-resolution root spatiotemporal map reveals dominant expression patterns. Science. 2007 Nov 2;318(5851):801-6.