Cory Jon Krediet Curriculum Vitae

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Research Interests

My primary research interests lie in host-microbe interactions and specifically how mutualistic or commensal microbiota influence the host's response to various abiotic and biotic stressors. These types of interactions are present in a wide array of systems ranging from humans and other vertebrates, to invertebrates and to plants. My current research focuses on a cnidarian-dinoflagellate symbiosis. Specifically, my research aims to identify differentially expressed genes in the host in response to thermal- and/or light-stress, which leads to a breakdown of the symbiosis. To do this, I am using the model sea anemone, *Aiptasia pallida*.

Appointments

Postdoctoral Scholar, Department of Genetics, Stanford University 2012
Adviser: John R. Pringle

Education

Ph.D., Interdisciplinary Ecology, University of Florida, Gainesville, FL, USA 2012
Adviser: Max Teplitski
Ph.D. project: Resilience in the coral holobiont: dynamic interactions between coral commensal bacteria and opportunistic pathogens

M.Sc., Interdisciplinary Ecology, University of Florida, Gainesville, FL, USA 2008
Adviser: Max Teplitski
Title: Inter-kingdom signaling and characterization of a coral white pox pathogen, *Serratia marcescens*.

B.A., Biology and German, Drew University, Madison, NJ 2006
Title: Growth/mortality trade-offs along a depth gradient in the Jonah crab, *Cancer borealis*
Summa cum laude and Specialized Honors in Biology

Awards and Recognitions

UF/IFAS Jimmy G. Cheek Graduate Student Medal of Excellence Award (2012)
UF-Howard Hughes Medical Institute (HHMI) Science for Life Graduate Student Award (2012)
UF Soil and Water Science Research Symposium-Best Graduate Oral Presentation (2011)
UF Marine Biology Symposium-Best Graduate Oral Presentation (2011)
NSF EAPSI Australia Fellowship (2010)
Best Thesis in Interdisciplinary Ecology, University of Florida (2009)
UF-SNRE Alumni Award (2008-2011)
National Science Foundation Graduate Fellowship, Honorable Mention (2007)
Drew University Anna Barofsky Prize in Biology (2006)
Beta Beta Beta Brooks Award for Oral Presentation (2006)
Unsung Hero Award, Morristown Memorial Hospital (2005)
Delta Phi Alpha German Linguistics Honor Society Leadership Scholarship (2005)
Presidential Scholarship, Drew University (2002-2006)

Grant Support

UF/IFAS Davidson Travel Grant PI (Krediet) 07/2012-10/2012
Resilience of the coral holobiont: dynamic interactions between commensal bacteria and opportunistic pathogens.
Role: PI

Protect Our Reefs Grant PI (Teplitski) 06/2011-05/2012
Efficacy of three formulations of beneficial coral-associated bacteria for the control of coral pathogens
Role: Co-PI

NSF EAPSI-Australia Fellowship PI (Krediet) 06/2010-08/2010
Use of stable fluorescent-tagged *Vibrio coralliilyticus* strains to investigate bacterial-coral host interactions and coral disease infection process
Role: PI

UF/IFAS Travel Grant PI (Krediet) 02/2010-05/2010
Colonization and attachment behaviors of pathogenic and commensal bacteria in a coral surface mucus layer
Role: PI

Protect Our Reefs Grant PI (Teplitski) 08/2009-07/2010
Feasibility of using probiotics to control bacterial diseases in corals
Role: Co-PI

Protect Our Reefs Grant PI (Teplitski) 08/2008-07/2009
Investigating the potential of native coral bacteria to prevent white pox disease
Role: Co-PI

UF/IFAS Travel Grant PI (Krediet) 03/2008-07/2008
Bacterial quorum sending signals and settlement of coral larvae
Role: PI

UF/SNRE Travel Grant PI (Krediet) 03/2008-07/2008
Phenotypic characterization of a coral white pox pathogen
Role: PI

National Geographic Society #8207-7 PI (Teplitski) 08/2006-07/2009
Master manipulators: corals may protect themselves by recruiting bacteria that inhibit quorum sensing in pathogens
Role: Co-PI

Publication List:

Peer-Reviewed Publications

1. **Krediet, C. J.**, Ritchie, K. B., Teplitski, M. 2012. Coral-associated microorganisms and their roles in promoting coral health and thwarting diseases. *Proc Roy Soc B* (*in review*).

2. **Krediet, C. J.**, Ritchie, K. B., Teplitski, M. 2012. Contribution of *gacA* to the regulation of biofilm formation and swarming motility in an opportunistic coral pathogen *Serratia marcescens* PDL100. *FEMS Microbiol* (*in review*)
3. **Krediet, C. J.**, Alagely, A., Ritchie, K. B., Teplitski, M. 2012. Members of native coral microbiota thwart colonization of coral mucus by an opportunistic pathogen. *ISME J* (*in review*).
4. **Krediet, C. J.**, Zaragoza, W. J., Alagely, A., Ritchie, K. B., Teplitski, M. 2012**.** *Aiptasia pallida*: a surrogate model polyp susceptible to infection by coral opportunistic pathogens. *Appl Environ Microbiol* (*in review*).
5. Alagely, A., **Krediet, C. J.**, Ritchie, K. B., Teplitski, M. 2011. Signaling-mediated cross-talk modulates swarming and biofilm formation in a coral pathogen *Serratia marcescens*. The *ISME J* 5: 1609-1620.
6. Rajamani, S., Teplitski, M., Kumar, A., **Krediet, C. J.**, Sayre, R. T., Bauer, W. D. 2011. AHL lactonase (AiiA) inactivation of quorum sensing agonists produced by *Chlamydomonas reinhardtii* (Chlorophyta) and characterization of aiiA transgenic algae. *J Phycology*. 47(6): 1219-1227.
7. Gauthier, J. D., Jones, M. K., Thiaville, P., Joseph, J. L., Swain, R. A., **Krediet, C. J.**, Gulig, P. A., Teplitski, M. A., Wright, A. C. 2010. Role of GacA in virulence of *Vibrio vulnificus*. *Microbiology*. 156: 3722-3733.
8. **Krediet, C. J.**, Ritchie, K. B., Cohen, M., Al-Agely, A., Lipp, E., Sutherland, K., Teplitski, M. 2009. Utilization of mucus from the coral *Acropora palmata* by environmental and pathogenic isolates of *Serratia marcescens*. *Appl Environ Microbiol*. 75: 3851-3858.
9. **Krediet, C. J.**, Ritchie, K. B., Teplitski, M. 2009. Catabolite control in a coral white pox pathogen, *Serratia marcescens* PDL100. *Dis Aquat Org*. 87: 57-66.
10. **Krediet, C. J.** and Donahue, M. J. 2009. Growth-mortality trade-offs along a depth gradient in *Cancer borealis*. *J Exp Mar Biol Ecol* 373: 133-139.
11. Donahue, M. J., Nichols, A., Santamaria, C. League-Pike, P. E., **Krediet, C. J.**, Perez, K. O. and Shulman, M. J. 2009. Predation risk, prey abundance and the vertical distribution of three brachyuran crabs at the intertidal-subtidal boundary in the Gulf of Maine. *J Crust Biol* 29(4): 536-543.

Book Chapters

1. Cox, C. E., Zaragoza, W. J., **Krediet, C. J.**, Teplitski, M. 2011. Bioassays for the detection of compounds that disrupt biofilm formation in γ-proteobacteria. *in* Biofouling Methods. Ed. Dobretsov, S. Wiley-Blackwell, New York. 416 pages.

Non-Referred Publications

1. **Krediet, C. J.** 2012. Resilience of the coral holobiont: dynamic interactions between commensal bacteria and opportunistic pathogens. University of Florida Ph.D. Thesis.
2. **Krediet, C. J.** 2011. "Life Lessons Learned while Working with Undergraduate Researchers." *Myakka*: Soil and Water Science Newsletter. Vol. 11 No. 13. Fall 2011. UF/IFAS.
3. **Krediet, C. J.**, Ritchie, K. B., Teplitski, M. 2010. The importance and status of Florida coral reefs: questions and answers. Florida Cooperative Extension Service Electronic Data Information Source (EDIS)-UF/IFAS SL 305/SS518 http://edis.ifas.ufl.edu/ss518
4. **Krediet, C. J.** 2010. Coral Reefs: Biology and Value. EcoLearnIt RLO#50. Available at: http://EcoLearnIT.ifas.ufl.edu/viewer.asp?rlo_id=366&final_id=50.
5. **Krediet, C. J.** 2010. Coral Reefs: Coral Decline and Disease. EcoLearnIt RLO#51. Available at: http://EcoLearnIT.ifas.ufl.edu/viewer.asp?rlo_id=380&final_id=51.

6. **Krediet, C. J.**, Ritchie, K. B., Alagely, A., Teplitski, M. 2010. Coral Reefs: Quorum Sensing. EcoLearnIt RLO#52. Available at: http://EcoLearnIT.ifas.ufl.edu/viewer.asp?rlo_id=381&final_id=52
7. **Krediet, C. J.** 2008. Inter-kingdom signaling and characterization of a coral white pox pathogen, *Serratia marcescens*. University of Florida M.Sc. Thesis.
8. **Krediet, C. J.** 2006. Physical and biological tradeoffs along a depth gradient in *Cancer borealis*. Drew University. B.A. Thesis.

First Author Research Presentations (in chronological order)

1. "Physical and biological trade-offs exhibited by the Jonah crab, *Cancer borealis*" Drew University Summer Internship Poster Session, Madison, NJ, 2005.
2. "Physical and biological trade-offs along a depth gradient in *Cancer borealis*." Tri-Beta National Biological Honor Society Regional Conference, York, PA, 2006.
3. "Growth-mortality trade-offs in *Cancer borealis*." Ecological Society of America Regional Conference, Branchburg, NJ, 2006.
4. "Carbon-source utilization by a coral white pox pathogen, *Serratia marcescens*." University of Florida Soil and Water Science Research Symposium, 2007.
5. "Bacterial quorum sensing signals and settlement of coral larvae." 11th International Coral Reef Symposium, Ft. Lauderdale, FL, 7-11 July 2008.
6. "Phenotypic characterization of a coral white pox pathogen, *Serratia marcescens*." 11th International Coral Reef Symposium, Ft. Lauderdale, FL, 7-11 July 2008.
7. "Phenotypic characterization of a coral white pox pathogen, *Serratia marcescens*." University of Florida Soil and Water Science Research Symposium, 2008.
8. "Catabolite control in a coral white pox pathogen, *Serratia marcescens*." FL/SE Joint Annual Branch Meeting of the American Society for Microbiology, Jacksonville, FL 6-8 November 2008.
9. "Utilization of mucus by a coral pathogen and commensals." 1st Annual University of Florida Marine Symposium, The Whitney Laboratory, St. Augustine, FL, 29-30 January 2009.
10. "Coral reef microbiology: Bacteria are talking, who is listening." *Invited presentation*. The Pingry School Guest Lecture Series in the Sciences. The Pingry School, Martinsville, NJ, 7-8 May 2009.
11. "Bacterial quorum sensing signaling and enhancement of coral settlement and recruitment." 10th Annual University of Florida Soil and Water Science Research Symposium, 2009.
12. "Utilization and attachment to coral mucus by a coral white pox pathogen." FL Annual Branch Meeting of the American Society for Microbiology, Islamorada, FL 10-12 October 2009.
13. "Colonization and attachment behaviors of pathogenic and commensal bacteria in a coral surface mucus layer." 110th General Meeting of the American Society for Microbiology, San Diego, CA 23-27 May 2010.
14. "Using GFP-tagged strains of *Vibrio coralliilyticus* to study coral-microbe dynamics." *Invited presentation*. Understanding Marine Microbes and Symbioses Team Seminar. Australian Institute of Marine Science (AIMS), Townsville, Queensland, Australia, 02 August 2010.
15. "The coral holobiont: dynamic interactions in a tripartite symbiosis." 3rd Annual University of Florida Marine Biology Symposium, The Whitney Laboratory, St. Augustine, FL, 27-28 January 2011.
16. "Dynamic interactions between commensal bacteria and opportunistic pathogens of the coral holobiont." 12th Annual Soil and Water Science Research Forum, University of Florida, Gainesville, FL, 09 September 2011.
17. "Coral Reef Biodiversity and Microbiology." *Invited presentation.* Honors Seminar: Global Environmental Issues (UF-IDH3931). University of Florida, Gainesville, FL, 22 September 2011.

18. "Coral commensal bacteria modulate swarming and mucus utilization in *Serratia marcescens*." 97th Annual Southeastern Branch American Society for Microbiology Meeting, University of Florida, Gainesville, FL, 20-22 October 2011.
19. "Resilience of the coral holobiont: dynamic interactions between commensal bacteria and opportunistic pathogens." 12th International Coral Reef Symposium, Cairns, Queensland, Australia, 09-13 July 2012.

Research Experience

Research Fellow-NSF EAPSI-Australia-Australian Institute of Marine Science (2010)

The objective of this study is to use stable fluorescent-tagged *Vibrio coralliilyticus* strains to investigate bacterial-coral host interactions and coral disease infection processes. Tracing the strains through the infection process may elucidate novel targets for coral disease management. Mentor: David Bourne

Graduate Alumni Fellow, University of Florida (2008-2012)

The goal of this project is to identify and characterize genes involved in the colonization and infection of a coral host by a white pox pathogen, *Serratia marcescens*. I tested the hypothesis that a specific suite of genes (including metabolic and virulence genes) is expressed differentially during colonization and infection of the coral host. These genes may serve as targets for control and management of coral diseases.

Graduate Research Assistant, University of Florida, School of Natural Resources and Environment, Interdisciplinary Ecology Program (2006-2008)

The characterization of a coral white pox pathogen, *Serratia marcescens* revealed that the pathogen specifically induces catabolic and other enzymes during colonization of coral mucus as compared to other isolates of *S. marcescens* and coral commensal bacteria.

Field Research

Caribbean Coral Reef Spawning (2006-2011)

Summer collection of either gametes from broadcasting spawning species (*Acropora palmata* and *Montastraea faveolata*) or planula larvae from brooding corals (*Porites asteroides*) from Looe Key in the Florida Keys National Marine Sanctuary and tested subsequent coral settlement and metamorphosis in response to chemical or bacterial biofilm cues. I also tested virulence of coral pathogens (*Serratia marcescens* and *Vibrio coralliilyticus*) on competent coral larvae.

Stream Sampling Project to assess water quality of the Great Swamp Watershed in New Jersey (2006)

Used macro-invertebrate larvae distribution and abundance to assess water quality in ten streams in central New Jersey in collaboration with the Great Swamp Watershed Association. Data gathered on overall water quality compared to standards were added to the larger long-term data set to help policy makers manage the water system that supplies 1.2 million New Jersey residents with drinking water.

Intertidal Ecology-Shoals Marine Laboratory-NSF Research Experience for Undergraduates (2005)

Investigated biological and physical tradeoffs by the Jonah Crab, *Cancer borealis*. Field studies demonstrated that the crabs undergo growth/mortality trade-offs in order to benefit from increased food reserves while risking great mortality due to gull predation in the intertidal zone of the rocky shores in the Gulf of Maine. These results were published in the Journal of Experimental Marine Biology and Ecology and the Journal of Crustacean Biology

Reef Conservation in the Northern Red Sea, Drew University (2004)

Studied the cultural and environmental effects of coastal development for tourism in the northern Red Sea. Met with environmental experts in Cairo and local businesses and tourists so as to make recommendations for future development of the region.

Teaching Experience

Teaching Assistant-Drew University-Biol 6 (Animals) & Biol9 (Plants) (2005-2006)

Drew University teaching assistant for freshman Biology laboratory, assisting students with questions, setting up and maintaining labs

Teaching Assistant-University of Florida-SWS4307/5308: Ecology of Waterborne Pathogens (2008-2012)

Guest lectures included: pathogens in social and historical contexts; environmental pathogens; microbial sample collection; microscopic techniques; nucleic acids techniques; marine diseases; environments where microbes survive: soil, water and air; global climate change and infectious diseases; urban microbiology; microbes and bioterrorism; drinking water disinfection and treatment.

Adjunct Lecturer-Drew University-Biol 183 Marine Ecology: Tropical Habitats (2008, 2010, 2012)

Field Tropical Marine Ecology course in Belize taught every two years. Ten to fifteen students participated in this course. As an adjunct lecturer my responsibilities included lecturing about coral reef environments and coral diseases as well as preparing and leading field activities. I designed an experiment to survey abundance and diversity of bacteria from the water column and associated with corals. The results demonstrated that there are more microbes associated with corals (both in terms of abundance and diversity of colony morphology) as compared to open water environments. Students led independent projects investigating seagrass primary productivity, schooling behavior of reef fishes, cleaning station behavior reef fishes, and damselfish territoriality. I applied for and received collection permits from the Department of Fisheries in Belize to collect coral mucus to study the bacterial communities associated with healthy and diseased colonies.

Instructor-University of Florida-SWS4307/5308: Ecology of Waterborne Pathogens Distance Education (DE) Section (2011 and 2012)

As the instructor for this distance education section, I was responsible for the development of the course including all lectures, assignments, and exams. Lectures were narrated and audio recorded using AdobePresenter and were posted on the UF e-Learning Sakai website (http://lss.att.ufl.edu). Seven to ten students (undergraduate and graduate) were registered in this section.

Student Mentoring

Jennifer Kizza (2007)—middle school student investigating chemical influence on coliform loads in freshwater systems

Emily Norman (2006)—middle school student investigating fecal coliform loads in fresh water systems

Amanda Vaughn (2008-2009) -- propagation and maintenance of a lab stock of sea anemones, *Aiptasia* sp.

Ali Alagely (2006-2011)—As an undergraduate student, Ali conducted independent research projects focused on quorum sensing in coral-associated bacterial isolates. Ali's research proposal was selected for UF CALS University Scholars (2006). He presented a poster at 2010 General Meeting of American Society for Microbiology (ASM), an oral presentation at the 2009 Annual Meeting of ASM, Florida Branch. Ali also earned a paid UF-PMCB Summer Internship. Ali's results have been published in The ISME Journal (April 2011). Ali is currently pursuing an MD/PhD degree at Scripps Florida/FAU.

Beck Frydenborg (2009-2011) – As an undergraduate student conducting independent research

following an REU internship at Mote Marine Laboratory, Beck focused on interactions between coral commensal bacteria and pathogenic bacteria on a coral model system, *Aiptasia* sp. Beck tested the hypothesis that coral commensal bacteria have inhibitory activities against invading pathogens. He investigated bacterial growth and enzyme induction during growth on coral mucus and found temperature dependence to the make-up of the microbial population associated with the surface of the coral. During his time in our lab, Beck received a undergraduate fellowship through the American Society for Microbiology and presented his work in poster form at the national meeting of ASM in New Orleans in June 2011 and as an oral presentation at the Florida Branch meeting in October 2011. Beck is currently pursuing a MSc degree at the University of Georgia College of Marine Science.

Nicholas Gimbrone (2011-2012) – As an undergraduate student, Nicholas looked at the role of motility in the ability of *Serratia marcescens* PDL100 to colonize and infect coral surfaces.

Jasmine Meinke (2011-2012) – As an undergraduate student, Jasmine investigated the role of the abundant polymer, chitin for virulence in coral pathogens. Specifically, she studied *Serratia marcescens* PDL100 and *Vibrio coralliilyticus*.

Memberships to Professional Societies

International Society for Microbial Ecology (ISME)-since 2012
Gamma Sigma Delta Honor Society of Agriculture (UF)-since 2010
American Association for the Advancement of Science (AAAS)- since 2009
American Society for Microbiology (national)- since 2008
American Society for Microbiology (FL branch)- since 2008
International Society for Reef Studies- since 2007
Phi Beta Kappa National Honor Society- since 2005
Beta Beta Beta Biological Honor Society at Drew University- since 2003
Chapter President 2005-2006
Chapter Treasurer 2004-2005
Delta Phi Alpha German Linguistics Honor Society: Iota Phi Chapter- since 2003

References

Dr. John Pringle, Stanford University, 650.723.8523, jpringle@stanford.edu
Dr. Max Teplitski, University of Florida, 352.273.8189, maxtep@ufl.edu
Dr. Kim Ritchie, Mote Marine Laboratory, 941.388.4441 x 353, ritchie@mote.org