

How can plants stay in this world while their pathogens can evolve much faster?the properties, dynamics, and evolution of the plant immune signaling network"

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Department of Plant and Microbial Biology, University of Minnesota June 24, 2025 14:00-15:30 Room8 at Lecture building in Agricultural department



Abstract:

Plants survive in a world where their pathogens can evolve much faster but plants don't play fair when the odds are against them. Instead, plants hide and shift the evolutionary goals of their pathogens. In terms of network properties, the plant immune signaling network is built with multiple backup mechanisms that effectively obscure its core functions, making it harder for pathogens to target. In terms of dynamics, plants can activate immune responses ahead of pathogen spread—although many pathogens appear to have already figured this out. While a one-geneversus-one-gene race would be a losing battle, plants coordinate the evolution of homologous but not-too-similar genes to constantly move the goalposts for their enemies. In some cases, plants have evolved entirely new ways to synthesize a key immune hormone. It is fortunate for us humans that plants have evolved such creative strategies to stay in this world so that we can enjoy them (in many ways!).

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