

**The Plasminogen-Apple-Nematode (PAN) domain is a key negative regulator of Jasmonic Acid and Ethylene-mediated defense responses in plants.**

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**Project goals: This project seeks to elucidate the molecular basis of negative host defense regulation during establishment of host-microbe interactions in the genus *Salix***

Negative regulation of Jasmonic Acid and Ethylene mediated defense responses by G-LecRLKs in plants during host-cell invasion by microbes has been reported in *Populus* during infection with the fungal pathogen *Sphaerulina musiva*<sup>1</sup>, parasitism of *Arabidopsis* by nematodes<sup>2</sup>, and engineering of *Arabidopsis* into a host of the fungal symbiont *Laccaria bicolor*<sup>3</sup>. G-LecRLKs are the only Plasminogen-Apple-Nematode (PAN) domain carrying proteins in the plant kingdom and have been reported to mediate self-incompatibility during pollination as well<sup>4</sup>. Across eukaryotes, immunosuppression is an essential biological phenomenon for gamete fertilization, cell growth and proliferation during organismal development. Here, we propose that the PAN domain, comprised of a core of highly conserved amino acid residues, is a unifying feature that is found in association with proteins involved in immunosuppression across highly divergent organisms. We present biochemical and molecular genetic evidence that mutating conserved amino acid residues restores defense signaling in both *Arabidopsis* and tobacco overexpressing *Salix*-derived G-LecRLKs.

## References:

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**Acknowledgement:** This research was supported by the United States Department of Energy’s Office of Science Early Career Research Program under the Biological and Environmental Research office.