INTERACTION OF BRASSINOSTROIDS AND ETHYLENE IN INHIBITORY GROWTH OF ARABIDOPSIS ROOTS

Chan Ho Park*, A-Ram Kim, Seung Hyun Son, Seong-Ki Kim

Department of Life Science, Chung-Ang University, Seoul 156-756, Korea

ABSTRACT

Exogenous applied brassinosteroids (BRs) or ethylene showed inhibitory growth of Arabidopsis roots. Application of BRs activated ethylene production in the Arabidopsis roots. AVG or Co applied with BRs exhibited activation of root growth than that induced by only BRs. Application of BRs with AVG showed shorter roots than that induced by application of AVG alone. Application of BRs with Co showed no difference in root growth compared to application of Co alone. These suggest that the BR-induced inhibition of Arabidopsis root growth is mediated by ethylene production, especially conversion of ACC to ethylene. In fact, an ACC oxidase in Arabidopsis, AtACO1, showed up-regulated expression in Arabidopsis roots by application of BRs. In addition, transcript level of AtACO1 was increased in the roots of bes1-D, a dominant mutant of BRs transcription factor. Further, electrophoretic mobility shift assay (EMSA) exhibited that one of the BR transcription factor, BES1, binds two of four E-boxes in promoter region of AtACO1, demonstrating that a BR signaling for inhibitory growth of Arabidopsis roots is mediated by ethylene production, especially up-regulation of AtACO1. It suggests that AtACO1 is the firstly identified meaningful target protein in BES1-mediated BR signaling. In this presentation, more details about molecular evidence for involvement of AtACO1 in BR signaling pathway of root growth in Arabidopsis are discussed.