

**The 14th International
Symposium on
Nitrogen Fixation
with Non-Legumes**

Program and Abstracts

30 October – 2 November, 2014

Chengdu, China

Program

THURSDAY 30 OCTOBER

All day

All day registration/check-in desk open at Holiday Inn

Free airport shuttle: From Chengdu International Airport to the hotel

FRIDAY 31 OCTOBER

08: 30 - 9: 00

Opening Speeches

Chair: Min Lin and Qi Cheng

09: 00 - 11: 50

Session 1: Biochemistry and regulation of nitrogen fixation

Chair: Anton Hartmann and Gary Stacey

09: 00 - 09: 30

OPS01-1

Nitrogenase: still a mystery after all these Years?

William Newton, Virginia Polytechnic Institute & State University, USA

09: 30 - 09:50

OPS01-2

One more proton in R-homocitrato iron vanadium cofactor of V-nitrogenase, a structural comparison

Zhaohui Zhou, Xiamen University, China

09: 50 - 10:20

Coffee break

10: 20 - 10:50

OPS01-3Defining the functions of three Fnr-like transcriptional regulators in *Herbaspirillum seropedicae***Ray Dixon**, John Innes Centre, UK

10: 50 - 11: 10

OPS01-4Global regulation of nitrogen fixation island in *Pseudomonas stutzeri* A1501**Yongliang Yan**, Biotechnology Research institute, CAAS, China

11: 10 - 11: 30

OPS01-5Biofilms containing cyst-like cells enable nitrogen fixation of *Pseudomonas stutzeri* strain A1501 under aerobic condition**Luyan Ma**, Institute of Microbiology, Chinese academy of sciences, China

11: 30 - 11:50

OPS01-6Functional analysis of nitrogenase-like genes of *Paenibacillus sabinae* T27**Sanfeng Chen**, China Agricultural University, China

11: 50 - 14: 00

Lunch

14: 00 – 16 : 00

Session 2: Bioresource and genomics
Chair: Gladys Alexandre and Yiping Wang

14: 00 - 14: 30

OPSo2-1 Nitrogen-fixing *Pseudomonas stutzeri*: from isolation to genomics
Claudine Elmerich, Institut Pasteur, France

14: 30 - 14: 45

OPSo2-2 Genetic diversity of endophytic diazotrophs of the wild rice *Oryza alta* and *O. austral iensis* and identification of two novel species
Zhiyuan Tan, South China Agricultural University, China

14: 45 - 15: 00

OPSo2-3 Biological nitrogen fixation associated with sugarcane grown in Guangxi, China
Qianli An, Zhejiang University, China

15 : 00 - 15 : 15

OPSo2-4 Comparative genomic and protein sequence analyses of the chemotaxis system of *Azorhizobium caulinodans*
Zhihong Xie, Yantai Institute of Coastal Zone Research, China

15 : 15 - 15 : 30

OPSo2-5 Coordinated regulate nodule morphogenesis with rhizobial infection in legumes
Fang Xie, Shanghai Institute of Plant Physiology and Ecology, CAS, China

15: 30 - 15: 45

OPSo2-6 Characterization of MtNFH1 of *Medicago truncatula* and LjCOCH of *Lotus japonicus*
Wei Liu, Sun Yat-sen University, Guangzhou, China

15: 45 - 16: 00

OPSo2-7 Transcriptome analysis of rice seedlings inoculated *Sinorhizobium meliloti* 1021 reveals the growth promotion mechanisms
Qingqing Wu, Institute of Botany, CAS, China

16 : 00 - 18 : 00

Coffee Break and Even/Odd-numbered Poster Session

18 : 00 - 20 : 00

Buffet

18 : 30

Dinner for the International Committee, discussing the time and hosting country of the 15th international symposium

SATURDAY 1 NOVEMBER

08:30 – 12:00

Session 3: Plant-microbe interactions
 Chair: Ray Dixon and Ertao Wang

08:30 - 09:00

OPSo3-1 Characterization of plant-associated diazotrophic bacteria in Non-Legumes using a combination of molecular and cultivation techniques
Anton Hartmann, Helmholtz Zentrum München, Germany

09:30 - 10:00

OPSo3-2 The actinorhizal symbiosis *Casuarina glauca*-*Frankia*: Current knowledge and perspectives
Claudine Franche, Institut de Recherche pour le Développement of Montpellier, France

10:00 - 10:30

OPSo3-3 *Setaria viridis*, a C₄ model plant for the study of associative nitrogen fixation and plant growth promoting rhizobacteria
Gary Stacey, University of Missouri-Columbia, USA

10:30 – 11:00

Coffee break

11:00 - 11:20

OPSo3-4 Cooperation and cheating: The evolutionary genetics of pyoverdinin production by *Pseudomonas*
Xue-Xian Zhang, Senior Lecturer at Massey University, New Zealand

11:20 - 11:40

OPSo3-5 The effects of plant genotypes and local soil on diazotrophs associated with *Miscanthus*
Dongfang Li, University of Illinois, USA

11:40 - 12:00

OPSo3-6 High photosynthesis efficiency rice breeding and rhizosphere nitrogen fixation
Hao Lin, Biotechnology Research institute, CAAS, China

12:00 – 14:00

Lunch Break

14: 00 – 18 : 00

Session 4: Rhizosphere ecology and non-legumes utilization for sustainable agriculture

Chair: Claudine Elmerich and Claudine Franche

14: 00 - 14: 30

OPSo4-1 Coping with oxygen stress by cell-to-cell clumping in the microaerophilic diazotroph, *Azospirillum brasilense*
Gladys Alexandre, University of Tennessee, USA

14: 30 - 15: 00

OPSo4-2 N₂-fixing methanotrophs as non-leguminous rhizobia in paddy rice roots
Kiwamu Minamisawa, Tohoku University, Japan

15: 00 - 15: 30

OPSo4-3 Plant growth promotion abilities and commercial applications of *Azospirillum brasilense*
Yaacov Okon, The Hebrew University of Jerusalem, Israel

15:30 - 16: 00

Coffee break

16: 00 - 16: 30

OPSo4-4 Biological nitrogen fixation in poplar trees: Applications for bioenergy and agriculture
Sharon Doty, University of Washington, USA

16: 30 - 17: 00

OPSo4-5 The signalling pathways that establish arbuscular mycorrhizal symbiosis in plants
Ertao Wang, National Laboratory of Plant Molecular Genetics, CAS, China

17: 00 - 17: 20

OPSo4-6 Visualize the chemical exchanges during biological nitrogen fixation with non-legumes
Yuquan Xu, Biotechnology Research institute, CAAS, China

17: 20 - 17:40

OPSo4-7 Contribution of nitrogen fixation to plant growth-promoting ability of *Pseudomonas stutzeri* A15 on rice
Pham Thi Khanh Van, Katholieke Universiteit Leuven, Belgium

17: 40 - 18: 00

OPSo4-8 Heterotrophic and phototrophic ¹⁵N₂ fixation and distribution of fixed ¹⁵N in a flooded rice-soil system
Qicheng Bei, Institute of Soil Science, CAS, China

18 : 30 -

Banquet

Chair: Yiping Wan

SUNDAY 2 NOVEMBER

08: 30 - 12: 00

Session 5: Future prospects for non-legume nitrogen fixation

Chair: Kiwamu Minamisawa and Saul Purton

08: 30 - 09: 00

OPS05-1

Prospects and challenges of expressing nitrogenase genes in the chloroplast

Saul Purton, University College London, UK

09: 00 - 09: 30

OPS05-2

Reconstruction and minimal gene requirements for the alternative iron-only nitrogenase in *Escherichia coli*

Yiping Wang, Peking University, China

09: 30 - 10: 00

OPS05-3

Global consideration of nitrogen fixation engineering

Qi Cheng, Biotechnology Research Institute, CAAS, China

10: 00 – 10: 30

Coffee break

10: 30 - 11: 00

OPS05-4

A role for N₂ fixation in the coming eras of climate change, in the context of correcting errors regarding greenhouse gases and global warming

Ivan R. Kennedy, University of Sydney, Australia

11: 00 - 11:20

OPS05-5

Innovative R&D and solutions for sustainable agriculture

Aimin Zhao, Dow AgroSciences, USA

11: 20 - 11: 40

OPS05-6

Next generation hybrid technology and improvement of nitrogen fixation efficiency

Haiyang Wang, Biotechnology Research Institute, CAAS, China

11: 40 - 12: 00

OPS05-7

Development and application of microbial N-fixing products in China

Guoping Yang, Dongguan Baode Biological Engineering Co., Ltd., China

12: 00 – 12: 15

Closing Session

Chair: Anton Hartmann

12: 15 – 14: 00

Buffet

MONDAY 3 NOVEMBER

08 : 00 - 12: 00

Excursion routes

Route 1) Panda Breeding and Research Center

(<http://www.panda.org.cn/english>)

Route 2) Dujiangyan Irrigation Water System

(<http://www.djygov.com>)

Free airport shuttle: From the hotel to Chengdu International Airport