GATERSLEBEN LECTURE

IPK LEIBNIZ-INSTITUT

Speaker: **Prof. Dr. Caroline Gutjahr**
Max-Planck-Institute of Molecular Plant Physiology, Potsdam-Golm, Germany

Title: **Form and function of a plant-fungal symbiosis**

Time: **Tuesday, May 13, 2025, 2 pm**
https://ipk-gatersleben-de.zoom-x.de/j/62357857477?pwd=NKfpDF1avHyFakQX4jOi1Mvvvo30b2.1
Meeting-ID: 623 5785 7477 Kenncode: 198929

Place: **IPK Lecture Hall and via Zoom,**
Correnssstr. 3, 06466 Seeland OT Gatersleben

Abstract:
All grasses Most land plants form symbioses with Glomeromycotina fungi to acquire mineral nutrients from the soil. This so-called arbuscular mycorrhiza (AM) symbiosis is evolutionarily ancient and found in the oldest fossils of land plants, sparking speculations about its importance in the colonization of the land by originally aquatic plants during evolution, at a time when plants had not yet evolved complex root systems for nutrient uptake. The fungi form extended hyphal networks in the soil to scavenge mineral nutrients. These are transported into the root and released via beautifully-shaped, highly branched hyphal structures, the arbuscules inside inner root cells. In return they receive up to 20% of photosynthetically fixed carbon from their host in the form of sugars and lipids. As a consequence, AM contributes significantly to plant nutrition and to global carbon cycles.
For symbiosis establishment, AM fungi colonize the root interior and the inside of plant cells. Symbiotic infection of single, already differentiated cells within the tissue context requires a poorly understood cellular remodeling program that is intertwined with mechanisms that control plant development and physiology. In my presentation, I will provide examples of how we investigate the molecular mechanisms underlying development and functioning of this fascinating symbiosis.

Short BIO
Caroline Gutjahr is a director of the Max-Planck-Institute of Molecular Plant Physiology in Potsdam-Golm, Germany, where she hads the Department of Root Biology and Symbiosis. Previously she was Professor of Plant Genetics at the Technical University of Munich and before that an independent Emmy Noether group leader at the LMU Munich. She gained her PhD at the University of Lausanne in the laboratory of Uta Paszkowski and studied Biology at the University of Freiburg. Her research group aims at understanding the development and function of arbuscular mycorrhiza, a symbiosis between land plants and beneficial fungi. The research of her team focuses in particular on the regulation of nutrient exchange and the role of plant hormones and transcriptional networks in physiological, molecular and plant cell developmental changes required to accommodate arbuscular mycorrhiza fungi inside the root and to adjust symbiosis development with environmental conditions and the resulting physiological needs of the plant. As the fungi can enhance nutrition and increase stress resistance of plants there is increasing interest in the use of the fungi in sustainable agricultural practices. Therefore, the Gutjahr lab also investigates the genetic underpinnings of fungus-mediated improvement of plant-performance with the aim to enable breeding of mycorrhiza-optimized crops.
Website: https://www.mpimp-golm.mpg.de/2724220/dept_9

Prof. Dr. Nils Stein (Organizer) *Prof. Dr. Nicolaus von Wirén (host)*