

# 2013

4<sup>th</sup> Annual Scientific Advisory Board Review Meeting  
on North Carolina State University  
NSF Plant Genome Research Program Project  
June 25 & 26, 2013  
Raleigh, NC

Board Members

Wout Boerjan, Ghent University  
Richard Dixon, Samuel Roberts Nobel Foundation  
Catherine Lapierre, AgroParisTech  
Debra Mohnen, University of Georgia

Project DBI-0922391  
(Sept. 2009 – Sept. 2013)

## **Regulation and modeling of lignin biosynthesis**

(Progress report: September 15, 2009 to May 31, 2012)

PI

Vincent L. Chiang, NCSU

CoPIs

Ron Sederoff, NCSU  
John Ralph, UW, Madison  
Joel Ducoste, NCSU  
Fikret Isik, NCSU

**Room 463, Monteith Research Center, Centennial Campus**

**AGENDA**

**June 25**

8:30 am Transportation of Board Members from hotel to meeting location

9:00 am Welcome and overview of the project

**Vincent Chiang**

**Project Progress Report Presentations**

**Transgenics:**

9:15 am An Overview of Current Status on Transgenic Plant Production and Data Acquisition

**Jack P. Wang**, Chenmin Yang, Rui Shi, Hsi-Chuan Chen, Quanzi Li, Ying-Chung Lin, Kevin Lin, Jie Liu, Punith Naik, Joel Ducoste, Cranos Williams, Fikret Isik, Christopher Shuford, Philip Loziuk, Zhichang Yang, David Muddiman, Jina Song, Sermsawat Tunlaya-anukit, Ying-Hsuan Sun, Chris Smith, Ron R. Sederoff, and Vincent L. Chiang

**Proteomics and Metabolomics:**

9:45 am Development of Discovery and Targeted Proteomic Methods for Elucidating Biologically Pertinent information within the Monolignol Biosynthetic Pathway by Mass Spectrometry

**Philip L. Loziuk**, Wei Li, Jack Wang, Quanzi Li, Ronald R. Sederoff, Vincent Chiang, David C. Muddiman

10:30 am Quantitative Metabolic Profiling of the lignin Biosynthetic Pathway

**Jie Liu**, Zhichang Yang, Christopher M. Shuford, David C. Muddiman, Ron R. Sederoff and Vincent L. Chiang

**11:15 am Break**

11:30 am Ptr-miR397a is Negative Regulator of Laccase Genes Affecting Lignin Content in *Populus trichocarpa*

Shanfa Lu, Quanzi Li, Hairong Wei, Mao-jun Chang, Sermsawat Tunlaya-Anukit, Hoon Kim, Jie Liu, Jingyuan Song, Ying-Hsuan Sun, Lichai Yuan, Ting-Feng Yeh, Ilona Peszlen, John Ralph, Ronald R. Sederoff, **Vincent L. Chiang**

**12:00 Lunch**

**Systems Modeling:**

1:00 pm Lignin Systems: Database and Website ([www.Ligninsystems.org](http://www.Ligninsystems.org))

**Chris Smith**, Ying-Hsuan Sun, Rui Shi, Jie Liu, Ron R. Sederoff  
Vincent L. Chiang

1:20 pm System Biology of Lignin Biosynthesis in *P. trichocarpa*:  
Heteromeric 4-Coumaric acid: CoA Ligase (4CL) Protein Complex  
Formation, Regulation and Numerical Modeling

Hsi-Chuan Chen, Jina Song, Joel Ducoste, Christopher M. Shuford,  
Jie Liu, Quanzi Li, Rui Shi, Fibret Isik, David C. Muddiman, **Cranos  
Williams, Jack P. Wang**, Ronald R. Sederoff, Vincent L. Chiang

**3:00 pm Break**

3:15 pm Development of a Unifying Regulatory Metabolic Network Model for  
Monolignol biosynthesis in *P. trichocarpa*

**Joel Ducoste, Punith Naik, Jack P. Wang**

4:30 pm Meeting Adjourns, transportation of Board Members to hotel

## June 26

9:00 am Transportation of Board Members from hotel to meeting location

### Genetic Regulatory Networks for Lignin Biosynthesis:

9:15 am *P. trichocarpa* Differentiating Xylem Protoplasts as a Model System for Studying a Transcriptional Regulatory Hierarchy in Wood formation

**Ying-Chung Lin**, Wei Li, Ying-Hsuan Sun, Sapna Kumar, Hairong Wei, Quanzi Li, Sermsawat Tunlaya-Anukit, Ron R. Sederoff, Vincent L. Chiang

9:45 am A Top-down Graphic Gaussian Model Algorithm (GGM) for Reconstructing Gene Regulatory Networks (GRN) using RNA-seq Data from *P. trichocarpa* SDX protoplasts

**Hairong Wei**

10:15 am A Bottom-up Graphic Gaussian Model Algorithm (GGM) for Reconstructing Gene Regulatory Networks (GRN) controlling Biological Pathways

**Hairong Wei**

**10:30 am Break**

10:45 am A Bottom-up Graphic Gaussian Model Algorithm (GGM) for Reconstructing Gene Regulatory Networks (GRN) controlling Biological Pathways

**Sermsawat Tunlaya-Anukit and Hairong Wei**

11:15 am Splice Variant of the SND1 Transcription Factor is a Dominant Negative of SND1 Members and their Regulation in *P. trichocarpa*

**Ying-Chung Lin**, Quanzi Li, Ying-Hsuan Sun, Jina Song, Hao Chen, Xing-Hai Zhang, Ron R. Sederoff, and Vincent L. Chiang

**12:00 am Lunch**

1:00 pm Project Progress Summary

**Vincent L. Chiang**

**Scientific Advisory Board Session**

1:15 pm Preparation of Scientific Advisory Board annual report to NSF

**Scientific Advisory Board members only**

2:30 pm Comments and suggestions from the Scientific Advisory Board members

Board members and all project personnel

3:00 pm **Meeting Adjourns**, transportation of Board Members to hotel