

# GATERSLEBEN LECTURE



**Speaker:** **Prof. Dr. Markus Grebe**  
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Germany)

**Title:** **Cytoskeleton and Lipid-Domain  
Functions in *Arabidopsis* Planar  
Polarity.**

**Time:** **Monday, April 27, 2015, 3 pm**

***Abstract:***

The orientation of cell division and the coordination of cell polarity within the plane of the tissue layer (planar polarity) contribute to shape diverse multicellular organisms. The root of *Arabidopsis thaliana* displays regularly oriented cell divisions, cell elongation and planar polarity providing a plant model system to study these processes. Specifically, coordinated polar positioning of hairs within the plane of the root epidermal layer provides an easily accessible planar polarity system coordinated by an auxin concentration gradient (1-4). Here, I discuss our work on SABRE encoding a large protein with similarity to proteins of unknown function throughout eukaryotes. SABRE localizes to the mitotic spindle, cell plate, plasma membrane and unidentified endomembrane structures. SABRE stabilizes orientation of CLASP-labelled preprophase band microtubules, predicting the cell division plane, and of cortical microtubules driving cell elongation. During planar polarity establishment, SABRE and the conserved microtubule regulator CLASP act in one genetic pathway to direct polar membrane domains of Rho-of-plant GTPases. Our work mechanistically links SABRE to CLASP-dependent microtubule organization, providing a stepping-stone for further elucidation of molecular functions of SABRE and related proteins in plants and other eukaryotes. In the second part, I discuss roles of the actin cytoskeleton during planar polarity formation. We identify ACTIN-INTERACTING PROTEIN 1-2 (AIP1-2), whose expression we find to be restricted by WEREWOLF-dependent patterning and modified by ethylene/auxin signalling, as a modulator of actin-mediated planar polarity (6). Finally, I discuss our work on the role of a sterol/lipid-enriched polar membrane domain at the site of root hair formation in basal-to-planar polarity switching of a late planar polarity signalling component.

**Place:** **Lecture Hall, IPK Gatersleben**

**Prof. Dr. Andreas Graner**  
(organizer)

**Prof. Dr. Nico von Wirén**  
(host)

If you are interested in personal discussions with the speaker please contact the host (phone: 039482/5602) beforehand.