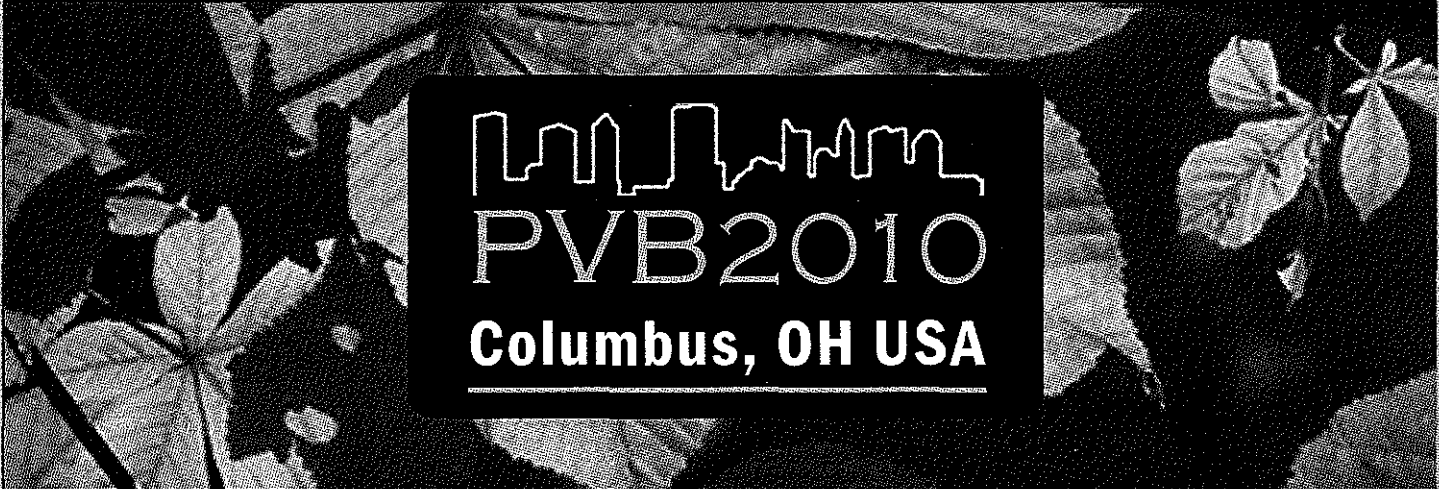



*international conference
on plant vascular biology 2010*




PVB2010
Columbus, OH USA

Hosted by The Ohio State University and Iowa State University

7.24.10-7.28.10

Plant Vascular Biology 2010

July 24-28, 2010

The Fawcett Center, The Ohio State University

Sponsors

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Integrative Organismal Systems

Plant Vascular Biology 2010
Program Schedule
(The Fawcett Center, The Ohio State University)

FRIDAY, JULY 23

Participant arrival; Shuttle bus transports participants from Port Columbus International Airport to campus dorms and hotels.

SATURDAY, JULY 24

8:30-12:30 Shuttle transports participants from campus dorms and hotels to The Fawcett Center. The shuttle runs continuous loops between these destinations during these hours. Continental breakfast provided at The Fawcett Center.

8:30-1:00 Registration; Poster set-up (all posters will be on display throughout the conference)

11:30-12:45 Lunch

1:00-1:30 Welcome and Introduction

1:30-2:30 Keynote address: William Lucàs (University of California at Davis, USA)
"The Plant Vascular System: Its Secrets Hold Great Promise for Sustainable Food, Fiber and Energy Initiatives"

Session I. Development of Vascular Tissues 1
Co-Chairs: Ji-Young Lee & Yka Helariutta

2:30-3:00 Thomas Berleth (University of Toronto, Canada)
"Control of Leaf Vascular Patterning"

3:00-3:30 Karl J. Oparka (University of Edinburgh, UK)
"Super-resolution Imaging of the Phloem"

3:30-4:00 Coffee break

4:00-4:30 Hiroo Fukuda (University of Tokyo, Japan)
"An Arabidopsis Cell Culture System Harboring Inducible VND6 - Cellular and Transcriptome Analyses of Tracheary Element Formation"

4:30-5:00 Zheng-Hua Ye (University of Georgia, USA)
"Molecular Dissection of Secondary Cell Wall Biosynthesis"

5:00-5:20 Short talk: William W. Adams III (University of Colorado, USA)
"Phloem Anatomy and Photosynthetic Capacity"

5:20-5:40 Short talk: Makoto Shirakawa (Kyoto University, Japan)
"Vacuolar SNAREs Function in the Formation of the Leaf Vascular Network by Regulating Auxin Distribution"

5:40-6:00 Short talk: Rebecca S. Lamb (The Ohio State University, USA)
"The Paralogous Poly(ADP-ribose) Polymerases RCD1 and SRO1 Control Vascular Patterning and Differentiation"

6:00-6:30 Group Photo

6:30-9:30 Reception and Social (The Fawcett Center)

8:00-10:00 Shuttle runs loops to transport participants back to campus dorms and hotels

SUNDAY, JULY 25

Session II. Development of Vascular Tissues U

Co-Chairs: Andrew Groover & Hiroo Fukuda

- 7:30-8:15 Shuttle transports participants from campus dorms and hotels to The Fawcett Center.
Continental breakfast provided at The Fawcett Center.
- 8:30-9:00 Ji-Young Lee (Boyce Thompson Institute for Plant Research, USA)
"Root Vascular Tissue Patterning Directed by Cell-to-Cell Communication"
- 9:00-9:30 Yka Helariutta (University of Helsinki, Finland)
"Cell Signaling during Root Procambial Development in Arabidopsis"
- 9:30-9:50 Short talk: Thomas Greb (Gregor Mendel Institute of Molecular Plant Biology, Austria)
"Microdissecting the Cambium: New Insights into Secondary Growth Regulation in Arabidopsis thaliana"
- 9:50-10:10 Short talk: Hans E. Waldenmaier (Miami University, USA)
"Gene Expression Patterns of Programmed Cell Death During Vascular Aerenchyma Formation in Seedling Roots of Glycine max cv. 'Yukihomare'"
- 10:10 - 10:40 Coffee break

Session IU. Secondary Growth in Woody Species

Co-Chairs: Mechthild Tegeder & David Granot

- 10:40-11:10 Andrew Groover (Institute of Forest Genetics, US Forest Service, USA)
"Evolution and Development of Vascular Cambium and Secondary Growth"
- 11:10-11:40 Vincent Chiang (North Carolina State University, USA)
"Regulation and Modeling of Lignin Biosynthesis: A Systems Biology Approach"
- 11:40-12:00 Short talk: Xin-Qiang He (Peking University, China)
"Polycomb Group Proteins Are Involved in Regulation of Plant Secondary Vascular Tissue Development"
- 12:00-12:20 Short talk: Rachel Spicer (Harvard University, USA)
"Auxin Transport in Populus during the Shift from Primary to Secondary Growth"
- 12:20 - 1:10 Lunch break

Session IV. Mechanisms of Vascular Transport I

Co-Chairs: John Patrick & Katarzyna Sokolowska

- 1:10-1:40 N. Michele Holbrook (Harvard University, USA)
"Physical and Physiological Constraints on Xylem Transport"
- 1:40-2:10 Norbert Sauer (FAU Erlangen-Nürnberg, Germany)
"Phloem and Nerve Cells - Common Proteins, Common Functions?"
- 2:10-2:30 Short talk: Barbara Demmig-Adams (University of Colorado, USA)
"Adjustment of Leaf Structure and Function to Cold Temperature"
- 2:30-2:50 Short talk: Michael R. Thorpe (Forschungszentrum Jülich, Germany)
"Briefly Arresting: The Mechanism for Transient Cessation of Phloem Transport after Abrupt Stimuli Remains Mysterious, Other Than in Legumes Where Calcium Triggered Dispersion of Forisomes Is Responsible"
- 2:50-3:10 Short talk: Hui Tian (University of Minnesota, USA)
"AtNaKRI Is a Phloem Mobile Protein Necessary for Phloem Function and Root Meristem Maintenance"
- 3:10-3:30 Short talk: Ziv Spiegelman (The Hebrew University of Jerusalem, Israel)
"LeCyp1s Involved in Long-distance Signalling in Tomato (Solanum lycopersicum) Plants"
- 3:30-4:00 Coffee break

Session V. Mechanisms of Vascular Transport H
Co-Chairs: Thomas Greb & Norbert Sauer

- 4:00-4:30 Robert Turgeon (Cornell University, USA)
"Regulation of Sucrose Transporter Activity in Tobacco Leaves"
- 4:30-5:00 Rainer Hedrich (Universität Würzburg, Germany)
"Sucrose- and H^+ - dependent Gating of the Power Horse of Phloem Loading SUC2"
- 5:00-5:30 John Patrick (University of Newcastle, Australia)
"Phloem Unloading of Resources - A Push-me Pull-me Phenomenon"
- 5:30-5:50 Short talk: Qiushi Fu (Cornell University, USA)
"Leaf Polar Metabolite Concentrations and Starch Levels in Relation to Phloem Loading Type"
- 5:50-6:10 Short talk: Mechthild Tegeder (Washington State University, USA)
"Phloem Loading of Amino Acids Affects Plant Metabolism and Productivity"
- 6:10-6:30 Short talk: Katarzyna Sokolowska (University of Wrocław, Poland)
"The Dynamics of the Symplasmic Transport in the Cambial Region"
- 6:30-10:00 Dinner, Refreshments and Poster Viewing
- 8:00- 10:00 Shuttle runs loops to transport participants back to campus dorms and hotels

MONDAY, JULY 26

Session VI. Mechanisms of Vascular Transport HI
Co-Chairs: Julia Kehr & Brian Ayre

- 7:30-8:15 Shuttle transports participants from campus dorms and hotels to The Fawcett Center.
Continental breakfast provided at The Fawcett Center.
- 8:30-9:00 David Braun (University of Missouri, USA)
"Genetic Regulation of Sucrose Transport into the Phloem"
- 9:00-9:30 Michael Grusak (USDA-ARS Children's Nutrition Research Center, USA)
"Micronutrient Trafficking in Plants: A Multi-compartmental Journey from the Rhizosphere to Seeds"
- 9:30-9:50 Short talk: David Granot (The Volcani Center, Israel)
"Role of Hexose Phosphorylating Enzymes in Vascular Development and Function"
- 9:50-10:10 Short talk: Ralf Metzner (Forschungszentrum Jülich, Germany)
"A Snapshot of Xylem Vessel - Stem Tissue Interactions: New Perspectives on Mineral Nutrient Transport"
- 10:10-10:40 Coffee break

Session VII. Vascular Trafficking and Development I
Co-Chairs: David Braun & Susanne Hoffmann-Benning

- 10:40-11:10 Julia Kehr (Centro de Biotecnología y Genómica de Plantas, Spain)
"Phloem RNAs, Nutrient Stress, and Systemic Mobility"
- 11:10-11:40 David Hannapel (Iowa State University, USA)
"The Long-distance Transport of a Full-length mRNA Mediates Development"
- 11:40-12:10 Paula Suarez-Lopez (Centre for Research in Agricultural Genomics, Spain)
"Involvement of a miRNA in the Long-distance Regulation of Potato Tuber Induction"
- 12:10-12:30 Short talk: Brian G. Ayre (University of North Texas, USA)
"Geminivirus-mediated Delivery of Florigen to Ancestral Cotton Uncouples Flowering from Photoperiod and Promotes Determinate Growth"
- 12:30-12:50 Short talk: Shweta Shah (Iowa State University)
"Photoperiodic Effect on Protein Profiles of Potato Petiole and Phloem"
- 1:00 Box lunch for free time and social

For participants choosing tours of Easton Mali and Short North, the shuttle bus starts to pick up at 1:00 pm from The Fawcett Center and sends to these destinations. The shuttle runs hourly loops among Fawcett Center - Hotels - Dorms - Short North - Easton Mall. The last return shuttle pick up from Easton Mali is 9:00 pm.

TUESDAY, JULY 27

Session VIII. Vascular Trafficking and Development II

Co-Chairs: Paula Suarez-Lopez & Jae-Yean Kim

7:30-8:15 Shuttle transports participants from campus dorms and hotels to The Fawcett Center.

Continental breakfast provided at The Fawcett Center.

8:30-9:00 Leslie Sieburth (University of Utah, USA)

"Long Distance Root-to-Shoot Signaling: Intersection between the bpsI Mobile Signal and Auxin"

Sieburth@biology.
utah.edu

9:00-9:30 David Jackson (Cold Spring Harbor Laboratory, USA)

"The Role of Protein Folding in Cell-Cell Protein Trafficking"

9:30-9:50 Short talk: Susanne Hoffmann-Benning (Michigan State University, USA)

"Identification of Putative Lipid Binding Proteins in the Phloem and Their Role in Plant Development and Stress Response"

9:50-10:10 Short talk: Sylvie Dinant (INRA-AgroParisTech Versailles, France)

"P-proteins in Sieve Elements: A Role in Macromolecular Trafficking?"

10:10-10:40 Coffee break

Session IX. Vascular Trafficking and Development III

Co-Chairs: Sylvie Dinant & Michael Thorpe

10:40-11:10 Andy Maule (John Innes Centre, UK)

"Omics Approaches to Defining the Plasmodesmal Proteome"

11:10-11:40 Patricia Zambryski (University of California at Berkeley, USA)

"Three Mutations, ise1, ise2, dse1, Affect Arabidopsis Embryo Development and Increase or Decrease Plasmodesmata Function"

11:40-12:00 Short talk: Byung-Kook (Brian) Ham (University of California at Davis, USA)

"PLASMODESMAL GERMIN-LIKE PROTEIN 1 (PDGLP1) Functions in Selective Cell-to-Cell Trafficking of Non-cell-autonomous Proteins (NCAPs)"

12:00-12:20 Short talk: Ikuo Nishida (Saitama University, Japan)

"Roles of RESTRICTED SUCRaSE EXPORT1 Pectate Lyase in Sucrose Translocation and Secondary Plasmodesmal Biogenesis in the Leaf Vein of Arabidopsis Source Leaves"

12:20-12:40 Short talk: Jae-Yean Kim (Gyeongsang National University, Korea)

"Callose Synthase, A Fine Tuner of Intercellular Movement of Signaling Molecules through Plasmodesmata"

12:40-1:30 Lunch break

1:30- 4:30 Coffee and Poster viewing

4:30-6:30 Poster Presentations by Authors I: Poster Numbers PI-P33 (Authors Need to Be at Posters)

6:30-7:30 Dinner

7:30-9:30 Refreshments and Poster Presentations by Authors II: Poster Numbers P34-P67 (Authors Need to Be at Posters)

8:00-10:00 Shuttle runs loops to transport participants back to campus dorms and hotels

WEDNESDAY, JULY 28

Session X. Biotic Plant Interactions 1
Co-Chairs: Na-Sheng Lin & Aardra Kachroo

- 7:30-8:15 Shuttle transports participants from campus dorms and hotels to The Fawcett Center.
Continental breakfast provided at The Fawcett Center.
- 8:30-9:00 Peter M. Gresshoff (The University of Queensland, Australia)
"Long-distance Chemical Signaling Facilitates Autoregulation of Nodulation in Legumes"
- 9:00-9:30 Ulrich Hammes (University of Regensburg, Germany)
"Differential Vascularization of Nematode-induced Feeding Sites"
- 9:30-10:00 Linda Walling (University of California at Riverside, USA)
"Phloem-feeding Whiteflies and the Evasion of Plant Defense"
- 10:00-10:20 Short talk: Fiona L. Goggin (University of Arkansas, USA)
"Influence of a Fatty Acid Desaturase in Tomato on Plant Defenses Against a Phloem-feeding Herbivore"
- 10:20 - 10:50 Coffee break

Session XI. Biotic Plant Interactions II
Co-Chairs: Linda Walling & Fiona Goggin

- 10:50-11:20 Daniel Klessig (Boyce Thompson Institute for Plant Research, USA)
"SA, Methyl Salicylate, Lipids, and Systemic Acquired Resistance - the Plot Thickens!"
- 11:20-11:50 Pradeep Kachroo (University of Kentucky, USA)
"Photoreceptors and Resistance Protein-mediated Signaling against Turnip Crinkle Virus in Arabidopsis"
- 11:50-12:10 Short talk: Ratnesh Chatrvedi (University of North Texas, USA)
"Identification of a Diterpenoid as a Vasculature Translocated Signal Associated with the Activation of Systemic Acquired Resistance"
- 12:10-12:30 Short talk: Aardra Kachroo (University of Kentucky, USA)
"RPGI-B Derived Resistance to AvrB Expressing Pseudomonas syringae Requires RIN4-like Proteins in Soybean"
- 12:30-1:30 Lunch break

Session XII. Biotic Plant Interactions III
Co-Chairs: Shmulik Wolf & Ulrich Hammes

- 1:30-2:00 Richard S. Nelson (The Samuel Roberts Noble Foundation, Inc., USA)
"Virus Transport: Diversity in Motion"
- 2:00-2:30 Michael E. Taliansky (Scottish Crop Research Institute, UK)
"Role of the Plant Nucleolus in Virus Movement through the Phloem"
- 2:30-2:50 Short talk: Na-Sheng Lin (Institute of Plant and Microbial Biology, Academia Sinica, Taiwan)
"Multiple Factors Coordinate the Movement of Satellite RNA Associated with Bamboo mosaic virus in Infected Plants"
- 2:50-3:10 Short talk: Byoung-Eun Min (University of Kentucky, USA)
"Cytoplasm-tethered Transcription Activators Are Implicated in the Cell-to-Cell Movement of Sonchus yellow net virus"
- 3:10-3:30 Short talk: Alison Roberts (Scottish Crop Research Institute, Scotland)
"An N-terminal Domain of Potato mop-top virus TGB1 Protein Mediates Nucleolar Targeting and Is Essential for Long-distance Movement of Viral RNAs"
- 3:30-3:50 Short talk: Lidor Gil (The Hebrew University of Jerusalem, Israel)
"Sucrase Transporters Play a Role in Phloem Loading of CMV-Infected Melon Plants that Are Defined as Symplastic Loaders"
- 3:50-4:20 Coffee break

Session XIII. Integrative Plant Vascular Biology
Chair: Gary Thompson

- 4:20-4:40 Short talk: Currel W. Windt (Forschungszentrum Jülich, Germany)
"How Fast Can Phloem Sap Flow?"
- 4:40-5:00 Short talk: Denis Renard (INRA, UR 1268 Biopolymères, Interactions,
Assemblages, F-44300 Nantes, France)
*"Towards An Elucidation of the Three-Dimensional Structures of Complex and Flexible
Biological Materials"*
- 5:00-5:20 Short talk: Shu Fujimaki (Japan Atomic Energy Agency, Japan)
*"Tracing Cadmium from Culture to Spikelet: Noninvasive Imaging of Long-distance Transport of
Cadmium in Rice Plant"*
- 5:20-5:40 Short talk: Johannes Liesche (University of Copenhagen, Denmark)
"Phloem Loading in Gymnosperms and the Functional Analysis of Plasmodesmata"
- 5:40-6:00 Closing remarks
- 6:00-6:30 Shuttle picks up participants from The Fawcett Center and transports to The Blackwell Inn
- 7:00-9:00 Conference Banquet and Best Short Talk and Poster Awards (at The Blackwell Inn)
- 9:00-10:00 Shuttle picks up and transports participants back to campus dorms and hotels

THURSDAY, JULY 29

Participant departure; Shuttle bus transport from campus dorms and hotel to Port Columbus International Airport at designated times.

Identification of Pathogenicity Factors in the Xylem-invading Pathogen *Xanthomonas albilineans* by Transposon Mutagenesis

Philippe ROTT^{1,2,*}, Laura FLEITES², Gary MARLOW², Monique ROYER¹ and Dean W. GABRIEL²

IUMR BGPI, CIRAD, TA A-54K, Campus International de Baillarguet, 34398 Montpellier Cedex 5, France

²University of Florida, Plant Pathology Department, 1453 Fiefield Hall, Gainesville 32605, Florida, USA

philippe.rott@cirad.fr

Xanthomonas albilineans is a systemic, xylem-invading pathogen that causes sugarcane leaf scald. Leaf symptoms vary from a single, white, narrow, sharply defined stripe to complete wilting and necrosis of infected leaves, leading to plant death. *X. albilineans* produces the toxin albicidin that blocks chloroplast differentiation, resulting in disease symptoms. Albicidin is the only previously known pathogenicity factor in *X. albilineans*, yet albicidin-deficient mutant strains are still able to efficiently colonize sugarcane. We used TnS (transposome) mutagenesis in an attempt to identify additional *X. albilineans* pathogenicity factors. Sugarcane cultivar CP80-1743, moderately susceptible to leaf scald, was inoculated by the decapitation method with 1,216 independently derived TnS insertions in Florida strain XaFL07-1. Leaf scald symptoms were recorded on emerging leaves one month after inoculation, and stalk colonization by the pathogen was determined two months after inoculation. In addition to the previously identified albicidin biosynthesis gene cluster mutations, 33 new loci were identified in which insertions were correlated with reduced pathogenicity. These insertions affected genes predicted to encode proteins involved in a variety of functions, including exopolysaccharide and lipopolysaccharide biosynthesis, fatty acid biosynthesis, regulatory and cell signaling, and secretion systems. Several of these have been associated with virulence in other bacterial plant pathogens that invade the xylem. However, some loci were identified that are predicted to encode previously unrecognized and apparently essential pathogenicity factors, at least for sugarcane leaf scald, including an OmpA family outer membrane protein. Five independent TnS insertions in OmpA locus XALc_0557 of *X. albilineans* strain XaFL07-1 produced no or very few leaf symptoms. These mutants produced albicidin *in vitro* and were able to multiply in sugarcane leaf tissue to levels similar to the wild-type strain, but did not efficiently colonize the sugarcane stalk. These *ompA* mutants were also affected in growth rate, motility and biofilm formation *in vitro*,