GATERSLEBEN LECTURE

IPK LEIBNIZ-INSTITUT

Speaker: **Dr. Matthew J. Moscou**
Research Plant Pathologist, USDA-ARS
Cereal Disease Laboratory,
University of Minnesota, St. Paul, USA

Title: **Evolution of immunity in the grasses**

Time: **Tuesday, June 11, 2024, 2 pm**

Place: **IPK Lecture Hall and via Zoom** (Hybrid Meeting)
https://ipk-gatersleben-de.zoom.us/j/68663091777?pwd=T2h0ZTd3U1ZTM2xQYmx1Vlg4S2d2UT09
Meeting-ID: 686 6309 1777   Kenncode: 941544

Abstract:
The Poales order emerged during Early Cretaceous (100-125 Mya) period and rapidly expanded to represent over 7% of angiosperm diversity. The major field crops maize, wheat, sorghum, millet, barley, and rice belong to the grasses (Poaceae), a family within the Poales. Sequencing of these six Poaceae crops and other grass species uncovered large-scale conservation in gene content between species. During the evolution and divergence of the Poaceae from other species in the Poales, several gene families experienced expansion, contraction, and innovation. In previous work, we discovered a lineage-specific clade of plant immune receptors (nucleotide-binding, leucine-rich repeat proteins; NLRs) that harbor substantial diversity in integrated domains. Due to the limited number of sequenced species, we could not establish the emergence of this clade in the evolution of the grasses and the degree of intraspecific integrated domain diversity. In ongoing work, we have leveraged genomic and transcriptomic data from 124 Poales species including 334 accessions to bioinformatically characterize NLR diversity. We establish a timeline of emergence of the lineage-specific clade of NLRs with integrated domains and identify the diversity of integrated domains in grasses. These discoveries have uncovered several lineage-specific genetic innovations that are key virulence targets in grasses.

Short CV

Dr. Moscou's scientific career started at the University of California, Riverside, USA where he studied Pure Mathematics and Physics (BSc), working as a programmer and molecular biologist in the laboratory of Prof. Timothy Close. He conducted his PhD work at Iowa State University, Ames, Iowa with Prof. Roger Wise studying gene expression and regulation during the interaction of barley with different obligate biotrophic fungal pathogens. In 2010, he conducted his post-doctoral scientist at the Sainsbury Laboratory in 2010 in the 2Blades Group with Dr. Eric Ward. He became a team leader in 2012 and group leader in 2014 with a focus on understanding immunity to non-adapted pathogens of grasses. Dr. Moscou recently moved back to the US in 2022 to take on the role of Research Plant Pathologist with the United States Department of Agriculture, Agricultural Research Service broadly working on cereals and their interaction with cereal rusts.

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Prof. Dr. Nils Stein (Organizer)   *Prof. Jochen C. Reif (host)*