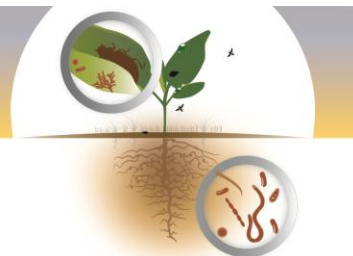


Phytobiomes 2015

Designing a New Paradigm for Crop Improvement

June 30 – July 2, 2015 | Washington, DC



Welcome to Phytobiomes 2015: Designing a New Paradigm for Crop Improvement. We are pleased you are participating in this highly focused meeting designed to bring together renowned experts in diverse fields related to phytobiomes. The sessions range from the lessons that can be learned from other microbiome efforts to designing a path forward for a phytobiomes systems approach. We encourage your active involvement throughout the meeting. Comment boards are available in the foyer for you to share your insights on key concepts for the draft Phytobiomes Roadmap and an incredible display of science will be presented on the posters for the first two days of the meeting. Special thanks to all of our presenters, sponsors, early career travel awardees, and steering committee members who helped make this program possible.

*Phytobiomes 2015 Organizers: Jan Leach, Colorado State University;
Gwyn Beattie, Iowa State University; and Kellye Eversole, Eversole Associates*

Program Outline

Tuesday, June 30

7:30 AM Registration Opens | Pre-function Area, Grand Ballroom
8:00 AM Poster Set-up | Congressional Hall AB
Continental Breakfast & Networking | Congressional Hall AB

9:00 AM **Plenary Session: Establishing a foundation for discussions | Grand Ballroom South**

Moderator: Gwyn Beattie, Iowa State University

- **What are phytobiomes and why are we interested?**
Jan Leach, Colorado State University
- **The untapped power of the plant microbiome**
Jo Handelsman, Office of Science and Technology Policy
- **Diffuse symbioses: Plant community and plant species effects on soil microbiomes and pathogen suppression and function**
Linda Kinkel, University of Minnesota

10:30 AM Break & Poster Viewing | Congressional Hall AB

11:00 AM **Plenary Session (continued)**

- **Learning to harness the phytobiome by growing our understanding of plant-microbe interactions**
Christine Hawkes, University of Texas at Austin
- **How phytobiomes can help feed the world**
Rodrigo Mendes, EMBRAPA Environment, Brazil

12:00 PM Lunch & Poster Viewing | Congressional Hall AB

1:15 PM **General Session: How far have we come in understanding phytobiomes?**

Moderator: Yazmín Rivera, USDA ARS / Rutgers University

- **Assembly and role of microbes on above-ground parts of plants**
Steven Lindow, University of California, Berkeley
- **From micro environment, to microbial envelopes: Role of insect microbiomes in plant-insect communication**
Cristina Rosa, The Pennsylvania State University
- **Identifying mechanisms of root microbiome composition control**
Sarah Lebeis, University of Tennessee
- **The microbiome of cultivated rice: Structure, variation and assembly of the root-associated microbiota**
Joseph Edwards, University of California, Davis

Free Wifi is available
during the meeting.
Compliments of
Bayer CropScience.



- **Finding and optimizing soil microbes for enhancing agricultural productivity and sustainability**

Daniel Schachtman, University of Nebraska-Lincoln

3:10 PM Break & Poster Viewing | Congressional Hall AB

3:40 PM **General Session: How far have we come in understanding phytobiomes? (continued)**

- **Metagenomic approaches to the study of the maize phyllosphere and lessons from microbiome research**
Barbara Methe, J Craig Venter Institute
- **Characterization of the grapevine endophytic phytobiome and its influence on Pierce's disease development**
Caroline Roper, University of California, Riverside
- **The soil microbiome: Focusing on one part of the phytobiome**
Vanessa Bailey, Pacific Northwest National Laboratory
- **The *Populus* microbiome: Progress and limitations of our understanding of microbiome community structure and function over space and time**
Christopher Schadt, Oak Ridge National Laboratory
- **Open Discussion/Q&A**

5:30 PM Reception & Poster Viewing | Congressional Hall AB

Authors present at posters from 6:00-7:00 p.m.

Wednesday, July 1

7:30 AM Registration Opens | Pre-function Area, Grand Ballroom

8:00 AM Continental Breakfast & Networking | Congressional Hall AB

9:00 AM **General Session: Establishing the breadth and relevance of phytobiomes | Grand Ballroom South**

Moderator: Deb Hamernik, University of Nebraska – Lincoln

- **Drivers of plant microbial community composition**
Susannah Tringe, DOE Joint Genome Institute
- **The phytobiome influences the development of immunocompetency in *Arabidopsis***
Brian Kvitko, Michigan State University
- **Designing robust synthetic microbiota for increasing plant productivity**
Omri Finkel, University of North Carolina 
- **Symbiotic drivers of plant adaptation: Reprogramming plant physiology for agricultural sustainability and food security**
Rusty Rodriguez, Adaptive Symbiotic Technologies

10:20 AM Break & Poster Viewing | Congressional Hall AB

10:50 AM **General Session: Establishing the breadth and relevance of phytobiomes (continued)**

- **Engineering communication and collaboration in synthetic microbial communities**
Cynthia Collins, Rensselaer Polytechnic Institute
- **Fungal volatile organic compounds: Mostly overlooked novel effectors controlling fungal interaction with plants and rhizosphere**
Ningxiao Li, The Pennsylvania State University 
- **Leaf endophytes modify *Melampsora* rust disease in *Populus***
Posy Busby, Duke University 
- **Harnessing the plant microbiome: Pathways toward sustainable crop production**
Angela Kent, University of Illinois at Urbana–Champaign
- **Open Discussion/Q&A**

12:30 PM Lunch & Poster Viewing | Congressional Hall AB

1:45 PM	General Session: Lessons learned from recent microbiome and systems biology efforts Moderator: Larry Halverson, Iowa State University ▪ Integration on multiple-omics datasets Claire Fraser, University of Maryland ▪ Modeling soil microbial communities using artificial neural networks Marcio Lambais, ESALQ, Brazil ▪ Analysis of the maize leaf microbiome across 270 diverse maize lines Jason Wallace, Cornell University  ▪ Soil microorganisms as a source of new antimicrobials Kim Lewis, Northeastern University
3:15 PM	Break & Poster Viewing Congressional Hall AB <i>Authors to remove posters prior to the end of the break.</i>
3:35 PM	General Session: Lessons learned from recent microbiome and systems biology efforts (continued) ▪ Mind the (culture) gap: Translating microbiomes into microbiota Mark Morrison, University of Queensland, Australia ▪ Toward a systems understanding of plant-bacterial interactions Kenichi Tsuda, Max Planck Institute for Plant Breeding, Germany ▪ Prospects for the soil microbiome and sustainable intensification Richard Conant, Colorado State University ▪ Modeling of complex systems: Applications in microbiome research Zaid Abdo, USDA-ARS ▪ Open Discussion/Q&A
5:30 PM	Session Concludes <i>Dinner on your own.</i>
Thursday, July 2	
7:30 AM	Registration Opens Pre-function Area, Grand Ballroom
8:00 AM	Continental Breakfast & Networking Congressional Hall AB
9:00 AM	General Session: Exploring the applications of phytobiomes Grand Ballroom South Moderator: Kellye Eversole, Eversole Associates ▪ Exploiting phytobiomes for improved crop productivity Magalie Guilhabert-Goya, Bayer CropScience ▪ Food and agricultural phytobiomes: Use of metagenomics to better understand food safety Andrea Ottesen, U.S. Food & Drug Administration ▪ Linking rice microbiomes with future cropping systems Ricardo Oliva, International Rice Research Institute, Philippines ▪ Phytobiomes and Forest Health Monica Lear, U.S. Forest Service
10:40 AM	Break Congressional Hall AB
10:55 AM	General Session: Exploring the applications of phytobiomes, continued ▪ Increasing functional photosynthetic efficiency (PFE) and inducible resistance to drought by application of endophytic fungi to the root phytobiome Gary Harman, Cornell University ▪ Understanding beneficial and pathogenic microorganisms that can impact production of forage crops Carolyn Young, The Samuel Roberts Noble Foundation ▪ Open Discussion/Q&A
12:00 PM	Wrap-Up & Closing Comments Facilitator: Kellye Eversole, Eversole Associates
12:30 PM	Symposium Adjourns

Special Thanks to the Program Organizers

Special thanks to the Organizers and Steering Committee Members and their organizations for their collaboration and support on this important event.

Meeting Coordination by



Organizers

Jan Leach, University Distinguished Professor, Colorado State University

Gwyn Beattie, Robert Earle Buchanan Distinguished Professor of Bacteriology, Iowa State University

Kellye Eversole, Eversole Associates

Additional Steering Committee Members

William Buckner, CEO, The Samuel Roberts Noble Foundation

Gary Felton, Professor, The Pennsylvania State University

Clair Fraser, Professor, University Maryland School of Medicine

Magalie Guilhabert-Goya, Biologics, Bayer CropScience

Larry Halverson, Associate Professor, Iowa State University

Deb Hamernik, Associate Dean of Agricultural Research, Associate Director Nebraska Ag Experiment Station

Linda Kinkel, Professor, University of Minnesota

Steven Lindow, Professor, University of California, Berkeley

Carolyn Young, Associate Professor, The Samuel Roberts Noble Foundation

Early Career Awardee Review Team

Laura Felice, University of Minnesota

Yazmin Rivera, USDA ARS / Rutgers University

Angela Records, USAID

Thank You Sponsors

This meeting was made possible in part by support from these important sponsors:



The Phytobiomes Initiative

The Phytobiomes Initiative is an effort to increase interest and funding in phytobiomes research and promote the application of this knowledge to increase food, feed, and fiber production to meet growing global demands. As part of this effort, the Phytobiomes 2015 workshop provides a venue for multidisciplinary exchange focused on the successes, gaps, and future needs of phytobiomes research.



Phytobiomes Initiative

An effort to increase interest and funding in phytobiomes research and application of the knowledge to promote food, feed, and fiber production.

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