ABSTRACT

"Establishment of a method for comprehensive plant hormone analysis by LC-MS/MS"

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Current studies revealed that the hormonal regulations were not always independent or parallel but rather often synergistic or antagonistic. In order to better understand their interactive networks, we have developed a method for plant hormone analysis by using a liquid chromatography-tandem mass spectrometry (LC-MS/MS). Our objective is to establish a method for quantitative analysis of as many hormones and related metabolites as possible. A difficulty in this method is mainly depending on their low concentrations in plants. Because co-migrating impurities suppress ionization of target compounds, it is necessary to establish a simple but effective purification method before analysis by LC-MS/MS. We will report our current status of hormone analysis. Auxin-related compounds we analyze are indole-3-acetic acid (IAA), indole-3-aldoxime, indole-3-acetaldehyde, indole-3-acetamide and IAA-amino acid conjugates. Cytokinins are *trans*-zeatin, N^6-(Δ^2-isopentenyl)adenine, dihydrozeatin and their 3 ribosides. Abscisic acid (ABA) and its metabolites are phaseic acid (PA), dihidro-PA, 7'-OH-ABA, neo-PA and ABA-glycosyl ester (internal standards were kindly provided by Dr. Suzanne Abrams). Gibberellins are GA_1, GA_4 and other 12 GAs involved in GA_1 and GA_4 biosynthesis and metabolism. Jasmonic acid (JA) and precursors are OPDA, OPC:8 and metabolites including JA-Ile and 12-OH-JA. Salicylic acid has been analyzed relatively easily. Brassinosteroids are still difficult to analyze for now, and we can only detect castasterone. We will report our current results of Arabidopsis dry seeds, seedlings, leaves, roots and flowers. Minimum amount of plant materials we need were depending on concentrations of hormones. Usually we need approximately 250 mg fresh weight of plant materials for general hormone analysis. We can also extend the method we established for Arabidopsis to other plants.