

# Julia M. McGonigle, PhD

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NASA Postdoctoral Fellow, Bigelow Laboratory for Ocean Sciences

Phone: (971) 340-5253

mcgonigle.julia@gmail.com

## EDUCATION

PhD Biology, University of Utah, 2020

B.S *Cum Laude* Botany with Botanical Research Option, Oregon State University, 2011

## RESEARCH EXPERIENCE

### **Bigelow Laboratory for Ocean Sciences**

2020 - *current*

*Postdoctoral Researcher*

Advisor: Dr. Beth Orcutt

Currently using single-cell genomic approaches to investigate biogeochemical cycling and evolution of active microbes inhabiting the subsurface of the Lost City hydrothermal vent field.

### **University of Utah**

2014 - *current*

*Graduate Research Assistant*

Advisor: Dr. William

Brazelton

Used 16S rRNA and metagenomic sequencing approaches to complete first culture-independent microbial study of Bonneville Salt Flats and advanced knowledge of the metabolic capacity in microbes inhabiting the Lost City hydrothermal vent field.

Graduate Dissertation: *Life in Endolithic Environments: Ecology of the Bonneville Salt Flats and Lost City Hydrothermal Vent Field*

### **University of North Dakota**

Summer 2011

*Participant, NASA Student Airborne Research Program*

Advisor: Dr. Raphael Kudela

Developed an algorithm for detecting harmful algal blooms of *Microcystis aeruginosa* using remote sensing data collected with the MASTER instrument.

### **Oregon State University**

2010 - 2011

*Undergraduate Student Researcher*

Advisor: Dr. Robert Meinke

Discovered germination barriers and reproductive rates for wild populations of the endangered plant, *Limnanthes floccosa* ssp. *grandiflora* in order to aid in seed production for supplementing wild populations.

Undergraduate Thesis: *Cultivation and Propagation Studies for Large-Flowered Woolly Meadowfoam*

### **Oregon State University**

2010 - 2011

*Laboratory Assistant*

Advisor: Dr. Kate Lajtha

Collected samples and performed density fractions of soils for the international DIRT (detrital input and removal treatments) project aimed at determining the relationship of litter inputs, soil organic matter, and soil nutrients over the time span of decades and longer.

## **INDUSTRY EXPERIENCE**

**Optimization Chemist**, Branan Medical Corporation. Irvine, CA. 2012-2014

*Optimized antibody/antigen combinations for large scale manufacturing of lateral flow assay type multi-panel drug screening devices in an FDA regulated environment.*

**QC Microbiology Technician**, Gilead Sciences. San Dimas, CA. 2011-2012

*Performed microbial and particulate testing of ISO 5 to 8 cleanrooms, including adhering to all SOPs and aseptic gowning requirements. Conducted weekly data review to ensure all testing results met FDA cleanroom standards.*

## **PUBLICATIONS**

**McGonigle, J.M.**, Lang, Susan Q., Brazelton, W.J., **2020**. Genomic Evidence for Formate Metabolism by Chloroflexi as the Key to Unlocking Deep Carbon in Lost City Microbial Ecosystems. *AEM* 86:8

**McGonigle, J.M.**, Rapf, R. J., Motamedi, S., **2019**. The Astrobiology Graduate Conference: A 15 Year Retrospective. *ACS Earth and Space Chemistry* 3, 2675-2677

**McGonigle, J.M.**, Bernau, J.A., Bowen, B.B., Brazelton W.J., **2019**. Robust Archaeal and Bacterial Communities Inhabit Shallow Subsurface Sediments of the Bonneville Salt Flats, *mSphere* 4:4 e00378-19

Lang, S. Q., Früh-Green, G. L., Bernasconi, S. M., Brazelton, W. J., Schrenk, M. O., **McGonigle, J. M.**, **2018**. Deeply-sourced Formate Fuels Sulfate Reducers but not Methanogens at Lost City Hydrothermal Field, *Scientific Reports* 8:755

**McGonigle, J.**, Amsberry, K., Brickner, A., Brown, J., Currin, R., Groberg, M., Johnson, A., Meyers, S., Reuss-Schmidt, K., Thorley, L., Wilson, C., Woolverton, R., and Meinke, R., **2012**. Cultivation and Propagation Studies for Large-Flowered Woolly Meadowfoam—Year 2: Seed Bulking (OR-EP-2, Segment 21). Submitted by the Oregon Department of Agriculture (ODA), Plant Conservation Biology Program to U.S. Fish and Wildlife Service, Region One.

## **SELECTED RECENT PRESENTATIONS** (12 Total from 2010 - Present: 4 Oral, 8 Poster)

**2019** “Metabolic Strategies of the Dense Biofilms Inhabiting the Lost City Hydrothermal Vent Field.” McGonigle, J.M., and Brazelton, W.J. *Fourth Microbial Single Cell Genomics Workshop*, Boothbay, ME, September 23 (**Oral**)

**2019** “Metabolic Strategies of the Dense Biofilms Inhabiting the Lost City Hydrothermal Vent Field.” McGonigle, J.M., Lang S.Q., and Brazelton W.J. *Astrobiology Science Conference*, Bellevue, WA, June 24 (**Poster**)

**2018** “Deeply-Sourced Formate Fuels Sulfate Reducers but not Methanogens at Lost City Hydrothermal Field.” McGonigle J.M., Brazelton W.J. & Lang S.Q. *Goldschmidt*, Boston, MA. August 14 (**Poster**)

**2018** “Diversity and Metabolic Characterization of the Bonneville Salt Flats” McGonigle, J.M., and Brazelton, W.J. *Rocky Mountain GeoBiology Symposium*, Golden, CO. April 7 (**Oral**)

**2017** “Community Composition and Metabolic Characterization of the Bonneville Salt Flats.” McGonigle, J.M., Dart, E.R., Kleba, B., Bowen, B.B, Brazelton, W. J. *Astrobiology Graduate Conference*, Charlottesville, VA. June 7 (**Oral**)

## **FIELD WORK EXPERIENCE**

**Research Expedition Return to the Lost City 2018**, R/V Atlantis, AT42-01: Dr. Susan Q. Lang, Chief Scientist, Dr. William J. Brazelton, Co-Chief Scientist, September 2018

*Responsibilities as part of the science team included event logging and media recording in the ROV Jason van, turning over the HOG fluid sampler, CTD and HOG fluid and chimney rock sample processing.*

**Bonneville Salt Flats**, Biology team: Dr. Brenda B. Bowen, Principle Investigator, September 2016

*Responsible for sterile sampling of sediment at predetermined sampling locations, event logging, and sample transport back to the laboratory.*

**Student Airborne Research Program**, Ocean Team: Dr. Raphael Kudela, Principle Investigator 2011

*Participated in the NASA DC-8 flight where remote sensing data was collected using the MASTER instrument and air samples were collected using the Whole Air Sampler. Collected light reflectance spectrometry data from seawater, kelp, and salt-water marsh of a bird refuge using a handheld spectroradiometer.*

## **TEACHING EXPERIENCE**

**Teaching Assistant**, School of Biological Sciences, University of Utah, Salt Lake City, UT

*BIOL 3270 Microbial Ecosystems, Spring 2018 - lab activity supervision and prep*

*BIOL 5275 Microbial Diversity, Genomics and Evolution, Fall 2016 - lead exam reviews, responsible for grading, lab supervision and prep*

*BIOL 2010 Evolution & Diversity of Life, Fall 2015 - lead discussion sections, exam reviews, responsible for grading*

## **SERVICE AND PUBLIC ENGAGEMENT**

**Co-Organizer** Astrobiology Graduate Student Conference 2017 - 2019

*Conference organized by and for early career scientists, funded by NASA Astrobiology Institute and external sponsors*

2019 - **Conference Chair:** managed and held budget of ~\$130,000 and logistics for 75 participants, lead for all organizational committees

2017 - Co-lead for outreach event and Session Chair

**Co-Organizer** Proposal Writing Retreat Workshop 2017 - 2019

*Intensive grant-writing workshop held the weekend prior to Astrobiology Graduate Student Conference*

Organized participant logistics (~35 people) with budget of \$9,900 (2017), \$14,000 (2018), and \$18,000 (2019) and assisted in running workshop

**Committee member** for the Graduate Student Invited Speaker, University of Utah. 2017

*Helped organize graduate student survey, voting, and speaker invitation*

**Invited Speaker:** Aliens Among Us, Aliens Before Us, Science on Tap. SLC, UT. February 2020

**Invited Author:** McGonigle, J. Searching for Life Underneath the Lost City. UA Magazine August 2019

**Interview** by Elaine Clark, KUER 90.1 NPR Utah. Gunky, Snotty Extremophiles Could Point To Life On Moon Of Jupiter. August 19, 2019

**Science Communication Fellowship**, Natural History Museum of Utah. 2018

Scientist in the Spotlight, Salt Lake City, UT. December & April 2018

Presenter for Science Cafe, Salt Lake City, UT. April 2018  
**STEM Ambassador Program**, University of Utah. SLC, UT. 2016 - 2017

Presenter for Fermentation 101 at Harmons Grocery Store. SLC, UT. August 2016 & April 2017  
**Presenter** for “An Out of This World” dinner at The Leonardo Museum. SLC, UT. March 2017

### **PROFESSIONAL DEVELOPMENT WORKSHOPS**

Effective Science Communication. STEM Ambassadors. Salt Lake City, UT April 2016  
Research Focus Group, Astrobiology Graduate Student Conference. Estes Park, CO July 2016  
Making the Transition from Graduate Studies to the Interdisciplinary Workforce, C-DEBI. Santa Barbara, CA. October 2015

### **AWARDS**

**2020** NASA Postdoctoral Program Fellowship  
**2019** Graduate Student Travel Award, University of Utah Department of Biology  
**2017** Graduate Student Travel Award, University of Utah Department of Biology  
**2017** Student Travel Award Astrobiology Science Conference  
**2010** Ernest and Pauline Jaworski Fund for Summer Research Experiences for Underserved Undergraduates in Plant Science, Oregon State University