

GATERSLEBEN LECTURE



Speaker: Prof. Dr. Frank Hochholdinger
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Title: Gene expression complementation during
heterosis manifestation in maize hybrids

Time: Tuesday, October 19, 2021, 2 pm

Place: VCS Zoom: Meeting-ID: 875 4996 1754 Kenncode: 050518
[https://ipk-gatersleben-
de.zoom.us/j/87549961754?pwd=VWdESDB0MzAvZHYrVnRwVXI0R0FiQT09](https://ipk-gatersleben-de.zoom.us/j/87549961754?pwd=VWdESDB0MzAvZHYrVnRwVXI0R0FiQT09)

Skype for Business: <https://ipk-gatersleben-de.zoom.us/skype/87549961754>

Abstract:

Distantly related maize inbred lines exhibit an exceptional degree of structural genomic diversity, which is probably unique among plants. Heterozygous F1-hybrid progeny of such inbred lines are often more vigorous than their homozygous parents, a phenomenon known as heterosis. Single-parent expression (SPE) is an extreme form of complementation on the gene expression level in hybrids consistent with the dominance model of heterosis. SPE describes the observation that a gene is expressed in the hybrid but in only one of its two parental inbred lines. As a result of gene expression complementation, we determined hundreds of additionally active genes in hybrids compared to their parental inbred lines across all surveyed genotypes, organs and developmental stages in a diverse set of maize hybrids.

In this talk, I will discuss the plasticity of SPE patterns in different maize organs and during development as well as the surprising stability of these patterns under drought stress conditions compared to other gene expression patterns. Moreover, I will highlight evolutionary implication of extreme gene expression complementation and the contribution of SPE to mid-parent heterosis for a number of phenotypic traits.

In summary, our results demonstrate that phenotypic mid-parent heterosis and the prevalence of extreme gene expression complementation are linked supporting the notion that hybrids benefit from SPE complementation in coordinating maize development under fluctuating environmental conditions.

Academic CV

- since 2010
Professor, Chair for Crop Functional Genomics, INRES, University of Bonn
- 2001-2010
Research Group Leader, ZMBP, General Genetics, University of Tuebingen
- 1999-2001
Postdoc, Iowa State University, USA, Prof. Dr. Patrick S. Schnable
- 1999
Postdoc, University of Freiburg, Prof. Dr. Günter Feix
- 1995-1999
PhD Program, University of Freiburg, Prof. Dr. Günter Feix
- 1989-1995
Studies in Biology, University of Freiburg

Prof. Dr. Nils Stein (*Organizer and Host*)