

Statement of anticipated involvement in Botany and Plant Sciences

I am a new Assistant Professor in the Department of Bioengineering at the University of California, Riverside. My lab research program focuses on understanding host-microbe interactions, particularly cnidarian-algal symbiosis, utilizing interdisciplinary approaches such as mutagenesis screens, molecular and cell biology, biochemical, genetics, genomics, metabolomics, proteomics, bioinformatics, and engineering in our work. Our research aligns well with the research interests of groups in the Department of Botany and Plant Sciences.

My laboratory discovers and engineers the biology and metabolism of organismal interactions using forward genetics, functional genomics, and systems biology tools.

Increased knowledge about the biology of these organisms may allow us to engineer strategies to stem coral bleaching, control disastrous red tides, and engineer host-microbe relationships. My lab's research focuses on three thrusts:

(1) Elucidating molecular and cellular mechanisms governing host-microbe interactions with a focus on coral-dinoflagellate symbiosis. This research area is highly relevant to the research groups including Drs. Katayoon Dehesh, Hailing Jin, Joel Sachs, Jason Stajich, Paul Nability, Robert Jinkerson, and Linda Walling.

(2) Elucidating cellular mechanisms of symbiont proliferation by using accessory pigment mutants. This area will be highly collaborative with the research group of Drs. Julia Bailey-Serres, Jaimie Van Norman, Carolyn Rasmussen, and Sean Cutler.

(3) Uncovering secondary metabolite (carotenoids, toxins, chlorophyll) biosynthetic pathways in dinoflagellates using high-throughput genetic screens, biochemistry, metabolomics, and computational analysis. We will develop strong collaborations with the groups including Drs. Adam Jozwiak, David Nelson, Thomas A Girke, and Zhenyu Jia.

(4) Understanding toxin biosynthesis in red-tide dinoflagellates. This area will be highly collaborative with the research groups including Drs. Adam Jozwiak and David Nelson.

A cooperating faculty member in the Department of Botany & Plant Sciences would be mutually beneficial in many ways:

1. I will bring a unique research program that is timely and very engaging to graduate and undergraduate students due to the current global crisis of coral bleaching.
2. I will bring unique perspectives on host and microbe relationships that range from mutualistic to pathogenic interactions.
3. Our research will benefit from the diverse expertise in the Department of Botany & Plant Sciences as detailed above.

Taken together, the appointment of a cooperating faculty member in the Department of Botany & Plant Sciences will create a productive environment among departments, help amplify innovation and broaden the horizons of research endeavors. The fusion of varied perspectives could catalyze new collaborations between researchers with broad expertise.