Chemistry of Molecular Biocatalysts Lab.
Institute for Chemical Research, Kyoto University

Research Information

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Research Field

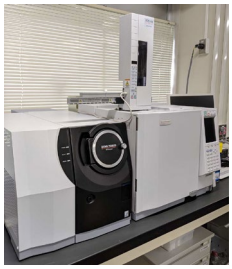
Plant hormones are a group of small molecules that regulate growth, development and environmental responses in plants. We have been studying how plant hormones are synthesized and act in plants by chemical, biochemical and biological approaches. We are also looking for new hormone-like compounds in plants using mutants that show developmental phenotypes.

Research Facility

Plant hormone levels in plant tissues are extremely low. It is necessary to analyze plant hormones using a highly sensitive and selective method such as LC-MS/MS and GC-MS/MS.

LC-MS/MS

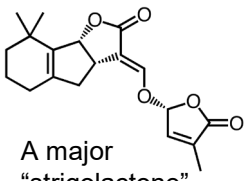
GC-MS/MS



Research Activities

1) On-going research: We have previously discovered a new class of plant hormones, strigolactones, which regulate shoot branching. We are currently studying the biosynthesis and perception mechanisms of strigolactones.
2) International collaboration: Gibberellins are a group of growth-promoting hormones. We have been studying their deactivation mechanisms using tall mutants of rice as an international collaboration.

Wild type Strigolactone biosynthesis mutant



A major "strigolactone" in rice

Comments

Plant hormones are closely related to agriculture. For example, mutants defective in the biosynthesis or signaling of gibberellins have contributed to the Green Revolution in the 1960s. Understanding the molecular mechanisms of plant hormone actions has a potential to improve crop productivities.

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