

IPB Seminar Series in Plant Biochemistry

From Structure to Evolution: Deciphering the Role of an Oxidoreductase in Systemic Acquired Resistance

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*Plant-microbe interactions and systems biology in plant immunity
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Thursday 20th of February, 2025, at 4 p.m.

Kurt Mothes Hall, Leibniz Institute of Plant Biochemistry

Summary: Systemic Acquired Resistance (SAR) represents a crucial aspect of plant innate immunity, offering broad-spectrum, long-lasting defense against a multitude of pathogens. Crucial for enhancing crop resilience and sustainability in agriculture, SAR minimizes reliance on chemical pesticides and contributes to environmental protection. Our study focuses on the role of an oxidoreductase enzyme in the pipercolic acid biosynthesis pathway, a key component of SAR in vascular plants. Through structural analysis, we contrast the specialized substrate specificity of plant-specific SARD4 oxidoreductases with the broader functionality of non-plant orthologs. Our comparative genomics approach uncovers novel genetic markers potentially indicative of plant speciation. Additionally, molecular dynamics used for enzyme-substrate interaction analysis identify essential catalytic sites, opening avenues for molecular engineering aimed at strengthening plant defenses. These insights offer new perspectives on the molecular mechanisms of SAR, with significant implications for advancing plant disease resistance.

Host:

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