

Sarah M. Hatcher, Ph.D.

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EDUCATION

University of North Carolina at Chapel Hill

Chapel Hill, NC

Gillings School of Global Public Health

Doctor of Philosophy

August 2015

Environmental Sciences and Engineering

Dissertation title: "Environmental presence of and potential occupational exposure to antibiotic-resistant *Staphylococcus aureus* in regions of high industrial hog operation density"

Dissertation Committee: Jill Stewart (Chair), Mark Sobsey, Rebecca Fry, Melissa Miller, Chris Heaney

Institute for the Environment

Bachelor of Science in Environmental Science with Highest Honors

December 2011

Minor in Marine Sciences

Honors Thesis Title: "The Ecology of *Vibrio sp.* and *Vibrio vulnificus* in the Neuse River Estuary, North Carolina"

Honors Thesis Committee: Rachel Noble (Chair), Michael Piehler

School for International Training (SIT) Semester Abroad

Comparative Ecology and Conservation Program

Quito, Ecuador

January-May 2008

AWARDS & HONORS

Delta Omega Theta Chapter Service Award

2016

Member, Delta Omega Honorary Public Health Society – Theta Chapter

2016

UNC Graduate Education Advancement Board Impact Award

2016

Steve Wing International Environmental Justice Award

2015

American Society for Microbiology Postdoc Travel Grant

2015

National Science Foundation Graduate Research Fellowship Program

2012-2015

Ueltschi Service-Learning Course Development Grant

2012-2013

Dr. Jessie A. Satia Scholarship

2011-2012

Office of Undergraduate Research Summer Undergraduate Research Fellowship

2009

APPLES Service-Learning Community-based Research Fellowship

2009

RESEARCH EXPERIENCE

UNC-Chapel Hill Gillings School of Global Public Health

July 2015 - present

Postdoctoral Trainee, Department of Environmental Sciences and Engineering

Environmental Health Microbiology Laboratory

- Conduct research investigating the association between occupational and environmental exposure to industrial livestock operations and antibiotic-resistant *Staphylococcus aureus* nasal carriage and infection among emergency department patients
- Work with graduate students to complete Internal Review Board (IRB) approvals
- Conduct pilot research to validate swine-, poultry-, human-, and cattle-specific microbial source tracking (MST) markers in air samples and integrate this method into human exposure assessment studies
- Write grant proposals to investigate microbial drinking and surface water quality in the Galápagos Islands, Ecuador

UNC-Chapel Hill Gillings School of Global Public Health

January 2011-June 2015

Doctoral research, *Environmental Health Microbiology Laboratory*

- Partnered with the Rural Empowerment Association for Community Help (REACH) to collect nasal swabs and questionnaires from 400 adult-child household pairs
- Using epidemiologic and laboratory methods, examined the association between adult household member occupation in an industrial hog operation (IHO) and nasal carriage of livestock-adapted *S. aureus*, MRSA and MDRSA in children
- Identified and characterized waterborne antibiotic-resistant *S. aureus* collected from surface waters near IHOs in eastern NC

NSF Research Experience for Undergraduates Program

June 2010-December 2010

UNC-Chapel Hill Institute of Marine Sciences Microbial Ecology Laboratory

- Performed DNA extractions and applied quantitative PCR (qPCR) to enumerate *Vibrio vulnificus* and *Vibrio parahaemolyticus*, two autochthonous human pathogens in the Neuse River Estuary (NRE), in approximately 400 archived water samples
- Processed biweekly water samples collected from the NRE utilizing membrane filtration techniques and isolated bacterial pathogens of interest

Summer Undergraduate Research Fellowship & Community-Based Research Grant

May-August 2009

- Collaborated with the North Carolina Environmental Justice Network (NCEJN) and the Rural Empowerment Association for Community Help (REACH) to sample well water in areas of southeastern North Carolina near industrial hog operations
- Investigated the presence of nutrient and microbial well water contamination at 33 rural households and mapped the locations of wells and nearby IHOs using ESRI Geographic Information Systems (GIS) ArcMap Software
- Administered well and sewer infrastructure surveys
- Analyzed results of total and fecal coliform and nitrate tests to evaluate private well water quality

TEACHING

Workshop Co-facilitator, National Institute of Environmental Health Sciences Partnerships in Environmental & Public Health Annual Meeting: “REACHing Out: How to Improve Scientific Literacy and Risk Communication in Communities Directly Impacted by Research,” *Fall 2014*

Carolina Center for Public Service, First Year Service Corps guest speaker

- Summer reading group discussion on community-university partnerships, *Fall 2013*
- Community-university partnerships and service: discussion and tour of Rogers-Eubanks neighborhood, *Fall 2014*

Teaching Assistant, Humans and their Microbiological Footprint (ENVR 296-01S), June 2013

- Course familiarizes students with basic processes in coastal systems, with a focus on human impacts including waste disposal, onsite wastewater systems, wastewater treatment processes, and transport of microbial contaminants
- Instructed laboratory portion of the course, teaching common techniques for microbial water quality laboratory sampling, detection, data analysis, and results interpretation

Instructor, Environmental Justice and Community-based Participatory Research, Spring 2013

- Developed and taught a one credit-hour service-learning course that explored how research in the environmental sciences can address issues of environmental injustice in North Carolina

Guest lecturer, Water and Health Research. ENVR 809-005

- “Environmental justice and community-based participatory research (CBPR),” Fall 2012 & 2013
- “Community-based participatory research (CBPR): A brief introduction,” Fall 2014

Guest lecturer, Introduction to Public Health (HNRS 350) Fall 2014

- “Environment and Poverty” (2012), Fall 2012
- “Environmental justice and community-based participatory research (CBPR),” Fall 2013

MENTORING

Undergraduate students

- **Katie Overbey, B.S.** (August 2012-May 2014): completed independent research and successfully defended an undergraduate Honors Thesis, graduating with highest honors
- **Sharon Jiang** (January 2014-present): Conducted independent research on antibiotic-resistant *S. aureus* and successfully defended an undergraduate Honors Thesis, receiving highest honors
- **Daira Melendez** (January 2014-May 2015): work-study laboratory assistant

UNC Institute for the Environment: Environmental Capstone (ENST 698)

- *Developing Energy Leaders Through Action (DELTA) Graduate Intern* (January 2011-May 2011): Advised a team of undergraduates in carrying out their required capstone project

LEADERSHIP AND SERVICE

Rural Empowerment Association for Community Help (REACH)

Board of Directors Member (September 2013-present)

- Oversee decisions regarding the sustainability of the organization, including finances and personnel decisions
- Assist with networking and funding opportunities; train staff to maintain REACH website
- Work with REACH members to develop a Community Review Board for the screening and selection of proposed research projects

UNC-Chapel Hill Daniel A. Okun Chapter of Engineers Without Borders (EWB) Local Project

Member (2009-2010), *Project Leader* (February 2011 – February 2013)

- Organized a watershed assessment team that evaluated the distribution and size of over 40 illegal dumping sites in the Rogers-Eubanks historic neighborhood
- Helped plan the community’s 2nd annual trash sweep, to which over 90 volunteers attended and gathered 2,440 pounds of trash
- As an undergraduate member, served as liaison between undergraduate student groups and EWB to assist in the development and maintenance of a neighborhood community garden

PUBLICATIONS

Overbey KN, **Hatcher SM**, and Stewart JR (2015). Water quality and antibiotic resistance at beaches of the Galápagos Islands. *Front Environ Sci.* 3:64. doi:10.3389/fenvs.2015.00064.

Hatcher SM, Myers K, Heaney CD, Hall D, Larsen J, Miller MB, and Stewart JR. Multidrug- and methicillin-resistant *Staphylococcus aureus* in surface waters near industrial hog operation spray fields in North Carolina. In submission.

Hatcher SM, Rhodes S, Stewart JR, Hall D, Larsen J, Carroll K, Silbergeld E, and Heaney CD. High methicillin-resistant *Staphylococcus aureus* nasal carriage prevalence among children living with industrial hog operation workers. In submission.

PRESENTATIONS

Hatcher SM, Rhodes SM, Stewart JR, Larsen J, Jiang S, Hall D, Krosche A, Carroll K, Silbergeld E, and Heaney CD. “Prevalence of antibiotic-resistant *Staphylococcus aureus* nasal carriage among children living with industrial hog operation workers.” 4th ASM-ESCMID Conference on Methicillin-resistant Staphylococci in Animals: Veterinary and Public Health Implications. November 2-5, 2015. Chicago, IL. [Oral]

Hatcher SM and Hall D. “Livestock worker and community exposure to antibiotic-resistant bacteria in eastern North Carolina.” 17th Annual North Carolina Environmental Justice Summit. Oct 16-17, 2015. Whitakers, NC [Poster]

Hatcher SM, Rhodes SM, Heaney CD, Jiang S, Le T, Larsen J, Hall D, and Stewart JR. “Prevalence of methicillin- and multidrug-resistant *S. aureus* among children living with industrial hog operation workers in North Carolina.” Ecology and Evolution of Infectious Diseases 13th Annual Conference. May 26-29 2015. Athens, GA. [Poster]

Hatcher SM, Myers K, Heaney CD, Hall D, Wing S, Larsen J, Miller MB, and Stewart JR. “Multidrug- and methicillin-resistant *Staphylococcus aureus* in surface waters near industrial hog operation spray fields in North Carolina.” Water Microbiology Conference: Microbial contaminants from watersheds to human exposure. May 5-7 2014. Chapel Hill, NC. [Oral]

Hatcher SM, Myers K, Heaney CD, Hall D, Larsen J, Wing S, and Stewart JR. “Multidrug- and methicillin-resistant *Staphylococcus aureus* are present near industrial hog operations in North Carolina.” 3rd ASM-ESCMID Conference on Methicillin-resistant Staphylococci in Animals: Veterinary and Public Health Implications. November 4-7, 2013. Copenhagen, Denmark [Poster]

Hatcher SM, Myers K, Hall D, Heaney CD, Wing S, and Stewart JR. “Microbial water quality assessment near industrial swine operations in North Carolina.” Water and Health Conference: Science, Policy, and Innovation. October 30-Nov 1, 2012. Chapel Hill, NC. [Poster]

Hatcher SM, Prevette E, Heaney CD, Wade T, and Stewart JR. “Multidrug-resistant *Staphylococcus* sp. isolated from sand at a tropical beach and a beach impacted by non-point source pollution.” American Society for Microbiology General Meeting. June 16-19, 2012. San Francisco, CA. [Poster]

Hatcher SM, Binder E, Blackwood AD, Conn KE, Helmy T, Oliver JD, and Noble RT. “The interplay of estuarine dynamics and pathogenic members of the *Vibrio* genus.” 2011 American Society for Limnology and Oceanography Meeting. Feb 13-18, 2011. San Juan, PR. [Poster]

Hatcher SM and Muhammad N. “Effects of CAFO location on well water contamination.”

- North Carolina Environmental Justice Network Summit. Oct 16-17, 2009. Whitakers, NC [Oral]
- UNC Office of Undergraduate Research Symposia: Celebration of Undergraduate Research. April 23, 2010. Chapel Hill, NC. [Oral]