ENERGETIC HOMEOSTASIS AND SUGAR SIGNALING: DIVERSIFICATION OF THEMOLECULAR MECHANISMS INVOLVED IN THE CONTROL OF THE ENERGETIC BALANCE IN ANGIOSPERMS

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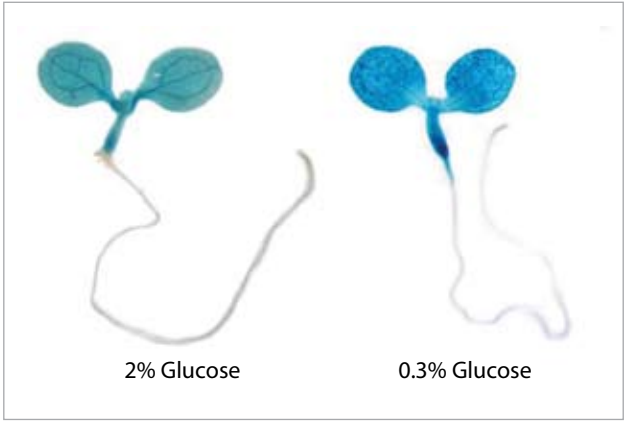
To optimize their growth and development, plants, as sessile organisms, have developed a range of efficient mechanisms to sense and respond adequately to ever changing environmental conditions. The production of sugar through photosynthesis primarily relies on light accessibility.

These photosynthetic-derived sugars represent important signals, which, in combination with developmental and environmental cues, such as mineral nutrition, water availability or pathogens attacks, influence the use of energy resources to ensure survival and propagation. Interaction between developmental, hormonal and sugar regulatory signals is deeply involved in growth control and ultimately in biomass production. The molecular mechanisms responsible for the cross talk between these different signaling pathways and their diversification in plants still need to be further elucidated to better understand plant growth patterns and biomass production. Overall, the present proposal aims at unraveling new mechanistic aspects of sugar signal transduction in plants. More specifically, we intend to: 1) define the diversification of glucose and sucrose-induced gene expression programs among angiosperms (sugarcane, rice and Arabidopsis); 2) evaluate and describe glucose-mediated mRNA stability; 3) characterize the function of bZIP transcription factors mediating glucose-related processes; 4) provide new insight into mannose signaling. We anticipate that the data will improve our view of sugar signaling and energy homeostasis control in plants and the results will be integrated into databases that could feed projects related to biomass and bioenergy research.



Transgenic Arabidopsis thaliana *plants expressing* AtbZIP63 *promoter:* gusA *fusion was generated and GUS expression in seedlings grown in 2% and 0.3% glucose show differential levels of GUS activity*

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