

Checkmate: How plant protein Feronia protects against bacterial attackers

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Manipulating the expression of the Feronia protein leads to noticeable changes in the growth of *Arabidopsis* plants. ISU researchers have shown how Feronia also interacts with the plant's disease response. Credit: Trevor Nolan

Plant scientists at Iowa State University have shed new light on a genetic pathway that influences both plant growth and disease resistance, making it a promising target for breeding new crop varieties that can fight pathogens without sacrificing performance.

The research, published this week in the peer-reviewed academic journal *Current Biology*, details how the protein Feronia works in the model plant *Arabidopsis* to promote growth and to confer [disease resistance](#) in the presence of bacterial pathogens.

A game of chess inside a plant cell

The research focuses on Feronia, a receptor kinase protein found in plant cells that previous research has shown to have a hand in plant growth and stress response processes.

When [plants](#) are attacked by bacterial pathogens, a substance called coronatine, produced in the pathogens, utilizes the jasmonic acid system inside the plant cells to suppress the plant's disease response.

"The pathogen-produced coronatine tells the plant to disarm the plant's defense system," said Hongqing Guo, an assistant scientist in genetics, development and cell biology, and first author of the study. "That makes the plant more susceptible to disease."

But the ISU research shows Feronia can detect the pathogen's attempts to hijack the [jasmonic acid](#) system and diminish a protein called MYC2 to fight off the disease. The researchers said it's a little bit like a game of chess playing out inside the cells of the host plant. The [bacterial pathogen](#) tries to trick the plant, but the Feronia protein can see through the ploy and counteract the pathogen.

Yanhai Yin, professor and chair of genetics, development and cell biology and corresponding author of the paper, said the positive association Feronia shares with growth and disease response means it has great potential to be targeted by plant breeders who want to develop crops that can withstand disease without sacrificing growth. Yin said growth and disease resistance are often thought of as competing factors that plant breeders must balance.

"If we can understand this signaling pathway better, we can manipulate plants to promote growth and disease immunity at the same time," Yin said.

More information: Hongqing Guo et al. FERONIA Receptor Kinase

Contributes to Plant Immunity by Suppressing Jasmonic Acid Signaling in *Arabidopsis thaliana*, *Current Biology* (2018). [DOI: 10.1016/j.cub.2018.07.078](https://doi.org/10.1016/j.cub.2018.07.078)

Provided by Iowa State University

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