S-MPMI

Reporter International Society for Molecular Plant-Microbe Interactions

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IS-MPMI REPORTER DEADLINE Deadline for submitting items for the next issue is Dec. 15, 2009.

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Vive le Québec! The XIV International Congress on **Molecular Plant-Microbe Interactions**



Congress Organizer Hani Antoun and IS-MPMI President Federico Sanchez

From June 19 to June 23, 2009, the charming and lively city of Québec, Canada, and Laval University hosted the XIV International Congress on Molecular Plant-Microbe Interactions. Québec was full of life and contagious energy with the Summer Festival at its best, the streets filled with visitors, and all varieties of fine arts, concerts, and prime street spectacles. This fun environment was also the ideal setting to witness top-quality science offered by the scientific program presented at the XIV Congress. There were 956 participants coming from nearly 50 different countries. The congress was considered a great success by most attendees and about 92% would recommend this meeting to others in this area of study.

The congress presented cutting-edge science, establishing new collaborations and networking opportunities with colleagues in the diverse fields of plant-microbe interactions. In particular, it was very exciting to know that 50% of the attendees were students and young scientists! Also exciting was the fact that IS-MPMI's membership reached the 1,000-member mark for the first time ever—a clear sign of the vitality, growth, and expansion of the scientific frontier in the field of plant-microbe interactions.

Highlights from the 2009 Congress include the opening lecture given by **Luis Sequeira**, who stressed the urgent need to rapidly increase translational biology in the field of molecular plant-microbe interactions, particularly to manage an imminent grain shortage resulting from the accelerated spread of devastating diseases affecting both wheat and citrus crops. Another highlight was the presentation given by Jeff Dangl, who was this year's recipient of the 2009 IS-MPMI Award in recognition of his pioneering and insightful work unraveling the signaling pathways that plants trigger in defense of pathogens. Dangl is an elected member of the U.S. National Academy of Sciences, a fellow in the American Association for the Advancement of Science, and associate director of the Carolina Center for Genome Science. He served on the MPMI Editorial Board for 11 years. This year, he also received the important Stephen Hales Prize from the American Society of Plant Biologists.

According to attendees, pathogenic interactions, common host mechanisms, signaling and molecular dialogues, and plant immunity were highly ranked plenary sessions; nearly 90% considered these sessions in particular the most informative, stating that they met, exceeded, or greatly exceeded their expectations. Likewise, attendees indicated that the most informative concurrent sessions were those highlighting molecular dialogues, microbe effector proteins, programmed cell death, and emerging technologies. Indeed, the unraveling of the functions performed by the effector proteins delivered by pathogens and symbionts into plant-host cells is a major achievement in the field. Consequently, this major leap is providing new directions and insights into

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Images from the XIV International Congress on Molecular Plant-Microbe Interactions



Luis Sequeira (right), pictured with Congress Organizer Hani Antoun, provided the Opening Address for the XIV International Congress, "Facing the issues in agricultural biotechnology."



Plenary Session presenter, Sharon Long, speaking on the regulation of *Sinorhizobium meliloti* genes during early and intermediate stages of nodule formation.



IS-MPMI Board of Directors



More than 700 posters were put up on Sunday for viewing during the congress.



Attendees arrived from 46 different countries; here they are marking where they are from on this map in IS-MPMI Central.



Attendees learn about the added features of MPMI Online.

Visit the IS-MPMI Facebook site for more meeting photos. Link to it from www.ismpminet.org.



Showing off their new flash drives courtesy of MPMI Online.



Relaxing aboard the boat cruise on the St. Lawrence River.



Letting loose at the Final Banquet and Show on Thursday evening.



A huge thanks to the volunteers! We couldn't have done it without you.



IS-MPMI Central was the place for attendees to find out about all their member benefits.



Exhibitors sharing information about their products and services.

Award-Winning Plant Scientist and Pioneer, Jeff Dangl, Talks About His Field, His Philosophy, and His Passion



Jeff Dangl

Jeff Dangl, a plant-genome scientist and the John N. Couch Professor in the Department of Biology at the University of North Carolina (UNC), Chapel Hill, NC, U.S.A., is this year's recipient of the IS-MPMI Award. The award honors outstanding innovative research, and this is only the second time it has been given.

Dangl has made significant contributions to the understanding of plant defense from pathogens and the molecular basis of the innate immune response in plants. For these and other important contributions to the field of molecular-plant interactions and following an internal vote process by the IS-MPMI Board of Directors, Dangl was elected as the recipient of the 2009 award, which he recieved during the congress in Québec.

Q: How do you describe what you do to people outside of your area of specialty?

A: I tell them we work on the plant immune system and that, like our own immune systems, plants need to be able to identify pathogens and respond to them. I then digress immediately away from molecular genetics and toward the dinner table and explain that the genes and proteins that make up the receptors in the plant immune system are critical components of modern agriculture and have been used by plant breeders since 1905 to generate disease-resistant crops.

Q: How did you feel when you found out about the award from IS-MPMI?

A: I was honestly stunned. I hope it is not a sign that the Award Committee considers me to be on the downward slope of my career!

Q: How would the folks in your lab describe you?

A: It's probably better to ask them! I hope they would say that I help them leave our lab better scientists, while staying as happy, or happier, than when they arrived. Sarah [Grant] and I have the philosophy that if you love what you do and you are dedicated, then you'll thrive in our lab.

Q: Have you always had a passion for what you do? Was there a moment when you thought, "This is what I am going to do with my career."

A: Yes. During the summer after my second year in university, I was hoping to find a summer job that would allow me to stay on campus at Stanford and earn enough money to survive. I was very, very fortunate to land a job learning to run, and then running, the fluorescence activated cell sorter (FACS) in the lab of its creator, **Len Herzenberg**. It was completely engrossing to be able to actually do experiments, dissect mice, stain cells with antibodies, and study how the cells of the mouse immune system functioned. I stayed in that lab from 1978 to 1986. I could never thank Len, and a senior post-doc in his lab, **Vernon Oi**, enough for what they taught me about science, passion for discovery, and dedication to excellence.

Q: When did you decide to start your work in unraveling the molecular mechanisms of the innate immune response in plants?

A: I had been sent to the library to find a particular paper and literally stumbled across a paper in PNAS describing plant defense responses. The paper was from Klaus Hahlbrock's lab, then in Freiburg, Germany, but as I learned later, about to move to the Max Planck Institute in Cologne, Germany. So, I did some reading, mostly from a genetics perspective (papers from Flor, Ellingboe, Keen, Crute) and figured [out that] this was an emerging new field. I was again very fortunate to land an NSF-funded post-doctoral slot in Klaus's lab at a time when he was surrounded by superb scientists who were instrumental in my own development (such as **Dierk Scheel**, **Imre** Somssich, Wolfgang Knogge, Carl Douglas, and a fiery young doctoral student named Paul Schulze-Lefert). After three years there, I was given the golden opportunity to start a lab in a new institute for "junior group leaders" that was on the MPIZ site, called the Max-Delbrueck Laboratory (MDL). It was there, in July 1989 (20 years ago!), that we started to look for pathogens that would cause disease, or not, on various Arabidopsis accessions. I was lucky to have **Jeff Schell** as a superb mentor (he had an incredible ability to listen intently and deliver constructive criticism on the fly) and Csaba Koncz, who is one of the leading Arabidopsis scientists in the world, as a friend and fellow devotee of Arabidopsis. We also were fortunate in that the more senior folks in the field, particularly Brian Staskawaicz, Fred Ausubel, Jonathan Jones, and Jeff Ellis, were very open about sharing results and reagents to drive the new field forward. This very collegial attitude exists to this day, and frankly, is, I think, a very important contribution to the molecular plant-microbe interactions community. My group at the MDL was a lot of fun and they worked very hard to put

us (us being **Murray Grant** and **Laurence Godiard**, in collaboration with the **Roger Innes**'s lab) in a position to clone one of the first NB-LRR disease resistance genes, *RPM1*, in 1995.

Q: What does basal immunity really mean in plants?

A: Well, I will borrow this from **Jonathan Jones**: Basal immunity is the sum of PAMP-triggered immunity (PTI) minus effector-triggered suppression (ETS) of that PTI output. If the former is greater than the latter, the plant will not support significant pathogen growth. If ETS is strong, PTI is suppressed and eventually the pathogen will prosper. Of course, this is a conceptual view of basal immunity. How this is achieved mechanistically is still quite a mystery, though of course the classic output responses (secreted antimicrobials and buttressing of cell wall appositions, etc.) are all likely to be relevant in at least some contexts.

Q: Why do plants have so many receptors to defend from microbes?

A: It's not clear that they do. So far, there are less than a handful of PAMP/MAMP receptors identified. Let's assume there are 200 in the *Arabidopsis* reference Col-0 sequence (a big jump from current data!). Add a further 125 NB-LRR proteins as intracellular effector receptors. And, let's assume that they are all active—so, 325 receptors. Let's further assume there are 100 different, active alleles/

paralogs across the *Arabidopsis* population (a big jump!). Now we have ~32,500 "specificities" (if each operates in a classic gene-for-gene or as a single-ligand PAMP receptor). Still not a large repertoire when compared with any of the rearranging immune systems. And I reckon the number is actually much *smaller* for NB-LRR proteins, since indirect recognition of effector action on host targets (in essence, recognition of modified self) allows for a "collapsing" of the overall pathogen effector repertoire onto a smaller number of host cellular targets whose homeostasis is monitored by a small number of NB-LRR proteins. There are now a growing number of cases where multiple effectors target the same host protein, leading to a genetic context-specific activation of a particular *R* gene.

Q: What's next for Dr. Dangl?

A: I am interested in the collapse of effectors onto targets, as detailed above. I think that fungal and bacterial pathogenomics will make a huge impact on how we think about disease resistance, as well as unlocking the doors of microbial virulence. I am also fascinated by possibilities to move beyond the binary interactions that most of us have studied for the last 20 years. Plant-microbe interactions usually happen in complex microenvironments and the microbial community on a leaf surface, for example, might have significant contributions to the ultimate outcome of the interactions (microbe-microbe, host-microbe, etc.) occurring there. So, in a word, metagenomics.

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plant immunity and defense mechanisms from a molecular viewpoint. Additionally, more than 85% of surveyed participants considered the number of concurrent and plenary sessions favorable, suggesting the expanding interest in this field. Indeed, the high-quality and vast information that is presented at the poster session is a key traditional element of interest and a guaranteed success at the biannual IS-MPMI Congress.

This year, social events included a welcome reception, a boat trip on the St. Lawrence River, and the final banquet and show with traditional, delicious food and music from a local folk band of young and gifted family musicians.

At the closing ceremony, the presidency was passed from **Federico Sanchez** to the newly elected President **Felice Cerbone**. **Ko Shimamoto** announced that the next IS-MPMI Congress will be held at the beginning of August 2011 in the breathtaking city of Kyoto. Start making plans to attend the XV IS-MPMI Congress in this beautiful and unique venue!

For an additional open-access review of the congress, written by *MPMI* Editor-in-Chief Jonathan Walton, see the December 2009 issue of *MPMI*. ■

Nominations Due November 1 for the Noel T. Keen Award for Research Excellence in Molecular Plant Pathology

The American Phytopathological Society (APS) is now accepting nominations for the Noel T. Keen Award for Research Excellence in Molecular Plant Pathology. Noel T. Keen was a former board member of IS-MPMI and was a prolific scholar who made many major contributions to the field of molecular plant-microbe interactions on very diverse systems. Recipients of the Noel T. Keen Award receive a certificate and a cash prize derived from a fund established through the APS Foundation. For instructions, visit www.apsnet.org/members/awards/closing.asp; nominees must be APS members. Nomination packages should be submitted by November 1, 2009, as specified in the directions for consideration. Additional inquiries can be directed to **David Weller** (wellerd@mail.wsu.edu) at +1.509.335.6210.

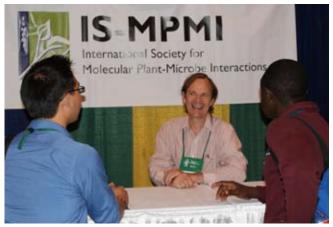


Thanks for visiting IS-MPMI Central at the 2009 IS-MPMI Congress!



Thank you to everyone who signed up for profiles at the meeting!

More than 400 IS-MPMI Congress attendees set up savedsearch alerts in their MPMI Online profile during the fiveday meeting in Québec City this July. Saved-search alerts help researchers by automatically sending an e-mail when new information is published that pertains to keywords in their research areas. You can set up your own savedsearch alerts in MPMI Online. To begin, set up your profile by visiting www.ismpminet.org/mpmi and clicking on "My Profile." Sign in using your MPMI username and password. If you don't have one, you will need to fill out the registration form to create one. Then enter a search term in the search bar and click "Search." When your results appear, enter a name under which you'd like to save your term in the "Saved-Search Alerts" box and click "Save." You can run or delete saved searches by clicking "Advanced Search" and scrolling to the bottom of the



"Ask the Editor-in-Chief" session helps prospective authors.

page. If you have any questions, e-mail **Kayla Heurung** (kheurung@scisoc.org).

At the congress, prospective authors also had the opportunity to meet **Jonathan Walton**, editor-in-chief of *MPMI*, and ask questions regarding publishing in the journal. If you would like to learn about publishing in *MPMI*, take a look at the Instructions for Authors at http://apsjournals.apsnet.org/userimages/ContentEditor/1173402237082/mpmi_author_instructions.pdf.

Thank you to everyone who stopped by IS-MPMI Central at the 2009 Congress! Miss the meeting? Check out more meeting photos on Facebook at www.facebook.com/photo_search. php?oid=185915680283&view=all. ■

New IS-MPMI Board of Directors

IS-MPMI is pleased to welcome its new board members. The new leadership assumed their responsibilities at the conclusion of IS-MPMI's Congress in Québec, Canada.

Felice Cervone, La Sapienza University, is the new IS-MPMI president and Jane Glazebrook, University of Minnesota, is a new director. Returning to the board are Sophien Kamoun, Sainsbury Laboratory, president-elect and IS-MPMI Reporter editor-in-chief; Federico Sanchez, University of Mexico, immediate past president; Maria J. Harrison, Boyce Thompson Institute, secretary; Matteo Lorito, University Degli Studi Di Napoli, treasurer; Jonathan D. Walton, Michigan State University, MPMI editor-in-chief; Peter Dodds, CSIRO, director; Sheng Yang He, Michigan State University, director; and Eva Kondorosi, CNRS, director.

A listing, with contact information for each member, can be found on the back cover of this issue. ■

Have News? Send it to the REPORTER! As the primary source of society information, the IS-MPMI Reporter is the best way to keep members informed of your activities. Send details about your latest meeting, award, presentation, publication, organization, or any newsworthy item you feel members would like to read. Submit your articles for the next issue

Submit your articles for the next issue of the *Reporter* by December 15. You can e-mail ismpmireportereditor@scisoc.org or submit your item online at www.ismpminet.org/newsletter/submissionform.asp.



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Congress Opening Lecturer Luis Sequeira Addresses the Issues Facing Agricultural Biotechnology



Luis Sequeira

Following the recent 2009 Congress in Québec, IS-MPMI contacted opening lecturer Luis Sequeira about his address.

Q: In your opening address, you began by explaining that more than simply giving a speech, you wanted to use the occasion to comment on the current and prospective state of the field of molecular plantmicrobe interactions, including

the importance of relevance, translational research, and funding. For those members who were unable to attend the congress this year, we've developed a few in-depth questions, for your input, to provide a summary of your presentation, while also highlighting concrete solutions, translating into possible opportunities, for the challenges scientists currently face today.

You talked a great deal about the connection between research and the real world, particularly the needs of agriculture and, more specifically, those interactions that affect growth and productivity within agriculture (globally and locally). You emphasized the importance of scientists making their research more "relevant." Could you share your thoughts on how researchers should refocus to remain relevant outside of their niche areas?

A: My point is that I am entirely in favor of basic research in host-parasite interactions and I agree that one cannot predict where or how applications of that research will be found. However, there are too many pressing needs, of which several I mentioned during my speech, and we must speed up the process. I suggested that the journal [MPMI] publish some article of general interest about these current problems, so that basic researchers are aware of the needs out there. Awareness is the first step.

Q: You also discussed not only the dire need for translational research in the molecular plant-microbe interactions community but how this requires money, which in turn requires proposals. How can those reading this article today make an impact or be part of the solution to this problem?

A: You are right. Funding for translational research in the plant sciences will be required. In the medical arena, the Howard Hughes Foundation and NIH have destined many millions of dollars to speed up the process of bringing the results of discovery to the patient. We need to do the same in the plant sciences and NSF is the logical source of funding. We should also approach the current members of the National Science Board.

Q: Although you have been retired for many years, you are still extremely active in the scientific community,

specifically obtaining funding for agricultural research. What do you see as the biggest obstacles to funding? What is your most recent success in this regard in terms of your work?

A: After I retired from the University of Wisconsin in 1993, I worked for many different organizations, attempting to increase funding for agricultural research. I was successful in some instances and failed at other times (for example, I was not able to get the large banana companies to continue to fund the highly successful Banana Improvement Program of the World Bank). In terms of recent success, I was a member of a committee that created the National Institute for Food and Agriculture (NIFA) at the USDA, a significant departure from previous funding for research.

Q: You cited citrus greening and stem rust of wheat as problems greatly affecting agriculture. Can you expand on how the molecular plant-microbe community can become more involved in issues such as this?

A: *MPMI* recently published the complete DNA sequence of the citrus greening pathogen. This is a great achievement. We must continue to publish articles on citrus greening, wheat stem rust, and other important problems. I guess that it is up to the editor to contact the people doing research on host-parasite interactions involved in these problems.

Q: Can you elaborate more on your position that plants are not really "free," (quoting **Bob Goodman**) and talk more about the difficulty of working with patented plants, such as rice with beta carotene, which you mentioned has 30 patents currently?

A: Goodman made the obvious point that most crops have been selected by man over thousands of years and that introducing a single gene now should not give anyone the right to patent the entire genome. In addition, patenting has slowed up the whole process of plant improvement because of licensing requirements when the work is being done in developing countries.

Q: You had said that the *MPMI* journal, of which you were the very first editor-in-chief, is a "veritable jewel," yet you discussed several issues you had with the journal. For those who were not at the congress, can you explain the improvements you suggested?

A: *MPMI* is a "veritable jewel," but it can improve along translational lines and making an effort to publish articles dealing with current problems (the recent greening article is a good example). I do not believe that the two statements are contradictory.

Noel T. Keen Awardee Andrew Bent and His Contributions Toward Molecular Plant-Microbe Interactions



Andrew Ben

Andrew Bent is this year's recipient of the Noel T. Keen Award for Research Excellence in Molecular Plant Pathology. The award, established in Keen's honor in 2002, recognizes outstanding contributions and demonstrated sustained excellence and leadership in research that significantly advances the understanding

of molecular aspects of host-pathogen interactions, plant pathogens or plant-associated microbes, or molecular biology of disease development or defense mechanisms.

Bent, a professor of plant pathology at the University of Wisconsin-Madison (UWM), obtained a B.A. degree in biology, from Oberlin College (1983) and a Ph.D. degree from MIT (1989). Following post-doctoral work at the University of California-Berkeley, he joined the faculty at the University of Illinois in 1994 and, in 1999, transferred to UWM.

Bent is an authority on the molecular mechanisms of plant disease resistance, including pathogen recognition, signaling events leading to gene activation, and the host defenses induced. As a post-doctoral scientist, Bent helped to develop the Arabidopsis-Pseudomonas interaction as an experimental system and was a leader in the initial discovery that many R genes encode NB-LRR proteins. His lab improved upon Agrobacterium-mediated transformation of Arabidopsis, which led to numerous impacts on plant science. By isolation of Arabidopsis mutants, his group clearly separated the phenomenon of R gene-mediated (gene-for-gene) resistance from cell death per se. His group showed strain-to-strain variation in the defense-eliciting activity of flagellin, demonstrating that pathogen-associated molecular patterns (PAMPs, also called MAMPs) can be more variable than was previously known. By using ethylene-insensitive lines of soybeans to conduct field studies of both defense and yield, he demonstrated that manipulation of ethylene responses should be targeted to specific tissues, environments, or growth stages. Additionally, Bent has been lauded as an outstanding teacher and has contributed generously to university and professional services, including numerous contributions to The American Phytopathological Society and IS-MPMI. And, without further ado, Bent's comments on receiving the award:

I was thrilled and also a bit embarrassed when I received the phone call from APS President **Jim Moyer** informing me that I had been selected as the sixth recipient of one of APS's top awards—the Noel T. Keen Award. I thought immediately about Noel, a role model and whip-cracker for me and for many of us in the molecular plant-microbe interactions (MPMI) field. But my immediate vision was that Noel, after sharing heartfelt congratulations, would then be smiling and saying, "Now what have you discovered lately? Get your butt back into the lab because we sure as hell aren't going to waste any more air on you if that's all you've done!" (For those who didn't know him, Noel was supportive but also demanding, and his choice of words and subject matter was refreshingly plain and direct.)

I then award my colleagues who have done great work. The past award winners are **Brian Staskawicz**, **Alan Collmer**, **Tom Wolpert**, **Pierre de Wit**, and **Brett Tyler**, and I quickly thought of a dozen others who have done path-breaking work. Why me? Moyer assured me that they were confident in their selection. I rushed to add that the key phrase here was "contributions toward"—in each case, a number of other people and laboratories had played significant roles in the discovery—but he assured me again. So, my comment at this point is to say a sincere and simple "thanks" to my colleagues who set the context or were cocontributors to these discoveries. There are many folks who deserve this award.

Noel Keen was important to our discipline because, beyond his own work, he was both a "cheerleader" and a "corrective force" for our discipline. When he heard new results, he was quick to place them into the larger context and verbalize the broad positives of the new finding or to point out the holes in the developing story. He wasn't shy about asking tough questions, but he also wasn't shy about saying nice things (but he only said them where he felt it was deserved). Many of us miss that plain, undisguised mode of interaction.

I want to reiterate something from Noel that Jeff Dangl has also said in public many times. I'm not sure if enough people have fully absorbed the message. Much of the success in our discipline has been multiplied and made bigger due to colleagues talking very openly with each other about their work, often well in advance of publication. The students, post-docs, and professors who have succeeded the most in our discipline have often been those who have really bought into this sharing. As good ideas circulate and get criticized/modified, credit flows, ideas flow, and good projects get made better in "real time." Keen was an early force in this—he was very open and encouraged it in others. Good research has repeatedly been made better in our discipline and successful people have become more successful when they have been highly interactive with colleagues and competitors. Noel operated this way and many of our other most successful people have also operated this way. They are successful people and, like Noel, they seem to be having a great deal of fun along the way. ■

People

New Positions



Roger Beachy

Roger Beachy has been appointed first director of a new federal agriculture agency by President Barack Obama. Beachy, founding president of the Donald Danforth Plant Science Center (DDPSC) in St. Louis, MO, U.S.A., joined the National Institute of Food and Agriculture (NIFA), a USDA agency, in October. The new agency will award competitive grants to fund research and technological

innovations aimed at making agriculture more productive, environmentally sustainable, and economically viable. Beachy will also become vice chair of the DDPSC's Board of Trustees.

In Memory



Chris Lamb

Chris Lamb, who died suddenly at his home from heart failure at the age of 59, was a Middlesbrough lad who became one of the leading plant scientists of his generation.

Until his death, he was director of the John Innes Centre (JIC) in Norwich. The demands of running a world-leading research center did not remove him from his deep passion for research or the

cut and thrust of debate or diminish his commitment to popularizing the science he loved; though, it often made his day a long one.

If he was in Norwich, he made a point of ending his week with a drink at the JIC bar. According to the bar staff, Budvar was his favorite drink, but he also liked a JI No. 5—a strong hoppy mixture, ideal for propagating discourse and containing elements essential for the vigorous growth of friendship.

He managed to combine visionary leadership with his own continued scientific endeavors. He ran his own research group, investigating how plants defend themselves against pathogens. At the same time, he recognized the impact that plant science could have on addressing food security issues, delivering sustainable agriculture, developing bioenergy, and improving healthy aging. If only the world was aware, interested, and open to science.

Chris took plant research well beyond the lab to the local community in Norwich, to regional and national media, and to Westminster. His articulate conversation and convivial nature made him a good lobbyist for the JIC and plant science. For example, he hosted, with **Charles Clarke** (the Norwich South MP and former labor cabinet minister), regular dinners at the House of Commons to

discuss all aspects of science with politicians, journalists, and other opinion formers.

Chris recognized the need to bring society along with scientists if the challenges of providing sufficient food for a growing world population are to be met. He was not afraid to point out where genetic modification could provide solutions to food production that could not be met with traditional plant breeding. For example, if cereal crops could fix their own nitrogen from the air as legumes, such as peas, do, they would no longer need nitrogen fertilizers. Nitrogen fertilizers are responsible for nearly half the fossil fuel usage by agriculture.

One of Chris's major legacies will be the number of careers he nurtured, which are now flourishing at major universities and institutes across the world. He had a skill for talent spotting and for finding ways to continue to stretch and reward such talent.

This is all a long way from his Middlesbrough roots. He was brought up by loving adoptive parents and, after Middlesbrough High School, was the first in his adopted family to go to university. From a young age, he was mad on cricket and football and was a passionate Boro fan. Even during 17 years in America, during which he adopted his youngest child, he always followed the fortunes of his team. He had recently traced and met his siblings, though he never met his real parents.

He barely made it into Fitzwilliam College at Cambridge to read biochemistry but earned a first-class degree and went on to complete a Ph.D. degree there. He met Jane, his wife of 39 years, during freshers' week. His Ph.D. degree was supervised by **Phillip Rubery**, who was not yet 30 but already on the faculty. After completing his degree, Chris became a research fellow at Queen's College, Oxford.

A research paper in 1978, coauthored by **Rick Dixon**, was the start of a 26-year collaboration that resulted in 114 joint publications in top international journals.

When Dixon moved to the University of London, there were constant visits, often involving long lunches in a local pub to design the next set of experiments, and Chris and his students departing for Oxford with radio-labelled plant cell culture samples in large boxes of dry ice.

Chris was a reserved person and most comfortable when talking about science, but once past this barrier he was a warm individual with a remarkable scientific mind. He took pleasure in working out ideas and discussing hypotheses.

When the Salk Institute in La Jolla, CA, decided to establish a plant biology program, an advisor recognized his leadership potential and recommended him for the director position. This was remarkable, considering Chris had not yet held a permanent faculty position. Chris's legacy at La Jolla is not just his own science, but the scientists he identified and mentored who have made it one of the top places for plant science in the United States. He created an enjoyable yet scientifically rigorous environment in which students and coworkers could sharpen their own critical-thinking skills and develop as independent scientists.

Chris's lab published a series of highly cited papers in the area of plant-pathogen interactions. The top five papers have been cited 1,409; 1,128; 884; 639; and 424 times—remarkable by the standards of any field, but off the scale in a small field such as plant pathology.

Plants cannot run away from danger and instead have established intricate defences against pests and pathogens. Chris sought to investigate them and, between 1989 and 1999, published some of his most important discoveries. In an elegant series of papers, he and his team showed that the woody cell walls of plants rapidly harden upon attack to create a protective barrier.

When a pathogen invades a plant, some cells rapidly die to limit the invader to a small group of dead or dying cells. His lab made the seminal discovery that this is associated with the production of hydrogen peroxide. He later identified the role of nitric oxide, too. These chemicals are generated by a burst of metabolic activity, termed the "oxidative burst," that initiates cell death. These messengers are also important in animals, including humans. So, the findings established a link between defense responses in plants and animals, showing the deep similarities of all living creatures.

These discoveries ultimately led to Chris's recognition by the Institute for Scientific Information as one of the most highly cited researchers in the plant and animal sciences. He was made a fellow of the Royal Society in 2008 and in June this year was appointed CBE. Sadly, he has yet to be invested.

Although Chris's move to the John Innes Centre in 1999 resulted in his spending more time on administration, he maintained a small research group and never lost his interest in probing the mechanisms of plant disease resistance.

During his time as director, he revitalized the institute, bringing many new young faculty to the institute. Chris firmly believed in investing in young scientists and giving them the opportunity and resources to develop their research ideas. He always kept up with people's science programs, particularly the young scientists.

Most days, Chris completed the *Guardian* crossword, sometimes at the same time as running a meeting. His ability to multitask was astounding or perhaps helped to hone his thinking. Often when running a meeting in his office, he would wander off to send a couple of e-mails and find out the cricket scores before continuing the theme of a complex discussion. With so many competing thoughts, he sometimes appeared absent minded. Cycling had become a serious hobby for he and his family, and he cycled the 20 miles to work about three times a week. Sometimes he forgot which clothes he had in the office and sometimes meetings were conducted with him in his lycra shorts and top.

After meetings, serious study was given in the coffee room to the obscure management speak and footballing metaphor that peppered his legendary vocabulary.

Chris led by consensus. He had an incredible ability to bring disparate parties together to work toward a greater vision. He had been working toward making Norwich science greater than the sum of its parts (JIC, the Institute of Food Research, UEA, and the Norfolk and Norwich University Hospital). This involved working with many different groups and individuals. He worked not by forcing an agenda but by inspiring others in his vision.

He has left the institute much stronger than when he started as director and has ensured that the JIC, which is about to mark its centenary, will continue to lead the world in plant and microbial sciences for many years to come.

He is survived by his wife, Jane, and their children, Catherine, William, and Donald. He had recently become a grandfather to Sadie. ■

Recently published research in Molecular Plant-Microbe Interactions

Find complete abstracts online with links to full-text articles at www.ismpminet.org/mpmi

July 2009, Volume 22, Number 7

CURRENT REVIEW—Weights in the Balance: Jasmonic Acid and Salicylic Acid Signaling in Root-Biotroph Interactions.

Ralstonia solanacearum Encounters an Oxidative Environment During Tomato Infection.

Gene Disruption of an Arabinofuranosidase/β-Xylosidase Precursor Decreases *Sclerotinia sclerotiorum* Virulence on Canola Tissue.

Molecular Characterization and Functional Analysis of *MgNLP*, the Sole NPP1 Domain–Containing Protein, from the Fungal Wheat Leaf Pathogen *Mycosphaerella graminicola*.

Absence of Symbiotic Leghemoglobins Alters Bacteroid and Plant Cell Differentiation During Development of *Lotus japonicus* Root Nodules.

The Putative Secreted Serine Protease Chp-7 Is Required for Full Virulence and Induction of a Nonhost Hypersensitive Response by *Clavibacter michiganensis* subsp. *sepedonicus*.

Suppression of the Rice Fatty-Acid Desaturase Gene *OsSSI2* Enhances Resistance to Blast and Leaf Blight Diseases in Rice.

Fusarium oxysporum Ste12 Controls Invasive Growth and Virulence Downstream of the Fmk1 MAPK Cascade.

Multiple *R*-Like Genes Are Negatively Regulated by *BON1* and *BON3* in *Arabidopsis*.

Regulatory Interactions Between Quorum-Sensing, Auxin, Cytokinin, and the Hrp Regulon in Relation to Gall Formation and Epiphytic Fitness of *Pantoea agglomerans* pv. *gypsophilae*.

Bacterial Growth Restriction During Host Resistance to *Pseudomonas syringae* Is Associated with Leaf Water Loss and Localized Cessation of Vascular Activity in *Arabidopsis thaliana*.

NADPH Oxidase-Mediated Reactive Oxygen Species Production: Subcellular Localization and Reassessment of Its Role in Plant Defense.

Oxygenase Coordination Is Required for Morphological Transition and the Host–Fungus Interaction of *Aspergillus flavus*.



August 2009, Volume 22, Number 8

Developing Kernel and Rachis Node Induce the Trichothecene Pathway of *Fusarium* graminearum During Wheat Head Infection.

Type IV Pili Are Required for Virulence, Twitching Motility, and Biofilm Formation of *Acidovorax avenae* subsp. *citrulli*.

Full-Size ABC Transporters from the ABCG Subfamily in *Medicago truncatula*.

Repeat-Induced Point Mutation (RIP) as an Alternative Mechanism of Evolution Toward Virulence in *Leptosphaeria maculans*.

The YAP1 Homolog–Mediated Oxidative Stress Tolerance Is Crucial for Pathogenicity of the Necrotrophic Fungus *Alternaria alternata* in Citrus.

The ERECTA Receptor-Like Kinase Regulates Cell Wall–Mediated Resistance to Pathogens in *Arabidopsis thaliana*.

Pseudomonas syringae pv. *phaseolicola* Mutants Compromised for Type III Secretion System Gene Induction.

Are Grapevine Stomata Involved in the Elicitor-Induced Protection Against Downy Mildew?

Does *Botrytis cinerea* Ignore H₂O₂-Induced Oxidative Stress During Infection? Characterization of *Botrytis* Activator Protein 1.

Identification of *Beet necrotic yellow vein virus* P25 Pathogenicity Factor–Interacting Sugar Beet Proteins That Represent Putative Virus Targets or Components of Plant Resistance.

Complete Genome Sequence of Citrus Huanglongbing Bacterium, 'Candidatus Liberibacter asiaticus' Obtained Through Metagenomics.

The ThPG1 Endopolygalacturonase Is Required for the *Trichoderma harzianum*—Plant Beneficial Interaction.

A Metabolic Signature of the Beneficial Interaction of the Endophyte *Paenibacillus* sp. Isolate and In Vitro–Grown Poplar Plants Revealed by Metabolomics.

September 2009, Volume 22, Number 9

Partial Resistance of *Medicago truncatula* to *Aphanomyces euteiches* Is Associated With Protection of the Root Stele and Is Controlled by a Major QTL Rich in Proteasome-Related Genes.

Tsn1-Mediated Host Responses to ToxA From *Pyrenophora tritici-repentis*.

The Majority of the Type III Effector Inventory of *Pseudomonas syringae* pv. *tomato* DC3000 Can Suppress Plant Immunity.

Analysis of Class III Peroxidase Genes Expressed in Roots of Resistant and Susceptible Wheat Lines Infected by *Heterodera avenae*.

Signaling by the Pathogenicity-Related MAP Kinase of *Cochliobolus heterostrophus* Correlates With Its Local Accumulation Rather Than Phosphorylation.

Disease-Specific Expression of Host Genes During Downy Mildew Infection of *Arabidopsis*.

Identification of a Hydroxyproline Transport System in the Legume Endosymbiont *Sinorbizobium meliloti*.

Structural and Functional Diversity of *CLAVATA3/ ESR* (*CLE*)-Like Genes from the Potato Cyst Nematode *Globodera rostochiensis*.

Effect of Carbendazim Resistance on Trichothecene Production and Aggressiveness of *Fusarium graminearum*.

Strain-Specific Cylindrical Inclusion Protein of *Soybean mosaic virus* Elicits Extreme Resistance and a Lethal Systemic Hypersensitive Response in Two Resistant Soybean Cultivars.

Three Combined Quantitative Trait Loci from Nonhost *Lactuca saligna* Are Sufficient to Provide Complete Resistance of Lettuce Against *Bremia lactucae*.

Expression Analysis of the First Arbuscular Mycorrhizal Fungi Aquaporin Described Reveals Concerted Gene Expression Between Salt-Stressed and Nonstressed Mycelium.

The Mycorrhiza Fungus *Piriformospora indica* Induces Fast Root-Surface pH Signaling and Primes Systemic Alkalinization of the Leaf Apoplast Upon Powdery Mildew Infection.

October 2009, Volume 22, Number 10

FOCUS on Specificity in the Tomato-C. fulvum Interaction.

REVIEW—Recognitional Specificity and Evolution in the Tomato-Cladosporium fulvum Pathosystem.

The Major Specificity-Determining Amino Acids of the Tomato Cf-9 Disease Resistance Protein Are at Hypervariable Solvent-Exposed Positions in the Central Leucine-Rich Repeats.

Regions of the Cf-9B Disease Resistance Protein Able to Cause Spontaneous Necrosis in *Nicotiana benthamiana* Lie Within the Region Controlling Pathogen Recognition in Tomato.

The *Arabidopsis* ATAF1, a NAC Transcription Factor, Is a Negative Regulator of Defense Responses Against Necrotrophic Fungal and Bacterial Pathogens.

Differential Effects of Mild and Severe *Cucumber mosaic virus* Strains in the Perturbation of MicroRNA-Regulated Gene Expression in Tomato Map to the 3' Sequence of RNA 2.

RNAi-Mediated Transgenic Tospovirus Resistance Broken by Intraspecies Silencing Suppressor Protein Complementation.

Biosynthesis and Role in Virulence of the Histone Deacetylase Inhibitor Depudecin from *Alternaria brassicicola*.

Suppression of Two Tungro Viruses in Rice by Separable Traits Originating from Cultivar Utri Merah.

Functional Analysis of the N Terminus of the *Erwinia amylovora* Secreted Effector DspA/E Reveals Features Required for Secretion, Translocation, and Binding to the Chaperone DspB/F.

Calcineurin Is an Antagonist to PKA Protein Phosphorylation Required for Postmating Filamentation and Virulence, While PP2A Is Required for Viability in *Ustilago maydis*.

The Determinant of Potyvirus Ability to Overcome the RTM Resistance of *Arabidopsis thaliana* Maps to the N-Terminal Region of the Coat Protein.

The Influence of RNA-Dependent RNA Polymerase 1 on *Potato virus Y* Infection and on Other Antiviral Response Genes. ■

Employment

Post-Doctoral Position

A post-doctoral position is available to develop and assess the use of peptide aptamers to inhibit protein function in plants. This is a technology development project funded by an NSF EAGER Award, although there will be a substantial basic research component to the work. Peptide aptamers are random peptides (in this instance, 20 aa in length) that can interact with proteins and potentially inhibit their function. They can also be used for defining functional protein domains and as bioinformatics tools in proteomic studies. Our expression system utilizes bimolecular fluorescence complementation as an imaging tool to detect aptamer-target protein interactions and is designed to function both in yeast and in plant systems to detect these interactions. The successful candidate will help build the random aptamer library in the yeast/ plant expression vector and will test the library against a variety of plant proteins important for plant development and for Agrobacterium-mediated genetic transformation. Applicants must be highly skilled in molecular and cell biology techniques. Experience in epifluorescence and confocal microscopy is also desirable. Salary will be commensurate with experience. Applicants must be available for a personal interview. Please send a CV and the names of three references to Stanton B. Gelvin. Purdue University is an equal opportunity employer. Contact: Stanton B. Gelvin, Department of Biological Sciences, Purdue University, West Lafayette, IN 47907-1392 U.S.A. E-mail: gelvin@bilbo.bio.purdue.edu.

Post-Doctoral Research Associate Position, Transgenic Plants and Aphid Resistance

A position for a post-doctoral research associate is available for a collaborative project in the labs of Bryony C. Bonning and W. Allen Miller at Iowa State University (ISU). This project pursues a novel approach for exploiting virus-aphid interactions to construct aphicidal genes. Responsibilities will include production of recombinant proteins, insect feeding assays, detection of proteins in aphids, and construction and testing of transgenic plants. Applicants should have solid molecular biology skills. Experience with aphids or other sucking insects and/or plant transformation advantageous. Funding is for two years. ISU is committed to maintaining its status as a top institution in plant genetics and molecular biology (www.plantsciences.iastate.edu). Outstanding nucleic acids, protein, microscopy, plant transformation, and other biotechnology facilities are available. The diverse faculty has strengths in both basic and applied research and has strong collaborative and interdepartmental interactions. Ames, IA, combines a relaxing, safe, clean, and friendly small town environment with the intellectual stimuli expected of a world-class university community. ISU is an affirmative action/equal opportunity employer. Send a statement of research experience; career goals; CV; and names, e-mail, addresses, and telephone numbers for three letters of reference to Bryony C. Bonning. **Salary:** In the range of \$38,000 to \$40,000, depending on qualifications. Contact: Bryony C. Bonning, Department

of Entomology, Iowa State University, 418 Science II, Ames, IA 50011-3222 U.S.A. **E-mail:** bbonning@iastate.edu and cc W. Allen Miller, Department of Plant Pathology, Iowa State University, 351 Bessey Hall, Ames, IA 50011 U.S.A. (wamiller@iastate.edu); **Web:** www.public.iastate.edu/~wamiller.

Post-Doctoral Position Available at University of Minnesota

A post-doctoral associate is needed to work on the NSFfunded project "Analysis of the role of CBP60 proteins in defense signaling." The successful applicant will take primary responsibility for the research related to the project. The research goals are to understand the roles of the calmodulin-binding protein CBP60g and the related, noncalmodulin-binding protein CBP60h in activation of salicylate signaling in response to pathogen attack in the plant Arabidopsis thaliana. The position requires a Ph.D. degree in a suitable area of biology. The successful applicant will have demonstrated ability in independent design and execution of molecular biology experiments, scientific writing, and working well as part of a research team. The position is in the laboratory of Jane Glazebrook in the Department of Plant Biology, University of Minnesota. The university is a first-rate research institution and is well equipped with modern instrumentation and computing resources. The laboratory is located in the Cargill Microbial and Plant Genomics Building, which has a modern open lab design, built in 2003. The twin cities of Minneapolis and St. Paul comprise a vibrant urban area. Some early work on the project has been published (Wang et al., PLoS Pathogens, 5(2): e1000301. doi:10.1371/journal. ppat.1000301 [2009]). Contact: Jane Glazebrook;

E-mail: jglazebr@umn.edu. ■

Find a Job with IS-MPMI!

The IS-MPMI Job Board, located in IS-MPMI Central during the congress, was the place to be if you were looking for a job or an employee. Frequented by meeting attendees, the job board attracted a variety of employment postings from around the world.

Don't forget you can find and post jobs in molecular plant-microbe interactions throughout the year with IS-MPMI*net*'s Placement Service Listings, found at www.ismpminet.org/career. This is a free service available to companies looking to post jobs suited for IS-MPMI members, simply e-mail jobs to ismpmi@scisoc.org. Your posting may also run in the *IS-MPMI Reporter* and will have a link in the IS-MPMI news capsule.

Welcome New Members

The following members joined IS-MPMI between May 1 and August 31, 2009. Please join us in welcoming them to the society!

Suzan A. Abdallah Welington Luiz de Araujo Jaap Bakker Elsa Ballini Josephine M. Brennan John P. Carr Iose Cervantes-Chavez Khim Phin Chong R. V. Chowda Reddy Hyen-Mi Chung Peter Eckes Ibrahim K. Elmaghraby Roger Freedman Stefanie Goetze Carmen Gonzalez-Bosch Ruth Gordon-Weeks Xu Hu

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COMING EVENTS

2009

November 1-4
6th Canadian Workshop on
Fusarium Head Blight
Ottawa, Canada
www.cwfhb.org

December 7-9 **2009 National Fusarium Head Blight Forum** Orlando, FL, U.S.A.

http://scabusa.org/forum09.html

2010

Dan Ruzicka

Yusuke Saijo

March 14-19

Receptors and Signaling in Plant
Development and Biotic Interactions

Tahoe City, California, U.S.A.

www.keystonesymposia.org/meetings/viewmeetings.cfm?meetingID=1063

March 21-26

Plasmodesmata 2010—Seventh International Conference

Sydney, Australia

www.bio.usyd.edu.au/pd2010/index.html

April 18-22

Fifth EPSO Conference

Olos (Lapland), Finland

www.epsoweb.org

June 6-8

2010 Oomycete Molecular Genetics Meeting

Toulouse, France

http://pmgn.vbi.vt.edu/workshops.php

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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