Biology Seminar

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What's bugging plants? Pest recognition by plant cell surface receptors

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The plant immune system recognizes pests and pathogens and activates inducible defense responses. Our lab aims to understand how plants detect and respond to different classes of attackers, and how plants recognize the huge breadth of potential threats through a limited number of receptor-encoding genes. Our lens on immune recognition is to study the large set of several hundred receptor kinases, which can specifically bind diverse pest-associated molecular patterns (PAMPs). I will discuss our progress on three questions in plant immune receptor biology: 1) How does immune recognition contribute to defenses, especially against chewing herbivores such as caterpillars? 2) How do immune receptors transduce extracellular ligand binding to intracellular signaling? 3) How do receptors evolve new recognition specificities? We use genetic, biochemical, and comparative genomic approaches in both crop and model plant systems to address each of these questions. Our long-term goal is the ability to predict a given plant's resistance profile from its immune receptor repertoire, and to translate insights into sustainable agricultural protection.