

Curriculum Vitae

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Contact Information

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Overview

My research interests focus on anthropogenic perturbations of the aquatic environment and their subsequent negative impacts on the health and well being of human populations. My work addresses eutrophication of fresh, estuarine and marine waters and toxin-producing harmful algal blooms (HABs).

Education

Ph.D. in Environmental Science & Engineering, University of North Carolina at Chapel Hill, Gillings School of Global Public Health, 2012

Dissertation: *Ecophysiology and Toxicogenicity of the Harmful Algal Bloom Forming Cyanobacterium Microcystis spp.*

M.P.H. in Environmental & Occupational Health, The George Washington University, School of Public Health and Health Services, 2007

Thesis: *Is Nitrite Exposure a Health Risk in Chloraminated Drinking Water? An Investigation of Water Quality in Childcare Centers in the District of Columbia*

B.S. in Environmental Biology/Zoology, Michigan State University, 2005

B.A. in Spanish Language, Michigan State University, 2005

Awards and Honors

International Society for the Study of Harmful Algae (ISSHA) Travel Award, 2010

NSF East Asia and Pacific Summer Institutes Fellow, 2009

NSF Graduate Research Fellowship Program Honorable Mention, 2009

Research Experience

Ongoing Research:

- Involved in a partnership between UNC, UC Santa Cruz, the Nanjing Institute of Geography and Limnology Chinese Academy of Sciences (NIGLAS) and a private company (Spyglass) to design and implement microfluidic environmental sample processing (ESP) devices that can remotely sample drinking waters for harmful bacteria populations using a suite of molecular and biochemical tools. Initial deployments for pilot studies and proof of concept will take place in China, Northern California and/or North Carolina reservoirs
- Collaborating with UNC, San Francisco State University and UC Santa Cruz on a 3-yr project to assess the ecological impacts of microcystin producing cyanobacteria (specifically *Microcystis* spp.) on the pelagic organism decline occurring throughout the San Francisco Bay Delta
- Teaming up with paleontologists from Macalester University to investigate the possibility that toxic cyanobacteria in a seasonal dry land ecosystem in Madagascar poisoned a variety of animals (birds, crocodiles and dinosaurs) found in and around drying pools from the Late Cretaceous period using molecular techniques on recovered DNA from the rock substrate

Doctoral Research: University of North Carolina at Chapel Hill; Department of Environmental Sciences & Engineering (Adviser: Prof. Hans W. Paerl)

- Used quantitative molecular techniques and DNA sequencing to characterize the toxin-producing phytoplankton comprising annual algal blooms in hypertrophic Lake Taihu, China
- Developed a long PCR assay and shotgun cloning procedure to screen cyanobacteria capable of producing potent liver toxins (microcystins) and identify mobile genetic elements involved in gene loss/acquisition processes
- Applied biochemical and molecular assays to characterize toxic cyanobacterial blooms and conducted risk assessments on a variety of important drinking water reservoirs (St. Johns River, FL; Cape Fear River, NC, San Francisco Bay Delta, CA; Lake Taihu, China)

Masters Research: The George Washington University; Department of Environmental & Occupational Health (Adviser: Prof. Marina S. Moses)

- Interned at the DC Water and Sewer Authority's Water Quality Division, where I conducted methemoglobinemia (blue-baby syndrome) risk assessments of children exposed at childcare centers to nitrate and nitrite in their drinking water due to the city's switch to chloramine disinfectants and the potential for ammonia oxidizing bacteria to convert these compounds into harmful substances
- Collaborated on an emergency preparedness outreach project to determine the best methods to disseminate emergency information to hard-to-reach populations (e.g. non-native English speakers) in Arlington, VA

Research Interests

- The linkage between human interactions with the environment, and the reciprocal effects of these actions on public health (e.g. nutrient pollution of waterways leads to eutrophication resulting in toxin-producing algal blooms that sicken humans and animals)
- Acquisition and transfer of resistance/virulence genes across bacterial populations
- Influence of climate change on toxigenicity of bacterial populations (e.g. how do warmer temperatures or increased CO₂ concentrations impact heterotrophic bacteria and phytoplankton in aquatic systems?)

Teaching Experience

- Teaching assistant in UNC PUBH 600: Environmental Health
- Small group instructor in GWU PUBH 204: Environmental & Occupational Health
- Mentor NSF REU undergraduate students doing summer internships in our lab

Publications

Otten TG, Xu H, Qin B, Zhu G, Paerl HW. Spatiotemporal patterns and ecophysiology of toxigenic *Microcystis* blooms in Lake Taihu, China: Implications for water quality management. *Environmental Science & Technology*, in press.

Otten TG, Paerl HW. Phylogenetic inference of colony isolates comprising seasonal *Microcystis* blooms in Lake Taihu, China. *Microbial Ecology*. 2011, 62(4): 907-918.

Wang X, Qin B, Gao G, Wang Y, Tang X, **Otten TG**. Phytoplankton community from Lake Taihu, China, has dissimilar responses to inorganic and organic nutrients. *Journal of Environmental Sciences*. 2010, 22(10):1491-1499.

Moses MS, Caruso DS, **Otten TG**, Simmens S, Guidotti TL. Community ready! Assessing and meeting the needs of parents in Arlington County, VA. *Journal of Emergency Management*. 2007, 5(6):53-60.

Moses MS, Caruso DS, **Otten TG**, Guidotti TL. Public Health Training Program of School Employees – A Pilot Program. *Journal of School Health*. 2007, 77(10):649.

Presentations

Otten TG. 2011. Molecular methods for identifying toxin-producing cyanobacteria. Nanjing Institute of Geography and Limnology, Chinese Academy of Sciences. Nanjing, China. 6-3-2011.

Otten TG, Paerl HW. 2011. Bloom Dynamics and Controlling Factors of Perennial Toxin-Producing *Microcystis* Blooms in China's Lake Taihu. American Society of Limnology and Oceanography. San Juan, Puerto Rico. 2-18-2011.

Otten TG, Paerl HW. 2010. A Long PCR Assay for Improved Screening of Toxic and Non-Toxic Strains of the Bloom Forming Cyanobacterium: *Microcystis aeruginosa*. American Society for Microbiology. San Diego, CA. 5-26-2010.

Professional Memberships

American Public Health Association

American Society of Limnology and Oceanography

American Society for Microbiology

International Society for the Study of Harmful Algae

References

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