



From Competition to Cooperation: Evolutionary Drivers of Squid-Vibrio Specificity

Michele K. Nishiguchi, Ph.D.

Professor

Department of Molecular and Cell Biology, UC Merced

Abstract: The mutualistic association between sepiolid squids (Mollusca: Cephalopoda) and their *Vibrio* symbionts is an experimentally tractable model to study the evolution of animal-bacterial associations through both wild-caught and experimentally evolved populations. Since *Vibrio* bacteria are environmentally transmitted to new hosts with every generation, it provides a unique opportunity to resolve how changing environmental conditions may effect bacterial infection, colonization, and persistence in different host species. *Vibrio* bacteria encounter potentially conflicting selective pressures, competing with one another to colonize the sepiolid light organ, but also vying for resources in the environment outside the squid. Both abiotic and biotic factors contribute to the fitness of individual strains of *Vibrio* bacteria, but which of these factors are amenable to adaptation and eventually lead to a successful beneficial association has yet to be elucidated. This seminar will cover how environmental conditions and host specificity lead to the development of symbiotically adapted *Vibrio* bacteria, generating new ideas on the evolution of beneficial associations.

Bio: Dr. Michele “Nish” Nishiguchi is presently a Professor in the Department of Molecular and Cell Biology, Co-Director of the established NSF Biological Integration Institute INSITE: Institute for Symbiotic Interactions, Training and Education in the Face of a Changing Climate, Co-Director for the undergraduate training program URISE@UC Merced, Director of UC Merced COSMOS STEM summer school, and is President and one of the co-PIs for the Society for Integrative and Comparative Biology BIO-LEAPs IDEA (Inclusivity, Diversity, Equity, and Access) program. She was the UC Merced SNS Associate Dean for Equity, Justice and Inclusive Excellence, New Mexico State Regents professor, the Sundt Honors College Endowed Chair, and Academic Department Head (2016-20) in the Department of Biology at New Mexico State University. She obtained her B.S. in Biochemistry/Theatre Arts at the University of California, Davis, M.S. in Marine Biology at Scripps Institution of Oceanography, University of California, San Diego, and Ph.D. in Biology at the University of California, Santa Cruz. She focuses her work on the evolutionary ecology between marine organisms and their symbiotic bacteria. Despite being a marine biologist in the middle of the Central Valley, Nish manages to chase after squid and their bioluminescent bacteria in places such as the Indo-West Pacific, Australia, and the Mediterranean Sea, and manages to eat some calamari along the way. Her work spans the bridge between microbial ecology and evolution, and is best known for deciphering the mechanisms for environmental transmission of beneficial bacteria that occur in animal hosts. She has been passionate about reaching out to students in the US Southwest and now Central California by introducing them to marine biology and microbial ecology. She has trained over 200 students, many from underrepresented groups and continues her commitment to increasing diversity through research, teaching, service, and outreach. Her hobbies include marathons/ultras, ironman triathlons, ballroom dancing, and cooking/eating.

Hosted by: Prof. Alon Gorodetsky