IS-MPMI Reporter
International Society for Molecular Plant-Microbe Interactions
Issue No. 2, 2011

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**Mark Your Calendars for the XV International Congress on MPMI in 2012**

**Early Registration/Abstract Submission**
December 7, 2011

**Abstract Submission Deadline**
April 17, 2012

**XV International Congress on MPMI**
July 29–August 2, 2012

## XV International Congress on MPMI Moves to July 2012

Due to concern regarding the earthquake in Japan, the IS-MPMI Board of Directors, International Advisory Committee, and the Asian and National Organizing Committees made the decision to postpone the XV Congress until 2012. The new dates for the congress are July 29–August 2, 2012, and it will be held in the original location of Kyoto, Japan, at the Kyoto International Conference Center.

Kyoto was not damaged by the earthquake, nor is it vulnerable to the potential nuclear issues with the damage to the power plant in Fukiyama. Regardless, the number of scientists registering for the congress as planned in July was unusually low, presumably due to concerns regarding the earthquake and the destruction in much of Japan. With lower registration rates, some major financial difficulties could have been realized given the contracts that are held with the Kyoto International Conference Center. It was therefore decided that holding the congress on its original date was no longer an option for IS-MPMI.

Initial discussion involved moving the congress to a November date, much like what was done in 2005 after Hurricane Emily damaged much of Cancun and the plans for that congress. However, the conference center did not have dates available at that time. For financial reasons, it is best to keep the congress in Kyoto at the Kyoto International Conference Center. Therefore, leadership needed to look at 2012 as an option. Fortunately, July 29–August 2 was available, which is during the typical time of year that IS-MPMI meets.

We apologize for this inconvenience. The congress organizers can fully refund registration fees and charges for the congress dinner, excursion, and hotel room reservations, which were paid for through the congress website. Visit http://mpmi2011.umin.jp for contact information.

Your patience and support is greatly appreciated. ■

## *MPMI* Journal Editors Participate in CrossCheck Software Pilot Project

*Molecular Plant-Microbe Interactions* (*MPMI*) and other APS journals are valued for the quality of the articles and the integrity of the science. Nevertheless, over the past several years, editors have discovered a few instances of plagiarism in submitted manuscripts. To monitor how well authors comply with the APS Journals Publication Ethics Statement (http://apsjournals.apsnet.org/page/Ethics_Statement), the APS Publications Board approved the use of CrossCheck software available through Manuscript Central to check manuscripts for freedom from plagiarized material. Other academic journals use this practice. Results of this pilot project will be on the agenda at the Publications Board's August meeting and publicized thereafter in the *IS-MPMI Reporter*. Gary Stacy, editor-in-chief of *MPMI* and an IS-MPMI member, serves on the APS Publications Board. ■

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## IS-MPMI *Reporter*

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***IS-MPMI REPORTER* DEADLINE**

**The deadline for submitting items for the next issue is August 26, 2011.**

Share your news, accomplishments, and upcoming meeting details with your colleagues. Submit articles, announcements, and any ideas you may have for the next issue. You can send an e-mail (ismpmireporteredit@scisoc.org) or submit your item online (www.ismpminet.org/newsletter/submissionform.asp).

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Felice Cervone, President

# A Letter from the President

This is my last message in the *Reporter* as president of IS-MPMI; the next issue will host instead a message from the new president, Sophien Kamoun. It has been for me a great honor to represent IS-MPMI in the past two years. Our community has celebrated its 20th anniversary and it has been a great pleasure to be on the front line monitoring the continuous progress and the excellent contribution that our society has given to plant science and sustainable agriculture in these 20 years.

Unfortunately, the last months of my presidential duty were sorrowful because of the earthquake and tsunami in Japan and the subsequent nuclear power plant crisis. These events heavily hit Japan, our Japanese colleagues, and our society, which was going to celebrate in Kyoto one of the most important events, the XV International Congress on Molecular Plant-Microbe Interactions. Chair Ko Shimamoto and the Organizing Committee of the XV IS-MPMI Congress have been doing tremendous work organizing an exciting congress this August. However, although Kyoto is not affected by the disaster and life is reported to be quite normal there, scientists outside Japan may feel uncomfortable travelling to Japan nowadays and the number of registrations and abstract submissions has so far been very low compared with those of past IS-MPMI congresses. A low participation seriously affects the success of the congress and may cause a heavy financial loss. The organizers therefore, with the support of the society, decided to postpone the congress until the summer of 2012. The 2012 congress will be held in the same place, i.e., Kyoto, and I am sure that next year we will have the enthusiastic attendance of many participants.

The society is aware that this decision causes some inconvenience, especially to those who have already purchased their tickets to Japan. A similar situation occurred in Mexico, where the planned congress had to be cancelled twice. We are powerless in front of emergencies arising from such unexpected disasters; but we strongly encourage the organizers to continue their work and their efforts to prepare an even more exciting congress next year. I encourage Ko to keep on working against the adversities and look forward to meeting him next year in Japan, as do many members of my lab. I look forward to your massive participation at the Kyoto congress next year to give further support to our science and to our society as you did in Mexico.

I would like to finish this message with some of the words written by the editor of ICO News, RIKEN Global Relations Office, which I had the opportunity to read recently: “Here at the Wako campus, the cherry trees are just starting to bloom. After the great earthquake and tsunami and the subsequent nuclear crisis it is hard to believe that spring has come just as it does every year. Life at RIKEN, and for most of us who reside here, is very much back to normal. For those of you who have left Japan temporarily, we hope to see you here again soon.” ■

## Meet IS-MPMI Members

IS-MPMI's diverse membership spans the globe and includes professionals who have been in their field for decades, as well as those who are just starting out. To help members learn more about their colleagues, the *IS-MPMI Reporter* includes profiles of randomly chosen members at different career stages.

Peter M. Gresshoff

### Distinguished Member

**Peter M. Gresshoff**
ARC Centre of Excellence for
Integrative Legume Research
University of Queensland
St. Lucia, Brisbane, Australia

My education started with my mother in Berlin, schoolteachers like Fraeuleins Buchwald and Henschel, and teachers at the Schulfarm Insel Scharfenberg. Emigrating from Berlin, I studied biochemistry and genetics at the University of Alberta. Who could forget the genetics lectures of John Kuspira or discussing genetics with Phil Hastings, who got me into plants, albeit it was *Chlamydomonas?*

I went to the Australian National University (ANU) in Canberra in 1970 for my Ph.D. degree, which dealt with translational biology. We wanted to apply microbial techniques to whole plants. I published the first plant regeneration of *Arabidopsis* in 1972. Having cell cultures of genetically amenable species, we attempted early gene transfer experiments and coined the term "transgenosis."

With Barry Rolfe and John Shine, we developed the agar plate method for screening transposon-induced mutants (Rolfe et al., 1980, *Plant Sci. Lett.*) and then cloned the first bacterial symbiosis gene (Scott et al., 1982, *J. Mol. Appl. Genet.*; a now-defunct journal). This teaches you to pick the correct journal!

I progressed onto plant components that control nodulation. By the early 1980s, the literature described clover variants and one naturally occurring soybean nonnodulator, but none was based on a *Drosophila*-type mutagenesis. My opportunity came in 1981 when Agrigenetics Corporation sponsored induced mutagenesis and selection of nodulation mutants in soybean. Concurrently, I was tenured at ANU, which meant focusing on long-term questions. David Day, David McNeil, Dean Price, Angela Delves, and many outstanding honors and post-graduate students. By 1985, we published the first supernodulation and nonnodulation mutants of soybean (Carroll et al., 1985, *Plant Physiol.*; *PNAS*).

Significantly, we discovered that the phenomenon of supernodulation was associated with nitrate tolerance. By 1986, Delves discovered that supernodulation, caused by the absence of autoregulation of nodulation (AON), was shoot-controlled (Delves et al., 1986, *Plant Physiol.*). This publication has been selected as a top 25 citation classic (Ferguson, 2010, *Plant Physiol.*) Much of my thinking then was influenced by the late Dietz Bauer.

Using split root experiments, we further demonstrated that the supernodulation circuit was systemic. These discoveries allowed the proposal of the AON circuit in 1986 (Gresshoff and Delves, 1986; *Plant Gene Res.*), including the concept of a root-derived signal, called Q, and the shoot-derived inhibitor (SDI). This model is still current.

In 1988, I moved to the University of Tennessee. With Gary Stacey, Beth Mullins, Fred Allen, and Dan Roberts, we formed the Center for Legume Research and organized the 1990 International Congress of Nitrogen Fixation and the 1996 IS-MPMI Congress.

In Knoxville, I employed Gustavo Caetano-Anollés. He, together with Artem Men, Alexander Kolchinsky, Roel Funke, Tara Sutherland, Brant Bassam, James Bond, Ray McDonnell, Qunyi Jiang, Debbie Landau-Ellis, and Sieglinde Angermüller, were instrumental in pushing us forward toward the eventual characterization of the supernodulation (*GmNARK*; then called *nts*) gene.

That cloning came from the collaboration with Bernard Carroll. I had returned to the University of Queensland in 1999, and Artem Men and Sandra Laniya joined with Iain Searle and Carroll to discover that *nts* represented a lesion in a leucine-rich repeat (LRR) receptor kinase gene (*GmNARK*) with structural similarities to *Arabidopsis* CLAVATA1 (Searle et al., 2002, *Science*). Independently, Jens Stougaard and Masayoshi Kawaguchi cloned the *har1* gene of *Lotus japonicus*. Their head-to-tail papers in *Nature* (2002) instantly confirmed the concept that a CLV1-like receptor was involved in long-distance nodule regulation.

Our current research focus is on the signals that interact with the NARK receptor, and its downstream signaling. We found two CLAVATA3-like peptides (RIC1 and 2) that are *Bradyrhizobium*-induced that completely suppress nodulation of soybean when axenically overexpressed in transgenic roots. This suppression is not seen when using a *NARK*-deficient background (Reid et al., 2011, *MPMI*). Similar data came from *Lotus* (Kawaguchi's group) and *Medicago* (Goormachtig's group). We also found a nitrate-induced CLE peptide (GmNIC1), which acts locally via *GmNARK* expression in the root. Perhaps we now have an explanation why AON-deficient mutants also have nitrate tolerance of nodulation.

Using a novel petiole feeding method (Lin et al., 2011, *Nat. Protoc.*), Yu-Hsiang Lin was able to extract aqueous fractions from *Bradyrhizobium*-inoculated wild-type soybean leaves, feed them through a cut petiole, and suppress supernodulation. Of interest was the fact that

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corresponding extracts from *GmNARK* mutant leaves or uninoculated wild type failed to suppress (Lin et al., 2010, *New Phytol.*).

I would like to reflect on the birth of the society (IS-MPMI) and its journal *Molecular Plant-Microbe Interactions* (*MPMI*). It all started from the early work on *Rhizobium* and *Agrobacterium*, the two important organisms that opened the doors of molecular biology in plants and other plant-associated bacteria and fungi. During the International Congress of Nitrogen Fixation, organized by Alan Gibson and Bill Newton in Australia, several of us sat around the dinner table; the group was lead by Desh Pal Verma and Alf Pühler. Fred Ausubel, Andy Johnson, Barry Rolfe, John Shine, John Beringer, Sharon Long, the late Christina Kennedy, and I were there. We realized that the emerging power of molecular genetics is equally applicable to symbiotic and pathogenic interactions. It was decided to form a molecular plant-microbe interactions (MPMI) group!

Pühler agreed to run the first MPMI meeting in Bielefeld, Germany, and the "young bucks claimed their new territory." Following another meeting at Cornell, Verma organized a gathering of all "nitrogen-fixers and non-fixers" at McGill University, where we formed the International Society of Molecular Plant-Microbe Interactions (IS-MPMI). Verma (now in Ohio) became the founding president of IS-MPMI.

Verma had connections with The American Phytopathological Society and explored the possibility of a journal, which gave birth to *MPMI*.

While most of the molecular work in this field began with *Rhizobium* and *Agrobacterium*, the major breakthrough in plant molecular biology came from the discovery of host-specific plant genes (Nodulin genes) responsible for building symbiosis with *Rhizobium* (Verma in Montreal, Marcker in Aarhus, and Bisseling in Wageningen).

Looking back at it all, I wonder whether there are "young bucks" now, who look at us "older" gentlemen and ladies of the molecular plant-microbe interaction field who feel secretively that there is a time for another quantum jump!!! Perhaps there is?

## Post-Doctoral/Early Career Member

Milena Roux

**Milena Roux**
University of Copenhagen
Copenhagen, Denmark

I grew up in Johannesburg, South Africa, where I completed my master's degree at the University of Johannesburg in the lab of Ian Dubery. The project fostered in me a keen interest in plant defense responses and led to my application for the international rotation Ph.D. program at the John Innes Centre, Norwich, United Kingdom. I was accepted and did a rotation year featuring three different projects in three labs during 2006 and ultimately joined the lab of Cyril Zipfel at The Sainsbury Laboratory (TSL) in 2007 for the remainder of my Ph.D. degree. My thesis was focused on the in planta identification of interacters of elongation factor (EF-Tu) receptor (EFR), which is responsible for detection of the pathogen-associated molecular pattern (PAMP) EF-Tu in *Arabidopsis*. TSL is a great place for science, and I had a very fulfilling experience working there. The density of research on plant-microbe interactions creates a perfect environment for nurturing ideas and productivity, and I really developed as a scientist. In 2010, I was fortunate to meet my current boss at a conference. In January 2011, I started as a post-doc in the laboratory of Morten Petersen and John Mundy at the Biocentre of the University of Copenhagen. I have remained in the area of plant-microbe interactions, as I find this field most exciting. I am learning new approaches while characterizing MAP kinase 4-associated proteins and mapping a lesion mimic suppressor mutant.

I joined IS-MPMI in 2006 and I attended the meetings in Sorrento and Quebec. It has been very useful to be a member of the society and meet others in the same field to gain contacts and exchange ideas. As a student, the society helped me to be aware of the work other scientists in the field are doing and to meet colleagues and friends. ■

## Uncovering the Mycorrhization Signal

*Below is an interview with Fabienne Maillet, Véréna Poinsot, and Olivier André on their article "Fungal lipochitooligosaccharide symbiotic signals in arbuscular mycorrhiza," recently published in* Nature *(Maillet, F., Poinsot, V., André, O., et al., 2011, Nature 469:58-63).*

**Q: When did the study start (was it all completely planned from the beginning, did some unexpected findings play a role, where did ideas come from)?**

From left to right and top to bottom: Virginie Puech-Pages, Alexandra Haouy, Fabienne Maillet, Véréna Poinsot, Guillaume Bécard, Monique Gueunier, Olivier André, and Jean Dénarié.

**A:** While the "Myc factor" project actually started in 2006, the driving idea dates back to the characterization of Nod factors in the 1990s. Indeed the chitin structure of Nod factors was surprising; these signals were neither usual bacterial metabolites, nor plant hormones, but looked like fungal metabolites, leading to the hypothesis that rhizobia use a symbiotic signal of fungal evolutionary origin.

From 2000, the use of model legumes showed the existence of a mycorrhization signaling pathway sharing common proteins with the Nod pathway and activated by diffusible fungal signals. Since 2000, the LIPM lab has had a fruitful collaboration with the EMD Crop Bioscience Company, world leader for the production of legume inoculants. This led to the development of inoculants enriched in Nod factors. As a result, this company agreed to cofinance the Myc factor project.

**Q: What is the composition of the group involved (Ph.D. students, post-docs, other collaborators, nationalities, atmosphere during the work)?**

**A:** The project was carried out by three French research groups. Jean Dénarié's group (LIPM, UMR2594/441) developed and performed the biotests. Guillaume Bécard's group (LRSV, UMR5546) contributed to the mycorrhization studies. Véréna Poinsot's group (IMRCP, UMR5623) purified and characterized active molecules. The hard core of the group consisted of three researchers and four research assistants and met frequently to coordinate the diverse interdisciplinary contributions.

**Q: What were the big stumbling blocks? How did you manage to get them out of the way (if any)?**

**A:** The working hypothesis was that Myc factors would be lipochitooligosaccharides (LCOs), like Nod factors. The first step was therefore to try and identify LCOs in mycorrhizal material. In order to have large quantities of mycorrhized root exudates, we bought by-products of commercial mycorrhizal inoculants. The purification and characterization processes were very difficult because of the presence of gelling agents, but the quantities (300 liters) were sufficient to start structural studies, essentially based on mass spectrometry. The very sensitive and efficient separation technologies (UPLC/Q-ToF and Q-Trap) available in the technological platforms in Toulouse enabled us to detect nanomolar quantities of LCOs in complex mixtures and to prove their fungal origin by analyzing strictly fungal exudates and noninoculated root exudates as controls. Next, in order to study the biological effects of Myc-LCOs, and because of the low level of Myc-LCOs produced by fungi, we contacted Hugues Driguez's group (CERMAV, Grenoble). These experts in LCO synthesis agreed to synthesize milligram quantities of the Myc-LCOs rapidly. This enabled us to obtain very exciting results on the stimulation of mycorrhization in legumes and nonlegumes and root-branching stimulation in *Medicago truncatula*.

The last step was the study of the Myc-LCO perception and signaling pathway. We chose to use the *Medicago truncatula* root-branching assay because of the availability of a series of mutants of the Myc/Nod signaling pathways. However the structural similarity between sulfated Myc-LCOs and *Sinorhizobium meliloti* Nod factors gave us a lot of work and brainstorming to distinguish Myc and Nod pathways.

**Q: Any great exciting moments? Any downs and how did you get over them?**

**A:** At the beginning of this project, we experienced a lot of frustration and failure, but there was always someone ready to motivate the others and to help overcome the difficulties. The working atmosphere was sometimes electric during moments of doubt, but enthusiastic when we started getting key results.

The presence in Toulouse of diverse and complementary expertise and powerful technologies were determinant for the identification of these signal molecules involved in the molecular dialog between the partners of the arbuscular mycorrhizal symbiosis. We are very happy to

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**Uncovering the Mycorrhization Signal** *continued from page 5*

have contributed to a new chapter of a nice evolution story between two root endosymbioses: a very ancient and widespread one (more than 400 million years old) and a much younger (65 million years old) and sophisticated symbiosis restricted to the legumes.

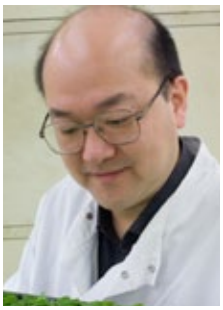
**Q: What's next?**

**A:** The characterization of these Myc factors opens many questions: namely their perception and transduction (Myc receptor[s] and specific Myc signaling components), the activity of different structures of Myc-LCOs (e.g., sulfated and nonsulfated), the characterization of other arbuscular mycorrhizal fungal LCOs, the study of the effect of Myc-LCOs in root development, and arbuscular mycorrhizal colonization in both dicots and monocots. As we say in French "*Il y a du pain sur la planche!*" ■

## A Look into the Recent Research of Fan and Crooks on Disease Resistance in *Arabidopsis* Mediated by Secondary Metabolites and Complementary Disabling Mechanisms in the Pathogen

*Below is an interview with Jun Fan and Casey Crooks on their recently published work, "Pseudomonas sax genes overcome aliphatic isothiocyanate–mediated non-host resistance in Arabidopsis" (Fan, J., Crooks, C., et al., 2011, Science 331(6021):1185-1188).*

**Q: When did the study start (was it all completely planned from the beginning, did some unexpected findings play a role, where did ideas come from)?**



Jun Fan

Casey Crooks

**A:** The project started some time ago back at the Salk Institute. It was shortly after the heyday of many discoveries in major *R* gene-mediated resistance and we were trying to find some means to genetically look into nonhost resistance. We were thinking of adaptive versus innate immunity in animal systems and sought to illicit responses with nonhost bacteria using high doses of nonhost bacteria and purified LPS and were considering flagellin when we noticed that *Arabidopsis* seemed fundamentally more toxic to nonhost bacteria. That's when we started focusing on extracts, and the notion of using them for a host bacteria library screen in *E. coli* soon came into play. From there, the steps were pretty straightforward until we got to the point where there seemed to be significant redundancy in the *sax* system.

**Q: What is the composition of the group involved (Ph.D. students, post-docs, other collaborators, nationalities, atmosphere during the work)?**

**A:** Chris Lamb led the project up until his death in 2009. The group consists of post-doctoral and faculty scientists from America, China, Germany, and the United Kingdom. The project started at the Salk Institute and migrated with Chris to Edinburgh and then the John Innes Centre. It was a very easy-going collaborative effort. The multinational makeup of the group (and multiple locations) made for plenty of fun, a few extra holidays, and a special focus on the World Cup.

**Q: What were the big stumbling blocks? How did you manage to get them out of the way (if any)?**

**A:** The major source of problems arose from the redundancy in ITC/*sax* interactions between *Arabidopsis* and pathogenic *Pseudomonas*. Early tests had shown that extracts from plants deficient in 4-MSB ITC were as inhibitory as Col-0 to *E. coli*, which initially led us to assume something else was conferring this antimicrobial activity. Once we identified the detoxifying *sax* operon, we found it provided resistance to a broad panel of purified ITCs, which clarified that point. However, when we knocked out the detoxifying operon, it had a very limited impact on bacterial growth when confronted with ITCs. This layer of redundancy in ITC resistance proved confounding and required us to use a high-throughput, luminescence-based assay we had developed to perform iterative rounds of loss-of-function transposon mutagenesis. Unfortunately, however, the cumulative mutant (Δ*saxAB/F/D/G*) showed only marginal growth defects when conventional growth assays were performed at an early stage of disease development in fully expanded leaves of 4- to 5-week-old plants. After numerous trials, we finally discovered that, in young leaf discs from Col-0 plants, bacterial populations of Δ*saxAB/F/D/G* mutant were wiped out at a later stage of infection and after disease symptom had developed. These observations not only revealed the defensive role of ITCs but also indicated that this layer of defense is developmentally regulated and that it is effective in disrupted tissues.

**Q: Any great exciting moments? Any downs and how did you get over them?**

**A:** We were excited when we found the growth defect of Δ*saxAB/F/D/G* mutant in *Arabidopsis* young leaf discs but had difficulty persuading others this was relevant in planta to restrict true nonhost bacteria. Driven by these criticisms, we significantly expanded the investigation into many more bacteria along with the complementation work to make the results more convincing.

**Q: What's next?**

**A:** Many interesting questions could be asked based on this study. Why is the *sax* operon kept by many crucifer-pathogenic bacteria while the MDR pumps already provide protection? How is glucosinolate degradation triggered by bacterial infection? What are the targets of ITCs in bacteria? And finally, this study implied that other components in addition to ITCs are also important for *Arabidopsis* nonhost resistance to bacterial infection; what are they and how are they coordinated? ■

## "Surprise Finding" Leads to Breakthrough for Researchers Chanda and Xia

*Below is an interview with Bidisha Chanda and Ye Xia on their recent publication, "Discovering glycerol-3-phosphate as systemic signal for resistance in Arabidopsis" (Nat. Genet., 2011, 43:421-427).*

**Q: When did the study start (was it all completely planned from the beginning, did some unexpected findings play a role, where did ideas come from)?**


The P & A Kachroo Labs

**A:** The study really wasn't a part of the mainstream projects in the laboratory. A surprise finding obtained during experiments related to glycerolipid-derived defense signaling led to the initiation of this work. Needless to say, it was a significant "burden" on both our schedules. And oh, what a great one it turned out to be!

But for Pradeep's keen scrutiny, the initial findings could just as easily have been written off as failed experiments. It all started because we were working on an NSF-funded project in the lab that relates to the role of glycerol metabolism in defense to hemibiotrophic pathogens. It was quite a struggle to get that project funded in the first place, but the foresight of Program Manager Michael Mishkind eventually enabled the research that led to the initiation of this work.

**Q: What is the composition of the group involved (Ph.D. students, post-docs, other collaborators, nationalities, atmosphere during the work)?**

**A:** This work was the result of the combined and enthusiastic efforts of graduate students, post-doctoral fellows, research associates, and PIs alike. Keshun's (Yu) fatty acid/lipid chemistry know-how, Mihir's (Mandal) biochemical analyses, and Qing-Ming's (Gao), Ken's (Sekine), and Dev's (Selote) SAR-related work all helped advance this research rapidly and efficiently. Of course, none of this would've been possible without valuable assistance from our unsung heroes—Ludmila Lapchyk (lab manager) and her troupe of undergraduate assistants (Hilda Guerra, Steven Bliss, and Wesley McSparin)—who prepared laboratory material and transplanted and genotyped thousands of plants for us, as well as Amy Crume who manages our plant growth facilities, waters plants, and tirelessly prepares countless trays for sowing. Valuable assistance from the Statistics Department (University of Kentucky) and Washington State University also contributed to this work.

**Q: What were the big stumbling blocks? How did you manage to get them out of the way (if any)?**

**A:** There were many pitfalls. Some trivial ones, such as failed pathogen infections, problems with culture media, etc., were easily solved. Others were more significant, such as resolving G3P on TLCs, obtaining sufficient purified DIR1, exudate-related experiments, and so on. The most memorable stumbling blocks were related to the detection and subsequent resolution of G3P (and derived metabolites) in the systemic tissues. Pradeep's "out-of-the-box" ideas, Aardra's suggestions, and Keshun's technical expertise really helped resolve this. Mihir worked hard at obtaining DIR1 and determining its subcellular location.

**Q: Any great exciting moments? Any downs and how did you get over them?**

**A:** It was an intense but exciting period involving odd-hour meetings, e-mails, and phone conversations when "ideas" happened. The core group involved in the research met once, often twice, a week to discuss results, troubleshoot, or simply brainstorm. We begged and borrowed plants and chamber space from our very gracious lab mates. All of us pressed on through weekends, late nights, skipped meals, nightmares of failed experiments, and on occasion, severe weather. Exciting moments such as the very first observation of G3P-derived induction of SAR, the resolution of G3P-related bands on TLC, and the symplastic localization of DIR1 and its correlation with the systemic movement of G3P really kept us going. The "light at the end of the tunnel" appeared when we received the first reviews of our work. This was also crunch time when everyone, and we truly mean

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**Surprise Finding Leads to Breakthrough** *continued from page 7*

EVERYONE in the lab pitched in to make things happen. We do thank the editors and reviewers who made the publication of this work possible.

**Q: What's next?**

**A:** Summer ("aka" Ye): Since the acceptance of this work, I have successfully graduated from the plant pathology program and am now a post-doctoral researcher in another laboratory. Although my post-doctoral work does not directly involve plant pathogenesis, I remain extremely excited about G3P and its role in plant defense.

Bidisha: I continue to work toward my Ph.D. degree and explore the pathways via which G3P mediates plant defense. The next, most important step for this particular project is the identification of the G3P derivative that is translocated to the systemic tissues, its precise relationship to DIR1, the specific combined effects of DIR1-G3P derivative in the systemic tissue, and how the plant cuticle contributes to the "perception" of this signal. ■

## *Botrytis-Sclerotinia* Post-Genome Workshop in France

The availability of annotated *Botrytis cinerea* and *Sclerotinia sclerotiorum* genome sequences has brought these two phytopathogenic fungi into the post-genomic era. To gather our scientific communities around new experimental approaches and strategies for capitalizing on these genomic resources, we are organizing a *Botrytis-Sclerotinia* Post-Genome Workshop (BSPGW) in Lyon, France, in September. This workshop will provide the opportunity to establish new contacts and participate in scientific exchanges on all aspects of *Botrytis* and *Sclerotinia* biology. This will include "-omic" technologies, post-genomic functional analyses, comparative genomics, and molecular tool advances. Host-pathogen interactions will be given particular attention and molecular studies on the host side are encouraged as well.

We invite you to participate in this workshop by submitting abstracts for oral or poster sessions. Please stay informed of organizational details through the workshop website (http://bspgw2011.univ-lyon1.fr/en) and join us September 15–17, 2011, in Lyon! ■

## Hemipteran-Plant Interactions Symposium, July 11–14, 2011

The Hemipteran-Plant Interactions Symposium will be held in Piracicaba, SP, Brazil, July 11–14, 2011. This is an interdisciplinary conference designed to bring together plant physiologists/molecular biologists and entomologists interested in the feeding behavior of phytophagous hemipterans, the plant physiological and molecular responses to their feeding, and how the physiology of the plant tissues being fed upon (e.g., phloem, xylem, parenchyma) affect hemipterans that specialize on these plant tissues. The conference will also include the latest findings on the mechanisms of transmission of plant pathogens by hemipteran vectors. The goal of the conference is to foster a greater degree of interdisciplinary understanding and collaboration among researchers from different fields of biology who share a common interest in the interactions between hemipteran feeding behavior, plant physiology, and plant pathogens. Partial travel support is available with priority for students, post-docs, and new investigators! For more details and a list of invited speakers, visit www.infobibos.com/Hemipteran/index.html. ■

## Biotechnology Havana 2011—November 28–December 3, 2011

The meetings on biotechnology, organized by the Center for Genetic Engineering and Biotechnology (CIGB) of Havana, Cuba, are devoted to the agricultural applications of modern biotechnologies. The environment at CIGB and the opportunities for scientific exchange will reward the efforts of those wishing to attend from many countries all over the world. At the congress, there is a symposium on molecular plant-pathogens interaction, covering the plant immune system, mechanisms involved in pathogen virulence, mechanisms related to plant resistance, and the application of plant-pathogen interaction studies in order to find plant disease resistance.

The main confirmed speakers include Jean-Pierre Metraux, Bart Tomma, Ryohei Terauchi, Paul Birch, Sophien Kamoun, Cyril Zipfel, Felice Cervone, Giulia de Lorenzo, Jonathan Walton, Peter Waterhouse, Brian J. Staskawicz, Roger Innes, and Petra Epple. We hope you will spend a very fruitful time in Havana in November. Visit http://bh2011.cigb.edu.cu for more information. ■


## APS-IPPC Joint Meeting, August 2011

The American Phytopathological Society (APS) and the International Association for Plant Protection Sciences (IAPPS) will join forces August 6–10, 2011, in Honolulu, Hawaii, for a multidisciplinary meeting of two premier professional plant science associations. More than 1,200 abstracts will be presented at the meeting as posters and oral technical presentations. Attendees represent more than 45 countries worldwide! The international and scientific diversity of attendees ensures many unique perspectives will be presented.

Visit **www.apsnet.org/meet** for more information on this exciting meeting.

## People

**Presentation**

**Hemanth K. N. Vasanthaiah**, Center for Viticulture and Small Fruit Research, Florida A&M University, Tallahassee, FL, U.S.A., was invited to deliver two oral presentations on his research at the prestigious Plant and Animal Genome Conference held in San Diego, CA, U.S.A., January 9–13, 2010. This is one of the biggest and most recognized conferences in the world. He presented on "Transcriptome and proteome approach to unveil Pierce's disease-tolerance genes in grape and identification of molecular markers associated with low chill/heat tolerance in raspberry."

**Students**

In 2009–2010, the following students associated with the Netherlands Graduate School Experimental Plant Sciences (EPS) and participating in research on interactions between plants and biotic agents defended their Ph.D. theses. The EPS Graduate School is a collaborative research and teaching institution of Wageningen University (WU), Radboud University in Nijmegen (RU), Free University in Amsterdam (VU), Leiden University (LU), University of Amsterdam (UvA), and Utrecht University (UU).

**P. M. J. A. van Poppel.** The *Phytophthora infestans* avirulence gene *PiAvr4* and its counterpart *R4* in potato. F. Govers, P. J. G. M. de Wit (promoters); WU, Wageningen, 4 February 2009.

**U. Ellendorff.** Genome-wide investigation into roles of Arabidopsis receptor-like proteins in pathogen defense. P. J. G. M. de Wit (promoter); B. P. H. J. Thomma (copromoter); WU, Wageningen, 11 March 2009.

**I. de Bruijn.** Biosynthesis and regulation of cyclic lipopeptides in *Pseudomonas fluorescens*. P. J. G. M. de Wit (promoter); J. M. Raaijmakers (copromoter); WU, Wageningen, 31 March 2009.

**M. H. A. van Hulten.** Priming Arabidopsis for defense: Molecular and ecological aspects. C. M. J. Pieterse (promoter); J. Ton, S. C. M. van Wees (copromoters); UU, Utrecht, 8 April 2009.

**T. A. L. Snoeren.** Herbivore-induced indirect defense of Arabidopsis: Ecogenomic approach to the role of infochemicals in parasitoid attraction. M. Dicke (promoter); WU, Wageningen, 11 May 2009.

**G. Wang.** The role of receptor-like proteins in Arabidopsis development. G. C. Angenent, P. J. G. M. de Wit (promoters); B. P. H. J. Thomma (copromoter); WU, Wageningen, 13 May 2009.

**R. Aghnoum.** Basal resistance of barley to adapted and non-adapted forms of *Blumeria graminis*. R. G. F. Visser (promoter); R. E. Niks (copromoter); WU, Wageningen, 16 June 2009.

**H. A. Leon-Reyes.** Making sense out of signaling during plant defense. C. M. J. Pieterse (promoter); T. Ritsema (copromoter); UU, Utrecht, 8 July 2009.

**A. Kavalenka.** Modeling membrane protein structure through site-directed ESR spectroscopy. H. van Amerongen (promoter); M. A. Hemminga, J. Strancar (copromoters); WU, Wageningen, 30 September 2009.

**W. Jonkers.** The role of the F-box protein Frp1 in pathogenicity of *Fusarium oxysporum* f. sp. *lycopersici*. B. J. C. Cornelissen (promoter); M. Rep (copromoter); UvA, Amsterdam, 6 October 2009.

**E. J. Slootweg.** Structure, function and subcellular localization of the potato resistance protein Rx1. J. Bakker (promoter); A. Schots, A. Goverse (copromoters); WU, Wageningen, 23 October 2009.

**A. C. M. E. Agbicodo.** Genetic analysis of abiotic and biotic resistance in cowpea. R. G. F. Visser (promoter); G. C. van der Linden, C. Fatokun (copromoters); WU, Wageningen, 27 October 2009.

**R. F. Doorbos.** Analysis of rhizosphere bacterial communities in Arabidopsis: Impact of plant defense signaling. L. C. van Loon (promoter); P. A. H. M. Bakker (copromoter); UU, Utrecht, 23 November 2009.

**Ourania I. Pavli.** Molecular characterization of *Beet necrotic yellow vein virus* in Greece and transgenic approaches towards enhancing rhizomania disease resistance. J. M. Vlak, G. N. Skaracis (promoters); M. W. Prins (copromoter); WU, Wageningen, 11 January 2010.

**Kamila B. Koropacka.** Molecular contest between potato and the potato cyst nematode *Globodera pallida*: Modulation of Gpa2-mediated resistant. J. Bakker (promoter); A. Goverse (copromoter); WU, Wageningen, 5 February 2010.

**Inge R. M. Hanssen.** *Pepino mosaic virus*: An edemic pathogen of tomato crops. P. J. G. M. de Wit (promoter); B. P. H. J. Thomma (copromoter); WU, Wageningen, 19 March 2010.

**Yaite Cuesta Arenas.** Ethylene perception and NEP-like protein production by *Botrytis cinerea*. P. J. G. M. de Wit (promoter); J. A. L. van Kan (copromoter); WU, Wageningen, 17 May 2010.

**Mathieu Pel.** Mapping, isolation and characterization of genes responsible for late blight resistance in potato. R. G. F. Visser (promoter); H. J. van Eck (copromoter); WU, Wageningen, 21 May 2010.

**Sameer G. Joshi.** Towards durable resistance to apple scab using genetic modification of susceptible,

**People** *continued on page 10*

**People** *continued from page 9*

elite varieties with only resistance genes derived from apple itself. E. Jacobsen (promoter); H. J. Schouten (copromoter); WU, Wageningen, 27 May 2010.

**Klaas Bouwmeester.** The interplay between a *Phytophthora* RXLR effector and an Arabidopsis lectin receptor kinase. P. J. G. M. de Wit, F. Govers (promoters); WU, Wageningen, 31 May 2010.

**J. (Ko) Th. J. Verhoeven.** Identification and epidemiology of prospiviroids. J. M. Vlak (promoter); J. W. Roenhorst (copromoter); WU, Wageningen, 2 June 2010.

**Anoma A. Lokossou.** Dissection of the major late blight resistance cluster on potato linkage group IV. R. G. F. Visser, E. Jacobsen (promoters); WU, Wageningen, 7 June 2010.

**Nicolas Champouret.** Functional genomics of *Phytophthora infestans* effectors and *Solanum* resistance genes. E. Jacobsen, R. G. F. Visser (promoters); V. G. A. A. Vleeshouwers (copromoter); WU, Wageningen, 9 June 2010.

**John W. van 't Klooster.** The *Cladosporium fulvum* Avr2 protein behaves both as a virulence and an avirulence factor. P. J. G. M. de Wit (promoter); B. P. H. J. Thomma (copromoter); WU, Wageningen, 11 June 2010.

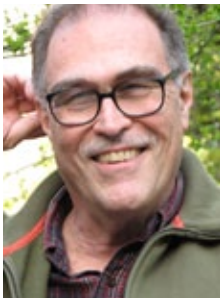
**Marcel C. van Verk.** WRKY transcription factors involved in salicylic acid-induced defense gene expression. J. Memelink, J. F. Bol (promoters); H. J. M. Linthorst (copromoter); LU, Leiden, 15 June 2010.

**Laurens P. N. M. Kroon.** The genus *Phytophthora*: Phylogeny, speciation and host specificity. F. Govers, P. J. G. M. de Wit (promoters); W. G. Flier (copromoter); WU, Wageningen, 16 June 2010.

**Estelle C. Verzaux.** Resistance and susceptibility to late blight in *Solanum*: Gene mapping, cloning and stacking. R. G. F. Visser, E. Jacobsen (promoters); WU, Wageningen, 17 June 2010.

**Esther Schnettler.** Viral counterdefense on RNA silencing: Analysis of RNA silencing suppressors from arthropod-borne negative-strand RNA plant viruses. J. M. Vlak (promoter); R. J. M. Kormelink (copromoter); WU, Wageningen, 27 September 2010.

## In Memory


Wolfgang Dietzgen Bauer

**Wolfgang Dietzgen Bauer** died on January 12, 2011. Until his heart gave way, he was working on a grant proposal, which aimed to define the role of vitamins in the symbiosis formed by *Sinorhizobium meliloti* and *Medicago* spp. Throughout his professional career at the Kettering Research Laboratory, Battelle, Ohio State University, and University of California-Davis, Bauer studied mechanisms by which symbioses are established and maintained. Following the discovery of plant compounds that stimulate bacterial quorum-sensing responses, he coined the term "AHL signal-mimic." His studies of plant cell walls, early developmental events in the invasion of legumes by rhizobia, chemotaxis and flavonoids, discoveries of the autofeedback in nodulation, and the role of lectins in symbioses have been cited hundreds of times. They are still cited today.

He was fascinated by symbiotic interactions. He had little interest in selfish behaviors—microbial or human. In his writing about cooperative cross-kingdom interactions, he often anthropomorphized, as the benefits of cooperation were self evident to him. Indifference, egotism, and greed baffled him.

He had no taste for "safe science" or "safe decisions". He believed in a special role for science in a human society. Science had to provoke thought, effect change, and compel us to question the world around us. For science to provoke thoughts, it had to be cutting edge. For decisions to be effective, they had to have come from a deliberate compromise that was born out of difficult, contentious thoughts.

He could talk for hours about plants eavesdropping on bacterial conversations, but he detested gossip. He never heaped hollow praise on his students. "That is neat!" he would say instead, and tap his index finger on his lips.

He loved to play racquetball, volleyball, and billiards. In these sports, players rely on the strength and the skill of the partner. He was a strong skilled partner. And he filled with strength his opponents and partners alike, no matter how weak we were. That is how he lived, how he played, how he worked.

*Submitted by Max Teplitski.* ■

Have news you want to share with the society? Submit it online at **www.ismpminet.org/newsletter/submissionform.asp.**

## Recently published research in *Molecular Plant-Microbe Interactions*

Find complete abstracts online with links to full-text articles at http://apsjournals.apsnet.org/loi/mpmi

**March 2011, Volume 24, Number 3**

CURRENT REVIEW—The Evolutionary Genetics of Emerging Plant RNA Viruses.

TECHNICAL ADVANCE—Identification and Validation of Reference Genes for Normalization of Transcripts from Virus-Infected *Arabidopsis thaliana*.

Expression of *Xanthomonas campestris* pv. *vesicatoria* Type III Effectors in Yeast Affects Cell Growth and Viability.

Light Quantity and Photosystem Function Mediate Host Susceptibility to *Turnip mosaic virus* Via a Salicylic Acid–Independent Mechanism.

Biocontrol Treatments Confer Protection Against *Verticillium dahliae* Infection of Potato by Inducing Antimicrobial Metabolites.

Endophytic *Trichoderma* Isolates from Tropical Environments Delay Disease Onset and Induce Resistance Against *Phytophthora capsici* in Hot Pepper Using Multiple Mechanisms.

Plants Respond to Pathogen Infection by Enhancing the Antifungal Gene Expression of Root-Associated Bacteria.

*Pyrenophora bromi*, Causal Agent of Brownspot of Bromegrass, Expresses a Gene Encoding a Protein with Homology and Similar Activity to Ptr ToxB, a Host-Selective Toxin of Wheat.

An ABC Transporter and a Cytochrome P450 of *Nectria haematococca* MPVI Are Virulence Factors on Pea and Are the Major Tolerance Mechanisms to the Phytoalexin Pisatin.

Transcription Factor AtMYB44 Regulates Induced Expression of the *ETHYLENE INSENSITIVE2* Gene in *Arabidopsis* Responding to a Harpin Protein.

**April 2011, Volume 24, Number 4**

Effects of Jasmonic Acid, Ethylene, and Salicylic Acid Signaling on the Rhizosphere Bacterial Community of *Arabidopsis thaliana*.

A Necrosis-Inducing Elicitor Domain Encoded by Both Symptomatic and Asymptomatic *Plantago asiatica mosaic virus* Isolates, Whose Expression Is Modulated by Virus Replication.

Growth Promotion of Chinese Cabbage and *Arabidopsis* by *Piriformospora indica* Is Not Stimulated by Mycelium-Synthesized Auxin.

Pectin Methylesterase Is Induced in *Arabidopsis* upon Infection and Is Necessary for a Successful Colonization by Necrotrophic Pathogens.

Linked, if Not the Same, *Mi-1* Homologues Confer Resistance to Tomato Powdery Mildew and Root-Knot Nematodes.

Expression and Functional Roles of *Bradyrhizobium japonicum* Genes Involved in the Utilization of Inorganic and Organic Sulfur Compounds in Free-Living and Symbiotic Conditions.

*Ca*. Liberibacter asiaticus Carries an Excision Plasmid Prophage and a Chromosomally Integrated Prophage That Becomes Lytic in Plant Infections.

Gene Encoding a c-Type Cyclin in *Mycosphaerella graminicola* Is Involved in Aerial Mycelium Formation, Filamentous Growth, Hyphal Swelling, Melanin Biosynthesis, Stress Response, and Pathogenicity.

Controlling the Expression of Rhizobial Genes During Nodule Development with Elements and An Inducer of the *lac* Operon.

The *HDF1* Histone Deacetylase Gene Is Important for Conidiation, Sexual Reproduction, and Pathogenesis in *Fusarium graminearum*.

*Ralstonia solanacearum* Virulence Increased Following Large Interstrain Gene Transfers by Natural Transformation.

Silencing Genes Encoding Omega-3 Fatty Acid Desaturase Alters Seed Size and Accumulation of *Bean pod mottle virus* in Soybean.

**May 2011, Volume 24, Number 5**

Identification and Characterization of 2′-Deoxyuridine from the Supernatant of Conidial Suspensions of Rice Blast Fungus as an Infection-Promoting Factor in Rice Plants.

The Plant Growth–Promoting Rhizobacterium *Bacillus cereus* AR156 Induces Systemic Resistance in *Arabidopsis thaliana* by Simultaneously Activating Salicylate- and Jasmonate/Ethylene-Dependent Signaling Pathways.

454 Genome Sequencing of *Pseudoperonospora cubensis* Reveals Effector Proteins with a QXLR Translocation Motif.

Development of a Host-Induced RNAi System in the Wheat Stripe Rust Fungus *Puccinia striiformis* f. sp. *tritici*.

Quantitative Proteomic Analysis of the Interaction Between the Endophytic Plant-Growth-Promoting Bacterium *Gluconacetobacter diazotrophicus* and Sugarcane.

The HrpN Effector of *Erwinia amylovora*, Which Is Involved in Type III Translocation, Contributes Directly or Indirectly to Callose Elicitation on Apple Leaves.

**Recently Published Research** *continued on page 12*

Bacterial Effector HopF2 Suppresses *Arabidopsis* Innate Immunity at the Plasma Membrane.

Identification of New Candidate Pathogenicity Factors in the Xylem-Invading Pathogen *Xanthomonas albilineans* by Transposon Mutagenesis.

Inoculation- and Nitrate-Induced CLE Peptides of Soybean Control NARK-Dependent Nodule Formation.

Preventing Fusarium Head Blight of Wheat and Cob Rot of Maize by Inhibition of Fungal Deoxyhypusine Synthase.

**June 2011, Volume 24, Number 6**
CURRENT REVIEW—Invasion by Invitation: Rhizobial Infection in Legumes.

Found in Translation: High-Throughput Chemical Screening in *Arabidopsis thaliana* Identifies Small Molecules That Reduce Fusarium Head Blight Disease in Wheat.

HrpG and HrpX Play Global Roles in Coordinating Different Virulence Traits of *Xanthomonas axonopodis* pv. *citri*.

Activation of a *Lotus japonicus* Subtilase Gene During Arbuscular Mycorrhiza Is Dependent on the Common Symbiosis Genes and Two *cis*-Active Promoter Regions.

Use of a Secretion Trap Screen in Pepper Following *Phytophthora capsici* Infection Reveals Novel Functions of Secreted Plant Proteins in Modulating Cell Death.

The 2b Silencing Suppressor of a Mild Strain of *Cucumber mosaic virus* Alone Is Sufficient for Synergistic Interaction with *Tobacco mosaic virus* and Induction of Severe Leaf Malformation in 2b-Transgenic Tobacco Plants.

Quantitative and Temporal Definition of the *Mla* Transcriptional Regulon During Barley–Powdery Mildew Interactions.

Salicylic Acid-Dependent Restriction of *Tomato ringspot virus* Spread in Tobacco Is Accompanied by a Hypersensitive Response, Local RNA Silencing, and Moderate Systemic Resistance.

Loss of cAMP-Dependent Protein Kinase A Affects Multiple Traits Important for Root Pathogenesis by *Fusarium oxysporum*.

Auxin Signaling and Transport Promote Susceptibility to the Root-Infecting Fungal Pathogen *Fusarium oxysporum* in *Arabidopsis*. ■

## Welcome New Members

The following members joined IS-MPMI between January 1 and April 30, 2011.
Please join us in welcoming them to the society!

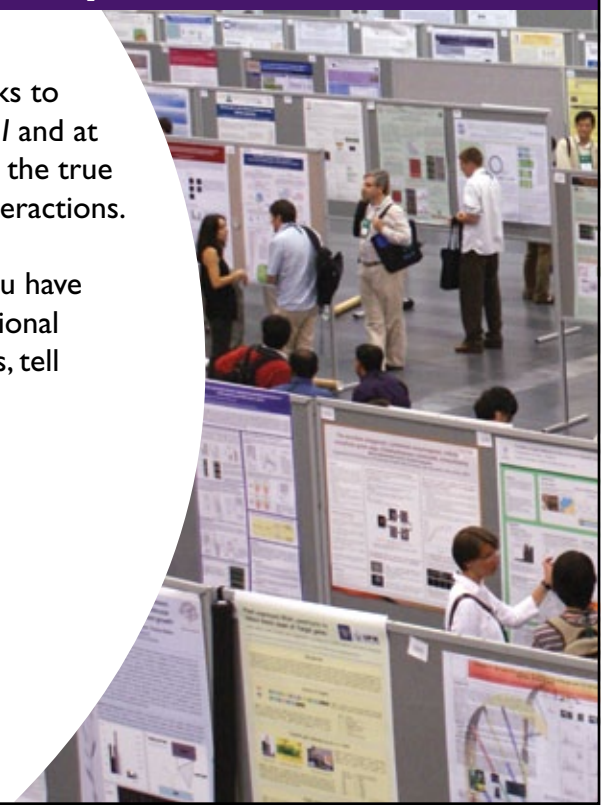
Johanna Acevedo-Garcia
Aya Akagi
Shohei Akita
Poliane Alfenas-Zerbini
Erik Andreasson
Annette A. Angus
Polymnia Antoniou
Kotb Abdelhamid Attia
Laurence V. Bindschedler
Ana Maria Bocsanczy
Laurence S. Boutemy
Ratnesh Chaturvedi
Mathias Choquer
Xinnian Dong
Carole Dubreuil
Kenneth Frame
Zhengqing Fu
Amit Gal-On
Sankar Ganesh P
Otto Geiger
Christiaan M. Greeff
Stephane Hacquard
Linda J. Harris
Yael Helman
Hau-Hsuan Hwang
Takako Ishiga
Yasuhiro Ishiga
Maelle Jaouannet
Yaowei Kang
Yasuyuki Kawaharada
Tsutomu Kawasaki
Sang Gon Kim
Mitsuko Kishi-Kaboshi
Bostjan Kobe
Seonghee Lee
Chen Li-Qing
Rosemary Loria
Paula M. M. Martins
Lucy Moleleki
Jacqueline Monaghan
Bong Gyu Mun
Mari-Anne Newman
Stan Oome
Epaminondas Paplomatas
Hee-Jin Park
Sambasivam Periyannan
Sorina Popescu
Katie Porter
Joël F. Pothier
Nathalie Poussereau
Svante Resjo
Clemencia M. Rojas
Klaus Schlaeppi
Gautam Shirsekar
Paraskevi Skamnioti
Peter S. Solomon
Deborah J. Springer
Heidi Szemenyei
Alice Teillet
Sotirios E. Tjamos
Saskia C. M. Van Wees
Selvakumar Veluchamy
Eduard Venter
Muriel Viaud
Yiming Wang
Hailei Wei
Ella Wilson
Joe Win
Lennart Wirthmueller
Porntip Wongkaew
Jingni Wu
Shunyuan Xiao
Haruko Yamamoto
Sima Yaron
Nobuko Yasuda
Minsoo Yoon
Francisco M. Zerbini
Shujian Zhang
Jun Zhao
Laurent Zimmerli

## A Growing and Vibrant Community

IS-MPMI is a growing and vibrant community thanks to members like you. The research published in *MPMI* and at the congress continues our excellence. IS-MPMI is the true home for scientists in molecular plant-microbe interactions.

***Share this unique community with others!*** If you have colleagues interested in attending the XV International Congress on Molecular Plant-Microbe Interactions, tell them to join to save on congress registration.

**www.ismpminet.org**



## Employment

**Post-Doctoral Position on Soybean-Fungus Interactions**
A post-doctoral research position is available to explore the functions of candidate effector proteins of the Asian soybean rust fungus, *Phakopsora pachyrhizi*. The successful applicant will use a variety of bioinformatic and molecular genetic approaches to identify *P. pachyrhizi* proteins with effector-like functions and/or avirulence functions. The approaches will exploit model plant systems as well as soybean. The research project has a long-term goal to provide novel control measures for fungal pathogens in soybean, and therefore, the successful applicant will be expected to consider potential practical applications of the research. The successful candidate will work within a collaborative team of university and USDA researchers. The project is directed by Steven Whitham and Thomas Baum. The position will have a duration of two years and will be renewable annually dependent upon satisfactory performance and continuation of funding. Compensation is commensurate with experience. To be considered, applicants must have a Ph.D. degree with strong training and experience in molecular biology. Research experience with genomics, plant-pathogen interactions, or genetics of fungal plant pathogens is a plus but not required. The project will require a high level of creativity, motivation, and technical skill. The successful candidate will have strong verbal and written communication skills and an ability to work effectively within a collaborative team environment. Send curriculum vita, including names of three referees, to Steve Whitham, Department of Plant Pathology, Iowa State University, 351 Bessey Hall, Ames, IA 50011-1020 U.S.A., or by e-mail to swhitham@iastate.edu.

**Graduate Research Assistantship Positions**
Two graduate research assistantship (assistantship + reduced tuition) positions (one Ph.D., one M.S.) are open in Sen Subramanian's lab in the Department of Plant Science, South Dakota State University (SDSU), Brookings, SD, to qualified and motivated candidates. Symbiotic root nodule formation in legumes (bean family of plants) is a fascinating example of a beneficial plant-microbe interaction. Nodules capable of fixing atmospheric nitrogen result from the interaction between legumes and rhizobia bacteria in the soil. Plants activate a multitude of signaling pathways both at the cellular level and the whole-plant level upon recognition of a compatible rhizobial species, leading to a sequence of physiological events ultimately resulting in functional nodules. My lab's research interests include studying the exchange of signal molecules between the plants and rhizosphere microbes, understanding the role of microRNAs in regulating auxin action during nodule development, and studying signaling mechanisms governing nodule and lateral root development. My lab is interested in studying the symbiotic interaction between soybean and *Bradyrhizobium japonicum* as a model system. The recent completion of soybean genome sequencing and the importance of soybean as a major crop in the United States make it an attractive model to study nodule development and rhizobial symbiosis. In addition to the enhancement of scientific knowledge and scholarship, this research has economic and environmental benefits, since symbiotic nitrogen fixation in legume root nodules alleviates the use of chemical fertilizers. For information about graduate studies in the Department of Plant Science at SDSU see these links: Plant Science Graduate Program, SDSU Graduate School. International students see additional admission requirements. If interested in graduate student opportunities in the lab, please send a detailed CV, statement of research interests, and contact details (phone, e-mail) for at least two professional references to Sen Subramanian; e-mail: Senthil.Subramanian@sdstate.edu; Phone: +1.605.688.5623; Fax: +1.605.688.4452.

**Post-Doctoral Fellowships**
The Biodiversity Centre at the University of Montreal would like to announce the availability of up to 12 post-doctoral fellowships available through large-scale Genome Canada/Genome Quebec funds. The centre includes cutting-edge laboratories (high-throughput molecular biology [fully robotic equipment], microbial isolation, cellular imaging, and next-generation sequencing facilities) to enhance research on bacterial and fungal biodiversity through genomics and proteomics. The Biodiversity Centre is built in the heart of the Montréal Botanical Garden; one of the biggest in the world. The projects will focus on the environmental genomics, genome sequencing, and genome evolution of bacteria and fungi with a particular focus on arbuscular mycorrhizal fungi in mixed organic- and inorganic-polluted soils. Candidates must have a Ph.D. degree in bioinformatics, computer science, genomics, population genetics, or other relevant fields of biology. All the positions are initially for three years. Research experience (with strong record of first-author publications) in computational genomics, molecular evolution, population genetics, microbiology, molecular biology, or a closely related field is desired. Candidates for bioinformatic positions should be comfortable in a linux/unix environment, with large data sets, computer clusters, and databases. Candidates for microbiology and molecular biology should have experience in isolation, characterization of microbes, and analysis of DNA-seq and RNA-seq data, as well as experience constructing complex biological networks. Candidates with multidisciplinary background, spanning both life sciences and computer sciences, are especially encouraged to apply. The successful candidate will lead and coordinate the de novo assembly of several fungal and/or bacterial genomes and contribute to functional and evolutionary genomics analyses. In addition, the candidate is expected to help organize and analyze comparative transcriptomics sequence data obtained by next-generation sequencing technologies. Closing Date: Open until filled, but applications, including a CV, letter of motivation, list of published papers, and at least two letters of recommendation, should be received by June 30, 2011, to ensure full consideration. The positions will start at the earliest possible date. Candidates should indicate the position topics and when they could take up the position. Please

send applications to Mohamed Hijri, Institut de Recherche en Biologie Végétale (IRBV), Centre sur la Biodiversité, Département de Sciences Biologiques, Université de Montréal, 4101 Sherbrooke est, Montréal, QC, Canada H1X 2B2; E-mail: Mohamed.Hijri@umontreal.ca; Phone: +1.514.343.2120; Web: www.irbv.umontreal.ca/cherch-eurs/mohamed-hijri.

**Faculty Positions in Plant & Microbial Biology**
The Institute of Plant and Microbial Biology, Academia Sinica, Taipei, Taiwan, is inviting applications for several research-oriented faculty positions at the levels of assistant, associate, and full research fellow (equivalent to assistant, associate, and full professor at a university). Successful candidates must have demonstrated expertise in studies of plant-microbe interaction OR mechanisms of plant function. Excellent facilities and starter funds will be provided for the new fellows. For details of the Institute and Academia Sinica, as well as a special recruitment brochure, please visit the website at http://ipmb.sinica.edu.tw/. Applicants are expected to have a Ph.D. degree plus post-doctoral training. Chinese language is not essential. International scientists are encouraged to apply. The application folder should include curriculum vitae, a statement of research accomplishments, and research plans. The application folder and, separately, three letters of recommendation should be sent to Shu-Hsing Wu, Chair of Search Committee, Institute of Plant and Microbial Biology, Academia Sinica, 128, Sec. 2, Academia Road, Nankang, Taipei, Taiwan 11529; E-mail: wsearch@gate.sinica.edu.tw; Fax: (+886)2-2782-1605. The review of applications will begin on May 15, 2011, and continue until the positions are filled.

**Assistant or Associate Professor of Biology**
The College of Science, Concordia University Texas, invites applications for assistant or associate professor of biology. The university has a new a nursing program and this individual will primarily teach courses that are prerequisites for the nursing program and the biology major based upon their expertise. Most important of these would be Human Anatomy and Physiology I and II, other courses include Cellular and Molecular Biology, Microbiology, Nutrition, and Pharmacology; assignment to these courses would depend upon the qualifications of the individual. It is anticipated that additional biology faculty will need to be added in the coming years as the nursing program grows. The position will begin July 1, 2011, if possible. Position includes teaching 24 credit hours in an academic year (four courses every fall and spring semester); completing a 30-hour expectation with the remaining 6 hours consisting of advising, committee work, course development; and other duties (additional expectations include being part of the Concordia community and building up the major both in number of students and in academic excellence); establishing best practices, technology adoptions, and textbook selections for biology classes; communicating regularly with other instructors; demonstrating computer literacy and a willingness to incorporate new technologies into the classroom; maintaining effective academic advising and regular office hours; attending (on occasion) students' extra-curricular events, such as concerts, athletic events, art shows, and drama; and serving on university committees and attend division, college, and faculty meetings. Education and Experience Required: Candidates for assistant or associate professor should hold a minimum of a master's degree in biology or a related area. Applicants who do not hold a doctorate in biology should be willing to consider undertaking doctoral study. Demonstrated experience in college-level teaching and scholarship is required. Applicants must have a strong commitment to undergraduate education within the community of a Lutheran Christian university. How to Apply: E-mail letter of interest, copies of transcripts, and three letters of recommendation to jobs@concordia.edu or mail to Human Resources, Concordia University Texas, 11400 Concordia University Drive, Austin, TX 78726 U.S.A. If hired, original transcripts are required. Review of applications will begin immediately and will continue until a successful candidate is identified. The head of the search committee for this position is Donna Janes (donna.janes@concordia.edu). Salary depends upon rank and credentials. The salary range as of January 1, 2010, is approximately $44,300–56,800 for an assistant professor and $51,000–61,200 for an associate professor.

**Research Entomologist/Molecular Biologist/Plant Pathologist (Post-Doctoral Research Associate) GS-0401/0414/0434-11**
A two-year appointment as a post-doctoral research associate in the USDA, ARS, Corn and Soybean Research Unit, Wooster, OH, is available. The research associate will use second-generation sequence analysis to define the responses of insect vectors to feeding on virus-infected soybean and maize. The successful candidate will develop EST databases for the soybean aphid (*Aphis glycines*) and blackfaced leafhopper (*Graminella nigrifrons*) and use them for comparative genomic analysis of the vectors and will characterize gene expression differences between vectors feeding on virus-infected and healthy plants. This is an interdisciplinary team research project that involves collaborations among USDA, ARS scientists and Ohio State University faculty and students in the Departments of Plant Pathology, Entomology, and Horticulture and Crop Science. A Ph.D. degree in entomology, molecular biology, plant pathology, or a closely related scientific discipline is required; knowledge of or skill with current methods used in molecular entomology, plant pathology, or vector biology, including genome or transcriptome sequence analysis, is desirable. Ability to plan and conduct research and publish results in peer-reviewed journals is required. Salary is commensurate with experience ($57,408–74,628 per annum) plus benefits. More information is available in announcement RA-11-048-H at www.afm.ars.usda.gov/divisions/hrd/hrdhomepage/vacancy/pd962.html. Send application materials to Peg Redinbaugh, USDA/ARS, Corn and Soybean Research Unit, Department of Plant Pathology, Ohio State University/OARDC, 1680 Madison Avenue, Wooster, OH 44691 U.S.A., or e-mail to peg.redinbaugh@ars.usda.gov. ■

**International Society for Molecular Plant-Microbe Interactions**
3340 Pilot Knob Road
St. Paul, MN 55121
United States of America

# COMING EVENTS

July 1-3, 2011
**International Conference on Microorganisms in Environmental Management and Biotechnology**
Bhopal, India
www.bioinfobubpl.nic.in

July 11–14, 2011
**Hemipteran-Plant Interactions Symposium**
Piracicaba, SP, Brazil
www.infobibos.com/Hemipteran/index.html

August 6–10, 2011
**2011 APS-IPPC Joint Meeting**
Honolulu, HI, U.S.A.
www.apsnet.org/meet

September 15–17, 2011
***Botrytis-Sclerotinia* Post-Genome Workshop**
Lyon, France
http://bspgw2011.univ-lyon1.fr/en

October 2–4, 2011
**First International SFB 796 Conference—Mechanisms of Viral Host Cell Manipulation: From Plants to Humans**
Bamberg, Germany
www.sfb796.forschung.uni-erlangen.de/conference.shtml

November 28–December 3, 2011
**Biotechnology Havanna 2011**
Havana, Cuba
http://bh2011.cigb.edu.cu

July 29–August 2, 2012 NEW DATE
**XV International Congress on Molecular Plant-Microbe Interactions**
Kyoto, Japan
www.ismpminet.org

Include your meeting in IS-MPMI's printed and online event calendar. Submit online at **www.ismpminet.org/meetings/calsubmit.asp.**