

言語 / 英語 Language/English

# Damage-associated signals boost plant innate immunity



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東京農工大学 府中キャンパス 第一講義棟 18 教室

Room 18, Lecture Hall 1 for Faculty of Agriculture, Fuchu Campus, TUAT

Plants are continuously exposed to various stresses caused by changes in the environment and attacks by other organisms. Therefore, plants require sophisticated surveillance systems to detect potentially life-threatening events as danger signals. There are >600 plant receptor kinases, some of which recognize enemy-derived non-self-molecules (i.e., MAMP and HAMP) and endogenous molecules from own damaged cells and tissues as danger signals, referred to as damage-associated molecular patterns (DAMPs). Plants sense these molecular patterns to evoke immune responses and damage healing. Our research focuses on the signal function of DAMPs, especially extracellular ATP, in plant defense mechanisms against pathogen and insect attacks. ATP, the universal energy currency, is maintained at a high concentration (~mM) intracellularly. Once ATP is released into the extracellular space following cellular damage, it acts as a danger signal for damaged-self recognition. Although a growing body of circumstantial evidence indicates a role in plant defense against pathogens, mechanisms of extracellular ATP signaling are largely unknown. Our recent omics studies provided new insights into the extracellular ATP signaling in plants. In addition, genetic analysis using mutants and overexpression lines showed that the extracellular ATP receptor P2K1 plays an important role for the plant wound response, supporting our hypothesis that ATP acts as a danger signal in a recognition system of self-damage in plants. I will also present the potential use of DAMPs as a novel class of plant protective bio-pesticides, using non-food transgenic delivery systems, which could be deployed on farmer-preferred cultivars.

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