

IPB Seminar Series in Plant Biochemistry

The importance of barriers in a functional relationship

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Casparian strips (CS) need no introduction in this meeting. Due to members of this community, we have gained a tremendous insight into the CS barrier system and how it functions. However, most of this comes from the model *Arabidopsis thaliana* and we lack deeper insights into the CS in other species - especially the nodule-forming, nitrogen-fixing legumes where the initiation of these specialized bacteria-hosting organs occur in the CS-containing root zone. With basis on this, we focused on the symbiosis model *Lotus japonicus* and identified mutants without CS. Combined, our findings reveal a surprising role for the CS in root-shoot communication of N-status which is essential for correct nodule establishment. Moreover, in these mutants, the forming nodules are devoid of vascular-associated CS, which creates an intriguing model to study the role of the CS in controlling metabolic exchange between the plant host and the associated bacteria. Through correlative meta transcript- and metabolomic imaging we were able to study how the homeostasis of nodule-residing bacterioids is affected when to-and-from flow of photo assimilates, nutrients and fixed-N is unrestricted. Taken together, our work establishes a novel toolbox for the study of symbiotic relationships and emphasizes the importance of barriers in spatially restricted plant-microbe associations.

Host: Debora Gasperini, Jasmonate signalling group, MSV, IPB, tel. 1230