

IS-MPMI *Reporter*

**International Society for Molecular Plant-Microbe Interactions
Winter, 1997**

President's Column

Ninth IS-MPMI Meeting - Amsterdam, The Netherlands

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IS-MPMI Officers

President's Column Barry G. Rolfe

By the time you receive this newsletter congress attendees should have received the Proceedings book for the recent July Knoxville meeting. Additional copies are available for purchase through IS-MPMI headquarters. Let me take this opportunity to thank all those who have worked so hard to get the final book completed.

We have 570 current members and a vibrant Society so you can imagine how frustrated the Board felt when we had to delay by one year our next meeting. Pierre De Wit has undertaken the large task of hosting the next meeting in the Netherlands in 1999 and Sally Leong the subsequent conference in Madison, Wisconsin, 2001.

The Society has always wanted to involve its younger members and it is seeking ways of how best to do this. Hence, the new addition of the on-line employment listing on the IS-MPMI homepage is a beginning towards this goal. Please, if you have some additional suggestions of how we might help our younger scientists to obtain employment opportunities and better access to grant funding possibilities we would like to hear from you at the Society headquarters.

During October a number of the Society members had the opportunity to visit different laboratories in the Asian region. Linda Thomashow went to Korea and Gary Stacey, Frank Dazzo and I visited the National Institute for Biotechnology and Genetic Engineering, Faisalabad, Pakistan. The overwhelming impression is the quality of their

Molecular Biology facilities and the practical and ambitious programs that they have undertaken offer many opportunities for future collaborations with them to work on important global problems. They are very conscious of the future population-food equation and its environmental implications for the planet.

Linda reported back that the Korean scientists would like to be more involved in the IS-MPMI and as the APEC (Asia-Pacific Economic Co-operation) movement strengthens and impacts on the global economy, it would be good if the IS-MPMI could play some role in the growth of science in the area.

Finally I would like to thank Eugene Nester for all his efforts and fine leadership over the last four years.

My very best wishes.

Barry G. Rolfe

Amsterdam Looks Forward To Hosting The Ninth IS-MPMI Meeting July 25-30, 1999

We wish to invite the International Molecular Plant-Microbe Interaction community to come to Amsterdam, The Netherlands, to attend the 9th IS-MPMI-meeting, July 25-30, 1999. The meeting will be held in the RAI International Exhibition and Congress Centre. This Meeting is atypical because it will be an "Out of Frame" meeting (i.e. three year gap instead of two). The reason for the longer time between meetings is to avoid conflicts of interest between two internationally very well attended meetings i.e. the International Congress of Plant Pathology (ICPP) and the IS-MPMI meeting. The ICPP gathers every five years and will have its seventh meeting August 9-16, 1998 in Edinburgh.

In the beginning (early 1980's), not many plant pathologists attended the IS-MPMI biennial meetings. The first meetings focused on the molecular interactions between Rhizobium/Agrobacterium and their host plants. In later meetings the molecular phytopathology community had more contributions on molecular studies on plant pathogenic bacteria belonging to the genera Erwinia, Pseudomonas and Xanthomonas. During more recent MPMI-meetings molecular studies on plant pathogenic viruses and fungi, plant growth promoting bacteria and mycorrhizae became more prominent. Within the last 16 years the number of scientists attending the biennial IS-MPMI-meetings has grown from approximately 50 in Bielefeld, 1982, to over 900 hundred in Knoxville, 1996. Today many molecular plant pathologists attend both IS-MPMI and ICPP. As the International Society of Plant Pathology (ISPP) had fixed the date for their seventh quinquennial ICPP on August 9-16, 1998, the board of directors of IS-MPMI decided to delay the next IS-MPMI meeting until 1999.

Gary Stacey and the organizing committee put together an excellent congress in Knoxville. The science presented at the Knoxville meeting in oral presentations and posters was of the highest quality, and it will be difficult to improve upon this.

As the IS-MPMI is a vital and young society with great momentum, I am sure that in three years time there will be many new exciting developments to be presented in Amsterdam. On behalf of the Local Organizing and Programme Committee, we invite all scientists from starting graduate students to well recognized senior scientists in the MPMI-community to come to Amsterdam to present their latest exciting data.

THE RAI-FACILITY

The RAI-Congress Centre is considered to be one of the top ten meeting venues in the world. It offers easy accessibility (there is an 8 minute train trip leaving every 15 minutes to Schiphol International Airport) and is only 3 kilometers from the historic and cultural town centre of Amsterdam. The auditorium of the RAI Centre can host up to 1,750 attendants. We will probably not reach that number but hope to reach the magic number of 1,000. There is also plenty of space in the Congress Centre to have posters up during the entire meeting. Facilities are available for one plenary up to 3 parallel sessions if required.

THE CITY OF AMSTERDAM

Amsterdam has much to offer. There is a relaxed atmosphere, beautiful canals with over 1,000 bridges and over 7,000 historic buildings, many of which date to Holland's Golden Age. There are many museums including the Rijksmuseum, the Van Gogh Museum, and the Stedelijk (Municipal) Museum. Amsterdam is also home of the Royal Concertgebouw Orchestra, the Dutch National Ballet, the Dutch Dance Theatre and the Dutch Opera. It also hosts many attractive bars, pubs and a variety of good restaurants where one can "eat in every language". Also many excursions can be made in the city and surrounding countryside. Amsterdam has 30,000 hotel rooms with hotels ranging from 5-star to economy class. We will reserve sufficient economy class student accommodation during the IS-MPMI meeting in 1999.

TIME SCHEDULE

The Local Organizing and Programme Committee will soon contact the Headquarters and International Scientific Advisory Board about the future organization of the meeting. We will review the comments on the scientific programme collected during the Knoxville meeting. We will do our utmost best to have another great IS-MPMI meeting in Amsterdam and will frequently keep the IS-MPMI community informed of the progress of the upcoming NINTH IS-MPMI MEETING.

On behalf of the Local Organizing and Programme Committee, Pierre J.G.M. De Wit, Chair.

Research Consortia Maximize Resources and Scientific Progress By Bringing Together Researchers With Common Interests

In this and subsequent issues of The Reporter we will present overviews of existing and emerging research consortia relevant to studies of molecular plant-microbe interactions.

This approach is allowing rapid progress to occur in a number of research areas by allowing researchers to collaborate more effectively and to make use of common research facilities.

In the United States, the NSF-funded Science and Technology Centers have played a key role in advancing studies of host-parasite interactions (Center for Engineering Plants for Resistance against Pathogens, University of California, Davis) and microbial ecology (Center for Microbial Ecology, Michigan State University, E. Lansing).

In Europe, the European Union has opened new avenues of research funding for consortia of scientists in different countries. Three such consortia dealing with studies of microbial ecology are described in this issue.

European Research Consortia

MAREP

A European Concerted Action concerning the use of Marker and Reporter Genes in Microbial Ecology.

MAREP: Funded by the European Commission, Directorate General XII

Coordinator:

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OBJECTIVES:

- To promote information and technology exchange between laboratories having expertise with different marker genes, reporter genes and monitoring methods.
- To monitor progress on novel approaches for monitoring GMMs in nature and their biosafety aspects.
- To propose some standardised test-methods for risk assessment purposes.
- To review and develop the use of reporter genes for monitoring gene activity in specific environments.
- To promote coordination of scientific efforts between academic and regulatory authorities in the handling of biosafety data and development of monitoring tools.

BRIEF DESCRIPTION:

Genetically modified microorganisms (GMMs) are being designed for use in the environment. The deliberate release of GMMs (e.g. biofertilizers and biopesticides) is regulated to ensure that the risk of hazardous consequences is kept to a minimum. Specific genes can be used as markers for monitoring of bacterial survival or as reporters for monitoring gene expression (activity). There are a variety of specific marker and reporter genes being developed; each with particular advantages and disadvantages.

Marker techniques provide significant advantages for risk assessment studies in comparison with traditional

methodologies and, when used in combination with other approaches, provide information which is essential for risk assessment of GMMs. This information arises directly from tracking of GMMs in dedicated risk assessment studies but also through more fundamental studies designed to increase our understanding of microbial ecology.

It is necessary to have closer harmony of European Community efforts with national efforts regarding the rational basis of regulation of GMMs intended for release into nature; especially since marker genes and monitoring methods vary widely between different countries and even between different laboratories within the same country.

Proper risk assessment of GMMs is dependent on the methodologies available for monitoring of released strains. A concerted evaluation of current and upcoming detection systems will provide the basis for development of standardized tests for assessment of the risk to humans and to the environment upon release.

The goal of this concerted action is to enable key players within the European Union to interact within a common framework of proposal actions, for symposia and workshops concerning the use of marker genes and reporter genes in microbial ecology. This cooperation will be particularly valuable for relay of information between the academic groups and the regulatory authorities.

Country: Sweden

Institution: Stockholm University

Partners: Janet Jansson

Contribution and Expertise:

- Quantization of *luc*-tagged bacteria in environmental samples
 - *gfp*-based monitoring methods; including fiber optics and flow cytometry
 - DNA-based monitoring and quantization of GMMs
-

Country: Sweden

Institution: National Chemicals Inspectorate

Partners: Kersti Gustafsson

Contribution and Expertise:

- Regulation of GMMs in Sweden
 - Development of methods for quantization of *luc*-tagged bacteria in environmental samples (together with Janet Jansson)
-

Country: Belgium

Institution: University of Gent

Partners: Willy Verstraete

Contribution and Expertise:

- Expertise with tagging plasmids with a variety of marker genes
- Determination of the fate of plant growth promoting bacteria, tagged with a *mu d(lac)* element

Country: Belgium

Institution: Flemish Institute for Technological Research

Partners: Max Mergeay

Contribution and Expertise:

- Expertise with metal resistance genes as markers and reporters
 - Luminometry for monitoring luciferase in *lux*-tagged cells
 - Use of *lux* as a reporter gene
-

Country: Belgium

Institution: Catholic University, Leuven

Partners: Jos Vanderleyden

Contribution and Expertise:

- Molecular study of bacterial-plant different marker genes
 - Variety of promoter-probe broad host range vectors with marker genes
-

Country: Germany

Institution: Federal Research Center for Agriculture

Partners: Christoph Tebbe

Contribution and Expertise:

- Field release experience with *luc*-tagged bacteria
 - Marker and reporter systems for soil invertebrate gut colonizing microbes
-

Country: Germany

Institution: University of Bielefeld

Partners: A. Pühler

Contribution and Expertise:

- Field release experience using bacteria tagged with firefly *luc* or *E. coli gusA* genes
 - Expertise with gene activity measurements using different reporter genes
-

Country: Denmark

Institution: Technical University of Denmark

Partners: Soren Molin

Contribution and Expertise:

- Suicide systems (biosafety) for GMMs
 - Sensitive camera equipment for luminescence and fluorescence measurement
 - Development of specialized vectors for tagging GMMs
-

Country: Denmark

Institution: Royal Veterinary and Agricultural University

Partners: Ole Nybroe

Contribution and Expertise:

- Expertise with *lux*-tagged reporter bacteria for nutrient limitations
 - *In situ* detection in rhizosphere using *lux*-tagged bacteria and immunoprobes
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Country: Spain

Institution: University of Seville

Partners: Antonio Palomares

Contribution and Expertise:

- Development of different eukaryotic luc genes for environmental monitoring of GMMs
 - Development of regulated transcriptional unit fusions
-

Country: Spain

Institution: Consejo Superior de Investigaciones Cientificas

Partners: Victor de Lorenzo

Contribution and Expertise:

- Variety of genetic tools for stable chromosomal insertion of reporter genes
 - Field release experience with monitoring of catabolic promoter activity
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Country: Finland

Institution: University of Helsinki

Partners: Kristina Lindström

Contribution and Expertise:

- Intrinsic strain markers for identification of bacteria in nature
 - Expertise with nodule forming and phyllosphere colonizing microbes
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Country: Finland

Institution: University of Turku

Partners: Matti Karp

Contribution and Expertise:

- Comparisons of different luciferase genes
 - Extensive comparative work on best reporter system for individual applications
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Country: Finland

Institution: Finnish Environment Agency

Partners: Kirsten Jorgensen

Contribution and Expertise:

- Construction and detection of luc- tagged bioremediation inocula for efficacy studies
-

Country: Great Britain

Institution: University of Aberdeen

Partners: James Prosser

Contribution and Expertise:

- Development of lux as a marker for GMMs
 - Variety of lux monitoring methods
 - Comparisons of different markers for GMMs
 - Analysis of promoters for activity measurements
 - Introduction of lux genes into a wide variety of bacteria
 - Single cell detection of lux-tagged bacteria
 - lux-reporter systems
 - Plant/soil expertise for effective application of reporter systems
-

Country: Great Britain

Institution: Horticulture Research International

Partners: Alun Morgan

Contribution and Expertise:

- Expertise with plasmid vs. Britain chromosomal markers
 - Development of gfp as a marker
-

Country: Great Britain

Institution: University of Nottingham

Partners: Gordon Stewart

Contribution and Expertise:

- Considerable experience in the application of bioluminescent reporter genes
 - State of the art photon imaging systems
 - Repertoire of both gram positive and gram negative bacteria that are tagged with lux
-

Country: Great Britain

Institution: University of Warwick

Partners: Elizabeth Wellington

Contribution and Expertise:

- Methods for determination of the incidence of antibiotic producing bacteria and antibiotic biosynthesis in soil
 - Fate of marker DNA, including DNA quantization methods
-

Country: Great Britain

Institution: National Environment Research Council

Partners: Mark Bailey

Contribution and Expertise:

- Experience with variety of marker and reporter genes
 - Experience with field release of GMMs
 - Gene transfer studies
 - Experience with biosafety considerations
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Country: Italy

Institution: University degli Studi de Padova

Partners: Marco Nuti

Contribution and Expertise:

- Experience with field release of GMMs
 - Environmental impact analysis following field releases
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Country: Holland

Institution: Institute for Plant Protection

Partners: Jan Dirk van Elsas

Contribution and Expertise:

- Experience with field release of GMMs
 - Reporter system for rhizosphere bacteria
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Country: Norway

Institution: University of Bergen

Partners: Vigdis Torsvik

Contribution and Expertise:

- Extraction of DNA from soil/sediment
 - Work with luc as a marker for gene transfer studies
-

Country: USA

Institution: North Carolina University

Partners: James Oliver

Contribution and Expertise:

- Expert on the viable, but non-culturable state in bacteria
 - Use of lux genes as indicators for metabolic status of cells
 - Knowledge as to environmental stress responses
-

Country: USA

Institution: University of California, Berkley

Partners: Steven Lindow

Contribution and Expertise:

- Extensive experience with several reporter genes including lux, lac, ina and gfp
 - Discovered and developed the ice-nucleation gene as a sensitive reporter
 - Conducted the first field trial of a GMM (USA)
-

Country: USA

Institution: Michigan State University

Partners: Frans de Bruijn

Contribution and Expertise:

- Use of reporter genes to monitor environmental control of gene expression, both in soil/rhizosphere and in plants
 - Use of moc genes to construct a biased rhizosphere for biological containment
 - gfp as a marker and reporter system
-

Country: USA

Institution: University of Louisville

Partners: Ron Atlas

Contribution and Expertise:

- First to develop PCR for environmental samples
 - Bioremediation applications
-

IMPACT / IMPACT 2

COORDINATOR:

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Objectives of the IMPACT project:

The IMPACT project is a cost-shared generic research project funded by the European Community Biotechnology Programme (EC DGXII) in the area of ecological implications of biotechnology. The IMPACT

acronym stands for "Interactions between Microbial inoculants and resident Populations in the rhizosphere of Agronomically important Crops in Typical soils". The overall objective of the project is to assess the ecological impact of microbial inoculants on key biological components of the rhizosphere following the introduction of wild-type or genetically-modified (GM) microbial inoculants.

The IMPACT project was initially funded from September 1993 to September 1996 inclusive. IMPACT II is a continuation of this project and will run from November 1996 until November 1999.

In keeping with the demand for more integrated and sustainable approaches for food production, the IMPACT project is evaluating the combined use of microbial biofertilizers and biopesticides under field conditions. Microbial pesticides are being evaluated not only for their impact on the resident soil microbiota but also for their possible interactions with microbial biofertilizers, e.g. rhizobia and mycorrhizal fungi. The project focuses also on developing a better understanding of the molecular ecology of genetically-modified bacteria in rhizosphere ecosystems. The effect of genetically-modified inoculants on crops and the resident microbiota is being compared to that of wild-type strains with the objective to improve our knowledge on the safe use of genetically-modified microorganisms.

The IMPACT project is providing the impetus to enhance research on the molecular ecology of microorganisms in general and will materialise in an important new knowledge that will be of use to European scientists and regulators; for example, provide a base line to assess the effect of transgenic crops on the soil microflora.

Furthermore, IMPACT is providing information and technologies that are of considerable benefit for the commercial use of microorganisms in several areas of biotechnology. For instance, the identification and tracking methods developed within IMPACT will be useful in the medical area, e.g. to monitor the presence of disease-causing bacteria in patients with chronic infections and the risk of cross-infection between hospitalised patients; in the food industry, e.g. to detect food pathogens.

Organisation of the IMPACT project:

IMPACT is a multidisciplinary project and involves seventeen academic and industrial centres of excellence in eight EU member states. The project also incorporates an industrial platform.

The expertise of the different centres involved in IMPACT covers microbial ecology, molecular genetics, crop protection and agronomy and allows a comprehensive approach, from the gene to the field. The experiments concerning the release of microbial inoculants are carried out at different scales, from laboratory and greenhouse experiments to field trials.

In several European countries, the experiments implemented within IMPACT represent the first application of the new European laws and regulations concerning the release of genetically-modified microorganisms and offer a unique opportunity for the competent authorities to evaluate the current regulatory framework.

IMPACT is coordinated by Professor Fergal O'Gara, Microbiology Department, University College Cork, Cork (Ireland).

IMPACT II

Objectives:

1. Evaluate natural rhizosphere communities during normal agricultural practice including transgenic rhizospheres and GM microbial inoculants. Evaluate genetic traits useful for predicting the effect and fate of GM inoculants released into the rhizosphere.
2. Develop and evaluate GM inoculants (*Azospirillum*, *Rhizobium*) with controlled survival and persistence under commercially relevant field conditions.
3. The role of viable but non-culturable (VBNC) microorganisms in biological containment strategies, consequences for biosafety evaluation. Estimate the diversity of VBNC microbes in the rhizosphere.
4. Microbial diversity and its functional significance in the rhizosphere of key European crop plants (model and transgenic plants). Evaluate natural variation of microbes and key genetic traits of biotechnological importance in the rhizosphere i.e. biopesticides and biofertilisers.

Description of IMPACT II Work Programme:

The objective of IMPACT II is to study the molecular-ecological interactions of GMOs (genetically modified organisms) of commercial interest with indigenous species of the rhizosphere of key European food crops.

International regulation governs the use of GM plants and microbial inoculants. A thorough knowledge of their behaviour and interactions with different components of the soil ecosystem is therefore required.

The IMPACT II project is designed to provide a multidisciplinary and coordinated approach to generate information and solutions to key issues necessary to improve the commercialisation of new plant and microbial biotechnology products. A unique feature of the project is that it builds on the knowledge base of an existing network of 17 partners (including 5 industries) to integrate critical expertise in a number of areas necessary to develop aspects of molecular ecology, biodiversity and biosafety.

In the project, existing and newly developed GMOs with novel traits will be selected from network participants and will include industrially-relevant biofertilizer (*Rhizobium*, *Azospirillum*) and biopesticide (*Pseudomonas*, *Trichoderma*) inoculants. The impact of these GM inoculants on key bacterial and fungal populations and the biodiversity of the rhizosphere of important European crop plants will be assessed under normal agricultural practice.

The impact of the structure and function of soil microbial communities will be monitored in an integrated fashion and will incorporate biochemical parameters for microbial mass and activity, bioindicator organisms for soil quality, plant health, and crop yield and quality. The impact of antifungal proteins generated from transgenic plants on microbial communities and their diversity in the rhizosphere will also be investigated.

Impact studies relating to GMMs (genetically modified microorganisms) and transgenic plants will evaluate the genetic basis of interactions between biocontrol agents and the host plant, and the role and activity of viable but nonculturable (VBNC) microorganisms in the rhizosphere. The analysis of these mechanisms and of the genes

involved is a prerequisite to predict the fate, the effect and the biosafety of GMMs in the soil environment. Management will involve inputs from a science panel, in addition to the role of the coordinator.

Project outputs will provide key information to national and European institutions and agencies on the benefits and likely ecological impact/risks associated with GMMs and transgenic plants in European agricultural systems.

Keywords:

Azospirillum, *Rhizobium*, *Pseudomonas*, biodiversity, molecular microbial ecology, transgenic rhizospheres, biopesticides, biofertilizers, arbuscular mycorrhiza, rhizosphere, viable but nonculturable (VBNC), rhizomania, chemotaxis, indole-3-acetic acid (IAA), 2,4-diacetylphloroglucinol (Phl), antifungal proteins (AFPs), BIOLOG, ARDRA, RAPD, endocytobiotic bacteria.

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Rhizosphere Communication

Impact of small molecule mediated cell-cell communication on the efficacy of inoculant bacteria in the rhizosphere.

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In the last three of four years it has become evident that many bacteria monitor their cell density using secreted molecules that are accumulated in their extracellular growth medium. This phenomenon has been termed "quorum sensing". This is particularly true among soil bacteria, including plant pathogens and plant growth promoting bacteria such as rhizobia and pseudomonads. Both rhizobia and pseudomonades are likely to be inoculated widely in soils but relatively little is known about the impact of the cell-density-dependent gene regulation in such potential inoculants. It is already evident that the signalling is likely to influence horizontal gene transfer, nodulation by rhizobia, and the production of extracellular components, such as antibiotics, siderophores and secreted enzymes.

Understanding the role of such cell-density-dependent regulation is of importance with regard to the beneficial effects of such inoculated bacteria. The "Rhizosphere communication" project addresses the role of cell density-dependent gene regulation and its effects on optimal efficacy of inoculants. In addition it is possible that inoculated bacteria can influence various traits in indigenous soil bacteria. Such traits could include stimulation of pathogenicity and plasmid transfer. This project will measure the role of quorum sensing in plant growth-promoting bacteria and the potential for "cross-talk" between inoculant bacteria and some plant pathogens that are often found in the rhizosphere.

A group of ten partners successfully applied for an EU Biotechnology grant to analyse the impact of quorum sensing via acyl homoserine lactones (AHLs) on the efficacy of potential rhizobial and pseudomonad inoculant strains. These partners brought together a range of different skills. Gordon Stewart and Paul Williams (Nottingham University) have been instrumental in analysis of quorum sensing regulation and the various AHLs produced by many different bacteria ranging from animal pathogens to soil saprophytes. Ben Lugtenberg (Leiden) and Fergal O'Gara (Cork) have been working on plant growth-promoting pseudomonads for several years and are particularly interested in the regulation of secondary metabolites. Allan Downie (John Innes Centre, Norwich) has been working on AHL-dependent gene regulation in rhizobia and Yves Dessaux (CNRS Gif-sur-Yvette) is interested in the interaction between *Agrobacterium* strains and various plants. Soren Molen (Technical University of Denmark) is particularly involved in the in situ analysis of gene induction by bacteria on surfaces using light-based reporter systems.

Part of the work necessitates field release of genetically modified bacteria under controlled conditions and Andrea Squartini and Marco Nuti (Padova, Italy) have a strong background in assessing the effects of genetically modified bacteria on plant growth under controlled release in field conditions.

Two small companies are also involved in the programme. Adam Hajjar (MicroBio, UK) will coordinate assessment of alterations in inoculant viability using rhizobial strains altered in AHL production and Jim Powell (Irish Sugar) is interested in assessing the potential for stimulation of plant growth by pseudomonads.

The goals of the project include identifying the various AHL-based regulatory circuits present in potential inoculant strains and isolating mutants altered in AHL-based sensing. Such mutants will aid analysis of secondary metabolites whose production is under the control of quorum sensing systems. It may be possible to enhance AHL production by altering the regulatory networks. The up- and down-regulated mutants will then be tested for the effects of the mutations on plant-microbe interactions, cross talk with other soil bacteria, plasmid transfer, antibiotic production and exoenzyme production.

It is anticipated that the results of the work will be presented at scientific meetings (including ISMPMI meetings

in which this has already been a lively area of interest) and in the refereed literature. It is not intended that the EU-funded partnership should be exclusive and indeed a number of the partners will maintain active collaborations outside the partnership. We hope that other such collaborations will enhance rapid progress in this rapidly growing area of research. Funding for this project has only just begun and so there is little of substance to report by way of progress at this stage.

The partnership will meet at 6-monthly intervals and will be happy to include in some of these meetings a number of other scientific colleagues from outside the partnership. The project is coordinated by Alan Downie and he will be happy to provide more information to those who are interested.

Announcing . . .

The opening of the

new IS-MPMI

Job Placement Service

The new IS-MPMI Job Placement Service is designed to give members access to employment opportunities related to the field of molecular plant-microbe interactions.

It's a free service and it's simple to use.

Employers send a description of the position they have available to IS-MPMI headquarters where it is added to the ISMPMI.net. Employers do not have to be members of IS-MPMI to have a listing posted. To view the job listings on-line, members need to use their member password.

Of course the more listings we receive the better the service works, so please pass this information on to your organization's Human Resource department (or to others you know who are responsible for hiring) so they can make a point of sending us their position announcements in the future.

In the meantime, here's how you can find out about current job listings and receive the member password if you do not know it:

Contact Maureen Mullin
IS-MPMI Job Placement Service Manager
IS-MPMI Headquarters
3340 Pilot Knob Road
St. Paul, MN 55121-2097
Phone: +1-(651) 454-7250
Fax: +1-(651) 454-0766
E-mail: maureen@scisoc.org

IS-MPMI Employment Listings

Oops!

In our last issue of the IS-MPMI Reporter, we neglected to include coverage of the Rhizobium work presented at the meeting. We apologize for this oversight.

Rhizobium Highlights From the 8th Biennial IS-MPMI Meeting July, 1996

The opening session on Plant-Microbe Symbioses began with a comprehensive outline by Sharon Long of the papers and poster papers to be presented at the conference. This excellent introduction to the Rhizobium work to follow was done very well and concluded with a Video film tracing Ca²⁺-fluxes across inoculated root hairs.

Herman Spaink reported on the collaborative programs of the Leiden group describing the biochemistry required for the biosynthesis of the Rhizobium lipo-chitin oligosaccharides (LCOs) and the determination of host specificity. The functions associated with the NodC, NodF, E, A, S, Z, L, X, I, and NodJ proteins were outlined. He also described additional experiments using a recently developed microtargeting system for transferring specific molecules into inner cortical cells of the legume root.

Alan Downie reported on a protein required for the secretion of the NodO protein and a bacterial endoglucanase. A class of secretion mutants were non-nitrogen-fixing (Fix⁻). Rhizobium polysaccharides still hold a lot of interest as possible signal molecules important for successful infection of legume roots.

A group of laboratories, York et al., Reuhs, Noel et al., Niehaus et al., reported on the structures of exopolysaccharides and lipopolysaccharides, their possible role in nodule invasion and the suppression of plant defense systems. In this session Graham Walker described experiments which support the view that the Low Molecular Weight (LMW) form of the galactoglucan (EPS II) of *R. meliloti* is active at low concentrations as signal molecules which probably modulate plant defense and developmental responses.

Marilynn Etzler and collaborators described some very interesting experiments about the properties of lectins from the legume *Dolichos biflorus* and again raised the possible involvement of lectins in plant-microbe interactions. In particular, the lectin DB46 which can be detected in the roots, binds readily to chitin tetrasaccharides and has a nucleotide phosphatase activity. The findings suggested that the DB46 lectin could be a good candidate for a Nod factor receptor and be part of a signal transduction system.

Adam Kondorosi described a series of experiments that explored the possible components at work in the control of nodule initiation, such as Nod factors, cytokinins, nodulin gene Msend40, uridine, sucrose, nitrogen limitation and the ratio of auxin/cytokinin. This work was developed into a useful working model that should contribute to the further understanding of possible involvement of secondary signals in the early stages of nodule formation.

Michael Djordjevic reported on the use of transgenic white clovers containing reporter genes fused to either an auxin responsive promoter or to chalcone synthase (CHS) promoters to investigate the roles of the phytohormone auxin and plant flavonoids in root nodulation. The results provided the first experimental evidence consistent with the view that flavonoids can be produced in the inner cortical cell region of inoculated roots.

The flavonoids that potentially accumulate possibly act as auxin transport inhibitors and lead to local, elevated

levels of auxin which then promote cell division to generate a nodule primordium.

Other interesting reports come from Bill Broughton on the broad host range *Rhizobium* strain NGR234 and its host-specific nodulation loci, Don Phillips on bacterial colonization of roots and the importance of biotin as a growth factor for *Rhizobium* strains, Clare Gough on the intracellular colonization of non-legume roots by the genetically labelled strain ORS571 and many very good poster contributions.

Trichoderma/Gliocladium International Working Group Sought

The number of laboratories working with *Trichoderma/Gliocladium* worldwide is increasing and the field would benefit with better organization, as well as improved communication. It would be useful to have a *Trichoderma/Gliocladium* International Working Group made up of all the researchers strongly involved in this subject.

The first step would be to make an updated list of all the people/laboratories working with these fungi. Then, an International Committee for *Trichoderma/Gliocladium* could be formed. The duty of this Committee would be to promote research and collaboration, help to organize meetings, and establish projects as well as consortia.

Of course, there is more than one area of research in this field, thus the Committee should include people interested in BIOCONTROL, BIOLOGY, BIOTECHNOLOGY, PHYSIOLOGY, TAXONOMY and MOLECULAR GENETICS. Everybody is invited to provide suggestions on this matter.

If you are interested in this field and want to be included in the *Trichoderma* and *Gliocladium* International working group, please answer the short questionnaire at right and send it, preferably by E-mail, to:

Matteo Lorito
Istituto di Patologia Vegetale
Universita degli Studi di Napoli Federico II
Via Universita, 100
80055 Portici (Naples) ITALY
E-mail LORITO@unina.it
Fax: +39-81-7755129/7753579
Tel: +39-81-7755142/7755121
(look for the acknowledge of receipt to your message)

If this initiative is successful, you will receive by E-mail a copy of an updated list of the researchers interested in *Trichoderma/Gliocladium* with complete addresses and a short summary of each person's research interests. This list will be regularly updated. Thank you for your cooperation.

QUESTIONNAIRE

1 - Name and full address, including E-mail

2 -Brief description of your research interest with *Trichoderma* and/or *Gliocladium* (key words - three lines at most)

3 -Your suggestions are very valuable for improving this idea, please indicate your comments.

Send your questionnaire to:

Dr. Matteo Lorito
Istituto di Patologia Vegetale
Universita degli Studi di Napoli Federico II
Via Universita, 100
80055 Portici (NA) ITALY
E-mail LORITO@unina.it
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MEETING CALENDAR

March 18-23, 1997, The 18th Fungal Genetics Meeting

Asilomar, California, US, Contact: Dr. N. Louise Glass, Biotechnology Laboratory, University of British Columbia, VANCOUVER, B.C. V6T 1W5 Canada Fax: 604 /822-6097 or Dr. Michael J. Hynes, Department of Genetics, University of Melbourne, Parkville, VIC. 3052 Australia; Email: hynes_lab@muwayf.unimelb.edu.au
Fax: 613/ 934-45139 http://www.kumc.edu/*fgsc

June 22-27, 1997, The Second International Bacterial Wilt Symposium

Gosier, Guadeloupe (French West Indies, Contact: Dr. Philippe, Prior, INRA, B.P.515, 97165 Pointe-a-Pitre, Guadeloupe, French West Indies Fax: (590) 94 11 72.
E-mail: prior@antilles.inra.fr

July 20-25, 1997, 11th International Congress on Nitrogen Fixation

Paris, France, Contact: Dr. C. Elmerich, Unite de Physiologie Cellulaire, Dept. des Biotechnologies, Fax: +33 1 45 68 87 90 E-mail: elmerich@pasteur.fr

July 20-25, 1997 International Symposium on Iron Nutrition and Interactions in Plants

Stuttgart, Germany Contact: Dr. Volker Romheld, Institut fur Pflanzenernahrung (330), Universitat Hohenheim, D 70593 Stuttgart, Germany Telephone: +49 711 459 3714 Fax: +49 711 459 3295

August 9-13, 1997 American Phytopathological Society Annual Meeting

Rochester, NY, USA Contact: Debbie Merritt, APS Headquarters, 3340 Pilot Knob Rd., St. Paul, MN 55121-2097 USA Telephone: +1-(651) 454-7250 Fax: +1-(651) 454-0766 E-mail: aps@scisoc.org, <http://www.scisoc.org>

September 21-27, 1997, 5th International Congress of Plant Molecular Biology Singapore, Contact:

Congress Secretary, ISPMB, Dept. of Biochemistry & Molecular Biology, Univ. of Georgia, Athens, GA
30602-7229 USA Fax: +1 706-542-2090 E-mail: ldure@uga.cc.uga.edu

September 29-October 2, 1997, The 11th Annual Australasian Plant Pathology Society Meeting
Perth, Australia, Contact: Mrs. M. Eyres, 11th APPS Conference, Plant Pathology, Agriculture Western
Australia, Baron-Hay Court, SOUTH PERTH, WA6151
E-mail: apps97@agric.wa.gov.au

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
Congressses and Tour Operators, Ltd., P.O. Box 50006 Tel Aviv 61500, Israel
<http://indycc1.agri.huji.ac.il/~tzvika/iaptc/congress.htm>

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
<http://lsb380.plbio.1su.edu/ima/index.html>

If you have a meeting you would like to list here, please send the information to:

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A Note From The Editors

We welcome your suggestions for future articles and ways to improve the newsletter.

This is *your* newsletter and we want it to serve your interests and needs.

Please do not hesitate to contact us.

The IS-MPMI Reporter 1997 schedule is:

Spring Issue

Articles due: April 1

Mail date: April 30

Summer issue (includes member directory and post meeting highlights)

Articles due: August 1

Mail date: August 30

Fall/Winter Issue

Articles due: December 1

Mail due: December 30

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