MEGAN E DUFFY

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EDUCATION

University of Washington School of Oceanography - Seattle, WA, Ph.D anticipated 2021

Advisor: Dr. Richard Keil

University of Washington School of Oceanography - Seattle, WA, M.S. 2018

Advisor: Dr. Richard Keil

Thesis: *De-novo assisted protein sequencing reveals degradation patterns in marine organic matter*

Reed College - Portland, OR, B.A., Chemistry, 2012

Advisors: Drs. Arthur Glasfeld and Martina Ralle

Thesis: *Effects of Copper Exposure on Intracellular Calcium Distribution in a Wilson and Menkes Disease Human Fibroblast Cell Model*

EXPERIENCE

Graduate Research Assistant

School of Oceanography, University of Washington, September 2015-

Investigating carbon preservation in marine sediment on a protein/peptide level, with a goal of developing quantitative protocols for extraction/identification of proteins from sediments and understanding specific preservation mechanisms through targeted and metaproteomic approaches, mineral-protein interaction studies, and bulk elemental analysis.

Research Assistant II

Department of Molecular and Medical Genetics, Oregon Health and Sciences University, 2012-15

Explored the roles of transition metals in neurodegenerative disorders using synchrotron-based X-ray fluorescence, LC-MS/MS, live-cell confocal microscopy, and molecular biological techniques. Prepared and analyzed a wide variety of biological, environmental, and industrial samples with an Agilent 7700x inductively coupled mass spectrometer (ICP-MS) as part of work for the Elemental Analysis Core.

Research Assistant

Department of Chemistry, University of Tennessee, April-June 2015

Designed iron nanoparticle-tagged antibody-based probes for live-cell fluorescent imaging of organellular targets. Developed protocols for synthesis and validation for all probe components using oxygen-free organic synthetic techniques. Mentored a summer REU student to assist with nanoparticle synthesis.

Undergraduate Research Assistant

Department of Biochemistry, Oregon Health and Sciences University, 2011-12

Used two human cells lines for copper metabolism disorder research. Developed protocols for cell fractionation and metals analysis, as well as live-cell imaging using fluorescent tags.

Research part of a year-long B.A. thesis project under the guidance of Dr. Ralle and Dr. Arthur Glasfeld (Reed College).

HONORS AND AWARDS

NSF Graduate Research Fellowship, 2017

University of Washington eScience Institute Student Cloud Computing grant, $1000

Merit Fellowship, University of Washington School of Oceanography, 2015-2016

Reed College Student Initiative Grant funding research at the Advanced Photon Source at Argonne National Lab, November 2011

Valedictorian, Peoples Academy High School, June 2008

ACTIVITIES

Committee Chair, John Hedges Honorary Visiting Scholar in Chemical Oceanography program, 2018-2019

Mentor, University of Washington Aquatic Organic Geochemistry High School Summer Internship, Summers 2016 - 2017, 2019

Member, PyLadies Women in Coding Group, 2014-

Student Mentor, Partnership for Scientific Inquiry, Oregon Health and Science University, 2015

Volunteer Lab Instructor, Lewis and Clark College Department of Chemistry, 2013-14

Volunteer Instructor, Reed College Chemistry Outreach, 2009-12

Coordinator, Reed College Green Chemistry Group, 2009-12

SPECIAL SKILLS AND TRAINING

Laboratory

Experience with LC-MS/MS in environmental and biomedical contexts, 1D and 2D NMR, X-ray diffraction, ICP-MS, GC-MS, IR spectroscopy, Raman spectroscopy, synchrotron-based X-ray fluorescence, X-ray absorbance near-edge spectroscopy, transmission electron microscopy, mammalian cell culture.

Computational

Courses: Python for Data Scientists (Treehouse, July 2015); Proteomics Informatics Course (Institute for Systems Biology, February 2016).

Language

French, fluent written and spoken; American Field Service Student Ambassador to Belgium, 2006-2007; Spanish, intermediate written and spoken; English, native.

PUBLICATIONS AND PRESENTATIONS

Clara A. Fuchsman, Hilary I. Palevsky, Brittany Widner, **Megan Duffy**, Michael C.G. Carlson, Jacquelyn A. Neibauer, Margaret R. Mulholland, Richard G. Keil, Allan H. Devol, Gabrielle Rocap. 2019 "Cyanobacteria and cyanophage contributions to carbon and nitrogen cycling in an oligotrophic oxygen-deficient zone" *The ISME Journal*, (In press).

Mak A Saito, Erin M Bertrand, **Megan E Duffy**, David A Gaylord, Noelle A Held, William Judson Hervey, Robert L Hettich, Pratik Jagtap, Michael G Janech, Danie B Kinkade, Dasha Leary, Matthew McIlvin, Eli Moore, Robert Morris, Benjamin A Neely, Brook Nunn, Jaclyn K Saunders, Adam Shepherd, Nicholas Symmonds, David Walsh. 2019 "Progress and Challenges in Ocean Metaproteomics and Proposed Best Practices for Data Sharing" *Journal of Proteome Research*, (In press).

Megan Duffy, Cheyenne Adams, Kathleen Thornton, Jaqui Neibauer, Jamee Adams, Lawrence Mayer, Rick Keil. *De-novo assisted protein sequencing reveals degradation patterns in marine organic matter* Talk presented at Cascadia Proteomics Symposium in Seattle, WA (July 2018).

Megan Duffy, Cheyenne Adams, Kathleen Thornton, Jaqui Neibauer, Jamee Adams, Lawrence Mayer, Rick Keil. *De-novo assisted protein sequencing reveals degradation patterns in marine organic matter* Poster presented at Ocean Sciences Meeting in Portland, OR (February 2018).

Megan Duffy, Jaqui Neibauer, Jamee Adams, Clara Fuchsman, Rick Keil. *De novo-assisted protein sequencing shows peptide preservation in marine systems.* Poster presented at the Gordon Research Conference in New London, CT (August 2017).

Ashima Bhattacharjee, Haojun Yang, **Megan Duffy**, Emily Robinson, Arianrhod Conrad-Antoville, Ya-Wen Lu, Tony Capps, Lelita Braiterman, Michael Wolfgang, Michael P Murphy, Ling Yi, Stephen G Kaler, Svetlana Lutsenko, Martina Ralle. "The activity of Menkes disease protein ATP7A is essential for redox balance in mitochondria" 2016 *Journal of Biological Chemistry* 291 (32), 16644-16658

Bonnemaison, Mathilde L., **Megan E. Duffy**, Martina Ralle, Richard E. Mains, and Betty A. Eipper. 2016 "Copper, Zinc and Calcium: three metals needed by one anterior pituitary secretory granule enzyme". *Metallomics*, 8 (9), 1012-1022

Bonnemaison, Mathilde L., Nils Bäck, **Megan E. Duffy**, Martina Ralle, Richard E. Mains, and Betty A. Eipper. 2015. "Adaptor Protein-1 Complex Affects the Endocytic Trafficking and Function of Peptidylglycine α-Amidating Monooxygenase, a Luminal Cuproenzyme." *The Journal of Biological Chemistry* 290 (35), 21264-79

Tallino, Savannah, **Megan Duffy**, Martina Ralle, María Paz Cortés, Mauricio Latorre, and Jason L. Burkhead. 2015. "Nutrigenomics Analysis Reveals That Copper Deficiency and Dietary Sucrose up-Regulate Inflammation, Fibrosis and Lipogenic Pathways in a Mature Rat Model of Nonalcoholic Fatty Liver Disease." *The Journal of Nutritional Biochemistry*, 26 (10), 996-1006

Voss, Kellen, Christopher Harris, Martina Ralle, **Megan Duffy**, Charles Murchison, and Joseph F. Quinn. 2014. "Modulation of Tau Phosphorylation by Environmental Copper." *Translational Neurodegeneration* 3 (1), 24

Megan E. Duffy, Tony R. Capps, Amelia Munson, Charlotte S. Gleber, David Vine, Stefan Vogt, and Martina Ralle. *Characterizing Copper Resistance in Primary Astrocytes.* Poster presented at the International Copper Meeting, Vico Equense, Italy (October 2014).