NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

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Hosted by A/P Chew Fook Tim

"Zig-Zag-Zig"

: Arms Race of Plant-Microbe Interplay via differential modifications of a host protein



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Complex mechanisms govern detection of microbes by two functionally interconnected tiers plant immune system receptors. Equally complex mechanisms evolved by pathogens suppress detection. RIN4, a small plasma membrane-tethered protein, negatively regulates responses to microbe-associated molecular patterns (MAMPs)-triggered immunity (MTI). These responses are de-repressed upon perception of the well-studied flagellin peptide MAMP, flg22. We demonstrate that flg22-dependent accumulation of serine 141 phosphorylation of RIN4 (RIN4 pS141) mediates de-repression of several immune system outputs in MTI. RIN4 is targeted by at least four bacterial pathogen type III effector proteins, delivered temporally after flagellin perception. One of these, AvrB, acts with a host kinase to increase levels of threonine 166 phosphorylation on RIN4 (RIN4 pT166). We demonstrate that RIN4 pT166 is epistatic to RIN4 pS141. Thus, AvrB contributes to virulence by enhancing 're-repression' of immune system outputs. Our results explain the evolution of independent effectors that antagonize accumulation of RIN4 pS141, and of a specific plant intracellular NLR protein, RPM1, that is activated by AvrB-mediated accumulation of RIN4 pT166.

A DBS Search Candidate

Artwork by Ann Nee, DBS, NUS