Yibing Hu, J Biotechnol Biomater 2017, 7:5 (Suppl)
DOI: 10.4172/2155-952X-C1-083

Sugar apoplastic transport in rice caryopsis during grain filling

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Using β-glucoronidase (GUS) and Green Fluorescent Protein (GFP) represented expression, CRISPR-associated gene editing, cross-fertilization and determination of sugar related physiological parameters in gene mutant lines and wild type plants, we aimed to investigate the function of sugar transporter OsSWEETs and OsSUTs in rice caryopsis development during grain filling. Currently, we demonstrated that OsSWEET11 play an essential role in sucrose release from maternal tissue to the maternal–filial interface. It might also induce sucrose release from the ovular vascular trace and cross cells of developing caryopsis. In addition, OsSWEET15, a homolog of OsSWEET11 in rice SWEET family, also play an important part in grain filling besides its prominent role in pollen development of rice. By contrast, the sucrose-proton symporters OsSUT1/2 which locate at the plasma membrane of cells adjacent to that of SWEETs located assume influx of sucrose from the apoplast in the caryopsis. It implies that SWEET and SUT together undertake efflux and influx of sucrose across the plasma membranes when the sugar traverses apoplastic space in developing caryopsis. These findings will hopefully elucidate the molecular mechanism of post-phloem sugar transport in rice caryopsis and facilitate the improvement of rice yield and quality by adjusting these gene's expression in the future.

Biography

Yibing Hu completed his Ph.D. in 2007, from Institute of Botany, Chinese Academy of Sciences. He is an associate professor of Nanjing Agricultural University with more than 20 papers in related journals.

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