The Adam Kondorosi Academia Europaea Award for Advanced Research 2023

The award will be presented on Tuesday 10th October, 2023,
at Ludwig-Maximilians-Universität München
Große Aula (Raum E120)
Geschwister-Scholl-Platz 1, 80539 München
to

Professor Michael UDVARDI (Queensland, Australia)

Professor Udvardi will deliver the 2023 Adam Kondorosi Lecture:

"Genetics and Genomics of Symbiotic Nitrogen Fixation: Past, Present and Future".

The laudation will be given by Professor Luis Manuel Rubio Herrero MAE

"The Adam Kondorosi Academia Europaea Award for Advanced Research" recognizes landmark research in symbiosis and related fields that has changed our understanding and made a significant scientific impact.

The awards consist of a diploma/medal and prize money. This prize was established in recognition of the significant achievements made in the field of plant and microbe interactions and symbiotic nitrogen fixation by the late Professor Adam Kondorosi.

Members of the Award Committee:

- Jens Stougaard, ENFC president
- Eva Kondorosi, ENFC board
- Sharon Long, Stanford University
- Graham O´Hara, Murdoch University
- Klaus Palme, Academia Europaea
- Mart Saarma, Academia Europaea
- Luis M. Rubio, ENFC board (Chair of the committee)

MEDAL CITATION

Professor Michael Udvardi receives the Adam Kondorosi Academia Europaea Award for Advanced Research 2023 in recognition of the tremendous impact of his research on plant-microbe interactions and plant science and his generous service to the scientific community.

TITLE AND FULL NAME: Professor Michael UDVARDI

AFFILIATION: Queensland Alliance for Agriculture and Food Innovation, University of Queensland, Australia

LINK TO WEBPAGE: https://qaafi.uq.edu.au/profile/10442/michael-udvardi
https://scholar.google.com/citations?user=Yz19c0oAAAAJ&hl=en

TITLE OF PRESENTATION: **Genetics and Genomics of Symbiotic Nitrogen Fixation: Past, Present and Future.**

ABSTRACT OF PRESENTATION: Legumes contribute about 50 million tonnes of nitrogen, worth about $50 billion, to protein production and agricultural soils each year via symbiotic nitrogen fixation (SNF) with bacteria called rhizobia. Over the past 50 years, this natural process has been overshadowed by industrial production and use of industrial fertilizers, now well over 120 million tonnes per year, which have become essential for food security but undermine environment and human health. Legumes offer a sustainable solution to food security without environmental harm, if only they were used more intensively in agricultural systems. To make them more attractive to producers, plant breeders are working to increase legume resistance to plant diseases, tolerance to drought, heat and other abiotic stresses, and yield and quality of the seed and biomass they produce. There are also opportunities to increase the fraction of nitrogen that legumes obtain from the atmosphere versus the soil, via improvements in SNF. Over the past 20 years, genetic and genomic research has uncovered over 200 plant genes that are required for SNF, some of which I will describe in my presentation. At the same time, it has become clear that there is substantial natural variation in SNF effectiveness within plant species that could be harnessed via genome-enabled plant breeding to enhance this important process, as I will explain. In a world full of wicked, hard-to-solve problems, there is hope that we can solve the current nitrogen problem confronting humanity and planet earth.

BIOGRAPHICAL NOTE: Dr. Udvardi earned his Ph.D. in plant biochemistry from the Australian National University in 1989. He is primarily interested in how plants obtain nitrogen for growth and protein production, either as mineral nitrogen from the soil or from atmospheric di-nitrogen via symbiotic nitrogen fixation in bacteria. He has contributed to our understanding of symbiotic nitrogen fixation in legumes, especially of transport and metabolism in root nodules, using biochemical, molecular, genetic, and genomic methods. He was amongst the first to characterize ammonium and nitrate transporters in plants. He was part of a large international team that sequenced and analyzed the genome of the model legume, *Medicago truncatula*. Currently, his group focusses on the development of pan-genomic resources to accelerate breeding of tropical pulses, including mungbean and pigeonpea.

Dr. Udvardi has published over 200 papers in refereed scientific journals. He was Elected Fellow of the American Association for Advancement of Science in 2012 for his contributions to our understanding of legume biology, especially symbiotic nitrogen fixation.

Laudator

TITLE AND FULL NAME: Professor Luis Manuel Rubio Herrero MAE

AFFILIATION: Universidad Politécnica de Madrid

LINK TO WEBPAGE: http://www.cbgp.upm.es/index.php/es/informacion-cientifica/synbio2/nitrogen-fixation

BIOGRAPHICAL NOTE:

Dr. Rubio received his Ph.D. in Biology from the University of Seville in 1999. He was a postdoctoral researcher at the University of Wisconsin-Madison and a staff scientist at the University of California-Berkeley before joining the faculty of Universidad Politécnica de Madrid. His interest is in the biotechnological applications of microbial enzymes, with a focus on the enzyme nitrogenase, which catalyzes the conversion of inert atmospheric nitrogen into metabolically tractable ammonia. He has contributed to our understanding of the complex pathway for nitrogenase biogenesis in bacteria. He currently leads one of the few groups that are attempting to generate cereals capable of nitrogen fixation, an improved agronomic trait that would reduce dependence on external nitrogen fertilization for highly productive crops.

He is the current Chairman of the European Nitrogen Fixation Conference and of the Adam Kondorosi-Academia Europaea Awards Committee. He has been elected to the Academia Europaea in 2022. He has received several research awards for his contributions to the bioengineering of nitrogen fixation in plants and yeast.