How modifications of intercellular and/or intracellular sugar transport via SWEET transporters impact plant growth and development? Authors

Beate Hoffmann, Françoise Vilaine, Catherine Bellini, Sylvie Dinant, Rozenn Le Hir

▶ **To cite this version:**

Beate Hoffmann, Françoise Vilaine, Catherine Bellini, Sylvie Dinant, Rozenn Le Hir. How modifications of intercellular and/or intracellular sugar transport via SWEET transporters impact plant growth and development? Authors. Workshop sugar allocation in plants, Oct 2021, Versailles, France. hal-03580550

HAL Id: hal-03580550
https://hal.inrae.fr/hal-03580550

Submitted on 18 Feb 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

How modifications of intercellular and/or intracellular sugar transport via SWEET transporters impact plant growth and development?

Authors

Beate Hoffmann, Françoise Vilaine[1], Catherine Bellini[1,2], Sylvie Dinant[1] and Rozenn Le Hir[1]

Affiliations

[1]Institut Jean-Pierre Bourgin, INRAE, AgroParisTech, Université Paris-Saclay, 78000 Versailles, France.

[2]Umeå Plant Science Centre, Department of Plant Physiology, Umeå University, 90187 Umeå, Sweden

Abstract

In plant cells, sugars fulfill various functions since they are the main building blocks for carbohydrate storage and polysaccharides synthesis, serve as signaling molecules and protective compounds during abiotic stress responses. The intercellular and intracellular sugar transport is therefore critical to mediate the long-distance sugar allocation but also to modulate the distribution of sugars at a tissular, cellular and subcellular scale. Therefore, studying the impact of sugar transport modifications can provide new strategies to improve biomass production, yield and plant responses to environmental changes. Among the various families of sugar transporters, we are interested in going deeper into the role of SWEET transporters in plant growth and development. SWEET transporters, the latest sugar transporter family identified, facilitate the movement of soluble sugars along the concentration gradient mainly at the plasma membrane or at the tonoplast. By using a multiscale approach (from whole plant to cell level) on *Arabidopsis thaliana*, we functionally characterized several members of the SWEET transporter family and show that they are important for the vascular system development and the secondary cell wall formation. Additionally, our work shed new light on the central role of vascular parenchyma cells in these processes and highlight how important it is for the plant to finely regulate intercellular and/or intracellular sugar transport to assure an appropriate growth and adaptation to a changing environment.