Bienvenue à Québec!

XIV International Congress Update

The organization of the XIV International Congress on Molecular Plant-Microbe Interactions is going well. To be held July 19–23, 2009, in Quebec City, Canada, the congress will begin with a beautiful opening ceremony and continue with the scientific program including eight plenary and 14 concurrent sessions.

Plenary Sessions
1 - Pathogenic interactions
2 - Symbiotic interactions
3 - Common host mechanisms
4 - Signaling and molecular dialogues
5 - Dynamics of plant responses to microbes
6 - Plant-microbe interactions and technology transfer
7 - Ecology and evolution
8 - Plant immunity

Confirmed Speakers

Historic Québec
The historic district of old Québec has been a UNESCO world heritage site since 1985 (http://whc.unesco.org/en/list/300).

Social Events
- Welcome reception—Cruise on the St.-Lawrence River on the Louis Jolliet (www.croisieresaml.com/regions.html?S=1&RegionLink=QUE&L=En)

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A Message from the President

At the end of a recent meeting report of The Keystone Symposium on Plant Innate Immunity, written by Silke Robatzek and Yusuke Saijo (Genome Biology 9:304, 2008), the authors cited the concluding remarks of Jeff Dangl’s presentation. Dangl stated that “one reason for the successful growth of the field of plant-microbe interactions had been the sharing of resources and unpublished information between researchers,” and that he hoped that this would continue. I could not agree more with Dangl—this is one of the fundamental reasons to become a member of IS-MPMI and, by this, to promote its continuity.

IS-MPMI members have the opportunity to witness and to be part of the fast development of this exciting and vigorous field. Members gain immediate access to the IS-MPMI Reporter and to the recent addition of MPMI’s new online features and custom content alerts. These two member benefits are key elements to create networking, promote growth, and increase the robustness that lay in the heart of the MPMI vibrant community. The IS-MPMI Reporter, lead by Editor-in-Chief Sophien Kamoun, is a prime channel to communicate news about meetings, job opportunities, and relevant information in the field and to publish and read hot scientific notes.

IS-MPMI members receive an 80% discount on subscriptions to MPMI. The MPMI journal has an outstanding international reputation and is a leading scientific publication specializing in the interaction of plants with microbes. MPMI publishes significant primary research and reviews on the molecular biology and genetics of pathological, symbiotic, and associative interactions between microbes and plants. The success of the journal is greatly due to the excellent labor performed by the Editorial Board, headed by Editor-in-Chief Jonathan Walton, which accounts for the quality and novelty of the research accepted for publication. MPMI research articles are now fully open-access within just 12 months of publication. I invite you to visit http://apsjournals.apsnet.org/loi/mpmi to learn more about the advantages of publishing in MPMI.

By becoming members, we automatically gain a substantial price cut of the registration fee for the biennial congress that the society sponsors. In keeping with the international nature of the society, the congress moves among different continents and countries. Congress venues usually are held at top cultural centers in interesting and historical cities. Even more important, the congresses become the auspicious occasion during which attendees at all career levels have opportunities to interact with and learn from renowned scientists, share unpublished information, and trigger fruitful and stimulating discussions and long-lasting collaborations with colleagues from all over the world.

Help us to grow and become a stronger community! Invite a colleague to join the society by December 31, 2008. You will automatically become eligible to get into a drawing for free registration to the XIV Congress to be held in Québec City in 2009! Members who bring in five or more new members will receive free membership renewal for 1 year. Please visit the Member-Get-A-Member webpage (www.ismpminet.org/members/refermember.asp) to learn more regarding this special campaign. Start recruiting new members today!

Federico Sanchez
President

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Preregistration and web site will open summer 2008. For more information, contact the Local Organizing Committee at mpmi2009@ulaval.ca.

Does Your Institution Subscribe to MPMI Online?

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Your Ideas Wanted!

- Have ideas for articles for the Reporter?
- Want to share graduation news, job changes, new appointments, thesis abstracts, or more?

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Interviews with IS-MPMI Leadership

The IS-MPMI Reporter is continuing its effort to better acquaint the membership with the leadership of their society by publishing interviews with members of the Board of Directors. In this issue, you will find an interview with Treasurer Matteo Lorito and Director Sheng Yang He. Please feel free to contact the leaders of IS-MPMI with any questions or concerns; a list of the board with their contact information is printed in every issue. You can find the list on page 32.

Matteo Lorito, IS-MPMI Treasurer

Q: Tell us about yourself and your work.

A: I am a happy father of two beautiful kids (7 and 3 years old) and I am part of a husband-and-wife research team. I basically started my professional career at the same time that I met Sheri Woo, my wife, at the Department of Horticultural Sciences at Cornell University in 1990. I was a young visiting scientist coming from the University of Naples with very little lab experience and a less-than-basic English proficiency. Needless to say, Sheri helped me a lot on both aspects (she was already in the lab of Gary Harman that hosted me at Cornell).

I obtained my degree from the University of Siena with a thesis in plant physiology and cytology. I started to work on plant-fungus interactions in 1989 in Naples first and then continued for another 3 years at Cornell. I returned to Italy in 1994 with Sheri because the Italian National Council of Research was funding a new program on biological control at the Department of Plant Pathology of the University of Naples, and I was basically hired to develop the molecular side of the project. We decided to take the risk, with the idea of going back to the U.S.A. if things didn’t work out well. Eventually we stayed, and both obtained faculty positions, but most importantly we managed to build a new research group. From a single room filled with boxes, our Biocontrol Group is now about 25-people strong, occupying an entire building with two entire floors of lab space and several permanent staff.

My scientific interest used to be more on the microbial (fungal) side (in fact, I am probably better known in the fungal scientific community than the MPMI one), but the chemical interaction with the plant has become more and more important in the biocontrol processes that I have been studying now for about 20 years. I have been intrigued by the basic concept of biocontrol since I was a student: it seemed such an important beneficial work to try to kill pathogens and reduce chemical contamination in food and the environment! I almost immediately became fascinated by the great potential of biocontrol fungi, in particular those belonging to the genus Trichoderma, not only for their versatility in terms of practical applications but also for the incredibly complex mechanisms of interaction with other microbes and of course the plant. This has been my general field of research. Even if our work has been focused on one system, it has been expanded to cover a variety of aspects.

We have been studying at the same time new fungal genes, effectors involved in mycoparasitism, and factors that activate plant beneficial responses but have also constructed new plant varieties resistant to fungal pathogens as well as developed and took to the market new biopesticide and biofertilizer products. We have studied promoter elements and used genomics techniques, but we have always kept an eye to the application potential as well as the farmer needs and expectations. A combination of papers published in journals, such as PNAS and Nature, along with the foundation of a few start-up biotech companies for the implementation of the new technologies and knowledge have been accomplishments that make me more satisfied with what we have done so far. Unfortunately, the system we are working with, which is the multiplayer interactions between plants, beneficial microbes, and pathogens, could be defined as a “fractal”: a geometric figure considered to be infinitely complex that reveals more details the more you look closer! Almost like organizing an MPMI congress!

Q: When and why did you first join the society?

A: I can’t remember, it must be over 10 years ago; at that time, the society had a lot fewer members than today. When I saw the advertisement, my thought was: I am already an APS member, should I join this one too? Well, I had a very strong feeling about getting myself involved. It seems something new destined to grow, plus I liked the idea that it is an international society.

Q: Which IS-MPMI congress did you first attend? What was the experience like?

A: I briefly attended the congress in Amsterdam and fully attended the one in St. Petersburg. I was amazed by the amount of novel information that I was able to collect and use immediately for my research and my classes at the university. The complexity of the scientific program was astonishing...so many subjects! Very stimulating!!

Q: Do you think it is important that Ph.D. and post-doc students in your lab are IS-MPMI members? What can/should IS-MPMI offer young scientists in our field?

A: Yes, of course it is important, even though it is often difficult for Ph.D. students to figure out what field of research, if any, they will end up in to work. Unfortunately, today you have to go where the funds are, and thus, it is hard to make previsions. Regardless, I often remind them how important is to formally join a scientific community that fits their interests. I feel that IS-MPMI...
Interviews with IS-MPMI Leadership continued from page 3

is already doing a good job in serving young members, especially by organizing a congress every 24 months. This provides at least one congress opportunity in any Ph.D. course/post-doc term.

Of course, students and post-docs became much more attracted to the field of plant-microbe interactions when they have the chance to acquire a much deeper understanding of a particular subject or paper by listening to the presentations of the authors or of the senior scientists. In addition, an international congress can effectively promote and consolidate the first or a new job opportunity or contacts. Of course it is critical that congress organizers prioritize the participation of students and the social activities; in Sorrento, we kept student costs to a minimum (the society also helped by lowering the membership registration fee), provided about 50 bursaries, and lunches for all delegates together, basically by saving on the reimbursement of speaker travel costs. We had an attendance of almost 500 students and I believe most of the speakers understood and accepted the “sacrifice.” However, the society can still do more. Perhaps we could establish a few “best Ph.D. thesis awards” for IS-MPMI young members to be given every 2 years in the various areas of research in MPMI.

Q: What drew you to plant-microbe interactions?
A: I was attracted by the aspects of the biocontrol field that relate to MPMI (see above) and the idea that virtually any “basic science” project in plant-microbe interactions, of which I find the brainstorming involved fascinating, may produce results of direct utility for an industrial or agricultural application.

Q: What inspired you most in your career?
A: Various things. The obvious problems related to the fact that we depend so much on the use of huge quantities of chemical pesticides to fill our plate. The Snow White dilemma: should I eat this beautiful but chemical-loaded apple? or else? The incredible variety and potential application of the natural germplasm of beneficial microbes. The power of transgenic biotechnologies, applied both on plants and microbes. Finally, the marvel and the excitement of the look of students when they come, usually running, into your office to show his/her first new original research result.

Q: What’s the most exciting paper you read recently?
A: There are actually two of them. The first is “Recent fungal diseases of crop plants: Is lateral gene transfer a common theme?” by Richard Oliver and Peter Solomon published in the March 2008 issue of MPMI, a very informative and well-written review (editor’s note: see interview with author Richard Oliver on page 6). The second is a biotech work done in China by Xiao-Ya Chen and coworkers entitled “Silencing a cotton bollworm P450 monooxygenase gene by plant-mediated RNAi impairs larval tolerance of gossypol” and published in Nature Biotechnology (selected for the cover page) last year (vol. 25). An intriguing story about using a plant transformed with a specific dsRNA to directly silence genes in insects and eventually pathogens attacking the plant.

Q: What is the next “big thing” in plant-microbe interactions?
A: It’s difficult to say. Clearly the research on the similarities of the mechanisms by which plants and animals interact with microbes, insects, and viruses are going to expand and produce more fascinating results. From a biotechnological point of view, I expect to see a great deal of applications based on the rapidly growing knowledge of the role of RNAi, which will be more and more directly used for positively influencing plant interactions in agriculture. I am also particularly intrigued by the possibility of using bacterial secretion systems to deliver specific effectors in the plant cells, a technology recently developed by a few leading scientists in this field.

Q: What’s your favorite gene?
A: An endochitinase-encoding gene of Trichoderma spp. Its product has a variety of functions: kills and degrades other fungi during the mycoparasitism process, releases compounds that activate the beneficial fungus, is recognized by the plant cells, and activates a specific response related to priming of the ISR. It is useful for industrial purposes to degrade chitin in marine wastes.

Q: What are your favorite activities outside the lab?
A: I grew up in a seaside town and I am an absolute sea lover. I have done many sea-related activities and sports, and at the moment, I am particularly fond of deep sea scuba diving, but without a fishing purpose (with age, I became more concerned and switched my objective from catching to observing). I am also a good Blockbuster client!

Q: What book are you reading these days?
A: Just finished reading The Kite Runner by Khaled Housseini, a great story of friendship and human interactions in a war-torn environment. I am also reading, again, the Divine Comedy of Dante Alighieri. I was forced to study this classical Italian poetry book as a high school student with a humanistic program, but I hated it at that time and couldn’t appreciate the complexity and beauty of this story in which the poet imagines the visit to Hell, Purgatory, and Heaven.

Q: What’s your favorite vacation?
A: With my family to our house by the sea. Life is a beach!
Sheng Yang He, IS-MPMI Director

Q: Tell us about yourself and your work.

A: I grew up in a major agricultural province (Zhejiang Province) in China. “Crop protection” was a familiar term, even when I was in elementary school. The distinct smells of pesticides sprayed on rice fields and removing cotton boll weevil larvae from shoulder-tall cotton plants by hand (with other classmates) were part of my childhood.

I completed both B.S. and M.S. degrees at Zhejiang Agricultural University. My M.S. thesis was on the identification of fungi that parasitize cotton root-knot nematodes in the laboratory of Qixin Ge. Although it was a lot of fun collecting soil samples in cotton fields and watching fungi using contracting rings to capture nematodes, toward the end of my master’s program I was really attracted by the idea of using molecular techniques to study plant pathology questions.

In the fall of 1986, I came to the United States to pursue a Ph.D. degree (first at the University of Maryland, College Park, and then at Cornell University). I was soon mesmerized by research into the cloning of various bacterial genes involved in plant-pathogen interactions, particularly the cloning of avr genes (by Brian Staskawicz et al., 1984) and brp genes (by Peter Lindgren et al., 1986). The mysterious nature of these genes was a topic of numerous discussions throughout my Ph.D. program in the laboratory of Alan Collmer. There were many fellow students/post-docs in the Departments of Plant Pathology (too many to mention here) and Plant Breeding (e.g., Greg Martin and Pam Ronald).

In 1991, I completed my Ph.D. research on the cloning of Erwinia chrysanthemi out genes involved in type II secretion. I continued part of my post-doctoral research in Collmer’s laboratory and was given the great opportunity to work on the function of Pseudomonas syringae brp genes, a subject that remained for many years the focus in my own laboratory, first at the University of Kentucky and then at Michigan State University. During the entire decade of the 1990s, my colleagues and I investigated the putative secretion function of brp genes, the action of AvrB inside the plant cell, and the assembly of the Hrp pilus.

During my post-doctoral years, I was also fascinated by the development of the Arabidopsis–P. syringae interaction as a model pathosystem in the laboratories of Fred Ausubel, Brian Staskawicz, and Jeff Dangl (where I spent my first sabbatical leave). However, I noticed that the research efforts on this pathosystem were concentrated almost entirely on the study of disease resistance mechanisms. There was very little emphasis on studying how Pst DC3000 causes disease. We created several brp mutants in Pst DC3000 and focused on how AvrPto, AvrE, and HopM1 (sequences of these effectors were available prior to 1996) facilitate Pst DC3000 pathogenesis in Arabidopsis. It turns out that a major function of these virulence effectors is suppressing host defenses.

We also study the P. syringae toxin coronatine, especially its activity in suppressing bacteria-triggered stomatal closure. Experiments with coronatine also helped the identification of the substrates (JAZ repressor proteins) of the SCF<sup>E3</sup> ubiquitin ligase involved in jasmonate signaling and implicated COI1/JAZ complexes as receptors for JA-Ile and coronatine.

Q: When and why did you first join the society?

A: It must have been around 1990? IS-MPMI is a natural scientific home for me.

Q: Which IS-MPMI congress did you first attend? What was the experience like?

A: Interlaken, Switzerland (1990). The science, conversations, and surrounding scenery were all fantastic!

Q: Do you think it is important that Ph.D. and post-doc students in your lab are IS-MPMI members? What can/should IS-MPMI offer young scientists in our field?

A: They should definitely be members. IS-MPMI provides a unique and exciting scientific home and identity. We should find innovative ways to enhance the involvement of young scientists in various activities of IS-MPMI.

Q: What inspired you most in your career?

A: The prospect of finding affordable and effective methods of controlling plant diseases through innovative research.

Q: What’s the most exciting paper you read recently?

A: There are so many great stories in all areas of MPMI recently and it is impossible to pick one. On the topic of P. syringae, I just read a paper from the laboratories of Robert Dudler and Steve Lindow (Nature 452:755-758) this week. This paper reports an intriguing virulence activity of a P. syringae toxin, syringolin A. This toxin directly inhibits the eukaryotic 26S proteasome, which could potentially shut down many plant cellular processes. This is another example of a small toxin having big effects.

Q: What is the next “big thing” in plant-microbe interactions?

A: One of the first papers I read after I came to the United States was the coat protein-mediated resistance against TMV from Roger Beachy’s lab, illustrating a novel method of engineering disease resistance. Something like that for

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Why Do New Diseases Emerge?

A review in the March 2008 issue of MPMI examined the recent emergence of many new diseases and offered a reason why those diseases may be prominent now. “Recent fungal diseases of crop plants: Is lateral gene transfer a common theme?,” by Richard P. Oliver and Peter S. Solomon of the Australian Center for Necrotrophic Fungal Pathogens, Murdoch University, Australia, pulls together several lines of evidence about the diseases of crop plants that emerged in the twentieth century.

IS-MPMI Reporter had the opportunity to speak with Oliver about his review article. Oliver says they were struck by how many features these “new” diseases had in common. “First, many were necrotrophic, second, many were producers of host-specific toxins, and third, many are in the fungal order called the Pleosporales. Finally, evidence of lateral gene transfer exists for some of these host-specific toxin (HST) genes and in most cases the question is still open.” Oliver stated that the article is a speculation from the specific to the general as to whether some or even all new diseases of crops are the result of lateral gene transfer. “Our aim was to stimulate discussion and we seem to have succeeded in that,” said Oliver.

Oliver works on the necrotrophic diseases of broadacre crops of Australia with a particular focus on diseases of legumes and on the wheat pathogen Stagonospora nodorum. Said Oliver, “The dogma was pathogens like Stago produce a cocktail of nonspecific toxins and cell-wall-degrading enzymes. This fit with the observation that resistance in wheat was variable and partial. Genetic analysis of resistance in wheat identified numerous weak and variable QTLs. Progress in improving disease resistance (and remember we are funded directly by farmers here in Australia) was always going to be a hard slog.” Oliver’s team was able to obtain the S. nodorum genome sequence in 2005 and this showed that S. nodorum had the ToxA gene. ToxA was well known as an HST from Pyrenophora tritici-repentis, the wheat tan spot pathogen.

Like many IS-MPMI members, fungal taxonomy was a black box for Oliver, but his team couldn’t help being intrigued by the finding that both species they study are Pleosporales. Together with Bruce McDonald’s group in Zurich and Tim Friesen’s group in Fargo, they put together a portfolio of evidence that ToxA was laterally transferred from S. nodorum to P. tritici-repentis. Tan spot is now a major disease but was unknown on wheat before about 1940, so it clearly is a new disease.

On creating the review article, Oliver said the most difficult part was to identify new diseases. Questioned Oliver, “Different diseases are more important now than 100 years ago, but why is that? Is it because the pathologists back then didn’t notice the symptoms?” A couple of conversations with Nick Money encouraged them to read some of the early literature in plant pathology, and the reading convinced them that there is no way the pathologists in 1920 would have missed these sorts of fungi. Microscopes and plating techniques were perfectly adequate and the surveys were being done efficiently. Name changes could be an issue. “So new diseases have emerged, but that could be for a variety of reasons, changes in the hosts, changes in agronomic conditions, by moving from some other part of the world into the fields, or by incremental mutation, but the most interesting possibility is lateral gene transfer,” Oliver concluded.

Oliver admits that lateral gene transfer was a “slow burn sort of topic, but is now flaming up. In the past, sequencing of genes was very likely to lead to the suggestion that it had been laterally transferred, but in most cases the evidence collapsed in due course. However, the flood of whole-genome sequences raises the evidence to a whole new level and we are seeing a clearing picture of genomic flexibility in timescales ranging from a few decades to hundreds of millions of years.”

Oliver feels that the most important information that IS-MPMI members should know about lateral gene transfer is the realization that HSTs are important in S. nodorum and many other related pathogens, and they give scientists a new and much more direct way to dissect these interactions and assist the breeders in producing resistant cultivars. “This approach looks good for S. nodorum and P. tritici-repentis but the intriguing question is whether it applies to other related pathogens like the Alternaria alternata group, the Ascochyta/Phoma group of legume pathogens, and P. teres on barley. We need more people researching these diseases and, with genome sequences costing a few thousand dollars, progress should be very rapid,” Oliver said.

As for his own research, Oliver says the top priority is to find more HSTs in S. nodorum and to use the toxin’s information to improve wheat resistance breeding. His team is working in a very productive collaboration with Friesen’s group to achieve those goals.

Review articles are welcome for MPMI and should consist of four to five pages that focus on a rapidly developing area of the molecular aspects of plant-microbe interactions. These may be solicited by the MPMI editor-in-chief or a senior editor or may be submitted by authors to be peer reviewed.

To access MPMI online, go to http://apsjournals.apsnet.org/loi/mpmi.
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.

I received my honors degree in genetics from UWE in 2006. During my undergraduate studies, I spent my placement year working in the molecular genetics lab in the ophthalmology research department, run by Andrew Dick, at the Bristol Eye Hospital. Here, I worked on various projects, looking at single nucleotide polymorphisms associated with particular eye diseases. This experience sparked my interest in research. I became particularly interested in plant pathology and plant-microbe interactions after undertaking a summer project at UWE in the Arnold lab looking at activation and inactivation of MAPK in bean and Arabidopsis after infection with different Pseudomonas syringae pathovars.

I was lucky enough to be able to stay on at UWE to pursue a Ph.D. degree. One of the major focuses in the Arnold lab is studying the interaction between Pseudomonas syringae pv. phaseolicola and its host, the common bean, in which it causes halo blight. P. syringae pv. phaseolicola race 4, strain 1302A contains a 106-kb genomic island designated PPHGI-1, which harbors the avirulence gene avrPphB. It is known that PPHGI-1 can excise from the genome of P. syringae pv. phaseolicola 1302A, causing a change in virulence from the hypersensitive response to disease. My project includes identifying genes responsible for the excision, mobility, and integration of PPHGI-1, as well as investigating the conditions that lead to island loss in planta. The overall aim being to provide a molecular explanation of how exposure to host resistance mechanisms in plants forces the selection of new, virulent forms of plant pathogens.

I joined IS-MPMI in 2007 shortly before attending the XIII International Congress in Sorrento, Italy. This was the first conference I had ever attended and it was an excellent experience. IS-MPMI also provided me with some of the funding I required to attend this conference, which was much appreciated, thank you. I’m really looking forward to the XIV International Congress in 2009.

My research interest is functional genomics, especially of genes involved in stress response. I study stress response using analyses of transcriptome and proteome changes. There has been a long-lasting battle leading to the coevolution of defense and invasion strategies of plants and their pathogens. Both plants and pathogens developed an arsenal of molecules to control and manipulate each other. Differences of plant tolerance and susceptibility within the same species interactions are often a matter of combination of plant genotype and pathogen race. To investigate interactions in-depth, we need to analyze them at as many levels as possible from transcriptome and proteome to metabolome and phenotype.

Since spring 2003, I have been at the Center of Life and Food Sciences Weihenstephan of the Technische Universität München and have performed my research on tree species, such as Picea abies (Norway spruce) and Fagus sylvatica (European beech). Stress adaptation is important for all plants, but trees are exceptionally long-lived organisms and it takes years for them to be mature enough for sexual reproduction. Therefore, they will have to survive more stress events than short-lived plants during their life cycle. It is reasonable to expect differences in stress response strategies between long- and short-lived species.

In order to start analysis in tree species, the first challenge is always to establish the methods, because most protocols are inefficient for trees. This was particularly true for protein extraction and isoelectric focussing protocols used in the proteome analyses. But another issue is the lack of sequence information for most trees, with the exception of poplar. In the case of the genus spruce, there is a great number of ESTs in the databases (~470,000), but in the case of beech, there are as few as 350 ESTs available so far. Thus, I first generated 1,149 ESTs from a subtractive library of Phytophthora citricola-infected roots of Fagus sylvatica. These were utilized to design an oligo array I use for transcriptional profiling of the local and systemic reactions of beech in this compatible interaction. The overlap of pathways of pathogen and wound response caused me to also compare the pathogen to the wound reaction.
Another interest of mine is the response and adaptation of plants to heat stress. The rising temperatures and, in particular, the currently fast speed of climate change will tremendously affect especially long-lived plants with long generation cycles and, consequently, very long replacement cycles. We were able to detect differential protein expression in heat-stressed *Picea abies* ecotypes originating from different elevations and with differing thermostolerance, which gives an insight into the adaptation of Norway spruce to higher temperatures. In addition to this abiotic stress, climate change and the introduction of alien species by humans will challenge plants with new pathogens and pests in the future. The response of plants to the changing environment and their interactions within changing biological communities will be an important issue of research.

Before studying trees, I worked on truly smaller but as interesting plants. From the beginning of the year 2001 until spring 2003, I was a post-doc in the Plant Biotechnology group of Ralf Reski (Albert-Ludwigs-Universität Freiburg, Germany). In this collaboration project with BASF Plant Science, homologous recombination in the moss *Physcomitrella patens* was used to produce a large collection of knock-out mutants (more than 73,000 plants) that was metabolically and phenotypically characterized to gain knowledge about gene functions. *Physcomitrella* is the only model plant with a high rate of homologous recombination in the nucleus enabling efficient gene targeting. In addition, the access to gene functions is straightforward since the mutants exist as haploids in the gametophytic stage dominating the moss life cycle. During this project, I also concentrated on the mechanisms of recombination and the comparison with higher plants that rarely show events of homologous recombination when attempting to target nuclear genes. The molecular mechanisms show high similarities but the frequency is shifted predominantly toward homologous recombination in *Physcomitrella*. In cooperation with the group of David Cove (Centre for Plant Sciences, University of Leeds, U.K.), we were able to propose a model for transgene integration in *Physcomitrella*. It would be of enormous advantage if the high efficiency of homologous recombination could be transferred to higher plants.

I even worked with organisms a good deal smaller than moss. After I obtained my diploma in biology in 1996 from the Ruhr-Universität Bochum (Germany), I moved to the lab of Klaus V. Kowallik at the Heinrich-Heine Universität in Düsseldorf, Germany. The group worked on endosymbiosis and plastid evolution, and my research was focused on gene function analysis in cyanobacteria. During this Ph.D. project, I received a scholarship from the Industrie Club Düsseldorf to work abroad. I used this scholarship to join the lab of Don Bryant at Pennsylvania State University, United States, for almost 1 year. I am grateful that he accepted me into his group and supported my project. This was a great experience and I met some of my dearest friends. In 2000, I received my doctorate degree from the Faculty of Mathematics and Natural Sciences of the Heinrich-Heine-Universität Düsseldorf.

I joined IS-MPMI in 2006. I enjoy reading the newsletter and keeping informed about recent developments and the field of plant pathology. I highly value the great variety of aspects of plant interactions with viruses, prokaryotes, fungi, oomycetes, nematodes, and insects covered by the society’s journal.

**Distinguished**

Lee Hadwiger
Washington State University
Pullman, WA, U.S.A.

It is indeed a pleasure at this point in my career to get this invitation to describe, as a member of IS-MPMI, my educational background and some of the contributions of my students over the years.

My Ph.D. degree work was on the biochemistry of disease resistance of watermelons against *Colletotrichum lagenarium* and was directed by Charles Hall at Kansas State University. Hall bred excellent watermelons, such as Crimson Sweet. On post-doctorals, I worked on alkaloid biosynthesis under George Waller at Oklahoma State University and on plant amino acid/cyanoglucoside biosynthesis under Eric Conn at the University of California Davis. Except for a sabbatical under Klaus Hahlbrock at Freiburg, Germany, I have been in the Department of Plant Pathology at Washington State University to date, working mainly on the molecular biology of nonhost resistance.

The major system employed is the cuticle-free, intact endocarp tissue of pea challenged both by the bean pathogen *Fusarium solani* f. sp. *phaseoli* and the true pea pathogen *F. solani* f. sp. *pisi*. A mini-review covering much of this research appears in the April issue of *Phytopathology*. This system produced some of the first clones of PR genes such as DRR49 and DRR276 (RNase), DRR206 (intermediate enzyme in lignan synthesis), and pl39 and pl230 (defensins). Two signals were identified, FspH DNase and chitosan, that are released from the fungus and are able to induce total immunity in pea tissue to *F. solani* f. sp. *pisi*. Follow-up research on the modes of action of these elicitors has enabled the investigations of their modes of action at the chromatin level. Components of this basic research have a potential for practical applications. A combination of the promoter from the PR gene, DRR206, and the open reading frame of the FspH DNase gene when transferred to tobacco enabled the development of immunity to *Pseudomonas syringae* pv. *tabaci*. Individual pea PR genes have been used with a constitutive promoter to enhance disease resistance in potatoes and canola. The latter was in collaboration with Brian Fristensky, a former student, and was published in *MPMI*. Fristensky, now at the University of Manitoba, and Robert Riggelman did the early cloning in my lab.
The pea system, while not the ideal mutational genetic tool of choice, has the advantage of monitoring the total resistance response against the bean pathogen that occurs within 6 hours. The synchronization of the response throughout the tissue enables the examination of the early changes in structure that lead to transcription of the PR genes at the nucleosome level.

Spin-offs from chitosan research have enabled the development of a control of late blight of potatoes that is useful to organic growers.

I have been amazed that pathologists have not further pursued the DNases, which are released from most classes of plant-pathogenic fungi, as elicitors in other plant systems.

I have previously encouraged MPMI editors to develop the flexibility that allows publication of contributions of the many plant-microbe interactions in addition to those of model systems. MPMI is the ultimate publication for our profession worldwide. IS-MPMI–sponsored meetings continue to be valuable venues for one-on-one interchanges between scientists.

Q: What's your favorite gene?
A: At present, _avrE_. The _avrE_ gene was cloned in the laboratory of Professor Noel Keen. This gene and its orthologues (called _dspE_ or _WtsE_) in other pathogen species play an important role in bacterial pathogenesis. However, their molecular action in plants remains a puzzle.

Q: What are your favorite activities outside the lab?
A: Picking up my son from school and accompanying him to various after-school activities.

Q: What books are you reading these days?

Q: What's your favorite vacation?
A: I enjoy visiting my parents who still live in the same village where I grew up, although rice and cotton fields have been replaced mostly by buildings.

We would like to extend our most sincere congratulations to APS on its Centennial Anniversary. For 100 years APS has been instrumental in advancing plant health science worldwide.

The APS Centennial Celebration will be held July 26-30, 2008 in Minneapolis, Minnesota. The celebration will include an incredible scientific program, special centennial events and an exhibition of important industry suppliers. Hundreds of experts will discuss the latest research, look back on APS’s history of excellence, and plan for the future.
People

James Carrington was recently among the 72 new members and 18 foreign associates elected to The National Academy of Sciences. New members were chosen in recognition of their distinguished and continuing achievements in original research. Carrington is a professor at the Department of Botany and Plant Pathology, and the director of the Center for Genome Research and Biocomputing at Oregon State University in Corvallis. Carrington was the keynote speaker during the 12th International Congress in Sorrento.

Hye-Sook Oh recently completed her Ph.D. degree from the Department of Plant Pathology and Plant-Microbe Biology at Cornell University under the direction of Alan Collmer. Her thesis was entitled “Investigation of the lytic transglycosylase, HrpH, and other Pseudomonas syringae suppressors of basal defense.” As part of this project, Oh developed novel assays for the elicitation of plant basal defenses and used these assays to identify proteins secreted by the Pseudomonas syringae type III secretion system that are capable of suppressing such defenses. Her work focused on HrpH, which is a specialized lytic transglycosylase that plays an important role in the translocation of type III effector proteins and is itself translocated into plant cells.

The following students from the Graduate School Experimental Plant Sciences, a collaborative research and teaching institution of Wageningen University (WU), Radboud University (RU), Vrije Universiteit Amsterdam (VU), Leiden University (LU), University of Amsterdam (UvA), and Utrecht University (UU), focused their Ph.D. theses on interactions between plants and biotic agents.


C. C. N. van Schie. Biosynthesis of volatile and hormonal terpenes in tomato. M. A. Haring (promotor); R. C. Schuurink (copromotor); UvA, Amsterdam, 9 January 2007.

M. Staats. Botrytis species on flower bulb crops; Phylogeny, genetic variation and host specificity. P. J. G. M. de Wit (promotor); J. A. L. van Kan (copromotor); WU, Wageningen, 15 January 2007. EPS certificate requested and granted.


H. J. Finkers. The genetics of Botrytis cinerea resistance in tomato. R. G. F. Visser (promotor); A. W. van Heusden and J. A. L. van Kan (copromotors); WU, Wageningen, 3 April 2007. EPS certificate requested and granted.


T. C. Marcel. Genetic architecture of basal resistance of barley to Puccinia bordei. R. G. F. Visser (promotor); R. E. Niks (copromotor); WU, Wageningen, 11 May 2007. EPS certificate requested and granted.


M. Djavaheri. Iron-regulated metabolites of plant growth promoting Pseudomonas fluorescens WCS374: Their role in induced systemic resistance. L. C. van Loon (promotor); P. A. H. M. Bakker (copromotor); UU, Utrecht, 26 June 2007.

I. Kars. The role of pectin degradation in pathogenesis of Botrytis cinerea. P. J. G. M. de Wit (promotor); J. A. L. van Kan (copromotor); WU, Wageningen, 21 September 2007. EPS certificate requested and granted.

H. Tran Thi Thu. Interactions between biosurfactant-producing Pseudomonas and Phytophthora species. P. J. G. M. de Wit (promotor); J. M. Raaijmakers (copromotor); WU, Wageningen, 9 October 2007. EPS certificate requested and granted.

D. Ribeiro. Towards understanding TSWV particle assembly: Analysis of the intracellular behaviour of the viral structural proteins. R. W. Goldbach (promotor);
R. J. M. Kormelink (copromotor); WU, Wageningen, 6 November 2007. EPS certificate requested and granted.


Have news you want to share with the society? Submit it online at www.ismpminet.org/newsletter/submissionform.asp. Send us news of your degree completion and, as a special graduation gift, you can receive 2 years of membership in IS-MPMI for the price of 1!

XIV International Congress
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Make plans now to attend the XIV International Congress on Molecular Plant-Microbe Interactions in beautiful Québec City!

Visit www.ismpminet.org for Congress updates.
Post-Doctoral Position Opening in Molecular Plant-Pathogen Interactions

Candidate should have Ph.D. degree in plant pathology, microbiology, plant science, or related fields. Experience in molecular biology and microscopy and strong written and communication skills are highly desirable. Applicant must have a successful publication history. The selected post-doctoral researcher will be part of an NIH-funded project to investigate stome-based innate immunity against bacterial infections in Arabidopsis and fresh vegetable crops. The project also aims at a basic understanding of how different bacteria activate or inactivate this newly discovered plant immune response (see publications: Cell 126:969-980; Cellular Microbiology 9:1621-1629; Nature 448:661-665). The University of Texas at Arlington (UTA) is a full-service research and teaching university with more than 25,000 students. See: http://www.uta.edu/biology/. The University is located in the city of Arlington and in close proximity of the Dallas-Ft. Worth Metroplex, one of the leading centers of aerospace, electronics, and telecommunications activity in the United States. Excellent recreational, entertainment, and cultural facilities, major airport, modern shopping complexes, and professional sports organizations are located in Arlington and the surrounding area. Cost of living is very affordable in this area. UTA is an equal opportunity/affirmative action employer. Salary: Commensurate with qualifications and experience. Closing Date: Position is available immediately and applications will be considered until a suitable candidate is identified. Please send a letter of interest, curriculum vitae, and contact information for three professional references. Contact: Maeli Melotto, University of Texas at Arlington, Department of Biology, B-29 Life Science, 501 S. Nedderman Drive, Arlington, TX 76019 U.S.A. E-mail: melotto@uta.edu.

Post-Doctoral Position

A post-doctoral position is available immediately to conduct research directed at the molecular and biochemical analysis of cyst nematode parasitism proteins. This project will involve expression of nematode parasitism genes in plants, silencing of nematode genes through RNAi, and identifying plant proteins interacting with nematode parasitism proteins, among other approaches. The University of Missouri offers excellent opportunities in plant biology through the Interdisciplinary Plant Group (www.plantgroup.org). Our laboratory is located in the Christopher S. Bond Life Sciences Center (http://bondlsc.missouri.edu/), which provides state of the art infrastructure and an interdisciplinary research and education environment. For more information, visit our lab website at http://plantsci.missouri.edu/mitchumlab/. Highly motivated individuals with a strong background in molecular plant-microbe interactions, plant molecular biology, and/or genetics are encouraged to apply. Expertise in plant molecular biology is required. Experience working with Arabidopsis is desirable. Nematology experience is not required. The successful candidate is expected to be independent and have excellent written and verbal communication skills. Post-doctoral positions are for 1 year with the possibility of extension. Salary: Commensurate with experience. A full benefits package is provided with the position. Closing Date: Review of applications will continue until a suitable candidate is found. Interested candidates should send a cover letter describing your interest and expertise, a CV, and contact information (name, e-mail address, and phone number) for three scientists who can serve as references to Melissa Goellner Mitchum. Please enter POSTDOC POSITION in the subject line. Contact: Melissa Goellner Mitchum. E-mail: goellem@missouri.edu.

Product Development Manager

FMC Corporation is a Fortune 1000, diversified chemical company serving the agricultural, industrial, and consumer markets globally for more than a century with innovative solutions, applications, and quality products. As a global leader utilizing advanced technologies and customer-focused research and development, FMC provides innovative and cost-effective solutions within their key business segments: agricultural products, specialty chemicals, and industrial chemicals. This position reports to the manager of Product Development, North America. The purpose of this position is to facilitate and oversee North American product development activities for assigned active ingredients, crop segments, geographic area, and product or customer specific initiatives. This position works closely with marketing, sales, regulatory, formulations, and peer product development managers along with key customers and global development to apply broad product development knowledge and prioritize product development investments. The position will have responsibility and accountability for prioritizing and implementing product development plans related to existing and new products for North America. Visit https://fmc.ats.hrsmart.com/cgi-bin/a/highlightjob.cgi?jobid=561 for responsibilities and experience requirements. Salary: Employees enjoy very competitive compensation, a full menu of work/life benefits, and opportunities to continue developing their skills and expanding their career. Please submit a resume. Contact: E-mail: careers@fmc.com; Web: https://fmc.ats.hrsmart.com/cgi-bin/a/highlightjob.cgi?jobid=561.
Welcome New Members

The following members joined IS-MPMI between January 1 and April 30, 2008. Please join us in welcoming them to the society!

Melvin D. Bolton
USDA ARS
Fargo, ND, U.S.A.

Monika Debreczeny
Bay Zoltan Foundation
Szeged, Hungary

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Toronto, ON, Canada

Dulguun Dorjgotov
Inst for Plant Genomics
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Georg Felix
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Tuebingen, Germany

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Gloria M. Mosquera
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Klaus H. Oldach
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Osman E. Radwan
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Urbana, IL, U.S.A.

Maryam Rafiqi
Australian Natl Univ
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Pascal Rate
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Arantxa Rico
Univ of Oxford
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Heather C. Rowe
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Jon Y. Suzuki
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Hilo, HI, U.S.A.

Adrian Alberto Vojnov
Centro de Ciencia Y Tecnologia
Saladillo, BA, Argentina

Xinhua Zhao
Aureogen BioScience
Portage, MI, U.S.A.

Share the Value of Membership

IS-MPMI is nearly 700 members strong. Help IS-MPMI continue to grow by recruiting your colleagues to join the society today.

Current members who successfully recruit new members through December 31, 2008, will be entered into a drawing for free registration to the XIV Congress! Members who bring in five or more new members will receive free membership renewal for one year.

For each new member you recruit, your name will be entered into the drawing, so the more new members you bring in, the higher your chances are of winning!

Visit www.ismpminet.org/members/refermember.asp to download special membership applications or complete the online referral form and an e-mail will be sent to your colleague.

Contact the IS-MPMI membership department at +1.651.454.7250 or ismpminfo@scisoc.org with questions regarding this special campaign.

Start recruiting new members today!
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 2008, Vol. 21, Number 3

REVIEW—Recent Fungal Diseases of Crop Plants: Is Lateral Gene Transfer a Common Theme?

OsRAR1 and OsSGT1 Physically Interact and Function in Rice Basal Disease Resistance.

The Response Regulator HrpY of Dickeya dadantii 3937 Regulates Virulence Genes Not Linked to the hrp Cluster.

The Arg-Gly-Asp–Containing, Solvent-Exposed Loop of Ptr ToxA Is Required for Internalization.

Virulence of Plant Pathogenic Bacteria Attenuated by Degradation of Fatty Acid Cell-to-Cell Signaling Factors.

Tobacco mosaic virus (TMV) Replicase and Movement Protein Function Synergistically in Facilitating TMV Spread by Lateral Diffusion in the Plasmodesmal Desmotubule of Nicotiana benthamiana.

Characterization and Antifungal Properties of Wheat Nonspecific Lipid Transfer Proteins.

The Pseudomonas syringae Type III Effector HopAM1 Enhances Virulence on Water-Stressed Plants.

April 2008, Vol. 21, Number 4

TECHNICAL ADVANCE—Polyubiquitin Promoter-Based Binary Vectors for Overexpression and Gene Silencing in Lotus japonicus.

TECHNICAL ADVANCE—Pathogenicity of Pseudomonas syringae pv. tomato on Tomato Seedlings: Phenotypic and Gene Expression Analyses of the Virulence Function of Coronatine.

Identification of a New Locus, Prt(t), Required for Rice Blast Resistance Gene Pi-ta–Mediated Resistance.

Transcription of ENOD8 in Medicago truncatula Nodules Directs ENOD8 Esterase to Developing and Mature Symbiosomes.

The rsmA-like Gene rsmAc of Xanthomonas campestris pv. campestris Is Involved in the Control of Various Cellular Processes, Including Pathogenesis.

Cyst Nematode Parasitism of Arabidopsis thaliana Is Inhibited by Salicylic Acid (SA) and Elicits Uncoupled SA-Independent Pathogenesis-Related Gene Expression in Roots.

May 2008, Vol. 21, Number 5


A Putative MAP Kinase Kinase Kinase, MCK1, Is Required for Cell Wall Integrity and Pathogenicity of the Rice Blast Fungus, Magnaporthe oryzae.

api, A Novel Medicago truncatula Symbiotic Mutant Impaired in Nodule Primordium Invasion.

Citrate Uptake into Pectobacterium atrosepticum Is Critical for Bacterial Virulence.

Two Xanthomonas Extracellular Polygalacturonases, PghAxc and PghBxc, Are Regulated by Type III Secretion Regulators HrpX and HrpG and Are Required for Virulence.

Silencing a Candidate Nematode Effector Gene Corresponding to the Tomato Resistance Gene Mi-I Leads to Acquisition of Virulence.

NTH201, a Novel Class II KNOTTED1-Like Protein, Facilitates the Cell-to-Cell Movement of Tobacco mosaic virus in Tobacco.

Host-Dependent Expression of Rhizobium leguminosarum bv. vicieae Hydrogenase Is Controlled at Transcriptional and Post-Transcriptional Levels in Legume Nodules.

Oxalic Acid Is an Elicitor of Plant Programmed Cell Death during Sclerotinia sclerotiorum Disease Development.

Multiple Activities Associated with the Capsid Protein of Satellite Panicum Mosaic Virus Are Controlled Separately by the N- and C-Terminal Regions.

Evidence for Transcriptional and Post-Translational Regulation of Sucrose Synthase in Pea Nodules by the Cellular Redox State.

Transcription Profiling of Soybean Nodulation by Bradyrhizobium japonicum.

Discovery of ADP-Ribosylation and Other Plant Defense Pathway Elements Through Expression Profiling of Four Different Arabidopsis–Pseudomonas R-avr Interactions.

Genome Organization and Evolution of the AVR-Pita Avirulence Gene Family in the Magnaporthe grisea Species Complex.

**June 2008, Vol. 21, Number 6**

**REVIEW**—Twenty Years of Transgenic Plants Resistant to Cucumber mosaic virus.

**REVIEW**—Roadmap to New Virulence Determinants in Pseudomonas syringae: Insights from Comparative Genomics and Genome Organization.

**REVIEW**—Early Progress in Aphid Genomics and Consequences for Plant–Aphid Interactions Studies.

**REVIEW**—Global Switches and Fine-Tuning—ABA Modulates Plant Pathogen Defense.

**TECHNICAL ADVANCE**—Virus-Induced Gene Silencing (VIGS) as a Reverse Genetic Tool to Study Development of Symbiotic Root Nodules.

Tomatinase from Fusarium oxysporum f. sp. lycopersici Is Required for Full Virulence on Tomato Plants.

Soil Bacteria Confer Plant Salt Tolerance by Tissue-Specific Regulation of the Sodium Transporter HKT1.

Basic Compatibility of Albugo candida in Arabidopsis thaliana and Brassica juncea Causes Broad-Spectrum Suppression of Innate Immunity.

WRR4 Encodes a TIR-NB-LRR Protein That Confers Broad-Spectrum White Rust Resistance in Arabidopsis thaliana to Four Physiological Races of Albugo candida.

Distinct and Combined Roles of the MAP Kinases of Cochliobolus heterostrophus in Virulence and Stress Responses.

Expression of Medicago truncatula Genes Responsive to Nitric Oxide in Pathogenic and Symbiotic Conditions.

Expression of Two Functionally Distinct Plant Endo-β-1,4-Glucanases Is Essential for the Compatible Interaction Between Potato Cyst Nematode and Its Hosts.


NADPH Oxidases Are Involved in Differentiation and Pathogenicity in Botrytis cinerea.

Structure of the Glucanase Inhibitor Protein (GIP) Family from Phytophthora Species Suggests Coevolution with Plant Endo-β-1,3-Glucanases.


Molecular Analysis of Lipoxygenases Associated with Nodule Development in Soybean.
COMING EVENTS

2008

June 22-26
4th EPSO Conference
Toulon (Côte d’Azur), France
www.epsoweb.org/catalog/conf2008.htm

July 14-16
Plant-Associated Microbe Gene Ontology (PAMGO) Training Workshop
Blacksburg, VA, U.S.A.
www.cpe.vt.edu/vbi-genome/

July 16-18
Oomycete Bioinformatics Workshop
Blacksburg, VA, U.S.A.
www.cpe.vt.edu/vbi-genome/

July 26-30
The American Phytopathological Society Centennial Meeting
Minneapolis, MN, U.S.A.
www.apsnet.org/centennial

August 17-22
16th Congress of the Federation of European Societies of Plant Biology (FESPB)
Tampere, Finland
www.fespb2008.org

August 18-22
7th International Mycosphaerella and Stagonospora Symposium
Ascona, Switzerland
www.path.ethz.ch/news/conferences/Mycosphaerella_Ascona_2007

August 20-22
4th International Symposium on Rhizoctonia
Berlin, Germany
www.rhizoctonia.org

August 23-24
3rd International Phytophthora and Pythium Workshop in association with the 9th ICPP
Torino, Italy

August 24-29
9th International Congress of Plant Pathology
Torino, Italy
www.icpp2008.org

August 30-September 2
10th International Fusarium Workshop
Alghero, Sardinia, Italy
www.ars.usda.gov/Main/docs.htm?docid=9850

August 30-September 3
8th European Nitrogen Fixation Conference
Ghent, Belgium

September 3-4
11th International Symposium on Nitrogen Fixation with Non-Legumes
Ghent, Belgium

November 16-21
10th International Symposium on the Biosafety of Genetically Modified Organisms (ISBGMO)
Wellington, New Zealand
www.isbgmo.info

November 30-December 5
Biotechnology Havana 2008
Havana, Cuba

2009

July 8-10
Plant ROS 2009
Helsinki, Finland
http://pog2009.org/

July 19-23
XIV International Congress on Molecular Plant-Microbe Interactions
Québec City, Québec, Canada
www.ismpminet.org/meetings

October 25-30
9th International Plant Molecular Biology Congress
St. Louis, MO, U.S.A.
www.ipmb2009.org

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