CSCS-/RCB–Colloquium (Part I)

Thursday, March 5th, 2026, at 2 p.m.
H53

Dr. Juliana Yassitepe

Embrapa Digital Agriculture

(Campinas, Brazil)

"Maize transformation and phenotyping for drought stress"

At the Genomics for Climate Change Research Center (GCCRC) in Campinas, the Yassitepe lab focusses on overexpressing and knocking out candidate genes to deepen our understanding of maize tolerance mechanisms to drought and heat stress. They established a maize transformation pipeline using *Agrobacterium tumefaciens*-mediated transformation and significantly increased transformation efficiency by implementing ternary vectors and morphogenic regulator (MR) genes. These optimizations enabled the efficient transformation and genome editing of tropical maize lines, surpassing the transformation performance of B104. To mitigate limitation caused by seasonal variation, they are testing a leaf-based transformation protocol that has shown promising results for year-round transformation. To evaluate the resulting transgenic events, they developed an affordable digital phenotyping platform for controlled-environment drought assays, and use unmanned aerial systems (UAS) equipped with RGB and multispectral cameras to monitor and predict plant responses throughout the crop cycle in the field. Together, these advances demonstrate a comprehensive, scalable pipeline - from gene manipulation to high-throughput phenotyping and predictive modeling - that accelerates the discovery and validation of genes conferring drought and heat resilience in maize. This integrated approach not only enhances our understanding of stress tolerance mechanisms but also provides practical tools for developing climate-resilient maize germplasm adapted to tropical environments.

Host: Prof. Dr. Thomas Dresselhaus <thomas.dresselhaus@ur.de>

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Plant Cell Biology, Biochemistry, and Biotechnology