

Eli K. Moore

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Education

- 2005-2011 Ph.D. University of Maryland, Chesapeake Biological Laboratory (CBL), Marine Chemistry
Adviser: H. Rodger Harvey
Thesis: Identifying and tracking marine protein and its importance in the nitrogen cycle using proteomics
- 2000-2005 B.S. Oregon State University, Chemistry
B.S. Oregon State University, Bioresource Research
Minors: Oceanography, Toxicology
Adviser: Staci Simonich
Thesis: Bioaccumulation of semi-volatile organic compounds in Lichen

Professional and Research Experience

- 2015-Present Postdoctoral Research Associate, Rutgers University
Adviser: Paul G. Falkowski
Research: Protein structure evolution and how it has been influenced by the geosphere
- 2011-2015 Postdoctoral Research Assistant, Royal Netherlands Institute for Sea Research (NIOZ)
Adviser: Jaap S. Sinninghe Damsté
Research: Structural determination of novel membrane lipid structures to track microbial communities and biogeochemical processes in the environment
- 2005-2011 Graduate Research Assistant, University of Maryland, CBL

Publications

Moore EK, Hopmans EC, Rijpstra WIC, Villanueva L, Schoutsen F, Ayden R, Stams F, Sinninghe Damsté JS. **2016**. Identification of amino acid containing intact polar membrane lipids through novel fragmentation pathways using liquid chromatography-high resolution mass spectrometry. *Rapid Communications in Mass spectrometry*, 30, 739-750.

Moore EK, Villanueva L, Hopmans EC, Mets A, Rijpstra WIC, Dedysh SN, Sinninghe Damsté JS. **2015**. Abundant Trimethylornithine Lipids and Specific Gene Sequences are Indicative of Planctomycete Importance at the Oxic/Anoxic Interface in *Sphagnum*-Dominated Northern Wetlands. *Applied and Environmental Microbiology*, 81, 6333-6344.

- Moore EK**, Hopmans EC, Rijpstra WIC, Villanueva L, Wienk H, Schoutsen F, Ayden R, Stams F, Sinninghe Damsté JS. **2015**. Lysine and novel hydroxylysine lipids in soil bacteria: amino acid membrane lipid response to temperature and pH in *Pseudopedobacter saltans*. *Frontiers in Microbiology*, 6, 637.
- Moore EK**, Harvey HR, Faux JF, Goodlett DR, Nunn BL. **2014**. Electrophoretic extraction and proteomic characterization of proteins buried in marine sediments. *Chromatography*, 1, 176-193. *Invited author to Bioseparations theme issue
- Moore EK**, Harvey HR, Faux JF, Goodlett DR, Nunn BL. **2014**. Protein recycling in Bering Sea algal incubations. *Marine Ecology Progress Series*, 515, 45-59.
- Moore EK**, Hopmans EC, Rijpstra WIC, Villanueva L, Dedysh SN, Kulichevskaya IS, Wienk H, Schoutsen F, Sinninghe Damsté JS. **2013**. Novel mono-, di-, and trimethylornithine membrane lipids in northern wetland planctomycetes. *Applied and Environmental Microbiology*, 79, 6874-6884.
- Moore EK**, Nunn BL, Goodlett DR, Harvey HR. **2012**. Identifying and tracking proteins through the marine water column: Insights into the inputs and preservation mechanisms of protein in sediments. *Geochimica et Cosmochimica Acta*, 83, 324-359.
- Moore EK**, Nunn BL, Faux JF, Goodlett DR, Harvey HR. **2012**. Evaluation of electrophoretic protein extraction and database-driven protein identification from marine sediments. *Limnology and Oceanography: Methods*, 10, 353-366.

Publications in Preparation

- Moore EK**, Ozuolmez D, Plugge CM, Hopmans EC, Sinninghe Damsté JS. Microbial membrane lipid distribution shifts in coastal marine subsurface sediment enrichment cultures. To be submitted to *Aquatic Microbial Ecology*.
- Villanueva L, **Moore EK**, Villa Q, Hopmans EC, Sinninghe Damsté JS. Intact polar lipid recycling and production during anammox biomass degradation. To be submitted to *Applied Geochemistry*.
- Moore EK**, Jelen B, Giovannelli D, Falkowski PG. Archean Redox Influence on Metal Availability, the Evolution of Microbial Metabolisms, and the Emergence of a Global Electron Transfer Network. To be submitted to *PNAS*.

Non Peer-Reviewed Publications

- Moore EK**, Villanueva L, Hopmans EC, Mets A, Rijpstra WIC, Dedysh SN, Sinninghe Damsté JS. **2015**. Living on the Edge: Planctomycetes at the Oxidic/Anoxic Interface in Northern Wetlands. *Atlas of Science*, <http://atlasofscience.org/living-on-the-edge-planctomycetes/> *Invited author.
- Moore EK**, King D. **2011**. Greenhouse Gas Emission Footprint of the Chesapeake Biological Laboratory. *University of Maryland Center for Environmental Science – Carbon Audit*.

Teaching/Advising Experience

Mass spectrometry advising to graduate student Winnie Liu, Rutgers University (2015-2016).

Teaching intact polar lipid extraction techniques, instrument operation, and instruction to graduate students and technicians, Royal Netherlands Institute for Sea Research (2015).

Teaching proteomic lab techniques, instrument operation, and instruction to graduate students and technicians, University of Maryland (2005-2011).

Grad Student Mentor: Goldschmidt Conference, 2015 – Prague, Czech Republic
Patuxent High School Earth Science guest lecturer, Lusby Maryland (2010)

CBL Science Social Lecture Series – presenting scientific research to the public (2009-2010)

High School/College chemistry and math tutor (2005-2007), Innovative Study Techniques. Largo, MD

Research Funding

CBL Graduate Research Fellow (2005-2007): Two years tuition and stipend

Invited Lectures

Biogeochemical Lipidomics: Discovering new membrane lipids and their functions.
Department of Geosciences, Princeton University, October 15th, 2015.

Novel amino acid containing lipids: Importance in *Sphagnum*-dominated northern wetlands, and stress response in soil bacteria. Organic Geochemistry Unit (OGU), University of Bristol, UK. February 6th, 2015.

Selected Presentations at International Scientific Meetings

Moore EK, Jelen BI, Giovannelli D, Falkowski PG. Archean Redox Influence on Metal Availability, the Evolution of Microbial Metabolisms, and the Emergence of a Global Electron Transfer Network. *Gordon Conference - Metallocofactors*, Easton, MA. June 12-17, 2016.

Moore EK, Ozuolmez D, Plugge C, Hopmans E, Sinninghe Damsté JS. Microbial Membrane Lipid Distribution Shifts in Baltic Sea Subsurface Sediment Enrichment Cultures. Poster Presentation. *Goldschmidt*, Prague, Czech Republic. August 16-21, 2015.

Moore EK, Villanueva L, Hopmans E, Rijpstra WIC, Mets A, Dedysh S, Sinninghe Damsté JS. Abundant trimethylornithine lipids and specific gene sequences suggest microbial community shift at the oxic/anoxic interface in *Sphagnum*-dominated northern wetlands. Oral Presentation. *Darwin Days*, Leeuwenhorst, Netherlands. November 20-21, 2014.

Moore EK, Hopmans EC, Villanueva L, Rijpstra WIC, Dedysh SN, Wienk H, Schoutsen F, Stams AJM, Sanchez Andrea I, Mets A, Sinninghe Damsté JS. Novel amino acid-containing membrane lipids in northern wetland planctomycetes and soil bacteria: Potential biomarkers for microbial populations. Poster Presentation. *Gordon Research Conference on Organic Geochemistry*, Holderness, NH. August 3-8, 2014.

Moore EK, Rijpstra WIC, Hopmans EC, Villanueva L, Dedysh SN, Wienk H, Schoutsen F, Mets A, Sinninghe Damsté JS. Novel mono-, di-, and trimethylated ornithine membrane lipids in northern wetland planctomycetes. Poster Presentation. *Royal Dutch Society for Microbiology*, Papendal, Netherlands. April 15-16, 2014.

Moore EK, Hopmans EC, Rijpstra WIC, Villanueva L, Dedysh SN, Wienk H, Schoutsen F, Sinninghe Damsté JS. Novel mono-, di-, and trimethylornithine membrane lipids in northern wetland planctomycetes. Poster Presentation. *International Meeting on Organic Geochemistry*, Tenerife, Spain. September 15-20, 2013.

- Moore EK**, Nunn BL, Faux JF, Goodlett DR, Harvey HR. Identifying and Tracking Marine Protein and its Importance in the Nitrogen Cycle Using Proteomics. Oral Presentation. *Dissertations on Chemical Oceanography*, Kauai, HI. October 7-11, 2012.
- Moore EK**, Rijpstra WIC, Hopmans EC, Villanueva L, Dedysh SN, Wienk H, Sinnighe Damsté JS. Amino acid containing intact polar lipids: Biomarker potential for environmental stress response. Poster Presentation. *Gordon Research Conference on Organic Geochemistry*, Holderness, NH. July 29-August 3, 2012.
- Moore EK**, Nunn BL, Goodlett DR, Harvey HR. When diatom blooms die: tracking proteins from traps to sediments in the Bering Sea using proteomic mass spectrometry. Oral Presentation. *Ocean Sciences*, Portland, OR. February 22-26, 2010.
- Moore EK**, Nunn BL, Goodlett DR, Harvey HR. A proteomic approach to the sources and fate of proteins in the Bering Sea. Poster Presentation. *American Society of Mass Spectrometry*, Philadelphia, PA. May 31-June 4, 2009.
- Moore EK**, Harvey HR. Linking geochemical and proteomic approaches to characterize sedimentary proteins and mechanisms for protein preservation. Oral Presentation. *Ocean Sciences*, Orlando, FL. March 2-7, 2008.
- Moore EK**, Connelly W, Kerin E, Woodland R. The projected effects of climate change on Chesapeake Bay. Poster Presentation. *ASLO Aquatic Sciences*, Santa Fe, NM. February 4-9, 2007.
- Moore EK**, Wilson G, Simonich S. Tracking semivolatile organic contaminants in the environment using lichen. *SETAC World Congress*, Portland, OR. November 14-18, 2004.

Technical Skills

High Performance Liquid Chromatography-Mass Spectrometry (HPLC-MS)

- Thermo LTQ XL Ion Trap-MS analysis of intact polar lipids
- Thermo LTQ Orbitrap-MS analysis of protein tryptic digests
- Thermo LTQ Velos-MS analysis of protein tryptic digests
- Thermo Q-Exactive High Resolution Accurate Mass Orbitrap-MS analysis of intact polar lipids

Intact polar lipid extraction, purification and nuclear magnetic resonance (NMR) structural analysis

Gas Chromatography (GC)-MS analysis of fatty acids, amino acids and semi-volatile organic contaminants

GC-FID analysis of fatty acids, amino acids and semi-volatile organic Contaminants

Proteomic database searching of mass spectral data using SEQUEST, Mascot, and PepArML Meta software/search engines

RCSB Protein Databank – Protein structural interpretation

RRUFF Database – Deep Time Mineralogy Data Interpretation

LC/MS analysis of organic compounds synthesized through abiological processes as potential precursors to biomacromolecules

Awards

CBL Graduate Education Committee, Scientific Meeting Travel Award (2007, 2008, 2009, 2010)

Invited Speaker at the Dissertations in Chemical Oceanography (DISCO) Meeting, 2012. All travel, room and board expenses paid.

Cum laude – Oregon State University, 2005

Professional Organizations

American Geophysical Union
European Association of Organic Geochemists

Service and Leadership

Session Chair, Ocean Sciences Meeting - Proteomics and Lipidomics: Expanding the Macromolecular Toolbox to Understand Oceanic Processes. New Orleans, 2016
National Science Foundation (NSF) proposal reviewer – Chemical Oceanography AAAS Science and Technology Policy Fellowship Finalist, 2015
CBL Faculty Search Committees – Environmental Chemistry and Community Ecology, Student Representative, 2011
University of Maryland Center for Environmental Science (UMCES) Sustainability Council, CBL Student Representative.
CBL Computer Systems Committee, Student Representative, 2008-2011
Univ. of Maryland, CBL Graduate Student Organization Representative 2007-08

Workshops

GDGT-Based Proxies: State of the Art and Future Directions. *Royal Netherlands Institute for Sea Research (NIOZ)*. April 23-25, 2014
Quantitative Proteomics Workshop. *American Society for Mass Spectrometry*, Philadelphia, PA. May 30-31, 2009.
Joint Subcommittee on Ocean Science and Technology (JSOST), Ocean Research Priorities Planning Workshop, Staff, Denver, CO, April 17-20, 2006

Scientific Expeditions and Fieldwork

Bering Sea Ecosystem Study (BEST) Oceanographic Cruise. June-July, 2009. Activities: Conducted shipboard algal biomass degradation experiment; sediment core collection and slicing; krill collection and lipofuscin analysis; water filtering for suspended particle collection. *R/V Knorr*
Delaware Bay sampling Cruise. June 2006. Activities: Collected suspended particles and high molecular weight dissolved material using tangential flow filtration.
Western Airborne Contaminants Assessment Project, Sequoia & Kings Canyon National Parks Sampling and Observation Expedition. August, 2003. Activities: Collected lichen, conifer needles, and willow bark to analyze for semivolatile organic pollutants.

Current Collaborations

Keck Foundation Protein Structure Deep Time Geology Project: PIs - Bob Hazen, Carnegie Geo. Lab; Andy Knoll, Harvard; Dimitri Sverjensky, Johns Hopkins; Peter Fox, Rensselaer Polytech.; Bob Downs University of Arizona; Paul Falkowski, Rutgers University. 2015- Present.
Brook Nunn, University of Washington Department of Genome Sciences. Proteomic analysis of marine particles and sediments. 2008-present.

- Svetlana Dedysh, Russian Academy of Sciences, Moscow, Russia. Intact polar membrane lipid analysis of northern wetland Planctomycetes and peats to understand ecosystem response to environmental change. 2011-present.
- Fons Stams & Irene Sanchez Andrea, Wageningen University, Laboratory of Microbiology, Wageningen, Netherlands. Intact polar membrane lipid analysis of soil bacteria and environmental change. 2011-present.
- Hans Wienk, Bijvoet Center for Biomolecular Research, Utrecht University, Utrecht, Netherlands. Nuclear Magnetic Resonance (NMR) structural characterization of intact polar membrane lipids. 2012-present.