

IS-MPMI REPORTER

Winter 1998

MPMI Announces New Editorial Board Members



Jan E. Leach



Jeff Dangl



Michael J. Daniels



Anne Osbourn



Peter Palukaitis



Herman P. Spaink

In January, the new editorial board for *Molecular Plant–Microbe Interactions* began its three-year term. The senior editors, appointed on the recommendation of the editor-in-chief, are responsible for overseeing the review and disposition of manuscripts submitted to *MPMI*. To better acquaint IS-MPMI members with the new members of the board, brief biographies are presented.

Jan E. Leach is the new editor-in-chief of *MPMI* for 1998–2000. She previously served as senior editor for bacterial pathogenesis (1995–1997) and as associate editor (1991–1994). Dr. Leach is a professor of Plant Pathology at Kansas State University. She holds adjunct appointments in the Division of Biology at KSU and in the Division of Entomology and Plant Pathology at the International Rice Research Institute in the Philippines. She earned an M.S. in Microbiology from the University of Nebraska and a Ph.D. in Plant Pathology from the University of Wisconsin in 1981. From 1981 to 1984 she was a postdoctoral researcher at East Malling Research Station in Kent, England. Her research interests include investigations of pathogen and host genes involved in resistant interactions between bacteria (*Xanthomonas oryzae* pv. *oryzae*) and plants (rice), a study of targeted secretion of defense response proteins, and an analysis of changes in the genetic structure of pathogen populations. Currently she is president-elect of the International Society for Molecular Plant-Microbe Interactions and serves on the IS-MPMI science advisory board. In the past, she has served APS as a member of the Bacteriology and the Biochemistry, Physiology, and Molecular Biology committees.

Jeff Dangl received degrees in Biology and Modern Literature from Stanford University in 1981, and subsequently a doctoral degree in Genetics from the Stanford Medical School in 1986. He was an NSF Plant Sciences post-doctoral fellow in Prof. Klaus Hahlbrock's laboratory at the Max-Planck Institute for Plant Breeding in Köln, Germany from 1986 to 1989, where he worked on transcriptional regulation of defense genes

in the parsley phenylpropanoid pathway. In 1989, he became an independent research group leader at the Max-Delbrück Laboratory, where his group began exploration of Arabidopsis as a model for plant–pathogen reactions. In 1997, he joined the faculty of the University of North Carolina at Chapel Hill as an Associate Professor of Biology. His group is interested in the structure, function, and evolution of plant disease resistance genes, signal transduction leading to disease resistance and SAR, control of plant cell death, and the mechanisms of bacterial pathogenesis.

Michael J. Daniels received his B.A., M.A., and Ph.D. degrees from the University of Cambridge, specializing in Biochemistry. His thesis research was concerned with the biosynthesis of a peptide antibiotic by *Bacillus*. He worked as a postdoctoral fellow with Moselio Schaechter at Tufts Medical School in Boston on the attachment of a bacterial chromosome to the cell membrane. This work continued during his tenure as a Guinness fellow in the microbiology unit of the Department of Biochemistry, University of Oxford, where his interests in the role of the membrane in bacterial growth developed. In 1970 he moved to the genetics department of the (then) John Innes Institute in Norwich, where he developed a project on interactions of phytopathogenic prokaryotes with plants. For some years he worked on a newly discovered wall-free prokaryotes (phytoplasmas and spiroplasmas), and he was the first to fulfill Koch's postulates and demonstrate that spiroplasmas are pathogenic to plants. During this time, he served as chairman of the WHO/FAO International Research Programme on Comparative Mycoplasmaology, which later became the International Organization for Mycoplasmaology. A desire to work on genetically more tractable organisms led him, around 1981, to switch his research to *Xanthomonas*. This has been a major interest ever since and has proved to be a fertile source of information about pathogenicity mechanisms. In 1987 he moved to become the first head of the Sainsbury Laboratory, a new laboratory for molecular plant pathology set up in Norwich with funding from the Gatsby Charitable Foundation. Although the *Xanthomonas* work continued to form a major part of the program he also set up, with Anne Osbourn, a new project on *Gaeumannomyces* molecular pathology, which has led to interests in the role of preformed inhibitors in plants as antifungals. He was one of the first associate editors of MPMI and was a founding member of IS-MPMI, serving as president from 1992 to 1994.

Anne Osbourn received her Ph.D. degree in the area of fungal genetics and plant pathology from the University of Birmingham in 1985. From 1985 to 1988 she was a postdoctoral researcher at the John Innes Centre (Norwich, England) investigating the genetic basis of bacterial pathogenicity to plants. When the Sainsbury Laboratory was created at the John Innes Centre in 1988, she joined this new laboratory as a research associate and initiated a fungal research program. Her interests are in the general area of fungus–plant interactions. Current specific research interests involve the contribution of antimicrobial compounds to plant defense, and strategies employed by fungal pathogens to circumvent or overcome the effects of these antibiotics. She previously served as an associate editor of MPMI.

Peter Palukaitis received his Ph.D. degree in biochemistry from the University of Adelaide in 1981, and from 1980 to 1984 he did postdoctoral research in molecular virology at Cornell University with Milton Zaitlin. He became a faculty member of the Department of Plant Pathology at Cornell in 1984 and continues to maintain an association with the department as an adjunct associate professor. In 1996, he took the position of head of the virology department at the Scottish Crop Research Institute near Dundee. He also holds an honorary Senior Lecturer position at the University of Dundee. At Cornell, he taught plant virology, plant molecular biology, and molecular plant-virus interactions. His research interests are in the areas of molecular biology and molecular plant-virus interactions, specifically with regard to the biochemistry, genetics, and cell biology of the replication and movement of cucumber mosaic virus in its many hosts. Dr. Palukaitis has served as an associate editor for the journal *Virology* from 1986 to 1992 and from 1996 to the present, as well as senior editor from 1992 to

1996. He has also served as associate editor for *Molecular Plant-Microbe Interactions* from 1988 to 1996 and as a senior editor since 1997. In addition, he has authored or coauthored a number of reviews in virology as well as reviews of techniques used in virology.

Herman P. Spaink received his Ph.D. degree (cum laude) in 1989 from Leiden University. He was a post-doctoral researcher at Harvard Medical School with Eugene P. Kennedy before joining the Faculty of Sciences at Leiden University, where he currently holds the chair of full professor in Molecular and Cellular Biology. He is a codirector of the recently started Center for Microscopic Imaging Techniques (CMIT), which specializes in high-tech applications in microspectroscopy. Furthermore, he is one of the coordinators of the Leiden Centre for Physics and Chemistry of Life Sciences. His current research focuses on the molecular biology of organogenetic processes. In this study the three main model systems are 1) the interaction between rhizobial bacteria and leguminous plants resulting in the formation of nitrogen fixing root nodules, 2) signal transduction in early embryogenesis of rice and *Arabidopsis*, and 3) the function of chitin oligosaccharides in plant and vertebrate organogenesis. With respect to the first model system, an important long-term goal is to extend the host range of rhizobia to include non-leguminous plants.

MEETINGS



March 26-27, 1998. 2nd International Symposium on Fungal Genomics. Athens, Georgia USA, Contact: IBC USA Conferences, Inc., 225 Turnpike Road, Southborough, MA 01772, USA, Telephone: 508-481-6400, Fax: 508-481-7911, E-mail: inq@ibcusa.com Internet: <http://www.ibcusa.com/conf/fungal>

March 29-April 2, 1998. 5th International Workshop on Pathogenesis-Related Proteins in Plants: Signalling Pathways and Biological Activities. Aussois, France. Contact: Bernard Fritig, IBMP-CNRS, 12, rue du Gnral Zimmer, 67084 Strasbourg, cedex, Fax: +33-(0)388 61 4442, E-mail: PR-98@medoc.u-strasbg.fr
Internet: <http://scilla.u-strasbg.fr/PR98/PR98.html>

June 3-7, 1998. The 42nd Annual Wind River Conference on Prokaryotic Biology, Aspen Lodge, Estes Park, Colorado, USA, Contact: Marty Roop, Department of Microbiology and Immunology, Louisiana State University Medical Center, 1501 Kings Highway, Shreveport, LA 71130-3932, Telephone: 318-675-5750, Fax 318-675-5764
E-mail: rroop@nomvs.lsumc.edu

June 14-19, 1998. IX International Congress On Plant Tissue and Cell Culture. Jerusalem, Israel. Contact: Secretariat: IX International Congress on Plant Tissue and Cell Culture, Kenes, Organisers of Congresses and Tour Operators, Ltd., P.O. Box 50006 Tel Aviv 61500, Israel
Internet: <http://indycc.agri.huji.ac.il/~tzvika/iaptc/congress.htm>

July 26-29, 1998. 7th Biennial Conference on the Molecular and Cellular Biology of the Soybean, Knoxville, Tennessee, USA. UT Conferences, 600 Henley Street, Suite 212, Knoxville, TN 37902. Telephone: 423-974-0280, Fax: 423-974-0264 E-mail: susandavis@utk.edu Internet: <http://www.ce.utk.edu/conference/soybean.htm>

August 4-8, 1998. 2nd International Rice Blast Conference, Montpellier, France. Contact: Secretariat IRBC 98, CIRAD-CA, UR PHYMA, Bat. 2, BP 5035, 34032 Montpellier, France. Fax: +(33) 4 67 61 56 03 E-mail: IRBC98@cirad.fr

August 9-16, 1998. 7th International Congress of Plant Pathology, Edinburgh, Scotland. Contact: ICPP98 Congress Secretariat, c/o Meeting Makers, 50 George Street, Glasgow G1 1QE, Scotland, UK. Telephone: +44 141 553 1930 Fax: +44 141 552 0511, E-mail: icpp98@meetingmakers.co.uk

August 23-28, 1998. 6th International Mycological Congress, Jerusalem, Israel. Contact: Congress Secretariat, P.O. Box 50006, Tel Aviv 61500, Israel, Telephone: +972 3 5140014 Fax: +972 3 5175674/5140077 E-mail: mycol@kenes.ccmil.compuserve.com
Internet: <http://lsb380.plbio.1su.edu/ima/index.html>

September 17-20, 1998. Fallen Leaf Lake Conference On Unifying Themes Among Protein and Nucleic Acid Transporters of Bacteria. Fallen Leaf Lake, South Lake Tahoe, California. Organizers: S. K. Farrand and E. Lanka. Organizing committee: U. bonas, D. Burns, G. Cornelis, D. Dubnau, J. Galan, B. Hohn, R. MacNab, E. Nester, M. Russel. Director of conference: C. I. Kado. Information can be requested by fax: (530) 752-5674 or by web: <http://www.plpnem.ucdavis.edu/flc.htm>

September 20-24, 1998. Third European Nitrogen Fixation Conference. De Blije Werelt in Lunteren, The Netherlands. Contact: Prof. Dr. Ben J.J. Lugtenberg, Institute of Molecular Plant Sciences, Leiden University, Clusius Laboratory, Wassenaarseweg 64, 2333 AL Leiden, P.O.Box 9505, 2300 RA Leiden, The Netherlands Telephone: (+31)71-5275063/5275065; Fax: (+31)71-5275088 E-mail: Lugtenberg@rulbim.leidenuniv.nl

November 8-12, 1998. APS/ESA Joint Meeting, Las Vegas, Nevada, USA, Contact: Lori Kuennen, IS-MPMI, 3340 Pilot Knob Road, St. Paul, MN 55121-2097 Telephone: 612-454-7250 Fax: 612-454-0766 E-mail: ismpmi@scisoc.org

July 25-30, 1999, 9th IS-MPMI Congress, Amsterdam, The Netherlands (more information to come).

SPECIAL ANNOUNCEMENT: Trichoderma/Gliocaldium Working Group

The Trichoderma/Gliocaldium International Working Group has been established and a directory of the group containing names, addresses, e-mail and research interests is available at the following e-mail address: lorito@unina.it Together with the directory you will receive the call for starting an electronic newsletter on Trichoderma and Gliocladium. Join the group, support the newsletter and help us to improve communication in this field!

A Column from the President

1997-A Transition Year?

This is a particularly interesting phase of human history because of the development of the global market place, the rapid expansion of the international financial sector, the current push for Multilateral Agreement on Investment (MAI) which could enhance the privilege and power of a select group of multinational companies, a growing concern for the total world environment, the growth of the human population, and the realisation that food production must be markedly increased during the next century. The optimistic view is that as nations become wealthier, they experience general economic security, improved education and falling

birthrates. If present trends continue, we can project a steady human population of about eleven billion being attained during the next 100 years. This may not be the most ideal global community but the situation does demand that we find solutions to the various problems entailed. The most fundamental problem will be feeding a population of this size. The sooner we start working on the problem the better for all concerned. There is, however, a real problem facing us in the near future. The current economic crisis afflicting the countries of East and South-East Asia (Japan, Thailand, Indonesia, Philippines, South Korea, Malaysia, Hong Kong) will have many unexpected medium term effects. The key to the next phase of this story will be how Japan deals with its banking and investment sector.

But why does this effect us as scientists? Well, because of the pressures from the International Monetary Fund and World Bank many of these nations are already starting to restructure their economies and guess what is, and will be, a casualty? Funding for science research and development! This year began with a report of the global decline in the funds available for agricultural research (Nature, Vol. 385, p281-282, 23 January, 1997). This situation has led to a wave of research staff redundancies in many of the Third world agricultural research centres and great difficulties in finding another Director-General for the International Rice Research Institute in Los Banos, Philippines, (Nature, Vol. 390, p11, 6 November, 1997). Even senior scientists in Japan are worried about the future of support for basic research in their country. Before North Americans and Europeans get too complacent they should consider this - if Japan should sell off its major holdings of US bonds, there will be an almighty fear response by the New York Stock market and no one knows where it may end - perhaps the big "R" or the big "D" word, and then how secure will your science funding be? As I said these are interesting times as we approach the new millennium!

My very best wishes for 1998.

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Professor Barry G Rolfe

Institute for Pest and Pathogen Management A First for Wisconsin and the Nation

by Dedee Wardle, UIR, University of Wisconsin

Formed in 1997, The Institute for Pest and Pathogen Management (IPPM) is, dedicated to deriving knowledge about pests and pathogens and developing new management strategies. Headed up by Jo Handelsman, Professor of Plant Pathology in UW-Madison's College of Agricultural and Life Sciences, IPPM is the nation's first training program that brings together researchers with multidiscipline expertise in medical and agricultural research at both the basic and applied levels in both the public and private sectors to create new management strategies for pests and pathogens.

At the interfaces between disciplines, students will conduct research on microorganisms, insects, and weeds in the biosphere and in association with their hosts. Among the outcomes of this initiative will be management strategies that are sustainable, cost-effective, and safe to the environment, the producer, and the consumer.

Two developments in the past decade have crippled our ability to manage agricultural and human pathogens and pests; according to Handelsman. One is the emergence of pest and pathogen populations that are resistant to antibiotics and pesticides. The other is accumulating evidence that links current agricultural pesticides to cancer and other toxicity problems. The future of agriculture will depend on a combination of more intensive crop management, astute use of pesticides, and a new perspective on our agricultural systems.

The Institute's research will focus on principles governing behavior of organisms in the agroecosystem, drawing liberally on parallel problems and research strategies in human disease. This approach draws on UW-Madison's diverse expertise in the broad area of pest and pathogen biology.

Research focuses in three major areas:

- Understanding the molecular basis and evolution of antibiotic resistance,
- Developing new technologies for control of pests and pathogens, and
- Discovery of new approaches for managing the health of the host.

Projects in progress include:

- Identification of new genes for resistance to pesticides and antibiotics in pests and pathogens,
- Predictive computer programs for integrated pest management of field and vegetable crops.
- Tactics to minimize development and spread of pesticide-resistant weeds and other crop pests,
- Biological control of plant diseases, pest insects, and weeds,
- Crops genetically modified to attract communities of beneficial microbes,
- Development of sensitive screens for new bioinsecticides,
- A new approach to discovery of antibiotics produced by soil microorganisms,
- Molecular probes for beneficial insects and organisms that suppress plant disease,
- Development of new antibiotics using innovations in combinatorial chemistry,
- New methods to study ecology of soil microorganisms based on oligonucleotide arrays, and
- Development of disease- and pest-resistant plants.

IPPM research and development is already underway. For example, efforts toward the development of new antibiotics are in progress. The "WISDOM" computer program for potato management is being marketed.

To maintain its credibility as a source of unbiased information, IPPM is maintaining a balance in its approach to pest and pathogen management solutions. Research funding and training program support are being sought from

diverse sources, including private industry, commodity groups, private foundations, and state and federal governments.

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The broad-based interdisciplinary training program is open to undergraduates, graduate students, and postdoctoral associates. Funds will be distributed through an annual competition, in which students apply for undergraduate (one year), graduate (three years), or postdoctoral (two years) research support. Funding decisions will be made to insure student quality, foster multidisciplinary research, and maintain disciplinary balance and breadth in the program.

Departments, programs, or sponsors may nominate graduate students who have been accepted by UW-Madison's Graduate School for Institute support. In addition, sponsors may support specific research projects headed up by faculty groups. Projects may be proposed by faculty or sponsors. The support structure will vary by project. For interdisciplinary projects, multi-year funding must be guaranteed. The faculty involved in a specific project will manage the support for that project.

For more information, contact Jo Handelsmann at: joh@plantpath.wisc.edu

RESEARCH CONSORTIA

Meeting of European Biotechnologists Involved in Assessing the Ecological Impact of Microbial Inoculants

IMPACT is a shared-cost research project funded by the biotechnology programs of the European Community (EC DGXII) and is involved in assessing ecological implications of biotechnology. The IMPACT project (Interactions between Microbial Inoculants and resident Populations in the rhizosphere of Agronomically important Crops in Typical soils) represents a multidisciplinary consortium of seventeen independent research groups in eight EU member states representing both university and industry sectors. In essence, the IMPACT project is investigating the effects of microbial inoculants such as biological control agents on the suppression of plant disease under field conditions and the effect of inoculant release on resident microbial populations. The project was initially funded from September 1993 to September 1996. IMPACT II is a continuation of this work and will run until November 1999 (See IS-MPMI Reporter, Winter 1997, for more information on IMPACT).

The expertise of the different research groups involved in the IMPACT project covers the areas of microbial ecology, molecular genetics, crop protection, and agronomy, and allows the comprehensive study of the increasingly sophisticated area of agricultural biotechnology. In order to allow efficient communication of research developments within the IMPACT consortium, a number of interim meetings have been organized. The most recent of these meetings was organized by Prof. P. Young at the University of York, United Kingdom (October 1997) where informal Round Table seminars focused on recent experimental results relating to:

- A) Changes in the population structure and function of rhizosphere microbial communities.
- B) Importance of new GM biocontrol agents and phyto-hormone producing inoculants.
- C) Evaluation of the role and impact of the VBNC state with respect to inoculants in the rhizosphere.

D) Defining microbial diversity and function in the rhizosphere.

In addition to formal meetings, the IMPACT partnership provides the opportunity for the training of young scientists, the transfer of technology and expertise within the project consortium, and the pro-active integration of external centers of research excellence.

Recently, Prof. Brian P. Nichols, Dept. of Biological Sciences, University of Illinois at Chicago spent a six month period working in the BIOMERIT Laboratory at the Dept. of Microbiology, National University of Ireland, Cork. During this visit, Prof. Nichols worked in collaboration with Prof. Fergal O’Gara attempting to elucidate the complex regulation of iron responsive genes in *Pseudomonas* strains of interest due to their potential for biological control.

Employment Opportunities

Research Scientist in Molecular Microbiology

The mission of the BIOMERIT Research Laboratory, which is located in the Microbiology Department at University College Cork, is to maximise education and research in innovative biotechnology. BIOMERIT research is supported with the aid of external funding, and the research interests cover Molecular Microbiology applied to the areas of Microbial Ecology, Plant-Bacterial Interactions, Bioremediation and Biomedicine in collaboration with both national and international industries and research centres. Further details are available on the Internet [<http://www.ucc.ie/ucc/research/biomerit/homepage.html>].

Microbial Genetics: A research microbiologist is required to work on the molecular genetics and regulation of genes involved in biocontrol in *Pseudomonas* with particular emphasis on the nature of quorum sensing mechanisms. Applicants should have completed a PhD and have relevant experience of rDNA techniques applied to microorganisms. The research scientist post will be offered on a one-year renewable contract and salary will be competitive and commensurate with experience. Applicants should submit a full CV including a list of publications, and arrange to have 2 letters of reference sent to: Professor Fergal O’Gara, Microbiology Department, University College Cork, Ireland. Telephone: +353-21-272097, Fax: +353-21-275934, E-Mail: f.ogara@ucc.ie UCC is an equal opportunity employer.

Postdoctoral Position

A postdoctoral position is open to investigate *Arabidopsis* mutants and ecotypes that are resistant to transformation by *Agrobacterium*. This is a NSF-funded project. We have already shown that there are differences among ecotypes in their susceptibility to *Agrobacterium* infection, and these differences reflect (among other things) differences in bacterial binding and T-DNA integration (Nam et al., *Plant Cell* 9, 317-333, 1997). We would like to perform map-based cloning of the genes involved in T-DNA integration. In another on-going project, we have identified over 20 T-DNA tagged *Arabidopsis* mutants that are resistant to *Agrobacterium* transformation. Plasmid rescue of the T-DNA/plant DNA junctions, and subsequent sequence analysis of the corresponding wild-type cDNA and genomic clones, have revealed genes involved in cell wall biosynthesis (an arabinogalactan protein, a xylan synthase-like protein, and other wall proteins) and histone H2A. We have a large number of other mutants to investigate, as well as much more of the Feldmann library to screen.

Applicants should have demonstrated research experience in plant molecular genetics, including genetic analysis. Salary will be commensurate with research experience. Please send your c.v. and three letters of recommendation to: Dr. Stanton B. Gelvin, Department of Biological Sciences, Purdue University, West Lafayette, IN 47907-1392, Telephone: 765-494-4939, FAX: 765-496-1496

Plant Transformation Specialist (Laboratory Technician Level VI), Agronomy Department, Purdue University

Serve as a plant transformation specialist to support a research program which investigates the molecular basis of disease resistance in plants.

- 1) Produce transgenic tomato, tobacco and potato plants using Agrobacterium-based transformation methods;
- 2) Produce and maintain plant suspension cell cultures and callus tissue;
- 3) Maintain plants in the greenhouse including sowing seeds, watering, fertilizing, making crosses, harvesting seeds, and keeping seed inventory; and
- 4) Perform experimental procedures to characterize transgenic plants including inoculation of plant with characterized pathogens, scoring symptoms, preparation of DNA and RNA, hybridization with radiolabeled DNA probes, and determining protein expression with ELISA and western blots.

Qualifications: Education: B.S. in genetics, plant pathology, horticulture, agronomy or related field. Experience: Recent experience with Agrobacterium-mediate plant transformation, plant tissue culture, plant maintenance, general laboratory techniques, and some background in molecular biology. Skills required: Successful plant transformation requires technical skill to perform many laboratory procedures, planning and preparation for complicated procedures, excellent sterile technique, ability to troubleshoot when things go wrong, meticulous attention to detail and careful record-keeping.

Knowledge of microbiology procedures including media preparation, growing bacteria, and molecular biology procedures such as plasmid preparation, cloning, hybridization, RNA and genomic DNA isolation, gel electrophoresis Other: Must be reliable, have independent judgment, have initiative, and enjoy working with people in a scientific setting. Ability to prioritize your work, efficiently schedule your time, and meet goals. Pay scale: Depends upon experience and qualifications. Duration: Two years. Benefits apply.

To apply contact Purdue Personnel Services at 765-494-7417 (position number: 21560). For more information contact Dr. Greg Martin (765-494-4790) Department of Agronomy, Purdue University, West Lafayette, IN 47907-1150, email: gmartin@dept.agry.purdue.edu or see web page: <http://www.adpc.purdue.edu/personnel/currjobs/newjobs.html>

Agricultural Science Research Technician (Plants)

The USDA-ARS Agricultural Research Station in Salinas, CA, is seeking to fill a position to assist a staff scientist with research on alternatives to methyl bromide in strawberry and vegetable production systems. A background in plant pathology and soil microbiology is essential. While not required, experience with phytobacteriology, molecular genetic techniques, and research on rhizosphere ecology is desirable. Highly motivated individuals with the ability to work in an independent fashion are encouraged to apply. This is a permanent position with hiring level (GS 7-9) and salary (\$26,075-\$41,470) commensurate with experience. U.S. citizenship is required. The location is at the heart of a \$2 billion agricultural industry only two hours from San Francisco and a short drive from the Monterey Peninsula and Big Sur area. For additional information about the position, contact Dr. Carolee T. Bull, USDA-ARS, 1636 E. Alisal St., Salinas, CA 93905. Phone: (408)755-2889, Fax:(408)755-2814. For general information and application forms contact Rosemary Cairo at (408)755-2812. Applications must be postmarked by 03/02/97. USDA-ARS is an equal opportunity employer.

Graduate Research Assistant Fellowship Available

A graduate research assistant fellowship will be available to study the molecular mechanisms of temperature signalling in plant-microbe interactions. We are seeking a highly motivated individual who wants to work on protein-membrane interactions at the molecular level.

Membrane associated proteins will be studied using various biochemical and molecular techniques. The position will be funded for a total of three years giving the successful candidate the chance to acquire the PhD degree at the Philipps-University Marburg. The candidate should have an MS degree in biology, biochemistry, chemistry, molecular biology, or a related biomedical research field with excellent university certificates. The Max Planck Institute for terrestrial Microbiology is a well-funded research facility with state-of-the-art scientific equipment and is located in Marburg, Germany. Please forward your letter of application, CV, transcripts, and one letter of recommendation to: Dr. Matthias Ullrich Max-Planck-Institut für terrestrische Mikrobiologie Karl-von-Frisch-Strasse 35043 Marburg / Lahn Germany, Fax: (+49) 6421 178 609

Phone: (+49) 6421 178 600

E-mail: ullrichm@mail.uni-marburg.de

<http://www.uni-marburg.de/mpi/ullrich/ullrich.html>

Deadline for receipt of applications is April 1, 1998

Welcome New Members

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