



# 23rd EUROPEAN NITROGEN CYCLE MEETING PROGRAMME

## Wednesday, 19<sup>th</sup> September

**17:00-19:00 Registration**

**19:00-19:30 Welcome**

**19:30-20:30: Opening Lecture**

*Chair: David J. Richardson, University of East Anglia, United Kingdom*

*Speaker: Michael Wagner, University of Vienna, Austria*

*Title: A new perspective on microbes formerly known as ammonia- and nitrite-oxidizers*

**21:00-22:30 Reception Cocktail**

## Thursday, 20<sup>th</sup> September

### **S1-Denitrification/Nitrate respiration (9:00-10:30)**

*Chair: Jörg Simon, Technische Universität Darmstadt, Department of Biology, Microbial Energy Conversion and Biotechnology, Darmstadt, Germany*

**9:00-9:30** Denitrification phenotypes - simple does not mean easy

Pawel Lycus. Norwegian University of Life Sciences, Faculty of Chemistry, Biotechnology and Food Science, Ås, Norway

**9:30-9:45** Hmp controls bet-hedging in *Paracoccus denitrificans* switching to denitrification by curtailing NO-signalling during the transition to anoxia

Linda Bergaust. Norwegian University of Life Sciences, Faculty of Chemistry, Biotechnology and Food Science, Ås, Norway

**9:45-10:00** Anaerobic reduction of nitrate to nitrous oxide is lower in *Bradyrhizobium japonicum* than in *Bradyrhizobium diazoefficiens*

Cristina Sánchez. Graduate School of Life Sciences, Tohoku University, Japan

**10:00-10:15** Characterization of proteome of *Paracoccus denitrificans* PD1222 NtrY- mutant under denitrifying conditions. Effect of pH and carbon source on the proteome

Alfonso Olaya. Departamento de Bioquímica y Biología Molecular, Universidad de Córdoba, Edificio Severo Ochoa, 1<sup>a</sup> planta, Campus de Rabanales, Córdoba, 14071, Spain



**10:15-10:30** Defense response of *Sphingopyxis granuli* strain TFA to anaerobiosis

Yolanda Elisabet González-Flores. Universidad Pablo de Olavide, Sevilla, Spain

**10:30-11:30 Coffee break/Posters**

**S2-NO and N<sub>2</sub>O production/Climate change. PART I (11:30-13:15)**

Chair: Nicholas Watmough, University of East Anglia, United Kingdom

**11:30-12:00** Regulatory and metabolic controls of denitrification intermediates in nodule-forming rhizobia

Åsa Frostegård. Norwegian University of Life Sciences, Faculty of Chemistry, Biotechnology and Food Science

**12:00-12:15** Biosynthesis of nitrous oxide reductase: a complex bacterial multicopper enzyme essential for the global nitrogen cycle

Andrew Gates. Centre for Molecular and Structural Biochemistry (CMSB), School of Biological Sciences, University of East Anglia, Norwich, NR4 7TJ, UK

**12:15-12:30** The catalytical cycle of nitrous oxide reductase from a marine clade I bacterium.

Sofia Pauleta. Microbial Stress Lab, UCIBIO, REQUIMTE, Dep. Química, FCT-NOVA, Portugal

**12:30-12:45** Nitric oxide and nitrous oxide production by complete ammonia oxidizers (comammox)

Holger Daims. Department of Microbiology and Ecosystem Science, University of Vienna, Althanstrasse 14, 1090 Vienna, Austria

**12:45-13:00** Copper centre biogenesis in the nitrous oxide reductase of *Paracoccus denitrificans*

Sophie P. Bennett. Centre for Molecular and Structural Biochemistry, School of Chemistry, University of East Anglia, Norwich Research Park, Norwich, NR4 7TJ, UK

**13:00-13:15** Smart residue amendments to modulate greenhouse emissions from agricultural soils

Kristof Brenzinger. Department of Microbial Ecology, Netherlands Institute of Ecology (NIOO-KNAW), Droevendaalsesteeg 10, 6708 PB Wageningen, The Netherlands

**13:30-15:00 Lunch**



**S2-NO and N<sub>2</sub>O production/Climate change. PART II (15:00-16:30)**

Chair: Linda Bergaust, Norwegian University of Life Sciences, Faculty of Chemistry, Biotechnology and Food Science, Ås, Norway

**15:00-15:30** *Rhizobium etli* produces nitrous oxide by coupling the assimilatory and denitrification pathways

María Jesús Delgado. Estación Experimental del Zaidín, Consejo Superior de Investigaciones Científicas (CSIC), Granada, Spain

**15:30-15:45** Laughing gas production by the nitrate-ammonifying bacterium *Wolinella succinogenes*

Vanesa Mijic. Technische Universität Darmstadt, Department of Biology, Microbial Energy Conversion and Biotechnology, Darmstadt, Germany

**15:45-16:00** Laughing gas respiration of *Wolinella succinogenes*: composition and function of the electron transport chain

Sascha Hein. Technische Universität Darmstadt, Department of Biology, Microbial Energy Conversion and Biotechnology, Schnittspahnstr. 10, 64287 Darmstadt, Germany

**16:00-16:15** It is not all about biology: environmental niche, kinetics and mitigation of abiotic N<sub>2</sub>O production from hydroxylamine and free nitrous acid

Aina Soler-Jofra. Department of Biotechnology, Faculty of Applied Sciences, Delft University of Technology, Van der Maasweg 9, 2629 HZ Delft, The Netherlands

**16:15-17:00 Coffee break/Posters**

**S3- NO sensing and detoxification (17:00-18:15)**

Chair: Sofia Pauleta. Microbial Stress Lab, UCIBIO, REQUIMTE, Dep. Química, FCT-NOVA, Portugal

**17:00-17:30** Independent regulation of nitrate reduction and the nitrosative stress response in *Desulfovibrio desulfuricans* 27774

Jeff Cole. School of Biosciences, University of Birmingham, Birmingham B15 2TT, UK

**17.30-17:45** CycA, a soluble cytochrome positively controlled by the FixK2 and NnrR transcription factors, is required for nitrous oxide reductase activity in *Bradyrhizobium diazoefficiens*

Socorro Mesa. Department of Soil Microbiology and Symbiotic Systems, Estación Experimental del Zaidín, CSIC, Granada, Spain



**17:45-18:00** Biochemical characterisation of Bjgb-Flp, a two-component system from *B. diazoefficiens* for nitric oxide detoxification

Ana Salas. Department of Soil Microbiology and Symbiotic Systems, Estación Experimental del Zaidín, CSIC, Granada, Spain

**18:00-18:15** The *Bradyrhizobium diazoefficiens* denitrification regulator NnrR binds nitric oxide through a ferrous heme cofactor *in vitro*

Andrea Jiménez-Leiva. Department of Soil Microbiology and Symbiotic Systems, Estación Experimental del Zaidín, CSIC, Granada, Spain

#### **S4- Nitrogen Fixation (18:15-19:45)**

*Chair: María Jesús Delgado. Estación Experimental del Zaidín, Consejo Superior de Investigaciones Científicas (CSIC), Granada, Spain*

**18:15-18:45** Diversity of N<sub>2</sub>-fixing cyanobacteria from Andalusian paddy fields and analysis of their potential as bioinoculants

Vicente Mariscal. Instituto de Bioquímica Vegetal y Fotosíntesis, CSIC and Universidad de Sevilla, Sevilla, Spain

**18:45-19:00** Raman Gas Spectroscopy – a promising tool to study the nitrogen cycle

Andreas Knebl. Max-Planck-Institute for Biogeochemistry, IMPRS gBGC, Jena

**19:00-19:15** Effects of increased atmospheric reactive nitrogen deposition upon rates of biological nitrogen fixation in peatlands

Ernesto Saiz. Faculty of Natural Sciences, Keele University, Staffordshire, UK

**19:15-19:30** Discriminatory determinants for FixK2-DNA interaction

Juan J. Cabrera. Department of Soil Microbiology and Symbiotic Systems, Estación Experimental del Zaidín, CSIC, Granada, Spain

**19:30-19:45** Unravelling the controversial effects of the cysteine183 to aspartic acid exchange in *Bradyrhizobium diazoefficiens* FixK2 transcription factor

Sergio Parejo. Department of Soil Microbiology and Symbiotic Systems, Estación Experimental del Zaidín, CSIC, Granada, Spain

**20:00-22:30 Dinner**



**Friday, 21<sup>st</sup> September**

**S5- Other N-cycle processes PART I (9:00-10:30)**

*Chair: María Dolores Roldán. Departamento de Bioquímica y Biología Molecular. Universidad de Córdoba. 14071-Córdoba-Spain*

**9:00-9:30** Beyond nitrogen metabolism: nitrogen sources, cyclic-di-GMP and bacterial biofilms

Serena Rinaldo. Istituto Pasteur Italia-Fondazione Cenci Bolognetti, Department of Biochemical Sciences, Sapienza University of Rome, Rome (I)

**9:30-9:45** Acetate assimilating *Burkholderiaceae* from acidic peat circles of the arctic Tundra drive N<sub>2</sub>O consumption

Stefanie Hetz. Institut für Mikrobiologie, Herrenhäuser Straße 2, Germany

**9:45-10:00** Changes in bacterial nitrate assimilation in response to carbon source oxidation state

Alexander R. Jarvis. Centre for Structural and Molecular Biochemistry, School of Biological Sciences, University of East Anglia, Norwich Research Park, Norwich, NR4 7TJ

**10:00-10:15** CopC as a copper chaperone for copper-containing enzyme thiocyanate dehydrogenase from haloalkaliphilic bacterium *Thioalkalivibrio paradoxus*

Olga Kulikova. Research Centre of Biotechnology, Russian Academy of Sciences, Moscow, Russia

**10:15-10:30** Enrichment and physiological characterization of a novel comammox *Nitrospira*

Dimitra Sakoula. Department of Microbiology, IWWR, Radboud University, Heyendaalseweg 135, 6525 AJ Nijmegen, the Netherlands

**10:30-11:30 Coffee break/Posters**

**S5- Other N-cycle processes PART II (11:30-13:15)**

*Chair: Andrew J. Gates, University of East Anglia, United Kingdom*

**11:30-12:00** Nitrifier denitrification, a *fata morgana*?

Lars Bakken. Norwegian University of Life Sciences, Faculty of Chemistry, Biotechnology and Food Science, Ås, Norway



**12:00-12:15** Dissimilatory nitrate reduction in freshwater cable bacteria

Ugo Marzocchi. Department of Chemistry, Research Group of Analytical, Environmental and Geo-Chemistry, Vrije Universiteit Brussel, Belgium

**12:15-12:30** Deciphering the role of nitrilases from *Pseudomonas pseudoalcaligenes* CECT5344 in the metabolism of cyanoderivative compounds

Victor Luque-Almagro. Departamento de Bioquímica y Biología Molecular. Universidad de Córdoba. 14071-Córdoba-Spain

**12:30-12:45** Biochemical analyses of DNA ligases from *Paracoccus denitrificans*

Richard P. Bowater. School of Biological Sciences, University of East Anglia, Norwich Research Park, Norwich, NR4 7TJ, UK

**13:30-15:30 Lunch**

**S6- N-cycle and biotechnology /anthropogenic activities on N-cycle (15:30-16:45)**

*Chair: Rob van Spanning, Vrije Universiteit Amsterdam, The Netherlands*

**15:30-16:00** Long-term operation and process characterization of an up-flow Anammox reactor treating mainstream real wastewater at 20 °C

Xènia Juan-Díaz. GENOCOV Research Group, Department of Chemical, Biological and Environmental Engineering, School of Engineering, Universitat Autònoma de Barcelona. Ed. Q-Campus UAB, 08193, Bellaterra, Barcelona, Spain

**16:00-16:15** Next generation bio-fertilizer: mitigating N<sub>2</sub>O emissions from soil by microbial enrichment of anaerobic digested wastewater sludge

Kjell Rune Jonassen. Norwegian University of Life Sciences, Faculty of Chemistry, Biotechnology and Food Science, Ås, Norway

**16:15-16:30** The effect of organic pollution and sulphate reduction on N-loss pathways in coastal sediments

Nuria Casado-Coy. Departamento de Ciencias del Mar y Biología Aplicada, Universidad de Alicante, PO Box 99, E-03080 Alicante, Spain

**16:30-16:45** Nitrate reduction capacity of the oral microbiota before and after periodontal treatment

Bob Rosier. Department of Genomics and Health, FISABIO Foundation, Center for Advanced Research in Public Health, Valencia, Spain



**17:00-18:00 Closing Lecture**

*Chair: Jeff Cole, University of East Anglia, United Kingdom*

Speaker: Stuart Ferguson, University of Oxford, United Kingdom

Title: Denitrification: problems solved and unsolved

**18:15-18:30 Closing remarks**

**20:30-22:30 City tour and Gala Cocktail at the “Santa Bárbara Castle”**