

Taylor K. S. Richter

EDUCATION

Postdoctoral Traineeship *Oct 2014-present*

Institute for Genome Sciences, University of Maryland School of Medicine, Baltimore, MD

Advisor: Dr. David Rasko

Project focus: Bioinformatic analyses of the impacts of diarrhea-causing pathogens on the human gut microbiome

Ph.D. in Marine Biology *May 2014*

Scripps Institution of Oceanography, UC San Diego, La Jolla, CA

Advisor: Dr. Bradley Moore

Dissertation: Discovery, biosynthesis, and evolutionary history of sioxanthin, a novel carotenoid from marine bacteria

M.S. in Biology *June 2008*

University of California, San Diego, La Jolla, CA

Advisor: Dr. Doug Bartlett

Thesis: Genome analysis of high-pressure adaptation in deep sea bacteria

B.S. General Biology *June 2006*

University of California, San Diego, La Jolla, CA

Study abroad: University of Tasmania, Hobart, Australia

RESEARCH EXPERIENCE

Postdoctoral Research *Oct 2014- present*

- Genomic analyses of commensal and pathogenic *E. coli* in the human gut before, during, and after infection with Enterotoxigenic *E. coli* (ETEC)
- Metagenomic and metatranscriptomic investigations of the human gut before and during ETEC and *V. cholerae* infection and after antibiotic treatment
- Analysis of dynamics and diversity of commensal *E. coli* in the gastrointestinal tract of children in Tanzania

Doctoral Research *Sept 2008-May 2014*

- Isolation, purification, and structure elucidation of a novel carotenoid from marine bacteria
- Bioinformatics, genetic mutations, and chemical analyses to determine genomic arrangement of secondary metabolite biosynthetic pathways
- Phylogenetics to understand the evolutionary history of a novel carotenoid compound
- Imaging mass spectrometry to investigate the impact of genetic mutation and biological challenges on the activation of silent secondary metabolic pathways

Masters Research *March 2006-June 2008*

- Genome sequence closure and annotation of several deep sea bacterial genomes
- Analysis of protein sequences of known pressure sensitive proteins to deduce patterns in piezophilic adaptation
- Development of an RNA extraction protocol for highly piezophilic bacterium *Colwellia* MT41

RESEARCH INTERESTS

- Using chemical, molecular, and sequence-based techniques to investigate microbial environmental adaptations
- Mechanisms and biological functions of microbial metabolic processes
- Microbial interactions in the environment, with other microbes, and in host systems

PUBLICATIONS

"Sioxanthin, a novel glycosylated carotenoid, reveals an unusual subclustered biosynthetic pathway" (2015) **T.K.S. Richter**, C.C. Hughes, B.S. Moore. *Environ Microbiol* 17(6):2158-2171.

"Ecotype diversity and conversion in *Photobacterium profundum* strains" (2014) F.M. Lauro, E.A. Eloe-Fadrosh, **T.K.S. Richter**, S. Ferriera, J. Johnson, D.H. Bartlett. *PLoS One* 9(5):e96953.

"Bioactivity guided genome mining reveals a lomaiviticin biosynthetic gene cluster in *Salinisporea tropica*" (2013) R.D. Kersten, A.L. Lane, M. Nett, **T.K.S. Richter**, B.M. Duggan, P.C. Dorrestein, B.S. Moore. *Chembiochem* 14(8): 955-962.

"Complete genome sequence of the deep-sea bacterium *Psychromonas* strain CNPT3". (2013) F.M. Lauro, **T.K. Stratton**, R.A. Chastain, S. Ferriera, J. Johnson, S.M.D. Goldberg, A.A. Yayanos, D.H. Bartlett. *Genome Announc* 1(3):e00304-e00313.

PRESENTATIONS

"Diversity, dynamics, and diarrhea: How ETEC infection impacts resident *E. coli*" (Jun 2016). **T.K.S. Richter**, J.M. Michalski, J.B. Kaper, W.H. Chen, and D.A. Rasko. Oral presentation to the *PATH Vaccines Against Shigella and ETEC Conference 2016*.

"Dynamics of *Escherichia coli* from human populations in Tanzania" (Jun 2016). **T.K.S. Richter**, T.H. Hazen, D. Lam, C.L. Coles, J.C. Seidman, Y. You, E.K. Silbergeld, C.M. Fraser, and D.A. Rasko. Poster presentation to *American Society for Microbiology Microbe 2017*.

"Diversity, dynamics, and diarrhea: How ETEC infection impacts resident *E. coli*" (Jan 2016). **T.K.S. Richter**, J.M. Michalski, J.B. Kaper, W.H. Chen, and D.A. Rasko. Poster presentation to *18th International Conference on Emerging Infectious Diseases in the Pacific Rim*.

"Discovery and biosynthesis of sioxanthin, a new glycosylated carotenoid endemic to *Salinisporea* marine bacteria" (March 2014) **T.K.S. Richter**, C.C. Hughes, and B.S. Moore. Poster presented to *Gordon Research Conference on Marine Natural Products*.

"Characterization of carotenoid biosynthesis uncovers an unusual genome arrangement in *Salinisporea*" (Dec 2011) **T.K.S. Richter** and B.S. Moore. Poster presented to *International Symposium on the Biology of Actinomycetes XVI*.

AWARDS AND GRANTS

Ruth L Kirschstein National Research Service Award June 2015-June 2016
through Jean-Pierre Raufman's T32 Research Training in Gastroenterology, University of Maryland School of Medicine

California Sea Grant Graduate Trainee Sept 2009-Sept 2012
through Brad Moore at Scripps Institution of Oceanography

UC San Diego Regent Fellowship Sept 2008-Sept 2009

NSF Graduate Research Fellowship Honorable Mention 2008

TEACHING EXPERIENCE

Practitioner level certification - Center for the Integration of Research, Teaching and Learning Network *March 2014*

Completed course through the UC San Diego Center for Teaching Development on teaching at the college level including training on effective teaching strategies, peer instruction, alternatives to lecture, and scholarly teaching

Mentor - High School AP Chemistry student *Dec 2010-March 2011*

Designed and supervised a high school student project involving the extraction, purification, and analysis of pigments in various marine bacteria

Teaching Assistant - Marine Biochemistry *Sept 2007-Dec 2007*

Collaborated with the instructors on exam development and grading, taught two weekly discussion section, performed exam reviews, held office hours and responded to student questions

Teaching Assistant - Bacteriology *Jan 2007-March 2007*

Collaborated with instructor and other TAs on exam development, grading, taught two weekly discussion sections, performed exam reviews, held office hours and responded to student questions

FIELD WORK

Research Volunteer - R/V New Horizon- Chief Scientist Mark Ohman *Nov 2011*

California Current cruise to repair deployed instruments and survey phytoplankton assemblages

Research Volunteer - R/V New Horizon - Chief Scientist Kathy Barbeau *June 2008-July 2008*

Baja California cruise examining the deep chlorophyll maximum and iron limitation

ADDITIONAL TRAINING

Internship in Science Communication University of Maryland School of Medicine *June 2015-June 2016*

Training in and discussion of communication of science to the public using diverse media, including: writing, videography, photography, website design, and social media

Communicating Science to Informal Audiences Birch Aquarium at Scripps and UC San Diego *Sept 2009-Dec 2009*

Lessons emphasized teaching science to aquarium and museum audiences and involved in developing and running activities about ocean science to aquarium visitors

International School of Astrobiology Santander, Spain *June 2009*

Summer seminar hosted by the NASA Astrobiology Institute and European Space Agency on *Earth extremophiles and the habitability of extraterrestrial environments*

Prokaryotic Annotation and Analysis Training Course The Institute for Genomic Research, Rockville, MD *April 2006*

A course on the standards and procedures for annotation of sequenced prokaryotic genomes

Open Water SCUBA Certification *Sept 2004*

LEADERSHIP EXPERIENCE

Co-chair Women and Minorities in Science *Sept 2010-Sept 2012*

Coordinated events designed to promote community among science minorities and discussion of work-life balance, alternative science careers, and mentorship

Coordinator Microbial Oceanography Journal Club *Sept 2010-Sept 2011*

Organized monthly meetings to discussed recent literature in the field of microbial oceanography

COMMUNITY SCIENCE OUTREACH

Volunteer Scripps Community Outreach Program for Education *2008-2013*

Participated in Scripps outreach efforts through providing tours of facilities to and discussing science with visiting school groups, donors, and other visiting members of the community

Awarded "SCOPE Top Volunteer" in 2010, 2011, and 2012

Volunteer Expanding Your Horizons *2008, 2013*

- Served as group leader and mentor for middle school-aged girls on a science overnight activity on the USS Midway
- Led a microbiology-based activity for groups of girls at the EYH annual conference

Volunteer Haunted Birch Aquarium *2008-2012*

Ran a series of Halloween-themed science activities for families with children from preschool to middle school age groups