

Erin M. Bertrand

Assistant Professor and Tier II CRC Chair in Marine Microbial Proteomics
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RESEARCH INTERESTS

My research is focused on understanding how microbes influence ocean biogeochemistry. I am particularly interested in how micronutritional requirements (demand for vitamins and trace metals) shape interactions between phytoplankton and bacteria and what the consequences of those requirements and interactions are for global carbon, nitrogen, and sulfur cycling. I am also interested in the evolutionary context behind maintenance or loss of trace nutrient dependencies in marine microbes. I use quantitative mass spectrometry-based proteomic techniques, paired with field and laboratory experiments, to ask these questions.

EDUCATION

MIT/ WHOI Joint Program, Woods Hole, MA

Chemical Oceanography. Degree date: February, 2012

Thesis title: *"Insights into vitamin B₁₂ production, use, and acquisition in marine microbes."*

Bates College, Lewiston, ME

B. S. May, 2005; Chemistry and Environmental Studies Majors with Honors, *Magna Cum Laude*

Thesis title: *"Substrate-based mechanistic inquiries into alkane hydroxylation by AlkB in Pseudomonas putida GPo1 and uncharacterized alkane hydroxylases from bacteria from deep sea hydrothermal vents."*

School for International Training, Ulaanbaatar, Mongolia. Fall 2003

Lewis S. Mills High School, Burlington CT. Graduated Salutatorian, Spring 2001

RESEARCH AND PROFESSIONAL EXPERIENCE

July 2015- Current Assistant Professor and CRC Tier II Chair in Marine Microbial Proteomics, Department of Biology, Dalhousie University, Halifax Nova Scotia

2012- 2015 NSF Office of Polar Programs Postdoctoral Fellow, Allen Lab, J. Craig Venter Institute and Scripps Institution of Oceanography, UC San Diego

- *Transcriptomic investigations of the consequences of vitamin and nitrogen deprivation for polar phytoplankton*
- *Metatranscriptomic investigations into micronutrient colimitation in Southern Ocean microbial communities*
- *Interactive impacts of multiple stressors on eukaryotic phytoplankton*

2011 (Sept- Dec) Postdoctoral Investigator, Saito Lab, Woods Hole Oceanographic Institution

- *Field-based investigations of the impact of vitamin B₁₂ availability on marine sulfur cycling*
- *High- volume marine microbial protein sampling*

2006-2011 PhD Student, WHOI/MIT Joint Program in Chemical Oceanography, Saito Lab

- *Development and implementation of mass spectrometry- based global and targeted proteomic assays for studies with marine microorganisms in field samples and in cultures grown under multiple nutrient limitation and trace metal defined conditions*
- *Field studies of nutrient limitation of primary production, vitamin B₁₂ production and consumption in polar marine environments*
- *Electrochemical and mass spectrometric analyses of trace metals and vitamins*
- *Characterization of eukaryotic phytoplankton proteins responsive to nutrient stress via cloning and overexpression in E. coli*

2007-2008 Guest Student, University of New South Wales, School of Biotechnology and Biomolecular Sciences, Neilan Lab

- *Development and implementation of nucleic acid probes to detect vitamin B₁₂ biosynthesis in the marine environment*
- 2005-2006 Research Assistant II, Woods Hole Oceanographic, Marine Chemistry and Geochem Dept.
 - *Field studies of trace metal speciation and nutrient limitation of primary production*
 - *Marine cyanobacterial culturing and development of mass spectrometry-based global proteomic assays for their characterization*
- 2005 Woods Hole Oceanographic Institution Summer Student Fellow
 - *Field-based assays of trace metal and vitamin uptake by marine phytoplankton*
- 2003-2005 Research Assistant, Department of Chemistry, Bates College, Austin Lab
 - *Development of whole-cell assays using diagnostic alkane substrates to uncover metalloenzyme reaction mechanisms*
- 2004 Research Assistant, Dept. of Environmental Engineering, Cornell University, Ahner Lab
 - *Inquiry into a potential role for thiol production in nitrogen storage in coccolithophores*

TEACHING EXPERIENCE

- 2016-2017 Dalhousie Department of Biology
 - Fall and Winter: BIOL/MARI 4900: 65 students, 25%
 - Fall: MARI4665/BIOL5665: Ocean Fertilization: 30 students, 100%
 - Winter: BIOL 2004: Diversity of Life II: 250 students, 50%
 - Winter : one grad and one undergrad special topics
- 2015-2016 Dalhousie Department of Biology
 - Fall and Winter: BIOL/MARI 4900: 65 students, 25%
 - Summer: BIOL4806 Special Topics in phytoplankton proteomics: 1 student, 100%
- 2009-2010 Course Instructor- Chemical Oceanography. Woods Hole Partnership Education Program
- 2008 Teaching Assistant, MIT/WHOI Joint Program 'Marine Chemistry' class
- 2003-2005 Teaching Assistant and peer assisted learning group coordinator, Environmental Studies and Chemistry Departments, multiple classes, Bates College

AWARDS AND FELLOWSHIPS

- 2017 Simons Foundation Early Career Investigator Award in Marine Microbial Ecology and Evolution, \$540,000 USD
- 2015 Ruth and Paul Fye Award for Excellence in Oceanographic Research: Best Graduate Student Paper, MIT/WHOI Joint Program
- 2015 NSERC Discovery Grant- \$32,000 yearly
- 2015 Canada Research Chair, Tier II, Marine Microbial Proteomics
- 2015 Canadian Foundation for Innovation: a liquid chromatography triple quadrupole mass spectrometry system- \$312,000
- 2012 George "Gera" Pavlovich Panteleyev Award conferred annually on the MIT/WHOI student who best exemplifies the commitment to improving graduate education at WHOI
- 2011 NSF Office of Polar Programs Postdoctoral Fellowship Award "Evaluating the Biochemical Underpinnings of Vitamin B₁₂ Limitation in Antarctic Diatom Populations"- \$138,540
- 2011 1st Place Poster Award, "Molecular Life of Diatoms" meeting, Atlanta, GA
- 2009 WHOI Ocean Ventures Fund Student Research Award- competitive internal grant- \$13,800
- 2009 C-MORE (Center for Microbial Oceanography- Research and Education) Ed-Ventures grant with M. Nieto- Cid, K. Munson, L.A. Ventouras- \$11,060
- 2008 WHOI Coastal Ocean Institute Student Research Award- competitive internal grant- \$3,500
- 2007 NSF Graduate Research Fellowship
- 2006 EPA STAR Graduate Research Fellowship
- 2006 Honorable Mention NSF Graduate Research Fellowship
- 2005 Woods Hole Oceanographic Institution Summer Student Fellowship
- 2005 Drake R. Bradley Award for Excellence in Undergraduate Research at Bates College
- 2005 Lawrence Award for Excellence in Research, Bates College Chemistry Department

- 2005 Maine Campus Compact Unsung Heroes Student Award for fostering community engagement
2004 NSF-DOE funded Environmental and Molecular Science Institute's Center for Environmental Bioinorganic Chemistry Undergraduate Summer Research Fellowship
2003 Howard Hughes Medical Institute Undergraduate Research Fellowship
2002 Dana Scholarship for academic achievement, leadership and community service; Bates College

CITATION METRICS (Google Scholar)

Citations: 760; h-index: 16; i10-index 17

PUBLICATIONS

- In review: T. J. Browning, E. P. Achterberg, I. Rapp, A. Engel, **E. M. Bertrand**, C.M. Moore. Nutrient co-limitation at the boundary of an oceanic gyre. *Nature*
- In review: A. O. Tatters, A. Schnetzer, K. Xu, N. G. Walworth, F. Fu, J. L. Spackeen, R. E. Sipler, **E. M. Bertrand**, J. B. McQuaid, A. E. Allen, D. A. Bronk, K. Gao, J. Sun, D. A. Caron, D. A. Hutchins. Interactive Effects of Temperature, CO₂, and Nitrogen Source on a Coastal California Plankton Assemblage: Diatom Community Composition and Domoic Acid Production. *Frontiers in Microbiology*
- In review: E.M. Bertrand Quantification of vitamin B12-related proteins in marine microbial systems using selected reaction monitoring mass spectrometry. *MiMB Microbime Analysis: Methods and Protocols* (Springer, Book Chapter).
- Prepared for Submission: E. M. Bertrand, A. E. Allen, J. P. McCrow, R. Sipler, J. Spackeen, K. Xu, D. A. Bronk, D. A. Hutchins. Temperature-dependence of microbial micronutrient stress and nutritional status in the Southern Ocean. *Nature Geoscience*.
- Prepared for submission: E. M. Bertrand, R. Paerl, R. Aucoin*, J. P. McCrow, A. E. Allen. Molecular signatures of thiamine starvation in picoeukaryotic phytoplankton. For submission to *ISME J*. (*student co-author)
- Prepared for submission: E. M. Bertrand, M. L. Chen*, H. Moss, P. A. Lee, R. Paerl, A. E. Allen. Cobalamin requirements in *Pelagomonas* sp.: interactions with bacteria and implications for nitrogen and sulfur cycling. For submission to: *Frontiers in Microbiology* (*student co-author)
2016. P.A. Lee, **E. M. Bertrand**, M.A. Saito, G. R. DiTullio. Influence of vitamin B12 availability on oceanic dimethylsulfide and dimethylsulfoniopropionate. *Environmental Chemistry* 13(2) 293-301 <http://dx.doi.org/10.1071/EN15043>
2015. **E. M. Bertrand**, J. P. McCrow, A. Moustafa, H. Zheng, Jeff. McQuaid, T. O. Delmont, A. F. Post, R. Sipler, J. Spackeen, K. Xu, D. A. Bronk, D. A. Hutchins, A. E. Allen. Phytoplankton-bacterial interactions mediate micronutrient colimitation at the coastal Antarctic sea ice edge *Proceedings of the National Academy of Sciences, USA*. 112 (32).9938–9943, doi: 10.1073/pnas.1501615112
- 2015 R. W. Paerl, **E. M. Bertrand**, A. E. Allen, B. Palenik, F. Azam. Vitamin B12 ecophysiology of marine picoeukaryotic algae: Strain-specific differences and a new role for bacteria in vitamin cycling. *Limnology and Oceanography*. 60, 215-228.
- 2013 **E.M. Bertrand**, D.M. Moran, M.R. McIlvin, J.M. Hoffman, A.E. Allen, M. A. Saito. Methionine synthase interreplacement in diatom cultures and communities: Implications for the persistence of B₁₂ use by marine eukaryotic phytoplankton. *Limnology and Oceanography*. 4: 1431-1450

- 2013 **E.M. Bertrand**, R. Keddiss, J.T. Groves, C. Vetriani, R.N. Austin. Identity and mechanisms of alkane-oxidizing metalloenzymes from deep-sea hydrothermal vents. *Frontiers in Microbiological Chemistry*. 4:109. doi: 10.3389/fmicb.2013.00109
- 2012 **E.M. Bertrand** and A.E. Allen. Influence of vitamin B auxotrophy on nitrogen metabolism in eukaryotic phytoplankton. *Frontiers in Microbiology*. 3(375). doi: 10.3389/fmicb.2012.00375
- 2012* **E.M. Bertrand**, A. E. Allen., C.L. Dupont, T. Norden-Kirchmar, J. Bai, R. E. Valas, M.A. Saito. Impact of cobalamin starvation on diatom molecular physiology and the identification of a novel cobalamin acquisition protein. *PNAS* 109(26): E1762-E1771. (* *Faculty of 1000 Biology "Recommended" article*)
- 2012 S. Dyhrman, B. Jenkins, T. Rynearson, M. Saito, M. Mercier, H. Alexander, L. Whitney, A. Drzewianowski, V. Bulygin, **E. Bertrand**, Z. Wu, C. Benitez-Nelson, and A. Heithoff. The Transcriptome and Proteome of the Diatom *Thalassiosira pseudonana* Reveal a Diverse Phosphorus Stress Response. *PLoS ONE*. 7(3): e33768.
- 2011 L.L. Wurch, **E.M. Bertrand**, M.A. Saito, B. Van Mooy, S. Dyhrman. Proteome changes driven by phosphorus deficiency and recovery in the brown tide forming alga *Aureococcus anophagefferens*. *PLoS ONE*. 6(12): e28949.
- 2011 **E.M. Bertrand**, M.A. Saito, P.A. Lee, P.N. Sedwick, R.B. Dunbar, G. R. DiTullio. Iron limitation of a springtime bacterial and phytoplankton community in the Ross Sea: implications for vitamin B₁₂ nutrition. *Frontiers in Microbiology* 2(160).
- 2011 M. A. Saito, **E. M. Bertrand**, S. Dutkiewicz, V. V. Bulygin, D. M. Moran, F. M. Monteiro, M. J. Follows, F. W. Valois, J. B. Waterbury. Iron conservation by reduction of metalloenzyme inventories in the marine diazotroph *Crocospaera watsonii*. *PNAS*. 108 (6) 2184-2189.
- 2011 **E.M Bertrand**, M.A. Saito, Y.J. Jeon, B.A. Neilan. Profiling vitamin B₁₂ biosynthesis gene diversity in the Ross Sea: the identification of a new group of putative polar B₁₂- biosynthesizers. *Environmental Microbiology*. 13(5), 1285–1298.
- 2011 C. J. Gobler, many others, **E. M. Bertrand**, M. A. Saito, I.V. Grigoriev. Niche of harmful alga *Aureococcus anophagefferens* revealed through ecogenomics. *PNAS*. doi:10.1073/pnas.1016106108
- 2010 M.A. Saito, T.J. Goepfert, A.E. Noble, **E.M. Bertrand**, P.N. Sedwick, and G.R. DiTullio. A Seasonal study of dissolved cobalt in the Ross Sea, Antarctica: micronutrient behavior, absence of scavenging, and relationships with Zn, Cd, and P. *Biogeosciences*. 7, 4059-4082.
- 2008 R.N. Austin, K. Luddy, K. Erikson, M. Pender-Cudlip, **E. M. Bertrand**, D. Deng, R. S. Buzdygon, J.B. van Beilen, J. T. Groves. Cage escape competes with geminate recombination during alkane hydroxylation by the diiron oxygenase AlkB. *Angewandte Chemie*, 120, 28, 5310–5312.
- 2007* **E. M. Bertrand**, M.A. Saito, J.M. Rose, C. R. Riesselman, M.C. Lohan, A. E. Noble, P.A. Lee, G. R. DiTullio. Vitamin B₁₂ and iron co-limitation of phytoplankton growth in the Ross Sea. *Limnology and Oceanography*. 52 (3) 1079-1093 (**Faculty of 1000 Biology "Recommended" article*)
- 2007 E.A. Rozhkova-Novosad, J.C. Chae, G.J. Zylstra, **E.M. Bertrand**, M. Alexander- Ozinskas, D. Deng, L.A. Moe, J.T. Groves, R.N. Austin. Profiling mechanisms of alkane hydroxylase activity *in vivo* using the diagnostic substrate norcarane. *Chemistry and Biology*. 14: 165-172

- 2005 **E. Bertrand**, R. Sakai, E. Rozhkova-Novosad, L. Moe, B. G. Fox, J.T. Groves, R. N. Austin. Reaction mechanisms of non-heme diiron hydroxylases characterized in whole cells. *Journal of Inorganic Biochemistry*. 99: 1998–2006

PUBLISHED ABSTRACTS

- 2016 **E. M. Bertrand**, J. McCrow, T. Delmont, D. Hutchins, A. Allen. Multi-omic insights into the role of temperature and iron availability in shaping coastal Southern Ocean microbial dynamics. Int. Soc. for Microbial Ecology, Montreal Quebec
- 2016 **E. M. Bertrand**, J. McCrow, D. Bronk, D. Hutchins, A. Allen. Planktonic Responses to Simulated Warming and Elevated Iron Availability in McMurdo Sound: Community Composition and Microbial Interactions. ASLO Ocean Science Meeting, New Orleans, LA
- 2014 **E. Bertrand**, J. McQuaid, D. Bronk, D. Hutchins, A. Allen. Metatranscriptomic analysis of continuous flow experiments manipulating iron, CO₂, and temperature: controls on late season primary production in the Ross Sea. ASLO Ocean Sciences meeting, Honolulu HI
- 2012 M. Saito and **E. Bertrand**. Marine metalloprotein abundance patterns yield insight into the implications of metal scarcity for oceanic biogeochemical processes. ACS Meeting, Environmental Bioinorganic Session. San Diego, CA.
- 2012 McIlvin, M., **E.M. Bertrand**, K. Waldron, D.M. Moran, N. Robinson and M.A. Saito. Metalloprotein characterization of marine bacteria and diatoms. Diving into marine microbial metallomes and the search for metalloproteins in the ocean. 60th American Society for Mass Spectrometry Conference. Vancouver, BC, Canada. May 20-24. Poster presentation.
- 2012 Dyhrman, S. T.; Wurch, L. L.; Gobler, C. J.; **Bertrand, E.**; Saito, M.; Transcriptome and proteome profiling identifies pathways of nutrient metabolism in *Aureococcus anophagefferens*. ASLO meeting Salt Lake City.
- 2012 Jenkins, B. D.; Rynearson, T. A.; Dyhrman, S. T.; Saito, M. A.; Chappell, P. D.; Whitney, L. P.; Alexander, H.; **Bertrand, E. M.**; From Lab To Launch: integrating biomarkers derived from genomics And proteomics approaches into remote observing platforms. ASLO meeting Salt Lake City.
- 2011 Saito, M.A., D.M. Moran, A.E. Allen, **E.M. Bertrand** and J. Badger. Physiological and proteomic analyses of iron limited polar phytoplankton. ASLO 2011 Aquatic Sciences Meeting. San Juan, Puerto Rico.
- 2011 L.L. Wurch, **E.M. Bertrand**, M.A. Saito, B. A. S. Van Mooy, S.T. Dyhrman. Shotgun proteomics identifies the phosphorus physiology of the brown tide-forming alga, *Aureococcus anophagefferens*. 6th Symposium on Harmful Algae, Austin, TX.
- 2011 **E.M. Bertrand**, M.A. Saito. A vitamin B₁₂ stress marker for diatoms: quantitative proteomic mass spectrometry as an emerging tool for monitoring micronutrient stress. ASLO Winter Meeting, San Juan, PR.
- 2010 M. A. Saito, **E. M. Bertrand**, V. Bulygin, A.D. Cox, T.J. Goepfert, D. Moran, The potential for colimitation of marine primary productivity: three biochemical definitions, field observations, application of proteomic diagnostics, and comments on the future. AGU/ASLO Ocean Sciences Meeting Portland.

- 2010 **E.M. Bertrand**, V. Bulygin, M. A. Saito. Proteomics of vitamin B₁₂ and iron stress and co-stress in marine diatoms. Oral Presentation. AGU/ASLO Ocean Sciences Meeting Portland, OR.
- 2009 M. A. Saito, **E. M. Bertrand**, V. Bulygin, D. Moran, J. B. Waterbury. Strategies for economization of cellular iron in *Crocospaera watsonii* as revealed by global quantitative proteomic analysis. Goldschmidt Conference, Davos Switzerland.
- 2008 M.A. Saito, **E.M. Bertrand**. A. Anbar. Neoproterozoic oxygenation of Earth's surface environments reflected in the late evolution of the O₂-dependent vitamin B₁₂ biosynthesis pathway. AGU, San Francisco, CA.
- 2006 **E.M. Bertrand**, A. E. Noble, D. J. Repeta M. A. Saito. Contrasting vitamin B₁₂ and cobalt uptake by phytoplankton populations in the Costa Rica Upwelling Dome. ASLO 2006 Victoria, British Columbia
- 2005 **E.M. Bertrand**, M. Alexander-Ozinskas, C. Lehmann, R.N. Austin. Mechanistic studies of hydrocarbon-degrading metalloenzymes in pristine, polluted and extreme environments. American Chemical Society National Meeting, San Diego, CA.
- 2004 **E. M. Bertrand**, R.N. Austin, C. Lehmann, B. Brazeau, J.D. Lipscomb, H. Zhang, G.Z. Zylstra, J.T. Groves. Mechanistic inquiries into environmental hydrocarbon degradation by microbial metalloenzymes: evolutions in method. European Bioinorganic Chemistry Conference, Garmisch-Partenkirchen, Germany.

PATENT:

Cobalamin Acquisition Protein and Use Thereof. US Patent 9,234,012, 2016. Mak Saito and Erin Bertrand.

INVITED TALKS AND PROFESSIONAL MEETING PARTICIPATION

- July, 2017 Chemical Oceanography Gordon Conference *Invited Talk*
- Jun, 2017 Canadian Society of Microbiologists *Invited Talk*
- Feb, 2017 Acadia University, Department of Biology *Invited talk*
- Dec, 2016 St. Mary's University, Department of Biology *Invited Talk*
- Aug, 2016 ISME Meeting, Montreal Quebec *Contributed talk*
- Apr, 2016 Columbia University and Barnard College, *Invited talk*
- Apr, 2016 Princeton EGGG Seminar, Princeton University, *Invited talk*
- Feb, 2016 Chemistry Department Seminar Series, Dalhousie University, *Invited talk*
- Dec, 2015 Biochemistry and Molecular Biology Dept. Seminar Series, *Invited talk*
- Oct, 2015 Chemistry and Biochemistry Department Seminar Series, Mt. Allison University, *Invited talk*
- Sept, 2015 Oceanography Department Seminar Series, Dalhousie University, *Invited talk*
- Sept, 2015 Bedford Institute of Oceanography, *Invited talk*
- May, 2015 CIFAR (Canadian Institute for Advanced Research) Microbial Diversity Meeting, *Invited talk*
- Feb, 2015 Concordia University, Biology Department, *Invited talk*
- Oct, 2014 Caltech Earth and Planetary Sciences Geoclub Seminar Series, *Invited talk*
- Sept, 2014 Stanford University School of Earth Science Seminar, *Invited talk*
- Feb, 2014 Ocean Science Meeting, Honolulu, HI. Poster
- Feb, 2014 Gordon and Betty Moore Foundation Marine Microbial Initiative Postdoctoral Symposium
- Dec, 2013 Dalhousie University Biology Department, *Invited talks*
- Aug, 2013 Chemical Oceanography Gordon Conference, Biddeford, ME. Poster
- Mar, 2013 Scripps Institution of Oceanography Earth Section Seminar, *Invited talk*
- Oct, 2012 University of Southern California Marine and Environmental Biology Tuesday Seminar, *Invited talk*

- Jun, 2012 Marine Microbes Gordon Research Seminar, *Invited talk*
 Mar, 2012 University of Rochester, Department of Earth and Environmental Sciences, *Invited talks*
 Aug, 2011 Chemical Oceanography Gordon Research Conference, Andover, NH. Poster
 Jun, 2011 The Molecular Life of Diatoms, Atlanta, GA. Poster (Best Poster Award)
 Apr, 2011 MIT Microbial Systems Seminar, *Invited talk*
 Jun, 2010 Environmental Bioinorganic Chemistry Gordon Conference, Newport, RI. Poster
 Feb, 2010 Ocean Science Meeting, Portland, OR. Oral presentation
 Feb, 2010 C-MORE All-Hands meeting, Honolulu, HI. Poster
 Aug, 2009 Chemical Oceanography Gordon Conference, Tilton, NH. Poster
 Aug, 2008 ISME Meeting; Cairns, Australia. Poster
 Jun, 2008 Environmental Bioinorganic Chemistry Gordon Conference, Waterville, NH. Poster
 Oct, 2007 *Aureococcus anophagefferens* Genome Jamboree, South Hampton, NY. *Invited talk*
 Sept, 2007 10th Symposium on Aquatic Microbial Ecology, Faro, Portugal. Poster
 Jun, 2007 Center for Environmental Bioinorganic Chemistry (CEBIC) Summer Conference, Princeton University, Princeton, NJ. *Invited talk*
 Jun, 2006 ASLO Summer Meeting 2006 Victoria, British Columbia . Poster
 Jun, 2005 CEBIC Summer Conference, Princeton University, Princeton, NJ. *Invited talk*
 Mar, 2005 American Chemical Society National Meeting, San Diego, CA. Poster
 Jan, 2005 Bioinorganic Chemistry Gordon Graduate Research Seminar, Ventura, CA. *Invited talk*
 Jun, 2004 European Bioinorganic Chemistry Conference, Garmisch-Partenkirchen, Germany. Poster
 Jun, 2003 CEBIC Summer Conference, Princeton University, Princeton, NJ. Poster

CRUISE PARTICIPATION AND FIELD WORK

- 2016 Fall Atlantic Zone Monitoring Program Cruise; Hudson
 2016 Spring Atlantic Zone Monitoring Program Cruise; Hudson
 2014-15 McMurdo Sound, Antarctica; Postdoctoral Research
 2014 West Antarctic Peninsula, Phantastic II Cruise, R/VIB N.B. Palmer; Postdoctoral Research
 2013 McMurdo Sound, Antarctica; Postdoctoral Research
 2011 Metzyme Cruise, Equatorial Pacific, R/V Kilo Moana; Postdoctoral Research
 2009 Station Aloha, CMORE photoperiod cruise, R/V Kilo Moana; PhD research
 2009 McMurdo Sound, Antarctica; PhD research
 2006 Ross Sea, CORSACS II Cruise R/VIB N.B. Palmer; PhD research
 2005 Ross Sea, CORSACS I Cruise R/VIB N.B. Palmer; research assistant
 2005 Costa Rica Dome, R/V Knorr; summer student fellow research

SUPERVISORY EXPERIENCE

- 2017- current J. Scott McCain, Dalhousie Biology/ TOSST PhD student
 2016-current Tor Kitching, and Carolyn Kachuk, Research Assistants
 2016-current Megan Roberts: Dalhousie Biology Honours Student
 2016-current Hugo Arriojas: Dalhousie Biology Honours Student
 2016 Heba El-Swais: Dalhousie Biology/ TOSST PhD Student.
 2015-2016 Rebecca Aucoin: Dalhousie Biology Honours Student
 2015-2016 Meghan Chen: Dalhousie Biology Honours Student
 2012-2014 Angela Zompoulis and Haley Moss, J. Craig Venter Institute Interns

COMMUNITY SERVICE

Manuscript reviewer- Biogeosciences 2010- current; Oceanography 2011- current, Marine Chemistry 2011- current; Limnology and Oceanography 2012- current; Journal of Plankton Research, 2013-current; Environmental Microbiology 2014- current; Proteomics 2015- current; ISME Journal 2014-current; Limnology and Oceanography Methods 2015- current; Rapid Communications in Mass Spectrometry 2014- current; Metallomics 2016- current; Frontiers in Microbiology, 2016- present, Proceedings of the National Academy of Sciences 2016- present; Plant Physiology, 2016- present

Proposal reviewer- NSERC, U.S. National Science Foundation, European Research Council
Session organizer- Microbial growth factors in the sea: Characterizing their importance at the molecular to ecosystem level. With Ryan Paerl. Ocean Sciences 2014 Honolulu, HI
Student Representative- Woods Hole Oceanographic Institution Educational Assembly, 2009-2010
Seminar Organizer- Woods Hole Oceanographic Institution Biogeochemistry Seminar, 2009-2011
Science Fairs Judge - Falmouth, MA Public Schools, 2006- 2012
School Volunteer- Falmouth, MA Public Schools for “The Artistic Oceanographer” program, 2006- 2012; San Diego Unified School District JCVI Mobile Lab volunteer, 2012-present
Outreach Volunteer- BeWise (Better Education for Women in Science and Engineering) San Diego Science Alliance. 2012-2014

Departmental Service:

2015- Present: Biology Department Seminar Committee Chair
2016- Present: Dalhousie Biology Department Representative, Science Atlantic
2016- Present: Search Committee member, CRC Tier II in Marine Quantitative Ecology

University Service:

2016: Chair Search Committee: Department of Chemistry- member

Outreach Publications:

E. M. Bertrand. Psychotherapy for Plankton: life can be stressful out there in the microscopic marine world. 2011. Oceanus Magazine. Vol 49 No. 1. [Link](#)
L. Lippsett. Recycling rare, essential nutrients in the sea. Oceanus Magazine. 2011. [Link](#)
A.D. Shapiro. Exploring an Icy, invisible realm in Antarctica: Audio slideshow. 2009. Oceanus Magazine. Vol 47, No. 3. [Link](#)
L. Lippsett. Growing marine plants need their vitamins. 2007. Oceanus Magazine. Vol 45. No. 3. [Link](#)

PROFESSIONAL AFFILIATIONS

International Society for Microbial Ecology
Canadian Society of Microbiologists
Association for the Sciences of Limnology and Oceanography
Science Atlantic

American Chemical Society
The Geochemical Society
American Geophysical Union
American Association for the Advancement of Science