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Academic interests: Plant defenses against herbivory, with an emphasis on mechanisms of resistance against vascular feeders such as aphids and root-knot nematodes.
Research Focus & Techniques of Expertise: Broadly speaking, my research focuses on the molecular and physiological basis of host plant resistance to herbivores, including insects and nematodes. One goal of my work is to facilitate the use of host plant resistance for pest management in order to reduce our dependence on pesticides. This approach addresses public safety concerns about pesticide residues on foods. In addition, my work on antioxidants explores the interplay between host plant resistance and food quality. Specifically, we are exploring how traits that enhance insect resistance influence plants' antioxidant content, and conversely, how value-added traits that enhance antioxidant content influence plants' level of susceptibility to herbivores. My laboratory utilizes virus-induced gene silencing to manipulate gene expression in tomato, and real-time RT-PCR to quantify transcript abundance. We maintain live cultures of the potato aphid (*Macrosiphum euphorbiae*) and root-knot nematodes (*Meloidogyne javanica*), and conduct bioassays to assess aphid and nematode survival and reproduction. We also have experience with microarray analysis and a variety of spectrophotometric assays for antioxidant analysis. As part of the P3 program, we will acquire a direct-current electropenetration graph (DC-EPG) system for monitoring aphid feeding behavior, and we will also be utilizing gas chromatography-mass spectrometry for oxylipin profiling.

Grants

Grant P3-110: Role of Oxylipins in Plant Defenses against Aphids.
PI: **Fioana Goggin ; Co-PI**: Robyn Hannigan

Grant P3-105: Intersection of Ascorbate Regulation, Jasmonate –Signaling, and Defense against Herbivory in Plants.
Co-PI's: Fioana Goggin, Argelia Lorence