

SFB 924-/BZR – Kolloquium

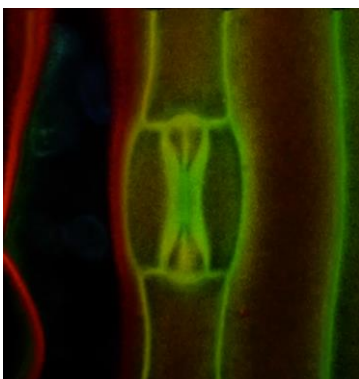
Donnerstag, 19. September 2019

14:00 Uhr, H53



Dr. Michael Raissig
Centre for Organismal Studies
University of Heidelberg

“Form, Development and Function of Grass Stomata“



Plants optimize carbon assimilation while limiting water loss by adjusting stomatal aperture. In grasses, a developmental innovation—the addition of subsidiary cells (SCs) flanking two dumbbell-shaped guard cells (GCs)—is supposedly linked to the grass family's improved stomatal gas exchange efficiency. A mutant screen in the wheat relative and model grass *Brachypodium distachyon* identified a transcription factor necessary and sufficient for SC formation. Unexpectedly, the transcription factor is an ortholog of the stomatal regulator *AtMUTE*, which defines GC precursor fate in *Arabidopsis*. The novel role of *BdMUTE* in specifying lateral SCs appears linked to its acquisition of cell-to-cell mobility in *Brachypodium*. Physiological analyses on *bdmute* mutant plants lacking SCs experimentally support classic hypotheses that SCs permit greater stomatal responsiveness to enhance water use efficiency and larger range of pore apertures to increase photosynthetic capacity. Recently, we profiled the transcriptome of developing and mature leaf regions of both wild-type and SC-less *bdmute* plants to identify novel factors regulating SC development and SC function, respectively. Discovering genes required for SC function will help understand how SCs actually improve stomatal gas exchange dynamics in grasses. Understanding how SCs are formed and enable grasses to breathe more efficiently might allow engineering of stomatal properties in many different crops to improve water use efficiency and plant performance.

Host: Dr. Karina van der Linde



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