

Signaling of Leucine-Rich-Repeat Receptor-Like Kinases in Higher Plants

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Abstract : Membrane localized Leucine-Rich-Repeat Receptor-Like Kinases (LRR-RLKs) play crucial roles in plant growth and abiotic/biotic stress responses in higher plants including Arabidopsis and Brassica species. Among several Receptor-Like Kinases (RLKs), Leucine-Rich-Repeat Receptor-Like-Kinases (LRR-RLKs) are the major group of genes that play crucial roles related to growth, development and stress conditions in plant system. Since it is involved in several functional roles, it seems to be very important to investigate their roles in higher plants. We are particularly interested in brassinosteroid (BR) signaling, which is mediated by the BRASSINOSTEROID INSENSITIVE 1 (BRI1) receptor kinase and its co-receptor, BRI1-ASSOCIATED KINASE 1 (BAK1). Autophosphorylation of receptor kinases is recognized to be an important process in activation of signaling in higher plants. Although the plant receptors are generally classified as Ser/Thr protein kinases, many other receptor kinases including BRI1 and BAK1 are shown to autophosphorylate on Tyr residues in addition to Ser/Thr. As an interesting result, we determined that several 14-3-3 regulatory proteins bind to BRI1-CD and are phosphorylated by several receptor kinases in vitro, suggesting that BRI1 is critical for diverse signaling.

Keywords : autophosphorylation, brassinosteroid, BRASSINOSTEROID INSENSITIVE 1, BRI1-ASSOCIATED KINASE 1, Leucine-Rich-Repeat Receptor-Like Kinases (LRR-RLKs)

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