Plant Pathology Seminar Series

"Quest for SnRK2 substrates in ABA signaling"

presented by

Taishi Umezawa

Associate Professor

Graduate School of Bio-Applications and Systems Engineering (BASE)

Tokyo University of Agriculture and Technology, Japan

Abscisic acid (ABA) is a phytohormone that is critical for stress responses or seed development. The major ABA signaling pathway consists of three core components; receptor, protein phosphatase (PP2C) and protein kinase (SnRK2), indicating the importance of phosphosignaling in this pathway. Recently, we are trying to investigate ABA-dependent phosphosignaling pathways by several experimental approaches. The one is phosphoproteomics, which has successfully identified a lot of phosphoproteins in Arabidopsis, including a number of potential SnRK2 substrates. Among them, SnRK2 substrate 1 (SNS1) is phosphorylated by SnRK2, and it negatively regulates seed germination of Arabidopsis. Now we are applying a phosphoproteomic approach to some other plants, for example Physcomitrella patens or barley, to consider evolutionary conserved parts of ABA signaling components in land plants. The other experiment is a protein-protein interaction (PPI) analysis. We are using a high-throughput PPI screening system based on in vitro translation and Alphascreen technology. This helps us to confirm SnRK2 substrates predicted from phosphoproteomic data, and also to identify novel SnRK2-interacting proteins. Recently we also identified a novel SnRK2-interacting protein which negatively regulates ABA responses. Those results suggested that our approaches bring some new insights of ABA signaling in plants.

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