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Conference

Satellites

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13th Symposium on Nitrogen Fixation with Non-Legumes

Confirmed speakers:

Ivo Baldani, Brazil
 Claudine Elmerich, France
 Karl Forchhammer, Germany
 Claudine Franche, France
 Ann Hirsch, USA
 Euan James, Scotland
 Lin Min, China
 Yaacov Okon, Israel
 Barbara Reinhold, Germany
 Anil Tripathi, India
 Jos Vanderleyden, Belgium
 Roseli Wasseem, Brazil

Main Topics:

- Genomics and diversity of diazotrophs
- Genetics, biochemistry and physiology of diazotrophs
- Rhizosphere ecology
- Interaction with Non-Legume hosts
- Cyanobacteria and Frankia: Genomics, Physiology, Ecology
- Applications of Nitrogen Fixation with Non-Legumes
- Biological Nitrogen Fixation and Energy Balance in Biofuel Production

Date:

September 6-7, 2012

Venue:

Helmholtz Zentrum München, German Research Center for Environmental Health,
 Auditorium, Ingolstaedter Landstrasse 1, D-85764 Neuherberg

Program

Thursday, 06.09.2012


10:00-
15:00 Registration

11:30-
12:30 *Lunch (at HMGU-Mensa, optional)*

12:30-
13:00 Opening session

13:00- Session 1: Functional Genomics of Diazotrophs
 15:30 (chair persons: Lin Min, Florence Wisnewski)

Search



ORGANIZERS:

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Helmholtz Zentrum München
 German Research Center for Environmental
 Health
 Research Unit Microbe-Plant Interactions
 Ingolstädter Landstraße 1
 D-85764 Neuherberg

13:00- 13:30	Florence Wisniewski-Dyé, Villeurbanne, France <i>Azospirillum</i> genomes reveal transition of bacteria from aquatic to terrestrial environments
13:30- 14:00	Min Lin, Beijing, China Genome transcriptome analysis and functional characterization of a nitrogen fixation island in the root-associated <i>Pseudomonas stutzeri</i>
14:00- 14:30	Ann Hirsch, Los Angeles, USA Plant-associated <i>Burkholderia</i> species fix nitrogen, solubilize phosphate, promote plant growth, and are phylogenetically distinct from disease-causing species
14:30- 14:45	Stefan Schwab, Seropedica, Brazil Global transcriptional shift analysis of nitrogenase switch-off by glutamate in <i>Azospirillum amazonense</i> CBAmc, isolated from sugar cane
14:45- 15:00	Benoit Drogue, Villeurbanne, France Transcriptome analysis of <i>Azospirillum lipoferum</i> during its interaction with rice
15:00- 15:15	Roseli Wassem, Curitiba, Brazil Transcript profiling of wheat (<i>Triticum aestivum</i>) roots colonized by <i>Azospirillum brasilense</i>
15:15- 16:00	<i>Group photo,</i> <i>Coffee / tea break</i>
16:00- 18:15	Session 2: Genetics, Biochemistry and Ecology of Diazotrophs (chair persons: Anil Tripathi, Ann Hirsch)
16:00- 16:30	Claudine Elmerich, Paris, France Plant-growth-promoting, nitrogen-fixing rhizobacteria: historical perspective
16:30- 17:00	Anil Tripathi, Varanasi, India Molecular analysis of the role of heat shock sigma factors in the environmental fitness of <i>Azospirillum brasilense</i>
17:00- 17:30	Stijn Spaepen, Heverlee, Belgium Role of auxin signalling in the interaction of <i>Arabidopsis</i> with the plant growth-promoting bacterium <i>Azospirillum</i>
17:30- 17:45	Andrea Krause, Bremen, Germany Alcohol dehydrogenase in <i>Azoarcus</i> sp. BH72: Important for the endophytic life but with a complex regulation of expression
17:45- 18:00	Carlos Meneses, Campina Grande, Brazil EPS of <i>Gluconacetobacter diazotrophicus</i> is involved in the resistance to oxidative stress
18:00- 19:30	Poster Session

Friday, 07.09.2012

09:00- 11:00	Session 3: Endophytic Interactions with Non-Legumes (chair persons: Barbara Reinhold-Hurek, Ivo Baldani)
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09:00-09:30	Barbara Reinhold-Hurek, Bremen, Germany Development of novel methods to study endophyte-rice interactions in the model diazotroph <i>Azoarcus</i> sp. BH72
09:30-10:00	Rose Adele Monteiro, Curitiba, Brazil <i>Herbaspirillum seropedicae</i> attachment and endophytic colonization requires the interaction between bacterial lipopolysaccharide and three maize lectins
10:00-10:30	Ivo Baldani, Seropedica, Brazil The multispecies inoculant for the Brazilian sugarcane: The reasons for choosing the bacterial strains
10:30-10:45	Sylvia Alqueres, Neuherberg, Germany The role of reactive oxygen during the <i>Gluconacetobacter diazotrophicus</i> – rice interaction
10:45-11:00	Simona Radutoiu, Aarhus, Denmark <i>Lotus japonicus</i> – a model species for root - microbiome interaction studies
11:00-11:15	Coffee / Tea break
11:15-12:30	Session 4: Rhizosphere Ecology and Physiology of Diazotrophs (chair persons: Euan James, Claudine Elmerich)
11:15-11:45	Euan James, Dundee, Scotland Biological Nitrogen Fixation (BNF) by C4-Poaceae: What is needed to make it a reliable and predictable resource?
11:45-12:00	Luc Rows, Seropedica, Brazil <i>Bradyrhizobium</i> spp. isolates obtained from sugarcane using new strategies
12:00-12:15	Yuan Liu, Bremen, Germany Identification of <i>Azoarcus</i> sp. BH72 as a major active diazotroph associated with spruce
12:15-12:30	Lambert Brau, Burwood, Australia Development of plant growth promoting rhizosphere organisms to enhance productivity of legumes and cereals
12:30-13:30	Lunch (HMGU, Mensa)
13:30-15:45	Session 5: Cyanobacterial and Actinorhizal Symbiosis (chair persons: Karl Forchhammer, Claudine Franche)
13:30-14:00	Karl Forchhammer, Tübingen, Germany Requirement of cell wall remodeling for cell-cell communication and cell differentiation in filamentous cyanobacteria of the order <i>Nostocales</i>
14:00-14:30	Claudine Franche, Montpellier, France Signaling and communication in actinorhizal symbiosis
14:30-15:00	Enrique Flores, Seville, Spain Cyanobacterial sugar transporters required for infection in a cyanobacterium - plant symbiosis
15:00-	Hermann Bothe, Köln, Germany

15:15	Nitrogen fixation and hydrogen metabolism in Cyanobacteria
15:15-15:30	Hassen Gherbi, Montpellier, France A truncated <i>Casuarina glauca</i> CCaMk triggers nodulation independently of <i>Frankia</i> regardless of the infection mode
15:30-15:45	Mitchell Andrews, Lincoln, New Zealand Nitrogen fixation in actinorhizal plants in natural ecosystems as indicated by their ¹⁵ N natural abundance
15:45-16:00	Coffee / Tea break
16:00-17:45	Session 6: Applications of Diazotrophs with Non-Legumes (chair persons: Yaacov Okon, Anton Hartmann)
16:00-16:30	Yaacov Okon, Rehovot, Israel Plant growth promotion abilities and commercial applications of <i>Azospirillum brasilense</i>
16:30-16:45	Robert M. Boddey, Seropedica, Brazil Multi-locational field trials of a mixed diazotroph inoculant on sugar cane in Brazil
16:45-17:00	Angela Kent, Urbana-Champaign, Illinois, USA Micro-managing sustainability: Ecology of diazotrophs associated with <i>Miscanthus</i>
17:00-17:15	Qi Cheng, Beijing, China Introduction of the nitrogen fixation gene cluster to the eukaryotic green alga <i>Chlamydomonas</i>
17:15-17:30	Veronica M. Reis, Seropedica, Brazil Maize/ <i>Azospirillum</i> inoculation: which species can be recommended as PGPR in Brazil?
17:30-17:45	Ruth Bonilla, Bogotá, Colombia Implementation of a production system formed by Guinea grass and Eucalyptus, managed under a sustainable approach based on the inoculation of indigenous <i>Azotobacter</i> strains
17:45-18:15	Closing Session
From 19:30	Symposium's Dinner

International Advisory Board:

Ivo Baldani, Brasil
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Transcriptome analysis of *Azospirillum lipoferum* during its interaction with rice

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The associative symbiosis between Plant Growth Promoting Rhizobacteria of the genus *Azospirillum* and cereals have mainly been studied from an agronomic and economic point of view, and several studies showed that plant morphological and metabolic changes depend on both bacterial and plant genotypes. However, if the specificity in the *Rhizobium*-legume symbiosis has been well characterized, the question of whether specificity occurs in the *Azospirillum*-plant associative symbiosis remains controversial. In this context, the overall gene expression of *A. lipoferum* 4B during its interaction with roots of two rice varieties (cv. Cigalon, cv. Nipponbare) was analyzed in order to characterize (i) genes differentially regulated in response to plant regardless of the variety and (ii) genes displaying a variety-dependent regulation. Results of the transcriptomic analysis show that presence of the host plant triggers stress response systems, a large number of putative transcriptional regulators, signal transduction pathways, and many proteins of unknown function. This indicates a reprogramming of bacterial gene expression, due to adaptation to host plant. Genes specifically expressed during the interaction with one of the two varieties could be identified, suggesting the existence of specificity in the associative symbiosis between *Azospirillum* and cereals.