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I. Education

- 2011 Ph. D., Ecology and Evolution. Rutgers, the State University of New Jersey, New Brunswick, NJ
Advisors: Dr. Tamar Barkay and Dr. John Dighton
Dissertation title: "Mercury Effects on Axenically Grown Fungal Isolates and on *Pinus rigida* and its Ectomycorrhizal Community"
- 1994 B.A. Ed., Secondary Education (second major in English Literature). Rider University, Lawrenceville, NJ

II. Teaching

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| 02/2016 – present | Teaching Instructor, Department of Biochemistry and Microbiology, Rutgers University |
| 2014 – present | Adjunct Instructor, Department of Biology, The College of New Jersey |
| 2011 – 2016 | Summer Faculty, Department of Biochemistry and Microbiology, Rutgers University |
| 2012 – 2016 | Adjunct Assistant Professor, Department of Biology, Rider University |
| 2011 – 2015 | Part-Time Lecturer, Department of Biochemistry and Microbiology, Rutgers University |
| 2009 – 2011 | Adjunct Instructor, Department of Biology, Rider University |
| 2009 – 2010 | Teaching Assistant, Department of Biochemistry and Microbiology, Rutgers University |
| 2007 – 2008 | Summer Teaching Assistant, Department of Biochemistry and Microbiology, Rutgers University |
| 2005 – 2008 | Teaching Assistant, Department of Biochemistry and Microbiology, Rutgers University |

Courses Taught at Rutgers University

As Instructor / Lecturer

Introductory Biochemistry Lab (11:115:313; Spring 2012 and Spring 2016 – present)

Responsible for coordination of 5 sections of this course, and a majority of the teaching in most sections. Responsible for weekly lectures on experimental methods in biochemistry. Provide guidance as students work through laboratory exercises designed to facilitate their understanding of biochemistry laboratory applications, including spectrophotometric analysis of biological macromolecules, buffer formulation, and protein, identification and concentration determination.

Contemporary Issues in Biochemistry (11:115:201; Spring 2016 – present)

Introduce students to important concepts in research including reading scientific literature, and data collection and analysis. Schedule guest speakers to meet the students and discuss current research in biochemistry at Rutgers, as well as other topics including ethics in research and research opportunities for undergraduates. Coordinate and evaluate student presentations on topics of their choosing.

General Microbiology (11:680:390 lecture; Summer Session 2011 – 2016)

Responsible for one-half of a lecture course designed to introduce life science majors to major concepts in microbiology. Topics include evolutionary, metabolic and functional diversity of microorganisms and the use of microorganisms in bioremediation and biotechnology.

General Microbiology (11:680:390 lab; Spring Semester 2015)

Responsible for oversight of lab operations for 8 sections of this course. Provided instructional support and training for laboratory teaching assistants. Maintained cultures required for laboratory activities. Organized lab equipment and supplies.

Marvelous Microbes (11:015:429; Spring Semester 2013 – 2015)

Facilitated discussion of advanced topics in microbiology among students with varying academic expertise. Topics include microbial ecology, industrial microbiology, food microbiology, microbial genetics, and the Human Microbiome Project.

Biochemical Communications (11:115:491; Spring Semester 2014)

Responsible for guiding students in the composition of various types of research and professional communications. Activities include oral presentation of review material, oral presentation of original research, research poster composition and the written manuscript.

Scientific Conduct and Ethics (16:682:530; Fall Semester 2012)

Co-taught a seminar course designed to introduce first-year graduate students in microbiology to the ethical issues and decisions they might face as they progress in their academic careers. Topics included plagiarism, fraud, communication with media and the public, and dual use research.

Ethics in Biochemistry Research (11:115:321; Fall Semester 2011 and Spring Semester 2012)

Facilitated (in-class and online) group discussions of ethical considerations in research. Students are encouraged to suggest reading materials and discussion topics. Topics include scientific misconduct, the use of animals and humans in biochemistry experiments, pharmaceutical trials, genetic engineering, and stem cell research.

As Teaching Assistant

Nucleotide Sequence Analysis (11:126:383; Fall Semester 2009 and Spring Semester 2010)

Provided instructional support and graded final papers for a computer lab class focused on the use of computer software (e.g., BLAST, Chromas, Lasergene) to analyze and interpret nucleotide and amino acid sequences

General Microbiology (11:680:390 lab; Fall Semester 2005, 2007 – 2008 and Summer 2007 – 2008)

Introduced students to a wide variety of techniques used in microbiological research including media preparation, microscopy, dilution plating, the use of selective media, gel electrophoresis and spectrophotometry.

Applied Microbiology (11:680:494 lab; Spring Semester 2006 – 2007)

Guided students in strengthening skills learned in General Microbiology Lab. Assisted students in learning new techniques used in fermentation, immunological detection, water analysis, food microbiology and identification of microorganisms based on fatty acid profiles.

Microbial Diversity Lab (11:680:492; Spring Semester 2006)

Guided students in the design and execution of projects using molecular techniques such as PCR, DGGE, cloning and subsequent DNA sequencing to investigate bacterial communities.

Courses Taught at The College of New Jersey

Inquiries in the Life Sciences (Fall 2014 – 2017, Summer 2015 and Spring 2017, lecture/lab)

Responsible for teaching a course designed to introduce Education majors to biology and the scientific method. Topics include molecular biology, evolution, biodiversity and ecology.

Principles of Microbiology (Spring 2014 – 2016, lecture/lab)

Responsible for a course designed to introduce nursing students to microbiology with a focus on infectious disease. Topics include microbial genetics, bacteriology, virology, immunology, and infectious diseases of various body systems.

Courses Taught at Rider University

Principles of Biology: Evolution, Diversity, and Biology of Plants (Spring 2010 and 2016, lab)

Delivered weekly laboratory lectures and guided students through laboratory activities associated with concepts covered in Plant Biology lecture course. Topics included anatomy and reproduction, transpiration, photosynthesis and evolutionary diversity of plants. Assisted students with independent group project design, implementation and data analysis.

Principles of Biology: Evolution, Diversity, and Biology of Animals (Fall 2009 – 2011 and 2015, lab)

Delivered weekly laboratory lectures and guided students in designing and executing experiments. Topics included chemical communication, natural selection, reproductive fitness, agonistic behavior, and community diversity. Collaborated with students in visual summary and statistical analysis of data.

Biostatistics (Spring 2011 – 2013, Fall 2012, lecture/lab)

Designed and implemented the initial offering of this course, which is intended to introduce students to data visualization and statistics (both descriptive and inferential). Topics include appropriate choice of graph, the meaningful use of error bars, basic probability theory, and the statistical analysis of data using both confidence intervals and null hypothesis testing. In the computer lab setting, students use Excel to graph their data and SPSS to conduct hypothesis tests.

Principles of Biology: Evolution, Diversity, and Biology of Animals (Summer 2010, lecture)

Developed lecture material intended to introduce prospective Biology majors to the life sciences through the lens of animal biology. Topics included Darwinian evolution, comparative anatomy and physiology of the major animal groups, endocrinology and ecology. Weekly “Journal Club” was held during which students facilitated discussions based on readings of primary literature.

Life Science: Ecobotanical Focus (Spring 2010, lecture)

Developed lecture material intended to introduce nonmajors to the life sciences through the lens of plant diversity and ecology. Topics included the evolution of photosynthesis, the major oxygenation event and its relation to the diversity of life, the endosymbiont theory, plant diversity in various biomes, and the ecology of invasive species.

Undergraduate Students Mentored at Rutgers

Nisa Mohammed: Student researcher (2016-2017)

Mackenzie Purdy: Student Researcher (2016-2017)

Juan Villegas: Bridges to Baccalaureate Participant (Summer 2016)

Mariusz Kocur: Student Researcher (2014-2015)

Jenifar Patel: Student Researcher (2013 – 2014)

Kathleen Bongco: Student Researcher (2013 – 2014)

Lara Agnew: Summer Research Volunteer (2013)

Valeria Tirado: Work-Study Student (2012-2013)

Josh Roden: Independent project on mercury-resistant, halophilic prokaryotes (2012)

Michael Husar: Independent project on mercury-tolerant, saprophytic fungi (2009 – 2010)

Michele Mensing: Partners in Science Participant (2009)

Nataliya Parobchak: Research Volunteer (2009)

Adriano Jorge: Cooperative Education Student (2008 – 2009)

Justin Crane: Student Researcher (2005, 2006)

III. Research

2011 – 2016 Occasional Technical Staff, Department of Biochemistry and Microbiology, Rutgers University

2011 – 2012 Visiting Scholar, Department of Biochemistry and Microbiology, Rutgers University

2008 – 2009 Graduate Assistant, Department of Biochemistry and Microbiology, Rutgers University

2002 – 2005 Graduate Assistant, Institute of Marine and Coastal Sciences, Rutgers University

2001 – 2002 Student Research Assistant, Department of Biology, Rider University

Current Project

Endophytes of *Physalis ixocarpa* (tomatillo). In collaboration with James F. White.

Publications

Crane, S., M. Husar, J. Patel, J. Dighton and T. Barkay. Mercury-tolerant *Aspergillus cervinus* and *Umbelopsis* sp. isolated from forest soil. In preparation for *Fungal Biology*.

Cabral, L., R-Q Yu, **S. Crane**, P. Giovanella, T. Barkay and F. A. O. Camargo. 2016. Methylmercury degradation by *Pseudomonas putida* V1. *Ecotoxicology and Environmental Safety* 130: 37-42.

Santos-Gandelman, J. F., K. Cruz, **S. Crane**, G. Muricy, M. Giambiagi-deMarval, T. Barkay and M. S. Laport. 2014. Potential application in mercury bioremediation of a marine sponge-isolated *Bacillus cereus* strain Pj1. *Current Microbiology* 69(3): 374-380.

Crane, S., T. Barkay and J. Dighton. 2012. The effect of mercury on the establishment of *Pinus rigida* seedlings and the development of their ectomycorrhizal communities. *Fungal Ecology* 5(2): 245-251.

Wang, Y., E. Boyd, **S. Crane**, P. Lu-Irving, D. Krabbenhoft, S. King, J. Dighton, G. Geesy and T. Barkay. 2011. Environmental conditions constrain the distribution and diversity of Archaeal merA in Yellowstone National Park, Wyoming, U.S.A. *Microbial Ecology* 62(4): 739-752.

Crane, S., J. Dighton and T. Barkay. 2010. Growth responses to and accumulation of mercury by ectomycorrhizal fungi. *Fungal Biology* 114(10): 873-880.

Ni Chadhain, S. M., J. K. Schaefer, **S. Crane**, G. J. Zylstra and T. Barkay. 2006. Analysis of mercuric reductase (merA) gene diversity in anaerobic mercury-contaminated sediment enrichment. *Environmental Microbiology* 8(10): 1746-1752.

Bidle, K., W. Amadio, P. Oliveira, T. Paulish, **S. Hicks** and C. Earnest. 2005. A phylogenetic analysis of haloarchaea found in a solar saltern. *Bios* 76(2): 89-96.

Conference and Symposium Presentations (as first author and/or presenter)

Crane, S. L. "The Peer Review Experience": increasing student awareness of the review process and improving term paper quality (Informal talk). American Society for Microbiology Conference for Undergraduate Educators, Danvers, Massachusetts. May 15-18, 2014.

Crane, S., M. Husar, J. Dighton and T. Barkay. The response of saprotrophic fungi from forest soils to mercury: tolerance and community diversity (Poster). The 10th International Conference on Mercury as a Global Pollutant, Halifax, Nova Scotia, Canada. July 24-29, 2011.

Dighton, J., **S. Crane** and D. Gray. Fungal succession on and decomposition of *Lymantria dispar* (Gypsy Moth) frass (Poster). The 109th Annual General Meeting of the American Society for Microbiology, Philadelphia, Pennsylvania. May 17-21, 2009.

Crane, S., T. Barkay and J. Dighton. Growth responses to and accumulation of mercury by ectomycorrhizal fungi (Poster). The 107th Annual General Meeting of the American Society for Microbiology, Toronto, Ontario, Canada. May 21-25, 2007.

Crane, S., J. Dighton and T. Barkay. Effects of mercury on *Pinus rigida* and its ectomycorrhizal community (Talk).

- Mid-Atlantic States Mycology Conference, Beltsville, Maryland. April 21, 2007
- Penn-Princeton-Rutgers Ecology and Evolutionary Biology Symposium, Philadelphia, Pennsylvania. April 4, 2009
- Rutgers-Wageningen Joint Graduate Student Microbiology Symposium, New Brunswick, New Jersey. April 20, 2009

Crane, S., J. Dighton and T. Barkay. Growth responses to and accumulation of mercury by ectomycorrhizal fungi (Poster – *preliminary results*). Annual Meeting of the British Mycological Society, Birmingham, United Kingdom. September 4-7, 2006.

Crane, S., J. Dighton and T. Barkay. Effects of mercury on ectomycorrhizal fungi (Poster). The 8th International Conference on Mercury as a Global Pollutant. Madison, Wisconsin. August 11-16, 2006.

Ni Chadhain, S. M., J. Schaefer, **S. Hicks,** T. Barkay and G. J. Zylstra. Novel mercuric reductase genes found in anaerobic communities of mercury contaminated sediments (Poster). Northeast Microbiologists: Physiology, Ecology and Taxonomy, Blue Mountain Lake, New York. June 25-27, 2004.

Other Research Presentations

Boyd, J., **S. Crane,** K. Dunn, A. Fassih, W.-H. Li, D. Miksa, J. Villegas and M. D. Southall. Utilization of 440-nm blue light to target *Propionibacterium acnes* for treating acne vulgaris (poster). Annual meeting of the American Academy of Dermatology. Orlando, Florida. March 3-7, 2017.

Crane, S., T. Barkay and J. Dighton. The effect of two precultivation methods on the response of *Pinus rigida* to mercury (Talk). Biochemistry and Microbiology Departmental Seminar, Rutgers University. September 18, 2009.

Crane, S., T. Barkay and J. Dighton. Fun with *Cenococcum geophilum* (Talk). Ecology and Evolution Graduate Student Seminar, Rutgers University. April 14, 2006.

IV. Honors and Awards

2016	Rutgers Instructional Computing Fund (\$17,137.55 for Biochemistry and Microbiology Teaching Laboratories: co-awardees Ines Rauschenbach and Natalya Voloshchuk)
2014	Rutgers PTL Professional Development Fund Award (\$799 for conference registration and travel)
2013	Rutgers PTL Professional Development Fund Award (\$699 for conference registration)
2009	Ralph Good Award for Pinelands Research
2009	Theobald Smith Society Graduate Scholarship (\$1000)
2008 – 2010	Rutgers Carnegie Academy for the Scholarship of Teaching and Learning (CASTL)
2007	American Society for Microbiology Student Travel Grant (\$300)
2006	New Jersey Mycological Association Ray Fatto Scholarship (\$1000)

V. Professional Affiliations

Academic Societies (current memberships)

- American Society for Microbiology
- Theobald Smith Society - New Jersey Branch of ASM

Student Organizations (former memberships)

- Rutgers Student ASM (Founding member; Vice President, 2008 – 2010)
- Rutgers Ecology and Evolution Graduate Student Association (Treasurer, 2003-2005)