

PROGRAM BOOK

2016 IS-MPMI

XVII CONGRESS



PORTLAND, OREGON • JULY 17–21
#MPMI16



Start Getting Your Member Benefits Today!

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Keep on top of leading research in molecular plant interactions and build lifelong relationships with scientists from around the globe – over 1,000 members from 50+ countries!

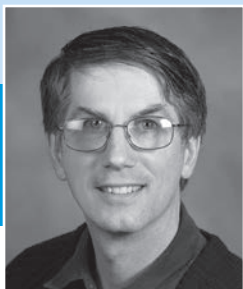
Member-Only Benefits:

- Subscription to *Molecular Plant-Microbe Interactions* (MPMI)
- IS-MPMI Job and Networking Community
- International Congress Event Member Rate
- Online Member Directory
- And more!

Diverse Backgrounds. Common Interests. Exciting Science.
Become a member and engage!

Connect with us!





WELCOME LETTER

from the Local Organizing Committee Chair

Welcome to Portland, the City of Roses, and the XVII International Congress on Molecular Plant-Microbe Interactions! We have put together a diverse and forward-looking program that highlights some of the most exciting upcoming research areas, such as the microbiome, tritrophic interactions, RNA-mediated interactions, and systems biology, as well as perennial favorites such as resistance mechanisms, mutualism, and microbial virulence functions. There is also a rich selection of special sessions on Sunday to serve as appetizers, including new training sessions on bioinformatics. Attendees and experts from nearly 50 countries around the world are here to discuss the future of molecular plant-microbe interactions. Seventy young scientist travel awardees will be networking with speakers and tweeting about their favorite talks.

The main program opens on Sunday with the IS-MPMI Award lecture by Sharon Long, “Bacterial Cell Dynamics and Molecular Differentiation in Symbiosis.” Monday will begin with the EMBO Keynote lecture by Ulla Bonas on “How Xanthomonas Manipulates the Plant,” while Tuesday will begin with a talk by the inaugural IS-MPMI Young Investigator Awardee Dong Wang, “Specialised Protein Secretion in Plant-Microbe Symbioses.” On Thursday morning, EMBO Young Investigator Awardee Lionel Navarro will give a talk on “Mechanisms of Bacterial Suppression of AGO1-RISC Activity and of Host Counter-Counter Defense”. Also on Thursday, we’ve added a new final day, lunch-time poster session so you can catch those posters you missed earlier in the meeting.

As the chair of the Local Scientific Committee, I encourage you to make the most of your time here in Portland and take advantage of all the unique cultural, social, and recreational activities this city has to offer. Portland is a young and vibrant city on the Pacific rim that offers a vast diversity of food experiences including beer, wine and coffee, and is an indie rock mecca for music buffs. July is a beautiful time to be in Oregon with sunshine, mild temperatures and low humidity.

Finally, I would like to take this opportunity to thank my fellow members of the Local Scientific Committee and members of the Board of Directors, and also the IS-MPMI headquarters staff, for their help with the careful planning of the XVII Congress. Although the congress will be over in five short days, it has been nearly four years in the making and could not have happened without the many volunteers who helped pull it all together.

Welcome to Portland,

Brett Tyler, Oregon State University

Local Scientific Committee Chair

XVII International Congress on Molecular Plant-Microbe Interactions

Local Scientific Committee

Program Chair, Brett Tyler, Oregon State University
Barbara Baker, USDA-ARS, Albany
Andrew Bent, University of Wisconsin-Madison
Jeff Chang, Oregon State University
Lynda Ciuffetti, Oregon State University
Shouwei Ding, University of California-Riverside
Valerian Dolja, Oregon State University
Nik Grunwald, USDA-ARS, Corvallis
Maria Harrison, Cornell University
Ann Hirsch, University of California-Los Angeles
Jan Leach, Colorado State University
Joyce Loper, USDA-ARS, Corvallis
Sharon Long, Stanford University
Wenbo Ma, University of California-Riverside
Richard Michelmore, University of California-Davis
Shauna Somerville, Stanford University
Brian Staskawicz, University of California-Berkeley
Guoliang Wang, The Ohio State University
Valerie Williamson, University of California-Davis
Mary Wildermuth, University of California-Berkeley
Tom Wolpert, Oregon State University

Plenary Session Chairs

Andrew Bent
Jeff Chang
Regine Kahmann
Jan Leach
Sharon Long
Joyce Loper
Brian Staskawicz

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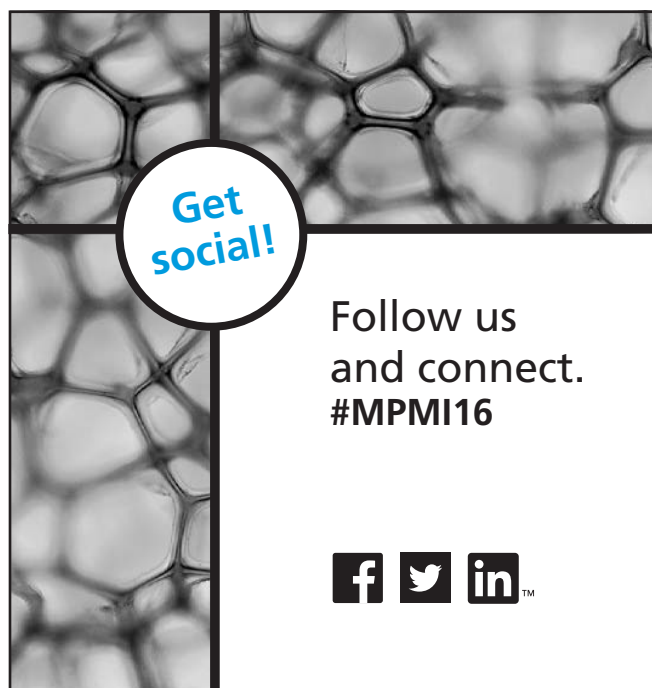
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Get social!

Follow us
and connect.
#MPMI16

f t in™

U.S. Food Waste Challenge

On June 4, 2013, the U.S. Department of Agriculture (USDA), in collaboration with the U.S. Environmental Protection Agency (EPA) launched the U.S. Food Waste Challenge, calling on others across the food chain—including producer groups, processors, manufacturers, retailers, communities, and other government agencies—to join the effort to reduce, recover, and recycle food waste. IS-MPMI supports this effort by working with the hotels and convention centers to donate food from IS-MPMI meetings to food shelves in the local area.

CONNECT WITH IS-MPMI

Connect at the Congress and All Year Long

Get Social—Share Your Congress Experience

Follow and join our social media groups so you can connect now and after the meeting.



On Twitter? Use #MPMI16 throughout the meeting and follow @ISMPMI



Like The International Society for Molecular Plant-Microbe Interactions on Facebook



Join The International Society for Molecular Plant-Microbe Interactions (IS-MPMI) group on LinkedIn

Where IS-MPMI Members Are From

IS-MPMI is a truly global society with membership representing more than 45 countries throughout the world. Find your country's flag and find out more about where your peers are practicing science. Don't forget to take your picture and share it on Twitter using #MPMI16.

Propel the Online Congress Conversations



We want to hear from you online! **Tweet** about your favorite presentation moments using #MPMI16; **share** your photos on Facebook at facebook.com/

ISMPMI and tag your friends; and **publish** updates to your personal blogs to share your favorite moments. Get excited and get connected at this year's Congress!

Complimentary Wi-Fi/Internet



IS-MPMI has provided complimentary Wi-Fi Internet throughout the Oregon Convention Center. Select Network: "IS-MPMI WiFi" on your personal device. No password or authentication is necessary.

App into the 2016 Congress! Mobile App—The Meeting at Your Fingertips!

Why use the app? Same content plus more features than the Program Book. It is quick, easy to use, a green effort for the environment...and it is FREE!



Here are the best features:

- Browse the program schedule, posters, and general information
- Customize your schedule and add appointments
- Access session information, including full abstracts
- Connect with other attendees: send messages and make appointments
- Connect with your iPad-specific version
- Schedule Posters by Appointment by connecting with poster authors to make appointments to meet and discuss poster content (in addition to the poster author time)

Get the app...it's free! Available for iOS (iPhone and iPad) and Android devices; Blackberry and Windows phone users have access to a mobile website that will offer the same functionality.

Go to www.ismpmi.org/mobileapp to find links to the mobile app.

THANK YOU TO OUR SPONSORS



United States Department of Agriculture
National Institute of Food and Agriculture

INSTRUCTIONS FOR POSTER PRESENTERS AND SPEAKERS

Poster Presenters

Presenting authors must be in attendance at their posters during their assigned times.

Posters will be numbered as indicated in the Program Book. Posters should be placed on the corresponding numbered poster board during poster set-up time. Velcro will be provided on each board for attaching a poster.

Poster set-up time is Sunday, July 17, 12:00 – 15:00, Exhibit Hall A-A1.

Poster authors present:

Monday, July 18 • 17:00 – 19:00

17:00 – 18:00 Even-numbered poster authors: Posters 1–360

18:00 – 19:00 Odd-numbered poster authors: Posters 1–360

Tuesday, July 19 • 17:00 – 19:00

17:00 – 18:00 Even-numbered poster authors: Posters 361–722

18:00 – 19:00 Odd-numbered poster authors: Posters 361–722

Thursday, July 21 • 12:50 – 14:50

12:50 – 13:50 Even-numbered poster authors: Posters 1–722

13:50 – 14:50 Odd-numbered poster authors: Posters 1–722

Poster take-down time is Thursday, July 21, from 14:50 – 15:30.

See page 34 for more information on the posters.

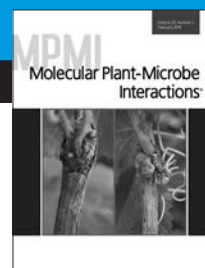
Instructions for Plenary and Concurrent Speakers

- Presentations should be uploaded prior to attendance at the congress using the Confex system
- **The Speaker Ready Room (Room A109, Convention Center)** will be available for speakers to make changes to their presentations and to upload presentations that were not uploaded prior to arrival at the congress. Changes and uploads should be done at least one day prior to the assigned presentation day.
- The moderator for each assigned session will ensure that your presentation is on the screen at the assigned time of the presentation.

Meet Senior Editors of Your Society's Journal



John McDowell



- Network with *MPMI* journal Editor-in-Chief John McDowell and *MPMI* senior editors.
- Find out what *MPMI* editors and reviewers are looking for in a well-developed, novel paper.
- See why your research in *MPMI* is highly visible! It's widely indexed in PubMed, Scopus, Web of Science, and other key databases including CrossRef and Google Scholar—plus open access after 12 months!
- Sign up for *MPMI* article alerts tailored to your specific research area.

Visit IS-MPMI Central
During Exhibit Hours

GENERAL INFORMATION

Boxed Lunches (*preurchased only*)

For those purchasing box lunches when registering for the congress, these lunches are available in the Exhibit Hall during the scheduled lunch times Monday – Thursday. Tickets are included with your registration and will be collected when picking up your boxed lunch.

Lunch Options—Cafes and Food Trucks (*for those who did not purchase a pre-boxed lunch*)

Several cafes/concession areas are located in the convention center where meals can be purchased. There will also be multiple food trucks parked outside the convention center daily from 11:00 – 14:00, if you wish to experience a variety of local foods for purchase.

Registration Hours

Prefunction Area A, Level 1, Convention Center

Saturday, July 16	15:00 – 19:00
Sunday, July 17	8:00 – 17:00
Monday, July 18	8:00 – 17:00
Tuesday, July 19	8:00 – 17:00
Wednesday, July 20	8:00 – 13:00
Thursday, July 21	8:00 – 15:00

Exhibit and Poster Hours

Sunday, July 17

12:00 – 15:00	Exhibit Set-Up
12:00 – 15:00	Poster Set-Up

Monday, July 18

9:45 – 21:00	Poster Viewing
17:00 – 19:00	Exhibits Open
17:00 – 19:00	Poster Viewing with Authors Present
17:00 – 18:00	Even-numbered posters 1–360
18:00 – 19:00	Odd-numbered posters 1–360

Tuesday, July 19

9:45 – 21:00	Poster Viewing
17:00 – 19:00	Exhibits Open
17:00 – 19:00	Poster Viewing with Authors Present
17:00 – 18:00	Even-numbered posters 361–722
18:00 – 19:00	Odd-numbered posters 361–722

Wednesday, July 20

10:10 – 21:00	Poster Viewing
10:10 – 21:00	Exhibits Open

Thursday, July 21

12:20 – 14:50	Exhibits Open
12:50 – 14:50	Poster Viewing
12:50 – 14:50	Poster Viewing with Authors Present
12:50 – 13:50	Even-numbered posters 1–722
13:50 – 14:50	Odd-numbered posters 1–722
14:50 – 15:30	Poster Take-Down
14:50 – 16:00	Exhibit Take-Down

IS-MPMI Central

Visit us in the Exhibit Hall to experience all that IS-MPMI has to offer! IS-MPMI Central will have several activities for attendees to take part in.

Learn About Publishing in *Molecular Plant-Microbe Interactions*

Meet with *MPMI* Editor-in-Chief John McDowell and his Editorial Board about publishing your research in the IS-MPMI community's dedicated journal. *MPMI* is indexed by PubMed, Scopus, Web of Science, and others. Sign up for *MPMI* alerts specific to your research area.

Catch up with the 2016 Awardees

An IS-MPMI Central video will feature this year's IS-MPMI Awardee and the first-ever Young Investigator Awardee. This year's 70 travel awardees will also be featured; get to know these up- and-coming IS-MPMI scientists.

Get Involved with *Interactions*

Are you working on a project that you want to share with the rest of the IS-MPMI community? Did you recently graduate? Do you know someone leading the field in the latest research? Share your news with *Interactions*! You can view a video of who has been featured on *Interactions* and submit your ideas at IS-MPMI Central in the Exhibit Hall and be entered into a drawing for a free Portland gift basket!

Job Boards

This year's Job Boards offer more space and job postings by location. Post your jobs according to global geographic regions, or weave your way through the Job Boards to discover a new opportunity in a new location.

Notice/Message Board

A notice/message board will be positioned in the main lobby, where you can post/receive messages and learn about any changes in the program.

Guest Program

Guests should pick up registration packets at the registration desk.

Photo Release

Photographs will be taken at the XVII Congress. By registering for this congress, you agree to allow IS-MPMI to use your photo in any of their publications or websites.

Dress

The official dress of the Congress is business casual.

continued

GENERAL INFORMATION

Safety Tips

Do not travel alone—stay in groups and travel in well-lit areas. ***Remove name badges when outside your hotel and the convention center unless you are participating in a congress event.***

Do not give your room number out to anyone you do not know and avoid giving out your room number in conversations where strangers may hear you talking.

Bolt your hotel room door and only open it when you know who is on the other side. (Note: hotel personnel wear uniforms and have identification badges. If in doubt, call hotel security to verify an employee's identity.)

Do not leave your door ajar if you are going down the hall for ice. Someone may enter when you are not looking. Know where the stairs are located in case of fire (do not use elevators). Also count the number of doors to the nearest exit in case you cannot see in a smoke-filled hallway. Valuables, airline tickets, and money should be kept in a hotel safety deposit box or in a room safe, if available.

Procedures in Case of a Fire

Try to leave the hotel as quickly as possible. If you cannot, stay in your room and call the operator or security to let them know you are in your room.

Put your hand on the room door to see if it is hot before opening it. If it is, do not open quickly. Open it just a crack to see what is on the other side and be prepared to slam it shut quickly if necessary.

If you leave the room, take your room key with you! Shut your room door to keep smoke out. You may have to return if the exit is blocked. Remember the way back to your room as you go to the exit in case you need to return.

If necessary, drop to your knees to avoid smoke. Tie a wet towel around your nose and mouth to act as a smoke filter. Fold it into a triangle and put the corner in your mouth. Do not take the elevator when you smell smoke or if you know that there is a fire in the building.

Emergency Information

Medical emergencies should be communicated to an IS-MPMI staff member at the registration desk or an employee of the Oregon Convention Center. The convention center staff is equipped to handle medical emergencies. In your hotel, dial the operator.

The hospital facility located closest to the congress is:

Legacy Emanuel Medical Center
2801 N. Gantenbein Avenue, Portland, Oregon 97227
Phone: +1.503.413.2200

Congress Facilities

Oregon Convention Center
777 NE Martin Luther King, Jr. Blvd.
Portland, Oregon 97232
+1.503.235.7575

DoubleTree by Hilton Portland (headquarters hotel)
1000 NE Multnomah Street
Portland, Oregon 97232
+1.503.281.6111

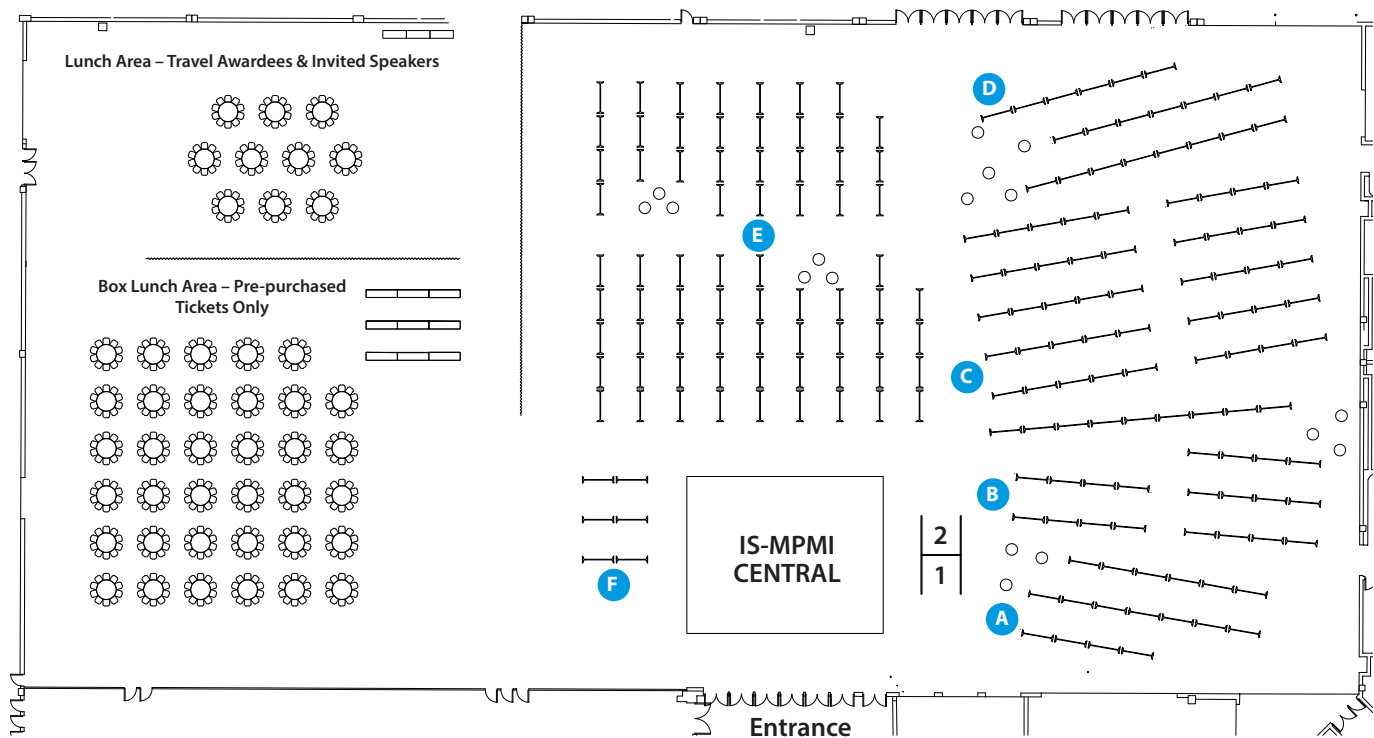
Quality Inn Downtown Convention Center
431 NE Multnomah Street
Portland, Oregon 97232
+1.503.233.7933

Hotel Rose
50 Southwest Morrison Street
Portland, Oregon 97201
+1.503.221.0711

University Place Hotel
310 SW Lincoln Street
Portland, Oregon 97201
+1.503.221.0140

Portland State University Lodging
625 Jackson Street
Portland, Oregon 97201
+1.503.725.4336

EXHIBIT HALL



Key: **Poster Boards**

Poster Areas:

- A** – Symbiosis and Mutualism
- B** – Phytobiome
- C** – Microbes
- D** – Genomics and Systems Biology
- E** – Host Resistance
- F** – Translational and Emerging Systems

Exhibitors

Booth #1: *New Phytologist*

Web: www.newphytologist.org

New Phytologist is an international journal offering rapid publication of high-quality, original research in plant science.

Owned by the non-profit-making New Phytologist Trust, we are dedicated to the promotion of plant science. Our activities range from funding symposia and workshops to ensuring free access for our prestigious Tansley reviews.

Booth #2: 11th International Congress of Plant Pathology

Mark your calendars for ICPP 2018 which will be held in Boston, Massachusetts, U.S.A. from July 29 – August 3, 2018! This once-every-five-years congress will focus on “Plant Health in a Global Economy.”

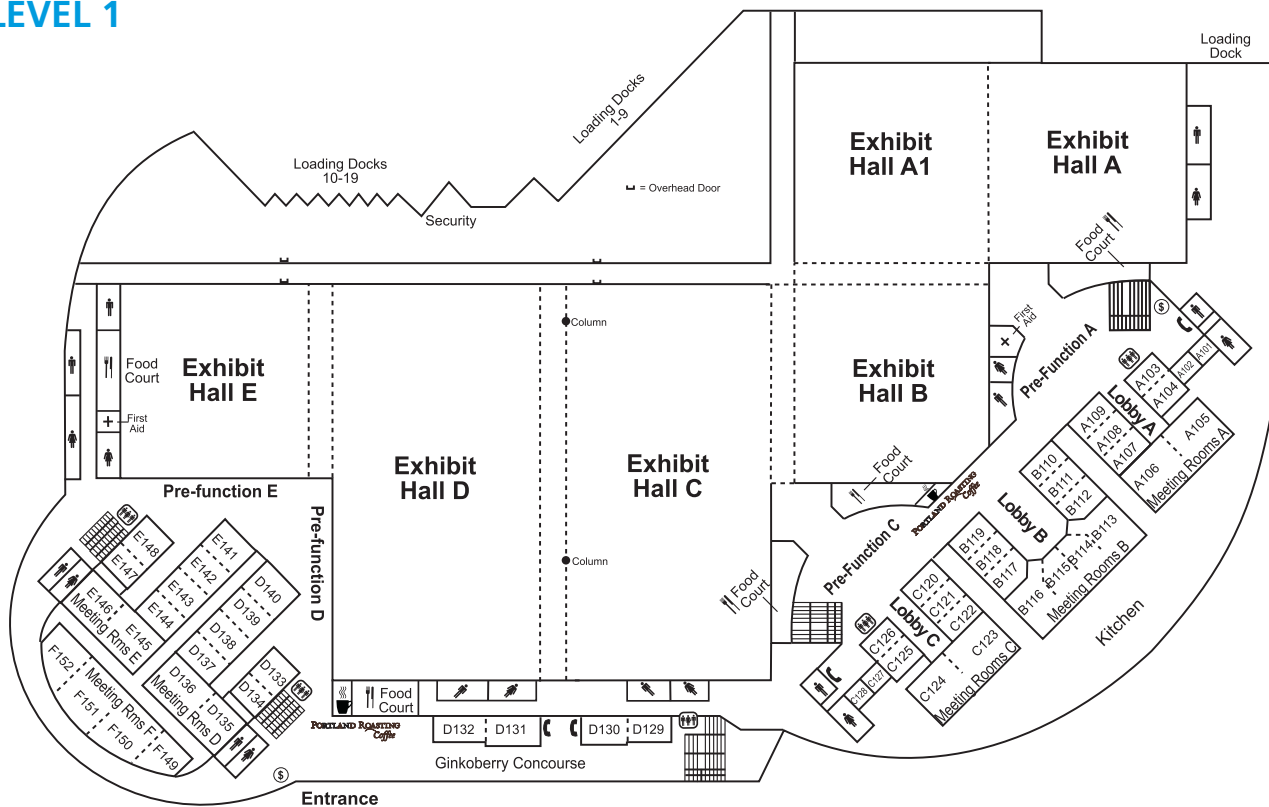
The American Phytopathological Society
The International Society for Plant Pathology
Learn more at icpp2018.org.

2019 IS-MPMI Congress Bookmarks

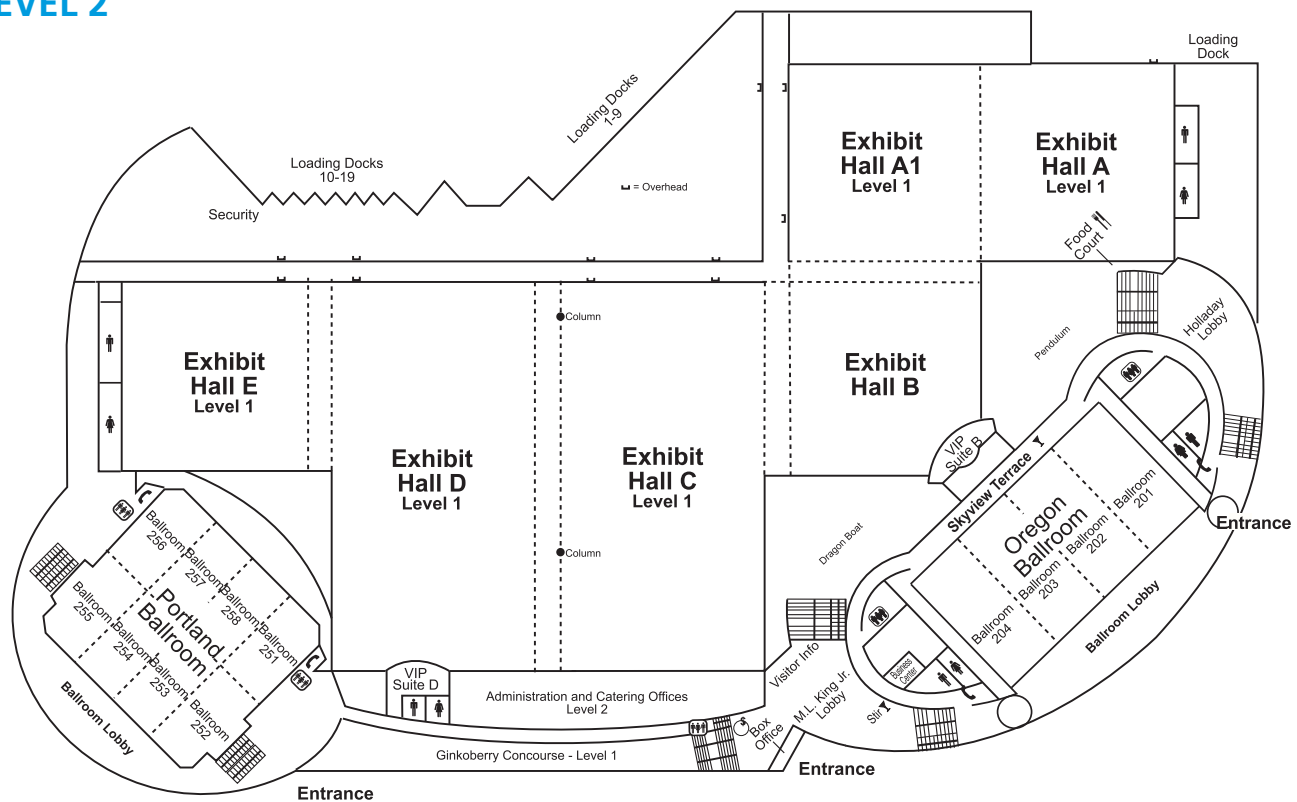
Use your eco-friendly bookmark (made from recycled tires) provided at registration as a reminder for the next IS-MPMI Congress in Glasgow, Scotland!

OREGON CONVENTION CENTER

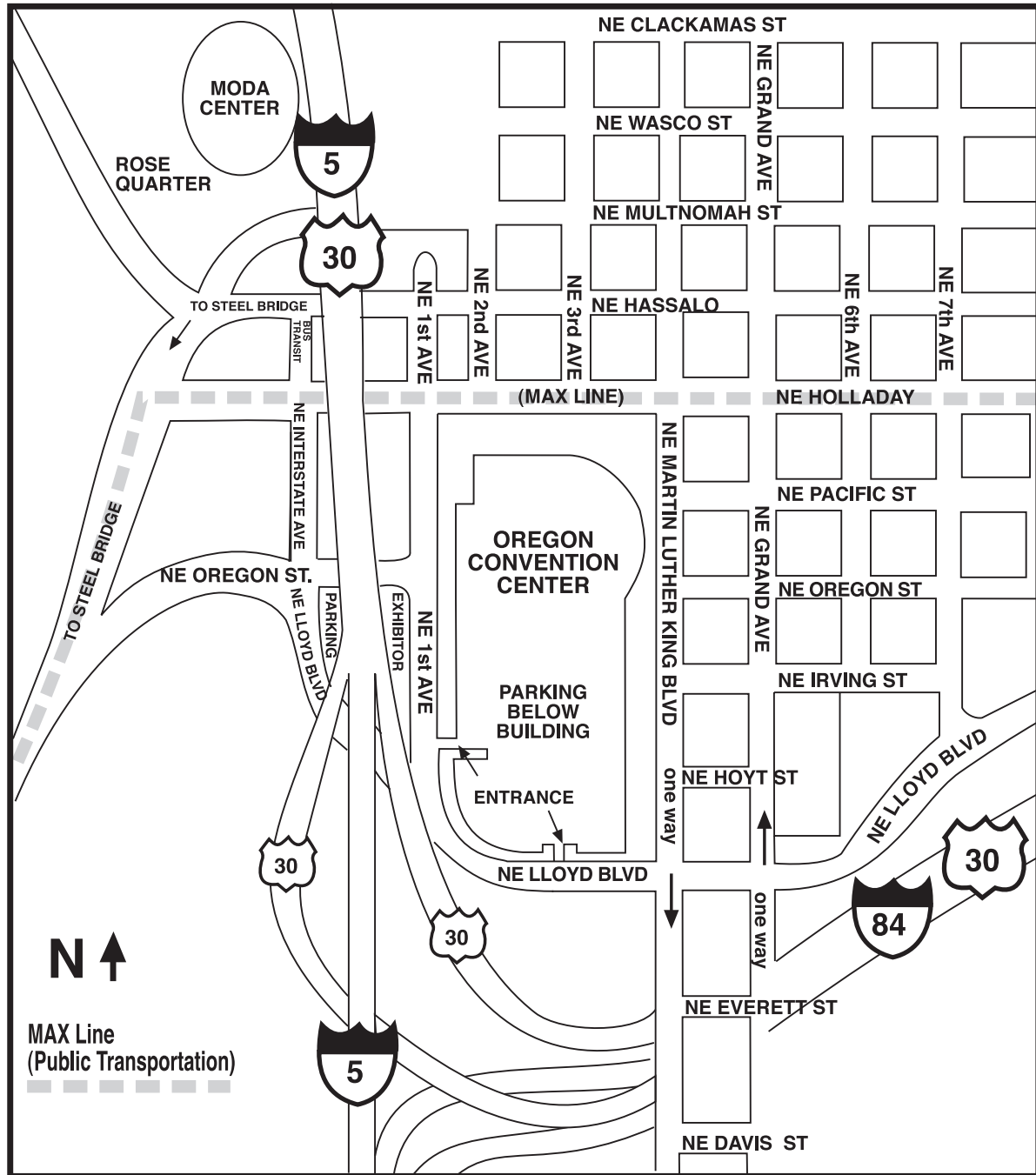
LEVEL 1



LEVEL 2



DOWNTOWN PORTLAND



PORTLAND LIGHT RAIL



Transportation

Portland's MAX light rail stops 300 times a day at the Oregon Convention Center, connecting riders to downtown, the Hotel Rose, University Place Hotel, Portland State University, and Portland International Airport. The Streetcar's Central Loop stops at the Oregon Convention Center MLK lobby entrance every 15 minutes. Also at the MLK lobby entrance, TriMet's Bus Line No. 6 provides access to downtown stops and outlying areas.

PROGRAM

CONGRESS HIGHLIGHTS

Sunday, July 17

Opening Ceremony and Keynote/Award • 15:00 – 16:30

Plenary Session 1 • 17:00 – 18:40

The Opening Ceremony features the IS-MPMI Award lecture by Sharon Long on “Bacterial Cell Dynamics and Molecular Differentiation in Symbiosis.” This will be followed by Plenary Session I with presentations from Jeff Dangl, Uta Paskowski, Sally Miller, and Giles Oldroyd.



IS-MPMI Awardee: Sharon Long is a professor of biology at Stanford University. She received her bachelor's degree from the California Institute of Technology and carried out her Ph.D. studies at Yale University, studying plant development with Ian Sussex. As a post-doctoral fellow, she trained with Fred Ausubel at Harvard, where

she began her work on *Rhizobium*-legume symbiosis. She joined the Stanford faculty in 1982. She was appointed an investigator of the Howard Hughes Medical Institute from 1994 to 2001, stepping out of that position to serve Stanford as dean of the School of Humanities and Sciences from 2001 to 2007. She returned to regular faculty research and teaching in autumn 2007. Her research group employs a spectrum of approaches, including microbial and plant molecular biology, biochemistry, and genetics, to study the symbiosis of *Rhizobium* bacteria and plant hosts. They are especially interested in the signals and signal transduction pathways used by nitrogen-fixing bacteria and plants.

Welcome Reception • 19:00 – 21:30

Join friends and colleagues for food, drinks, and conversation at the XVII International Congress's official Welcome Reception, located outside on the Convention Center Plaza. Enjoy connecting with colleagues, savor the food, and sample several Oregonian beers by visiting one of several Beer Flight stations, then vote for your favorite on the IS-MPMI Mobile App!

Tuesday, July 19

Plenary Session 4 • 8:10 – 9:50



Dong Wang, Young Investigator Awardee: Dong Wang received his Ph.D. training with Xinnian Dong at Duke University and conducted post-doctoral research with Sharon Long at Stanford University. Currently, he is a faculty member at the University of Massachusetts–Amherst, where he studies the symbiotic interactions

between plants and beneficial microbes.

Wednesday, July 20

Open Afternoon

IS-MPMI organizers have scheduled Wednesday afternoon, July 20, as an “open afternoon” for meeting attendees to explore Portland!

Still Waiting to Register for a Tour?

IS-MPMI is pleased to offer a variety of tours for those attendees interested in exploring more of what the Portland area has to offer. Your congress organizers have selected the most popular attractions that bring visitors from around the world to experience the Best of the Pacific Northwest:

Portland City Tour
Multnomah Falls and Gorge Waterfalls
Oregon Wine Tour
Oregon Half-Day Agricultural Tour

On-site Tour Desk

If you have not yet had the chance to preregister for a tour, visit the America's Hub World Tour desk located near registration. The booth will be staffed during the following days and times:

Saturday, July 16	15:00 – 19:00
Sunday, July 17	8:00 – 16:00
Monday, July 18	8:00 – 16:00
Tuesday, July 19	8:00 – 16:00
Wednesday, July 20	8:00 – 13:00

Thursday, July 21

Closing Event – Taste of Portland • 19:30 – 23:30

New Format!

This year's closing event takes on a new format that will be the perfect close to the 2016 Congress. Located in the Portland Ballroom, the evening includes food stations and beverages, including the opportunity to sample wines from local wineries at the Wine Flight stations. Adding to the fun, there will be a photo booth and live entertainment by the Blue Wave Band. This event will be the perfect place for one last mix and mingle with congress attendees and their guests before heading home. **Preregistration is required.**

PROGRAM-AT-A-GLANCE

Posters can be viewed on Monday 9:45 – 21:00, Tuesday 9:45 – 21:00, Wednesday 10:10 – 21:00, and Thursday 10:10 – 14:50

Sunday, July 17	Monday, July 18	Tuesday, July 19	Wednesday, July 20	Thursday, July 21
8:00 – 17:00 Registration open	8:10 – 9:45 Plenary Session 2 The EMBO Keynote Lecture <i>Oregon Ballroom 201-203</i> 2nd Floor	8:10 – 9:50 Plenary Session 4 IS-MPMI Young Investigator Award Presentation <i>Oregon Ballroom 201-203</i> 2nd Floor	8:30 – 10:10 Plenary Session 6 <i>Oregon Ballroom 201-203</i> 2nd Floor	8:30 – 10:10 Concurrent 16 Tritrophic Interactions and Biocontrol <i>Room C123-124</i> Concurrent 17 Microbial Manipulation of the Host II <i>Room B113-116</i> Concurrent 18 Cell Wall-Mediated Resistance <i>Room A105-106</i>
	9:45 – 10:15 Coffee Break	9:50 – 10:20 Coffee Break	10:10 – 10:40 Coffee Break	10:10 – 10:30 Coffee Break
10:20 – 12:00 Special Sessions Huanglongbing <i>Room C123</i> Rice and Pathogen Interactions <i>Room B115-116</i> Bioinformatics Training Workshop I <i>Room B113-114</i> Rust Fungi <i>Room A106</i>	10:15 – 11:30 Plenary Session 3 <i>Oregon Ballroom 201-203</i> 2nd Floor	10:20 – 11:35 Plenary Session 5 <i>Oregon Ballroom 201-203</i> 2nd Floor	10:40 – 12:20 Concurrent 13 Symbiosis & Mutualism II <i>Room B113-116</i> Concurrent 14 RNA-mediated Interactions <i>Room C123-124</i> Concurrent 15 Signal Transduction for Systemic Defense <i>Room A105-106</i>	Posters & Exhibits Open 10:10 – 14:50 <i>Exhibition Hall A-A1</i>
13:00 – 15:00 Recent Advances in Agrobacterium Biology <i>Meeting Room B115-116</i> Molecular Dissection of Wheat Diseases <i>Room C123</i> Bioinformatics Training Workshop II <i>Room A113-114</i>	Lunch Break	Lunch Break	Free Afternoon	10:40 – 12:20 Concurrent 19 Microbiome & Phytobiome II <i>Room B113-116</i> Concurrent 20 Apoplastic Interactions <i>Room C123-124</i> Concurrent 21 Emerging Systems <i>Room A105-106</i>
	12:50 – 14:50 Concurrent 1 Symbiosis & Mutualism I <i>Room B113-116</i> Concurrent 2 Genomes, Genomics and Epigenomics <i>Room C123-124</i> Concurrent 3 Translational Research; Developing World Needs <i>Room A105-106</i>	12:50 – 14:50 Concurrent 7 Commonalities between Mutualists and Pathogens <i>Room C123-124</i> Concurrent 8 Host-Microbe Co-evolution <i>Room A105-106</i> Concurrent 9 Recognition in Plant Immunity I <i>Room B113-116</i>		14:50 – 16:30 Concurrent 22 Inter-kingdom Signaling <i>Room C123-124</i> Concurrent 23 Population Genomics <i>Room A105-106</i> Concurrent 24: Recognition in Plant Immunity II <i>Room B113-116</i>
15:00 – 16:30 Opening Ceremony and Keynote/Award <i>Oregon Ballroom</i> 201-203, 2nd Floor 16:30 – 17:00 Coffee Break	14:50 – 15:20 Coffee Break 15:20 – 17:00 Concurrent 4 Molecular Ecology of Host-Microbe Interactions <i>Room C123-124</i> Concurrent 5 Microbial Manipulation of the Host I <i>Room B113-116</i> Concurrent 6 Systems Biology and Modeling <i>Room A105-106</i>	14:50 – 15:20 Coffee Break 15:20 – 17:00 Concurrent 10 Microbiome & Phytobiome I <i>Room B113-116</i> Concurrent 11 Cell Biology of Microbe- Host Interactions <i>Room C123-124</i> Concurrent 12 Plant Hormones & Regulators in Symbiosis and Defense <i>Room A105-106</i>		16:30 – 17:00 Coffee Break 17:00 – 18:40 Plenary Session 7 <i>Oregon Ballroom 201-203</i> 2nd Floor
17:00 – 18:40 Plenary Session 1 <i>Oregon Ballroom</i> 201-203, 2nd Floor 19:00 – 21:30 Welcome Reception <i>Convention Center Plaza</i> (outdoor)	Posters with Authors Present & Exhibits Open 17:00 – 19:00 <i>Exhibition Hall A-A1</i>	Posters with Authors Present & Exhibits Open 17:00 – 19:00 <i>Exhibition Hall A-A1</i>		18:40 – 19:30 Closing Ceremony
				19:30 – 23:30 Closing Event – Taste of Portland <i>Portland Ballroom 251</i>

DAILY PROGRAM SCHEDULE AND SESSIONS

All sessions take place in the Oregon Convention Center unless otherwise noted.

SATURDAY / SUNDAY

SATURDAY, JULY 16

15:00 – 19:00	Registration Open	Prefunction Area A
15:00 – 19:00	Speaker Ready Room Open	Room A109

SUNDAY, JULY 17

8:00 – 13:00	Board of Directors Meeting	Roosevelt Room, DoubleTree Hotel
8:00 – 17:00	Registration Open	Prefunction Area A
9:00 – 14:00	Speaker Ready Room Open	Room A109
10:00 – 12:00	Special Session: Huanglongbing (Citrus Greening): Insect, Bacterial, and Host Interactions	Room C123
10:00 – 12:00	Special Session: Rice and Pathogen Interactions	Room B115–116
10:00 – 12:00	Special Session: Bioinformatics Training I: Beginning Bioinformatics on the Web	Room B113–114
10:00 – 12:00	Special Session: Spotlight on Rust Fungi—Molecular Mechanisms Underlying Disease and Resistance, <i>sponsored by DuPont Pioneer</i>	Room A106
12:00 – 15:00	Poster Set-Up by Authors	Exhibit Hall A–A1
12:00 – 15:00	Exhibit Set-Up	Exhibit Hall A–A1
13:00 – 14:30	Travel Awardee Meeting	Multnomah Room, DoubleTree Hotel
13:00 – 15:00	Special Session: Recent Advances in <i>Agrobacterium</i> Biology	Room B115–116
13:00 – 15:00	Special Session: Molecular Dissection of Wheat Diseases	Room C123
13:00 – 15:00	Special Session: Bioinformatics Training II: So You've Got Your High Throughput Data – Now What?	Room A113–114
15:00 – 16:30	Opening Ceremony and Keynote/Award	Oregon Ballroom 201–203, Level 2
16:30 – 17:00	Coffee Break	
17:00 – 18:40	Plenary Session 1	Oregon Ballroom 201–203, Level 2
19:00 – 21:30	Welcome Reception	Convention Center Plaza (outdoors)

SPECIAL SESSIONS – Sunday Morning • 10:00 – 12:00

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

HUANGLONGBING (CITRUS GREENING): INSECT, BACTERIAL, AND HOST INTERACTIONS

Room C123

Chair: Gitta Coaker, University of California, Davis, U.S.A.

- S1-1. The problems and strategies of working with HLB
B. DAWSON (1). (1) University of Florida, U.S.A.
- S1-2. Genome sequence and genetic diversity of the Huanglongbing pathogen *Candidatus liberibacter asiaticus*
S. THAPA (1), W. Ma (2), N. Wang (3), J. Franco (1), G. Coaker (1) (1) University of California Davis, U.S.A.; (2) University of California Riverside, U.S.A.; (3) University of Florida, U.S.A.
- S1-3. Effectormics of Huanglongbing (HLB)-associated pathogen
W. MA (1), D. Pagliaccia (1), K. Clark (1), J. Liu (1), E. Hawara (1), G. Vidalakis (1), X. Ge (1), G. Coaker (2), N. Wang (3) (1) University of California, U.S.A.; (2) University of California, U.S.A.; (3) University of Florida, U.S.A.
- S1-4. *Sinorhizobium* as a model system to study *Liberibacter* gene regulators
S. LONG (1), M. Barnett (1). (1) Department of Biology, Stanford University, U.S.A.
- S1-5. Insights into the Sec-dependent effectors of *Candidatus Liberibacter asiaticus* and development of novel control strategy against citrus HLB
N. WANG (1). (1) University of Florida, U.S.A.
- S1-6. Molecular and genetic interactions between *Diaphorina citri* and *Candidatus Liberibacter asiaticus*
M. CILIA (1). (1) USDA ARS, U.S.A.

DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

RICE AND PATHOGEN INTERACTIONS

Room B115–116

Chair: Guoliang Wang, Ohio State University, Columbus, U.S.A.

- S2-1. Investigating the cell biology of appressorium-mediated plant infection and tissue invasion by the rice blast fungus *Magnaporthe oryzae*
N. TALBOT (1), L. Ryder (1), X. Yan (1), M. Osés-R. (1) University of Exeter, United Kingdom
- S2-2. *Rice stripe virus* overcomes NbREM-mediated inhibition of movement through interference of S-acylation
X. ZHOU (1), S. Fu (2), Y. Xu (2), C. Li (2). (1) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, China; (2) Zhejiang university, China
- S2-3. Durable and broad spectrum disease resistance to bacterial blight and bacterial leaf streak of rice
A. BOSSA-CASTRO (1), E. Delorean (2), C. Raghavan . (1) Colorado State University, U.S.A.; (2) Colorado State University, U.S.A.; (3) International Rice Research Institute (IRRI), Philippines; (4) Université des Sciences Techniques et Technologiques, Faculté des Sciences et Techniques, LBMA, Mali; (5) IRD
- S2-4. Biological functions of rice immune factors targeted by *Xanthomonas oryzae* effectors
T. KAWASAKI (1), K. Yamaguchi (2) (1) Kindai University, Japan; (2) Kindai University, Japan
- S2-5. Dissection of the APIP6-mediated ubiquitin-proteasome pathway in rice immunity against *Magnaporthe oryzae*
Y. NING (1), X. Shi (1), R. Wang (1), J. Fan (2), . (1) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, China; (2) Institute of Plant Protection, Chinese Academy of Agricultural Sciences; Department of Plant Pathology, Ohio State University, China; (3) Department of Plant Pathology
- S2-6. Fungal genetic tools in *Magnaporthe oryzae* for reactive oxygen species detection and identification of host basal immunity components
N. DONOFRIO

BIOINFORMATICS TRAINING I: BEGINNING BIOINFORMATICS ON THE WEB

Room B113–114

Chairs: Daniel Maclean, The Sainsbury Laboratory, Norwich, United Kingdom, and Adelaide Rhodes, Oregon State University, Corvallis, U.S.A.

- 10:00 Databases: iPlant/CyVerse. A. RHODES, Oregon State University, U.S.A.
- 10:15 Databases: FungiDB; DOE JGI. B. TYLER, Oregon State University, U.S.A.
- 10:30 Databases: ENSEMBL; SolGenomics; TAIR; Araport. D. MACLEAN, Sainsbury Laboratory, UK
- 10:45 Annotation, and Its Challenges: Tools Like Web BLAST, PFAM, Interpro, SignalP. A. RHODES, Oregon State University, U.S.A.
- 11:00 Ontologies; PAMGO, B. TYLER. Oregon State University, U.S.A.
- 11:15 Useful Features in NCBI and Uniprot. A. RHODES, Oregon State University, U.S.A.
- 11:30 Training Resources. A. RHODES, Oregon State University, U.S.A.
- 11:45 Software Carpentry. D. MACLEAN, Sainsbury Laboratory, UK

RUST FUNGI—MOLECULAR MECHANISMS UNDERLYING DISEASE AND RESISTANCE

Room A106

Chairs: Peter van Esse, The Sainsbury Laboratory, Norwich, United Kingdom, and Gusui Wu, DuPont Pioneer, Johnston, Iowa, U.S.A.

- S4-1. Transfer of a NLR gene from pigeonpea into soybean confers resistance to Asian soybean rust
H. VAN ESSE (1), C. Kawashima (2), J. Jones (3), S. Brommonschenkel (4), E. al (5) (1) The 2Blades Foundation - The Sainsbury Laboratory, United Kingdom; (2) The 2Blades Foundation -The Sainsbury Laboratory, United Kingdom; (3) The Sainsbury Laboratory, United Kingdom; (4) Universidade Federal de Viçosa, Brazil; (5) N/A, United Kingdom
- S4-2. A multi-pronged approach to elucidate the molecular basis of rust virulence and non-host resistance in *Brachypodium distachyon*
M. FIGUEROA (1), F. Li (1), V. Omidvar (1), S. Rot. (1) University of Minnesota, U.S.A.; (2) CSIRO Agriculture, Australia; (3) Plant Breeding Institute, University of Sydney, Australia; (4) CSIRO Agriculture, U.S.A.; (5) The Sainsbury Laboratory, United Kingdom; (6) USDA-ARS Cereal Disease Laboratory, U.S.
- S4-3. EffectorP: Using Machine Learning to Predict Fungal Effector Proteins and Their Subcellular Localization in the Plant Cell
J. SPERSCHNEIDER (1), D. Gardiner (1), P. Dodds (1). (1) CSIRO, Australia

- S4-4. Deciphering host specificity in poplar rust fungi through life-cycle transcriptomics and comparative genomics
S. DUPLESSIS (1), E. Morin (2), I. Grigoriev (3), S. De Mita (2), F. Halkett (2), P. Frey (2) (1) INRA, France; (2) INRA, France; (3) US DoE Joint Genome Institute, U.S.A.

SPECIAL SESSIONS – Sunday Afternoon • 13:00 – 15:00

RECENT ADVANCES IN AGROBACTERIUM BIOLOGY

Room B115–116

Chair: Kirankumar Mysore, Samuel Roberts Noble Foundation, Ardmore, Oklahoma, U.S.A.

- S5-1. Molecular mechanisms of the *Agrobacterium* Type VI DNase effector secretion and antibacterial activity during plant colonization
E. LAI (1) (1) Institute of Plant and Microbial Biology, Academia Sinica, Taiwan
- S5-2. Modulation of host defenses by the Type VI Secretion System (T6SS) of *Agrobacterium tumefaciens*
L. BANTA (1), M. Wang (2), A. Kenefick (2), B. Nguyen (2), J. Kim (2), R. Froom (2), A. Resnick (2), J. Bravo (1) (1) Williams College, U.S.A.; (2) Williams College, U.S.A.
- S5-3. *Agrobacterium tumefaciens*: A model system to investigate polar growth in bacteria
P. ZAMBRYSKI (1), J. Zupan (2), R. Grangeon (3), J. (1) University of California, U.S.A.; (2) University of California, U.S.A.; (3) University of California, U.S.A.
- S5-4. Potential novel role for the *Agrobacterium* virulence effector protein VirE2 in modulating plant gene expression
S. GELVIN (1), R. Lapham (1), L. Lee (1). (1) Purdue University, U.S.A.
- S5-5. Activity of plant non-homologous end-joining DNA repair proteins is not required for *Agrobacterium* T-DNA integration
K. MYSORE (1), Z. Vaghchipawala (2), B. Vasudevan . (1) The Samuel Roberts Noble Foundation, U.S.A.; (2) The Samuel Roberts Noble Foundation, U.S.A.; (3) Purdue University, U.S.A.; (4) University of Leeds, United Kingdom; (5) University of Missouri, U.S.A.; (6) University of Leeds, U.S.A.
- S5-6. A functional bacterium-to-plant DNA transfer machinery of *Rhizobium etli*
V. CITOVSKY (1). (1) State University of New York at Stony Brook, U.S.A.

MOLECULAR DISSECTION OF WHEAT DISEASES

Room C123

Chair: Peter Solomon, The Australian National University, Canberra, Australia

- S6-1. Harnessing plant immune receptors for resistance to wheat stem rust
P. DODDS (1), S. Cesari (1), R. Mago (1), N. Upadh. (1) CSIRO Agriculture, Australia; (2) CSIRO Agiculture, Australia; (3) University of Queensland, Australia; (4) Univeristy of Sydney, Australia; (5) University of Sydney, Australia
- S6-2. Exploring the *Fusarium graminearum* genome and the compatible interaction with wheat floral tissue
K. HAMMOND-KOSACK (1), W. Lee (1), N. Brown (1), A. (1) Rothamsted Research, United Kingdom
- S6-3. Next generation sequencing (NGS) based approaches for identification of virulence genes and host specificity determinants in the wheat pathogen *Zymoseptoria tritici*.
G. KETTLES (1), R. King (2), J. Hooper (2), W. Skinne. (1) Rothamsted Research, United Kingdom; (2) Rothamsted Research, United Kingdom; (3) Long Ashton Resaerch Station, United Kingdom; (4) Long Ashton Research Station, United Kingdom
- S6-4. Blast: a serious wheat disease
B. VALENT (1), M. Farman (2), K. Pedley (3), G. Peterson (3), C. Cruz (1), W. Bockus (1), R. Whitley (2), M. Navia-Urrutia (1), H. Trick (1), J. Nunes-Maciel (4), P. Paul (5), E. Oliveira-Garcia (1), J. Stack (1) (1) Kansas State University, U.S.A.; (2) University of Kentucky, U.S.A.; (3) USDA-ARS Foreign Disease-Weed Science Research Unit, U.S.A.; (4) EMBRAPA-Trigo, Brazil; (5) The Ohio State University, U.S.A.
- S6-5. Resistance gene cloning in wheat by mutational genomics
B. WULFF (1), B. Steuernagel (1), S. Periyannan (2). (1) John Innes Centre, United Kingdom; (2) CSIRO, Australia; (3) The Sainsbury Laboratory, Australia; (4) The Sainsbury Laboratory, United Kingdom; (5) USDA, U.S.A.; (6) University of Sydney, Australia
- S6-6. Understanding the *Parastagonospora nodorum* – wheat interaction; is it as simple as we think?
S. BREEN (1), S. Williams (2), M. Outram (2), B. K. (1) The Australian National University, Australia; (2) University of Queensland, Australia

continued

DAILY PROGRAM SCHEDULE AND SESSIONS

Key: *S* = *Special Session*, *C* = *Concurrent Session*, *PL* = *Plenary Session*

BIOINFORMATICS TRAINING II: SO YOU'VE GOT YOUR HIGH THROUGHPUT DATA – NOW WHAT?

Room A113–114

Chairs: Daniel Maclean, The Sainsbury Laboratory, Norwich, United Kingdom, and Adelaide Rhodes, Oregon State University, Corvallis, U.S.A.

- 13:00 Genome assembly and annotation: best practices, best tools. D. MACLEAN, Sainsbury Laboratory, UK
- 13:30 RNAseq: Best Practices, Best Tools. D. MACLEAN, Sainsbury Laboratory, UK and A. RHODES, Oregon State University, U.S.A.
- 14:00 metagenomics: Best Practices, Best Tools. D. MACLEAN, Sainsbury Laboratory, UK
- 14:30 Data Carpentry. A. RHODES, Oregon State University, U.S.A.

OPENING CEREMONY AND KEYNOTE AWARD

15:00 – 16:30

Oregon Ballroom 201–203, Level 2

Bacterial cell dynamics and molecular differentiation in symbiosis
S. LONG (1). (1) Department of Biology, Stanford University, U.S.A.

PLENARY SESSION 1

17:00 – 18:40

Oregon Ballroom 201–203, Level 2

Moderator: Brian Staskawicz, University of California, Berkeley, California, U.S.A.

- 17:00 PL-1. Understanding NLR Function and Biology. J. DANGL (1) (1) HHMI and UNC-Chapel Hill, U.S.A.
- 17:25 PL-2. Molecular genetics of arbuscular mycorrhizal symbiosis in cereals. U. PASZKOWSKI (1) (1) University Cambridge, United Kingdom
- 18:00 PL-3. Translational Plant Pathology to Improve Food Security in an Increasingly Insecure World. S. MILLER (1) (1) The Ohio State University, U.S.A.
- 18:25 PL-4. Dissecting and engineering symbiosis signaling. G. OLDROYD (1) (1) John Innes Centre, United Kingdom

MONDAY, JULY 18

8:00 – 17:00	Registration Open	Prefunction Area A
8:10 – 9:45	Plenary Session 2: Featuring the EMBO Keynote Lecture	Oregon Ballroom 201–203
9:00 – 14:00	Speaker Ready Room Open	Room A109
9:45 – 10:15	Coffee Break	
9:45 – 21:00	Posters available for viewing	Exhibit Hall A–A1
10:15 – 11:30	Plenary Session 3	Oregon Ballroom 201–203
11:30 – 12:30	Student Travel Awardees and Speaker Lunch, <i>invitation only</i>	Exhibit Hall A–A1
11:30 – 12:50	Box Lunches, <i>prepurchased only</i>	Exhibit Hall A–A1
11:30 – 12:50	Lunch Break (<i>concessions & food trucks</i>)	
12:50 – 14:50	Concurrent Session 1: Symbiosis & Mutualism I	Room B113–116
	Concurrent Session 2: Genomes, Genomics and Epigenomics	Room C123–124
	Concurrent Session 3: Translational Research: Developing World Needs	Room A105–106
14:50 – 15:20	Coffee Break	
15:20 – 17:00	Concurrent Session 4: Molecular Ecology of Host-Microbe Interactions	Room C123–124
	Concurrent Session 5: Microbial Manipulation of the Host I	Room B113–116
	Concurrent Session 6: Systems Biology and Modeling	Room A105–106
17:00 – 19:00	Exhibits Open	Exhibit Hall A–A1
17:00 – 19:00	Poster Viewing with Authors Present 17:00 – 18:00 <i>Posters 1–360: Even-numbered poster authors</i> 18:00 – 19:00 <i>Posters 1–360: Odd-numbered poster authors</i>	Exhibit Hall A–A1
19:00	Dinner, <i>on your own</i>	

SESSIONS – Monday Morning

Key: S = *Special Session*, C = *Concurrent Session*, PL = *Plenary Session*

PLENARY SESSION 2

8:10 – 9:45; Oregon Ballroom 201–203, Level 2

Moderator: Regine Kahmann, Max Planck Institute, Marburg, Germany

- 8:10 PL2-1. How *Xanthomonas* manipulates the plant
The EMBO Keynote Lecture: U. BONAS (1) (1) University of Halle, Germany
- 8:55 PL2-2. Dynamics, mechanisms, and evolution of a highly robust plant immune signaling network
F. KATAGIRI (1), R. Hillmer (2), K. Mase (2), N. H. (1) University of Minnesota, U.S.A.; (2) University of Minnesota, U.S.A.
- 9:20 PL2-3. Dissecting wilt diseases using the *Fusarium oxysporum*–*Arabidopsis* pathosystem
L. MA (1) (1) university of Massachusetts Amherst, U.S.A.

PLENARY SESSION 3

10:15 – 11:30; Oregon Ballroom 201–203, Level 2

Moderator: Joyce Loper, Oregon State University, Corvallis, Oregon, U.S.A.

- 10:15 PL3-1. Fine tuning plant innate immunity
B. BAKER (1). (1) UC Berkeley, U.S.A.
- 10:40 PL3-2. Biological control of Pierce's disease of grape caused by *Xylella fastidiosa* achieved by various strategies leading to pathogen confusion
S. LINDOW (1). (1) University of California, Berkeley, U.S.A.

continued

DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = *Special Session*, C = *Concurrent Session*, PL = *Plenary Session*

- 11:05 PL3-3. Reductionist approaches to explore plant microbiota functions
P. SCHULZE-LEFERT (1), R. Zgadzay (2), R. Garrido-Oter (2), S. Hacquard (2), P. Duran (2), S. Spaepen (2), T. Thiergart (2), Y. Bai (2), R. Nakano (2), M. Hashimoto (2), A. Hassani (2), S. Radutiu (3) (1) Department of Plant Microbe Interactions, Max Planck Institute for Plant Breeding Research, Germany; (2) Department of Plant Microbe Interactions, Max Planck Institute for Plant Breeding Research, Germany; (3) Department of Molecular Biology and Genetics, Faculty of Science and Technology, Aarhus University, Denmark, Denmark

CONCURRENT SESSION 1: SYMBIOSIS & MUTUALISM I

12:50 – 14:50; Room B113–116

Cochair: Mike Sadowsky, University of Minnesota, St. Paul, Minnesota, U.S.A.

Cochair: Jens Stougaard, Aarhus University, Aarhus, Denmark

- 12:50 C1-1. Receptor mediated recognition controls rhizobial infection of legumes
J. STOUGAARD (1), (1) Aarhus University, Denmark
- 13:10 C1-2. Karrikin signaling in arbuscular mycorrhiza development
C. GUTJAHR (1), S. Carbonnel (1), V. Basso (1), M. (1) LMU Munich, Faculty of Biology Genetics, Germany; (2) John Innes Center, Metabolic Biology, United Kingdom
- 13:30 C1-3. Identification of genes involved in the *Burkholderia tuberum* nodulating symbiosis
M. LUM (1), A. Arnell (2), B. Kwak (2), N. Behnken. (1) Loyola Marymount University, U.S.A.; (2) Loyola Marymount University, U.S.A.
- 13:50 C1-4. A novel interactor of symbiotic RLKs is involved in nodulation in *Lotus japonicus*
A. YAMAZAKI (1), Y. Shimoda (2), M. Hayashi (1). (1) Center for Sustainable Resource Science, Riken, Japan; (2) NIAS, Japan
- 14:10 C1-5. *Medicago truncatula* MtLAX2, an orthologue of the AtAUX1 auxin influx transporter, mediates auxin control of nodulation
S. ROY (1), J. Murray (2), A. Downie (2), J. Lille. (1) The Samuel Roberts Noble Foundation, U.S.A.; (2) John Innes Centre, United Kingdom; (3) University of Sheffield, United Kingdom; (4) Babraham Institute, United Kingdom
- 14:30 C1-6. Use of Crispr/Cas genome editing demonstrates a critical role for uricase and xanthine dehydrogenase in soybean nitrogen fixation and nodule development.
C. NGUYEN (1), M. Stacey (2). (1) Divisions of Plant Sciences and Biochemistry, National Center for Soybean Biotechnology University of Missouri, U.S.A.; (2) Divisions of Plant Sciences and Biochemistry, National Center for Soybean Biotechnology University of Missouri, U.S.A.

CONCURRENT SESSION 2: GENOMES, GENOMICS AND EPIGENOMICS

12:50 – 14:50; Room C123–124

Cochair: Bart Thomma, Wageningen University, Gelderland, Netherlands

Cochair: Valerie Geffroy, Université Paris-Sud, Paris, France

- 12:50 C2-1. Unusual features of NB-LRR sequences in common bean genome
V. GEFFROY (1) M. Richard (1), A. Gratiias (1), V. Thareau (1), M.. (1) Institute of Plant Sciences Paris-Saclay IPS2, CNRS, INRA, Univ Paris Sud, Univ Evry, Univ Paris-Diderot, Orsay, France; (2) Center for Applied Genetic Technologies, University of Georgia, Athens, GA 30602, U.S.A.
- 13:10 C2-2. Regulating fungal pathogenesis through chromatin modifications
D. COOK (1), M. Seidl (2), M. Kramer (2), B. Thomm. (1) Wageningen University, Netherlands; (2) Wageningen University, Netherlands
- 13:30 C2-3. Epigenetic regulation during infection for rust pathogens
- 13:50 C2-4. Comparative & Evolutionary Genomics of the *Pseudomonas syringae* Species Complex
D. GUTTMAN (1), S. Thakur (1), B. Weir (2). (1) University of Toronto, Canada; (2) Landcare Research, New Zealand
- 14:10 C2-5. Different waves of effector genes with contrasted genomic location are expressed by *Leptosphaeria maculans* during cotyledon and stem colonisation of oilseed rape
J. GERVAIS (1), T. Rouxel (1), M. Balesdent (1), I. (1) INRA BIOGER, France
- 14:30 C2-6. Variation in genome size and ploidy levels in plant pathogenic oomycetes, particularly the downy mildews.
L. BERTIER (1), J. Gil (1), S. Reyes-Chin-Wo (1), . (1) UC Davis Genome Center, U.S.A.

CONCURRENT SESSION 3: TRANSLATIONAL RESEARCH: DEVELOPING WORLD NEEDS

12:50 – 14:50; Room A105–106

Cochair: Leena Tripathi, International Institute of Tropical Agriculture, Oyo State, Kenya**Cochair:** Ricardo Oliva, International Rice Research Institute, Laguna, Philippines

- 12:50 C3-1. Improving bananas for resistance against *Xanthomonas campestris* pv. *Musacearum*
See *Addendum* (1), J. Tripathi (2), J. Kubiriba (3), W. Tushemereirwe (3) (1) International Institute of Tropical Agriculture, Kenya; (2) International Institute of Tropical Agriculture, Kenya; (3) National Agriculture Research Laboratories, Uganda
- 13:10 C3-2. Exploiting bacterial genomics to develop tools for effective pathogen monitoring in rice
R. OLIVA (1). (1) IRRI, Philippines
- 13:30 C3-3. High-throughput assay for small molecules targeting the Type I efflux pump of *Xylella fastidiosa*.
D. GABRIEL (1), M. Jain (1), L. Fleites (1), S. Zh. (1) University of Florida, U.S.A.
- 13:50 C3-4. TILLING for effective powdery mildew resistance: A non-transgenic approach aimed at the generation of hexaploid wheat mlo mutants
R. PANSTRUGA (1), J. Acevedo (1), H. Thieron (1), . (1) RWTH Aachen University, Germany; (2) Rothamsted Research, United Kingdom
- 14:10 C3-5. Expanding the recognition specificity of NLR proteins to confer disease resistance to the Soybean Mosaic Virus
M. HELM (1), R. Innes (1). (1) Indiana University, U.S.A.
- 14:30 C3-6. Dissecting the disease triangle of plant pathology
R. BART (1). (1) Donald Danforth Plant Science, U.S.A.

SESSIONS – Monday Afternoon**CONCURRENT SESSION 4: MOLECULAR ECOLOGY OF HOST-MICROBE INTERACTIONS**

15:20 – 17:00; Room C123–124

Cochair: Dmitri Mavrodi, University of Southern Mississippi, Gulfport, Mississippi, U.S.A.**Cochair:** Choong-Min Ryu, Korea Research Institute of Bioscience & Biotechnology, Daejeon, South Korea

- 15:20 C4-1. Phenazine-mediated community morphogenesis in the model biocontrol strain *Pseudomonas fluorescens* 2-79
D. MAVRODI (1), O. Mavrodi (1), L. Elbourne (2), J. (1) The University of Southern Mississippi, U.S.A.; (2) Macquarie University, Australia; (3) USDA-ARS Wheat Health, Genetics and Quality Research Unit, U.S.A.
- 15:40 C4-2. An air battle between good and bad bacteria: Airborne attenuation of *Pectobacterium carotovorum* virulence
C. RYU (1) (1) Korea Research Institute of Bioscience and Biotechnology, Korea
- 16:00 C4-3. Indole Antibiotic Biosynthesis in Edible Plants: *From Genomes to Bioactive Molecules*
A. KLEIN (1), E. Sattely (2). (1) Stanford University, U.S.A.; (2) Stanford University, U.S.A.
- 16:20 C4-4. Mutations conferring bacteriocin resistance in *Pseudomonas syringae* reduce virulence toward host plants.
K. HOCKETT (1), E. Carlson (2), D. Baltrus (3). (1) University of Arizona, School of Plant Sciences, U.S.A.; (2) University of Arizona, Dept. of Ecology and Evolutionary Biology, U.S.A.; (3) University of Arizona, School of Plant Sciences, U.S.A.
- 16:40 C4-5. A combination of comparative genomics and LAESI-MS facilitates the discovery of amino acid analogs produced by plant-associated bacteria
R. OKRENT (1), K. Trippe (1), V. Manning (1), E. D. (1) USDA-ARS, U.S.A.; (2) Oregon State University, U.S.A.; (3) Protea Biosciences, Inc., U.S.A.

CONCURRENT SESSION 5: MICROBIAL MANIPULATION OF THE HOST I

15:20 – 17:00; Room B113–116

Cochair: Thomas Baum, Iowa State University, Ames, Iowa, U.S.A.**Cochair:** Lindsay Triplett, Connecticut Agricultural Experiment Station, New Haven, Connecticut, U.S.A.

- 15:20 C5-1. Mechanisms of host manipulations by Heterodera cyst nematodes
T. BAUM (1). (1) Department of Plant Pathology and Microbiology; Iowa State University, U.S.A.
- 15:40 C5-2. Microbial manipulation of host primary metabolism using a type III secreted effector
L. TRIPLETT (1), T. Shidore (2), C. Broeckling (3). (1) The Connecticut Agricultural Experiment Station, U.S.A.; (2) The Connecticut Agricultural Experiment Station, U.S.A.; (3) Colorado State University, U.S.A.; (4) Colorado State University, U.S.A.

continued

DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = *Special Session*, C = *Concurrent Session*, PL = *Plenary Session*

- 16:00 C5-3. Delivery of *Phytophthora sojae* effector Avr1b in *planta* requires PI3P-binding, but does not require N-terminal cleavage
B. TYLER (1), Q. Wang (1), F. Arredondo (1), Y. Fa. (1) Center for Genome Research and Biocomputing, Oregon State University, U.S.A.
- 16:20 C5-4. A Land Plant-specific Transcription Factor Directly Enhances DNA-dependent RNA Polymerase II Transcribing A Pathogenic Noncoding RNA Template
Y. WANG (1), J. Qu (2), S. Ji (3), A. Wallace (2), J. Wu (2), Y. Li (3), V. Gopalan (2), B. Ding (2) (1) The Ohio State University, U.S.A.; (2) The Ohio State University, U.S.A.; (3) Peking University, China
- 16:40 C5-5. Mimicry of The Plant Hormone PSY1 by A Sulfated Bacterial Peptide, RaxX
A. JOE (1), R. Pruitt (1). (1) Department of Plant pathology the Genome Center, University of California Davis, USA, U.S.A.

CONCURRENT SESSION 6: SYSTEMS BIOLOGY AND MODELING

15:20 – 17:00; Room A105–106

Cochair: Katherine Denby, University of Warwick, Coventry, England, United Kingdom

Cochair: Dan Kliebenstein, University of California, Davis, California, U.S.A.

- 15:20 C6-1. Elucidating and re-designing regulatory networks underlying plant defence
K. DENBY (1), P. Consortium (2), K. Polanski (1), . (1) University of Warwick, United Kingdom; (2) <http://warwick.ac.uk/presta>, United Kingdom; (3) University of Cambridge, United Kingdom
- 15:40 C6-2. How lineage selection and domestication in eudicot plants structures virulence and genomic variation in the fungus, *Botrytis cinerea*, and vice versa
D. KLIEBENSTEIN (1). (1) University of California, Davis, U.S.A.
- 16:00 C6-3. Cell surface receptors networks control plant development and defenses
E. SMAKOWSKA (1), A. Mott (2), M. Stegmann (3), C. Zipfel (3), D. Desveaux (4), D. Guttman (4), Y. Belkadir (1) (1) Gregor Mendel Institute of Molecular Plant Biology (GMI), Austria; (2) Department of Cell & Systems Biology, University of Toronto, Canada; (3) The Sainsbury Laboratory, Norwich Research Park, United Kingdom; (4) Department of Cell & Systems Biology, Centre for the Analysis of Genome Evolution & Function, University of Toronto, Canada
- 16:20 C6-4. Integration of resistance QTL, expression QTL and co-expression modules reveals molecular responses of maize to the fungal pathogen *Cercospora zeina*
D. BERGER (1), N. Christie (2), A. Myburg (2). (1) Plant Science Department, Forestry and Agricultural Biotechnology Institute, University of Pretoria, South Africa; (2) Genetics Department, Forestry and Agricultural Biotechnology Institute, University of Pretoria, South Africa
- 16:40 C6-5. Integrating host-pathogen signaling networks during barley-powdery mildew interactions
J. ELMORE (1), P. Surana (2), W. Xu (2), M. Hunt (. (1) USDA-ARS/Iowa State University, U.S.A.; (2) Iowa State University, U.S.A.

TUESDAY, JULY 19

8:00 – 17:00	Registration Open	Prefunction Area A
8:10 – 9:50	Plenary Session 4	Oregon Ballroom 201–203
9:00 – 14:00	Speaker Ready Room Open	Room A109
9:45 – 21:00	Posters available for viewing	Exhibit Hall A–A1
9:50 – 10:20	Coffee Break	
10:20 – 11:35	Plenary Session 5	Oregon Ballroom 201–203
11:35 – 12:30	Student Travel Awardees and Speaker Lunch, <i>invitation only</i>	Exhibit Hall A–A1
11:35 – 12:50	Lunch Break (<i>concessions & food trucks</i>)	
11:35 – 12:50	Box Lunches, <i>pre-purchased only</i>	Exhibit Hall A–A1
12:50 – 14:50	Concurrent Session 7: Commonalities Between Mutualists and Pathogens	Room C123–124
	Concurrent Session 8: Host-Microbe Co-Evolution	Room A105–106
	Concurrent Session 9: Recognition in Plant Immunity I	Room B113–116
14:50 – 15:20	Coffee Break	
15:20 – 17:00	Concurrent Session 10: Microbiome & Phytobiome I	Room B113–116
	Concurrent Session 11: Cell Biology of Microbe-Host Interactions	Room C123–124
	Concurrent Session 12: Plant Hormones & Regulators in Symbiosis and Defense	Room A105–106
17:00 – 19:00	Exhibits Open	Exhibit Hall A–A1
17:00 – 19:00	Poster Viewing with Authors Present	Exhibit Hall A–A1
	17:00 – 18:00 <i>Posters 361–722: Even-numbered poster authors</i>	
	18:00 – 19:00 <i>Posters 361–722: Odd-numbered poster authors</i>	
19:00	Dinner, <i>on your own</i>	

SESSIONS – Tuesday Morning

Key: S = *Special Session*, C = *Concurrent Session*, PL = *Plenary Session*

PLENARY SESSION 4

8:10 – 9:50; Oregon Ballroom 201–203, Level 2

Moderator: Sharon Long, Stanford University, Stanford, California, U.S.A.

- 8:10 PL4-1. Specialised protein secretion in plant-microbe symbioses
D. WANG, **IS-MPMI Young Investigator Awardee** (1), O. Oztas (2), H. Pan (2), M. Kim (2), C. Stonoha (2), X. Wu (3), B. Wang (3) (1) University of Massachusetts, Amherst, U.S.A.; (2) University of Massachusetts, U.S.A.; (3) Nanjing University, China (*Special thanks to our industry partner BASF for making this award possible.*)
- 8:35 PL4-2. Inter-organellar communication during innate immunity
S. DINESH-KUMAR (1), E. Park (1), A. Kumar (2), A. Alqarni (2), A. Nedo (2), L. Ren (2), K. Hoban (2), M. Padmanabhan (1), S. Modla (2), C. Kambhamettu (2), J. Caplan (2) (1) University of California, Davis, U.S.A.; (2) University of Delaware, U.S.A.
- 9:00 PL4-3. Plant Elicitor Peptides: conserved mediators of immunity to pathogens and insects in higher plants
A. HUFFAKER (1), P. Weckwerth (2), K. Dressano (2), Z. Shen (2) (1) UC San Diego, U.S.A.; (2) UC San Diego, U.S.A.
- 9:25 PL4-4. Supercharging the radars for pathogen surveillance
D. SAUNDERS (1). (1) The Genome Analysis Centre & John Innes Centre, United Kingdom

PLENARY SESSION 5

10:20 – 11:35; Oregon Ballroom 201–203, Level 2

Moderator: Jeff Chang, Oregon State University, Corvallis, Oregon, U.S.A.

- 10:20 PL5-1. Nod factor recognition at root epidermis and its impact on microbiota assembly in *Lotus japonicus*
S. RADUTOIU (1), E. Murakami (2), R. Zgadzaj (3), . (1) Department of Molecular Biology and Genetics, Aarhus University, Denmark, Denmark; (2) Department of Molecular Biology and Genetics, Aarhus University, Denmark; (3) Max Plack Institute for Plant Breeding, Cologne, Germany; (4) Department of Molecular

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DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

- 10:45 PL5-2. Salicylic acid and jasmonic acid signal through a noncanonical pathway to promote effector-triggered immunity
X. DONG (1), L. Liu (1), F. Sonbol (2), Y. Gu (3),. (1) Duke University, U.S.A.; (2) Sinai University, Egypt; (3) Duke University, U.S.A.; (4) Western Michigan University, U.S.A.
- 11:10 PL5-3. Effectors that alter plant development and attract insect vectors are conserved among diverse phytoplasmas
S. HOGENHOUT (1) (1) John Innes Centre, United Kingdom

SESSIONS – Tuesday Afternoon

CONCURRENT SESSION 7: COMMONALITIES BETWEEN MUTUALISTS AND PATHOGENS

12:50 – 14:50; Room C123–124

Cochair: Shin Okazaki, Tokyo University A&T, Tokyo, Japan

Cochair: Catherine Masson-Boivin, INRA Toulouse, Toulouse, France

- 12:50 C7-1. Rhizobial type III secretion system and symbiosis with legumes
S. OKAZAKI (1) (1) Graduate School of Agriculture, Tokyo University of Agriculture and Technology, Japan
- 13:10 C7-2. Rewiring a plant pathogen into a legume symbiont by lab-evolution
C. MASSON-BOIVIN (1). (1) INRA, France
- 13:30 C7-3. Plant and microbial proteins contributing to beneficial and detrimental root colonisation by filamentous microbes
S. SCHORNACK (1), C. Quan (1), T. Rey (1), M. Bonh. (1) University of Cambridge, Sainsbury Laboratory, United Kingdom; (2) LRSV, University Paul Sabatier, France
- 13:50 C7-4. Metabolic consequences of the introduction of a *Populus trichocarpa* lectin receptor-like kinase into *Arabidopsis thaliana*, a non-ectomycorrhizal host species
T. TSCHAPLINSKI (1), Z. Zhang (2), J. Labbe (2), W. (1) Oak Ridge National Laboratory, U.S.A.; (2) Oak Ridge National Laboratory, U.S.A.; (3) University of Tennessee, U.S.A.
- 14:10 C7-5. The plant microbiome at the intersection of metabolism and defense
C. HANEY (1), L. Shapiro (2), J. Bush (3), N. Pier. (1) The University of British Columbia, Canada; (2) Harvard University, U.S.A.; (3) Massachusetts General Hospital, U.S.A.
- 14:30 C7-6. Aboveground activation of defense leads to recruitment of bacteria into the rhizosphere of *Arabidopsis thaliana*
R. BERENDSEN (1), K. Yu (1), C. Pieterse (1), P. B. (1) Utrecht University, Netherlands

CONCURRENT SESSION 8: HOST-MICROBE CO-EVOLUTION

12:50 – 14:50; Room A105–106

Cochair: Laura Rose, University Dusseldorf, Dusseldorf, Germany

Cochair: Suomeng Dong, Nanjing Agricultural University, Nanjing, China

- 12:50 C8-1. The interplay of pathogens, microRNAs, and regulation of resistance gene transcript abundance in tomatoes
L. ROSE (1), S. de Vries (1), T. Kloesges (1), J. von Dahlen (1), A. Kukuk (1) (1) University of Dusseldorf, Germany
- 13:10 C8-2. Effector evolution during arm race between Soybean and Phytophthora
S. DONG (1). (1) Department of Plant Pathology, Nanjing Agricultural University, China
- 13:30 C8-3. Maintenance of a stem loop structure is essential for the translation of the Potato leafroll virus minor capsid protein that regulates local virus movement in phloem tissues
Y. XU (1), S. Gray (2). (1) Cornell University, U.S.A.; (2) Cornell University; USDA-ARS, Robert W. Holley Center for Agriculture and Health, U.S.A.
- 13:50 C8-4. Code-cracking TAL effector function and evolution in the rice-*Xanthomonas oryzae* system
A. PEREZ-QUINTERO (1), M. Hutin (2), T. Tran (3), . (1) UMR IPME, IRD-CIRAD-Université Montpellier 2, France; (2) Department of Plant Pathology and Plant-Microbe Biology, Cornell University, U.S.A.; (3) Agricultural Genetics Institute, Vietnam; (4) UMR IPME, IRD-CIRAD-Université Montpellier 2, France
- 14:10 C8-5. Sequential expression of *Sclerotinia sclerotiorum* pathogenicity factors during infection of *Brassica napus* as revealed by RNA-Seq analysis
S. Seifbarghi (1), M. Borhan (2), Y. Wei (3), D. H. (1) Agriculture and Agri-Food Canada, Saskatoon SK, S7N 0X2, Canada, Canada; (2) Agriculture and Agri-Food Canada, Saskatoon SK, S7N 0X2, Canada, Canada; (3) Department of Biology, University of Saskatchewan, Saskatoon, Canada, Canada
- 14:30 C8-6. Natural variation in the *Arabidopsis* AGO2 gene alters antiviral activity
P. MOFFETT (1), A. Adurogbanga (1), C. Roussin-Léveillé (1), C. Brosseau (1) (1) Université de Sherbrooke, Canada

CONCURRENT SESSION 9: RECOGNITION IN PLANT IMMUNITY I

12:50 – 14:50; Room B113–116

Cochair: Mark Banfield, John Innes Centre, Norwich, United Kingdom

Cochair: Jijie Chai, Tsinghua University, Beijing, China

- 12:50 C9-1. An integrated domain in a rice NLR confers specificity for pathogen effector recognition
M. BANFIELD (1). (1) John Innes Centre, United Kingdom
- 13:10 C9-2. Molecular Mechanism for Fungal Cell Wall Recognition by Rice Chitin Receptor OsCEBiP
J. CHAI (1), S. Liu (1), J. Wang (1) (1) Tsinghua University, China
- 13:30 C9-3. RECEPTOR-LIKE PROTEIN REQUIRED FOR CSP22 RESPONSIVENESS (NbCSPR) underlies age-dependent immune responses to bacterial cold shock protein in *Nicotiana benthamiana*.
I. SAUR (1), Y. Kadota (2), N. Holton (3), J. Skle. (1) Department of Plant-Microbe Interactions, Max Planck Institute for Plant Breeding Research, Germany; (2) Plant Immunity Research Group, RIKEN Center for Sustainable Resource Science, Japan; (3) The Sainsbury Laboratory, United Kingdom; (4) Gregor Mend
- 13:50 C9-4. Two redundant plant TRAF proteins participate in NLR immune receptor turnover
S. HUANG (1), X. Chen (2), X. Zhong (2), M. Li (2). (1) University of British Columbia, Canada; (2) University of British Columbia, Canada
- 14:10 C9-5. The Arabidopsis leucine-rich repeat receptor kinase BIR3 has a dual function in the negative regulation of BAK1 receptor complex formation and stabilization of BAK1
S. SCHULZE (1), T. Halter (2), J. Imkampe (3), S. . (1) ZMBP-Centre for Plant Molecular Biology, Germany; (10) The Sainsbury Laboratory, Norwich Research Park, Norwich, England; (11) State Key Laboratory of Crop Stress Biology in Arid Areas, College of Horticulture, China; (2) Institut de Biologie de l'Eco
- 14:30 C9-6. Understanding and engineering immune receptor complexes in plants.
Z. DUXBURY (1), S. Huh (2), P. Ding (2), Y. Ma (2). (1) The Sainsbury Laboratory, United Kingdom; (2) The Sainsbury Laboratory, United Kingdom; (3) University of Exeter, United Kingdom

CONCURRENT SESSION 10: MICROBIOME & PHYTOBIOME I

15:20 – 17:00; Room B113–116

Cochair: Sarah Lebeis, University of Tennessee, Knoxville, Tennessee, U.S.A.

Cochair: Davide Bulgarelli, University of Dundee, Dundee, Scotland, United Kingdom

- 15:20 C10-1. Mighty duckweeds: growth promoting microbes associated with an aquatic plant
S. LEBEIS (1), E. Lam (2), K. McGuire (1), S. Gilb. (1) University of Tennessee, U.S.A.; (2) Rutgers University, U.S.A.
- 15:40 C10-2. Tracing the domestication route of the barley rhizosphere microbiota
D. BULGARELLI (1), R. Alegria Terrazas (2), S. Rob. (1) Plant Sciences, School of Life Sciences, Univeristy of Dundee, United Kingdom; (2) Plant Sciences, School of Life Sciences, University of Dundee, United Kingdom
- 16:00 C10-3. Adaptation of transmissible bacterial communities to multiple hosts: how the sap-feeding insect Scaphoideus titanus ships bacterial symbionts across grapevine plants
S. LOPEZ-FERNANDEZ
- 16:20 C10-4. Changes in phyllosphere microbiome - The dynamics of leaf city
S. KROLL (1), M. Agler (2), E. Kemen (2). (1) Max-Planck-Institute for Plant Breeding Research, Germany; (2) Max-Planck Institute for Plant Breeding Research, Germany; (3) Max-Planck Institute for Plant Breeding Research, Germany
- 16:40 C10-5. Sorghum microbiome discovery and characterization in nitrogen-limited soil for improved biomass production
D. CHINIQUY (1), D. Schachtman (2), J. Dangel (3), . (1) Joint Genome Institute, Lawrence Berkeley National Labs, U.S.A.; (2) University of Nebraska-Lincoln, U.S.A.; (3) University of North Carolina at Chapel Hill, U.S.A.

CONCURRENT SESSION 11: CELL BIOLOGY OF MICROBE-HOST INTERACTIONS

15:20 – 17:00; Room C123–124

Cochair: Antje Hesse, University of Missouri, Columbia, Missouri, U.S.A.

Cochair: Chris Staiger, Purdue University, West Lafayette, Indiana, U.S.A.

- 15:20 C11-1. Navigating the cellular seas - Roles of vesicular trafficking in plant immunity against bacterial infection
A. HEESE (1), A. Clarke (2), C. Collins (2), E. LaMontagne (2), G. Ekenayake (2), M. Leslie (2), J. Smith (2), S. Rogers (2) (1) University of Missouri-Columbia, Div. of Biochemistry-IPG, U.S.A.; (2) University of Missouri-Columbia, Div. of Biochemistry-IPG, U.S.A.

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DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

- 15:40 C11-2. Actin dynamics contribute to the innate immune response of *Arabidopsis*
C. STAIGER (1), J. Li (2), J. Henty-Ridilla (2), L. Cao (2), J. Chang (3), B. Day (4) (1) Purdue University, U.S.A.; (2) Purdue University, U.S.A.; (3) Oregon State University, U.S.A.; (4) Michigan State University, U.S.A.
- 16:00 C11-3. A *Pseudomonas syringae* type III effector uses calmodulin as co-factor to target the microtubule network
M. GUO (1), P. Kim (2), G. Li (1), C. Elowsky (3), (1) Center for Plant Science Innovation, University of Nebraska-Lincoln, U.S.A.; (2) School of Biological Sciences, University of Nebraska-Lincoln, U.S.A.; (3) Center for Biotechnology, University of Nebraska-Lincoln, U.S.A.
- 16:20 C11-4. RIP proteins of barley interact with the susceptibility factor RACB and distinctively localize in epidermal cells
C. MCCOLLUM (1), C. Höfle (1), R. Hueckelhoven (2). (1) Technische Universität München, Germany; (2) Technische Universität München, Germany
- 16:40 C11-5. The IRE1/bZIP60 pathway are activated by potexvirus and potyvirus small membrane binding proteins and suppress virus infection
J. VERCHOT (1), D. Halterman (2), O. Arias (1), L.. (1) Oklahoma State University, U.S.A.; (2) USDA/ARS Vegetable Crops Research Unit, U.S.A.; (3) Universidad de las Fuerzas Armadas – ESPE, Quito Ecuador, Ecuador

CONCURRENT SESSION 12: PLANT HORMONES & REGULATORS IN SYMBIOSIS AND DEFENSE

15:20 – 17:00; Room A105–106

Cochair: Mary Wildermuth, University of California, Berkeley, California, U.S.A.

Cochair: (see addendum)

- 15:20 C12-1. Salicylic acid at the forefront: Synthesis, manipulation, and hormone interplay to balance growth vs. defense
M. WILDERMUTH (1), R. Mackelprang (1), M. Steinwand (1), R. Ramos (1), D. Chandran (1) (1) UC Berkeley, U.S.A.
- 15:40 C12-2. Molecular basis of jasmonate-regulated plant defense
D. XIE (1). (1) Tsinghua University, China
- 16:00 C12-3. Ascorbate oxidation level determines the hormone balance during the interaction between parasitic root-knot nematodes and rice
T. KYNDT (1), A. Mekonene (2), R. Verbeek (2), R. Singh (2), A. Haeck (2), K. Demeestere (2), R. Tenhaken (3), S. Siddique (4), M. Frei (4) (1) Ghent University, Belgium; (2) Ghent University, Belgium; (3) University of Salzburg, Austria; (4) Rheinische Friedrich-Wilhelms-University of Bonn, Germany
- 16:20 C12-4. Colorful Signaling: Resolving cellular salicylic acid and jasmonate/ethylene responses during *Hyaloperonospora arabidopsidis*-*Arabidopsis thaliana* interactions
S. LAUKAMM (1), V. Lipka (2), O. Tetyuk (2), A. vo. (1) Georg-August-University Göttingen, Germany; (2) Georg-August-Universität Göttingen, Germany; (3) University of Nottingham, England; (4) University of Wageningen, Netherlands
- 16:40 C12-5. Regulon-guided Discovery of Defensive Secondary Metabolism in *Arabidopsis*
B. BARCO (1), N. Clay (1). (1) Yale University, U.S.A.

WEDNESDAY, JULY 20

7:30 – 11:30	Speaker Ready Room Open	Room A109
8:00 – 13:00	Registration Open	Prefunction Area A
8:30 – 10:10	Plenary Session 6	Oregon Ballroom 201–203
10:10 – 10:40	Coffee Break	
10:10 – 21:00	Posters available for viewing	Exhibit Hall A–A1
10:10 – 21:00	Exhibits Open	Exhibit Hall A–A1
10:40 – 12:20	Concurrent Session 13: Symbiosis & Mutualism II	Room B113–116
	Concurrent Session 14: RNA-Mediated Interactions	Room C123–124
	Concurrent Session 15: Signal Transduction for Systemic Defense, sponsored by Rijk Zwaan	Room A105–106
12:20 – 13:20	Student Travel Awardees and Speaker Lunch invitation only	Exhibit Hall A–A1
12:20 – 13:20	Boxed Lunches, prepurchased only	Exhibit Hall A–A1
12:20	Lunch Break (concessions & food trucks)	
	Free Afternoon	
	Tours (for those who preregistered via America's Hub World Tours, check ticket information for departure times)	
14:00 – 15:00	MPMI Focus Meeting, by invitation	Room 103–104

SESSIONS – Wednesday Morning

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

PLENARY SESSION 6

8:30 – 10:10; Oregon Ballroom 201–203, Level 2

Moderator: Jan Leach, Colorado State University, Fort Collins, Colorado, U.S.A.

- 8:30 PL6-1. Unraveling the molecular mechanism of rice immunity against the fungal pathogen *Magnaporthe oryzae*
G. WANG (1). (1) Ohio State University, U.S.
- 8:55 PL6-2. Diffuse symbioses: pathogen suppression in the soil microbiome
L. KINKEL (1) (1) University of Minnesota, U.S.A.
- 9:20 PL6-3. Improving plant resistance to fungal pathogens through cell wall modification: the callose effect
C. VOIGT (1), T. Hanak (2), B. Sode (1), H. El Kilani (3), M. Naumann (1), D. Eggert (4), C. Betzel (3), R. Reimer (4)
(1) University of Hamburg, Phytopathology and Biochemistry, Biocenter Klein Flottbek, Germany; (2) University of Hamburg, Phytopathology and Biochemistry, Biocenter Klein Flottbek, Germany; (3) University of Hamburg, Laboratory for Structural Biology of Infection and Inflammation, Germany; (4) Heinrich Pette Institute - Leibniz Institute for Experimental Virology, Germany; (5) University of Hamburg, Laboratory for Structural Biology of Infection and Inflammation, Germany
- 9:45 PL6-4. Pathogen glycoside hydrolase: a new player in the apoplastic battlefield
Y. WANG (1). (1) Department of Plant Pathology, Nanjing Agricultural University, China

CONCURRENT SESSION 13: SYMBIOSIS & MUTUALISM II

10:40 – 12:20; Room B113–116

Cochair: Joel Griffitts, Brigham Young University, Provo, Utah, U.S.A.

Cochair: Alga Zuccaro, Max Planck Institute, Marburg, Germany

- 10:40 C13-1. How rhizobial accessory plasmids impact symbiotic negotiations
J. GRIFFITTS (1), P. Price (1), C. Harrison (1). (1) Brigham Young University, U.S.A.
- 11:00 C13-2. Innate sensing of glucans in plant roots and its importance in shaping host associations with fungi
A. ZUCCARO (1), S. Wawra (1), P. Fesel (1) (1) CEPLAS, University of Cologne, Germany
- 11:20 C13-3. Insights into Symbiotic Plant-Fungal Communication using Innovative Imaging Approaches
R. ROTH (1), S. Hillmer (2), K. Schumacher (3), J. (1) University of Cambridge, United Kingdom; (2) EMCF@COS, Germany; (3) COS, Germany; (4) CAIC, England; (5) University of Cambridge, England

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DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = *Special Session*, C = *Concurrent Session*, PL = *Plenary Session*

- 11:40 C13-4. *In situ* metabolic profiling of symbiotic soybean-rhizobia interactions by laser ablation -electrospray ionization mass spectrometry (LAESI-MS)
B. AGTUCA (1), S. Stopka (2), C. Anderton (3), D. . (1) Divisions of Plant Sciences and Biochemistry, C. S. Bond Life Sciences Center, University of Missouri, U.S.A.; (2) Department of Chemistry, W. M. Keck Institute for Proteomics Technology and Applications, The George Washington University, U.S.A.; (3)
- 12:00 C13-5. Regulation of arbuscule degeneration during arbuscular mycorrhizal symbiosis
M. HARRISON (1), D. Floss (2), K. Bhattarai (2), S. (1) Boyce Thompson Institute, Cornell University, U.S.A.; (2) Boyce Thompson Institute, U.S.A.

CONCURRENT SESSION 14: RNA-MEDIATED INTERACTIONS

10:40 – 12:20; Room C123–124

Cochair: Richard Michelmore, University of California, Davis, California, U.S.A.

Cochair: Elizabeth Fontes, University Federal de Viçosa, Viçosa, Brazil

- 10:40 C14-1. Inverse modulation of the NIK-mediated antiviral signaling and antibacterial immunity in plants by RNA effectors
E. FONTES (1) (1) Universidade Federal de Vicosa, Brazil
- 11:00 C14-2. Cotton plants export small RNAs to induce target gene silencing in a wilt disease pathogen *Verticillium dahlia* (See addendum for presenter name) (1), T. Zhang (2) (1) Institute of Microbiology, Chinese Academy of Sciences, China; (2) Institute of Microbiology, Chinese Academy of Sciences, China
- 11:20 C14-3. Functional analysis of barley powdery mildew effector candidates and identification of their barley targets
A. AHMED (1), C. Pedersen (2), T. Schultz-Larsen (1) (1) University of California, Davis Genome center, U.S.A.; (2) University of Copenhagen, Denmark; (3) Aachen University, Germany
- 11:40 C14-4. Bidirectional sRNA-trafficking and RNA-based plant protection against *Botrytis cinerea* and other pathogens that utilize small RNA effectors
M. WANG (1), A. Weiberg (2), F. Lin (3), B. Thomma. (1) UC Riverside, U.S.A.; (2) University of Munich Martinsried, Germany; (3) National Chiao Tung University, Taiwan; (4) Wageningen University, Netherlands; (5) UC Riverside, U.S.A.
- 12:00 C14-5. Triticum mosaic virus contains a unique translation element within its 5' untranslated region
R. ROBERTS (1), J. Zhang (1), L. Mayberry (2), K. . (1) University of Wisconsin-Madison, U.S.A.; (2) University of Texas-Austin, U.S.A.

CONCURRENT SESSION 15: SIGNAL TRANSDUCTION FOR SYSTEMIC DEFENSE

Sponsored by Rijk Zwaan

10:40 – 12:20; Room A105–106

Cochair: Brigitte Mauch-Mani, University of Neuchâtel, Neuchâtel, Switzerland

Cochair: Corina Vlot, Helmholtz Zentrum, Munich, Germany

- 10:40 C15-1. Putative sugar-binding proteins additively promote systemic acquired resistance in parallel with salicylic acid
C. VLOT (1), E. Pabst (1), H. Breitenbach (1), M. Wenig (1), C. Knappe (1) (1) Helmholtz Zentrum Muenchen, Institute of Biochemical Plant Pathology, Germany
- 11:00 C15-2. Stress induces the accumulation of beta-aminobutyric acid (BABA) in plants
I. BACCELLI (1), D. Thevenet (1), A. Balmer (1), V. (1) University of Neuchâtel, Switzerland
- 11:20 C15-3. Regulatory DNA elements in the primed systemic immunity of *Arabidopsis thaliana*
E. REIMER-MICHALSKI (1), S. Baum (1), A. Bolger (2) (1) Department of Plant Physiology, RWTH Aachen University, Germany; (2) Department of Botany and Molecular Genetics, RWTH Aachen University, Germany; (3) Genomics Core Facility, EMBO Laboratories, Germany
- 11:40 C15-4. Underground AZA priming against pathogens
S. ROYCHOUDHRY (1), N. Cecchini (2), J. Greenberg (1) (1) University of Chicago, U.S.A.; (2) University of Chicago, U.S.A.
- 12:00 C15-5. Processive ubiquitination controls NPR1 coactivator activity in plant immunity
S. SPOEL (1), J. Furniss (1), M. Skelly (1), H. Gr. (1) University of Edinburgh, United Kingdom

THURSDAY, JULY 21

7:30 – 14:00	Speaker Ready Room Open	Room A109
8:00 – 15:00	Registration Open	Prefunction Area A
8:30 – 10:10	Concurrent Session 16: Tritrophic Interactions and Biocontrol	Room C123–124
	Concurrent Session 17: Microbial Manipulation of the Host II	Room B113–116
	Concurrent Session 18: Cell Wall-Mediated Resistance	Room A105–106
10:10 – 10:40	Coffee Break	
10:10 – 14:50	Posters available for viewing	Exhibit Hall A–A1
10:40 – 12:20	Concurrent Session 19: Microbiome & Phytobiome II	Room B113–116
	Concurrent Session 20: Apoplastic Interactions	Room C123–124
	Concurrent Session 21: Emerging Systems	Room A105–106
12:20 – 12:50	Lunch Break (<i>concessions & food trucks</i>)	
12:20 – 13:10	Student Travel Awardees and Speaker Lunch, <i>invitation only</i>	Exhibit Hall A–A1
12:20 – 12:50	Box Lunches, <i>preurchased only</i>	Exhibit Hall A–A1
12:20 – 14:50	Exhibits Open	Exhibit Hall A–A1
12:50 – 14:50	Poster Viewing with Authors Present 12:50 – 13:50 <i>Posters 1–722: Even-numbered poster authors</i> 13:50 – 14:50 <i>Posters 1–722: Odd-numbered poster authors</i>	
14:50 – 15:30	Poster Take-Down	Exhibit Hall A–A1
14:50 – 16:00	Exhibit Take-Down	Exhibit Hall A–A1
14:50 – 16:30	Concurrent Session 22: Inter-Kingdom Signaling	Room C123–124
	Concurrent Session 23: Population Genomics	Room A105–106
	Concurrent Session 24: Recognition in Plant Immunity II	Room B113–116
16:30 – 17:00	Coffee Break	
17:00 – 18:40	Plenary Session 7	Oregon Ballroom 201–203
18:40 – 19:30	Closing Ceremony	Oregon Ballroom 201–203
19:30 – 23:30	Closing Event – Taste of Portland	Portland Ballroom 251–258

SESSIONS – Thursday Morning

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

CONCURRENT SESSION 16: TRITROPHIC INTERACTIONS AND BIOCONTROL

8:30 – 10:10; Room C123–124

Cochair: Clare Casteel, University of California, Davis, California, U.S.A.

Cochair: Christoph Keel, University Lausanne, Lausanne, Switzerland

- 8:30 C16-1. A viral protease relocates in the presence of the vector to promote vector performance
C. CASTEEL (1), A. Bak (1), C. Yang (2), S. Whitham (2) (1) University of California, U.S.A.; (2) Iowa State University, U.S.A.
- 8:50 C16-2. Cucumber mosaic virus has plant species-specific effects on host-vector interactions
T. TUNGADI (1), A. Murphy (1), A. Pate (1), J. Iqb. (1) Department of Plant Sciences. University of Cambridge, United Kingdom
- 9:10 C16-3. Leaf transcriptomics reveals differing responses of Arabidopsis to colonization by ubiquitous phyllosphere colonizers with potential implications for plant health upon pathogen encounter
C. VOGEL (1), N. Bodenhausen (2), W. Gruissem (3), (1) Institute of Microbiology, ETH Zurich, Switzerland; (2) Institute of Microbiology, ETH Zurich, Switzerland; (3) Institute of Agricultural Sciences, ETH Zurich, Switzerland
- 9:30 C16-4. Exposure to subinhibitory concentrations of phenazine-1-carboxylic acid controls common scab of potato through transcriptomic changes in *Streptomyces scabies*
M. FILION (1), R. Roquigny (1), T. Arseneault (2), (1) Université de Moncton, Canada; (2) University of Reading, United Kingdom; (3) Agriculture and Agri-Food Canada, Canada

continued

DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

- 9:50 C16-5. Cell envelope-associated components contribute to pathogenicity towards pest insects and competitiveness of root-colonizing pseudomonads with biocontrol activities
C. KEEL (1), P. Kupferschmied (1), M. Péchy-Tarr (1) University of Lausanne, Switzerland; (2) University of Lausanne, Switzerland; (3) Swiss Federal Institute of Technology (ETH), Switzerland; (4) Zürich University of Applied Sciences, Switzerland

CONCURRENT SESSION 17: MICROBIAL MANIPULATION OF THE HOST II

8:30 – 10:10; Room B113–116

Cochair: Yi Li, Peking University, Peking, China

Cochair: Wenbo Ma, University of California, Riverside, California, U.S.A.

- 8:30 C17-1. Small RNAs mediated host antiviral defense in rice
Y. LI (1). (1) Peking University, China
- 8:50 C17-2. Phytophthora effectors promote infection by suppressing small RNA silencing in plants
W. MA (1), Y. Zhai (1), D. Choi (1), Y. Hou (1), T. Kuan (1), J. He (2), J. Ma (2) (1) University of California, U.S.A.; (2) Fudan University, China
- 9:10 C17-3. Role of *Rhg1*-encoded a-SNAPs in *Rhg1*-Mediated Resistance to Soybean Cyst Nematode
A. BAYLESS (1), J. Smith (1), J. Song (1), P. McMi. (1) UW-Madison, U.S.A.
- 9:30 C17-4. Mechanisms of Bacterial Suppression of AGO1-RISC Activity and of Host Counter-counter Defense
L. NAVARRO (1), O. Thiébeauld (2), M. Charvin (2), (1) IBENS-CNRS, France; (2) IBENS-CNRS, France; (3) University of Nebraska, U.S.A.; (4) LGDP, France; (5) LGDP, France
- 9:50 C17-5. RXLR effector PexRD54 couples host cellular transport components to autophagic compartments to stimulate autophagosome biogenesis and haustorial transport
T. BOZKURT (1), P. Pandey (1), Y. Dagdas (2), B. D. (1) Imperial College london, Department of Life Sciences, London, UK., United Kingdom; (2) The Sainsbury Laboratory, Norwich Research Park, Norwich, NR4 7UH, UK., United Kingdom; (3) Imperial College london, Department of Life Sciences, London, UK., United Kingdom; (4) INGEBI-CONICET, Obligado 2490, C.A.B.A., C1428ADN, Argentina, Argentina

CONCURRENT SESSION 18: CELL WALL-MEDIATED RESISTANCE

8:30 – 10:10; Room A105–106

Cochair: Giulia De Lorenzo, University of Rome, Rome, Italy

Cochair: Georg Jander, Boyce Thompson Institute of Plant Research, Ithaca, New York, U.S.A.

- 8:30 C18-1. Dampening a DAMP: a specific oxidase regulates homeostasis of oligogalacturonides and growth in Arabidopsis
G. DE LORENZO (1), M. Benedetti (1), I. Verrascina. (1) Università di Roma Sapienza, Italy; (2) Università di Roma Sapienza, Italy
- 8:50 C18-2. Proteins and small molecules in aphid saliva influence interactions with host plants
G. JANDER (1) (1) Boyce Thompson Institute, U.S.A.
- 9:10 C18-3. Cell-wall-based regulation of stomatal defense in Arabidopsis
L. ZHANG (1), W. Zeng (2), J. Chen (3), S. He (4). (1) Department of Plant Biology, DOE Plant Research Laboratory, Michigan State University, U.S.A.; (2) DOE Plant Research Laboratory, Michigan State University, U.S.A.; (3) Department of Computer Science and Engineering, DOE Plant Research Laboratory, Michigan State University, U.S.A.; (4) Department of Computer Science and Engineering, DOE Plant Research Laboratory, Michigan State University, U.S.A.
- 9:30 C18-4. The wheat *Stb6* gene controlling a gene-for-gene resistance to *Zymoseptoria tritici* encodes a wall-associated kinase like protein
C. SAINTENAC (1), W. Lee (2), F. Cambon (1), J. Ru. (1) INRA, and Université Blaise Pascal, France; (2) Rothamsted Research, United Kingdom; (3) John Innes Centre, United Kingdom
- 9:50 C18-5. UDP-D-Glucuronate 4-Epimerases 1 (GAE1) and GAE6 are Critical for Pectin Abundance and Immunity in *Arabidopsis thaliana*
G. BETHKE (1), A. Thao (1), G. Xiong (2), B. Li (3). (1) University of Minnesota, U.S.A.; (2) Energy Biosciences Institute, University of California, U.S.A.; (3) University of California, U.S.A.; (4) University of California, U.S.A.; (5) University of California, U.S.A.

CONCURRENT SESSION 19: MICROBIOME & PHYTOBIOME II

10:40 – 12:20; Room B113-116

Cochair: Angela Sessitsch, Austrian Institute of Technology, Vienna, Austria**Cochair:** Carolyn Young, Noble Foundation, Oklahoma, U.S.A.

- 10:40 C19-1. Tissue specificity of plant microbiomes and the role of seed-associated microbiota
A. SESSITSCH (1), B. Mitter (1), C. Escobar-Rodríguez (1), N. Pfaffenbichler (1), S. Compant (1), L. Antonielli (2)
(1) AIT Austrian Institute of Technology, Austria; (2) AIT Austrian Institute of Technology, Austria
- 11:00 C19-2. Understanding the spatial-temporal dynamics of a root rot disease: a bird's-eye view to molecular techniques
C. YOUNG (1). (1) The Samuel Roberts Noble Foundation, U.S.A.
- 11:20 C19-3. Succession of endophytic bacteria in the mountain sorrel (*Oxyria digyna*)
C. GIVEN (1), E. Häikiö (2), M. Kumar (1), R. Niss. (1) University of Jyväskylä, Finland; (2) University of Eastern Finland, Finland
- 11:40 C19-4. The Powdery Mildew Survey – a citizen science scheme for increasing the efficiency of identification of a harmful, fungal plant disease
O. ELLINGHAM (1), J. David (2). (1) University of Reading, United Kingdom; (2) Royal Horticultural Society, United Kingdom
- 12:00 C19-5. Drought and Host Selection in the Grass Root Microbiome
D. COLEMAN-DERR (1), D. Naylor (2), S. Deng (2). (1) USDA-ARS, U.S.A.; (2) University of California at Berkeley, U.S.A.

CONCURRENT SESSION 20: APOPLASTIC INTERACTIONS

10:40 – 12:20; C123-124

Cochair: Vivianne Vleeshouwers, Wageningen University, Netherlands**Cochair:** Thorsten Nuernberger, University Tübingen, Germany

- 10:40 C20-1. Effector-driven breeding for apoplastic immunity to *Phytophthora infestans* in potato
V. VLEESHOUWERS (1). (1) Wageningen University, Netherlands
- 11:00 C20-2. Identification and characterization of two novel plant immune receptors, RLP23 and RLP32 and engineering immunity in crops
T. NÜRNBERGER (1), H. Böhm (1), I. Albert (1), L. . (1) University Tübingen, Germany
- 11:20 C20-3. Finally: A Biochemical Function for the pathogenesis-related protein 1
J. GAMIR (1), P. van't Hof (2), R. Darwiche (2), R. (1) Department of Biology/University of Fribourg, Switzerland; (2) Department of Biology/University of Fribourg, Switzerland
- 11:40 C20-4. Apoplastic Venom Allergen-like Proteins of Plant Parasitic Nematodes Modulate the Activation of Plant Innate Immunity by Cell Surface Receptors
J. LOZANO-TORRES (1), R. Wilbers (1), S. Warmerdam. (1) Wageningen University/Laboratory of Nematology, Netherlands
- 12:00 C20-5. The repetitive *Ustilago maydis* effector Rsp3 shields hyphae and blocks the anti-fungal activity of a secreted maize protein
L. MA (1), C. Trippel (1), L. Wang (2), A. Mendoza-Mendoza (3), S. Ullmann (4), M. Moretti (1), S. Wawra (1), S. Reissmann (1), K. Münch (1), B. Zechmann (5), R. Kahmann (1) (1) Max Planck Institute for Terrestrial Microbiology, Germany; (2) Max Planck Institute for Heart and Lung Research, Germany; (3) Bio-Protection Research Centre, New Zealand; (4) Heinrich-Heine-Universität Düsseldorf, Germany; (5) Center for Microscopy and Imaging (CMI), Baylor University, U.S.A.

CONCURRENT SESSION 21: EMERGING SYSTEMS

10:40 – 12:20; Room A105-106

Cochair: James Westwood, Virginia Tech, U.S.A**Cochair:** Godelieve Gheysen, Ghent University, Belgium

- 10:40 C21-1. Nematode infection of rice: interactions with the plant host and with other pathogens
G. GHEYSEN (1). (1) Ghent University, Belgium
- 11:00 C21-2. Using the lens of molecular plant-microbe interactions to uncover the pathways of plant parasitization by the parasitic weed *Phelipanche aegyptiaca* (broomrape).
C. CLARKE (1), J. Westwood (1). (1) Virginia Tech, U.S.A.

continued

DAILY PROGRAM SCHEDULE AND SESSIONS

Key: S = Special Session, C = Concurrent Session, PL = Plenary Session

- 11:20 C21-3. Defending plants against the World's most pesticide-resistant insect, *Myzus persicae*: A role for calcium
T. VINCENT (1), M. Avramova (1), J. Canham (1), P. (1) John Innes Centre, United Kingdom; (2) University of Wisconsin - Madison, U.S.A.
- 11:40 C21-4. Identification of NB-LRR mediated nonhost resistance to wheat stripe rust in *Brachypodium distachyon*
J. BETTGENTHAEUSER (1), M. Gardiner (1), M. Opanowi. (1) The Sainsbury Laboratory, United Kingdom; (2) John Innes Centre, United Kingdom; (3) CSIRO Plant Industry, Australia; (4) IBERS, Aberystwyth University, United Kingdom
- 12:00 C21-5. A new model for virulence in the emerging Gram-positive phytopathogen, *Rhodococcus fascians*
E. SAVORY (1), A. Creason (1), S. Fuller (1), D. S. (1) Oregon State University, U.S.A.

SESSIONS – Thursday Afternoon

CONCURRENT SESSION 22: INTER-KINGDOM SIGNALING

14:50 – 16:30; Room C123–124

Cochair: Vittorio Venturi, ICGEB, Trieste, Italy

Cochair: Barbara Valent, Kansas State University, Manhattan, Kansas, U.S.A.

- 14:50 C22-1. Studies on inter-species and inter-kingdom signaling in plant-associated bacteria
V. VENTURI (1) (1) ICGEB, Italy
- 15:10 C22-2. Symplastic effector protein trafficking during biotrophic invasion of rice cells by the blast fungus
B. VALENT (1), E. Oliveira-Garcia (1), H. Zheng (1), M. Yi (2), P. Migeon (1), M. Dalby (1), K. Park (1), S. Park (1), M. Farman (3), Z. Wang (4), J. Zhou (4) (1) Kansas State University, U.S.A.; (2) The Noble Foundation, U.S.A.; (3) University of Kentucky, U.S.A.; (4) Fujian Agriculture and Forestry University, China
- 15:30 C22-3. Co-option of bacterial quorum sensing for interkingdom signaling
B. GONCALVES COUTINHO (1), A. Schaefer (2), Y. Oda. (1) University of Washington, U.S.A.; (2) University of Washington, U.S.A.; (3) Oak Ridge National Laboratory, U.S.A.; (4) ICGEB, Italy
- 15:50 C22-4. A *gacA*- mutant of *Pseudomonas syringae* hyper-responds to type III secretion-inducing plant signals yet is less virulent
M. O'MALLEY (1), S. Peck (2), J. Anderson (1). (1) Department of Botany & Plant Pathology, Oregon State University, U.S.A.; (2) Division of Biochemistry, University of Missouri, U.S.A.
- 16:10 C22-5. Interkingdom chemical crosstalk across the plant-microbe interface during Rice Blast
N. NAQVI (1), R. Patkar (1), Z. Qu (1), F. Yang (1). (1) Temasek Life Sciences Laboratory, Singapore

CONCURRENT SESSION 23: POPULATION GENOMICS

14:50 – 16:30; Room A105–106

Cochair: Boris Vinatzer, Virginia Tech, Blacksburg, Virginia, U.S.A.

Cochair: Erica Goss, University of Florida, Gainesville, Florida, U.S.A.

- 14:50 C23-1. Population genomics insights into *Pseudomonas syringae* disease emergence and pathogen dissemination
B. VINATZER (1). (1) Virginia Tech, U.S.A.
- 15:10 C23-2. Interspecific homologous recombination generates genomic and phenotypic diversity in Florida populations of *Xanthomonas perforans*
E. GOSS (1), J. Jones (2), G. Vallad (2), S. Timil. (1) University of Florida, U.S.A.; (2) University of Florida, U.S.A.
- 15:30 C23-3. Using population genomics to understand NLR diversity in wild tomato
R. STAM (1), A. Tellier (1), D. Scheikl (1). (1) Technische Universität München, Germany
- 15:50 C23-4. Elucidating mechanisms of *Phytophthora* pathogen emergence in the genomics era
N. GRUNWALD (1), B. Knaus (2), J. Tabima (3). (1) USDA ARS, U.S.A.; (2) USDA ARS, U.S.A.; (3) Oregon State University, U.S.A.
- 16:10 C23-5. Pathogenomic analysis of South African stripe rust populations
H. VAN SCHALKWYK (1), R. Prins (2), Z. Pretorius (1), L. Boyd (3), C. Uauy (4), D. Saunders (5) (1) University of the Free State, South Africa; (2) CenGen (Pty) Ltd and University of the Free State, South Africa; (3) National Institute of Agricultural Botany, United Kingdom; (4) John Innes Centre, United Kingdom; (5) The Genome Analysis Centre and The John Innes Centre, United Kingdom

CONCURRENT SESSION 24: RECOGNITION IN PLANT IMMUNITY II

14:50 – 16:30; Room B113–116

Cochair: Aska Goverse, University of Wageningen, Wageningen, Netherlands

Cochair: Dingzhong Tang, CAS, Beijing, China

- 14:50 C24-1. Molecular and cellular dynamics involved in effector recognition by the nematode immune receptor GPA2
A. GOVERSE (1), E. Slootweg (1), H. Overmars (1), J. Roosien (1), O. Caldararu (2), A. Petrescu (2), J. Bakker (1), G. Smant (1) (1) Wageningen University, Netherlands; (2) IBAR, Romania
- 15:10 C24-2. The role of a glycosylphosphatidylinositol-anchored protein in plant immunity
D. TANG (1), H. Pan (1), Q. Shen (1) (1) Institute of Genetics and Development Biology, Chinese Academy of Sciences, China
- 15:30 C24-3. Structural studies of signalling domains from plant NLRs.
S. WILLIAMS (7), A. Bentham (1), X. Zhang (2), L. Casey (3), P. Lavrencic (2), S. Cesari (4), D. Ericsson (5), P. Anderson (1), M. Mobli (6), M. Bernoux (4), P. Dodds (4), B. Kobe (2), (1) School of Biological Sciences, Flinders University, Australia; (2) School of Chemistry and Molecular Biosciences, University of Queensland, Australia; (3) School of Chemistry and Molecular Biosciences, University of Queensland, Australia; (4) CSIRO Agriculture Flagship, Australia; (5) MX Beamlines, Australian Synchrotron, Australia; (6) Centre for Advanced Imaging, University of Queensland, Australia; (7) Research School of Biology, Australian National University, Australia
- 15:50 C24-4. The NOI/RIN4 integrated domain of the rice NLR Pii-2 binds to OsExo70-F3, an accessory protein required for *Pii*-dependent resistance
K. FUJISAKI (1), Y. Abe (1), H. Saitoh (1), H. Kan. (1) Iwate Biotechnology Research Center, Japan; (2) The Sainsbury Laboratory, United Kingdom
- 16:10 C24-5. Mystery solved: How the atypical pair Mi-1.2 and SERK1 regulate aphid resistance?
I. KALOSHIAN (1), H. Peng (1), S. Mantelin (2), G.. (1) University of California Riverside, U.S.A.; (2) University of California Riverside, U.S.A.; (3) University of Amsterdam, Netherlands

PLENARY SESSION 7

17:00 – 18:40; Oregon Ballroom 201–203, Level 2

Moderator: Andrew Bent, University of Wisconsin, Madison, Wisconsin, U.S.A.

- 17:00 PL7-1. Molecular elucidation of plant-plant Interactions
K. SHIRASU (1). (1) RIKEN Center for Sustainable Resource Science, Japan
- 17:25 PL7-2. Kinase mediated regulation of plant innate immune responses
G. COAKER (1), Y. Chiang (1), M. Zhang (1), T. Toruno (1) (1) University of California, Davis, U.S.A.
- 17:50 PL7-3. Thousands ways to kill: transcriptional variation and distinct infection programs among individuals of the wheat pathogen *Zymoseptoria tritici*
E. STUKENBROCK (1), J. Haueisen (1), J. Grandaubert (1) (1) Max Planck Institute for Evolutionary Biology, Germany
- 18:15 PL7-4. The RPS4/RRS1 NLR pair: sensing of pathogen interference and regulation of post-activation signaling
L. DESLANDES (1), J. Parker (2), C. Le Roux (3), M. Escouboué (4), A. Delga (5), G. Huet (4), A. Jauneau (6), Y. Coutué (7), A. Kraut (7), K. Niefind (8), R. Berthomé (5), D. Tremousaygue (4), S. Carrere (5) (1) CNRS, France; (2) Max-Planck Institut, Germany; (3) Max-Planck Institut, Germany; (4) CNRS, France; (5) INRA, France; (6) FR3450, France; (7) CEA, France; (8) University of Cologne, Germany

POSTER TITLES BY CATEGORY

Taking photographs of material projected during presentations or displayed is prohibited without permission from the authors. Poster titles are listed on the following pages of this Program Book.

See Poster Presenter information on page 6 for poster author times and poster viewing.

Poster Presentation Categories

Primary: Symbiosis and Mutualism

Secondary

P1: Commonalities Between Mutualists and Pathogens.....	Posters 1–12
P2: Symbiosis & Mutualism (Mechanisms and Evolution)	Posters 13–63

Primary: Phytobiome

Secondary

P3: Molecular Ecology of Host-Microbe Interactions	Posters 64–87
P4: Plant Microbiome.....	Posters 88–122
P5: Tritrophic Interactions and Biocontrol.....	Posters 123–136

Primary: Microbes

Secondary

P6: Apoplastic Interactions.....	Posters 137–151
P7: Cell Biology of Microbe-Host Interactions.....	Posters 152–226
P8: Inter-Kingdom Signaling.....	Posters 227–232
P9: Microbial Manipulation of the Host.....	Posters 233–335
P10: RNA-Mediated Interactions.....	Posters 336–343

Primary: Genomics and Systems Biology

Secondary

P11: Genomes, Genomics and Epigenomics.....	Posters 344–393
P12: Host-Microbe Co-Evolution.....	Posters 394–407
P13: Population Genomics	Posters 408–416
P14: Systems Biology and Modeling.....	Posters 417–425

Primary: Host Resistance

Secondary

P15: Cell Wall-Mediated Resistance	Posters 426–437
P16: Plant Hormones and Regulators	Posters 438–484
P17: Recognition in Plant Immunity.....	Posters 485–656
P18: Signal Transduction for Systemic Defense.....	Posters 657–701

Primary: Translational and Emerging Systems

Secondary

P19: Emerging Systems	Posters 702–712
P20: Translational Research; Developing World Needs	Posters 713–722

POSTER TITLES AND AUTHORS

Please note: Poster titles and author information appears as submitted and has not been edited.

SYMBIOSIS AND MUTUALISM

Commonalities Between Mutualists and Pathogens

- P1-1 Relocation of nutrients during stripe rust infection of wheat. V. ROMAN-REYNA (1), J. Rathjen (2), F. Busch (2) (1) Research School of Biology, The Australian National University, Australia; (2) Research School of Biology, The Australian National University, Australia
- P1-2 Time series RNA-seq reveals early root responses to ISR-inducing *Pseudomonas simiae* WCS417 and the microbial elicitors flg22, flg22417, and chitin.. I. STRINGLIS (1), S. Proietti (2), M. van Verk (2), R. Hickman (2), C. Zamioudis (2), C. Pieterse (2) (1) Utrecht University, Netherlands; (2) Utrecht University, Netherlands
- P1-3 A mechanistic link between legume-rhizobium symbiosis and plant immunity. K. TOTH (1), G. Stacey (1) (1) University of Missouri, U.S.A.
- P1-4 Receptors complex associated with defense and symbiotic signaling in legumes. F. FENG (1), J. Sun (2), S. Radutoiu (3), J. Stougaard (4), G. Oldroyd (2) (1) John Innes Centre, United Kingdom; (2) John Innes Centre, United Kingdom; (3) Department of Molecular Biology and Genetics, Centre for Carbohydrate Recognition and Signalling, Aarhus University, Denmark; (4) Department of Molecular Biology and Genetics, Centre for Carbohydrate Recognition and Signalling, Aarhus University, United Kingdom
- P1-5 Common Accommodation Mechanisms for Mutualistic and Pathogenic Fungi in Rice. C. IBE (1) (1) University of Cambridge, United Kingdom
- P1-6 The development of hyphal symbionts and pathogens relies on fatty acid biosynthesis by the plant host. A. KEYMER (1) (1) University of Munich (LMU), Germany
- P1-7 Fungal endophytes from grapevine have host-dependent levels of virulence and produce antibiotic compounds in dual cultures. S. LÓPEZ-FERNÁNDEZ (1), A. Campisano (2), B. Schulz (1) (1) Technische Universität Braunschweig, Germany; (2) Fondazione Edmund Mach, Italy
- P1-8 Symbiosis or defense: the molecular mechanism involving LysM receptors of the model legume *Lotus japonicus*. S. RADUTOIU (1), J. Cheng (1), M. Blaise (2), J. Stougaard (1), Z. Bozsoki (1) (1) Aarhus University/CARB, Denmark; (2) CNRS, Centre d'études d'agents Pathogènes et Biotechnologies pour la Santé, Université de Montpellier, France
- P1-9 Metabolic consequences of the introduction of a *Populus trichocarpa* lectin receptor-like kinase into *Arabidopsis thaliana*, a non-ectomycorrhizal host species. T. TSCHAPLINSKI (1), Z. Zhang (2), J. Labbe (2), W. Muchero (2), Y. Yang (2), P. Ranjan (3), S. Jawdy (2), G. Tuskan (2), J. Chen (2) (1) Oak Ridge National Laboratory, U.S.A.; (2) Oak Ridge National Laboratory, U.S.A.; (3) University of Tennessee, U.S.A.
- P1-10 The plant microbiome at the intersection of metabolism and defense. C. HANEY (1), L. Shapiro (2), J. Bush (3), N. Pierce (2), F. Ausubel (3) (1) The University of British Columbia, Canada; (2) Harvard University, U.S.A.; (3) Massachusetts General Hospital, U.S.A.
- P1-11 Aboveground activation of defense leads to recruitment of bacteria into the rhizosphere of *Arabidopsis thaliana*. R. BERENDSEN (1), K. Yu (1), C. Pieterse (1), P. Bakker (1) (1) Utrecht University, Netherlands
- P1-12 Plant and microbial proteins contributing to beneficial and detrimental root colonisation by filamentous microbes. S. SCHORNACK (1), C. Quan (1), T. Rey (1), M. Bonhomme (2), C. Jacquet (2), A. Chatterjee (1), J. Toulotte (1) (1) University of Cambridge, Sainsbury Laboratory, United Kingdom; (2) LRSV, University Paul Sabatier, France

Symbiosis & Mutualism (Mechanisms and Evolution)

- P2-13 Role of Type V Protein Secretion System in endophytic rice root colonization by *Azoarcus* sp. BH72. M. MARSZALKOWSKA (1), A. Sarkar (1), M. Schäfer (2), B. Reinhold-Hurek (1) (1) Department of Microbe - Plant Interactions, University of Bremen, Germany; (2) John Innes Centre, United Kingdom
- P2-14 The role of ROP GTPases in Nod factor signalling. A. AKAMATSU (1), G. Oldroyd (2) (1) John Innes Centre, United Kingdom; (2) John Innes Centre, United Kingdom
- P2-15 A band of misfits: role of unexpected proteins in the plant symbiotic signaling pathway. J. ANE (1), M. Venkateshwaran (2), A. Wiley-Kalil (3), D. Jayaraman (1), M. Banba (4), A. Binder (5), S. Bernard (1), M. Chabaud (6), J. Maeda (1), A. Genre (7), M. Otegui (1), D. Barker (6), H. Imaizumi-Anraku (4), M. Parniske (5) (1) University of Wisconsin - Madison, U.S.A.; (2) University of Wisconsin - Platteville, U.S.A.; (3) University of Wisconsin - Madison, U.S.A.; (4) National Institute of Agrobiological Sciences (NIAS), Japan; (5) Ludwig-Maximilians-Universität München, Germany; (6) Laboratory of Plant-Microbe Interactions, France; (7) University of Torino, Italy
- P2-16 Autoregulation of infection in the *Sinorhizobium meliloti*-*Medicago* symbiosis. J. BATUT (1), A. GARNERONE (1), F. SORROCHE (1), M. WALCH (1), A. GASTEBOIS (1), C. MASSON-BOIVIN (1) (1) INRA-CNRS, France

- P2-17 Exploring Endophytic Colonization Mechanisms of the Nitrogen-fixing Diazotroph *Azoarcus* sp. BH72 in Rice. X. CHEN (1) (1) University of Bremen, Germany
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- P2-19 Poplar as a model for dissecting early mycorrhizal signaling in woody perennials. K. COPE (1), M. Venkateshwaran (2), J. Maeda (3), C. Ma (4), S. Strauss (4), J. Ané (3) (1) University of Wisconsin–Madison, U.S.A.; (2) University of Wisconsin-Platteville, U.S.A.; (3) University of Wisconsin-Madison, U.S.A.; (4) Oregon State University, U.S.A.
- P2-20 *Nod* genes are required for the colonization of different hosts by *Rhizobium* sp. IRBG74. M. CROOK (1), A. Wiley-Kalil (2), V. Poinso (3), S. Erdn (4), K. Garcia (1), M. Babcock (1), J. Maeda (1), A. Desbiez-Piat (2), F. Maillet (4), A. Mukherjee (5), J. Dénarié (4), J. Ané (1) (1) Department of Bacteriology, University of Wisconsin–Madison, U.S.A.; (2) Department of Agronomy, University of Wisconsin–Madison, U.S.A.; (3) Laboratoire des IMRCP, Université Paul Sabatier, France; (4) Laboratoire des Interactions Plantes–Microorganismes, INRA-CNRS, France; (5) Department of Biology, University of Central Arkansas, U.S.A.
- P2-21 Biological nitrogen fixation in poplar trees. S. DOTY (1), A. Sher (2), Z. Khan (1), M. Khorasani (1), N. Fleck (1), R. Bumgarner (1), S. Kim (1), T. DeLuca (1) (1) University of Washington, U.S.A.; (2) University of California, San Diego, U.S.A.
- P2-22 Drought tolerance and growth enhancement of hybrid poplar by inoculation with an endophyte consortium. S. DOTY (1), Z. Khan (1), H. Rho (1), A. Firrincieli (2), S. Hung (1), V. Luna (3), O. Masciarelli (3), S. Kim (1) (1) University of Washington, U.S.A.; (2) University of Tuscia, Italy; (3) Universidad Nacional de Río Cuarto, Argentina
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- P2-25 A *Brachypodium distachyon* LysM-RLK recognizes arbuscular mycorrhizal symbiotic signals. A. GIRARDIN (1), M. Cumener (1), L. Buendia (1), G. Virginie (1), R. Sibout (2), M. Dalmais (3), A. Bendahmane (3), B. Lefebvre (1) (1) Laboratory of Interaction Plant Microorganisms (LIPM) - INRA/CNRS, France; (2) INRA-Agro Paris Tech, France; (3) Univ. Paris 11-Univ. Evry-Univ. Paris7-CNRS-INRA, France
- P2-26 Genome exchange and biogeography of chickpea's nitrogen-fixing bacterial symbionts.. A. GREENSPAN (1), P. Chang (2), E. Von Wettberg (3), D. Cook (4) (1) University of California, Davis, U.S.A.; (2) University of Southern California, U.S.A.; (3) Florida International University, U.S.A.; (4) University of California, Davis, U.S.A.
- P2-27 Effect of arbuscular mycorrhizal (*Glomus intraradices*) inoculation on seed Germination and seedling growth of bambara groundnut (*Vigna subterranea* (L)). O. HAMZAT (1) (1) Federal University, Dutsin-Ma, Nigeria
- P2-28 Diazotrophic Endophytes: Symbionts for environmentally sustainable agriculture. L. HANNON (1), D. Melville (2), S. Doty (2) (1) University of Washington, U.S.A.; (2) University of Washington, U.S.A.
- P2-29 Sub-cellular distribution of polyphosphoinositide suggests a role in signaling during arbuscular mycorrhiza symbiosis.. S. IVANOV (1), M. Harrison (1) (1) Boyce Thompson Institute, U.S.A.
- P2-30 The high molecular weight form of the *Sinorhizobium meliloti* 1021 symbiotic exopolysaccharide succinoglycan is sufficient to mediate invasion of host plants. K. JONES (1), H. Mendis (1), T. Madzima (1), C. Queiroux (1) (1) Florida State University, U.S.A.
- P2-31 Elucidation of genes required for endophytic N-fixation and their role in plant growth promotion. P. JOUBERT (1), S. Doty (1) (1) University of Washington, U.S.A.
- P2-32 Evolutionary conservation of mycorrhiza-specific phosphate transporter gene regulation by CTTC MOTIF-BINDING TRANSCRIPTION FACTOR1 (CBX1). L. KLINNAWEE (1), L. Xue (1), M. Bucher (1) (1) Botanical Institute, Cologne Biocenter, University of Cologne, Germany
- P2-33 Enacting a symbiotic relationship: plant lectin receptor-like kinase, a key player in the ectomycorrhizal association. J. LABBE (1), W. Muchero (2), Y. Yang (2), R. Priya (2), S. Jawdy (2), T. Tschaplinski (2), G. Tuskan (2), J. Chen (2) (1) ORNL/ UT Knoxville, U.S.A.; (2) ORNL, U.S.A.
- P2-34 Mutualistic root endophytism of Sebaciales is not associated with the reduction of saprotrophic traits and requires a noncompromised plant innate immunity. G. LANGEN (1), U. Lahrmann (2), G. Jeena (1), H.

- Frerigmann (1), A. Zuccaro (1) (1) University of Cologne, Germany; (2) Fraunhofer Institute for Toxicology and Experimental Medicine, ITEM, Germany
- P2-35 Beta-rhizobial symbiosis: new insights from genome-wide transcriptome and proteome analysis. M. LARDI (1), Y. Liu (2), L. Eberl (2), G. Pessi (2) (1) University of Zurich, Switzerland; (2) University of Zurich, Switzerland
- P2-36 Genome-wide transcriptome analysis of a plant growth-promoting phototrophic bacterium, *Rhodospseudomonas palustris* strain PS3. C. LIU (1), K. Lo (2) (1) National Taiwan University, Taiwan; (2) Institute of Biotechnology, National Taiwan University, Taiwan
- P2-37 A characterization of candidate effector proteins in arbuscular mycorrhizal fungi. A. MACLEAN (1), H. Park (2), L. Mainzer (3), M. Hudson (4), V. Levesque-Tremblay (2) (1) Boyce Thompson Institute, U.S.A.; (2) Boyce Thompson Institute, U.S.A.; (3) University of Illinois at Urbana-Champaign, U.S.A.; (4) University of Illinois, Urbana-Champaign, U.S.A.
- P2-38 Involvement of gibberellic acid and auxin in the regulation of mycorrhizal symbiosis in *Bletilla striata* (Orchidaceae). C. MIURA (1), T. Yamamoto (2), M. Yamato (3), S. Nagata (2), Y. Otani (2), H. Asao (4), M. Matsumoto (4), T. Yagame (5), S. Shigenobu (4) (1) Tottori University, Japan; (2) Tottori University, Japan; (3) Chiba University, Japan; (4) National Institute for Basic Biology, Japan; (5) Tsukuba Botanical Garden, National Museum of Nature and Science, Japan
- P2-39 Plant Derived Glycoproteins and Glycolipids are Required for the Establishment of Functional Root-Microbe Symbiosis in *Medicago truncatula*. W. MOORE (1), E. Rennie (1), H. Wipf (2), P. Hussey (1), E. Cahoon (3), J. Mortimer (1), H. Scheller (1) (1) Joint BioEnergy Institute, U.S.A.; (2) UC Berkeley, U.S.A.; (3) University of Nebraska, Lincoln, U.S.A.
- P2-40 Signaling events during Arbuscular Mycorrhiza symbiosis. L. MUELLER (1), L. Mainzer (2), M. Hudson (2), M. Harrison (3) (1) Boyce Thompson Institute, U.S.A.; (2) Department of Crop Science, University of Illinois, U.S.A.; (3) Boyce Thompson Institute, U.S.A.
- P2-41 Gibberellin biosynthesis by symbiotic rhizobia and its effect on host legumes. R. NETT (1), X. Lu (1), R. Nagel (1), R. Peters (1) (1) Iowa State University, U.S.A.
- P2-42 A host signal to microbe-plant interface for the establishment of symbiosis. O. OZTAS (1), T. He (2), H. Pan (1), E. Limpens (3), E. Federova (3), T. Bisseling (3), M. Roberts (2), D. Wang (4) (1) University of Massachusetts Amherst, U.S.A.; (2) Boston College, U.S.A.; (3) Wageningen University, Netherlands; (4) University of Massachusetts Amherst, U.S.A.
- P2-43 Comparative genome analysis of lichen-forming fungi and partner algae. S. PARK (1), H. Song (2), J. Kim (1), J. Choi (2), J. Jeon (3), Y. Lee (2), J. Hur (1) (1) Korean Lichen Research Institute, Sunchon National University, Korea; (2) Fungal Bioinformatics Laboratory and Center for Fungal Genetic Resources, Seoul National University, Korea; (3) School of Biotechnology, Yeungnam University, Korea
- P2-44 Competition between beta-rhizobia for legume infection. G. PESSI (1), M. Lardi (2), G. Purtschert (2), A. Gandolfi (2), S. Bolzan de Campos (2), L. Eberl (2) (1) University of Zurich/ Department of Plant and Microbial Biology, Switzerland; (2) University of Zürich, Switzerland
- P2-45 A CCaMK-CYCLOPS-DELLA complex activates transcription of *RAM1*, a central regulator of arbuscule branching. P. PIMPRIKAR (1), S. Carbonnel (1), M. Paries (2), K. Katzer (2), V. Klingl (2), L. Karl (2), D. Floss (3), M. Harrison (3), M. Parniske (2), C. Gutjahr (2) (1) University of Munich (LMU), Germany; (2) University of Munich (LMU), Germany; (3) Boyce Thompson Institute for Plant Research, USA, U.S.A.
- P2-46 A pan-genomic perspective on microbial symbiont invasions. S. PORTER (1), J. Faber-Hammond (1), M. Friesen (2) (1) Washington State University, Vancouver, U.S.A.; (2) Michigan State University, U.S.A.
- P2-47 A secreted protein from *Rhizophagus irregularis* enhances the mycorrhization in *Nicotiana benthamiana*. C. QUAN (1), E. Evangelisti (2), S. Schornack (2) (1) The Sainsbury Laboratory, University of Cambridge, United Kingdom; (2) The Sainsbury Laboratory, University of Cambridge, United Kingdom
- P2-48 Effectors in symbiotic AMF-plant interaction. A. HOFFRICHTER (1), K. Sedzielewska Toro (1), A. Brachmann (1) (1) Ludwig Maximilian University of Munich, Germany
- P2-49 Discovery and transfer of novel pathways for phosphate solubilization. C. SHULSE (1), M. Blow (1), M. Chovatia (2), Y. Lei (3), A. Deutschbauer (4) (1) DOE Joint Genome Institute, U.S.A.; (2) DOE Joint Genome Institute, U.S.A.; (3) UC Berkeley, U.S.A.; (4) Lawrence Berkeley National Lab, U.S.A.
- P2-50 Comparative genomic analysis of five lichen-forming fungi. H. SONG (1), K. Kim (2), J. Jeon (1), S. Park (3), J. Hur (3), Y. Lee (2) (1) Interdisciplinary Program in Agricultural Genomics, Seoul National University, Seoul 151-921, Korea, Korea; (2) Department of Agricultural Biotechnology, Seoul National University, Seoul 151-921, Korea, Korea; (3) Korean Lichen Research Institute, Sunchon National University, Suncheon, South Korea, Korea
- P2-51 Gibberellin guidance is required for the spatial regulation of symbiosis gene expression and infection of arbuscular mycorrhizal fungi in *Lotus japonicus*. N. TAKEDA (1), M. Nagae (2), M. Kojima (3), H. Sakakibara

- (3), M. Kawaguchi (4) (1) Natl Inst of Basic Biology/SOKENDAI, Japan; (2) Natl Inst of Basic Biology, Japan; (3) RIKEN CSRS, Japan; (4) Natl Inst of Basic Biology/SOKENDAI, Japan
- P2-52 Novel nuclear protein, NsiA, and its interacting transcription factor Ste12 and MAP kinase Mak2 mediate balanced symbiotic infection of endophytic fungus *Epichloë festucae* in perennial ryegrass.. S. KAMIYA (1), Y. Ozaki (1), A. Okamura (1), S. Kameoka (1), Y. Kayano (1), S. Sanjay (2), B. Scott (3), J. Maruyama (4), A. Tanaka (1), D. Takemoto (1) (1) Nagoya University, Japan; (2) Massey University, New Zealand; (3) Nagoya University, New Zealand; (4) The University of Tokyo, Japan
- P2-53 Endophyte-assisted phytoremediation of arsenic contaminated soils. R. TOURNAY (1), S. Doty (1), D. Sivitilli (1), T. DeLuca (1) (1) University of Washington, U.S.A.
- P2-54 Genetic diversity of Rhizobia that nodulate *Onobrychis Eparseta* from the arid eastern area of Central Asia. B. UMAROV (1), Z. Shakirov (2), M. Sagdieva. (2) (1) Institute of Microbiology AS RUz, 7b A.Kadyri str. Tashkent 100128, Uzbekistan,, Uzbekistan; (2) Institute of Microbiology AS RUz,, Uzbekistan
- P2-55 Discovery of *Populus trichocarpa* small proteins and non-coding RNAs involved in mycorrhizal symbiosis. X. YANG (1), R. Mewalal (2), S. Jawdy (2), P. Vion (3), F. Le Tacon (3), J. Labbé (2), G. Tuskan (2) (1) Oak Ridge National Laboratory, U.S.A.; (2) Oak Ridge National Laboratory, U.S.A.; (3) INRA/Université de Lorraine, Centre INRA de Nancy, France
- P2-56 Karrikin signaling in arbuscular mycorrhiza development. C. GUTJAHR (1), S. Carbonnel (1), V. Basso (1), M. Kolodziej (1), T. Wang (2) (1) LMU Munich, Faculty of Biology Genetics, Germany; (2) John Innes Center, Metabolic Biology, United Kingdom
- P2-57 Identification of genes involved in the *Burkholderia tuberum* nodulating symbiosis. M. LUM (1), A. Arnell (2), B. Kwak (2), N. Behnken (2), J. Blankenship (2) (1) Loyola Marymount University, U.S.A.; (2) Loyola Marymount University, U.S.A.
- P2-58 A novel interactor of symbiotic RLKs is involved in nodulation in *Lotus japonicus*. A. YAMAZAKI (1), Y. Shimoda (2), M. Hayashi (1) (1) Center for Sustainable Resource Science, Riken, Japan; (2) NIAS, Japan
- P2-59 *Medicago truncatula* MtLAX2, an orthologue of the AtAUX1 auxin influx transporter, mediates auxin control of nodulation. S. ROY (1), J. Murray (2), A. Downie (2), J. Lilley (2), G. Oldroyd (2), D. Cousins (2), C. Bone (3), S. Walker (4), J. Sun (2) (1) The Samuel Roberts Noble Foundation, U.S.A.; (2) John Innes Centre, United Kingdom; (3) University of Sheffield, United Kingdom; (4) Babraham Institute, United Kingdom
- P2-60 Use of Crispr/Cas genome editing demonstrates a critical role for uricase and xanthine dehydrogenase in soybean nitrogen fixation and nodule development.. C. NGUYEN (1), M. Stacey (2) (1) Divisions of Plant Sciences and Biochemistry, National Center for Soybean Biotechnology University of Missouri, U.S.A.; (2) Divisions of Plant Sciences and Biochemistry, National Center for Soybean Biotechnology University of Missouri, U.S.A.
- P2-61 Insights into Symbiotic Plant-Fungal Communication using Innovative Imaging Approaches. R. ROTH (1), S. Hillmer (2), K. Schumacher (3), J. Skepper (4), U. Paszkowski (5) (1) University of Cambridge, United Kingdom; (2) EMCF@COS, Germany; (3) COS, Germany; (4) CAIC, England; (5) University of Cambridge, England
- P2-62 Regulation of arbuscule degeneration during arbuscular mycorrhizal symbiosis. M. HARRISON (1), D. Floss (2), K. Bhattarai (2), S. Gomez (2), H. Park (2), A. MacLean (2), V. Levesque-Tremblay (2) (1) Boyce Thompson Institute, Cornell University, U.S.A.; (2) Boyce Thompson Institute, U.S.A.
- P2-63 Genome sequencing reveals origins of a unique bacterial endosymbiosis in the earliest lineages of terrestrial Fungi. J. UEHLING (1), F. Dietrich (1), K. Barry (2), I. Grigoriev (2), A. Kuo (2), R. Ohm (2), A. Lipzen (2), M. Nolan (2), K. LaButti (2), J. Labbé (3), G. Bonito (4), F. Martin (5), R. Vilgalys (1) (1) Duke University, U.S.A.; (2) US Department of Energy Joint Genome Institute, U.S.A.; (3) Oak Ridge National Laboratory, U.S.A.; (4) Michigan State University, U.S.A.; (5) Institut National de la Recherche Agronomique, France

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- P3-65 Effect of plant extracts on *Pseudomonas syringae* pv. *actinidiae* behavior. G. BURIANI (1), L. Fiorentini (2), A. Cellini (2), F. Spinelli (2) (1) University of Bologna, Italy; (2) University of Bologna, Italy
- P3-66 Biological characterization, distribution and synergistic interactions of a Torradovirus with a Polerovirus infecting cassava in the Americas. M. CARVAJAL-YEPES (1), J. Jimenez (1), A. Quintero (1), W. Cuellar (1) (1) International center for tropical agriculture, Colombia
- P3-67 Soil Microbiome Profiling and Differential Taxonomic Analysis between High Yield and Low Yield Soybean Fields. H. CHANG (1), J. Haudenschild (2), C. Bowen (2), G. Hartman (3) (1) University of Illinois at

- Urbana-Champaign Department of Crop Sciences, U.S.A.; (2) USDA-ARS, U.S.A.; (3) University of Illinois at Urbana-Champaign Department of Crop Sciences; USDA-ARS, U.S.A.
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- P3-69 Effects of cotton root exudates on the rhizosphere colonization and biofilm formation of *Bacillus subtilis* strain NCD-2. Q. GUO (1), L. Dong (1), P. Wang (1), S. Li (1), X. Zhang (1), X. Lu (1) (1) Institute of Plant Protection, Hebei Academy of Agricultural and Forestry Sciences, China
- P3-70 Contribution of various multidrug resistance efflux transporters to the fitness and virulence of *Pseudomonas syringae*. T. HELMANN (1), S. Lindow (1) (1) University of California, Berkeley, U.S.A.
- P3-71 Syringafactin production by *Pseudomonas syringae*, is contact-dependent and affects its local environment via its hygroscopicity. M. HERNANDEZ (1), S. Lindow (1) (1) University of California, Berkeley, U.S.A.
- P3-72 Differential oilseed crop lipid accumulation through inoculation with *Pseudomonas fluorescens* LBUM677: rhizosphere competency, genetic determinants and species-specific variations . J. JIMÉNEZ BECERRA (1), M. Fillion (2), A. Novinscak (2) (1) Université de Moncton, Canada; (2) Université de Moncton, Canada
- P3-73 Investigating the role of bacterial effector phosphorylation and 14-3-3 binding. L. LEI (1) (1) University of California Davis, U.S.A.
- P3-74 Microbial eukaryotes: the dark matter in the phyllosphere universe. A. MARI (1), M. Agler (1), S. Hacquard (1), F. Roux (2), C. Alonso-Blanco (3), J. Ågren (4), M. Bonkowski (5), E. Kemen (1) (1) Max Planck Institute for Plant breeding research, Carl von Linné weg 10, 50829 Köln, Germany, Germany; (2) INRA, Laboratoire des Interactions Plantes-Microorganismes (LIPM), UMR441, F-31326 Castanet-Tolosan, France; France; (3) Centro Nacional de Biotecnología (CNB), Consejo Superior de Investigaciones Científicas (CSIC), Madrid-28049, Spain., Spain; (4) Department of Plant Ecology and Evolution, Uppsala University, Norbyvägen 18 D, 752 36 Uppsala, Sweden, Sweden; (5) Universität zu Köln, Department of Terrestrial Ecology, Zùlpicher Straße 47b, Köln, Germany, Germany
- P3-75 The molecular basis of efficient interspecies competition during host plant colonization. J. RUHE (1), M. Müller (1), M. Agler (1), I. Finkemeier (2), S. Ryazanov (3), C. Griesinger (3), E. Kemen (1) (1) Max Planck Institute for Plant Breeding Research, Germany; (2) Institute for Plant Biology and Biotechnology, University of Muenster, Germany; (3) Max Planck Institute for Biophysical Chemistry, Germany
- P3-76 Are bacterial volatile compounds poisonous odors to *Botrytis cinerea*, alarm signals to *Arabidopsis* to elicit induced resistance, or both? . R. SHARIFI (1), C. Ryu (2) (1) Razi University, Iran; (2) Korea Research Institute of Bioscience and Biotechnology, South Korea
- P3-77 Attenuating virulence of *Pectobacterium carotovorum* by beneficial bacterial volatiles . S. LEE (1), G. Song (2), C. Ryu (2) (1) Korea Research Insititute of Bioscience and Biotechnology, South Korea; (2) Korea Research Institute of Bioscience and Biotechnology, South Korea
- P3-78 Bacterial RNAs activate innate immunity in *Arabidopsis*. B. LEE (1), Y. Park (2), S. Lee (2), G. Song (2), C. Ryu (2) (1) Korea Research Insititute of Bioscience and Biotechnology, South Korea; (2) Korea Research Institute of Bioscience and Biotechnology, South Korea
- P3-79 Fabricating toluene phytosensor through a signal translator rhizosphere bacterium. H. LEE (1), C. Ryu (2) (1) Korea Research Insititute of Bioscience and Biotechnology, South Korea; (2) Korea Research Institute of Bioscience and Biotechnology, South Korea
- P3-80 Light modulates the switch to the pathogenic stage in *Pseudomonas syringae* pv. tomato DC3000. S. SANTAMARÍA HERNANDO (1), I. Del Río Álvarez (2), J. Rodríguez Hervá (2), E. López Solanilla (2) (1) Centre for plant biotechnology and genomics-Universidad Politécnica de Madrid, Spain; (2) Centre for Plant Biotechnology anf Genomics-Universidad Politécnica de Madrid, Spain
- P3-81 Rhizobacterial community structure and function in dryland wheat. L. THOMASHOW (1), D. Mavrodi (2), O. Mavrodi (3), J. Parejko (4), M. Le Tourneau (5), R. Bonsall (3), D. Weller (1) (1) USDA-ARS, U.S.A.; (2) Department of Biological Sciences, The University of Southern Mississippi, U.S.A.; (3) Department of Plant Pathology, Washington State University, U.S.A.; (4) Department of Microbiology, University of Wisconsin-LaCrosse, U.S.A.; (5) Department of Soils, Washington State University, U.S.A.
- P3-82 Codon usage is involved in regulation antibiotic production in *Pseudomonas protegens* Pf-5. Q. YAN (1), B. Philmus (2), C. Hesse (3), J. Chang (2), J. Loper (4) (1) Oregon State University, U.S.A.; (2) Oregon State University, U.S.A.; (3) USDA-ARS Horticultural Crops Research Unit, U.S.A.; (4) USDA-ARS Horticultural Crops Research Laboratory, U.S.A.
- P3-83 Adaptation of transmissible bacterial communities to multiple hosts: how the sap-feeding insect *Scaphoideus titanus* ships bacterial symbionts across grapevine plants. S. LÓPEZ-FERNÁNDEZ (1), V. Mazzoni (1), I. Pertot

- P3-84 (1), A. Campisano (1) (1) Fondazione Edmund Mach, Italy; (2) Fondazione Edmund Mach, Italy
The Powdery Mildew Survey – a citizen science scheme for increasing the efficiency of identification of a harmful, fungal plant disease. O. ELLINGHAM (1), J. David (2) (1) University of Reading, United Kingdom; (2) Royal Horticultural Society, United Kingdom
- P3-85 Indole Antibiotic Biosynthesis in Edible Plants: *From Genomes to Bioactive Molecules*. A. KLEIN (1), E. Sattely (2) (1) Stanford University, U.S.A.; (2) Stanford University, U.S.A.
- P3-86 Mutations conferring bacteriocin resistance in *Pseudomonas syringae* reduce virulence toward host plants. K. HOCKETT (1), E. Carlson (2), D. Baltrus (3) (1) University of Arizona, School of Plant Sciences, U.S.A.; (2) University of Arizona, Dept. of Ecology and Evolutionary Biology, U.S.A.; (3) University of Arizona, School of Plant Sciences, U.S.A.
- P3-87 A combination of comparative genomics and LAESI-MS facilitates the discovery of amino acid analogs produced by plant-associated bacteria. R. OKRENT (1), K. Trippe (1), V. Manning (1), E. Davis (2), C. Walsh (3) (1) USDA-ARS, U.S.A.; (2) Oregon State University, U.S.A.; (3) Protea Biosciences, Inc., U.S.A.

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- P4-88 Unraveling *Pseudomonas syringae* pv. *actinidiae* intra and inter-species signalling. G. BURIANI (1), L. Fiorentini (2), V. Venturi (3), F. Spinelli (2) (1) University of Bologna, Italy; (2) University of Bologna, Italy; (3) ICGEB, Italy
- P4-89 Phyllosphere bacterial communities structures on healthy and diseased kiwifruits. G. BURIANI (1), L. Orrù (2), A. Lamontanara (2), V. Michelotti (2), I. Donati (3), G. Tacconi (2), F. Spinelli (3) (1) University of Bologna, Italy; (2) Agricultural Research Council (CREA) Genomic Research Centre, Italy; (3) University of Bologna, Italy
- P4-90 The effect of climate change and site on the above- and belowground bacterial endophytic communities of subalpine conifer seedlings. D. CARPER (1), A. Carrell (2), L. Kueppers (3), C. Frank (1) (1) University of California, Merced, U.S.A.; (2) Department of Biology, Duke University, U.S.A.; (3) Climate and Ecosystem Sciences Division, Lawrence Berkeley National Laboratory, U.S.A.
- P4-91 Interplay between plant selenium hyperaccumulation and the bacterial rhizobiome. A. COCHRAN (1), J. Bauer (2), P. Lovecka (3), M. Sura de Jong (3), E. Pilon-Smits (1) (1) Department of Biology, Colorado State University, U.S.A.; (2) Department of Biology, Colorado State University, U.S.A.; (3) Department of Biochemistry and Microbiology, Institute of Chemical Technology, Czech Republic
- P4-92 Effects of inoculation with beneficial *Serratia proteamaculans* S4 and *Verticillium longisporum* on structure and allocation of plant-derived C in root and rhizosphere communities of oilseed rape. K. GKARMIRI (1), S. Mahmood (2), B. Andersson (2), S. Alström (2), N. Högborg (2), R. Finlay (2), K. Gkarmiri (1) (1) Swedish University of Agricultural Sciences, Sweden; (2) Swedish University of Agricultural Sciences, Sweden
- P4-93 Microbial Community Interactions Affect Induced Systemic Resistance in *Arabidopsis thaliana*. S. HARRIS (1), J. Corwin (1), M. Feltcher (1), E. Shank (1), J. Dangel (1) (1) University of North Carolina at Chapel Hill, U.S.A.
- P4-94 Synthetic communities dissect bacterial contributions to plant phenotypes. S. HERRERA PAREDES (1), G. Castrillo Molina (2), J. Macalino Esteban (2), P. Pereira Lima Teixeira (2), M. Feltcher (2), E. Getzen (2), C. Jones (2), J. Dangel (2) (1) The University of North Carolina at Chapel Hill, U.S.A.; (2) The University of North Carolina at Chapel Hill, U.S.A.
- P4-95 Deciphering the microbial mechanisms of biochar involved in suppression of fusarium crown and root rot in tomato. A. JAISWAL (1), Y. Elad (2), E. Graber (2), E. Cytryn (2), O. Frenkel (2) (1) Faculty of Agriculture, Hebrew University, Israel; (2) Agriculture Research Organization (ARO), The Volcani Center, Israel
- P4-96 WITHDRAWN
- P4-97 A plant-pathogen-microbiome disease triangle concept. J. KREMER (1), B. Paasch (2), S. He (3), J. Tiedje (4), B. Kvitko (5), J. Jerome (2) (1) Michigan State University, U.S.A.; (2) DOE Plant Research Laboratory, Michigan State University, U.S.A.; (3) Howard Hughes Medical Institute, Michigan State University DOE Plant Research Laboratory, U.S.A.; (4) Michigan State University Center for Microbial Ecology, U.S.A.; (5) University of Georgia Department of Plant Pathology, U.S.A.
- P4-98 Functional analysis of Stp1, a secreted effector of *Ustilago maydis* essential for host colonization. L. LIANG (1), K. Schipper (2), L. Lo Presti (1), N. Ludwig (1), B. Zechmann (3), T. Glatter (1), R. Kahmann (1) (1) Max Planck Institute for Terrestrial Microbiology, Germany; (2) Heinrich Heine University Düsseldorf, Dept. Microbiology, Germany; (3) Baylor University, Center for Microscopy and Imaging, U.S.A.
- P4-99 Impact of sugarcane rhizospheric selection on the *Pseudomonas* spp. community structure and genome evolution. L. LOPES (1), M. Pereira (2), E. Davis (3), A. Weisberg (3), C. Varize (2), J. Loper (3), J. Chang (3), F. Andreote (2) (1) University of Sao Paulo, Brazil; (2) University of Sao Paulo, Brazil; (3) Oregon State University, U.S.A.
- P4-100 – WITHDRAWN
- P4-107

- P4-108 Investigating the role of rain as source of the tomato leaf microbiome.. M. MECHAN LLONTOP (1), L. Tian (1), V. Bernal Galeano (1), B. Vinatzer (1) (1) Virginia Tech, U.S.A.
- P4-109 Microbial transformation of *Populus* higher-order salicylates by microbiome isolates. J. MORRELL-FALVEY (1), D. Pelletier (2), G. Hurst (2), A. Bible (2), K. Chourey (2), M. Denney (3), K. Kertesz (3), A. Zinkle (2), C. Doktycz (2), C. Timm (2), S. Lu (2), N. Engle (2), T. Tschaplinski (2), M. Doktycz (2) (1) Oak Ridge National Laboratory, U.S.A.; (2) Oak Ridge National Laboratory, U.S.A.; (3) University of Tennessee, U.S.A.
- P4-110 Influence of plant host species on the root associated microbial community and functional redundancy of the root microbiome under phosphate starvation. T. MUCYN (1), S. Yourstone (1), S. Paredes (1), H. Cameron (2), G. Castrillo (1), N. Breakfield (3), J. Dangel (1) (1) University of North Carolina, U.S.A.; (2) BASF corporation, U.S.A.; (3) NewLeaf Symbiotics, U.S.A.
- P4-111 Biogeographical diversity and host plant specificity of bacterial endophyte communities in arcto-alpine plants. R. NISSINEN (1), M. Kumar (2), J. van Elsas (3), A. Sessitsch (4) (1) University of Jyväskylä, Finland; (2) University of Jyväskylä, Finland; (3) University of Groningen, Netherlands; (4) Austrian Institute of Technology, Austria
- P4-112 Role of the microbiome on the maturation of plant innate immunity. B. PAASCH (1), J. Kremer (1), B. Kvitko (2), J. Jerome (1), J. Tiedje (3), S. He (4) (1) Michigan State University DOE Plant Research Laboratory, U.S.A.; (2) University of Georgia Department of Plant Pathology, U.S.A.; (3) Michigan State University Center for Microbial Ecology, U.S.A.; (4) Howard Hughes Medical Institute, Michigan State University DOE Plant Research Laboratory, U.S.A.
- P4-113 Constructed Communities of *Populus* and Bacterial Isolates to Study Microbiome Function. D. PELLETIER (1), C. Timm (2), A. Carrell (3), S. Jawdy (3), L. Gunter (3), Z. Yang (3), J. Aufrecht (3), T. Lu (3), N. Engle (3), T. Tschaplinski (4), G. Tuskan (3), M. Doktycz (3), D. Weston (3) (1) Bioscience Division, Oak Ridge National Laboratory, U.S.A.; (2) Bioscience Division, Oak Ridge National Laboratory, U.S.A.; (3) Bioscience Division, Oak Ridge National Laboratory, U.S.A.; (4) Bioscience Division, Oak Ridge National Laboratory, U.S.A.
- P4-114 Soil tillage as a driver of the Oilseed rape microbiome. R. RATHORE (1), K. GERMAINE (1), D. BULGARELLI (2), D. FORRISTAL (3), J. SPINK (3), P. COTTER (4), D. DOWLING (1) (1) EnviroCore, Dept. of Science & Health, School of Science, Institute of Technology Carlow, Carlow, Ireland., Ireland; (2) University of Dundee at James Hutton Institute, Errol Road, Invergowrie, Dundee, DD2 5DA, Scotland, UK., Scotland; (3) Department of Crop Science, Teagasc Crops Research Centre, Oak Park, Carlow, Ireland., Ireland; (4) Teagasc Food Research Centre, Moorepark, Fermoy, Cork, Ireland., Ireland
- P4-115 Prone to fix: Resilience of the active nitrogen-fixing rice root microbiome. B. REINHOLD-HUREK (1), M. Sabale (2), A. Sarkar (2), T. Hurek (1) (1) University of Bremen, Germany; (2) University of Bremen, Germany
- P4-116 The Influence of the endosphere microbiome on Pierce's disease development in grapevine.. M. ROPER (1), J. Yang (2), J. Borneman (1), P. Ruegger (1), P. Rolshausen (1) (1) University of California, Riverside, U.S.A.; (2) National Taiwan University, Taiwan
- P4-117 Soil type shapes the diversity of protists living in intimate association with *Arabidopsis thaliana*. M. SAPP (1), S. Ploch (2), M. Bonkowski (3), L. Rose (1) (1) Heinrich-Heine University, Germany; (2) Senckenberg Biodiversity and Climate Research Centre, Germany; (3) University of Cologne, Germany
- P4-118 The *Populus* Microbiome Atlas Project - Dissecting the microbiome landscape of an important economic and ecological model.. C. SCHADT (1), M. Cregger (2), M. Crouch (2), A. Veach (2), Z. Yang (2), T. Lu (2), N. Cude (3), P. Busby (4), K. Hameed (4), R. Vilgalys (4), T. Rials (5), C. Pan (6), S. Jun (6), I. Nookaew (6), D. Ussery (2), M. Podar (2), S. Tringe (8), G. Tuskan (2), D. Pelletier (2) (1) Oak Ridge National Laboratory, U.S.A.; (2) Oak Ridge National Laboratory, U.S.A.; (3) Novozymes Corporation, U.S.A.; (4) Duke University, U.S.A.; (5) University of Tennessee, U.S.A.; (6) Oak Ridge National Laboratory, U.S.A.; (7) Oak Ridge National Laboratory, U.S.A.; (8) DOE Joint Genome Institute, U.S.A.
- P4-119 Changes in phyllosphere microbiome - The dynamics of leaf city. S. KROLL (1), M. Agler (2), E. Kemen (2) (1) Max-Planck-Institute for Plant Breeding Research, Germany; (2) Max-Planck Institute for Plant Breeding Research, Germany; (3) Max-Planck Institute for Plant Breeding Research, Germany
- P4-120 Sorghum microbiome discovery and characterization in nitrogen-limited soil for improved biomass production. D. CHINIQUY (1), D. Schachtman (2), J. Dangel (3), S. Tringe (1) (1) Joint Genome Institute, Lawrence Berkeley National Labs, U.S.A.; (2) University of Nebraska-Lincoln, U.S.A.; (3) University of North Carolina at Chapel Hill, U.S.A.
- P4-121 Succession of endophytic bacteria in the mountain sorrel (*Oxyria digyna*). C. GIVEN (1), E. Häikiö (2), M. Kumar (1), R. Nissinen (1) (1) University of Jyväskylä, Finland; (2) University of Eastern Finland, Finland
- P4-122 Drought and Host Selection in the Grass Root Microbiome. D. COLEMAN-DERR (1), D. Naylor (2), S. Deng (2) (1) USDA-ARS, U.S.A.; (2) University of California at Berkeley, U.S.A.

Tritrophic Interactions and Biocontrol

- P5-123 Deciphering the genomic and phenotypic diversity of plant-associated phenazine-producing *Pseudomonas* spp.. A. BIESSY (1), M. Filion (1) (1) Université de Moncton, Canada
- P5-124 The topoisomerase IV ParE is a target of multiple Fic proteins. C. LU (1), E. Nakayasu (2), A. McCloskey (3), L. Zhang (4), Z. Luo (3) (1) Chian Agurictural University; Purdue University, U.S.A.; (2) Biological Sciences Division, Pacific Northwest National Laboratory, U.S.A.; (3) Purdue Institute for Inflammation, Immunology and Infectious Disease and Department of Biological Sciences, Purdue University, U.S.A.; (4) Department of Plant Pathology, China Agricultural University, China
- P5-125 Phenazine-1-carboxylic acid production by *Pseudomonas fluorescens* LBUM636 alters *Phytophthora infestans*' growth and late blight development . A. NOVINSKAK (1), M. Filion (1), C. Morrison (1) (1) Université de Moncton, Canada
- P5-126 Phenazine-1-carboxylic acid-producing *Pseudomonas fluorescens* LBUM223 represses the growth and alters the transcriptome of *Phytophthora infestans*. R. ROQUIGNY (1), D. Joly (1), M. Filion (1) (1) Université de Moncton, Canada
- P5-127 From seed to whole plant: Seed defense priming by rhizobacteria and their metabolites. C. RYU (1), G. Song (1), H. Choi (1), Y. Kim (2) (1) KRIBB, South Korea; (2) KRICT, South Korea
- P5-128 Foliar application of the leaf-colonizing yeast *Pseudozyma churashimaensis* elicits systemic defense of pepper against bacterial and viral pathogens . C. RYU (1), G. Lee (2), S. Lee (2), K. Kim (2) (1) KRIBB, Youseong, South Korea; (2) KRIBB, South Korea
- P5-129 Analysis of suppression mechanism of grapevine crown gall disease by nonpathogenic *Rhizobium vitis* strain ARK-1. K. SAITO (1), M. Watanabe (1), H. Matsui (1), M. Yamamoto (1), Y. Ichinose (1), K. Toyoda (1), A. Kawaguchi (2), Y. Noutoshi (1) (1) Okayama University, Japan; (2) Okayama Prefecture, Japan
- P5-130 Aboveground insect infestation attenuates belowground *Agrobacterium*-mediated genetic transformation. G. SONG (1), S. Lee (1), J. Hong (1), H. Choi (1), G. Hong (1), D. Bae (2), K. Mysore (3), Y. Park (1) (1) KRIBB, South Korea; (2) Gyeongsang National University, South Korea; (3) The Samuel Roberts Noble Foundation, South Korea
- P5-131 The Sphagnum – microbiome: insights from field manipulations and synthetic communities. D. WESTON (1), A. Carrell (2) (1) Oak Ridge National Lab, U.S.A.; (2) Duke University, U.S.A.
- P5-132 Bacterial secondary metabolites mediate cooperative and competitive interactions between rhizosphere microorganisms. Q. YAN (1), B. Philmus (2), J. Chang (3), J. Loper (4) (1) Oregon State University, U.S.A.; (2) Oregon State University, U.S.A.; (3) Oregon State University, U.S.A.; (4) USDA-ARS Horticultural Crops Research Laboratory, U.S.A.
- P5-133 Molculuar mechanism of perceptive insect behaviour induced by Geminivirus. J. YE (1) (1) Institute Of Microbiology Chinese Academy of Sciences, China
- P5-134 Cucumber mosaic virus has plant species-specific effects on host-vector interactions. T. TUNGADI (1), A. Murphy (1), A. Pate (1), J. Iqbal (1), J. Carr (1) (1) Department of Plant Sciences. University of Cambridge, United Kingdom
- P5-135 Leaf transcriptomics reveals differing responses of Arabidopsis to colonization by ubiquitous phyllosphere colonizers with potential implications for plant health upon pathogen encounter. C. VOGEL (1), N. Bodenhausen (2), W. Gruissem (3), J. Vorholt (2) (1) Institute of Microbiology, ETH Zurich, Switzerland; (2) Institute of Microbiology, ETH Zurich, Switzerland; (3) Institute of Agricultural Sciences, ETH Zurich, Switzerland
- P5-136 Exposure to subinhibitory concentrations of phenazine-1-carboxylic acid controls common scab of potato through transcriptomic changes in *Streptomyces scabies*. M. FILION (1), R. Roquigny (1), T. Arseneault (2), C. Goyer (3), A. Novinscak (1) (1) Université de Moncton, Canada; (2) University of Reading, United Kingdom; (3) Agriculture and Agri-Food Canada, Canada

MICROBES

Apoplastic Interactions

- P6-137 Biochemical, structural, and functional characterization of the Avr4 core effector family in fungi.. L. CHEN (1), A. Kohler (2), A. Salvucci (3), N. Hurlburt (4), B. Schwessinger (3), A. Fisher (5), I. Stergiopoulos (3) (1) Department of Plant Pathology, UC Davis, U.S.A.; (2) Joint BioEnergy Institute (DOE), U.S.A.; (3) Department of Plant Pathology, UC Davis, U.S.A.; (4) Department of Chemistry, UC Davis, U.S.A.; (5) Department of Molecular and Cellular Biology, UC Davis, U.S.A.

- P6-138 Sfa2 transcriptional regulator: a convergence node for fine tuning the expression of type III and VI secretion systems in *Pseudomonas syringae* pv. *tomato* DC3000. C. CHIEN (1), Y. Lu (2), N. Lin (1) (1) Department of Agricultural Chemistry, National Taiwan University, Taiwan; (2) Department of Agricultural Chemistry, National Taiwan University, Malaysia
- P6-139 Specific protease activities induced in the apoplast of a resistant tomato cultivar in response to *Ralstonia solanacearum* infection. N. COLL (1), M. Planas-Marquès (1), J. Paulus (2), F. Kaschani (3), R. van der Hoorn (2), M. Valls (1) (1) Centre for Research in Agricultural Genomics, Spain; (2) Plant Chemetics Laboratory, Department of Plant Sciences, University of Oxford, United Kingdom; (3) Chemical Proteomics, Fakultät für Biologie, Zentrum für Medizinische Biotechnologie, Universität Duisburg-Essen, Germany
- P6-140 Analysis by RNA-Seq of *Xylella fastidiosa* evidences transcriptional regulation exerted by calcium that is correlated with prolonged biofilm formation over time. L. DE LA FUENTE (1), J. Parker (1), H. Chen (1) (1) AUBURN UNIVERSITY, U.S.A.
- P6-141 Dissecting the regulon of the two-component system CvsSR: Identifying new virulence genes in *Pseudomonas syringae* pv. *tomato* DC3000. M. FISHMAN (1), P. Stodghill (2), M. Filiatrault (2) (1) Cornell University, U.S.A.; (2) USDA-ARS, U.S.A.
- P6-142 Transcriptome analysis revealed a potential role of RXLR effectors during mating in *Phytophthora infestans*. T. GEORGIOU (1), R. Vetukuri (1), A. Åsman (1), J. Fogelqvist (1), C. Dixelius (1) (1) Swedish University of Agricultural Sciences, Sweden
- P6-143 SOBIR1 plays a central role in signaling by receptor-like proteins. M. JOOSTEN (1), A. van der Burgh (1), J. Wu (1) (1) Wageningen University, Netherlands
- P6-144 A cytotoxic effector from the wheat pathogen *Zymoseptoria tritici*. G. KETTLES (1), K. Kanyuka (1), J. Rudd (1) (1) Rothamsted Research, United Kingdom
- P6-145 New approaches to access the *P. syringae* transcriptome in planta.. B. KVITKO (1), A. Lovelace (1), A. Smith (1) (1) University of Georgia, U.S.A.
- P6-146 Novel effectors identified in the apoplast of *Cladosporium fulvum*-infected tomato. C. MESARICH (1), B. Okmen (2), H. Rovenich (2), M. Karimi Jashni (2), C. Wang (2), S. Griffiths (2), J. Collemare (2), C. Deng (3), P. de Wit (2) (1) Laboratory of Molecular Plant Pathology, Institute of Agriculture and Environment, Massey University, New Zealand; (2) Laboratory of Phytopathology, Wageningen University, Netherlands; (3) Breeding and Genomics, The New Zealand Institute for Plant and Food Research, New Zealand
- P6-147 Dual function of Fly1 in *Ustilago maydis*-maize pathosystem. B. ÖKMEN (1), B. Kemerich (2), D. Hilbig (2), J. Aschenbroich (3), K. Schipper (3), G. Doehlemann (2) (1) University of Cologne, Germany; (2) University of Cologne, Germany; (3) Heinrich-Heine University, Germany
- P6-148 It's a sticky business – the role of *Pseudomonas* exopolysaccharides and motility during plant infection. S. PFEILMEIER (1), C. Zipfel (2), J. Malone (3) (1) The Sainsbury Laboratory / John Innes Centre, United Kingdom; (2) The Sainsbury Laboratory, United Kingdom; (3) John Innes Centre, United Kingdom
- P6-149 Finally: A Biochemical Function for the pathogenesis-related protein 1. J. GAMIR (1), P. van't Hof (2), R. Darwiche (2), R. Schneiter (2), F. Mauch (2) (1) Department of Biology/University of Fribourg, Switzerland; (2) Department of Biology/University of Fribourg, Switzerland
- P6-150 Apoplastic Venom Allergen-like Proteins of Plant Parasitic Nematodes Modulate the Activation of Plant Innate Immunity by Cell Surface Receptors. J. LOZANO-TORRES (1), R. Wilbers (1), S. Warmerdam (1), A. Finkers-Tomczak (1), A. Diaz-Granados (1), C. van Schaik (1), J. Helder (1), J. Bakker (1), A. Goverse (1), A. Schots (1), G. Smant (1), J. Lozano-Torres (1) (1) Wageningen University/Laboratory of Nematology, Netherlands
- P6-151 The repetitive *Ustilago maydis* effector Rsp3 shields hyphae and blocks the anti-fungal activity of a secreted maize protein. L. MA (1), C. Trippel (1), L. Wang (2), A. Mendoza-Mendoza (3), S. Ullmann (4), M. Moretti (1), S. Wawra (1), S. Reissmann (1), K. Münch (1), B. Zechmann (5), R. Kahmann (1) (1) Max Planck Institute for Terrestrial Microbiology, Germany; (2) Max Planck Institute for Heart and Lung Research, Germany; (3) Bio-Protection Research Centre, New Zealand; (4) Heinrich-Heine-Universität Düsseldorf, Germany; (5) Center for Microscopy and Imaging (CMI), Baylor University, U.S.A.

Cell Biology of Microbe-Host Interactions

- P7-152 A histological and biochemical comparison of resistant and susceptible *Populus* genotypes inoculated with *Sphaerulina musiva*. N. ABRAHAM (1), P. Borowicz (2), J. Leboldus (3) (1) North Dakota State university, Plant pathology Dept #7660, U.S.A.; (2) North Dakota state university, U.S.A.; (3) Oregon state university, U.S.A.
- P7-153 WITHDRAWN
- P7-154 A bacterial effector targets host plasmodesmata to promote pathogen virulence in plants. K. AUNG (1), S. He (1) (1) Michigan State University, U.S.A.

- P7-155 Host-specific gene induction in the plant parasitic nematode *Pratylenchus coffeae*. C. BELL (1), C. Lilley (1), H. Atkinson (1), J. McCarthy (1), P. Urwin (1) (1) University of Leeds, United Kingdom
- P7-156 High-throughput FACS-based mutant screen identifies a gain-of-function allele of the *Fusarium graminearum* adenyl cyclase causing deoxynivalenol over-production. A. BLUM (1), A. Benfield (2), J. Stiller (2), J. Batley (3), K. Kazan (4), D. Gardiner (2) (1) University of Queensland, CSIRO Agriculture, Australia; (2) CSIRO Agriculture, Australia; (3) University of Queensland, University of Western Australia, Australia; (4) CSIRO Agriculture, University of Queensland, Australia
- P7-157 Giant cell wall molecular structure and role of plant cell wall related genes on development of *Meloidogyne incognita*. R. BOZBUGA (1), C. Lilley (1), J. Knox (1) (1) Centre for Plant Sciences, Faculty of Biological Sciences, University of Leeds, Leeds, West Yorkshire, United Kingdom
- P7-158 The DinJ/RelE toxin-antitoxin system suppresses virulence in *Xylella fastidiosa*. L. BURBANK (1), D. Stenger (1) (1) USDA Agricultural Research Service, U.S.A.
- P7-159 The bacterial pathogen *Pseudomonas syringae* suppresses MAMP-triggered Ca²⁺ influx in a partly effector-independent manner. M. CAVDAR (1), R. Panstruga (1) (1) RWTH Aachen, Germany
- P7-160 Virulence of *Pseudomonas syringae* pv. *tomato* DC3000 is modulated through the Catabolite Repression Control protein Crc. S. CHAKRAVARTHY (1), B. Butcher (1), K. D'Amico (2), Y. Liu (1), M. Filiatrault (2) (1) Cornell University, U.S.A.; (2) USDA/ARS, and Cornell University, U.S.A.
- P7-161 Dissecting the role of NbRab small GTPase in different plant viruses. C. CHENG (1), P. Hou (1), P. Chen (1) (1) Tzu Chi University, Taiwan
- P7-162 Promotion of *Bamboo mosaic virus* accumulation in *Nicotiana benthamiana* by 5'3' exonuclease NbXRN4. L. CHENG-CHENG (1), M. Menghsiao (1) (1) National Chung Hsing University, Taiwan
- P7-163 The sugarcane pathogen *Leifsonia xyli* subsp. *xyli* reduces plant growth by interfering in the development of the shoot apex. M. CICARELLI CIA (1), J. Rodrigues Marques (1), R. Cunha Antunes de Faria (1), L. Aranha Camargo (1) (1) University of São Paulo, Brazil
- P7-164 Rerouting of selective autophagy towards the haustorial interface by *Phytophthora infestans*. Y. DAGDAS (1), K. Belhaj (1), A. Maqbool (2), A. Chaparro-Garcia (1), P. Pandey (3), N. Cruz-Mireles (1), B. Petre (1), N. Tabasum (3), R. Hughes (2), J. Sklenar (1), J. Win (1), F. Menke (1), K. Findlay (4), M. Banfield (2), T. Bozkurt (3), S. Kamoun (1) (1) The Sainsbury Laboratory, United Kingdom; (2) John Innes Centre, Department of Biological Chemistry, United Kingdom; (3) Imperial College, London, United Kingdom; (4) John Innes Centre, Department of Cell and Developmental Biology, United Kingdom
- P7-165 Diversity of disease-supportive respiratory metabolism among phylotypes of *Ralstonia solanacearum*. B. DALSING (1), B. McDonald (1), D. Khokhani (1), J. Klassen (2), F. Ailloud (3), E. Gonzalez-Orta (4), A. MacIntyre (1), P. Prior (5), C. Allen (6) (1) University of Wisconsin-Madison, U.S.A.; (2) University of Connecticut, U.S.A.; (3) Cirad, France; (4) Sacramento State, U.S.A.; (5) INRA, France; (6) University of Wisconsin-Madison, U.S.A.
- P7-166 Characterization of potential defense compound transporters in barley. M. EHLERT (1), H. Nour-Eldin (1), B. Møller (1), M. Lyngkjær (1) (1) Department of Plant and Environmental Sciences, Denmark
- P7-167 *Candidatus Liberibacter asiaticus* carries a chromosomal CI phage repressor homolog that binds a bacteriophage promoter and may be required for prophage maintenance. L. FLEITES (1), M. Jain (1), S. Zhang (1) (1) University of Florida, U.S.A.
- P7-168 Searching functional traits marker genes in biocontrol and hostile bacteria strains isolated from rhizosphere of wild plants and probed in *Capsicum annuum*. S. FRAIRE (1), I. Martínez-Raudales (1), K. Castro-Correa (2), Y. De la Cruz-Rodríguez (2), J. Vega-Arreguin (3), J. Larsen (4) (1) Universidad Autónoma de Zacatecas, Mexico; (2) Universidad Autónoma de Zacatecas, Mexico; (3) Escuela Nacional de Estudios Superiores, Universidad Nacional Autónoma de México, Campus León., Mexico; (4) Centro de Investigación en Ecosistemas, Universidad Nacional Autónoma de México, Campus Morelia., Mexico
- P7-169 Cellobiose transport: the key to trigger virulence in the plant pathogenic bacterium *Streptomyces scabies*. J. SALAZAR (1), S. Jourdan (2), M. Kim (3), S. Rigali (2), R. Loria (3), I. Francis (1,3) (1) California State University Bakersfield, U.S.A.; (2) University of Liege, Belgium; (3) University of Florida, U.S.A.; (4) California State University Bakersfield, U.S.A.
- P7-170 Solanaceous species recognise a novel PAMP from *Rhynchosporium commune*. B. FRANCO (1), A. Berepiki (1), P. Birch (2), K. Kanyuka (3), A. Avrova (1) (1) James Hutton Institute, United Kingdom; (2) University of Dundee, United Kingdom; (3) Rothamsted Research, United Kingdom
- P7-171 Characterization of the infection cycle of *Phytophthora betacearum* on tree tomato (*Solanum betacearum*). N. GUAYAZAN PALACIOS (1), M. Mideros Bastidas (1), G. Danies Turano (1), S. Restrepo Restrepo (2) (1) Universidad de Los Andes, Colombia; (2) Universidad de Los Andes, Colombia

- P7-172 Autophagy is involved in assisting the replication of *Bamboo mosaic virus* in *Nicotiana benthamiana*. Y. HUANG (1), Y. Hsiao (1), . Li (1), Y. Hsu (1), C. Tsai (1) (1) Graduate Institute of Biotechnology, National Chung Hsing University, Taiwan; (2) Graduate Institute of Biotechnology, National Chung Hsing University, Taiwan
- P7-173 Chloroplast Hsp70 isoform is required for efficient replication of *Bamboo mosaic virus* in old leaves of *Nicotiana benthamiana*. Y. HUANG (1), C. Hu (1), N. Lin (2), Y. Hsu (1) (1) Graduate Institute of Biotechnology, National Chung Hsing University, Taiwan; (2) Institute of Plant and Microbial Biology, Academia Sinica, Taiwan
- P7-174 A retroelement-encoded effector of *Blumeria graminis* targets barley RACB for exploitation of a host cell developmental pathway. R. HÜCKELHOVEN (1), T. Reiner (2), B. Scheler (2), V. Schnepf (2), B. Zechmann (3), M. Nottensteiner (2) (1) Technische Universität München, Germany; (2) TU München, Germany; (3) Center for Microscopy and Imaging at Baylor University in Waco, Texas, U.S.A.
- P7-175 The Type II secretion system mediates virulence for the xylem-limited pathogen, *Xylella fastidiosa*. B. INGEL (1), P. Wang (2) (1) University of California Riverside, U.S.A.; (2) University of California Riverside, U.S.A.
- P7-176 Identification and functional characterization of a Bcl-2 associated athanogene in *Aspergillus nidulans*. . S. JAIN (1), N. Keller (1), M. Kabbage (1) (1) University of Wisconsin-Madison, U.S.A.
- P7-177 Nutritional strategies of haustorial and nonhaustorial oomycete plant pathogens on Solanaceous hosts revealed by RNA-seq, metabolomics, fluorescent protein tagging, and gene silencing. H. JUDELSON (1), M. Kagda (1), M. Abrahamian (1), A. Ah Fong (1) (1) University of California, U.S.A.
- P7-178 *Brachypodium distachyon* - A new model host for *Claviceps purpurea*. S. KIND (1), S. Schurack (1), J. Hinsch (2), P. Tudzynski (1) (1) University of Muenster, Germany; (2) University of Duesseldorf, Germany
- P7-179 *Colletotrichum orbiculare* MOR is crucial for regulation of appressorium development and pathogenesis by communicating with plant-derived signals. S. KODAMA (1), J. ishizuka (1), I. Miyashita (1), T. Ishii (1), T. Nishiuchi (2), H. Miyoshi (3), Y. Kubo (1) (1) Graduate School of Life & Env Sciences, Kyoto Prefectural University, Japan; (2) Advanced Science Research Center, Kanazawa University, Japan; (3) Graduate School of Agriculture, Kyoto University, Japan
- P7-180 ER stress sensor IRE1 is involved in pathogen induced cell death. C. KOERNER (1), K. Mukhtar (1), X. Liu (1) (1) University of Alabama at Birmingham, U.S.A.
- P7-181 Phytopathological and molecular characterization of the partially *mlo*-virulent barley powdery mildew isolate HL-3. S. KUSCH (1) (1) RWTH Aachen University, Germany
- P7-182 Arabidopsis SYNAPTOTAGMIN A plays a key role in membrane contact sites formation, virus movement and plasmodesmata regulation.. A. LEVY (1), S. Lazarowitz (2) (1) University of Florida, U.S.A.; (2) Cornell University, U.S.A.
- P7-183 Discovery and functional profiling of *Phytophthora capsici* RXLR effectors in pepper plants. G. LIM (1), S. Oh (1) (1) Department of Applied Biology/Chungnam National University, South Korea
- P7-184 Identification of a C2H2-type zinc-finger transcription factor that binds to the promoter of *Parastagonospora nodorum* Tox3 and is similar to Con7. S. LIN (1), Y. Chooi (2), P. Solomon (1) (1) Plant Sciences Division, Research School of Biology, The Australian National University, Australia; (2) School of Chemistry and Biochemistry, University of Western Australia, Australia
- P7-185 *Arabidopsis thaliana* AtGCN2 kinase coordinates translational regulation and plant immune responses. X. LIU (1), K. Pajerowska-Mukhtar (1) (1) University of Alabama at Birmingham, U.S.A.
- P7-186 PXO_03177 encoding a hypothetical protein from *Xanthomonas oryzae* pv. *oryzae* is involved in polysaccharide production, stress tolerance, biofilm formation and virulence. F. LIU (1), G. Qian (2), G. Wu (1), Y. Zhao (1) (1) Institute of Plant Protection, Jiangsu Academy of Agricultural Sciences, China; (2) College of Plant Protection, Nanjing Agricultural University, China
- P7-187 Antimicrobial mechanism of peptides derived from *Trichoderma*. S. LIU (1), H. Lin (2), M. Hsieh (1), K. Peng (2) (1) Department of Molecular Biotechnology, Da-Yeh University, Taiwan; (2) Department of Life Science, National Dong Hwa University, Taiwan
- P7-188 Investigating the mechanisms of fungal effector uptake by plant cells. L. LO PRESTI (1), S. Uszkoreit (1), T. Heimerl (2), R. Kahmann (1) (1) Max Planck Institute For Terrestrial Microbiology, Germany; (2) Philipps University Marburg, Germany
- P7-189 Subversion of FLS2 subcellular transport by the bacterial effector HopM1.. J. LOISEAU (1), M. Schattat (2) (1) The Sainsbury Laboratory, United Kingdom; (2) Martin Luther University Halle-Wittenberg, Germany
- P7-190 Hydroxynitrile glucosides in barley and their involvement in disease resistance. M. LYGKJAER (1), E. Eva Knoch (1), P. Roelsgaard (1), C. Olsen (1) (1) Department of Plant and Environmental Science, University of Copenhagen, Denmark
- P7-191 Effects of movement protein mutants on *Ourmiavirus* infection, and their co-localization with plant cytoskeleton and organelles . P. MARGARIA (1), C. Anderson (1), M. Turina (2), C. Rosa (1) (1) Pennsylvania State University, U.S.A.; (2) Institute for Sustainable Plant Protection, Italy

- P7-192 *De novo* asparagine biosynthesis by *Magnaporthe oryzae* is required for fungal proliferation in rice cells . M. MARROQUIN-GUZMAN (1), R. Wilson (1) (1) University of Nebraska-Lincoln, U.S.A.
- P7-193 A quorum sensing-defective mutant of *Pectobacterium carotovorum* subsp. *brasiliense* 1692 is attenuated in virulence and unable to occlude xylem tissue of susceptible potato plant stems. L. MOLELEKI (1), R. Pretorius (1), C. Tanui (1), G. Mosina (1) (1) University of Pretoria, South Africa
- P7-194 Multiple quorum-sensing systems in phenazine-producing *Pseudomonas chlororaphis* subsp. *aurantiaca* StFRB508. T. MOROHOSHI (1), T. Yamaguchi (1), N. Someya (2), T. Ikeda (1) (1) Utsunomiya University, Japan; (2) National Agriculture and Food Research Organization (NARO), Japan
- P7-195 Air humidity is a circadian Zeitgeber influencing plant-microbe interactions. M. MWIMBA (1) (1) Duke University, U.S.A.
- P7-196 Analyses of the functions of *Magnaporthe oryzae* ATR gene with an efficient vector set for AtMT transgenesis of filamentous fungus.. M. NARUKAWA-NARA (1), Y. Hirato (2), K. Baba (2), T. Yasuda (2), T. Kamakura (2) (1) Tokyo University of Science, Japan; (2) Tokyo University of Science, Japan
- P7-197 Diverse host targets of a conserved *Pseudomonas syringae* effector form an ARF-GEF-based complex in Arabidopsis. K. NOMURA (1) (1) MSU, U.S.A.
- P7-198 Spatiotemporal imaging analysis of syncytium formation process induced by *Heterodera glycines* using two-photon excitation microscopy. M. OHTSU (1), T. Suzaki (2), Y. Sato (3), D. Kurihara (4), M. Kawaguchi (5), D. Maruyama (3), T. Higashiyama (3) (1) Graduate School of Science, Nagoya University, Japan; (2) Gene Research Center, Tsukuba University, Japan; (3) WPI-ITbM, Nagoya University, Japan; (4) JST ERATO, Nagoya University, Japan; (5) National Institute for Basic Biology, Japan
- P7-199 A two genes – for – one gene interaction between *Leptosphaeria maculans* and *Brassica napus*. Y. PETIT (1), A. Degrave (2), M. Meyer (2), F. Blaise (2), B. Ollivier (2), T. Rouxel (2), I. Fudal (2), M. Balesdent (2) (1) French National Institute for Agronomical Research, France; (2) INRA/AgroParisTech UMR1290 BIOGER, France
- P7-200 Fumonisin B1 produced *in planta* by *Fusarium verticillioides* is associated with inhibition of maize β -1,3-glucanase activity . J. PLASENCIA (1), E. Galeana-Sanchez (2), D. Sanchez-Rangel (3), M. de la Torre-Hernandez (2) (1) Departamento de Bioquímica, Facultad de Química, UNAM, Mexico; (2) Departamento de Bioquímica, Facultad de Química, UNAM, Mexico; (3) Instituto de Ecología, A.C., Mexico
- P7-201 Multiple *Xanthomonas euvesicatoria* type III effectors inhibit flg22-triggered immunity. G. POPOV (1), M. Fraiture (2), F. Brunner (2), G. Sessa (3) (1) Department of Molecular Biology and Ecology of Plants, Tel-Aviv University, Israel; (2) Department of Biochemistry, Centre for Plant Molecular Biology, Eberhard Karls University, Germany; (3) Department of Molecular Biology and Ecology of Plants, Tel-Aviv University, Israel
- P7-202 Contribution of cell surface carbohydrates to the *Xylella fastidiosa*-grapevine interaction. J. RAPICAVOLI (1), B. Blanco-Ulate (2), R. Figueroa-Balderas (2), A. Morales-Cruz (2), D. Cantu (2), M. Roper (1) (1) University of California, U.S.A.; (2) University of California, U.S.A.
- P7-203 Characterizing roles for lactate metabolism in rice blast disease: new insights into post-penetrative host infection strategies by *Magnaporthe oryzae*. R. ROCHA (1) (1) University of Nebraska-Lincoln, U.S.A.
- P7-204 An aphid effector interacts with a host protein involved in trafficking in a species-specific manner. P. RODRIGUEZ (1), C. Escudero (2), J. Bos (3) (1) James Hutton Institute, United Kingdom; (2) James Hutton Institute / University of Dundee, United Kingdom; (3) James Hutton Institute / University of Dundee, United Kingdom
- P7-205 The Regulation of Invasive Cell-to-Cell Movement during Tissue Colonisation by the Rice Blast Fungus. W. SAKULKOO (1), G. Littlejohn (1), M. Osés-Ruiz (1), N. Talbot (1) (1) Biosciences, University of Exeter, United Kingdom
- P7-206 Identification of quorum sensing-regulated virulence genes in plant pathogen *Pantoea ananatis*.. R. SATO (1), T. Ikeda (1), T. Morohoshi (1) (1) Utsunomiya University, Japan
- P7-207 Molecular understanding of parasitic plants' ability to avoid auto-parasitism and invade others. S. SAUCET (1), K. Shirasu (2) (1) RIKEN CSRS, Japan; (2) RIKEN CSRS, Japan
- P7-208 Development of an expression assay probing the ability of the P6 effector of *Cauliflower mosaic virus* expressed *in trans* to support virion accumulation.. J. SCHOELZ (1), Y. Zhang (1), A. Mustafa (1), R. Nelson (2), C. Angel (3) (1) University of Missouri, U.S.A.; (2) The Samuel Roberts Noble Foundation, U.S.A.; (3) Cenicana, Colombia
- P7-209 Investigating redundant roles by Myosin XI-K, Myosin XI-2 and CHUP1 during *Cauliflower mosaic virus* infection of *Arabidopsis thaliana*. J. SCHOELZ (1), C. Angel (2), A. Rodriguez (1), Y. Zhang (1), P. Harries (3), R. Nelson (4) (1) University of Missouri, U.S.A.; (2) Cenicafe, Colombia; (3) Pittsburgh State University, U.S.A.; (4) The Samuel Roberts Noble Foundation, U.S.A.
- P7-210 The *Magnaporthe oryzae* RSR1 gene regulates fungal antioxidation and is essential for host ROS neutralization during rice cell invasion . L. SEGAL (1), R. Wilson (1) (1) University of Nebraska-Lincoln, U.S.A.

- P7-211 Histopathological study of compatible and incompatible interactions between barley and the spot blotch fungus *Bipolaris sorokiniana*. S. SHRESTHA (1), R. Sharma Poudel (1), P. Borowicz (1), S. Zhong (1) (1) North Dakota State University, U.S.A.
- P7-212 Genome elements in *Rhodococcus fascians* D188 and PBTS *Rhodococcus* spp. . R. STAMLER (1), D. Vereecke (2), I. Francis (3), J. Randall (4) (1) New Mexico State University, U.S.A.; (2) Ghent University, Belgium; (3) California State University Bakersfield, U.S.A.; (4) New Mexico State University, U.S.A.
- P7-213 Glucose-TOR signaling regulates cell cycle progression and autophagy during appressorium development by the rice blast fungus *Magnaporthe oryzae*. G. SUN (1), M. Marroquin-Guzman (1), R. Wilson (1) (1) Department of Plant Pathology, U.S.A.
- P7-214 A protein deubiquitinating enzyme important for basal defence. H. THORDAL-CHRISENSEN (1), T. Schultz-Larsen (1), A. Lenk (1) (1) Department of Plant and Environmental Sciences, University of Copenhagen, Denmark
- P7-215 The defense gene NbeILP from *Nicotiana benthamiana* plays a role in assisting the cell-to-cell movement of *Bamboo mosaic virus*. C. TSAI (1), I. Chen (2) (1) National Chung Hsing University, Taiwan; (2) National Chung Hsing University, Taiwan
- P7-216 Assessing the alleged immobility of the phytopathogenic actinomycete *Rhodococcus fascians*. D. VEREECKE (1), P. Lambert (2), R. Stamler (2), I. Francis (3), J. Randall (2) (1) Ghent University, Belgium; (2) New Mexico State University, U.S.A.; (3) California State University Bakersfield, U.S.A.
- P7-217 The difficult search for the target of *Xanthomonas oryzae* pv. *oryzicola* virulence factor Tal11b. L. WANG (1), A. Bogdanove (2), L. Wang (3) (1) Cornell University, U.S.A.; (2) Plant Pathology and Plant-Microbe Biology Section, School of Integrative Plant Science, 334 Plant Sc, U.S.A.; (3) Plant Pathology and Plant-Microbe Biology Section, School of Integrative Plant Science, Cornell university, U.S.A.
- P7-218 Lysine biosynthesis and secondary metabolite production in *F. graminearum* . G. WIESENBERGER (1), C. Schüller (1), M. Peruci (2), A. Parich (3), A. Malachová (3), F. Berthiller (3), R. Schuhmacher (3), G. Adam (1) (1) University of Natural Resources and Life Sciences, Vienna (BOKU), Department of Applied Genetics and Cell Biology, Austria; (2) University of Natural Resources and Life Sciences, Vienna (BOKU), Department of Applied Genetics and Cell Biology, Austria; (3) University of Natural Resources and Life Sciences, Vienna (BOKU), IFA Tulln, Center for Analytical Chemistry, Austria
- P7-219 Identification and characterization of *SSD6* in *Arabidopsis*. W. XIE (1) (1) University of Copenhagen, Denmark
- P7-220 EFR-induced plant immunity can be effective against *Pseudomonas syringae* infection and Agrobacterium transformation.. F. YANG (1), M. Guo (1), G. Felix (3), J. Alfano (4) (1) Center for Plant Science Innovation and the Department of Plant Pathology, University of Nebraska, U.S.A.; (2) Center for Plant Science Innovation and the Department of Plant Pathology, University of Nebraska, U.S.A.; (3) Center of Plant Molecular Biology, University Tübingen, Germany; (4) Center for Plant Science Innovation and the Department of Plant Pathology, University of Nebraska, U.S.A.
- P7-221 Novel methodology for improving cell biology of yeast for the investigation of interactions between *Blumeria graminis* and hosts. S. YU (1), A. Henderson (1), A. Dawson (1), R. Woodruff (1), E. Lockyer (1), E. Read (1), G. Sritharan (1), M. Ryan (1), M. Sgroi (1), P. Ngou (1), Y. Liu (1), Y. Xiang (1), R. Zhang (1) (1) Imperial College London, United Kingdom
- P7-222 The dual-specificity protein phosphatase MoYvh1 functions upstream of MoPdeH to regulate the development and pathogenicity in *Magnaporthe oryzae*. H. ZHANG (1), X. Liu (1), B. Qian (1), C. Gao (1), X. Zheng (1), Z. Zhang (1) (1) Nanjing Agricultural University, China
- P7-223 Actin dynamics contribute to the innate immune response of *Arabidopsis*. C. STAIGER (1), J. Li (2), J. Henty-Ridilla (2), L. Cao (2), J. Chang (3), B. Day (4) (1) Purdue University, U.S.A.; (2) Purdue University, U.S.A.; (3) Oregon State University, U.S.A.; (4) Michigan State University, U.S.A.
- P7-224 A *Pseudomonas syringae* type III effector uses calmodulin as co-factor to target the microtubule network. M. GUO (1), P. Kim (2), G. Li (1), C. Elowsky (3), J. Alfano (1) (1) Center for Plant Science Innovation, University of Nebraska-Lincoln, U.S.A.; (2) School of Biological Sciences, University of Nebraska-Lincoln, U.S.A.; (3) Center for Biotechnology, University of Nebraska-Lincoln, U.S.A.
- P7-225 The IRE1/bZIP60 pathway are activated by potyvirus and potyvirus small membrane binding proteins and suppress virus infection. J. VERCHOT (1), D. Halterman (2), O. Arias (1), L. Pena (1), A. VelaArias (3) (1) Oklahoma State University, U.S.A.; (2) USDA/ARS Vegetable Crops Research Unit, U.S.A.; (3) Universidad de las Fuerzas Armadas – ESPE, Quito Ecuador, Ecuador
- P7-226 Role of *Rhg1*-encoded a-SNAPs in *Rhg1*-Mediated Resistance to Soybean Cyst Nematode. A. BAYLESS (1), J. Smith (1), J. Song (1), P. McMinin (1), A. Bent (1) UW-Madison, U.S.A.

Inter-Kingdom Signaling

- P8-227 Volatile signals from non-host plants deter growth and aflatoxin production by the fungus *Aspergillus*. M. BRODHAGEN (1), R. Kelsey (2), J. Young (3), A. Batson (4), J. Levy (3), J. McCollum (5), B. Kinash (6) (1) Western Washington University, U.S.A.; (2) US Forest Service, U.S.A.; (3) Western Washington University, U.S.A.; (4) Adaptive Symbiotic Technologies, U.S.A.; (5) Infectious Disease Research Institute, U.S.A.; (6) Twiss Labs, U.S.A.
- P8-228 *Pseudomonas syringae* pv. *tomato* oxidative stress-regulated transcription factors play an important role for virulence in tomato and *Arabidopsis*. Y. ISHIGA (1), Y. Ichinose (2) (1) University of Tsukuba, Japan; (2) Okayama University, Japan
- P8-229 Phytostimulation of drought stressed *Arabidopsis* by *B. phytofirmans* PsJN results from an interplay among contact-dependent induction of stress tolerance and volatile-mediated plant growth promotion. T. LEDGER (1), J. Tamayo (1), S. Rojas (1), J. Poupin (2) (1) Universidad Adolfo Ibáñez, Chile; (2) Universidad Adolfo Ibáñez, Chile
- P8-230 Co-option of bacterial quorum sensing for interkingdom signaling. B. GONCALVES COUTINHO (1), A. Schaefer (2), Y. Oda (2), D. Pelletier (3), V. Venturi (4), C. Harwood (2) (1) University of Washington, U.S.A.; (2) University of Washington, U.S.A.; (3) Oak Ridge National Laboratory, U.S.A.; (4) ICGEB, Italy
- P8-231 A *gacA*- mutant of *Pseudomonas syringae* hyper-responds to type III secretion-inducing plant signals yet is less virulent. M. O'MALLEY (1), S. Peck (2), J. Anderson (1) (1) Department of Botany & Plant Pathology, Oregon State University, U.S.A.; (2) Division of Biochemistry, University of Missouri, U.S.A.
- P8-232 Interkingdom chemical crosstalk across the plant-microbe interface during Rice Blast. N. NAQVI (1), R. Patkar (1), Z. Qu (1), F. Yang (1) (1) Temasek Life Sciences Laboratory, Singapore

Microbial Manipulation of the Host

- P9-233 How does "RALPH" effector BEC1054 work? Investigating the mode of action of an RNase-Like effector Protein associated with Haustoria in barley powdery mildew. P. SPANU (1), M. Przydacz (1), H. Pennington (1), R. Jones (1) (1) Imperial College London, United Kingdom
- P9-234 The impact of heavy metal contamination on particular ectomycorrhizal fungi and associated plant hosts. J. VELEZ (1), J. Velez (1) (1) University of Tennessee Knoxville, U.S.A.
- P9-235 A remorin protein from tobacco is targeted by the *Pseudomonas* type III effector protein HopZ1a: evidence for a novel virulence mechanism?. P. ALBERS (1), S. Üstün (1), C. Schroeder (2), K. Witzel (1), F. Börnke (1) (1) Leibniz-Institute of Vegetable and Ornamental Crops (IGZ), Germany; (2) Institute for Biochemistry and Biology, University of Potsdam, Germany
- P9-236 The *in planta* regulon of the major *Ralstonia solanacearum* virulence regulator PhcA. C. Allen (1), D. Khokani (1), T. Tran Minh (1) (1) UW-Madison, U.S.A.
- P9-237 Cell death inducing activity of the *Phytophthora capsici* effector CRN83_152 can be uncoupled from its virulence function(s). T. AMARO (1), G. Thilliez (1), R. McLeod (1), E. Huitema (2) (1) Division of Plant Sciences, University of Dundee, United Kingdom; (2) Division of Plant Sciences, University of Dundee, United Kingdom
- P9-238 Proteomics identifies infection-specific proteins of *Rhizoctonia solani*, insight into adaptation to different plant hosts and a thaumatin that enhances host susceptibility.. J. ANDERSON (1), J. Hane (2), T. Stoll (3), N. Pain (1), M. Hastie (3), P. Kaur (1), C. Hoogland (4), J. Gorman (3), K. Singh (1) (1) CSIRO Agriculture, Australia; (2) Curtin University, Australia; (3) QIMR Berghofer Medical Research Institute, Australia; (4) QIMR Berghofer Medical Research Institute, Australia
- P9-239 Translocation of RXLR effector Pi04314 from *Phytophthora infestans* into plant cells to form holoenzymes with host protein phosphatase PP1c. P. BIRCH (1), P. Boevink (2), S. Wang (1), X. Wang (3), H. McLellan (3), S. Naqvi (3), Q. He (3), M. armstrong (4), Z. Tian (5), I. hein (4), E. Gilroy (4), S. whisson (4) (1) University of Dundee, United Kingdom; (2) James Hutton Institute, United Kingdom; (3) University of Dundee, United Kingdom; (4) James Hutton Institute, United Kingdom; (5) Huazhong Agricultural University, China
- P9-240 Unconventional effects of TAL effectors. N. BOOHER (1), S. Carpenter (2), Z. Dubrow (1), N. Falahi-Charkhabi (2), Y. He (1), L. Kladuwan (1), A. Read (2), P. Singh (2), L. Wang (2), K. Wilkins (2), L. Maron (2), T. Tuan (4), B. Szurek (4), A. Bogdanove (1) (1) Cornell University, U.S.A.; (2) Cornell University, U.S.A.; (3) Cornell University, U.S.A.; (4) IRD, Montpellier, France
- P9-241 The *Xanthomonas* type-III effector XopS interferes with proteasomal turnover of a WRKY transcription factor to dampen the induction of plant defense responses. F. BÖRNKE (1), S. Üstün (1), D. van Thiel (1) (1) Leibniz-Institute for Vegetable and Ornamental Crops, Germany
- P9-242 Impact of Type VI Secretion System (T6SS) effectors on *Arabidopsis thaliana* transformation in *A. tumefaciens*. J. BRAVO (1), A. Kenefick (2), B. Nguyen (2), J. Kim (2), R. Froom (2), A. Resnick (2), L. Banta (2) (1) Williams College, U.S.A.; (2) Williams College, U.S.A.

- P9-243 Investigation of pathogenicity determinants in a hemibiotrophic ascomycete *Leptosphaeria maculans*. L. BURKETOVA (1), M. Novakova (1), D. Stehlik (2) (1) Institute of Experimental Botany, Academy of Sciences of the Czech Republic, Czech Republic; (2) University of Chemistry and Technology Prague, Faculty of Food and Biochemical Technology, Czech Republic
- P9-244 Identification and characterisation of a new flax rust effector. A. CATANZARITI (1), S. Williams (1), C. Anderson (1), J. Ellis (2), P. Dodds (2), A. Hardham (1), D. Jones (1) (1) Research School of Biology, Australian National University, Australia; (2) CSIRO Agriculture, Australia
- P9-245 The role of the phytotoxin coronatine in symptom development and growth in *Nicotiana benthamiana*. S. CHAKRAVARTHY (1), J. Worley (1), P. Parrish (2), A. Collmer (1) (1) Cornell University, U.S.A.; (2) Davidson College, U.S.A.
- P9-246 Structural and functional analyses of *Phytophthora sojae* RxLR effector PSR2 reveal functional domains for host RNA silencing suppression activity. D. CHOI (1), J. He (2), S. Duan (1), J. Ma (2), W. Ma (1) (1) University of California, Riverside, U.S.A.; (2) Fudan University, China
- P9-247 An endophytic bacterium, *Bacillus velezensis* YC7010 induces systemic resistance against brown planthopper in rice. Y. CHUNG (1), H. Rhasid (1), A. Khan (1), M. Hossain (2), J. Hwang (1) (1) Gyeongsang National University, South Korea; (2) Regional Agricultural Research Station, Bangladesh
- P9-248 The smut fungus *Thecaphora thlaspeos* colonizes the model plant *Arabidopsis thaliana*. K. COURVILLE (1), L. Frantzeskakis (1), K. Bösch (1), R. Kellner (2), M. Feldbrügge (1), V. Göhre (1) (1) University of Düsseldorf, Germany; (2) Max Planck Institute for Plant Breeding, Germany
- P9-249 BARLEY POWDERY MILDEW METALLO-PROTEASE-LIKE EFFECTOR: A UNIVERSAL VIRULENCE FACTOR IN FUNGI?. S. DAS GUPTA (1), M. Urban (2), G. Scalliet (3), K. Hammond-Kosack (2), L. Bindschedler (1) (1) Royal Holloway, University of London, United Kingdom; (2) Rothamsted Research, United Kingdom; (3) Syngenta, Switzerland; (4) Royal Holloway, University of London, United Kingdom
- P9-250 Harnessing power of fungal endophytes that enhance plants to tolerate abiotic stress. K. DASTOGEER (1), H. Li (1), K. Sivasithamparam (1), M. Jones (1), S. Wylie (1) (1) Murdoch University, Australia
- P9-251 Uncovering root microbiome functions by advanced metagenomics. R. DE JONGE (1), Y. Van de Peer (2), C. Pieterse (1) (1) Utrecht University, Netherlands; (2) University of Ghent - VIB, Belgium
- P9-252 A TAL effector from *Xanthomonas oryzae* pv. *oryzicola* may contribute to virulence by targeting a transcription factor. Z. DUBROW (1), L. Wang (1), A. Bogdanove (1) (1) Cornell University, U.S.A.
- P9-253 Every Jack has his Jill: Unveiling nuclear host targets of *Phytophthora capsici* RxLR effectors. S. ENGELHARDT (1), A. Howden (1), S. ten Have (2), E. Huitema (1) (1) Division of Plant Sciences, University of Dundee; Dundee Effector Consortium, Dundee, UK, United Kingdom; (2) Wellcome Trust Centre for Gene Regulation and Expression, University of Dundee, United Kingdom
- P9-254 Characterization of VP2145, a Putative Histone Deacetylase T3SS Effector from *Vibrio parahaemolyticus*. J. FERNANDEZ (1), P. Li (1), K. Orth (1) (1) UT Southwestern Medical Center, U.S.A.
- P9-255 Investigating the role of secreted citrus proteases during HLB progression. J. FRANCO (1), G. Coaker (1) (1) University of California, Davis, U.S.A.
- P9-256 A secreted root-knot nematode effector that disrupts the plant actin cytoskeleton. C. GLEASON (1), N. Leelarasamee (1) (1) Georg August University, Germany
- P9-257 Determination of Virulence Contributions from *Phytophthora infestans* Effectors IPI-O1 and IPI-O4. Y. CHEN (1), D. Halterman (2) (1) Department of Horticulture, University of Wisconsin-Madison, U.S.A.; (2) U.S. Department of Agriculture-Agricultural Research Service, U.S.A.
- P9-258 A simple test system for customized endonucleases and homology-directed genome editing. G. HENSEL (1), N. Budhagatapalli (2), S. Schedel (2), S. Hiekel (2), T. Rutten (2), J. Kumlehn (2) (1) Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) Plant Reproductive Biology Correns, Germany; (2) Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Germany
- P9-259 Suppression of basal defenses in the syncytium of the cyst nematode *Heterodera schachtii* by Arabidopsis miR827. T. HEWEZI (1), S. Piya (2), M. Qi (3), B. Muthukumar (2), J. Rice (2) (1) University of Tennessee, U.S.A.; (2) University of Tennessee, U.S.A.; (3) Iowa State University, U.S.A.
- P9-260 Host-induced gene silencing of *Phakopsora pachyrhizi* genes in soybean mediated by the *bean pod mottle virus*. D. HU (1), Z. Chen (1) (1) Department of Plant Pathology and Crop Physiology, Louisiana State University Agricultural Center, U.S.A.
- P9-261 An oomycete avirulence effector stabilizes a plant RNA binding protein to subvert host immunity. J. HUANG (1), J. Huang (2) (1) Nanjing Agricultural University, China; (2) Nanjing Agricultural University, Nanjing, China, China

- P9-262 Transcriptional profiling and effector identification of the *Exserohilum turcicum*-*Zea mays* interaction. M. HUMAN (1), O. Bezuidt (1), D. Berger (1), B. Crampton (1) (1) University of Pretoria, South Africa
- P9-263 *Xanthomonas oryzae*-triggered production of rice small RNAs during infection. J. JACOBS (1), G. Reshetnyak (1), F. Auguy (1), A. Perez-Quintero (1), C. Medina (2), R. Koebnik (1), B. Szurek (1), S. Lacombe (3), S. Cunnac (1) (1) IRD-Montpellier, France; (2) INRA, France; (3) IRD-Montpellier, France
- P9-264 Absence of a functional glyoxalase system in *Candidatus Liberibacter asiaticus* confirms that the bacterium scavenges host cells for its energy requirements. M. JAIN (1), L. Fleites (2), S. Zhang (2), D. Gabriel (2) (1) Department of Plant Pathology, University of Florida, U.S.A.; (2) Department of Plant Pathology, University of Florida, U.S.A.
- P9-265 Genetic variation of *Magnaporthe oryzae* avirulence genes, *AVR-PiK* and morphological characterization of rice blast isolates in Thailand. C. JANTASURIYARAT (1), A. Longya (1), T. Sirisathaworn (1), C. Chaipanya (1) (1) Department of Genetics, Faculty of Science, Kasetsart University, Chatuchak, Bangkok 10900, Thailand, Thailand
- P9-266 Interaction of the human pathogen *Shigella* with *Arabidopsis* plants. S. JO (1), M. Lee (2), J. Lee (2), D. Lee (2), C. Ryu (2), M. Kim (2), J. Park (2) (1) UST/KRIBB, South Korea; (2) KRIBB, South Korea
- P9-267 Investigating a potential role for SQUAMOSA promoter-binding protein (SBP) transcription factors as positive regulators of programmed cell death in tomato. R. KESSENS (1) (1) University of Wisconsin - Madison, U.S.A.
- P9-268 Cytokinins synthesized by the biotrophic fungus *Claviceps purpurea* are essential for a compatible rye-fungus interaction. J. HINSCH (1), S. Kind (2), P. Galuszka (3), P. Tudzynski (2) (1) University of Duesseldorf, Germany; (2) University of Muenster, Germany; (3) Centre of Molecular Biology and Genetics of the Palacký University, Czech Republic
- P9-269 A *Phytophthora* RxLR effector modulate host immunity by regulating histone acetylation. L. KONG (1), X. Qiu (2), J. Kang (2), Y. Wang (2), M. Qiu (2), Y. Lin (2), G. Kong (2), J. Huang (2), W. Ye (2), Y. Wang (2), S. Dong (2), Y. Wang (2) (1) Plant Pathology Department, Nanjing Agricultural University, Nanjing, China, China; (2) Plant Pathology Department, Nanjing Agricultural University, Nanjing, China, China
- P9-270 Perturbation of maize metabolism influences susceptibility to *Ustilago maydis*. M. KRETSCHMER (1), D. Croll (1), J. Kronstad (1) (1) Michael Smith Laboratories, The University of British Columbia, Canada
- P9-271 A new hypovirulence associated mycovirus from *Fusarium* spp. isolated from apple orchards. S. KULSHRESTHA (1), M. Sharma (1) (1) Shoolini University of Biotechnology and Management Sciences, India
- P9-272 N-Acetylglucosamine metabolism is crucial during infectious hyphal growth and virulence of the rice blast fungus *Magnaporthe oryzae*. A. KUMAR (1), S. Ghosh (2), D. Bhatt (3), A. Narurla (4), A. Datta (3) (1) National Institute of Plant Genome Research (NIPGR), India; (2) Central Institute of Medicinal and Aromatic Plants, India; (3) National Institute of Plant Genome Research, India; (4) Hamdard University, India
- P9-273 *Pseudomonas syringae* DC3000-derived auxin contributes to Virulence on Arabidopsis. B. KUNKEL (1), S. McClerklin (1), S. Lee (1), R. Nwumeh (1) (1) Washington University in St. Louis, U.S.A.
- P9-274 Tackling organ-specificity in the potato – late blight interaction. A. LACAZE (1), F. Sormany (1) (1) Université de Moncton, Canada
- P9-275 Global expression profiling of the corn smut fungus reveals unprecedented insights into how its metabolism and effectors are used in the plant environment.. D. LANVER (1), A. Müller (1), G. Schweizer (1), N. Ludwig (1), F. Haas (2), J. Altmüller (3), S. Rensing (2) (1) Max-Planck-Institute for Terrestrial Microbiology, Germany; (2) Philipps University Marburg, Germany; (3) Cologne Center for Genomics, Germany
- P9-276 A bacterial effector that suppresses activation of specific members of MAMP-activated MAPKs.. J. LEE (1), L. Eschen-Lippold (1), D. Scheel (1) (1) Leibniz Institute of Plant Biochemistry, Germany
- P9-277 Cleavage of BAK1 by a *Pseudomonas syringae* effector to subvert plant innate immunity.. L. LEI (1), K. Panya (2), Y. Liping (1), C. Gaihong (3), C. She (3), A. James (4), Z. Jian-Min (1) (1) State Key Laboratory of Plant Genomics, Institute of Genetics and Developmental Biology, CAS, China; (2) Center for Plant Science Innovation and School of Biological Sciences, University of Nebraska, Lincoln, NE, USA, U.S.A.; (3) National Institute of Biological Sciences, Beijing, China; (4) Center for Plant Science Innovation and Department of Plant Pathology, University of Nebraska, Lincoln, NE, USA, U.S.A.
- P9-278 The *Pseudomonas syringae* type III effector HopK1 targets phototropins to suppress blue-light-mediated immunity. G. LI (1), N. Suetsugu (2), M. Wada (2), J. Alfano (1) (1) Center for Plant Science Innovation and the Department of Plant Pathology The University of Nebraska, U.S.A.; (2) Graduate School of Biostudies Kyoto University, Japan
- P9-279 The rice blast fungus, *magnaporthe oryzae* causes specific disruption of the f-actin cytoskeleton and compromises chloroplast function during rice infection. G. LITTLEJOHN (1), X. Yan (2), M. Martin-Urdiroz (2), H. Saitoh (3), D. Sones (2), R. Terauchi (3), N. Talbot (2) (1) University of Exeter, United Kingdom; (2) University of Exeter, United Kingdom; (3) Iwate Biotechnology Research Centre, Japan

- P9-280 Heterologous Expression Screens of In planta-Expressed Blast Secreted Proteins Identify a Candidate Effector that Associates with Aquaporin-1 in Rice. W. LIU (1), X. Xie (2), G. Wang (3) (1) State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, China; (2) State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, China; (3) Department of Plant Pathology, Ohio State University, U.S.A.
- P9-281 CLCuMuB betaC1 Subverts Ubiquitination By Interacting With NbSKP1s To Enhance Geminivirus Infection In Nicotiana Benthamiana. Y. LIU (1), Q. Jia (1), N. Liu (1), K. Xie (1) (1) Tsinghua University, China
- P9-282 HpaP modulates the secretion of type 3 substrates and plays an essential role in *Ralstonia solanacearum* virulence. F. LONJON (1), D. Rengel (2), C. Henry (3), D. Lohou (2), M. Turner (5), O. Catrice (2), N. Peeters (2), S. Genin (2), F. Vailleau (2) (1) Laboratoire des Interactions Plantes Micro-organismes (LIPM), France; (2) Laboratoire des Interactions Plantes Micro-organismes (LIPM), France; (3) PAPPISO, Micalis Institute, INRA, AgroParisTech, Université Paris-Saclay, France; (4) Laboratoire des Interactions Plantes Micro-organismes (LIPM), France; (5) Laboratoire des Interactions Plantes Micro-organismes (LIPM), France
- P9-283 Bacterial wilt disease changes the xylem sap metabolome. T. LOWE (1), A. Jancewicz (1), R. Mitra (2), B. Dalsing (1), P. Masson (1), C. Allen (1) (1) University of Wisconsin-Madison, U.S.A.; (2) Carleton College, U.S.A.
- P9-284 Structure of *Pseudomonas syringae* HopZ1a reveals a conserved enzymatic mechanism for YopJ family of Type III effectors. K. MA (1), Z. Zhang (1), W. Ma (1), J. Song (1) (1) University of California Riverside, U.S.A.
- P9-285 A *Ralstonia solanacearum* type-III effector targets redox regulators to suppress immune responses. A. MACHO (1), Y. Sang (1), Y. Wang (1), H. Ni (1), A. Cazale (2), Y. She (1), N. Peeters (2) (1) Shanghai Center for Plant Stress Biology, China; (2) Laboratoire des Interactions Plantes-Microorganismes, France
- P9-286 Polyhydroxybutyrate and trehalose: A close look at metabolites present in tomato xylem sap during *Ralstonia solanacearum* infection. A. MACINTYRE (1) (1) University of Wisconsin-Madison, U.S.A.
- P9-287 Co-evolution of virulence and recognition in rice blast disease. J. MAIDMENT (1), A. Maqbool (1), H. Saitoh (2), H. Kanzaki (2), M. Franceschetti (1), C. Stevenson (1), S. Kamoun (3), R. Terauchi (2), M. Banfield (1) (1) John Innes Centre, United Kingdom; (2) Iwate Biotechnology Research Center, Japan; (3) The Sainsbury Laboratory, United Kingdom
- P9-288 Structural basis of host ATG8 binding by the Irish potato famine pathogen effector protein PexRD54. A. MAQBOOL (1), R. Hughes (1), Y. Dagdas (2), E. Zess (1), N. Tregidgo (1), K. Belhaj (2), A. Round (3), T. Bozkurt (4), S. Kamoun (2), M. Banfield (1) (1) John Innes Centre, United Kingdom; (2) The Sainsbury Laboratory, United Kingdom; (3) EMBL, France; (4) Imperial College London, United Kingdom
- P9-289 A Foxtail mosaic virus-based vector for virus-induced gene silencing in maize. Y. MEI (1), C. Zhang (2), J. Hill (1), S. Whitham (1) (1) Iowa State University, U.S.A.; (2) Alcorn State University, U.S.A.
- P9-290 Tomato 14-3-3 proteins are signaling components of immunity and common targets of *Xanthomonas* effectors. Z. DUBROW (1), S. Sukumaran (2), J. Kim (1), D. Teper (2), E. Bosis (2), G. Sessa (2), M. Mudgett (1) (1) Stanford University, U.S.A.; (2) Tel Aviv University, Israel
- P9-291 The barley powdery mildew effector protein ROPIP1 is encoded on an active retroelement. M. NOTTENSTEINER (1), R. Hückelhoven (1) (1) Chair of Phytopathology, Center of Life and Food Sciences Weihenstephan, TU München, Germany
- P9-292 Insights into the virulence role of *Blumeria graminis* f.sp *hordei* RNase-like effector CSEP0264 (BEC1011). K. ORMAN (1), L. Bindschedler (1), C. Turnbull (2) (1) Royal Holloway University of London, United Kingdom; (2) Imperial College London, United Kingdom
- P9-293 Regulation of bacterial virulence by two component signal transduction systems. A. PANDEY (1) (1) CSIR-Central Institute of Medicinal and Aromatic Plants, India
- P9-294 GENETIC BASIS OF TRANSLOCATION OF *MAGNAPORTHE ORYZAE* AVR-Pik INTO RICE CELLS. H. PENNINGTON (1), A. Bialas (1), K. Yoshida (2), M. Banfield (1), R. Terauchi (3), S. Kamoun (1) (1) The Sainsbury Laboratory, Norwich Research Park, United Kingdom; (2) Laboratory of Plant Genetics, Graduate School of Agricultural Science, Kobe University, Japan; (3) Iwate Biotechnology Research Center, Japan
- P9-295 *Burkholderia phytofirmans* PsJN regulates Arabidopsis growth through a signaling mechanism dependent of auxin and ethylene. M. POUPIN (1), M. Greve (1), V. Carmona (2), I. Pinedo (2), T. Ledger (2) (1) Facultad de Ingenieria y Ciencias, Universidad Adolfo Ibanez, Chile; CAPES, Chile, Chile; (2) Facultad de Ingenieria y Ciencias, Universidad Adolfo Ibanez, Chile; CAPES, Chile, Chile
- P9-296 Characterization of effector candidates from the soybean rust fungus that suppress plant immunity. M. QI (1), T. Link (2), R. Voegelé (3), T. Baum (1), S. Whitham (1) (1) Iowa State University, U.S.A.; (2) Institut für Phytomedizin, Universität Hohenheim, Germany; (3) Institut für Phytomedizin, Universität Hohenheim, Germany

- P9-297 The role of sulfate transporters in virulence of *Xanthomonas oryzae* pv. *oryzicola*. A. READ (1), A. Bogdanove (2) (1) Plant Pathology and Plant Microbe Biology - School of Integrative Plant Science - Cornell University, U.S.A.; (2) Plant Pathology and Plant-Microbe Biology - School of Integrative Plant Science - Cornell University, U.S.A.
- P9-298 Is the *Verticillium* effector Ave1 a dual function protein?. H. ROVENICH (1), J. Boshoven (1), C. Grandellis (2), M. Seidl (1), J. Ottado (2), B. Thomma (1) (1) Wageningen University, Netherlands; (2) IBR-CONICET, Argentina
- P9-299 Characterization of *Golovinomyces cichoracearum* Effectors. K. SCHEIBEL (1), S. Somerville (1) (1) UC Berkeley, U.S.A.
- P9-300 Symptom development in soybeans infected with Soybean dwarf luteovirus is tied to differential activation of the salicylic or jasmonic acid defense signaling pathways.. W. SCHNEIDER (1), C. Dardick (2), O. Smith (3), M. Graham (4), D. Luster (1) (1) USDA-ARS FDWSRU, U.S.A.; (2) USDA-ARS AFRC, U.S.A.; (3) Hood College, U.S.A.; (4) USDA-ARS CICGR, U.S.A.
- P9-301 Characterization of secreted modifying enzymes from the late blight pathogen *Phytophthora infestans*. C. SCHOINA (1), K. Bouwmeester (2), M. Seidl (2), S. Rodenburg (2), H. Meijer (2), F. Govers (2) (1) Wageningen University, Netherlands; (2) Wageningen University, Netherlands
- P9-302 The water soaking caused by the TAL effector AvrHah1 involves cell wall modification and may elucidate a role for lesion development during bacterial spot of tomato. A. SCHWARTZ (1), R. Morbitzer (2), T. Lahaye (2), B. Staskawicz (1) (1) University of California, Berkeley, U.S.A.; (2) University of Tübingen, Germany
- P9-303 RXLR effector PexRD54 links a plastid-localized protein to autophagy. M. SEGRETIN (1), Y. Dagdas (2), N. Sanguankiatichai (3), S. Kamoun (2) (1) INGEPI-CONICET, Argentina; (2) The Sainsbury Laboratory, United Kingdom; (3) Imperial College London, Department of Life Sciences, United Kingdom
- P9-304 *Xanthomonas* XopAU is an active protein kinase that manipulates host MAP kinase signaling to promote disease. G. SESSA (1), D. Teper (2), E. Bosis (2), G. Popov (2), G. Popov (2) (1) Tel Aviv University, Israel; (2) Tel Aviv University, Israel
- P9-305 Functional characterization of putative effector genes of basil downy mildew pathogen *Peronospora belbahrii*. D. SHAO (1), M. Tian (1) (1) University of Hawaii at Manoa, U.S.A.
- P9-306 *Puccinia graminis* f. sp. *tritici* Avr-r45; identification of an effector that manipulates an integrated domain R-protein complex. R. SHARMA POUDEL (1), J. Richards (1), S. Solanki (1), R. Brueggeman (1) (1) North Dakota State University, U.S.A.
- P9-307 Characterization of the functional duality of a bacterial type III secreted protein AvrRxo1 and its chaperone Arc1 as a toxin-antitoxin system. T. SHIDORE (1), J. Long (2), J. Leach (2), L. Triplett (1) (1) The Connecticut Agricultural Experiment Station, U.S.A.; (2) Colorado State University, U.S.A.
- P9-308 Functional and physiological characterization of OsSULTR3;6, a new class of susceptibility gene. P. SINGH (1), L. Wang (1), A. Read (1) (1) Cornell University, Plant Pathology and Plant-Microbe Biology Section, U.S.A.
- P9-309 WITHDRAWN
- P9-310 The Tin2 effector determines the pathogenic lifestyle in smut fungi. S. TANAKA (1), R. Kahmann (1) (1) Max Planck Institute for Terrestrial Microbiology, Germany
- P9-311 Investigating the functional convergence of pathogen effectors that target TCP transcription factors in *Arabidopsis thaliana*. P. TEIXEIRA (1), L. Yang (2), P. Eppe (3), S. Biswas (4), Y. He (5), O. Finkel (2), M. English (6), P. Mieczkowski (2), P. Braun (7), J. Dangl (2) (1) University of North Carolina at Chapel Hill, U.S.A.; (2) University of North Carolina at Chapel Hill, U.S.A.; (3) BASF Plant Science, U.S.A.; (4) Harvard Medical School, U.S.A.; (5) North Carolina State University, U.S.A.; (6) University of Tennessee, U.S.A.; (7) Technische Universität München, Germany
- P9-312 Establishment of a simple and efficient *agrobacterium*-mediated transformation system for *Phytophthora palmivora*. D. WU (1), N. Navet (1), M. Tian (1) (1) University of Hawaii at Manoa, U.S.A.
- P9-313 *Burkholderia phytofirmans* PsJN protects *Arabidopsis thaliana* against a virulent strain of *Pseudomonas syringae* DC3000 through additive mechanisms of biocontrol. T. TIMMERMAN (1), G. Armijo (2), R. Donoso (1), A. Seguel (2), L. Holuigue (2), B. Gonzalez (1) (1) Universidad Adolfo Ibanez, Chile; (2) Pontificia Universidad Catolica de Chile, Chile
- P9-314 Functional analysis of evolutionary conserved *Phytophthora* RxLR24 effector. I. TOMCZYNSKA (1), M. Stumpe (1), F. Mauch (1) (1) Department of Plant Biology, University of Fribourg, Chemin du Musee 10, CH-1700 Fribourg, Switzerland
- P9-315 Heterozygosity plays a key role in pathogenicity of *Hyaloperonospora arabidopsidis*. M. TOR (1), V. Cevik (2), O. Telli (1), E. Holub (3), D. Studholme (4), A. Woods-Tor (1) (1) Institute of Science and the Environment, University of Worcester, United Kingdom; (2) The Sainsbury Laboratory, Norwich, United Kingdom; (3) Life Sciences, University of Warwick, United Kingdom; (4) Biosciences, University of Exeter, United Kingdom

- P9-316 Probing the interaction between the *Phytophthora infestans* effector PexRD24 and the host enzyme Protein Phosphatase 1.. F. VARDEN (1), P. Birch (2), M. Banfield (1) (1) John Innes Centre, United Kingdom; (2) The James Hutton Institute, United Kingdom
- P9-317 Cell type-specific gene expression changes in *Arabidopsis thaliana* roots in response to beneficial *Pseudomonas simiae* WCS417 rhizobacteria . E. VERBON (1), L. Liberman (2), P. Benfey (2), C. Pieterse (3) (1) Utrecht University, Netherlands; (2) Duke University, U.S.A.; (3) Utrecht University, Netherlands
- P9-318 A Cyst Nematode Effector Regulates Plant Gene Expressions Through Epigenetic Modifications. P. VIJAYAPALANI (1), T. Hewezi (2), M. Mitchum (3), T. Baum (1) (1) Iowa State University, U.S.A.; (2) University of Tennessee, U.S.A.; (3) University of Missouri, U.S.A.
- P9-319 Proteomic identification of fungal induced protein hyperacetylation. J. WALLEY (1), G. Song (1), M. McReynolds (1) (1) Iowa State University, U.S.A.
- P9-320 HrpH, a multipurpose lytic transglycosylase associated with the type III secretion system of *Pseudomonas syringae* pv. *tomato* DC3000 . H. WEI (1), A. Collmer (1) (1) School of Integrative Plant Science, Section of Plant Pathology and Plant-Microbe Biology, Cornell University, U.S.A.
- P9-321 *In planta* interactor screen of RXLR effectors reveals plant processes manipulated by *Phytophthora infestans*. J. WIN (1), B. Petre (1), Y. Dagdas (1), T. Bozkurt (3), J. Sklenar (1), M. Schattat (4), A. Abd-El-Haliem (5), L. Cano (6), R. Lozano-Duran (7), A. Jones (8), J. Vossen (9), S. Robatzek (1), S. Schornack (10), S. Kamoun (1) (1) The Sainsbury Laboratory, United Kingdom; (10) Sainsbury Laboratory University of Cambridge, United Kingdom; (2) The Sainsbury Laboratory, United Kingdom; (3) Imperial College London, United Kingdom; (4) Martin Luther University Halle-Wittenberg, Germany; (5) University of Amsterdam, Netherlands; (6) University of Florida, U.S.A.; (7) The Shanghai Center for Plant Stress Biology, China; (8) University of Warwick, United Kingdom; (9) Wageningen UR Plant Breeding, Netherlands
- P9-322 Oomycete effector HaRxL106 interacts with Arabidopsis RADICAL INDUCED CELL DEATH1 and suppresses NPR1-dependent immunity. L. WIRTHMUELLER (1), S. Asai (2), G. Rallapalli (3), D. Kim (3), G. Fabro (4), M. Wrzaczek (5), J. Kangasjarvi (6), J. Sklenar (3), F. Menke (3), M. Banfield (7), J. Jones (3) (1) Freie Universität Berlin, Germany; (2) RIKEN Center for Sustainable Resource Science, Japan; (3) The Sainsbury Laboratory, United Kingdom; (4) Research Centre in Biological Chemistry of Córdoba, Argentina; (5) University of Helsinki, Finland; (6) University of Helsinki, Finland; (7) John Innes Centre, United Kingdom
- P9-323 Identification of *Pyrenophora teres* f. *teres* candidate effector genes in the VR1 and VR2 genomic regions.. N. WYATT (1), R. Brueggeman (2), J. Faris (3), T. Friesen (3) (1) North Dakota State University, U.S.A.; (2) North Dakota State University, U.S.A.; (3) Cereal Crops Research Unit, USDA-ARS, U.S.A.
- P9-324 Reconstitution of a model plant disease. X. XIN (1), K. Nomura (1), K. Aung (1), A. Velásquez (1), J. Yao (1), F. Boutrot (2), C. Zipfel (2), J. Chang (3), S. He (1) (1) Michigan State University, U.S.A.; (2) The Sainsbury Laboratory, United Kingdom; (3) Oregon State University, U.S.A.
- P9-325 Functional characterization of the novel SPRYSEC effector family members from the potato cyst nematode *Globodera rostochiensis*. X. WANG (1), R. Cui (2), H. Yang (2), S. Chen (2) (1) USDA-ARS, U.S.A.; (2) Cornell University, U.S.A.; (3) Cornell University, U.S.A.
- P9-326 A coin with double sides? *Phytophthora* essential effector Avh238 has dual functions in cell death activation and plant immunity suppression. B. YANG (1), Q. Wang (2), M. Jing (3), B. Guo (3), H. Wang (3), W. Ye (3), Y. Wang (3), S. Dong (3), Y. Wang (3) (1) Nanjing Agricultural University, China; (2) Department of Botany and Plant Pathology, Oregon State University, U.S.A.; (3) Nanjing Agricultural University, China
- P9-327 Exploring the mechanisms of immunosuppression by the plant-beneficial rhizobacterium *Pseudomonas capeferrum* WCS358. K. YU (1), R. Berendsen (1), C. Pieterse (1), P. Bakker (1) (1) Plant-Microbe Interactions, Faculty of Science, Utrecht University, Netherlands
- P9-328 Genetic diversity: an ally in TALE-targeted gene predictions in the Cassava-*Xanthomonas* pathosystem. C. ZARATE CHAVES (1), D. Osorio Rodriguez (2), M. Buitrago Acosta (2), L. Jaimes Niño (2), A. Perez Quintero (3), S. Restrepo Restrepo (2), C. Lopez Carrascal (4), B. Szurek (3), A. Bernal Giraldo (2) (1) Universidad de los Andes. Laboratorio de micología y fitopatología LAMFU, Colombia; (2) Universidad de los Andes. Laboratorio de micología y fitopatología LAMFU, Colombia; (3) Institut de Recherche pour le Développement. Interactions Plantes-Microorganismes-Environnement (IPME), France; (4) Universidad Nacional de Colombia. Manihot Biotech., Colombia; (5) Institut de Recherche pour le Développement. Interactions Plantes-Microorganismes-Environnement (IPME), France
- P9-329 Identification of *Phytophthora* Crinklers (CRNs) with RNA silencing suppression activity. Y. ZHAI (1), W. Ma (2), E. Huitema (3) (1) University of California, Riverside, U.S.A.; (2) Department of Plant Pathology and Microbiology and Center for Plant Cell Biology, University of California, Riverside, U.S.A.; (3) Division of Plant Sciences and College of Life Sciences, University of Dundee, United Kingdom

- P9-330 Identification of A *Phytophthora parasitica* RXLR effector that associates with *Arabidopsis thaliana* NPR1 to promote infection. M. ZHANG (1), Q. Li (1), Q. Zhang (2), W. Li (1), Y. Chen (1), D. Dou (3) (1) Nanjing Agricultural University, China; (2) Nanjing Agricultural University, China; (3) Nanjing Agricultural University, China
- P9-331 Mechanisms of Bacterial Suppression of AGO1-RISC Activity and of Host Counter-counter Defense. L. NAVARRO (1), O. Thiébeauld (2), M. Charvin (2), F. Yang (3), D. Pontier (4), E. Lastrucci (2), L. Bapaume (2), G. Li (3), T. Lagrange (5), J. Alfano (3) (1) IBENS-CNRS, France; (2) IBENS-CNRS, France; (3) University of Nebraska, U.S.A.; (4) LGDP, France; (5) LGDP, France
- P9-332 RXLR effector PexRD54 couples host cellular transport components to autophagic compartments to stimulate autophagosome biogenesis and haustorial transport. T. BOZKURT (1), P. Pandey (1), Y. Dagdas (2), B. Dagvadorj (3), A. Toufexi (3), C. Duggan (3), M. Segretiin (4), S. Kamoun (2) (1) Imperial College london, Department of Life Sciences, London, UK., United Kingdom; (2) The Sainsbury Laboratory, Norwich Research Park, Norwich, NR4 7UH, UK., United Kingdom; (3) Imperial College london, Department of Life Sciences, London, UK., United Kingdom; (4) INGEBI-CONICET, Obligado 2490, C.A.B.A., C1428ADN, Argentina, United Kingdom
- P9-333 Delivery of *Phytophthora sojae* effector Avr1b *in planta* requires PI3P-binding, but does not require N-terminal cleavage. B. TYLER (1), Q. Wang (1), F. Arredondo (1), Y. Fang (1), E. Perez (1) (1) Center for Genome Research and Biocomputing, Oregon State University, U.S.A.
- P9-334 Mimicry of The Plant Hormone PSY1 by A Sulfated Bacterial Peptide, RaxX. A. JOE (1), R. Pruitt (1) (1) Department of Plant pathology the Genome Center, University of California Davis, USA, U.S.A.
- P9-335 WITHDRAWN

RNA-Mediated Interactions

- P10-336 Small RNA-Based Antiviral Defense in the Phytopathogenic Fungus *Colletotrichum higginsianum*. K. GILBERT (1), S. Campo (2), J. Carrington (1) (1) Donald Danforth Plant Science Center, U.S.A.; (2) Centre for Research in Agricultural Genomics, Spain
- P10-337 Host-induced gene silencing targeting the *Aspergillus flavus omtA* gene to reduce aflatoxin contamination in maize. Y. RARUANG (1), O. Omolehin (2), Q. Wei (3), R. Brown (4), D. Bhatnagar (3), Z. Chen (2) (1) Louisiana State Univeristy AgCenter, U.S.A.; (2) Louisiana State University AgCenter, U.S.A.; (3) United States Department of Agriculture Agricultural Research Service, U.S.A.; (4) United States Department of Agriculture Agricultural Research Service, Canada
- P10-338 Functional analysis of *Ustilago hordei* effector UhAVR1 during compatible and incompatible interactions with its barley host. A. MONTENEGRO ALONSO (1), G. Bakkeren (2) (1) The University of British Columbia, Canada; (2) Agriculture and Agri-Food Canada, Canada
- P10-339 Cotton plants export small RNAs to induce target gene silencing in a wilt disease pathogen *Verticillium dahliae*. H. GUO (1), T. Zhang (2) (1) Institute of Microbiology, Chinese Academy of Sciences, China; (2) Institute of Microbiology, Chinese Academy of Sciences, China
- P10-340 Functional analysis of barley powdery mildew effector candidates and identification of their barley targets. A. AHMED (1), C. Pedersen (2), T. Schultz-Larsen (2), M. Kwaaitaal (3), H. Jørgensen (2), H. Thordal-Christensen (2) (1) University of California, Davis Genome center, U.S.A.; (2) University of Copenhagen, Denmark; (3) Aachen University, Germany
- P10-341 Bidirectional sRNA-trafficking and RNA-based plant protection against *Botrytis cinerea* and other pathogens that utilize small RNA effectors. M. WANG (1), A. Weiberg (2), F. Lin (3), B. Thomma (4), H. Huang (3), H. Jin (5) (1) UC Riverside, U.S.A.; (2) University of Munich Martinsried, Germany; (3) National Chiao Tung University, Taiwan; (4) Wageningen University, Netherlands; (5) UC Riverside, U.S.A.
- P10-342 Triticum mosaic virus contains a unique translation element within its 5' untranslated region. R. ROBERTS (1), J. Zhang (1), L. Mayberry (2), K. Browning (2), A. Rakotondrafara (1) (1) University of Wisconsin-Madison, U.S.A.; (2) University of Texas-Austin, U.S.A.
- P10-343 A Land Plant-specific Transcription Factor Directly Enhances DNA-dependent RNA Polymerase II Transcribing A Pathogenic Noncoding RNA Template. Y. WANG (1), J. Qu (2), S. Ji (3), A. Wallace (2), J. Wu (2), Y. Li (3), V. Gopalan (2), B. Ding (2) (1) The Ohio State University, U.S.A.; (2) The Ohio State University, U.S.A.; (3) Peking University, China

GENOMICS AND SYSTEMS BIOLOGY

Genomes, Genomics and Epigenomics

- P11-344 A novel approach to detect fungal and wheat genes involved in leaf rust disease by expression associations during various race-specific interactions. G. BAKKEREN (1), H. Khalil (1), X. Wang (2), R. Linning (1), D. Joly (3), D. Cram (4), N. Thiessen (5), G. Taylor (5), B. McCallum (2), B. Saville (6) (1) Agriculture & Agri-Food Canada, Summerland Research & Development Centre, Canada; (2) Agriculture & Agri-Food Canada, Morden Research & Development Centre, Canada; (3) Department of Biology, Université de Moncton, Canada; (4) National Research Council Canada, Canada; (5) Genome Sciences Centre, Canada; (6) Trent University, Canada
- P11-345 *B. napus-Leptosphaeria maculans* interaction: Perception and downstream signalling. H. BORHAN (1), P. Haddadi (2), L. Ma (2) (1) AAFC, Canada; (2) Agriculture and Agri-Food Canada, Saskatoon Research and Development Centre, Canada
- P11-346 Sequence identification of a novel begomovirus affecting bean crops in southwestern Colombia. M. CARVAJAL-YEPES (1), L. Zambrano (1), J. Bueno (1), C. Olaya (2), W. Cuellar (3) (1) International center for tropical agriculture, Colombia; (2) Washington State University, U.S.A.; (3) International center for tropical agriculture, Colombia
- P11-347 Direct repeat-mediated DNA deletion of the MAT1-2 genes results in unidirectional mating type switching in *Sclerotinia trifoliorum*. W. CHEN (1), L. Xu (2) (1) USDA ARS, U.S.A.; (2) Washington State University, U.S.A.
- P11-348 Behind enemy lines: investigating the molecular arsenal of the banana pathogen *Fusarium oxysporum* f.sp. *cubense*. E. CZISLOWSKI (1), S. Fraser-Smith (1), M. Zander (1), W. O'Neill (2), L. Tran-Nguyen (3), J. Batley (4), E. Aitken (1) (1) The University of Queensland, Australia; (2) Biosecurity Queensland, Department of Agriculture and Fisheries, Australia; (3) Northern Territory Department of Primary Industries and Fisheries, Australia; (4) The University of Western Australia, Australia
- P11-349 Fine mapping of a novel resistance gene to clubroot disease in *Brassica oleracea* through bulked segregant RNA sequencing. A. DAKOURI (1), X. Zhang (2), G. Peng (3), B. Gossen (3), K. Falk (3), F. Yu (3) (1) Agriculture and Agri-Food Canada, Canada; (2) Agriculture and Agri-Food Canada, Canada; (3) Agriculture and Agri-Food Canada, Canada
- P11-350 Evolution of the chromosomes in crown gall-causing *Agrobacteria*. E. DAVIS (1), A. Weisberg (1), J. Tabima (1), M. Putnam (1), M. Miller (1), M. Kohen (1), J. Loper (2), N. Grünwald (2), W. Ream (3), J. Chang (1) (1) Oregon State University, U.S.A.; (2) USDA-ARS Horticultural Crops Research Laboratory, U.S.A.; (3) Oregon State University, U.S.A.
- P11-351 Alteration of plant defense pathways by effectors of the protist plant pathogen, *Plasmodiophora brassicae*. M. DJAVAHERI (1), H. Borhan (2), P. Haddadi (2), L. Ma (2), S. Rolfe (3), S. Strelkov (4), M. Links (2), W. Clarke (5), S. Robinson (2), I. Parkin (2) (1) AAFC, Canada; (2) Agriculture and Agri-Food Canada, Saskatoon Research and Development Centre, Canada; (3) University of Sheffield, United Kingdom; (4) University of Alberta, Canada; (5) New York Genome Centre, U.S.A.
- P11-352 Is less actually more? Does the absence of group-specific DNA fragments in *Acidovorax citrulli* contribute to broaden its host range?. N. ECKSHAIN-LEVI (1), D. Shkedy (2), M. Gershovits (2), G. Mateus Da Silva (3), R. Walcott (3), T. Pupko (2), S. Burdman (4) (1) Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, U.S.A.; (2) Department of Cell Research and Immunology, George S. Wise Faculty of Life Sciences, Tel Aviv University, Israel; (3) Department of Plant Pathology, College of Agricultural and Environmental Sciences, University of Georgia, U.S.A.; (4) Department of Plant Pathology and Microbiology, Robert H. Smith Faculty of Agriculture, The Hebrew University of Jerusalem, Israel
- P11-353 Uncovering temporal gene expression profiles of the yellow rust pathogen during infection of wheat. M. ELMORE (1), C. Conley (2), B. Perroud (1), L. Froenicke (1), J. Peng (2), X. Wang (3), J. Dubcovsky (3), R. Michelmore (3) (1) Genome Center, University of California at Davis, U.S.A.; (2) Department of Statistics, University of California at Davis, U.S.A.; (3) Department of Plant Science, University of California at Davis, U.S.A.
- P11-354 Comparative Genomics of Temperate and Tropical Downy Mildews. K. FLETCHER (1), L. Derevnina (2), S. Reyes-Chin-Wo (3), L. Bertier (3), A. Kozik (3), R. Michelmore (3) (1) Genome Center, UC Davis, U.S.A.; (2) The Sainsbury Laboratory, United Kingdom; (3) Genome Center, UC Davis, U.S.A.
- P11-355 Disease progression and molecular response of flax (*Linum usitatissimum* L.) to the pathogenic fungus *Fusarium oxysporum* f.sp. *lini*. L. GALINDO-GONZALEZ (1), M. Deyholos (2) (1) Department of Biological Sciences, University of Alberta, Canada; (2) Department of Biology, University of British Columbia, Canada
- P11-356 Validation of genome wide association studies (GWAS) for the identification of candidate genes associated with virulence in *Parastagonospora nodorum*. Y. GAO (1), Z. Liu (1), J. Faris (2), J. Richards (1), R. Brueggeman (1), R. Oliver (3), B. McDonald (4), T. Friesen (2) (1) Plant Pathology Department, North Dakota State University, U.S.A.; (2) NCSL, USDA-ARS, U.S.A.; (3) School of Science, Curtin University, Australia; (4) Institute of Integrative Biology, Plant Pathology Group, Swiss Federal Institute of Technology, Switzerland

- P11-357 Virus detection in naturally infected plants using high-throughput sequencing. F. GAWEHNS (1), E. Meekes (1), I. Stulemeijer (2), M. de Kock (2), M. Ebskamp (1) (1) Naktuinbouw, Netherlands; (2) BKD, Netherlands
- P11-358 The transcriptome atlas of *Leptosphaeria*-Brassica interaction: Blackleg eQTL variations by RNA-seq. P. HADDADI (1), N. Larkan (1), M. Borhan (1) (1) Agriculture and Agri-Food Canada, Canada
- P11-359 Transcriptional control of plant immune-response genes by active DNA demethylation. T. HALTER (1), J. Wang (2), E. Lastrucci (2), D. Amesefe (2), R. Birkenbihl (3), I. Somssich (3), L. Navarro (2) (1) Institut de Biologie de l'Ecole Normale Supérieure (IBENS), France; (2) IBENS, France; (3) MPI Köln, Germany
- P11-360 WITHDRAWN
- P11-361 *Phytophthora* effector target enrichment and sequencing to aid the re-annotation of genomes and to elucidate effector diversity. I. HEIN (1), G. Thilliez (2), K. Baker (2), D. Cooke (2), E. Huitema (3), P. Birch (4) (1) The James Hutton Institute, United Kingdom; (2) The James Hutton Institute, United Kingdom; (3) University of Dundee, United Kingdom; (4) The University of Dundee, United Kingdom
- P11-362 Comparative Genomics of *Fusarium oxysporum* f sp. *fragariae*. P. HENRY (1), T. Gordon (2) (1) UC Davis Dept. Plant Pathology, U.S.A.; (2) UC Davis Department of Plant Pathology, U.S.A.
- P11-363 Global genome-wide DNA methylation patterns induced by the beet cyst nematode *Heterodera schachtii* in Arabidopsis roots. T. HEWEZI (1), T. Lane (1), S. Piya (1), A. Rambani (1), J. Rice (1) (1) University of Tennessee, U.S.A.
- P11-364 Identification of the phosphorylation targets of symbiotic receptor-like kinases using a high-throughput multiplexed assay for kinase specificity. D. JAYARAMAN (1), A. Richards (1), M. Westphall (1), J. Coon (1), J. Ané (1) (1) University of Wisconsin-Madison, U.S.A.
- P11-365 A proteomic, phosphoproteomic, and acetylotomic atlas of the model legume *Medicago truncatula*. D. JAYARAMAN (1), C. Minogue (1), H. Marx (1), A. Richards (2), J. Maeda (1), S. Rajasekar (1), A. Del Valle-Echevarria (1), M. Westphall (2), M. Sussman (1), J. Ané (2), J. Coon (2) (1) University of Wisconsin-Madison, U.S.A.; (2) University of Wisconsin-Madison, U.S.A.
- P11-366 WITHDRAWN
- P11-367 Genome analysis of receptor-like protein encoding genes in pepper reveals dynamics of global gene expression in plant growth and diverse responses to biotic stresses. W. KANG (1), D. Choi (2), S. Yeom (3), Y. Kim (4) (1) Institute of Agriculture & Life Science, Gyeongsang National University, South Korea; (2) Department of Plant Science, Seoul National University, South Korea; (3) Department of Agricultural Plant Science, Gyeongsang National University, South Korea; (4) Korea Bioinformation Center, Korea Research Institute of Bioscience and Biotechnology, South Korea
- P11-368 Whole genome sequencing of the oomycete pathogen *Sclerospora graminicola* and prediction of effector candidates. M. KOBAYASHI (1), Y. Hiraka (2), A. Abe (2), H. Yaegashi (2), S. Natsume (2), H. Kikuchi (2), H. Takagi (2), H. Saitoh (2), J. Win (3), S. Kamoun (3), R. Terauchi (2) (1) Iwate Biotechnology Research Center, Japan; (2) Iwate Biotechnology Research Center, Japan; (3) The Sainsbury Laboratory, United Kingdom
- P11-369 Genetic determinants of bacterial adaptation to plants. A. LEVY (1), S. Clingenpeel (1), B. Alvarez (1), K. Stillman (1), S. Yourstone (2), S. Paredes (2), T. Glavina del Rio (1), S. Lebeis (3), D. Lundberg (4), D. Pelletier (5), S. Doty (6), T. Woyke (1), S. Tringe (1), J. Dangel (2) (1) DOE Joint Genome Institute, U.S.A.; (2) University of North Carolina, Chapel Hill, U.S.A.; (3) University of Tennessee, Knoxville, U.S.A.; (4) Max Planck Institute for Developmental Biology, Germany; (5) Oak Ridge National Lab, U.S.A.; (6) University of Washington, U.S.A.
- P11-370 Functional analyses of candidate effector genes from *Hemileia vastatrix* based on the type three secretion system of *Pseudomonas syringae* pv. *garcae*. T. MAIA (1), G. Marin-Ramirez (1), S. Brommonschenkel (1) (1) Universidade Federal de Viçosa/Departamento de Fitopatologia, Brazil
- P11-371 Whole genome analysis and prediction of the quantitative disease resistance against *Verticillium* wilt. M. MAZURIER (1), A. Sbeiti (1), S. Benameur (1), M. Tardin (2), M. Gras (2), T. Tatarinova (3), S. Nuzhdin (3), P. Marjoram (3), M. Rickauer (1), C. Ben (1), L. Gentzbittel (1) (1) Université Fédérale de Toulouse, France; (2) Société R2n - Groupe RAGT, France; (3) University of Southern California, U.S.A.
- P11-372 Genome wide Identification and characterization of potato long intergenic noncoding RNAs responsive to *Pectobacterium carotovorum* subspecies *brasiliense* 1692 infection. L. MOLELEKI (1), S. Kwenda (1) (1) University of Pretoria, South Africa
- P11-373 Cotton Bacterial Blight: The case of a (re)emergent disease. A. PHILLIPS (1), M. Wilson (2), A. Vijayaraghavan (2), J. Burke (2), I. Bunn (3), K. Veley (2), R. Bart (2) (1) Donald Danforth Plant Science Center and Washington University in Saint Louis, U.S.A.; (2) Donald Danforth Plant Science Center, U.S.A.; (3) Harvard University, U.S.A.
- P11-374 Conservation and diversity of the *Agrobacterium* type VI secretion systems involved in interbacterial competition. M. Santos (1), S. Cho (1), H. Chang (1), C. Kuo (1), E. Lai (1) (1) Institute of Plant and Microbial Biology, Academia Sinica, Taipei, Taiwan, Taiwan

- P11-375 *Ustilago maydis* effectors in the post-genomic era. M. SCHUSTER (1), G. Schweizer (1), R. Kahmann (1), A. Lupas (2) (1) Max Planck Institute for Terrestrial Microbiology, Germany; (2) Max Planck Institute for Developmental Biology, Germany
- P11-376 New tools for wheat stripe rust research. B. SCHWESSINGER (1), H. Yiheng (2), W. Cuddy (3), R. Park (3), J. Rathjen (2) (1) Australian National University, Australia; (2) Australian National University, Australia; (3) University of Sydney, Australia
- P11-377 '*Candidatus* Phytoplasma solani' strain SA-1 has a highly repetitive genome. M. SERUGA MUSIC (1), S. Hogenhout (2), C. Kuo (3) (1) Department of Biology, Faculty of Science, University of Zagreb, Croatia; (2) Department of Cell and Developmental Biology, John Innes Centre, United Kingdom; (3) Institute of Plant and Microbial Biology, Academia Sinica, Taiwan
- P11-378 Towards understanding the *Panicum virgatum* microbiome - switchgrass geno-/ecotype and treatment practices influence the microbial community. E. SINGER (1), T. Juenger (2), T. Woke (1) (1) Joint Genome Institute, U.S.A.; (2) University of Texas Austin, U.S.A.
- P11-379 Utilizing gene tree variation to identify candidate effector genes in *Zymoseptoria tritici*. P. SOLOMON (1), A. Milgate (2), M. McDonald (1) (1) The Australian National University, Australia; (2) NSW DPI, Australia
- P11-380 A systems approach to breeding for disease resistance to necrotrophic fungal pathogens in lettuce. A. TALBOT (1), E. Ransom (1), J. Brough (2), J. Graham (3), J. Clarkson (2), P. Hand (3), K. Denby (2), D. Pink (3), C. Wagstaff (4) (1) University of Warwick, United Kingdom; (2) University of Warwick, United Kingdom; (3) Harper-Adams University, United Kingdom; (4) University of Reading, United Kingdom
- P11-381 Whole Genome Analyses of *Clavibacter michiganensis* subsp. *michiganensis* Strains Reveals Core Secreted Proteins that Promote Virulence on Tomato. S. THAPA (1), R. Gilbertson (1), G. Coaker (1) (1) University of California, U.S.A.
- P11-382 Ti plasmids cluster genetically and cluster by *Agrobacterium* taxa and plant host type. A. WEISBERG (1), E. Davis (1), J. Tabima (1), M. Putnam (1), M. Miller (1), M. Kohen (1), J. Loper (2), N. Grünwald (2), W. Ream (1), J. Chang (1) (1) Oregon State University, U.S.A.; (2) USDA ARS, U.S.A.
- P11-383 Identification of root-knot nematode genetic loci that modulate distinct patterns of host gene expression using a genetic/genomic approach. V. WILLIAMSON (1), D. Nielsen (2), D. Bird (2) (1) Univ. of California Davis, U.S.A.; (2) North Carolina State University, U.S.A.
- P11-384 Inter-chromosomal transfer of immune response during barley-powdery mildew interactions. R. WISE (1), P. Surana (2), D. Mistry (2), R. Xu (3), A. Chapman (2), G. Fuerst (1), J. Dickerson (2), D. Nettleton (2) (1) USDA-ARS / Iowa State University, U.S.A.; (2) Iowa State University, U.S.A.; (3) Google Inc., U.S.A.
- P11-385 Prediction and characterization of WY-domain effectors in downy mildews. K. WOOD (1), L. Derevnina (2), S. Reyes Chin Wo (3), J. Gil (3), J. Wong (4), R. Michelmore (3) (1) UC Davis, U.S.A.; (2) The Sainsbury Lab, United Kingdom; (3) UC Davis, U.S.A.; (4) Bayer, Belgium
- P11-386 Molecular characterization of two apple mosaic virus isolates and construction of an ApMV infectious cDNA clone. Y. XIANG (1), Z. Li (2), B. Bhagwat (1), J. Holmes (1), M. Bernardy (1), Y. Wu (2) (1) Agriculture and Agri-Food Canada, Summerland Research and Development Centre, Canada; (2) College of Plant Protection, Northwest A&F University, China
- P11-387 *Pseudomonas syringae* Effector AvrPtoB Exploits A Plant Defense-Essential Subset Of Ubiquitin-Conjugating Enzymes To Suppress Host Immunity. L. ZENG (1), B. Zhou (1), R. Mural (2), X. Chen (3), M. Oates (4), R. Connor (5), G. Martin (6), J. Gough (4) (1) University of Nebraska-Lincoln, U.S.A.; (2) University of Nebraska-Lincoln, U.S.A.; (3) Fujian Agriculture and Forestry University, China; (4) University of Bristol, United Kingdom; (5) University of Arkansas at Little Rock, U.S.A.; (6) The Boyce Thompson Institute for Plant Research, U.S.A.
- P11-388 Regulating fungal pathogenesis through chromatin modifications. D. COOK (1), M. Seidl (2), M. Kramer (2), B. Thomma (2) (1) Wageningen University, Netherlands; (2) Wageningen University, Netherlands
- P11-389 Epigenetic regulation during infection for rust pathogens. B. XU (1) (1) Commonwealth Scientific and Industrial Research Organisation, Australia
- P11-390 Comparative & Evolutionary Genomics of the *Pseudomonas syringae* Species Complex. D. GUTTMAN (1), S. Thakur (1), B. Weir (2) (1) University of Toronto, Canada; (2) Landcare Research, New Zealand
- P11-391 Different waves of effector genes with contrasted genomic location are expressed by *Leptosphaeria maculans* during cotyledon and stem colonisation of oilseed rape. J. GERVAIS (1), T. Rouxel (1), M. Balesdent (1), I. Fudal (1), C. Plissonneau (1) (1) INRA BIOGER, France
- P11-392 Variation in genome size and ploidy levels in plant pathogenic oomycetes, particularly the downy mildews. L. BERTIER (1), J. Gil (1), S. Reyes-Chin-Wo (1), K. Fletcher (1), R. Michelmore (1) (1) UC Davis Genome Center, U.S.A.

- P11-393 Pathogenomic analysis of South African stripe rust populations. H. VAN SCHALKWYK (1), R. Prins (2), Z. Pretorius (1), L. Boyd (3), C. Uauy (4), D. Saunders (5) (1) University of the Free State, South Africa; (2) CenGen (Pty) Ltd and University of the Free State, South Africa; (3) National Institute of Agricultural Botany, United Kingdom; (4) John Innes Centre, United Kingdom; (5) The Genome Analysis Centre and The John Innes Centre, United Kingdom

Host-Microbe Co-evolution

- P12-394 A downy mildew effector evades recognition by polymorphism of expression and subcellular localization. S. ASAI (1), V. Cevik (2), O. Furzer (2), N. Ishaque (2), K. Shirasu (1), J. Jones (2) (1) Center for Sustainable Resource Science, RIKEN, Japan; (2) The Sainsbury Laboratory, United Kingdom
- P12-395 Wheat side story: Characterizing host responses to yellow rust. P. CORREDOR MORENO (1), D. Saunders (2) (1) The Genome Analysis Centre, United Kingdom; (2) The Genome Analysis Centre / The John Innes Centre, United Kingdom
- P12-396 Comparative genome analysis of pathogenic *Clavibacter michiganensis* strain PF008 causing bacterial canker in pepper with its closely related pathogenic strains of the same species. C. OH (1), I. Hwang (1) (1) Department of Horticultural Biotechnology, Kyung Hee University, Korea; (2) Department of Horticultural Biotechnology, Kyung Hee University, Korea
- P12-397 Insights into molecular basis of disease susceptibility and resistance against *Phymatotrichum* root rot using multi-omics approach. P. KANKANALA (1), P. Jones (2), D. Weighill (2), D. Jacobson (2), K. Mysore (1) (1) The Samuel Roberts Noble Foundation, U.S.A.; (2) Oak Ridge National Laboratory, Oak Ridge, TN; The University of Tennessee, Knoxville, TN, U.S.A.
- P12-398 Comparative mapping of five-needle pine major genes for resistance to white pine blister rust. J. LIU (1), R. Snieszko (2) (1) 506 West Burnside Road, Canada; (2) USDA Forest Service, Dorena Genetic Resource Center, U.S.A.
- P12-399 An ancient event of Horizontal Gene Transfer (HGT) from *Agrobacterium* into sweetpotato and its wild relatives.. D. QUISPE-HUAMANQUISPE (1), J. Kreuze (2), G. Gheysen (3), T. Kyndt (3), R. Jarret (4), M. Ghislain (2) (1) Ghent University, Belgium; (2) International Potato Center (CIP), Peru; (3) Ghent University, Belgium; (4) USDA, U.S.A.
- P12-400 LIGHT as important environmental cue for pathogens and their hosts – from the perspective of the gray mold fungus *Botrytis cinerea*. J. SCHUMACHER (1) (1) IBBP, WWU Münster, Germany
- P12-401 Comparative genomics of the Sigatoka disease complex on banana indicates a direct link between pathogen emergence and nutritional virulence.. I. STERGIOPOULOS (1), T. Chang (1), A. Salvucci (1), P. Crous (2) (1) University of California Davis, U.S.A.; (2) CBS-KNAW Fungal Biodiversity Centre, Netherlands
- P12-402 Deciphering genetic mechanisms in *Plasmodiophora brassicae*. S. STJELJA (1), J. Fogelqvist (2), C. Dixelius (2) (1) Swedish University of Agricultural Sciences, Department of Plant Biology, P.O. Box 7080, Sweden; (2) Swedish University of Agricultural Sciences, Department of Plant Biology, P.O. Box 7080, Sweden
- P12-403 Effect of *Pythium arrhenomanes* elicitor NLP on the interaction with *Meloidogyne graminicola* in rice. R. VERBEEK (1), E. Rom Mas (2), M. Sikder (2), M. Höfte (2) (1) Ghent University, Belgium; (2) Ghent University, Belgium
- P12-404 Sequence reversion in the distal element of *Potato leafroll virus* coat protein gene stop codon indicates a strong bias toward the stem loop structure to allow efficient read-through . Y. XU (1), S. Gray (2) (1) Cornell University, U.S.A.; (2) Cornell University; USDA-ARS, Robert W. Holley Center for Agriculture and Health, U.S.A.
- P12-405 Code-cracking TAL effector function and evolution in the rice-*Xanthomonas oryzae* system. A. PEREZ-QUINTERO (1), M. Hutin (2), T. Tran (3), A. Derepeer (4), S. Cunnac (1), L. Gagnevin (4), B. Szurek (4) (1) UMR IPME, IRD-CIRAD-Université Montpellier 2, France; (2) Department of Plant Pathology and Plant-Microbe Biology, Cornell University, U.S.A.; (3) Agricultural Genetics Institute, Vietnam; (4) UMR IPME, IRD-CIRAD-Université Montpellier 2, France
- P12-406 Sequential expression of *Sclerotinia sclerotiorum* pathogenicity factors during infection of *Brassica napus* as revealed by RNA-Seq analysis . S. Seifbarghi (1), M. Borhan (2), Y. Wei (3), D. Hegedus (2) (1) Agriculture and Agri-Food Canada, Saskatoon SK, S7N 0X2, Canada, Canada; (2) Agriculture and Agri-Food Canada, Saskatoon SK, S7N 0X2, Canada, Canada; (3) Department of Biology, University of Saskatchewan, Saskatoon, Canada, Canada
- P12-407 Natural variation in the Arabidopsis AGO2 gene alters antiviral activity. P. MOFFETT (1), A. Adurogbangba (1), C. Roussin-Léveillé (1), C. Brosseau (1) (1) Université de Sherbrooke, Canada

Population Genomics

- P13-408 High genetic diversity of the grey leaf spot pathogen, *Cercospora zeina*, observed in commercial maize in South Africa. D. BERGER (1), M. Muller (2), N. Kunene (1), B. Crampton (2), B. Bluhm (3), S. Phillips (1), I. Barnes (4) (1) Plant Science Department, Forestry and Agricultural Biotechnology Institute, University of Pretoria, South Africa; (2) Plant Science Department, Forestry and Agricultural Biotechnology Institute, University of Pretoria, South Africa; (3) Department of Plant Pathology, University of Arkansas, U.S.A.; (4) Genetics Department, Forestry and Agricultural Biotechnology Institute, University of Pretoria, South Africa
- P13-409 Population structure of an aerial *Phytophthora* species in forest systems. S. BRAR (1), R. Bradshaw (1), R. McDougal (2), N. Williams (3) (1) Massey University, New Zealand; (2) Scion New Zealand Forest Research Institute Ltd, New Zealand; (3) Scion New Zealand Forest Research Institute Ltd, New Zealand
- P13-410 Genetic Dynamics and Mating Type Inheritance in an Experimental, Overwintering Biparental Population of *Phytophthora capsici*. M. CARLSON (1), E. Gazave (2), M. Gore (2), C. Smart (1) (1) Cornell University, Plant Pathology and Plant-Microbe Biology Section, School of Integrative Plant Science, U.S.A.; (2) Cornell University, Plant Breeding and Genetics Section, School of Integrative Plant Science, U.S.A.
- P13-411 Dissection of the genetic architecture of rice resistance to the blast fungus *Magnaporthe oryzae*. H. KANG (1), Y. Wang (2), S. Peng (2), Y. Zhang (3), Y. Xiao (2), D. Wang (2), S. Qu (4), Z. Li (1), S. Yan (5), Z. Wang (2), W. Liu (1), Y. Ning (1), P. Korniliev (6), H. Leung (7), J. Mezey (6), S. McCouch (6), G. Wang (8) (1) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, China; (2) Hunan Agricultural University, China; (3) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, China; (4) Institute of Virology and Biotechnology, Zhejiang Academy of Agricultural Sciences, China; (5) Tianjin Crop Research Institute, Tianjin Academy of Agriculture Sciences, China; (6) Department of Plant Breeding & Genetics, Cornell University, U.S.A.; (7) International Rice Research Institute, China; (8) Department of Plant Pathology, Ohio State University, Columbus, U.S.A.
- P13-412 Replication competence served as a driving force for experimental evolution of a satellite RNA associated with *Bamboo mosaic virus*. S. LEE (1), I. Wang (2), M. Liu (3), Y. Hsu (3), N. Lin (4) (1) Institute of Plant and Microbial Biology, Academia Sinica, Taiwan; (2) Department of Biological Sciences, University at Albany, U.S.A.; (3) Graduate Institute of Biotechnology, National Chung Hsing University, Taiwan; (4) Institute of Plant and Microbial Biology, Academia Sinica, Taiwan
- P13-413 Molecular and bioinformatics characterization of host and temperature dependent accumulation of dimeric viral RNA molecules derived from the S segment of Polygonum ringspot tospovirus. P. MARGARIA (1), A. Bertran (2), M. Ciuffo (3), C. Rosa (1), R. Oliveira Resende (2), M. Turina (3) (1) Pennsylvania State University, U.S.A.; (2) University of Brasília, Brazil; (3) Institute for Sustainable Plant Protection, Italy
- P13-414 Population genomics reveals intricate variation in a major pathogen of rice. S. MIDHA (1), K. Bansal (1), R. Sonti (2), P. Patil (1) (1) CSIR-Institute of Microbial Technology, India; (2) CSIR-Centre for Cellular and Molecular Biology, India
- P13-415 Using population genomics to understand NLR diversity in wild tomato. R. STAM (1), A. Tellier (1), D. Scheikl (1) (1) Technische Universität München, Germany
- P13-416 Elucidating mechanisms of *Phytophthora* pathogen emergence in the genomics era. N. GRUNWALD (1), B. Knaus (2), J. Tabima (3) (1) USDA ARS, U.S.A.; (2) USDA ARS, U.S.A.; (3) Oregon State University, U.S.A.

Systems Biology and Modeling

- P14-417 Wheat susceptibility to *Fusarium* head blight involves specific molecular responses shaped by both grain development process and *Fusarium graminearum* growth. L. BONHOMME (1), C. CHETOUHI (1), F. CAMBON (1), P. LASSERRE-ZUBER (1), P. LECOMTE (1), O. SOUDIERE (1), T. LANGIN (1) (1) UMR GDEC, France
- P14-418 Metabolomic profiling of sugarcane infected with *Leifsonia xyli* subsp. *xyli*, the causal agent of ratoon stunting disease. F. CASTRO-MORETTI (1), J. Cocuron (2), A. Alonso (2), L. Camargo (3) (1) Center for Applied Plant Sciences/The Ohio State University, U.S.A.; (2) Department of Molecular Genetics/The Ohio State University, U.S.A.; (3) Plant Pathology and Nematology Department/Universidade de Sao Paulo, Escola Superior de Agricultura “Luiz de Queiroz”, Brazil
- P14-419 Characterization of lectin receptor-like kinases in *Populus*-microbe interactions. J. CHEN (1), W. Muchero (1), Y. Yang (1), J. Labbé (1), X. Yang (1), S. Jawdy (1), M. Kennedy (2), J. Johnson (2), A. Sreedasyam (3), J. Schmutz (3), G. Tuskan (1) (1) Oak Ridge National Laboratory, U.S.A.; (2) Department of Energy Joint Genome Institute, U.S.A.; (3) HudsonAlpha Institute for Biotechnology, U.S.A.

- P14-420 Direct regulation of *ARGONAUTE7* by miRNA-regulated transcription factors. J. HOYER (1), J. Pruneda-Paz (2), G. Breton (3), M. Hassert (4), S. Kay (5), J. Carrington (4) (1) Donald Danforth Plant Science Center and Washington University in St. Louis, U.S.A.; (2) University of California San Diego, U.S.A.; (3) University of Texas Health Science Center at Houston, U.S.A.; (4) Donald Danforth Plant Science Center, U.S.A.; (5) Scripps Research Institute, U.S.A.
- P14-421 The Use of Integrated SNP Correlation, Co-expression and Genome-Wide Association Networks for *Populus trichocarpa* to Discover Pleiotropic & Epistatic Plant Functions Involved in Microbial Interactions. D. JACOBSON (1), D. Weighill (2), C. Bleker (2), W. Muchero (1), T. Tschaplinski (1), G. Tuskan (1) (1) Oak Ridge National Laboratory, U.S.A.; (2) Oak Ridge National Laboratory/University of Tennessee, U.S.A.
- P14-422 Getting to the edge: network science identifies biological modules in Arabidopsis regulatory and interactions networks. S. MUKHTAR (1) (1) University of Alabama at Birmingham, U.S.A.
- P14-423 Cell surface receptors networks control plant development and defenses. E. SMAKOWSKA (1), A. Mot (2), D. Desveaux (3), D. Guttman (3), Y. Belkhadir (1) (1) Gregor Mendel Institute of Molecular Plant Biology (GMI), Austria; (2) Department of Cell & Systems Biology, University of Toronto, Canada; (3) Department of Cell & Systems Biology, Centre for the Analysis of Genome Evolution & Function, University of Toronto, Canada
- P14-424 Integration of resistance QTL, expression QTL and co-expression modules reveals molecular responses of maize to the fungal pathogen *Cercospora zeina*. D. BERGER (1), N. Christie (2), A. Myburg (2) (1) Plant Science Department, Forestry and Agricultural Biotechnology Institute, University of Pretoria, South Africa; (2) Genetics Department, Forestry and Agricultural Biotechnology Institute, University of Pretoria, South Africa
- P14-425 Integrating host-pathogen signaling networks during barley-powdery mildew interactions. J. ELMORE (1), P. Surana (2), W. Xu (2), M. Hunt (2), G. Fuerst (1), A. Chapman (2), M. Liu (2), D. Nettleton (2), J. Walley (2), R. Wise (1) (1) USDA-ARS/Iowa State University, U.S.A.; (2) Iowa State University, U.S.A.

HOST RESISTANCE

Cell wall-mediated resistance

- P15-426 Understanding DAMP induced innate immunity in tomato and role of cell wall integrity. M. DASGUPTA (1), M. Sahoo (2), N. Prakash (2), S. Ngachan (3) (1) ICAR Research Complex for NEH Region, Manipur Centre, Lamphelpat, Imphal-795 004, India, India; (2) ICAR Research Complex for NEH Region, Manipur Centre, Lamphelpat, Imphal-795 004, India, India; (3) ICAR Research Complex for NEH Region, Umiam, Meghalaya, Pin 793103, India, India
- P15-427 3-Aminobenzamide inhibits callose deposition and alters PMR4 callose synthase abundance independently of poly(ADP-ribosyl)ation. B. KEPPLER (1), J. Song (1), A. Bent (1) (1) University of Wisconsin, U.S.A.
- P15-428 The role of reactive oxygen species in non-host resistance to *Rhizoctonia solani*. B. KIDD (1), R. Foley (1), K. Singh (2), J. Anderson (1) (1) CSIRO, Australia; (2) CSIRO, Australia
- P15-429 Simultaneous Integration of Plant Steroid Signaling and Immunity by a Pair of Cell Surface Receptors. J. KONG (1), Y. Belkhadir (2), E. Smakowska (2) (1) Gregor Mendel institute, Austria; (2) Gregor Mendel Institute, Austria
- P15-430 Not “Ten Years After” but “Twenty Years After”: Cloning of the barley Ror1 gene. R. PANSTRUGA (1), J. Acevedo (1), N. Ahmadijad (2), K. Drwiega (1), M. Kwaaitaal (1), M. Mascher (3), K. Baumgarten (1), X. Dong (4), G. James (4), K. Schneeberger (4), N. Stein (3), P. Schulze-Lefert (4) (1) RWTH Aachen University, Germany; (2) University of Bonn, Germany; (3) IPK Gatersleben, Germany; (4) MIPZ Köln, Germany
- P15-431 Function of a glutathione-S-transferase in Arabidopsis pre-invasive defence. M. PASTORCZYK (1), M. Pislewska-Bednarek (1), R. Nakano (2), K. Hiruma (2), A. Molina (3), Y. Takano (4), P. Schulze-Lefert (2), P. Bednarek (1) (1) Institute of Bioorganic Chemistry, Poland; (2) Max Planck Institute for Plant Breeding Research, Germany; (3) Centre for Plant Biotechnology and Genomics, Spain; (4) Graduate School of Life and Environmental Sciences, Jordan
- P15-432 MATE transporter-dependent export of hydroxycinnamic acid amides. S. ROSAHL (1), M. Dobritzsch (1), K. Gorzalka (1), A. Matern (1), L. Eschen-Lippold (1) (1) Leibniz Institute of Plant Biochemistry, Germany; (2) Leibniz Institute of Plant Biochemistry, Germany
- P15-433 Cell-wall-based regulation of stomatal defense in Arabidopsis. L. ZHANG (1), W. Zeng (2), J. Chen (3), S. He (4) (1) Department of Plant Biology, DOE Plant Research Laboratory, Michigan State University, U.S.A.; (2) DOE Plant Research Laboratory, Michigan State University, U.S.A.; (3) Department of Computer Science and Engineering, DOE Plant Research Laboratory, Michigan State University, U.S.A.; (4) Department of Plant Biology, DOE Plant Research Laboratory, Howard Hughes Medical Institute, Michigan State University, U.S.A.
- P15-434 The wheat *Stb6* gene controlling a gene-for-gene resistance to *Zymoseptoria tritici* encodes a wall-associated kinase like protein. C. SAINTENAC (1), W. Lee (2), F. Cambon (1), J. Rudd (2), R. King (2), A. Phillips (2),

- C. Uauy (3), K. Hammond-Kosack (2), T. Langin (1), K. Kanyuka (2) (1) INRA, and Université Blaise Pascal, France; (2) Rothamsted Research, United Kingdom; (3) John Innes Centre, United Kingdom
- P15-435 UDP-D-Glucuronate 4-Epimerases 1 (GAE1) and GAE6 are Critical for Pectin Abundance and Immunity in *Arabidopsis thaliana*. G. BETHKE (1), A. Thao (1), G. Xiong (2), B. Li (3), N. Soltis (3), N. Hatsugai (1), R. Hillmer (1), F. Katagiri (1), D. Kliebenstein (4), M. Pauly (4), J. Glazebrook (1) (1) University of Minnesota, U.S.A.; (2) Energy Biosciences Institute, University of California, U.S.A.; (3) University of California, U.S.A.; (4) University of California, U.S.A.; (5) University of California, U.S.A.
- P15-436 Colorful Signaling: Resolving cellular salicylic acid and jasmonate/ethylene responses during *Hyaloperonospora arabidopsidis*-*Arabidopsis thaliana* interactions. S. LAUKAMM (1), V. Lipka (2), O. Tetyuk (2), A. von Hoyningen-Huene (2), M. Pound (3), K. Hanika (4), H. Ghareeb (2) (1) Georg-August-University Göttingen, Germany; (2) Georg-August-Universität Göttingen, Germany; (3) University of Nottingham, England; (4) University of Wageningen, Netherlands
- P15-437 Regulon-guided Discovery of Defensive Secondary Metabolism in *Arabidopsis*. B. BARCO (1), N. Clay (1) (1) Yale University, U.S.A.

Plant Hormones and Regulators

- P16-438 Induction of ethylene inhibits development of soybean sudden death syndrome by inducing defense-related genes and reducing *Fusarium virguliforme* growth. N. ABDELSAMAD (1), G. MacIntosh (2) (1) Iowa State Univ, U.S.A.; (2) Iowa State University, U.S.A.
- P16-439 *Fusarium graminearum* is able to detoxify cereal defense compounds (tryptamine-derived hydroxycinnamic acid amides) and to convert the released tryptamine into auxin. G. ADAM (1), P. Spörhase (2), P. Fruhmman (3), E. Beltran Iturat (4), A. Bartholomäus (1), A. Stadler (1), C. Schmeitzl (1), G. Wiesenberger (1), B. Kluger (5), M. Doppler (6), C. Büschl (6), R. Krska (4), R. Schuhmacher (6), F. Berthiller (4) (1) Univ. of Natural Resources and Life Sciences, Vienna (BOKU), Dpt. of Applied Genetics and Cell Biol., Austria; (2) Univ. of Natural Resources and Life Sciences, Vienna (BOKU), Dpt. of Applied Genetics and Cell Biol., Austria; (3) TU Vienna, Inst. of Applied Synthetic Chemistry, Austria; (4) Univ. Nat. Res. and Life Sci. (BOKU), Dpt. IFA Tulln, Center for Analytical Chemistry, Austria; (5) bernhard.kluger@boku.ac.at, Austria; (6) Univ. Nat. Res. and Life Sci. (BOKU), Dpt. IFA Tulln, Center for Analytical Chemistry, Austria
- P16-440 Regulon-guided discovery of defensive secondary metabolism in *Arabidopsis*. B. BARCO (1), N. Clay (1) (1) Department of MCDB, Yale University, U.S.A.
- P16-441 PBS3 coordinates the leaf specific outcome of abiotic and biotic stress crosstalk through salicylic acid mediated immune signaling. M. BERENS (1), K. Tsuda (1) (1) Max Planck Institute for Plant Breeding Research, Germany
- P16-442 Jasmonate-induced oxygenases are novel players in immune suppression acting as jasmonic acid hydroxylases. L. CAARLS (1), J. Elberse (1), M. Awwanah (1), N. Ludwig (1), T. Zeilmaker (1), M. de Vries (2), R. Schuurink (2), G. Van den Ackerveken (1) (1) Utrecht University, Netherlands; (2) University of Amsterdam, Netherlands
- P16-443 Identification of transcription factors affecting *CrPR1a* induction in periwinkle and their potential roles in plant defense against phytoplasma. J. CHEN (1), H. Lo (2), C. Lai (2), C. Lin (2) (1) Institute of Biotechnology/National Taiwan University, Taiwan; (2) Department of Plant Pathology & Microbiology/National Taiwan University, Taiwan
- P16-444 Dehydroabietinal, an abietane diterpenoid, activates the autonomous pathway to impact flowering time and defense in *Arabidopsis thaliana*. Z. CHOWDHURY (1), M. Giri (1), R. Chaturvedi (1), B. Venables (1), J. Shah (1) (1) University of North Texas, U.S.A.
- P16-445 Dehydroabietinal, an abietane diterpenoid, activates the autonomous pathway to impact flowering time and defense in *Arabidopsis thaliana*. Z. CHOWDHURY (1) (1) University of North Texas, U.S.A.
- P16-446 Refactored SA-signaling for tunable defense. O. DE LANGE (1), A. Khakhar (2), J. Nemhauser (2), E. Klavins (2) (1) The University of Washington, U.S.A.; (2) The University of Washington, U.S.A.
- P16-447 Transcriptome analysis of cell-specific JAZ4 regulation of plant responses in *Arabidopsis*. L. DEMOTT (1), P. Oblessuc (1), M. Melotto (1) (1) University of California - Davis, U.S.A.
- P16-448 Identification of candidate genes that contribute to resistance towards *F. graminearum* in soybean PI 567301B. C. GEDLING (1), S. Verhoff (1), S. Lee (2), R. Mian (3), L. McHale (1), A. Dorrance (1) (1) The Ohio State University, U.S.A.; (2) North Carolina State University, U.S.A.; (3) USDA ARS, U.S.A.
- P16-449 Quantitative monitoring of pathogen-induced plant hormone dynamics with temporal and single cell resolution. H. GHAREEB (1), S. Laukamm (1), M. Pound (2), O. Tetyuk (3), K. Hanika (4), V. Lipka (3) (1) Department of Plant Cell Biology, Georg August University of Goettingen, Germany; (2) Centre for Plant Integrative Biology, University of Nottingham, United Kingdom; (3) Department of Plant Cell Biology, Georg August University of Goettingen, Germany; (4) University of Wageningen, Netherlands

- P16-450 *Phytophthora infestans* effector PiAvr2 targets StBSLs to activate The Brassinosteroid pathway. E. GILROY (1), D. Turnbull (2), S. Naqvi (3), S. Breen (4), H. Wang (5), M. Malec (6), H. McLellan (7), L. Welsh (8), P. Hedley (8), J. Stephens (8), F. Brunner (9), L. Yang (10), Z. Tian (5), J. Zhan (12), P. Birch (7) (1) The James Hutton Institute, Dundee, Scotland, United Kingdom; (10) Fujian Key Laboratory of Plant Virology, Fujian Agricultural and Forestry University, Fuzhou, China, China; (11) College of Horticulture and Forestry, Huazhong Agricultural University, Wuhan, China, China; (12) Fujian Key Laboratory of Plant Virology, Fujian Agricultural and Forestry University, Fuzhou, China, China; (2) The University of Dundee, Dundee, Scotland, United Kingdom; (3) James Hutton Ltd, United Kingdom; (4) The Australian National University, Australia; (5) College of Horticulture and Forestry, Huazhong Agricultural University, Wuhan, China, China; (6) Centre for Plant Molecular Biology, University of Tuebingen, Germany; (7) The University of Dundee, United Kingdom; (8) The James Hutton Institute, United Kingdom; (9) Centre for Plant Molecular Biology, University of Tuebingen, Tuebingen, Germany, Germany
- P16-451 Influence of fatty acid metabolism in plants on defense responses to aphid herbivory. F. GOGGIN (1) (1) University of Arkansas, U.S.A.
- P16-452 Dynamics and regulation of jasmonic acid and salicylic acid transcriptional networks in *Arabidopsis*. R. HICKMAN (1), M. Van Verk (1), A. Van Dijken (1), K. Denby (2), C. Pieterse (1), S. Van Wees (1) (1) Utrecht University, Netherlands; (2) Warwick University, United Kingdom
- P16-453 Temperature regulation of salicylic acid-mediated defense in *Arabidopsis thaliana*. B. HUOT (1), A. Velásquez (2), E. Hubbard (2), J. Pulman (3), J. Yao (4), K. Childs (3), K. Tsuda (6), B. Montgomery (7), S. He (8) (1) DOE-Plant Research Laboratory, Cell and Molecular Biology Program, Michigan State University, U.S.A.; (2) DOE-Plant Research Laboratory, Michigan State University, U.S.A.; (3) Plant Biology Department, Center for Genomics Enabled Plant Science, Michigan State University, U.S.A.; (4) Department of Biological Sciences, Western Michigan University, U.S.A.; (5) Plant Biology Department, Center for Genomics Enabled Plant Science, Michigan State University, U.S.A.; (6) Department of Plant-Microbe Interactions, Max Planck Institute for Plant Breeding Research, Germany; (7) DOE-Plant Research Laboratory, Department of Biochemistry and Molecular Biology, Michigan State University, U.S.A.; (8) DOE-Plant Research Laboratory, Howard Hughes Medical Institute-Gordon and Betty Moore Foundation, Michigan State University, U.S.A.
- P16-454 Diazotrophic bacteria in *Guzmania monostachia* (Bromeliaceae): hormonal signaling molecules and leaf tissue colonization. C. KLEINGESINDS (1), P. Mioto (1), R. Zuccarelli (2), M. Rodrigues (2), D. Demarco (2), M. Aïdar (3), H. Mercier (2) (1) University of São Paulo, Brazil; (2) University of São Paulo, Brazil; (3) Instituto de Botânica de São Paulo, Brazil
- P16-455 Ascorbate oxidation level determines the hormone balance during the interaction between parasitic root-knot nematodes and rice. T. KYNDT (1), A. Mekonen (2), R. Verbeek (2), R. Singh (2), A. Haeck (2), K. Demeestere (2), R. Tenhaken (3), S. Siddique (4), M. Frei (4) (1) Ghent University, Belgium; (2) Ghent University, Belgium; (3) University of Salzburg, Austria; (4) Rheinische Friedrich-Wilhelms-University of Bonn, Germany
- P16-456 Characterization of the interaction between the *Beet Necrotic Yellow Vein Virus* pathogenicity factor P25 and an Auxin/indole-3-acetic acid protein from sugar beet. S. LIEBE (1), H. Thiel (2), D. Gilmer (3), M. Varrelmann (2) (1) Institute of Sugar Beet Research, Germany; (2) Institute of Sugar Beet Research, Germany; (3) Institut de Biologie Moléculaire des Plantes, France
- P16-457 The plant growth-promoting rhizobacterium *Streptomyces coelicolor* M145 induces systemic resistance in *Arabidopsis thaliana* against *Pst* DC3000 by activating the salicylate signaling pathway. N. LIN (1), C. Chen (1) (1) Department of Agricultural Chemistry/National Taiwan University, Taiwan
- P16-458 Characterization of *Arabidopsis* *CALMODULIN-LIKE* genes involved in fine-tuning plant immune signaling. Y. LU (1), W. Truman (2), G. Bethke (1), J. Glazebrook (1) (1) University of Minnesota, Twin Cities, U.S.A.; (2) Institute of Plant Genetics of the Polish Academy of Sciences, Poland
- P16-459 The *Arabidopsis* oxygenases DOWNY MILDEW RESISTANT 6 and DMR6-LIKE OXYGENASE 1 negatively regulate immunity by hydroxylation of salicylic acid. N. LUDWIG (1), J. Elberse (1), T. Zeilmaker (1), C. Böttcher (2), A. Melquiond (1), G. Van den Ackerveken (1) (1) Utrecht University, Netherlands; (2) Julius-Kühn Institut, Germany
- P16-460 Genetic suppressor screen and transcriptional profiling elucidate the PBS3 node of plant immunity in *Arabidopsis thaliana*. R. MACKELPRANG (1), R. Ramos (1), M. Wildermuth (1), R. Okrent (2) (1) University of California, Berkeley, U.S.A.; (2) USDA-ARS Forage Seed and Cereal Research Unit, U.S.A.
- P16-461 A transcriptional regulator mediates the salicylic acid and Jasmonic acid/ethylene antagonism by modulating phosphoenolpyruvate shunt in *Arabidopsis*. W. MUCHERO (1) (1) Oak Ridge National Laboratory, U.S.A.
- P16-462 The role of strigolactone signaling in rice-endophytic bacterium interaction. H. NAKASHITA (1), M. Kusajima (1), T. Asami (2), H. Yamakawa (3) (1) Fukui Prefectural University, Japan; (2) The University of Tokyo, Japan; (3) NARO Agricultural Research Center, Japan

- P16-463 An uncharacterized GCN5-related N-acetyltransferase negatively regulates biotic and abiotic stress responses through the EDR1 signaling pathway. M. NEUBAUER (1), R. Innes (1) (1) Indiana University, U.S.A.
- P16-464 Expression profiling of marker genes for salicylic acid, jasmonic acid and ethylene in *Brachypodium distachyon* highlights its similar defense mechanism to rice. Y. NOUTOSHI (1), Y. Kouzai (1), M. Kimura (1), Y. Yamanaka (1), M. Watanabe (1), H. Matsui (1), M. Yamamoto (1), Y. Ichinose (1), K. Toyoda (1), Y. Onda (2), K. Mochida (2) (1) Okayama University, Japan; (2) RIKEN CSRS, Japan
- P16-465 Exploring the realm of unknown induced proteins by salicylic acid and their role in resistance against biotrophic pathogens. M. PEREIRA MENDES (1), R. Hickman (1), C. Pieterse (1), S. van Wees (1), M. van Verk (2) (1) Plant-Microbe Interactions, Dept. of Biology, Utrecht University, The Netherlands, Netherlands; (2) Plant-Microbe Interactions/Bioinformatics, Dept. of Biology, Utrecht University, The Netherlands, Netherlands
- P16-466 How members of the NPR receptor family sense the SAR signal salicylic acid – the alternate model. U. PFITZNER (1), D. Neeley (1), F. Maier (1), E. Konopka (1) (1) Universitaet Hohenheim, Germany
- P16-467 Genome-wide association study reveals novel regulators of defense hormonal crosstalk in *Arabidopsis thaliana*. S. PROIETTI (1), S. Coolen (1), L. Caarls (1), S. Van Wees (1), C. Pieterse (1) (1) Utrecht University, Netherlands
- P16-468 Plant immunity in *Arabidopsis thaliana* ecotypes with natural variations in defense related genes. N. SCHOLTEN (1), J. Zeier (1) (1) Heinrich-Heine-Universität Düsseldorf, Germany
- P16-469 PHB3 interacts with ICS1 and is involved in the SA-mediated defense response of *Arabidopsis thaliana*. A. SEGUEL (1), J. Jelenska (2), A. Herrera (1), J. Greenberg (2), L. Holuigue (1) (1) Pontificia Universidad Católica de Chile, Chile; (2) The University of Chicago, U.S.A.
- P16-470 Alternative Splicing of a Host Defense Regulatory Gene in Soybean (*Glycine max*) . P. SELIG (1), V. Nalam (1) (1) Indiana University-Purdue University, U.S.A.
- P16-471 The N-end rule pathway : a novel regulator of plant immunity. M. SOREL (1), R. De Marchi (1), B. Mooney (2), I. Fudal (3), K. Goslin (1), K. Kwasniewska (4), P. Ryan (4), M. Pfalz (5), J. Kroymann (5), S. Pollmann (6), A. Feechan (7), F. Wellmer (4), S. Rivas (8), E. Graciet (1) (1) Maynooth University, Biology department, Ireland; (2) Maynooth university, Biology department, Ireland; (3) INRA, UMR BIOGER, France; (4) Trinity College Dublin, Smurfit Institute of Genetics, Ireland; (5) CNRS, Laboratoire Ecologie Systematique Evolution, France; (6) Centro de Biotecnologia y Genomica de Plantas, U.P.M, Spain; (7) UCD Earth Institute and School of Biology and Environmental Science, Ireland; (8) INRA, CNRS, Laboratoire des Interactions Plantes-Microorganismes, France
- P16-472 The regulatory function of TCP8 in plant innate immunity. B. SPEARS (1), F. Gao (2), J. Nam (2), W. Gassmann (1) (1) University of Missouri, Columbia, U.S.A.; (2) University of Missouri, Columbia, U.S.A.
- P16-473 The role of auxin in susceptibility of soybean to *Phytophthora sojae*. A. STASKO (1), J. Lin (2), J. Blakeslee (2), A. Dorrance (1) (1) Department of Plant Pathology The Ohio State University-Ohio Agricultural Research and Development Center, U.S.A.; (2) Department of Horticulture and Crop Science The Ohio State University-Ohio Agricultural Research Development Center, U.S.A.
- P16-474 Completing the pathway: Salicylic acid biosynthesis and its role in disease resistance in *Arabidopsis thaliana*. M. STEINWAND (1), M. Strawn (2), M. Wildermuth (1) (1) University of California Berkeley, U.S.A.; (2) Boehringer Ingelheim, U.S.A.
- P16-475 Identification of cytoplasmic receptor-like kinases and transcription factors regulating the expression of *SARD1* and *CBP60g* . T. SUN (1), Q. Kong (1) (1) Department of Botany, University of British Columbia, Canada
- P16-476 Role of SNC1 and Nitrate reductase activity on autoimmunity in the SUMO E3 ligase mutant *siz1*. H. VAN DEN BURG (1), V. Hammoudi (1), G. Vlachakis (1), S. Chatterjee (1), B. Beerens (1) (1) University of Amsterdam, Netherlands
- P16-477 Elevated [CO₂] compromises both Type I and Type II wheat resistance to Fusarium head blight. M. VAUGHAN (1) (1) USDA ARS, U.S.A.
- P16-478 Comparative Analysis of Signaling Pathways Triggered by Different Pattern-recognition Receptor-types. W. WAN (1), M. Zaidem (2), J. Kilian (1), D. Weigel (2), A. Gust (1), T. Nuernberger (1) (1) Center for Plant Molecular Biology and Plant Biochemistry, University of Tuebingen, Germany; (2) Department of Molecular Biology, Max Planck Institute for Developmental Biology, Germany
- P16-479 Posttranslational Modifications of NPR1: Dynamic Regulation of Immune Responses through the Interplay of Sumoylation and Phosphorylation. J. WITHERS (1) (1) Duke University, U.S.A.
- P16-480 Activation of ethylene signaling pathways enhances disease resistance by regulating ROS and phytoalexin production in rice. C. YANG (1) (1) State Key Laboratory of Plant Genomics, Institute of Microbiology, Chinese Academy of Sciences, China
- P16-481 Divergent pathogen effectors promote virulence by manipulating a transcriptional node of growth-defense crosstalk. L. YANG (1), P. José Pereira Lima Teixeira (1), S. Biswas (2), Y. He (3), O. Finkel (4), M. English (5), P. Eppele (6), P. Mieczkowski (4), J. Dangl (7) (1) University of North Carolina Chapel Hill, U.S.A.; (2) Harvard Medical School, U.S.A.; (3) NC State University, U.S.A.; (4) University of North Carolina Chapel Hill, U.S.A.; (5)

- University of Tennessee, U.S.A.; (6) BASF Plant Science LP, U.S.A.; (7) University of North Carolina Chapel Hill; HHMI, U.S.A.
- P16-482 Analysis of the host hormonal signaling involved in *Brassica napus* - *Leptosphaeria maculans* pathosystem. C. YANG (1), D. Fernando (1) (1) Department of Plant Science, University of Manitoba, Canada
- P16-483 Comparative transcriptome profiling of qualitative- and quantitative-specific defense responses underlying the *Brassica napus* - *Leptosphaeria maculans* pathosystem. X. ZHANG (1), M. Becker (2), M. Belmonte (2), W. Fernando (1) (1) Department of Plant Science, University of Manitoba, Canada; (2) Department of Biological Sciences, University of Manitoba, Canada; (3) Department of Plant Science, University of Manitoba, Canada
- P16-484 WRKY70 Negatively Regulates *SARD1*, a Positive Regulator of SA Synthesis . M. ZHOU (1), Y. Lu (1), J. Glazebrook (1) (1) Department of Plant Biology, Microbial and Plant Genomics Institute, University of Minnesota, U.S.A.

Recognition in Plant Immunity

- P17-485 Differential recognition of AVR2 variants of *Phytophthora infestans* by diverse *R* genes from wild *Solanum* species. C. AGUILERA GALVEZ (1), N. Champouret (1), E. Eggers (1), H. Rietman (1), R. Visser (2), V. Vleeshouwers (1) (1) Wageningen University, Netherlands; (2) Wageningen University, Netherlands
- P17-486 Death be not proud – *rcs5* is a wall associated kinase gene that functions as a dominant susceptibility factor in the Barley- *Cochliobolus sativus* interaction to produce necroptosis. G. AMEEN (1), T. Drader (2), L. Sager (1), B. Steffenson (3), A. Kleinhofs (2), R. Brueggeman (1) (1) Department of Plant Pathology, North Dakota State University, U.S.A.; (2) Department of Crop and Soil Science, Washington State University, U.S.A.; (3) Department of Plant Pathology, University of Minnesota, U.S.A.
- P17-487 A unique TIR-only receptor is required for recognition of a bacterial type-III effector. R. ANDERSON (1), M. Nishimura (1), K. Cherkis (1), M. Machius (1), Q. Lui (4), T. Law (1), J. Dangel (1) (1) University of North Carolina at Chapel Hill, U.S.A.
- P17-488 Identification of gene pairs involved in the incompatibility between an *Eleusine* isolate of *Pyricularia oryzae* and common wheat. S. ASUKE (1), I. Chuma (1), Y. Tosa (1) (1) Kobe University, Japan
- P17-489 Identification of signaling components leading to induction of plant defense responses mediated by the MAMP EIX. A. AVNI (1) (1) Tel Aviv University, Israel
- P17-490 Bacterial outer membrane vesicles induce plant immunity and enhance bacterial disease resistance. O. BAHAR (1) (1) Dept. of Plant Pathology and Weed Science, ARO - Volcani Centre, Israel
- P17-491 Requirement for translationally regulated candidate genes during plant NB-LRR- mediated defense responses. T. BARFF (1), L. Meteigner (2), M. Cohen (2), M. El Oirdi (2), K. Yoshioka (3), P. Moffett (2) (1) Université de Sherbrooke, Canada; (2) Université de Sherbrooke, Canada; (3) University of Toronto, Canada
- P17-492 Biochemical screen to identify components of the ZAR1 immune complex. M. BAUDIN (1), N. Dina (2), G. Walker (3), V. William (4), N. Mori (2), J. Hassan (2) (1) Plant and Microbial Biology Department of UC Berkeley, U.S.A.; (2) Plant and Microbial Biology Department of UC Berkeley, U.S.A.; (3) Plant and Microbial Biology Department of UC Berkeley, U.S.A.; (4) ARS, U.S.A.
- P17-493 Does soybean use a fungal polyamine oxidase to induce immunity?. J. BAUMBACH (1), M. Bhattacharyya (1) (1) Iowa State University, U.S.A.
- P17-494 The rocky road to NLR diversity in *Arabidopsis thaliana*. F. BEMM (1), A. Keller (1), D. Weigel (1) (1) MPI for Developmental Biology, Tübingen, Germany, Germany
- P17-495 A receptor-like protein provides broad-spectrum resistance in soybean. M. BHATTACHARYYA (1), M. Ngaki (1), D. Sahoo (2), B. Wang (2), S. Swaminathan (2) (1) Iowa State University, U.S.A.; (2) Iowa State University, U.S.A.; (3) Iowa State University, U.S.A.
- P17-496 Folate is required for nonhost immunity of *Arabidopsis* against soybean pathogens.. M. BHATTACHARYYA (1), S. Kambakam (1), B. Sahu (1), R. Sumit (1), P. Singh (1), M. Ngaki (1) (1) Iowa State University, U.S.A.
- P17-497 Investigations into the localization and function of Sr35, a wheat CC-NBS-LRR protein that confers resistance to race TTKSK (Ug99) of *Puccinia graminis* f. sp. *tritici*. S. BOLUS (1), G. Coaker (1), J. Dubcovsky (1) (1) University of California, Davis, U.S.A.
- P17-498 Identification of a rice locus conferring broad spectrum disease resistance to bacterial pathogens. A. BOSSA-CASTRO (1), C. Raghavan (2), C. Tekete (3), E. Delorean (1), A. Dereeper (4), K. Dagno (5), O. Koita (3), G. Mosquera (6), H. Leung (2), V. Verdier (4), J. Leach (1) (1) Colorado State University, U.S.A.; (2) International Rice Research Institute (IRRI), Philippines; (3) Université des Sciences Techniques et Technologiques, Faculté des Sciences et Techniques, LBMA, Mali; (4) IRD, Cirad, Univ. Montpellier, Interactions Plantes Microorganismes Environnement, France; (5) Institute of Rural Economy, Plant Protection, Mali; (6) International Center for Tropical Agriculture (CIAT), Colombia

- P17-499 Dissecting multiple resistance specificities at the *Mla* locus in barley. H. BRABHAM (1), I. Hernández-Pinzón (1), P. Green (1), M. Moscou (1), P. Hayes (2) (1) The Sainsbury Laboratory, United Kingdom; (2) Oregon State University, U.S.A.
- P17-500 PAMP perception during *Fusarium graminearum* pathogenesis. E. BRAUER (1) (1) Agriculture and Agri-Food Canada, Canada
- P17-501 Extreme resistance to *Cowpea mosaic virus*: molecular forms of the virus-encoded elicitors. G. BRUENING (1), J. Gao (1), Q. Fan (2) (1) Plant Pathology, University of California at Davis, U.S.A.; (2) Huazhong Agricultural University, China
- P17-502 An improved purification system for flax resistance proteins M, L6 and L7. H. BURDETT (1), P. Anderson (1), S. Williams (2), P. Sornaraj (3), M. Rahman (1), B. Kobe (4) (1) Flinders University, Australia; (2) Australian National University, Australia; (3) Department of Industry Innovation and Science, Australia; (4) University of Queensland, Australia
- P17-503 Epistatic influence in tomato Ve1-mediated resistance. C. CASTROVERDE (1), R. Nazar (1), J. Robb (1) (1) Molecular and Cellular Biology, University of Guelph, Canada
- P17-504 Understanding the molecular basis for tomato resistance to the *Fusarium* wilt fungus *Fusarium oxysporum* f. sp. *lycopersici*. A. CATANZARITI (1), Y. Gonzalez-Cendales (1), H. Do (1), P. Bru (1), D. Jones (1) (1) Research School of Biology, Australian National University, Australia
- P17-505 Distinct resistance genes arrest development of the oomycete rust *Albugo candida* in *Arabidopsis thaliana* at different infection stages. V. CEVIK (1), S. Huh (1), A. Cooper (2), O. Furzer (1), S. Fairhead (3), J. Taylor (2), J. Carlier (4), P. Sarris (5), J. Jones (1), E. Holub (2) (1) The Sainsbury Laboratory, United Kingdom; (2) University of Warwick, School of Life Sciences, Warwick Crop Centre, United Kingdom; (3) University of Warwick, School of Life Sciences, Warwick Crop Centre, United Kingdom; (4) University of Algarve, Laboratory of Genomics and Genetic Improvement, Portugal; (5) Division of Plant and Microbial Sciences, School of Biosciences, University of Exeter, United Kingdom
- P17-506 Mining and Identification of Functional Novel Alleles of *Pi2/9* locus From Rice 3K Germplasm Against Rice Blast, *Magnaporthe oryzae* via Genome Wide Association Study (GWAS) Pipeline. C. CHAIPANYA (1), J. Divina (1), F. Borja (1), J. Yanoria (1), R. Mauleon (1), R. Opulencia (1), C. Jantasuriyarat (2), B. Zhou (1) (1) International Rice Research Institute, Philippines; (2) Department of Genetics, Faculty of Science, Kasetsart University, Bangkok, Thailand
- P17-507 The SERK family as co-receptors for FLS2. P. CHATELAIN (1), M. Albert (1), U. Furst (1), G. Felix (1) (1) ZMBP - Center for Plant Molecular Biology, Tuebingen University, Germany
- P17-508 Endoplasmic reticulum stress responses function in the HRT-mediated hypersensitive response in *Nicotiana benthamiana*. H. CHOI (1), J. Moon (1), J. Park (2) (1) Korea Research Institute Bioscience and Biotechnology(KRIBB)/UST, South Korea; (2) Korea Research Institute Bioscience and Biotechnology(KRIBB), South Korea
- P17-509 RECEPTOR-LIKE CYTOPLASMIC KINASE FACILITATES PLANT IMMUNITY VIA INTERACTION AND PHOSPHORYLATION WITH EFFECTOR-TARGETED PROTEIN RIN4 IN ARABIDOPSIS. E. CHUNG (1), R. Anderson (2), J. Dangel (3) (1) Howard Hughes Medical Institute (HHMI) / UNC-Chapel Hill, U.S.A.; (2) Department of Biology, UNC-Chapel Hill, U.S.A.; (3) Howard Hughes Medical Institute (HHMI), UNC-Chapel Hill, U.S.A.
- P17-510 A resistance mechanism from the American heirloom rice variety Carolina Gold Select is dependent on TAL effector central repeat region composition, but not the repeat variable diresidues. S. COHEN (1), L. Triplett (2), J. Leach (1) (1) Colorado State University, U.S.A.; (2) The Connecticut Agricultural Experiment Station, U.S.A.
- P17-511 Dissecting the role of lysin motif receptor-like kinases (LYKs) in chitin-triggered immunity in grapevine. L. DAVIES (1), C. Villano (2), D. Brulé (3), M. Héloir (3), F. Boutrot (4), C. Zipfel (4), B. Poinssot (3), I. Dry (1) (1) Commonwealth Scientific and Industrial Research Organisation, Australia; (2) University of Naples Federico II, Italy; (3) INRA, Université de Bourgogne, France; (4) The Sainsbury Laboratory, England
- P17-512 An E3 ubiquitin ligase, PUB4, regulates immune signaling through the interaction with Arabidopsis CERK1. Y. DESAKI (1), S. Takahashi (1), H. Koizumi (1), T. Miura (1), K. Yashima (1), Y. Ishibashi (1), K. Kito (1), M. Narusaka (2), Y. Narusaka (2), H. Kaku (1), N. Shibuya (1) (1) Department of Life Sciences, School of Agriculture, Meiji University, Japan; (2) Research Institute for Biological Sciences Okayama, Japan
- P17-513 Genomic Screens to Identify Next-Generation MAMPs and their Cognate Pattern Recognition Receptors. D. DESVEAUX (1), A. Mott (2), S. Thakur (2), E. Smakowska (3), P. Wang (1), Y. Belkhadir (3), D. Guttman (1) (1) University of Toronto / Centre for the Analysis of Genome Evolution and Function, Canada; (2) University of Toronto, Canada; (3) Gregor Mendel Institute (GMI), Austria
- P17-514 Heavy metal-associated isoprenylated plant protein is a putative host target of AvrPto5 effector of kiwifruit pathogen *Pseudomonas syringae* pv. *actinidiae*. K. DHARMARAJ (1), W. CUI (2), M. YOON (2), E. RIKKERINK

- (2), M. TEMPLETON (1) (1) The University of Auckland & The New Zealand Institute for Plant & Food Research Limited, New Zealand; (2) The New Zealand Institute for Plant & Food Research Limited, New Zealand
- P17-515 A dominant mutation in *BDA4* suppresses the autoimmune phenotypes in *snc2-1D*. Y. DING (1) (1) University of British Columbia, Canada
- P17-516 Characterization of increased *Pantoea stewartii* resistance in maize *pan1* mutants. P. DOBLAS IBANEZ (1), L. Smith (1) (1) University of California San Diego, U.S.A.
- P17-517 ELR INTERACTS WITH SOBIR1 TO MOUNT DEFENSE RESPONSES AGAINST *PHYTOPHTHORA INFESTANS* IN POTATO. E. DOMAZAKIS (1), M. Joosten (2), D. Wouters (2), S. Kamoun (3), R. Visser (2), V. Vleeshouwers (2) (1) Wageningen University, Netherlands; (2) Wageningen University, Netherlands; (3) The Sainsbury Laboratory, United Kingdom
- P17-518 Special Ks – doping RPM1 activity. F. EL KASMI (1), R. Anderson (1), E. Chung (1), J. Dangl (1) (1) University of North Carolina, U.S.A.
- P17-519 Characterization of barley host and non-host interactions with aphids. C. ESCUDERO-MARTINEZ (1), J. Morris (2), P. Hedley (3) (1) James Hutton Institute and Dundee University, United Kingdom; (2) James Hutton Institute Cell and Molecular Sciences, United Kingdom; (3) James Hutton Institute, Cell and Molecular Sciences, United Kingdom
- P17-520 Recognition specificity of the flax rust AvrP and AvrP123 effectors is determined by polymorphisms at their N- and C-termini. N. FARAH (1), A. Catanzariti (1), P. Dodds (2), A. Hardham (3), D. Jones (3) (1) Research School of Biology, ANU, Australia; (2) CSIRO, Australia; (3) Research School of Biology, ANU, Australia
- P17-521 Identification and characterization of a novel *Sclerotinia*-MAMP and its receptor in *Arabidopsis*. C. FEILER (1), W. Zhang (2), A. Gust (3), T. Nuernberger (3), D. Kolb (3) (1) University of Tuebingen, Center for plant molecular biology, Germany; (2) ETH Zurich, Switzerland; (3) University of Tuebingen, Germany
- P17-522 Development of genomic and breeding resources to uncover virulence mechanisms in oat crown rust. M. FIGUEROA (1), S. Rottschaefer (2), M. Miller (2), V. Omidvar (2), H. Karaoglu (3), F. Li (2), D. Singh (3), N. Upadhyaya (4), R. Dill-Macky (2), P. Dodds (4), R. Park (3), S. Kianian (5) (1) University of Minnesota, U.S.A.; (2) University of Minnesota, U.S.A.; (3) Plant Breeding Institute, University of Sydney, Australia; (4) CSIRO Agriculture, Australia; (5) USDA-ARS Cereal Disease Laboratory, U.S.A.
- P17-523 Molecular and functional characterization of the plant immune receptor RLP32. K. FROEHLICH (1), E. Melzer (2), L. Fan (3), T. Nuernberger (3) (1) Center for Plant Molecular Biology, Department of Plant Biochemistry, Germany; (2) Center for Plant Molecular Biology, Department of Plant Biochemistry, Germany; (3) Center for Plant Molecular Biology, Department of Plant Biochemistry, Germany
- P17-524 Potato Late Blight (*Phytophthora infestans* (Mont.) de Bary) Disease Development and Tuber Yield with Response to Planting Dates and Fungicides Application In Nepal. S. GAIRE (1) (1) Agriculture and Forestry University, Nepal
- P17-525 Characterization of Putative NPR1-dependent Aphid Resistance Factors in Tomato. A. GALLA (1), C. Avila (2), F. Goggin (1) (1) University of Arkansas, U.S.A.; (2) Department of Horticultural Science, Texas A&M University, U.S.A.
- P17-526 The role of chloroplast-resident RNA helicase ISE2 in defense response against pathogens. E. GANUSOVA (1), T. Burch-Smith (1) (1) University of Tennessee, U.S.A.
- P17-527 Interactions of *Arabidopsis* SRFR1, a negative regulator of effector-triggered immunity, with transcription factors and transcriptional co-repressors. C. GARNER (1), C. Rogan (2), S. Kim (1), S. Bhattacharjee (3) (1) University of Missouri, U.S.A.; (2) University of Missouri, U.S.A.; (3) Regional Centre for Biotechnology, India
- P17-528 The bacterial Type III-secreted protein AvrRps4 is a bipartite effector. W. GASSMANN (1), M. Halane (2), S. Kim (2), C. Garner (2), S. Bhattacharjee (2) (1) University of Missouri, U.S.A.; (2) University of Missouri, U.S.A.
- P17-529 Characterization of the role in plant defense of a cassava protein that potentially interacts with the HpaF effector from *Xanthomonas axonopodis* pv. *manihotis*. D. GÓMEZ DE LA CRUZ (1), C. Trujillo (1), V. Hurtado (1), C. Alvarado (1), S. Restrepo (1), A. Bernal (1) (1) Laboratorio de Micología y Fitopatología, Universidad de los Andes, Colombia
- P17-530 Tomato atypical receptor kinase 1 protein abundance is differentially regulated during pathogen infection. A. GUZMAN (1), D. Lanver (2), K. Taylor (1), J. Kim (1), H. Liu (3), M. Mudgett (1) (1) Stanford University, U.S.A.; (2) Max-Planck-Institut für terrestrische Mikrobiologie, Germany; (3) Department of Plant Pathology, Nanjing Agricultural University, China
- P17-531 Interaction dynamics between the potato late blight resistance protein RB and pathogen effectors. Y. LIN (1), D. Halterman (2) (1) University of Wisconsin-Madison, U.S.A.; (2) USDA, U.S.A.
- P17-532 Proteome-wide identification of protein poly(ADP-ribosylation) targets reveals an important role of FHA domain protein DAWDLE in *Arabidopsis* immunity. P. HE (1), B. Feng (1), S. Ma (2), S. Chen (3), S. Zhang (4),

- B. Yu (4), S. Dinesh-Kumar (2), L. Shan (1) (1) Texas A&M University, U.S.A.; (2) University of California, Davis, U.S.A.; (3) University of Florida, U.S.A.; (4) University of Nebraska, U.S.A.
- P17-533 The Tomato LRR-RLP CuRe1 detects molecular patterns of the parasitic plant *Cuscuta reflexa*. V. HEGENAUER (1), U. Fürst (1), B. Kaiser (1), M. Stahl (1), M. Albert (1), M. Smoker (2), C. Zipfel (2), G. Felix (1) (1) Eberhard Karls University of Tuebingen, Germany; (2) Sainsbury Laboratory, Norwich Research Park, United Kingdom
- P17-534 Tomato receptor FLS3 binds flgII-28 and activates the plant immune system. S. HIND (1), S. Strickler (1), P. Boyle (1), D. Dunham (1), Z. Bao (1), I. O'Doherty (2), J. Baccile (2), J. Hoki (2), C. Clarke (3), B. Vinatzer (3), F. Schroeder (2), G. Martin (2) (1) Boyce Thompson Institute, U.S.A.; (2) Boyce Thompson Institute; Cornell University, U.S.A.; (3) Virginia Tech, U.S.A.
- P17-535 Towards the identification of novel soybean cyst nematode resistance genes. K. HORGAN (1), C. Fliege (2), N. Yu (2), B. Diers (2), M. Hudson (3), A. Bent (4) (1) University of Wisconsin-Madison, U.S.A.; (2) University of Illinois at Urbana-Champaign, U.S.A.; (3) University of Illinois at Urbana-Champaign, U.S.A.; (4) University of Wisconsin-Madison, U.S.A.
- P17-536 RDR6 knock down line potentiates the BaMV infection in newly emerging leaves of *Nicotiana benthamiana*. Y. HSU (1), M. Luo (1), Y. Huang (1), N. Lin (3) (1) Graduate Institute of Biotechnology, National Chung Hsing University, Taiwan; (2) Graduate Institute of Biotechnology, National Chung Hsing University, Taiwan; (3) Institute of Plant and Microbial Biology, Academia Sinica, Taiwan
- P17-537 The rice NLR heteropair RGA4/RGA5 confers resistance to bacterial blight and bacterial leaf streak diseases. M. HUTIN (1), S. Cesari (2), V. Chalvon (3), C. Michel (3), T. Tran (4), R. Koebnik (4), S. Boris (4), T. Kroj (3) (1) Cornell University, PPPMB, U.S.A.; (2) CSIRO, Australia; (3) INRA, France; (4) IRD, France; (5) IRD, France
- P17-538 Flagellin peptide flg22 is transported to distal tissues in Arabidopsis. J. JELENSKA (1), S. Davern (2), R. Standaert (2), S. Mirzadeh (2), J. Greenberg (1) (1) University of Chicago, U.S.A.; (2) Oak Ridge National Laboratory, U.S.A.
- P17-539 Investigate the regulation of Mitogen-activated protein Kinase Phosphatase 1 (MKP1) in PAMP signaling and resistance to bacteria. L. JIANG (1), Y. Wan (1), J. Anderson (2), R. Ulm (3), S. Peck (2) (1) University of Missouri-Columbia, U.S.A.; (2) University of Missouri-Columbia, U.S.A.; (3) University of Geneva, Switzerland
- P17-540 Transcripts of disease resistance gene are under surveillance by of nonsense-mediated mRNA decay. H. JUNG (1), G. Jung (2), Y. Lee (2), K. Shin (3), S. Kim (3) (1) Dong-A University, Korea; (2) Dong-A University, Korea; (3) Myongji University, Korea
- P17-541 Identification of novel regulators of the NADPH oxidase RBOHD during plant immunity. Y. KADOTA (1), Y. Goto (2), H. Matsui (3), J. Sklenar (4), P. Derbyshire (4), F. Menke (4), H. Nakagami (3), C. Zipfel (4), K. Shirasu (2) (1) RIKEN CSRS, Plant Immunity Research Group, Japan; (2) RIKEN CSRS, Plant Immunity Research Group, Japan; (3) RIKEN CSRS, Plant Proteomics Research Unit, Japan; (4) The Sainsbury Laboratory, United Kingdom; (5) RIKEN CSRS, Plant Proteomics Research Unit, Japan
- P17-542 Pathogen infection and MORC1 affect chromatin accessibility of transposable elements and expression of their proximal genes in Arabidopsis. H. KANG (1), Y. Bordiya (1), Y. Zheng (2), J. Nam (1), H. Choi (2), B. Lee (3), J. Kim (3), D. Klessig (2), Z. Fei (2) (1) Texas State University, U.S.A.; (2) Boyce Thompson Institute, U.S.A.; (3) University of Texas, Austin, U.S.A.
- P17-543 Heavy metal-associated domain (HMA) proteins of rice confer susceptibility to *Magnaporthe oryzae* and are targeted by *M. oryzae* effector AVR-Pik. H. KANZAKI (1), H. Saitoh (1), S. Cesari (2), K. Fujisaki (1), E. Kanzaki (1), K. Yoshida (3), T. Takeda (1), K. Ito (1), C. Mitsuoka (1), A. Hirabuchi (1), M. Banfield (4), T. Kroj (5), S. Kamoun (6), R. Terauchi (1) (1) Iwate Biotechnology Research Center, Japan; (2) CSIRO Plant Industry, Australia; (3) Kobe Univ. Laboratory of plant Genetics, Japan; (4) John Innes Centre, Japan; (5) INRA, UMR BGPI, France; (6) The Sainsbury Laboratory, United Kingdom
- P17-544 Small GTPase OsRac1-induced S-nitrosylation of GAPDH is involved in disease resistance to rice blast fungus. Y. KAWANO (1), K. Kosami (1), J. Su (2), K. Shimamoto (2) (1) Shanghai Center for Plant Stress Biology, China; (2) Nara Institute of Science and Technology, Japan
- P17-545 Genome-based cloning of *Pvr4* conferring multiple potyvirus resistance from *Capsicum annuum* 'CM334'. S. KIM (1), J. Lee (2), D. Choi (2) (1) Seoul National University, South Korea; (2) Seoul National University, South Korea
- P17-546 GRP7 is involved in Salicylic acid-mediated defense by its binding to SA-related transcripts. P. KIM (1), A. Joe (2), J. Alfano (1) (1) University of Nebraska, U.S.A.; (2) University of California, U.S.A.
- P17-547 *Xanthomonas* AvrBsT interacts with calmodulin (CaM) and its CaM-binding domain is required for activation of effector-triggered immunity. M. CHENONG (1), J. Kim (2), N. Ozabaki-Yagan (2), Y. Wang (3), M. Mudgett (2) (1) Department of Biology, Stanford University, U.S.A.; (2) Stanford University, U.S.A.; (3) China Agricultural University, China

- P17-548 Studying the link between DNA-damage and NLR-mediated immune responses. M. KNIP (1), M. Cann (2), F. Takken (3) (1) University of Amsterdam, Netherlands; (2) Durham University, United Kingdom; (3) University of Amsterdam, Netherlands
- P17-549 Genomic and functional studies reveal important roles of integrated domains in NLR-immune receptors. T. KROJ (1), D. Ortiz (2), S. Cesari (3) (1) INRA, France; (2) INRA, France; (3) CSIRO, Australia
- P17-550 Mechanistic basis by which the Prf resistance protein manipulates the defense-related NAC1 transcription factor. J. KUD (1), X. Niu (2), W. Wang (1), Y. Liu (2), F. Xiao (1) (1) University of Idaho, U.S.A.; (2) Hefei University of Technology, China
- P17-551 Segregation of unknown signaling components in potato complicates marker-assisted selection for *Ve*-mediated *Verticillium* resistance. A. KUMAR (1), D. Halterman (2), D. Rouse (3), S. Jansky (1) (1) Department of Horticulture, University of Wisconsin-Madison, U.S.A.; (2) U.S. Department of Agriculture-Agricultural Research Service, Vegetable Crops Research Unit, Madison, Wisconsin, U.S.A.; (3) Department of Plant Pathology, University of Wisconsin-Madison, U.S.A.
- P17-552 The effects of calmodulin on plant immunity to *Pseudomonas syringae*. K. LAGERSTROM (1), P. Kim (1), J. Alfano (1) (1) University of Nebraska, U.S.A.
- P17-553 Towards unravelling the *exserohilum turcicum*-sorghum pathosystem through inoculation trials and transcriptome data. B. LANGENHOVEN (1), M. Craven (2), S. Murray (3), A. Nieuwoudt (4), M. Human (4) (1) University of Pretoria, South Africa; (2) Agricultural Research Centre-Grain Crops Institute, South Africa; (3) University of Cape Town, South Africa; (4) University of Pretoria, South Africa
- P17-554 Innate immunity in a forest tree: RLP-RLK complex mediates resistance to Septoria stem canker in *Populus trichocarpa*. J. LEBOLDUS (1), W. Muchero (2), J. Chen (2), J. Chang (3), A. Weisberg (3), K. Dunnell (3), G. Tuskan (2), R. Brueggeman (4) (1) Oregon State University, U.S.A.; (2) Oak Ridge National Laboratory, U.S.A.; (3) Oregon State University, U.S.A.; (4) North Dakota State University, U.S.A.
- P17-555 Elucidating the pathogenic effects of *Ramularia collo-cygni* in barley. M. Lyngkjær (1), R. Lemcke (1) (1) University of Copenhagen, Denmark
- P17-556 Quantitative high-throughput yeast two-hybrid screen identifies proteins that contribute to immunity against *Pseudomonas syringae*. J. LEWIS (1), J. Hassan (2), R. Rubalcava (2), D. Ouyang (2), K. Schreiber (2) (1) USDA, UC Berkeley, U.S.A.; (2) UC Berkeley, U.S.A.
- P17-557 Non-host resistance genes in *Brachypodium distachyon* against the rust pathogen *Puccinia graminis*. F. LI (1), V. Omidvar (1), R. Milne (2), S. Kianian (3), J. Vogel (4), M. Ayliffe (5), M. Moscou (6), P. Dodds (2), E. Lagudah (2), M. Figueroa (1) (1) University of Minnesota, U.S.A.; (2) CSIRO Agriculture, Australia; (3) USDA-ARS Cereal Disease Laboratory, U.S.A.; (4) Joint Genome Institute, U.S.A.; (5) CSIRO Agriculture, U.S.A.; (6) The Sainsbury Laboratory, United Kingdom
- P17-558 Arabidopsis heterotrimeric G proteins directly regulate FLS2-mediated immunity. X. LIANG (1), J. Zhou (2), J. Wang (2), M. Ma (2) (1) Institute of Genetics and Developmental Biology, CAS, China; (2) Institute of Genetics and Developmental Biology, CAS, China
- P17-559 Phosphoproteomic profiling reveals early regulatory mechanisms of membrane-associated proteins during ETI. T. LIEBRAND (1), D. Matuszak (1), G. Coaker (1) (1) UC Davis, Dept. of Plant Pathology, U.S.A.
- P17-560 Identifying the receptor of *Phytophthora infestans* apoplastic effector SCR74 from wild potato. X. LIN (1) (1) Wageningen UR, China
- P17-561 Bioactivities of *Trichoderma chrysophanol*. S. LIU (1), C. Liao (2), M. Hsieh (1), C. Lo (3), H. Yang (4), K. Lin (2), K. Peng (2) (1) Department of Molecular Biotechnology, Da-Yeh University, Taiwan; (2) Department of Life Science, National Dong Hwa University, Taiwan; (3) Department of Biotechnology, National Formosa University, Taiwan; (4) Department of Research, Buddhist Tzu Chi General Hospital, Taiwan
- P17-562 A Putative Lipase-like Protein Regulates Arabidopsis Immune Gene Expression and Defense Responses. C. LIU (1), F. Cui (1), P. He (2), L. Shan (1) (1) Department of Plant Pathology and Microbiology, Institute for Plant Genomics & Biotechnology, Texas A&M University, U.S.A.; (2) Department of Biochemistry and Biophysics, Institute for Plant Genomics & Biotechnology, Texas A&M University, U.S.A.
- P17-563 Arabidopsis Receptor-like kinase BIR1 negatively regulates cell death mediated by BAK1. Y. LIU (1), Y. Zhang (1) (1) University of British Columbia, Canada
- P17-564 Identification and characterization of rice mutants that suppress XA21-mediated immunity by combining forward genetics and genomics approaches. F. LIU (1), M. Chern (1), W. Zhang (1), R. Jain (1), P. Ronald (1) (1) UC Davis, U.S.A.
- P17-565 Autoimmunity in *camta3* is triggered by NLR immune receptors. S. LOLLE (1), C. Greeff (1), M. Roux (1), K. Sømark (1), J. Mundy (1), M. Petersen (1) (1) Department of Biology, University of Copenhagen, Denmark
- P17-566 How does pathogen perception via the WRKY domain activate the RRS1/RPS4 immune complex?. Y. MA (1), P. Martinez (1), Duxbury (2), P. Sarris (3), H. Brown (1), L. Wirthmueller (4), J. Jones (1) (1) The Sainsbury

- Laboratory, United Kingdom; (2) The Sainsbury Laboratory, United Kingdom; (3) University of Exeter, United Kingdom; (4) University of Berlin, Germany
- P17-567 XEGL1, a bidirectional decoy of *Phytophthora sojae*, safeguards the virulence function of XEG1 from interference in soybean. Z. MA (1), L. Zhu (1), T. Song (2), Y. Wang (1), Q. Zhang (1), Y. Xia (1), M. Qiu (1), Y. Lin (1), H. Li (1), W. Ye (1), Y. Wang (1), S. Dong (1), Y. Wang (1) (1) Nanjing agricultural university, China; (2) Jiangsu Academy of agricultural sciences, China
- P17-568 The interactome of BIR2 reveals a novel adapter protein potentially linking BAK1 to NB-LRR-type resistance genes. R. MANSTRETTA (1), T. Halter (2), N. Schmidt (3), S. Schulze (3), B. Kemmerling (3) (1) Department of Plant Biochemistry (ZMBP), Eberhard-Karls-University, 72076 Tübingen, Germany, Germany; (2) Institut de Biologie de l'Ecole Normale Supérieure (IBENS), 75005 Paris, France, France; (3) Department of Plant Biochemistry (ZMBP), Eberhard-Karls-University, 72076 Tübingen, Germany, Germany
- P17-569 An undergraduate team-research project: the comprehensive analysis of Arabidopsis loci associated with the functions of *Pseudomonas syringae* effectors.. K. MASE (1), E. Boak-Nyberg (2), R. Meyer (2), T. Pan (2), T. Reese (2), . Siegle (2), . Bair (2), P. Carlson (2), V. Carveth (2), C. Davis (2), S. Dumler (2), L. Gonsalves (2), H. Hanson (2), A. Heyder (2), P. Johnson (2), D. Kragh (2), R. Kurandina (2), K. Lim (2), A. Lord (2), A. Lord (2), S. Lothert (2), N. Luong Van (2), S. Miller (2), A. Ramnarayan (2), J. Resch (2), M. Rivi (2), N. Rudin (2), B. Spokely (2), N. Strom (2), B. Swanson (2), J. Walker (2), J. Wemmer (2), . Xie (2), S. Chakravarthy (3), H. Wei (3), A. Collmer (3), F. Katagiri (2) (1) University of Minnesota, U.S.A.; (2) University of Minnesota, U.S.A.; (3) Cornell University, U.S.A.
- P17-570 Unravelling the defence arsenal of the wild *Solanum dulcamara* to *Pythophthora infestans*: resistance and tolerance.. L. MASINI (1), K. Abreha (1), E. Alexandersson (1), L. Råberg (2), R. Vetukuri (1), L. Grenville-Briggs Didymus (1), E. Andreasson (1), I. Rieu (3), Å. Lankinen (1) (1) Swedish University of Agricultural Sciences (SLU), Sweden; (2) Lund University, Sweden; (3) Radboud University, Netherlands
- P17-571 The evolution and global diversity of *AvrPm3a2/f2* and *SvrPm3a1/f1*, two effector genes controlling race-specific resistance in wheat powdery mildew. K. MCNALLY (1), S. Bourras (2), F. Menardo (2), C. Praz (2), B. Keller (2) (1) University of Zurich Institute for Plant and Microbial Biology, Switzerland; (2) University of Zurich Institute of Plant and Microbial Biology, Switzerland
- P17-572 Identification and molecular characterization of novel MAMP activities from the gram-negative bacteria *Ralstonia solanacearum* and *Escherichia coli* perceived by RLP32 in *Arabidopsis thaliana*. E. MELZER (1), L. Fan (1), K. Fröhlich (1), T. Nürnberger (1) (1) Uni Tuebingen, Germany
- P17-573 Dual specificity at the *Mla* locus confers resistance to barley powdery mildew and wheat stripe rust. M. MOSCOU (1), I. Hernandez-Pinzon (1) (1) The Sainsbury Laboratory, United Kingdom
- P17-574 Role of Stomata in Nonhost Disease Resistance. K. MYSORE (1), S. Lee (2), A. Kaundal (2), R. Vemanna (2), M. Senthil-kumar (2), M. Kang (3), C. Rojas (2), S. Oh (2), S. Roy Choudhury (4), H. Lee (2), Y. Ishiga (2), R. Allen (3) (1) The Samuel Roberts Noble Foundation, U.S.A.; (2) The Samuel Roberts Noble Foundation, U.S.A.; (3) Oklahoma State University, U.S.A.; (4) Donald Danforth Center, U.S.A.
- P17-575 PAMP-responsive phosphoprotein MARK1 limits program cell death induction. H. NAKAGAMI (1), H. Matsui (2), Y. Nomura (3), M. Egusa (4), G. Hyon (3), H. Kaminaka (4), M. Trujillo (5), K. Shirasu (3) (1) RIKEN CSRS / Max Planck Institute for Plant Breeding Research, Japan; (2) RIKEN CSRS / Okayama University, Japan; (3) RIKEN CSRS, Japan; (4) Tottori University, Japan; (5) Leibniz Institute of Plant Biochemistry, Germany
- P17-576 Improving disease resistance in strawberry. C. NELLIST (1), R. Vickerstaff (1), A. Armitage (1), R. Harrison (1) (1) NIAB-East Malling Research, United Kingdom
- P17-577 The role of plant Cyanogenic Glucosides (CGs) in immunity and symbiosis. M. NEWMAN (1), L. Andersen Gersby (1), G. Erbs (2) (1) University of Copenhagen, Denmark; (2) University of Copenhagen, Denmark
- P17-578 A wheat defence related miRNA targets a WRKY-domain containing NLR. V. NICOLIS (1), E. Venter (1) (1) University of Johannesburg, South Africa
- P17-579 Characterization of PAMP-activated RLK genes in *Solanum tuberosum* . L. NIETZSCHMANN (1), S. Rosahl (1) (1) Leibniz Institute for Plant Biochemistry, Germany
- P17-580 Elucidating the structural basis of effector induced susceptibility in the *Parastagonospora nodorum* - wheat interaction . M. OUTRAM (1), X. Zhao (1), S. Breen (2), P. Solomon (2), B. Kobe (1), S. Williams (2) (1) University of Queensland, Australia; (2) The Australian National University, Australia
- P17-581 The arms-race of plant-pathogen perception: from structural understanding to disease resistance. J. PAULUS (1), S. Brouwer (1), R. van der Hoorn (1), S. Kumari (2) (1) Department of Plant Sciences, University of Oxford, United Kingdom; (2) Max Planck Institute for Plant Breeding Research, Germany
- P17-582 *Rpp1* encodes a ULP-NBS-LRR protein that controls immunity to *Phakopsora pachyrhizi* in soybean. K. PEDLEY (1), A. Pandey (2), A. Ruck (1), S. Whitham (3), M. Graham (4) (1) Foreign Disease-Weed Science Research Unit, United States Department of Agriculture-Agricultural Research Service, U.S.A.; (2) National Agri-Food

- Biotechnology Institute, India; (3) Department of Plant Pathology and Microbiology, Iowa State University, U.S.A.; (4) Corn Insects and Crop Genetics Research Unit, United States Department of Agriculture-Agricultural Research Service, U.S.A.
- P17-583 *Trichoderma koningii* Epl1 induces crops resistance to pathogens. S. LIU (1), C. Cheng (2), M. Hsieh (1), K. Peng (3), C. Lo (2) (1) Department of Molecular Biotechnology, Da-Yeh University, Taiwan; (2) Department of Biotechnology, National Formosa University, Taiwan; (3) Department of Life Science, National Dong Hwa University, Taiwan
- P17-584 Gene expression of *AtPEPR* receptors and *AtPep* peptides in response to *Xylella fastidiosa*. M. PEREIRA (1), J. Tomaz (2) (1) Instituto Agronômico do Paraná - IAPAR, Brazil; (2) Agronomic Institute of Paraná State - IAPAR, Brazil
- P17-585 Identification of septoria nodorum blotch responsive QTLs in wheat through the removal of defined necrotrophic effector-host sensitivity gene interactions. H. PHAN (1), K. Rybak (1), E. Furuki (1), R. Oliver (1) (1) Curtin University, Australia
- P17-586 Diversity of resistance and virulence mechanisms in the rice/*Rice yellow mottle virus* pathosystem. H. PIDON (1), A. Pinel (2), E. Hébrard (2), S. Chéron (1), A. Ghesquière (1), L. Albar (1) (1) IRD, UMR DIADE, France; (2) IRD, UMR IPME, France
- P17-587 WITHDRAWN
- P17-588 Novel sources of disease resistance in pepper against bacterial spot pathogen, *Xanthomonas gardneri*. N. POTNIS (1), P. Wechter (1) (1) USDA-ARS, U.S.A.
- P17-589 Fine mapping of QTLs responsible for Ascochyta blight in chickpea. S. PURAYANNUR (1), K. Kumar (2), C. Vemula (3) (1) National Institute of Plant Genome Research, India; (2) National Institute of Plant Genome Research, India; (3) School of Life Sciences, Central University of Gujarat, India
- P17-590 Genetic dissection of NLP-triggered immunity in Arabidopsis. T. RAAYMAKERS (1), R. Hijne (1), T. Van Butselaar (1), G. Van den Ackerveken (1) (1) Utrecht University, Netherlands
- P17-591 A Conserved Amino Acid Sequence in Harpin Family Proteins Required for the Binding of Fibrillin 4 and Activation of the Hypersensitive Response in Plants. W. RAHFELDT (1), C. Li (1) (1) Plant Health Care, Inc, U.S.A.
- P17-592 Suppressors of plant defense responses from wheat rust fungi. S. RAMACHANDRAN (1), C. Yin (2), J. Kud (3), K. Tanaka (2), S. Hulbert (2) (1) Washington State University, U.S.A.; (2) Washington State University, U.S.A.; (3) University of Idaho, U.S.A.
- P17-593 Inheritance of primed genes enhance common bean (*Phaseolus vulgaris* L.) resistance to halo blight (*Pseudomonas syringae* pv phaseolicola). G. RAMIREZ (1), R. Alvarez (2) (1) CINVESTAV, Mexico; (2) CINVESTAV, Mexico
- P17-594 Specificity of LORE-dependent lipopolysaccharide immune sensing in Arabidopsis. S. RANF (1) (1) Technische Universitaet Muenchen, Chair of Phytopathology, Germany
- P17-595 Role of plant-microbe interactions in host resistance and emergence of virulent races. M. RASHID (1), S. Liban (2), X. Zhang (1), P. Park (1), M. Borhan (3), W. Fernando (1) (1) University of Manitoba, Canada; (2) DL seeds, Canada; (3) Agriculture and Agri-Food Canada, Canada
- P17-596 Deciphering the role of NLR immune receptors DNA binding/damage in plant immunity. M. RICHARD (1), M. Knip (1), T. Aalders (1), M. Cann (2), F. Takken (1) (1) Molecular Plant Pathology, SILS, University of Amsterdam, Netherlands; (2) School of Biological and Biomedical Sciences, Biophysical Sciences Institute, Durham University, United Kingdom
- P17-597 High-Resolution Mapping and Candidate Gene Identification of Unique *Pyrenophora teres* f. *teres* Necrotrophic Effector Host Sensitivities on Barley Chromosome 6H. J. RICHARDS (1), T. Friesen (2), R. Brueggeman (1) (1) North Dakota State University, U.S.A.; (2) USDA-ARS, Cereal Crops Research Unit, Red River Valley Agricultural Research Center, U.S.A.
- P17-598 The natural alkamide affinin activates the priming of common bean (*Phaseolus vulgaris* L.) plants, and induces the JA and SA pathways. M. RICO (1), R. ALVAREZ (1) (1) CINVESTAV, Mexico
- P17-599 Systematic Mutagenesis Analysis of the Turnip yellows virus Suppressor of RNA Silencing P0. M. SACCO (1), T. Nguyen (1), M. Dughbaj (1), K. Valdez (1), S. Oza (1), T. Choi (1), K. Wang (1) (1) California State University, Fullerton, U.S.A.
- P17-600 Dissection of molecular interactions between *Magnaporthe oryzae* effector AVR-PikD and rice NLR Pikp-1/Pikp-2 in planta. H. SAITOH (1), A. Maqbool (2), M. Franceschetti (2), A. Uemura (1), H. Kanzaki (1), S. Kamoun (3), M. Banfield (2), R. Terauchi (1) (1) Iwate Biotechnology Research Center, Japan; (2) John Innes Centre, United Kingdom; (3) The Sainsbury Laboratory, United Kingdom
- P17-601 Independent evolution of powdery mildew avirulence effectors (AVRA) and their surveillance by the allelic barley Mildew Locus A (MLA) immune receptors.. I. SAUR (1), X. Lu (1), B. Kracher (1), S. Bauer (1), T.

- Maekawa (1), P. Schulze-Lefert (1) (1) Department of Plant-Microbe Interactions, Max Planck Institute for Plant Breeding Research, Germany
- P17-602 Receptor complex formation of the receptor-like kinase LORE in innate immunity. M. SCHÄFFER (1), S. Eibel (1), T. Illig (1), L. Raasch (1), R. Hückelhoven (1), S. Ranf (1) (1) TU München, Germany
- P17-603 PLDgamma1 is a negative regulator of MAMP signalling in *Arabidopsis thaliana*. M. SCHLOEFFEL (1), M. Šemanjski (2), W. Wan (3), B. Macek (2), A. Gust (3) (1) Plant Biochemistry, Center for Plant Molecular Biology, Germany; (2) Proteome Center Tuebingen Interdepartmental Institute for Cell Biology, Germany; (3) Plant Biochemistry, Center for Plant Molecular Biology, Germany
- P17-604 The uncharacterized protein ZED2 contributes to immune activation in *Arabidopsis* following recognition of the *Pseudomonas syringae* effector HopZ1a. K. SCHREIBER (1), J. Hassan (2), M. Baudin (2), D. Nazarchuk (2), G. Walker (2), T. Helmann (2), J. Lewis (2) (1) University of California - Berkeley, U.S.A.; (2) University of California - Berkeley, U.S.A.
- P17-605 Genome-wide comparative analyses and evolutionary history of nucleotide-binding leucine-rich repeat (NLR) gene family among Solanaceae plants. E. SEO (1), S. Yeom (2), H. Lee (3), D. Choi (3) (1) Seoul National University, South Korea; (2) Gyeongsang National University, South Korea; (3) Seoul National University, South Korea
- P17-606 Putative plant membrane receptor shedding: Case study on RLK902. J. SERNESTRAND (1), M. Berens (2), R. van der Hoorn (3), T. Colby (2), P. Huesgen (1) (1) Juelich Forschungszentrum, Germany; (2) Max planck institute for plant breeding research, Germany; (3) Department of Plant Sciences, University of Oxford, United Kingdom
- P17-607 HopF-triggered immunity in *Arabidopsis* requires a ZAR1/ZRK module. D. SETO (1), N. Koulana (2), T. Lo (2), D. Desveaux (2), D. Guttman (2) (1) University of Toronto, Canada; (2) University of Toronto, Canada
- P17-608 Microbe-associated molecular pattern-induced monoubiquitination of PRR complex-associated kinase BIK1 in *Arabidopsis* immunity. L. SHAN (1), X. Ma (1), P. He (1) (1) Texas A&M University, U.S.A.
- P17-609 Involvement of a putative SISOIR1-interacting receptor-like protein in plant response to elicitors. R. LIOU (1), W. Shih (1), C. Huang (1), C. Wang (2), K. Peng (1) (1) Dept. Plant Pathol. & Microbiol., National Taiwan University, Taiwan; (2) Institute of Plant & Microbial Biology, Academia Sinica, Taiwan
- P17-610 Plant defense responses to herbivores involve recognition of independent herbivore-associated molecular patterns in rice. T. SHINYA (1), Y. Hojo (2), Y. Desaki (3), J. Christeller (4), K. Okada (5), N. Shibuya (3), I. Galis (2) (1) Institute of Plant Science and Resources, Okayama University, Japan; (2) Institute of Plant Science and Resources, Okayama University, Japan; (3) Department of Life Sciences, Meiji University, Japan; (4) The New Zealand Institute for Plant & Food Research, New Zealand; (5) Biotechnology Research Center, The University of Tokyo, Japan
- P17-611 The *Arabidopsis* leucine-rich repeat receptor-like kinase NILR1 is required for induction of innate immunity to parasitic nematodes. S. SIDDIQUE (1), B. Mendy (2), M. Wangombe (2), Z. Radakovic (2), J. Holbein (2), F. Grundler (2), C. Zipfel (3) (1) INRES, Department of Molecular Phytomedicine, University of Bonn, Germany; (2) INRES, Department of Molecular Phytomedicine, University of Bonn, Germany; (3) The Sainsbury Laboratory, Norwich Research Park, Norwich, United Kingdom
- P17-612 Role of plant antiviral defense during VIGS in plant. D. SINGH (1) (1) Samuel Roberts Noble Foundation, India
- P17-613 Inter- and intramolecular interactions regulating the activity of the CNL immune receptors Rx1 and Gpa2 in complex with RanGAP2. E. SLOOTWEG (1), R. Pomp (1), O. Sukarta (2), I. Dols (2), J. Alkemade (2), J. Borst (3), A. Goverse (2) (1) Laboratory of Nematology, Wageningen University, Netherlands; (2) Laboratory of Nematology, Wageningen University, Netherlands; (3) Laboratory of Biochemistry, Wageningen University, Netherlands
- P17-614 Characterizing the dynamic changes in the subcellular localization of *Rhg1* gene products during SCN infection. J. SMITH (1), A. Bayless (1), J. Song (1), A. Teillet (1), A. Bent (1) (1) University of Wisconsin-Madison, U.S.A.
- P17-615 Comparative analysis of NLR-mediated recognition of a bacterial effector AvrRpt2 in *Malus* and *Arabidopsis*. K. SOHN (1), M. Prokchorkchik (2) (1) Postech, Korea; (2) Massey University, New Zealand
- P17-616 A Dual NLR with an integrated sensory domain, complexes with a transcription factor to mediate *Ug99* resistance in barley. S. SOLANKI (1), G. Ameen (1), R. Brueggeman (1) (1) North Dakota State University, U.S.A.
- P17-617 Antagonistic perception of endogenous peptides by FERONIA regulates plant immunity. M. STEGMANN (1), J. Monaghan (2), E. Smakowska (3), H. Roevenich (4), N. Holton (1), Y. Belkhadir (3), C. Zipfel (1) (1) The Sainsbury laboratory, United Kingdom; (2) Queens University, Canada; (3) Gregor Mendel Institute, Austria; (4) Wageningen University, Netherlands
- P17-618 Inhibition of plant apoplastic immune subtilases: of pathogen or plant origin?. D. SUELDO (1), T. Hong (1), S. Ninck (2) (1) University of Oxford, United Kingdom; (2) Universität Duisburg-Essen, Germany

- P17-619 Exploring the Resistosome of the Potato CC-NB-LRR Immune Receptor Rx1. O. SUKARTA (1) (1) Wageningen university, Netherlands
- P17-620 Identification and functional analysis of autophosphorylation sites in Arabidopsis CERK1. M. SUZUKI (1), S. Kenkichi (2), M. Shibuya (2), H. Shimada (2), N. Motoyama (2), S. Takahashi (2), I. Yoshida (2), M. Ohnishi (2), Y. Ishibashi (2), Z. Fujimoto (3), Y. Desaki (2), H. Kaku (2), K. Kito (2), N. Shibuya (2) (1) Meiji university, Japan; (2) Meiji university, Japan; (3) National Institute of Agrobiological Sciences, Japan
- P17-621 Responsiveness to microbe-associated molecular patterns in *Brachypodium distachyon*. A. TAKAHASHI (1), Y. Kouzai (1), M. Kimura (1), M. Watanabe (1), H. Matsui (1), M. Yamamoto (1), Y. Ichinose (1), K. Toyoda (1), Y. Noutoshi (1) (1) Okayama University, Japan
- P17-622 The *Fusarium oxysporum* effector Six8 manipulates plant immunity through association with the transcriptional co-repressors TPL and TPR1. F. TAKKEN (1), F. Gawehns (2), M. de Sain (2), P. Houterman (2), H. Dekker (3), D. Valkenburg (2), H. van den Burg (2), M. Rep (2), G. van den Ackervecken (4), H. Richter (2) (1) University of Amsterdam - Mol. Plant Pathology, Netherlands; (2) University of Amsterdam - Mol. Plant Pathology, Netherlands; (3) University of Amsterdam - mass spectrometry, Netherlands; (4) Utrecht University - Plant-Microbe Interactions,, Netherlands
- P17-623 A multilayered regulatory mechanism for the autoinhibition and activation of a plant CC-NB-LRR resistance protein with an extra N-terminal domain. X. TAO (1), X. Chen (2), M. Zhu (2), L. Jiang (2), W. Zhao (2), J. Li (2), J. Wu (2), C. Li (2), B. Bai (2), G. Lu (2), H. Chen (2) (1) Nanjing Agricultural University, China; (2) Nanjing Agricultural University, China
- P17-624 The difference of resistance level to *Septoria gentian* in *Gentian*.. C. TATEDA (1), R. Tomita (2), K. Sekine (3) (1) Iwate Biotechnology Research Center, Japan; (2) Iwate Biotechnology Research Center, Japan; (3) University of Ryukyus, Japan
- P17-625 Basal defense against root-knot nematodes in *Arabidopsis thaliana*. M. TEIXEIRA (1), I. Kaloshian (2) (1) UCR, U.S.A.; (2) Professor/UCR, U.S.A.
- P17-626 Arms race coevolution in rice blast disease: the link between an effector host target and plant immunity through an integrated NLR domain. R. TERAUCHI (1), H. Kanzaki (2), H. Saitoh (2), A. Maqbool (3), K. Yoshida (4), S. Cesari (5), T. Kroj (6), M. Banfield (3), S. Kamoun (7) (1) Iwate Biotechnology Research Center, Japan; (2) Iwate Biotechnology Research Center, Japan; (3) John Innes Centre, United Kingdom; (4) Kobe University, Japan; (5) CSIRO, Australia; (6) INRA, France; (7) The Sainsbury Laboratory, United Kingdom
- P17-627 The XA21::EFR Chimeric Receptor Recognizes RaxX and Confers Resistance to *Xanthomonas* Infection. N. THOMAS (1), N. Oksenberg (1), B. Schwessinger (1), Y. Ngyuen (1), P. Ronald (1) (1) UC Davis, U.S.A.
- P17-628 Gene expression of AtPEPR receptors and AtPep peptides in response to *Xylella fastidiosa*. J. TOMAZ (1), M. Pereira (1) (1) Agronomic Institute of Paraná State - IAPAR, Brazil
- P17-629 Phosphorylated RIN4 interacts with a unique set of client proteins in the absence of NLR perception. T. TORUNO (1), D. Lee (1), . Shen (2), D. Mackey (2), G. Coaker (1) (1) University of California, Davis, U.S.A.; (2) The Ohio State University, U.S.A.
- P17-630 Arabidopsis miRNA boosts host immunity against *Verticillium dahliae* via repression of plant target gene transcript. M. VAN DAMME (1), G. van den Berg (1), L. Faino (1), B. Thomma (1) (1) Wageningen University, Phytopathology, Netherlands
- P17-631 Screening *Arabidopsis thaliana* populations for disease resistance against *Xanthomonas campestris* pv *campestris*.. M. VAN HULTEN (1), S. Chatterjee (1), H. van den Burg (1) (1) Molecular Plant Pathology, Swammerdam Institute for Life Sciences, University of Amsterdam, Netherlands
- P17-632 Natural variation in *Arabidopsis thaliana* resistance mechanisms to *Pseudomonas syringae*. A. VELÁSQUEZ (1), M. Oney (1), B. Huot (1), S. He (1) (1) Michigan State University, U.S.A.
- P17-633 Unravelling the wheat-*Diuraphis noxia* miRNome. E. VENTER (1), P. Sibisi (2) (1) Department of Botany and Plant Biotechnology, University of Johannesburg, South Africa; (2) Department of Botany and Plant Biotechnology, University of Johannesburg, South Africa
- P17-634 Structural basis of the *Pseudomonas syringae* effector HopBB1 targeting two *Arabidopsis* jasmonate repressors to activate the jasmonate-signaling pathway. L. WAN (1), L. Yang (1), P. Teixeira (1), F. Monteiro (1), J. Dangl (1) (1) University of North Carolina at Chapel Hill, U.S.A.
- P17-635 The Arabidopsis major leaf ferredoxin Fd2 regulates immune responses and mediates Harpin-induced hypersensitive reaction. M. WANG (1), K. Zhang (2), L. Rui (3), M. Bellizzi (2), D. Tang (3), Z. Wei (4), G. Wang (1) (1) Ohio State University, U.S.A.; (2) Ohio State University, U.S.A.; (3) Institute of Genetics and Developmental Biology, Chinese Academy of Sciences, China; (4) Plant Health Care, Inc., U.S.A.
- P17-636 Identification of two novel receptor kinases from tomato that act as the receptor sites for bacterial cold shock protein and the wound factor systemin. L. WANG (1), M. Albert (1), G. Felix (1) (1) Center for Plant Molecular Biology, University of Tuebingen, Germany

- P17-637 PDBP1 is a novel regulator of plant elicitor peptide (PEP)-induced plant immunity. P. WECKWERTH (1), Z. Shen (2), S. Briggs (2), K. Dressano (2), A. Huffaker (1) (1) UCSD, U.S.A.; (2) UCSD, U.S.A.
- P17-638 Resistance to early blight in potato. J. WOLTERS (1), G. Bijsterbosch (2), R. Visser (2), G. van der Linden (2), V. Vleeshouwers (2) (1) Wageningen UR, Netherlands; (2) Wageningen UR, Netherlands
- P17-639 Leucine-rich repeats determine NLR helper-sensor specificity in a redundant immune signaling network. C. WU (1), A. Abd-El-Haliem (2), T. Bozkurt (3), K. Belhaj (4), J. Vossen (2), S. Kamoun (4) (1) The Sainsbury Laboratory, Norwich Research Park, United Kingdom; (2) Plant Breeding, Wageningen University, Netherlands; (3) Department of Life Sciences, Imperial College London, United Kingdom; (4) The Sainsbury Laboratory, Norwich Research Park, United Kingdom
- P17-640 Arabidopsis cysteine-rich receptor like kinases and their roles in amplifying plant immune responses. K. YADETA (1), A. Creer (1), J. Franco (1), J. Rufian (2), G. Coaker (1) (1) Department of Plant Pathology, University of California Davis, U.S.A.; (2) Instituto de Hortofruticultura Subtropical y Mediterránea “La Mayora” – Universidad de Málaga, Spain
- P17-641 Regulation of sugar transporter activity for antibacterial defense in *Arabidopsis*. K. YAMADA (1), Y. Saijo (2), Y. Takano (1) (1) Kyoto University, Japan; (2) NAIIST, Japan
- P17-642 PBL27 directly connects between the chitin receptor, CERK1 and MAPK cascade in chitin-triggered immunity. K. YAMAGUCHI (1), K. Yamada (2), T. Shirakawa (2), A. Mine (3), M. Narusaka (4), Y. Narusaka (4), K. Ichimura (5), K. Tsuda (3), F. Tamo (2), N. Shibuya (6), T. Kawasaki (2) (1) Dept. Adv. Biosci. Kindai Univ., Japan; (2) Dept. Adv. Biosci. Kindai Univ., Japan; (3) MPIPZ, Germany; (4) RIBS Okayama, Japan; (5) Faculty of Agriculture, Kagawa Univ, Japan; (6) Dept. Life Sci., Meiji Univ, Japan
- P17-643 Characterization of the *Xa10* paralog genes in rice cultivar Nipponbare for disease resistance to *Xanthomonas oryzae* pv *oryzae*. Z. YIN (1), J. Wang (2), X. Zeng (2), D. Tian (2), K. Gu (2), X. Yang (2), L. Wang (2), K. Ong (2) (1) Temasek Life Sciences Laboratory, Singapore; (2) Temasek Life Sciences Laboratory, Singapore
- P17-644 Phosphorylation of rice RBOH by CERK1-associated RLCK regulates chitin-triggered ROS burst. M. YOSHIOKA (1), K. Yamaguchi (2), M. Fujiwara (3), S. Yoshimura (2), T. Kawasaki (2), H. Yoshioka (1) (1) Nagoya University, Japan; (2) Kindai University, Japan; (3) Keio University, Japan
- P17-645 Epigenetic regulation of *Rhg1*, a Soybean Cyst Nematode resistance locus. R. ZAPOTOCNY (1) (1) University of Wisconsin-Madison, U.S.A.
- P17-646 Structural and functional investigation of plant TIR domain interaction. X. ZHANG (1), M. Bernoux (1), S. Williams (2), K. Sohn (3), T. Newman (4), T. Ve (2), P. Dodds (1), B. Kobe (2) (1) Commonwealth Scientific and Industrial Research Organisation Agriculture, Australia; (2) School of Chemistry and Molecular Biosciences and Australian Infectious Diseases Research Centre, University of Queensland, Australia; (3) Dept. of Life Sciences, School of Interdisciplinary Bioscience and Bioengineering, Pohang University of Science and Technology, Korea; (4) Bio-protection Research Centre, Institute of Agriculture and Environment, Massey University, New Zealand; (5) School of Chemistry and Molecular Biosciences and Australian Infectious Diseases Research Centre, University of Queensland, Australia
- P17-647 A barley protein kinase positively regulates disease resistance through mediating phosphorylation-coupled turnover of a defense repressor WRKY3. L. ZHANG (1), X. Han (1), P. Xue (1), Q. Shen (1) (1) Institute of Genetics and Developmental Biology, Chinese Academy of Sciences, China
- P17-648 *Acidovorax citrulli* Type III Effector Aave_2166 Interacts with a Tobacco WRKY transcription Factor to Triggers Plant Defense. B. ZHAO (1), J. Miao (2), S. Traore (2), D. Kong (2) (1) Virginia Tech, U.S.A.; (2) Virginia Tech, U.S.A.
- P17-649 Identification of a new subclade of *Leptosphaeria biglobosa* on *Brassica rapa* in Oregon, USA. Z. ZOU (1), X. Zhang (1), T. Paulitz (2), C. Ocamb (3), L. duToit (4), F. Dilantha (1) (1) University of Manitoba, Canada; (2) Washington State University, Pullman, U.S.A.; (3) Oregon State University, U.S.A.; (4) Washington State University, Mount Vernon NWREC, U.S.A.
- P17-650 Structural studies of signalling domains from plant NLRs.. A. Bentham (1), X. Zhang (2), L. Casey (3), P. Lavrencic (2), S. Cesari (4), D. Ericsson (5), P. Anderson (1), M. Mobli (6), M. Bernoux (4), P. Dodds (4), B. Kobe (2), S. Williams (7) (1) School of Biological Sciences, Flinders University, Australia; (2) School of Chemistry and Molecular Biosciences, University of Queensland, Australia; (3) School of Chemistry and Molecular Biosciences, University of Queensland, Australia; (4) CSIRO Agriculture Flagship, Australia; (5) MX Beamlines, Australian Synchrotron, Australia; (6) Centre for Advanced Imaging, University of Queensland, Australia; (7) Research School of Biology, Australian National University, Australia
- P17-651 The NOI/RIN4 integrated domain of the rice NLR Pii-2 binds to OsExo70-F3, an accessory protein required for *Pii*-dependent resistance. K. FUJISAKI (1), Y. Abe (1), H. Saitoh (1), H. Kanzaki (1), H. Takagi (1), E. Kanzaki (1), A. Uemura (1), S. Kamoun (2), R. Terauchi (1) (1) Iwate Biotechnology Research Center, Japan; (2) The Sainsbury Laboratory, United Kingdom

- P17-652 Mystery solved: How the atypical pair Mi-1.2 and SERK1 regulate aphid resistance?. I. KALOSHIAN (1), H. Peng (1), S. Mantelin (2), G. Hicks (2), F. Takken (3) (1) University of California Riverside, U.S.A.; (2) University of California Riverside, U.S.A.; (3) University of Amsterdam, Netherlands
- P17-653 RECEPTOR-LIKE PROTEIN REQUIRED FOR CSP22 RESPONSIVENESS (NbCSPR) underlies age-dependent immune responses to bacterial cold shock protein in *Nicotiana benthamiana*. I. SAUR (1), Y. Kadota (2), N. Holton (3), J. Sklenar (3), E. Smakowska (4), Y. Belkhadir (4), C. Zipfel (3), J. Rathjen (5) (1) Department of Plant-Microbe Interactions, Max Planck Institute for Plant Breeding Research, Germany; (2) Plant Immunity Research Group, RIKEN Center for Sustainable Resource Science, Japan; (3) The Sainsbury Laboratory, United Kingdom; (4) Gregor Mendel Institute of Molecular Plant Biology GmbH, Austrian Academy of Sciences, Austria; (5) Research School of Biology, The Australian National University, Australia
- P17-654 Two redundant plant TRAF proteins participate in NLR immune receptor turnover. S. HUANG (1), X. Chen (2), X. Zhong (2), M. Li (2), K. Ao (2), J. Huang (2), X. Li (1) (1) University of British Columbia, Canada; (2) University of British Columbia, Canada
- P17-655 The Arabidopsis leucine-rich repeat receptor kinase BIR3 has a dual function in the negative regulation of BAK1 receptor complex formation and stabilization of BAK1. S. SCHULZE (1), T. Halter (2), J. Imkamp (3), S. Huang (4), S. Manzotta (5), N. Schmidt (3), R. Manstretta (3), S. Postel (6), F. Tax (7), S. de Vries (8), S. Clouse (9), C. Zipfel (10), X. Wang (11), B. Kemmerling (3) (1) ZMBP-Centre for Plant Molecular Biology, Germany; (10) The Sainsbury Laboratory, Norwich Research Park, Norwich, England; (11) State Key Laboratory of Crop Stress Biology in Arid Areas, College of Horticulture, China; (2) Institut de Biologie de l'Ecole Normale Supérieure (IBENS), France; (3) ZMBP-Centre for Plant Molecular Biology, Germany; (4) State Key Laboratory of Crop Stress Biology in Arid Areas, College of Horticulture, Northwest A&F University, China; (5) Plant Science Company GmbH, Germany; (6) Institute of Human Virology, University of Maryland School of Medicine, U.S.A.; (7) Department of Molecular and Cellular Biology, University of Arizona, U.S.A.; (8) Laboratory of Biochemistry, Wageningen University, Netherlands; (9) Department of Horticultural Science, North Carolina State University, U.S.A.
- P17-656 Understanding and engineering immune receptor complexes in plants. Z. DUXBURY (1), S. Huh (2), P. Ding (2), Y. Ma (2), J. Sklenar (2), F. Menke (2), P. Sarris (3), J. Jones (2) (1) The Sainsbury Laboratory, United Kingdom; (2) The Sainsbury Laboratory, United Kingdom; (3) University of Exeter, United Kingdom

Signal Transduction for Systemic Defense

- P18-657 *Nicotiana benthamiana* MAPK-WRKY pathway regulates effector-triggered ROS burst to confer resistance against *Phytophthora infestans*. H. ADACHI (1), T. Nakano (2), N. Miyagawa (3), N. Ishihama (4), M. Yoshioka (2), Y. Katou (2), T. Yaeno (5), K. Shirasu (4), H. Yoshioka (2) (1) Graduate School of Bioagricultural Sciences, Nagoya University, Japan; (2) Graduate School of Bioagricultural Sciences, Nagoya University, Japan; (3) ZEN-NOH, Japan; (4) RIKEN CSRS, Japan; (5) Faculty of Agriculture, Ehime University, Japan
- P18-658 Impact of light and nitrogen supply on biosynthesis and action of metabolic regulators of systemic acquired resistance in Arabidopsis. Z. AJAMI-RASHIDI (1), J. Zeier (1), K. Gruner (1) (1) Heinrich Heine Universität, Germany
- P18-659 The solution structure of Sr33 coiled-coil domain challenges paradigms for coiled-coil dimerization in plant NLR immune receptors. A. BENTHAM (1), L. Casey (2), P. Lavrencic (2), P. Anderson (1), B. Kobe (2), S. Williams (2) (1) Flinders University, Australia; (2) University of Queensland, Australia
- P18-660 A novel virus defense gene determines fitness in the cereal pathogen *Fusarium graminearum*. J. BORMANN (1), C. Heinze (1), M. Mentges (1), A. Brockmann (1), A. Alder (1), C. Blum (1), M. Freitag (2), W. Schäfer (1) (1) Molecular Phytopathology, University Hamburg, Germany; (2) Biochemistry and Biophysics, Oregon State University, U.S.A.
- P18-661 Investigating long-distance signal movement during Systemic Acquired Resistance in Arabidopsis. P. CARELLA (1), J. Merl-Pham (2), D. Wilson (1), S. Dey (3), S. Hauck (2), A. Vlot (3), R. Cameron (1) (1) Department of Biology, McMaster University, Canada; (2) Helmholtz Zentrum Muenchen, Research Unit Protein Science, Germany; (3) Helmholtz Zentrum Muenchen, Institute of Biochemical Plant Pathology, Germany
- P18-662 A new chloroplast targeting mechanism revealed by systemic defense-associated lipid transfer proteins. N. CECCHINI (1), C. Hu (2), E. Agbo (2), K. Zodrow (2), D. Speed (2), S. Roychoudhry (2), J. Greenberg (2) (1) Molecular Genetics and Cell Biology - The University of Chicago, U.S.A.; (2) Molecular Genetics and Cell Biology, The University of Chicago, U.S.A.
- P18-663 Identify a novel MAP kinase that targets receptor-like cytoplasmic kinases to regulate plant innate immunity. Y. CHIANG (1), M. Zhang (1), T. Toruño (1), K. Yadeta (1), J. Banderas (1), G. Coaker (1) (1) University of California, Davis, U.S.A.

- P18-664 An RNA binding protein phosphorylated in response to Plant Elicitor Peptides is a negative regulator of plant innate immunity.. K. DRESSANO (1), P. Weckwerth (1), S. Briggs (1), A. Huffaker (1) (1) UCSD, U.S.A.
- P18-665 Overlapping metabolomes indicate common biomarkers to M/PTI responses induced by lipopolysaccharides, chitosan and flagellin-22 in *Nicotiana tabacum* cells.. I. DUBERY (1), M. Mhlongo (1), L. Piater (1), N. Madala (1), P. Steenkamp (2) (1) University of Johannesburg, South Africa; (2) CSIR, South Africa
- P18-666 Alterations of flg22-signaling and innate immunity in loss of functional mutants of dynamin related protein network.. G. EKANAYAKE (1) (1) University of Missouri, U.S.A.
- P18-667 The Receptor-like Kinase SDS2 Complexes with the E3 Ligase SPL11 and Two Receptor-Like Cytoplasmic Kinases to Regulate Cell Death and Immunity in Rice. J. FAN (1), G. Wang (1) (1) Department of Plant Pathology, The Ohio State University, U.S.A.
- P18-668 Reactive Oxygen Species Play a Role in the Infection of the Necrotrophic Fungi, *Rhizoctonia solani* in Wheat. R. FOLEY (1), B. Kidd (1), J. Anderson (1), J. Hane (1), K. Singh (2) (1) CSIRO, Australia; (2) CSIRO/UWA, Australia
- P18-669 Functional characterization of the *CYSTEINE DESULPHURASE (CD)* gene involved in nonhost disease resistance. J. FONSECA (1), S. Lee (2), S. Muthappa (3), K. Mysore (4) (1) Noble Foundation, U.S.A.; (2) University of Florida, U.S.A.; (3) NIPGR, India; (4) Noble Foundation, U.S.A.
- P18-670 Effects of endophytic colonization with *Azospirillum* strain on disease resistance in tomato plants. M. FUJITA (1), Y. Okumura (1), M. Kusajima (1), H. Nakashita (1) (1) Fukui Prefectural University, Japan
- P18-671 Investigating induction of SAR in during gene- for-gene interactions between *Arabidopsis thaliana* and *Pseudomonas syringae*. T. GAIKWAD (1), M. Grant (2), M. de Torres-Zabala (1), P. Winlove (3), S. Green (3), D. Horsell (3) (1) Biosciences, College of Life and Environmental Sciences, University of Exeter, UK, United Kingdom; (2) Biosciences, College of Life and Environmental Sciences, University of Exeter, UK., United Kingdom; (3) Physics, College of Engineering, Mathematics and Physics, University of Exeter, UK., United Kingdom
- P18-672 Investigation of host response in the pathosystem *Solanum tuberosum* L. / *Rhizoctonia solani* Kühn AG-3. F. GENZEL (1), P. Franken (2), R. Grosch (1) (1) Leibniz Institute of Vegetable and Ornamental Crops Großbeeren/Erfurt e.V., Germany; (2) Humboldt University of Berlin, Germany
- P18-673 A P450 monooxygenase homologue of *Pinus taeda* in *Arabidopsis* involves in the regulation of defense and development in plants. . M. GIRI (1), R. Chaturvedi (1), Z. Chowdhury (1), R. Petros (1), B. Venables (1), J. Shah (1) (1) University of North Texas, U.S.A.
- P18-674 An E3-BAG protein module controls cell death and autoimmunity in rice. Z. HE (1), Q. You (1) (1) Institute of Plant Physiology & Ecology, Shanghai Institutes for Biological Sciences, CAS, China
- P18-675 Identify specific small RNA biomarkers and master regulators of citrus natural defense responses against HLB. C. HUANG (1), D. Niu (2) (1) UCR Plant Pathology and Microbiology Department, U.S.A.; (2) UCR Plant Pathology and Microbiology Department, U.S.A.
- P18-676 Identification and characterization of small-molecules that inhibit plant immune responses. N. ISHIHAMA (1), Y. Noutoshi (2), S. Choi (3), I. Saska (3), S. Asai (3), B. Huot (4), S. He (4), K. Shirasu (3) (1) RIKEN Center for Sustainable Resource Science, Japan; (2) Graduate School of Environmental and Life Science, Okayama University, Japan; (3) RIKEN Center for Sustainable Resource Science, Japan; (4) Department of Energy Plant Research Laboratory, Michigan State University, U.S.A.
- P18-677 Proteomic characterization of plant immune complexes using proximity-based BioID. M. KHAN (1), D. Desveaux (1), R. Subramaniam (2) (1) University of Toronto, Canada; (2) Agriculture and Agri-Food Canada, Canada
- P18-678 Crosstalk between SA-mediated and ABA-mediated signaling pathways in tomato plants.. M. KUSAJIMA (1), Y. Okumura (1), H. Nakashita (1) (1) Fukui Prefectural University, Japan
- P18-679 The role of Clathrin-coated vesicle networks in plant innate immunity against bacterial infection. E. LAMONTAGNE (1), C. Collins (2), A. Clarke (1), A. Heese (1) (1) University of Missouri, U.S.A.; (2) University of Wisconsin-Madison, U.S.A.; (3) University of Missouri, U.S.A.
- P18-680 Wheat homologues of BAK1 contribute to basal resistance against *Zymoseptoria tritici* and *Fusarium graminearum*. W. LEE (1), J. Rudd (1), K. Hammond-Kosack (1), K. Kanyuka (1) (1) Rothamsted Research, United Kingdom
- P18-681 A Role of the *FZL* gene in regulating cell death and defense in *Arabidopsis*. H. LU (1), A. Tremblay (1), S. Seabolt (1), H. Zeng (2), S. Boeckler (3), D. Tate (1), T. Dong (1), N. Yao (2), B. Westermann (3) (1) University of Maryland Baltimore County, U.S.A.; (2) School of Life Sciences, Sun Yat-sen University, China; (3) Institut für Zellbiologie, Universität Bayreuth, Germany

- P18-682 Differential Roles of Two Homologous Cyclin-Dependent Kinase Inhibitor Genes in Regulating Cell Cycle and Innate Immunity in Arabidopsis. H. LU (1), S. Hamdoun (2), C. Zhang (1), M. Gill (1), N. Kumar (3), M. Churchman (3), J. Larkin (3), A. Kwon (1) (1) University of Maryland Baltimore County, U.S.A.; (2) University of Maryland Baltimore County, U.S.A.; (3) Louisiana State University, U.S.A.
- P18-683 The circadian clock component LUX ARRHYTHMO regulates Arabidopsis defense through salicylic acid. H. LU (1), C. Zhang (1), N. Seitz (2), W. Angel (1), D. Lin (1), A. Hallworth (1) (1) University of Maryland Baltimore County, U.S.A.; (2) University of Maryland Baltimore County, Canada
- P18-684 Dual and opposing roles of xanthine dehydrogenase in defense-associated reactive oxygen species metabolism in Arabidopsis. X. MA (1), W. Wang (2), F. Bittner (3) (1) University of Maryland, U.S.A.; (2) Sichuan Agricultural University, China; (3) Braunschweig University of Technology, Germany
- P18-685 Detection of *Ramularia collo-cygni* from winter barley (*Hordeum vulgare*) using a quantitative real-time PCR. A. MÄE (1), P. Sooväli (2) (1) Estonian Crop Research Institute, Estonia; (2) Estonian Crop Research Institute, Estonia
- P18-686 Functional analysis of PAMP-responsive phosphoprotein MARK2. H. MATSUI (1), I. Yotsui (2), K. Maeda (3), G. Hyon (2), Y. Nomura (2), Y. Ichinose (4), H. Nakagami (5) (1) RIKEN CSRS / Okayama University, Japan; (2) RIKEN CSRS, Japan; (3) Faculty of Agriculture, Okayama University, Japan; (4) Graduate school of Environmental and Life Science, Okayama University, Japan; (5) RIKEN CSRS / MPIPZ, Japan
- P18-687 The Molecular Basis Behind the “Silver Bullet”: *mlo*-based Powdery Mildew Resistance. J. MILLER (1), N. Clay (1) (1) Yale University, U.S.A.
- P18-688 AQUAPORIN INTERACTING PROTEIN (AQI), a new regulator of cell death in plants. A. PFITZNER (1), E. Glink (1), K. Fischer (1), B. Neuhäuser (1), U. Ludwig (1) (1) Universitaet Hohenheim, Germany
- P18-689 Global transcriptome and metabolome analyses reveal a key role for jasmonate and lignin biosynthetic pathways in soybean resistance to *Sclerotinia sclerotiorum*. A. RANJAN (1), D. Smith (1), M. Kabbage (2) (1) University of Wisconsin Madison, U.S.A.; (2) University of Wisconsin, U.S.A.
- P18-690 Extracellular vesicles isolated from the apoplast of Arabidopsis leaves carry stress-response proteins. B. RUTTER (1), R. Innes (1) (1) Indiana University, U.S.A.
- P18-691 Mitogen-activated protein kinases (MAPK) activation post effector recognition in tomato.. A. SHEIKH (1) (1) School of Life Sciences, University of Warwick, United Kingdom
- P18-692 Comparative & functional genomics of plant innate immunity using the moss *Physcomitrella patens* as a model. S. STANIMIROVIC (1), M. Petersen (1), J. Mundy (1) (1) University of Copenhagen, Department of Biology, Denmark
- P18-693 MAPK-targeted VQ-proteins: Novel modulators of plant immune responses. M. WEYHE (1), P. Pecher (2), L. Eschen-Lippold (1), D. Scheel (3), J. Lee (1) (1) Leibniz Institute of Plant Biochemistry, Germany; (2) John Innes Centre, United Kingdom; (3) Leibniz Institute of Plant Biochemistry, Germany
- P18-694 The role of Mono- and Digalactosyldiacylglycerol Lipids in Regulating Systemic Acquired Resistance in Plants. Y. XIA (1), Q. Gao (2), K. Yu (3), B. Shan (3), C. Wang (4), D. Navarre (5), A. Kachroo (6), P. Kachroo (6) (1) University of Kentucky (Ohio State University Current), U.S.A.; (2) University of Kentucky (USDA-ARS NCSL Current), U.S.A.; (3) University of Kentucky, U.S.A.; (4) Qingdao Agricultural University, China; (5) USDA-ARS & Washington State University, U.S.A.; (6) University of Kentucky (Corresponding author), U.S.A.
- P18-695 Molecular Characterization of the Broad-Spectrum Resistance to Powdery Mildew Conferred by the *Stpk-V* Gene from the Wild Species *Haynaldia villosa*. L. XING (1), C. qian (2), A. cao (1), J. xiao (1), X. wang (1), P. chen (1) (1) National Key Laboratory of Crop Genetics and Germplasm Enhancement , Nanjing Agricultural University/JCIC-MCP, China; (2) Laboratory of Forage Breeding, Institute of Animal Science, Jiangsu Academy of Agricultural Sciences, China
- P18-696 Conservation of chitin-induced MAPK activation mechanisms between rice and Arabidopsis. K. YAMADA (1), K. Yamaguchi (1), A. Terauchi (1), K. Ishikawa (1), T. Kawasaki (1) (1) Dept. Adv. Biosci. Kindai Univ, Japan
- P18-697 Identification of infection-specific proteins produced in Japanese birch plantlet No.8 infected with *Inonotus obliquus* strain IO-U1. S. YOKOTA (1), S. Iizuka (2), J. Ohshima (2), F. Ishiguri (2) (1) Utsunomiya University, Japan; (2) Utsunomiya University, Japan
- P18-698 Stress induces the accumulation of beta-aminobutyric acid (BABA) in plants. I. BACCELLI (1), D. Thevenet (1), A. Balmer (1), V. Pastor (1), A. Vallat (1), R. Neier (1), G. Glauser (1), B. Mauch-Mani (1) (1) University of Neuchâtel, Switzerland
- P18-699 Regulatory DNA elements in the primed systemic immunity of *Arabidopsis thaliana*. E. REIMER-MICHALSKI (1), S. Baum (1), A. Bolger (2), B. Usadel (2), V. Benes (3), U. Conrath (1) (1) Department of Plant Physiology, RWTH Aachen University, Germany; (2) Department of Botany and Molecular Genetics, RWTH Aachen University, Germany; (3) Genomics Core Facility, EMBO Laboratories, Germany

- P18-700 Underground AZA priming against pathogens. S. ROYCHOUDHRY (1), N. Cecchini (2), J. Greenberg (1) (1) University of Chicago, U.S.A.; (2) University of Chicago, U.S.A.
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- P19-708 Using the lens of molecular plant-microbe interactions to uncover the pathways of plant parasitization by the parasitic weed *Phelipanche aegyptiaca* (broomrape). C. CLARKE (1), J. Westwood (1) (1) Virginia Tech, U.S.A.
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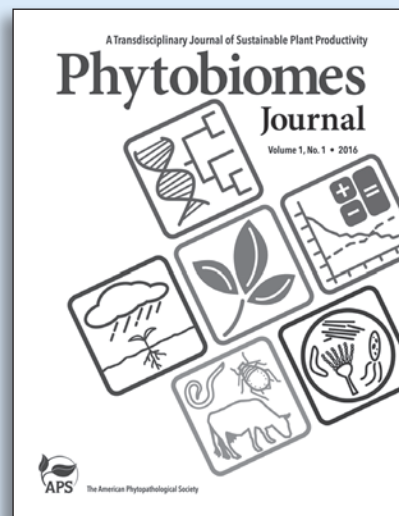


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