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Deciphering the bacterial initiation of plant innate immunity

The role of technology in deciphering the mechanisms of plant innate immunity and how that led to new adventures. Steven W Hutcheson, Department of Cell Biology and Molecular Genetics, University of Maryland, College Park, MD 20742. This all began with two simple questions: at the molecular level, what enables a pathogen to parasitize a susceptible plant host and what restricts the host range of that pathogen to that susceptible host? Working with cultured plant cell suspensions and several *Pseudomonas syringae* pathovars, we determined there were no simple answers to these questions. Through a genetic approach, colleagues and I were able to clone and sequence a gene cluster that ultimately was determined to be a Type III protein secretion system (TTSS). This discovery modified our original hypothesis to injected protein elicitors for which we showed to be AVR proteins and developed several approaches to finding the genes for these in strains of *P. syringae*. This work provided explanations for how *P. syringae* strains evolved and the commonalities in how many plant and mammalian pathogens cause disease. We were also able to define the components of the regulatory system controlling the expression of the TTSS and explain many of the phenomena associated with the development and expression of the TTSS. These successes opened up new directions for the laboratory examining the mechanisms for how an obscure bacterium degraded nearly all biopolymers through unique mechanisms and a commercial adventure.

Biography

Steven Hutcheson received his PhD from the UC Berkeley in 1982 and did his postdoctoral research with Dr T Kosuge at UC Davis on IAA production by a *P. syringae* strain. He joined the University of Maryland College Park in 1984 where he is now Professor of Microbiology in the Dept. of Cell Biology and Molecular Genetics. In addition to his many professional activities in plant pathology, he has been an invited speaker at numerous international conferences on molecular plant-microbe interactions. His research publications in this field and related topics have garnered in excess of 4700 citations.

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