Neish Young Investigator Awardee

Clare Casteel completed her M.S. in entomology at the University of California - Riverside and her Ph.D. in plant biology at the University of Illinois. Since 2014 she has been an assistant professor in the Department of Plant Pathology at the University of California in Davis. Her research addressed the function of microbes in plant-insect interactions using genetic and biochemical approaches. Her current focus is on plant signaling and defenses in response to insect vectors and the pathogens they transmit. Concerned with the practical application of biology and ecology, she has examined impacts of global climate change, soil management and invasive pathosystems on natural and agricultural ecosystems. In addition to her research, she is devoted to teaching and interested in fostering science literacy. She has taught courses in introductory biology, entomology, plant pathology and global disease biology.

[S7-5] The role of vector-borne viruses in altering host plant defenses

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Plants employ diverse responses to defend themselves against pathogens and herbivores. Previously, we demonstrated that infection with *Turnip mosaic virus*, a member of one of the largest families of plant-infecting viruses, increases vector attraction and reproduction on infected hosts through changes in plant chemistry. These changes were due to the expression of a single viral protein, NIa-Pro. Here, we show that NIa-Pro reversibly responds to the presence of the aphid vector during infection, relocalizing from the nucleus to the vacuole. Importantly, relocalization is required for NIa-Pro's ability to increase aphid reproduction on host plants and this phenomenon occurs for other potyviruses. Taken together, these results suggest that the virus must somehow "recognize" the presence of the vector and respond actively, promoting insect performance and transmission only when needed, a phenomenon that has not been previously demonstrated for any animal or plant virus.