

Brook Leanne Nunn*
University of Washington
Department of Genome Sciences
Box 357610; Seattle, WA 98195
(cell)206-200-5871
brookh@uw.edu | www.environmentalproteomics.org
* Previous publications under Brook L. Holcombe

EDUCATION:

2004	Ph. D	Chemical Oceanography, University of Washington
2000	M.S.	Chemical Oceanography, University of Washington
1998	B.A.	Geology and Chemistry, Colorado College

APPOINTMENTS

2022-	Co-Lead NASA Network for Life Detection
2020-	Research Associate Professor: Department of Genome Sciences; University of Washington
2019-	Network For Life Detection Steering Committee (NASA)
2017-2019	Lecturer CSI Seattle; designed and co-taught UW Early Fall Start 5-credit forensic chemistry course
2015-	Director UW Environmental Proteomics Center; proteomics research cost center
2014-2019	Research Assistant Professor Department of Genome Sciences; University of Washington
2013-2014	Research Scientist/PI Department of Genome Sciences (with MacCoss Lab) University of Washington (50% FTE)
2011-2013	Research Scientist/PI Medicinal Chemistry Department University of Washington (50% FTE)
2008-2011	Research Associate/ Co-PI David Goodlett University of Washington, collaboration with Rodger Harvey Chesapeake Bay Labs
2007-2008	Research Associate with David Goodlett, University of Washington
2006-2010	Research Associate/ Co-PI collaboration with Dr. Sylvia Sander Univ. of Otago; New Zealand
2005-2007	NSF Polar Program Postdoctoral Fellow with Phillip Boyd, and David Goodlett, Univ. of Otago; New Zealand/ University of Washington
2004	Postdoctoral Fellow (2004) with David Goodlett, University of Washington.
2001	Teaching Assistant, Chemical Oceanography: University of Washington

HONORS AND AWARDS

2022 New Investigator Award Joint Genome Institute
2020 Cover Design for MSphere Research
2016 Invited Speaker Gordon Research Conference Marine Microbes
2014 Cover Design for PNAS Research
2014 Travel Award and invited speaker to ASLO Ocean Sciences Meeting
2005 National Science foundation Postdoctoral Fellowship Award
2005 Best Speaker Award Australia & New Zealand Society of Mass Spectrometry Conference; Lorne, Australia.

FEDERAL FUNDING AWARDS

2023-	NSF- Sea-ice snow microbial communities' impact on Antarctic bromocarbon budgets and processes (Co-I)
--------------	---

- 2022- NSF- MCA: Utilizing high-throughput proteomic methods to build a more accurate conceptual model of the effects of environmental change on early life stages of genetically diverse herring populations **(Co-I)**
- 2022- NASA-TWSC Building a stronger, more inclusive research coordination network for life detection **(PI)**
- 2022- NIH-R21 Using Microbiomes as microsensors to forecast Harmful Algal Blooms **(PI)**
- 2022 New Investigator Award Joint Genome Institute **(PI)**
- 2020- NSF-IOS Collaborative grant to track cross-kingdom chemical signaling in phytoplankton-bacteria model systems using isotopically labeled proteins and metabolites **(PI)**
- 2020-2021 Royal Research Foundation: Microbiomes as microsensors to forecast HABs **(PI)**
- 2018-2021 NSF-BIOS Diel Physiological rhythms in a tropical oceanic copepod **(Co-I)**
- 2018-2021 NASA-Exobiology Using Proteome Dynamics of Psychrophilic Bacteria to Decipher Metabolic Strategies and Protein Signatures Indicative of Sustained Life in Ice **(Co-I)**
- 2018-2021 NASA- Exobiology Investigating Taphonomic processes under Cold and Dry conditions Using Sediment Samples from Untersee Oasis, Antarctica **(Co-I)**
- 2017-2020 NSF-IOS: Collaborative Research: Physiological mechanisms involved in the allocation of energy to reproduction in corals under thermal stress **(Co-I)**
- 2016-2019 NSF-OCE Collaborative grant to determine functional biomarkers of bacterial recycling. **(PI)**
- 2016-2017 NSF-OPP Polar Programs grant to develop methods to complete metaproteomes in Greenland subglacial sediments **(PI)**
- 2015-2019 NASA- Exobiology SubAward Characterization of Microbes Mediating Anaerobic Oxidation of Methane Coupled to Iron Reduction from an Ancient Ocean Analogue **(Co-I)**
- 2012-2015 Australian Discovery Project: transcriptomics and proteomics of S. Ocean plankton. **(Co-I)**
- 2012-2015 NSF-OCE Collaborative grant to examine protein recycling in the ocean. **(PI)**
- 2014 Early Career Travel Award ASLO Ocean Sciences Honolulu, HI
- 2011-2014 NSF-OCE grant to examine proteomic adaptations by Red Tide organisms. **(Co-I)**
- 2008-2011 NSF-OCE grant to examine protein preservation in oceanic sediments. **(Co-I)**
- 2006-2008 Marsden grant (New Zealand) **(Co-I)**
- 2005-2007 NSF Polar Programs Postdoctoral Fellowship **(PI)**

PUBLICATIONS:

- Axworthy, J.B., Timmins-Schiffman, E., Brown, T., Rodrigues, L.J., **Nunn, B.L.**, and Padilla-Gamiño, J.L. (2022). Shotgun Proteomics Identifies Active Metabolic Pathways in Bleached Coral Tissue and Intraskelatal Compartments. *Frontiers in Marine Science* 9, 50.
- Strzepek, R.F., **Nunn, B.L.**, Bach, L.T., Berges, J.A., Young, E.B., and Boyd, P.W. (2022). The ongoing need for rates: can physiology and omics come together to co-design the measurements needed to understand complex ocean biogeochemistry? *Journal of Plankton Research* 44, 485-495.
- Boyd, P.W., Doney, S.C., Eggins, S., Ellwood, M.J., Fourquez, M., **Nunn, B.L.**, Strzepek, R., and Timmins-Schiffman, E. (2022). Transitioning global change experiments on Southern Ocean phytoplankton from lab to field settings: Insights and challenges. *Limnol Oceanogr* 67, 1911-1930.
- Timmins-Schiffman, E., White, S.J., Thompson, R.E., Vadopalas, B., Eudeline, B., **Nunn, B.L.**, and Roberts, S.B. (2021). Coupled microbiome analyses highlights relative functional roles of bacteria in a bivalve hatchery. *Environ Microbiome* 16, 7.

- Mudge, M.C., **Nunn, B.L.**, Firth, E., Ewert, M., Hales, K., Fondrie, W.E., Noble, W.S., Toner, J., Light, B., and Junge, K.A. (2021). Subzero, saline incubations of *Colwellia psychrerythraea* reveal strategies and biomarkers for sustained life in extreme icy environments. *Environ Microbiol*.
- Tisthammer, K.H., Timmins-Schiffman, E., Seneca, F.O., **Nunn, B.L.**, and Richmond, R.H. (2021). Physiological and molecular responses of lobe coral indicate nearshore adaptations to anthropogenic stressors. *Sci Rep* *11*, 3423.
- Pollara, S.B., Becker, J.W., **Nunn, B.L.**, Boiteau, R., Repeta, D., Mudge, M.C., Downing, G., Chase, D., Harvey, E.L., and Whalen, K.E. (2021). Bacterial Quorum-Sensing Signal Arrests Phytoplankton Cell Division and Impacts Virus-Induced Mortality. *mSphere* *6*.
- Petrou, K., **Nunn, B.**, Padula, M., Miller, D., and Nielsen, D. (2021). Broad scale proteomic analysis of heat-destabilised symbiosis in the hard coral *Acropora millepora*. *Sci Rep-Uk* *11*, 1-16.
- Glass, J.B., Ranjan, P., Kretz, C.B., **Nunn, B.L.**, Johnson, A.M., Xu, M., McManus, J., and Stewart, F.J. (2021). Microbial metabolism and adaptations in Atribacteria-dominated methane hydrate sediments. *Environmental Microbiology* *23*, 4646-4660.
- Sajulga, R., Easterly, C., Riffle, M., Mesuere, B., Muth, T., Mehta, S., Kumar, P., Johnson, J., Gruening, B.A., Schiebenhoefer, H., Kolmeder, C.A., Fuchs, S., **Nunn, B.L.**, Rudney, J., Griffin, T.J., and Jagtap, P.D. (2020). Survey of metaproteomics software tools for functional microbiome analysis. *PLoS One* *15*, e0241503.
- Szeinbaum, N., **Nunn, B.L.**, Cavazos, A.R., Crowe, S.A., Stewart, F.J., DiChristina, T.J., Reinhard, C.T., and Glass, J.B. (2020). Novel insights into the taxonomic diversity and molecular mechanisms of bacterial Mn(III) reduction. *Environmental microbiology reports*.
- Boyd, P.W., Doney, S.C., Eggins, S., Ellwood, M.J., Fourquez, M., **Nunn, B.L.**, Strzepek, R.F., Timmins-Schiffman, E. (in review) Transitioning global change experiments on Southern Ocean phytoplankton from lab to field settings: insights and challenges. *Limnology and Oceanography*.
- Glass, J.B., Ranjan, P., Kretz, C.B., **Nunn, B.L.**, Johnson, A.M., Xu, M., McManus, J. and Stewart, F.J., (2021). Microbial metabolism and adaptations in Atribacteria-dominated methane hydrate sediments. *Environmental Microbiology*.
- Axworthy JB, Timmins-Schiffman E, Brown T, Rodrigues LJ, Nunn BL, Padilla-Gamiño JL (2022). Shotgun proteomics identifies active metabolic pathways in bleached coral tissue and intraskeletal compartments. *Frontiers in Marine Science* doi: 10.3389/fmars.2022.797517
- Tisthammer, K. H., Timmins-Schiffman, E., Seneca, F. O., **Nunn, B. L.**, & Richmond, R. H. (2021). Physiological and molecular responses of lobe coral indicate nearshore adaptations to anthropogenic stressors. *Scientific reports*, *11*(1), 1-11.
- Mudge, M. C., **Nunn, B. L.**, Firth, E., Ewert, M., Hales, K., Fondrie, W. E., ... & Junge, K. A. (2021). Subzero, saline incubations of *Colwellia psychrerythraea* reveal strategies and biomarkers for sustained life in extreme icy environments. *Environmental Microbiology*.
- Timmins-Schiffman, E., White, S. J., Thompson, R. E., Vadopalas, B., Eudeline, B., **Nunn, B. L.**, & Roberts, S. B. (2021). Coupled microbiome analyses highlights relative functional roles of bacteria in a bivalve hatchery. *Environmental Microbiome*, *16*(1), 1-12.
- Mehta, S., Kumar, P., Crane, M., Johnson, J. E., Sajulga, R., Nguyen, D. D. A., **Nunn, B.L.**,... & Jagtap, P. D. (2021). Updates on metaQuantome Software for Quantitative Metaproteomics. *Journal of Proteome Research*, *20*(4), 2130-2137.
- Johnson, R.S., Searle, B.C., **Nunn, B.L.**, Gilmore, J.M., Phillips, M., Amemiya, C.T., Heck, M., and MacCoss, M.J. (2020). Assessing Protein Sequence Database Suitability Using De Novo Sequencing. *Mol Cell Proteomics* *19*, 198-208.
- Szeinbaum, N., **Nunn, B.L.**, Cavazos, A.R., Crowe, S.A., Stewart, F.J., DiChristina, T.J., Reinhard, C.T., and Glass, J.B. (2020). Novel insights into the taxonomic diversity and molecular mechanisms of bacterial Mn(III) reduction. *Environmental microbiology reports*.
- Kumar, P., Johnson, J.E., Easterly, C., Mehta, S., Sajulga, R., **Nunn, B.**, Jagtap, P.D., and Griffin, T.J. (2020). A Sectioning and Database Enrichment Approach for Improved Peptide Spectrum Matching in Large, Genome-Guided Protein Sequence Databases. *J Proteome Res* *19*, 2772-2785. pubs.acs.org/doi/10.1021/acs.jproteome.0c00260
- Mikan, M.P., Harvey, H.R., Timmins-Schiffman, E., Riffle, M., May, D.H., Salter, I., Noble, W.S., and **Nunn, B.L.** (2020). Metaproteomics reveal that rapid perturbations in organic matter prioritize functional restructuring over taxonomy in western Arctic Ocean microbiomes. *Nature ISME J.*; pp.1-14
- Glass, J., Blanchard, J., Ranjan, P., Kretz, C.B., **Nunn, B.L.**, Johnson, A.M., McManus, J., and Stewart., F.J. (2019). Adaptations of Atribacteria to life in methane hydrates: hot traits for cold life. *bioRxiv*.
- Junge, K., Cameron, K., and **Nunn, B.L.** (2019). Diversity of Psychrophilic Bacteria in Sea and Glacier Ice Environments —Insights Through Genomics, Metagenomics, and Proteomics Approaches. In *Microbial Diversity in the Genomic Era* S. Das, and H.R. Dash, eds. (Academic Press), pp. 197-216.
- Saito, M.A., Bertrand, E.M., Duffy, M.E., Gaylord, D.A., Held, N.A., Hervey, W.J., Hettich, R.L., Jagtap, P.D., Janech, M.G., Kinkade, D.B., **Nunn, B.L.** *et al.* (2019). Progress and Challenges in Ocean Metaproteomics and Proposed Best Practices for Data Sharing. *Journal of Proteome Research* *18*, 1461-1476.
- Spencer, L.H., Horwith, M., Lowe, A.T., Venkataraman, Y.R., Timmins-Schiffman, E., **Nunn, B.L.**, and Roberts, S.B. (2019). Pacific geoduck (*Panopea generosa*) resilience to natural pH variation. *Comp Biochem Physiol Part D Genomics Proteomics* *30*, 91-101.

- Venkataraman, Y.R., Timmins-Schiffman, E., Horwith, M.J., Lowe, A.T., **Nunn, B.**, Vadopalas, B., Spencer, L.H., and Roberts, S.B. (2019). Characterization of Pacific oyster *Crassostrea gigas* proteomic response to natural environmental differences. *Mar Ecol Prog Ser* 610, 65-81.
- Timmins-Schiffman, E., Mikan, M.P., Ting, Y.S., Harvey, H.R., and **Nunn, B.L.** (2018). MS analysis of a dilution series of bacteria:phytoplankton to improve detection of low abundance bacterial peptides. *Sci Rep* 8, 9276.
- Smith, M.C., Timmins-Schiffman, E., Coton, M., Coton, E., Hymery, N., **Nunn, B.L.**, and Madec, S. (2018). Differential impacts of individual and combined exposures of deoxynivalenol and zearalenone on the HepaRG human hepatic cell proteome. *Journal of Proteomics* 173, 89-98.
- Riffle, M., May, D.H., Timmins-Schiffman, E., Mikan, M.P., Jaschob, D., Noble, W.S., and **Nunn, B.L.** (2018). MetaGOMics: A Web-Based Tool for Peptide-Centric Functional and Taxonomic Analysis of Metaproteomics Data. *Proteomes* 6.
- Blank, C., Easterly, C., Gruening, B., Johnson, J., Kolmeder, C.A., Kumar, P., May, D., Mehta, S., Mesuere, B., Brown, Z., Elias, J.E., Hervey, W.J., McGowan, T., Muth, T., **Nunn, B.L.**, Rudney, J., Tanca, A., Griffin, T.J., and Jagtap, P.D. (2018). Disseminating Metaproteomic Informatics Capabilities and Knowledge Using the Galaxy-P Framework. *Proteomes* 6.
- Timmins-Schiffman, E.B., Crandall, G.A., Vadopalas, B., Riffle, M.E., **Nunn, B.L.**, and Roberts, S.B. (2017a). Integrating Discovery-driven Proteomics and Selected Reaction Monitoring To Develop a Noninvasive Assay for Geoduck Reproductive Maturation. *Journal of Proteome Research* 16, 3298-3309.
- Timmins-Schiffman, E., May, D.H., Mikan, M., Riffle, M., Frazar, C., Harvey, H.R., Noble, W.S., and **Nunn, B.L.** (2017b). Critical decisions in metaproteomics: achieving high confidence protein annotations in a sea of unknowns. *Nature ISME J* 11, 309-314.
- Pino, L.K., Searle, B.C., Bollinger, J.G., **Nunn, B.L.**, MacLean, B., and MacCoss, M.J. (2017). The Skyline ecosystem: Informatics for quantitative mass spectrometry proteomics. *Mass Spectrom Rev.*
- Nunn, S., Chappell, P.D., Bonderenko, A., Jenkins, B., and **Nunn, B.L.** (2017). Phytoplankton plastid proteomics: Cracking open diatoms to understand plastid biochemistry under Fe limitation. *Journal of Emerging Investigators* 2, 1-8.
- May, D.H., Timmins-Schiffman, E., Mikan, M.P., Harvey, H.R., Borenstein, E., **Nunn, B.L.**, and Noble, W.S. (2016). An Alignment-Free "Metapeptide" Strategy for Metaproteomic Characterization of Microbiome Samples Using Shotgun Metagenomic Sequencing. *Journal of Proteome Research* 15, 2697-2705.
- Boyd, P.W., Dillingham, P.W., McGraw, C.M., Armstrong, E.A., Cornwall, C.E., Feng, Y.Y., Hurd, C.L., Gault-Ringold, M., Roleda, M.Y., Timmins-Schiffman, E., and **Nunn, B.L.** (2016). Physiological responses of a Southern Ocean diatom to complex future ocean conditions. *Nat Clim Change* 6, 207-+.
- Bridoux, M.C., Neibauer, J., Ingalls, A.E., **Nunn, B.L.**, and Keil, R.G. (2015). Suspended marine particulate proteins in coastal and oligotrophic waters. *J Marine Syst* 143, 39-48.
- Nunn, B.L.**, Slattery, K.V., Cameron, K.A., Timmins-Schiffman, E., and Junge, K. (2015). Proteomics of *Colwellia psycherythraea* at subzero temperatures - a life with limited movement, flexible membranes and vital DNA repair. *Environmental Microbiology* 17, 2319-2335.
- Timmins-Schiffman, E., Coffey, W.D., Hua, W., **Nunn, B.L.**, Dickinson, G.H., and Roberts, S.B. (2014). Shotgun proteomics reveals physiological response to ocean acidification in *Crassostrea gigas*. *BMC Genomics* 15, 951.
- Chan, C.Y., **Nunn, B.L.**, Goodlett, D.R., Koh, S.K., Zhou, L., and Chan, E.C.Y. (2014). Gluicat: A Novel Liquid Chromatography-Mass Spectrometry-Based Method for Profiling Protein Glutathionylation. *Drug Metab Rev* 45, 26-27.
- Moore, E.K., Harvey, H.R., Faux, J.F., Goodlett, D.R., and **Nunn, B.L.** (2014a). Protein recycling in Bering Sea algal incubations. *Mar Ecol Prog Ser* 515, 45-59.
- Moore, E.K., Harvey, H.R., Faux, J.F., Goodlett, D.R., and **Nunn, B.L.** (2014b). Electrophoretic extraction and proteomic characterization of proteins buried in marine sediments. *Chromatography* 1, 176-193.
- Poulson-Ellestad, K.L., Jones, C.M., Roy, J., Viant, M.R., Fernandez, F.M., Kubanek, J., and **Nunn, B.L.** (2014). Metabolomics and proteomics reveal impacts of chemically mediated competition on marine plankton. *Proc Natl Acad Sci U S A* 111, 9009-9014.
- Timmins-Schiffman, E., **Nunn, B.L.**, Goodlett, D.R., and Roberts, S.B. (2013). Shotgun proteomics as a viable approach for biological discovery in the Pacific oyster. *Conserv Physiol* 1, cot009.
- Nunn, B.L.**, Faux, J.F., Hippmann, A.A., Maldonado, M.T., Harvey, H.R., Goodlett, D.R., Boyd, P.W., and Strzepek, R.F. (2013). Diatom Proteomics Reveals Unique Acclimation Strategies to Mitigate Fe Limitation. *Plos One* 8.
- Morris, R.M., and **Nunn, B.L.** (2013). Sample Preparation and Processing for Planktonic Microbial Community Proteomics. *Method Enzymol* 531, 271-287.
- Mattes, T.E., **Nunn, B.L.**, Marshall, K.T., Proskurowski, G., Kelley, D.S., Kawka, O.E., Goodlett, D.R., Hansell, D.A., and Morris, R.M. (2013). Sulfur oxidizers dominate carbon fixation at a biogeochemical hot spot in the dark ocean. *Nature ISME J* 7, 2349-2360.
- Moore, E.K., **Nunn, B.L.**, Goodlett, D.R., and Harvey, H.R. (2012a). Identifying and tracking proteins through the marine water column: insights into the inputs and preservation mechanisms of protein in sediments. *Geochim Cosmochim Acta* 83, 324-359.
- Moore, E.K., **Nunn, B.L.**, Faux, J.F., Goodlett, D.R., and Harvey, H.R. (2012b). Evaluation of electrophoretic protein extraction and database-driven protein identification from marine sediments. *Limnol Oceanogr-Meth* 10, 353-366.

- Velasquez, I., **Nunn, B.L.**, Ibisani, E., Goodlett, D.R., Hunter, K.A., and Sander, S.G. (2011). Detection of hydroxamate siderophores in coastal and Sub-Antarctic waters off the South Eastern Coast of New Zealand. *Mar Chem* 126, 97-107.
- Nunn, B.L.**, Ting, Y.S., Malmstrom, L., Tsai, Y.S., Squier, A., Goodlett, D.R., and Harvey, H.R. (2010). The path to preservation: Using proteomics to decipher the fate of diatom proteins during microbial degradation. *Limnol Oceanogr* 55, 1790-1804.
- Morris, R.M., **Nunn, B.L.**, Frazar, C., Goodlett, D.R., Ting, Y.S., and Rocap, G. (2010). Comparative metaproteomics reveals ocean-scale shifts in microbial nutrient utilization and energy transduction. *Nature ISME J* 4, 673-685.
- McMillan, D.G., Velasquez, I., **Nunn, B.L.**, Goodlett, D.R., Hunter, K.A., Lamont, I., Sander, S.G., and Cook, G.M. (2010). Acquisition of iron by alkaliphilic bacillus species. *Appl Environ Microbiol* 76, 6955-6961.
- Nunn, B.L.**, Aker, J.R., Shaffer, S.A., Tsai, S., Strzepek, R.F., Boyd, P.W., Freeman, T.L., Brittnacher, M., Malmstrom, L., and Goodlett, D.R. (2009). Deciphering diatom biochemical pathways via whole-cell proteomics. *Aquat Microb Ecol* 55, 241-253.
- Hengel, S.M., Shaffer, S.A., **Nunn, B.L.**, and Goodlett, D.R. (2009). Tandem mass spectrometry investigation of ADP-ribosylated kemptide. *J Am Soc Mass Spectrom* 20, 477-483.
- Nunn, B.L.**, and Timperman, A.T. (2007). Marine proteomics. *Mar Ecol Prog Ser* 332, 281-289.
- Nunn, B.L.**, Shaffer, S.A., Scherl, A., Gallis, B., Wu, M., Miller, S.I., and Goodlett, D.R. (2006). Comparison of a *Salmonella typhimurium* proteome defined by shotgun proteomics directly on an LTQ-FT and by proteome pre-fractionation on an LCQ-DUO. *Brief Funct Genomic Proteomic* 5, 154-168.
- Nunn, B.L.**, and Keil, R.G. (2006). A comparison of non-hydrolytic methods for extracting amino acids and proteins from coastal marine sediments. *Mar Chem* 98, 31-42.
- Nunn, B.L.** (2004). Moving beyond amino acids : examinations of the protein component in sedimentary marine environments.
- Nunn, B.L.**, Norbeck, A., and Keil, R.G. (2003). Hydrolysis patterns and the production of peptide intermediates during protein degradation in marine systems. *Mar Chem* 83, 59-73.
- Holcombe, B.L.**, Keil, R.G., and Devol, A.H. (2001). Determination of pore-water dissolved organic carbon fluxes from Mexican margin sediments. *Limnol Oceanogr* 46, 298-308.

FIELDWORK

- 2022 PI: Orcas Island land-based field expedition: collected microbiome samples for genomics, proteomics, transcriptomics, metabolomics every 4 hours for 20 days. Designed experiment, mooring for direct pumping from bay to shore, and efficient on-shore sample collection regiment
- 2021 PI: Orcas Island land-based field expedition: collected microbiome samples for genomics, proteomics, transcriptomics, metabolomics every 4 hours for 20 days. Designed experiment, mooring for direct pumping from bay to shore, and efficient on-shore sample collection regiment
- 2019 Co-PI: Bermuda Time Series Station research cruise Diel Physiological rhythms in a tropical oceanic copepod
- 2005 Postdoctoral Fellow- Southern Ocean cruise on Palmer to Ross Sea to track siderophore chemistry
- 1998-2004 Graduate Student: >10 research cruises in Puget Sound, Washington Coast, and Mexican Margin to develop methods and quantify dissolved organic carbon diffusing from ocean sediments using 3 different methods: lander, core slicing (box core and multi-corer), and "sipper"

TEACHING AND MENTORING

- 2022 **UW Astrobiology Workshop: Simulated Mission to Detect Life.** Designed and led 1 week online workshop to detect life on another planet.
- 2017-2019 **CSI Seattle:** Developed and co-taught 5 credit Early Fall Start course on forensic analytical chemistry (paused due to Covid)
- 2001 **Teaching Assistant, Chemical Oceanography:** University of Washington

Guest Lectures: Haverford Marine Molecular Techniques (2021), Univ. of Rhode Island Molecular Methods (2021), International Metaproteomics Workshop (2021), Univ. of Washington Medicinal Chemistry Mass Spectrometry Course (2015-2019), Univ. of Texas Analytical Chemistry Course (2017)

STUDENT PHD COMMITTEES

Miranda Mudge- UW Molecular and Cellular Biology
 Jiwoon Park- UW Oceanography
 Jeremy Axworthy- UW Fisheries
 Damon May- UW Genome Sciences (PhD completed 2019)
 Molly Mikan- Old Dominion (PhD completed 2021)
 Jessica Faux- Univ. of Maryland (PhD completed 2016)
 Elisha Moore- Univ. of Maryland (PhD completed 2014)

SERVICE & OUTREACH

- 2022 **Developed and Led Astrobiology Workshop:** *Simulated Mission to Detect Life* workshop was designed for 18 UW Astrobiology PhD Students (>40hrs)
- 2021 **Provided Training at Galaxy P International Workshop:** Taught ocean mass spectrometry metaproteomic approaches in virtual course
- 2018 **Search Committee for Dept of Genome Sciences Faculty**
- 2013-2019 **Environmental Proteomics Summer High School Internships:** 1-2 students per summer conduct research, write peer-reviewed papers, and compete in science fairs (paused due to Covid)
- 2017 **Public Talk:** Wednesday Evenings at the Genome Lecture Series: "*What can the tiniest organisms teach us about the vast ocean?*"
- 2013-2018 **K-12 Public Outreach:** Development and Presentation of the Portable Hands-on LC-MS for K-12: PAWs on Science and Life Sciences Festivals at Pacific Science Center
- 2014,2016, 2018 **Session and Tutorial Leader:** ASLO International Ocean Sciences Meeting
- 2014 **Workshop Leader:** Science and Engineering Festival in Yakima, Washington
- 2005, 2008, 2017 **Motivational Speaker for Women in Science:** American Association of University Women's Annual Awards ceremony for highest achievement females in science, technology and Math and Women in Genome Science guest speaker
- 2013- **Research Website:** <http://www.environmentalproteomics.org>
- ongoing **Journal reviewer:** Environmental Microbiology; Nature; ISME; Marine Chemistry; Geochimica et Cosmochimica; Proteomics, Journal of Proteomics Research; Marine Ecology Progress Series; Molecular Cellular Proteomics, PNAS, Organic Geochemistry, Nature Climate Change etc.
- ongoing **Panel Reviewer:** NASA Panel Reviewer PSTAR program, NSF panel reviewer: Divisions of Chemical and Biological Oceanography, and Integrative Organismal Systems

SELECTED CONFERENCES

- Pollara, S.; Becker, J.; Nunn, B.; Downing, G; Overton, E, Chase, D. Harvey, E.; Whalen, K. (2020) Interkingdom signaling molecule leads to genomic instability in *Emiliana huxleyi* causing cell cycle arrest without mortality: Do bacteria use chemical signals to exploit eukaryotic cells? Feb 16-20. ASLO Ocean Sciences San Diego.
- Whalen, K. , Pollara, S.; Becker, J.; Nunn, B.; Downing, G; Overton, E, Chase, D. Harvey, E. The bacterial quorum sensing molecule 2-heptyl-4-quinolone physiological mode of action in *Emiliana huxleyi* controls critical pathways fundamental to algal metabolism and cell division. Feb 16-20. ASLO Ocean Sciences San Diego.
- Nunn, B.L., Mikan, M, Timmins-Schiffman, May, D.H, Riffle, M., Noble, W.S., Salter, H. Harvey, H.R.. (2020) Function over form: Using metaproteomics to identify the rates of functional and compositional changes within two Arctic microbiomes. Feb 16-20. ASLO Ocean Sciences San Diego.
- Mudge, M. C, Firth, E., Ewert, M., Hales, K., Fondrie, W. E., Junge, K. A., Nunn, B. L., (2020) Extreme colds provoke the synthesis of DNA protection proteins that have unique structures that grant stability. Feb 16-20. ASLO Ocean Sciences San Diego.
- Maas, A.E., Blanco-Bercial, L., McNamara-Bordewick, N., Nunn, B.L., Timmins-Schiffman, E., Tarrant, A.M. (2020) Biogeochemical Implications Of Diel Changes In Migratory Copepod Physiology. Feb 16-20. ASLO Ocean Sciences San Diego.

- Timmins-Schiffman, E., Boyd, P.W., Doney, S.C., Eggins, S., Ellwood, M.J., Fourquez, M., **Nunn, B.L.**, Strzepek, R.F., Subantarctic phytoplankton communities encounter climate change: Incubations to track the molecular underpinnings of the measured physiology. Feb 16-20. ASLO Ocean Sciences San Diego.
- Harvey, H.R., Nunn, B.L., Mikan, M., Timmins-Schiffman, May, D.H., Riffle, M., Noble, W.S., Salter, H. Coupling Organic Composition with Metaproteomics to Track the Functional Responses of Arctic Ocean Microbiomes to Carbon Inputs
- Pollara, S.; Becker, J.; Nunn, B.; Whalen, K. (2019) Investigating chemically induced stasis in marine coccolithophore *emiliania huxleyi* following exposure to the bacterial signaling molecule, HHQ. ASLO Aquatic Sciences Meeting San Juan Puerto Rico.
- R. Sajulga, C. Easterly, M. Riffle, B. Mesuere, R.G. Singh, T. Muth, S. Mehta, P. Kumar, J. Johnson, B. Gruening, D. May, W. J. Hervey, C. Kolmeder, A. Tanca, N. Held, M. Saito, B.L. Nunn, J. Rudney, T.J. Griffin, P. D. Jagtap (2018) Survey of metaproteomics software tools for functional microbiome analysis. International Metaproteome Symposium.
- Nunn, B.L. (2018) Microbial Sleuthing: Resolving the Power of Meta-Proteomics. Gordon Research Conference Marine Microbes. Invited speaker. July 1-6, 2018. Lucca Italy.
- Nunn, B.L. (2018) Taking protein inference out of the pipeline. Can we use peptides to link microbial taxa with their functional role in ocean ecosystems? Oral Session. Cascadia Proteomics. Seattle, WA. July 23-224, 2018.
- Jagtap; Easterly; Szeinbaum; Gruening; Parsons; Hubler; Mehta; Mesuere; Johnson; Argentini; Tanca; Kolmeder; Kumar; Martens; Rudney; Glass; Nunn; Griffin. (2018) Quantifying Functional Microbiomes: An integrated, quantitative metaproteomics approach reveals connections between taxa, function and protein expression in complex microbiomes. ASMS San Diego, CA.
- Easterly; Szeinbaum; Gruening; Parsons; Hubler; Mehta; Mesuere; Johnson; Argentini; Tanca; Kolmeder; Kumar; Martens; Rudney; Glass; Nunn; Griffin, Jagtap. (2018) Quantifying Functional Microbiomes: An integrated, quantitative metaproteomics approach reveals connections between taxa, function and protein expression in complex microbiomes. 2018 Galaxy Community Conference and Bioinformatics Open Source Conference. Portland, OR.
- Szeinbaum N, Henny, C., Crowe, S.A., Stewart, F.J., DiChristina, T.J., Reinhard, C.T., Nunn, B.L., Glass, J.B. New pathways for old metals: Metaproteomics reveals a novel betaproteobacterium with roles in metal and nitrogen cycling in the deep subsurface. Oral presentation by NS.
- Szeinbaum N, Henny, C., Crowe, S.A., Stewart, F.J., DiChristina, T.J., Reinhard, C.T., Nunn, B.L., Glass, J.B. Novel deep subsurface metal and nitrogen cycling pathway revealed by metaproteomics. Poster presentation by NS. Georgia Institute of Technology, Atlanta, GA, USA. Suddath Symposium on Chemical Ecology of Microbiomes, Atlanta, GA, Jan 30-31, 2018
- Kumar, E; Gilmore, G; Parsons; Hubler; Mehta; Mesuere; Johnson; Argentini; Tanca; Kolmeder; Martens; Rudney; Nunn, B.L.; Griffin, Riffle; Jagtap. (2018) Galaxy-based multi-stage two-step database searching pipeline for improved multi-omics analysis. ABRF
- Timmins-Schiffman, E.T., Nunn, B.L., Boyd, P. (2018) In-depth Community Proteomics Reveals a Sub-Antarctic Diatom's Physiological Acclimation to Future Ocean Change. 2018 Ocean Sciences Meeting, Portland, OR, 12-16 Feb.
- Nunn, B.L., Gilmore, J.G., Timmins-Schiffman, E.T., Junge. (2018) Metaproteomics of Glacial Meltwater Reveals Taxonomic and Functional Difference Across Time and Strata: Is This a New Puzzle Piece for Ocean Nutrient Modelers? 2018 Ocean Sciences Meeting, Portland, OR, 12-16 Feb.
- Mikan, M., Timmins-Schiffman, May, D.H., Riffle, M., Noble, W.S., Nunn, B.L., Salter, H. Rodger Harvey. Functional Response of Polar Bacterial Communities Under Variable Organic Inputs Revealed with Metaproteomic Analysis, 16S rRNA and Organic Compositional. 2018 Ocean Sciences Meeting, Portland, OR.
- Tisthammer, K., Nunn, B.L., Timmins-Schiffman, E., Richmond, R. Using proteomics to assess coral phenotypes in response to local chemical stressors. 2018 Ocean Sciences Meeting, Portland, OR, 12-16 Feb.
- Damon H. May, Emma Timmins-Schiffman, Molly P. Mikan, H. Rodger Harvey, Elhanan Borenstein, William S. Noble and B.L. Nunn. (2016) "Revealing phylogeny of microbiome samples with proteomics by translating shotgun sequencing reads". American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- Damon H. May, Emma Timmins-Schiffman, Molly P. Mikan, H. Rodger Harvey, Elhanan Borenstein, B.L. Nunn and William S. Noble. June 2016: American Society for Mass Spectrometry 2016 Annual Meeting: "Characterization of metaproteomes using databases of translated metagenomic sequencing reads". American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- Damon H. May, Emma Timmins-Schiffman, Molly P. Mikan, H. Rodger Harvey, Elhanan Borenstein, B.L. Nunn and William S. Noble. July 2016: Cascadia Proteomics Symposium 2016: "Characterization of metaproteomes using databases of translated metagenomic sequencing reads". American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- B.L. Nunn, Damon H. May, Emma Timmins-Schiffman, Molly P. Mikan, H. Rodger Harvey, Elhanan Borenstein, William S. Noble. (2016) "The peptide equivalent of the 16S rRNA assay to reveal functional and taxonomic distributions in the ocean". American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- B.L. Nunn, Emma Timmins-Schiffman, (2016) "An Open Source Proteomics and Metabolomics Visualization and Development Tool for Quantitative Mass Spectrometry Experiments". American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.

- Kristofer M. Gomes, BL Nunn, Bethany D. Jenkins (2016) "Plastid proteomics for elucidating iron limited remodeling of plastid physiology in diatoms." American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- Philip Boyd, BL Nunn, E Timmins Schiffman, Catriona Hurd, Peter Dillingham, Christina McGraw. (2016) "Physiological Diagnosis of a Southern Ocean Diatom's Responses to Future Complex Ocean Conditions."
- Emma Timmins-Schiffman, Damon H. May, Molly P. Mikan, H. Rodger Harvey, William S. Noble, BL. Nunn, (2016) "Achieving high confidence protein annotations in a sea of unknowns." American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- Molly P. Mikan, Emma Timmins-Schiffman, Damon H. May, H. Rodger Harvey, William S. Noble, BL. Nunn, (2016) "Proteomic Assessment of Polar Bacteria Phylogeny and Functional Shifts during POM Degradation at 0 degrees C." American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- Nunn BL, Faux JF, Hippmann AA, Maldonado MT, Harvey HR, Boyd PW, Strezepeck RS. (2014) Using proteomics to figure out how diatoms mitigate iron limitation. American Society of Limnology and Oceanography Ocean Sciences Meeting, Honolulu, HI.
- Nunn BL (2013) Pearls of Wisdom from a Proteomic Chemist: Passed down from father to daughter to you. Federation of Analytical Chemistry and Spectroscopy Society Annual SCIX Meeting.
- Nunn BL, Timothy Mattes, Sonia Ting, Giora Proskurowski, Michael MacCoss, Deborah Kelley, David Goodlett, Robert Morris (2013) Can we use conserved domains to reveal unique Protein functions Present in Hydrothermal Vent Plume Microbial communities? American Society of Mass Spectrometry Conference
- Harvey, H. R.; Nunn, B. L.; Faux, J. F.; Moore, E. K.; Goodlett, D. L.; (2012) A Methodology for protein extraction and proteomics characterization in marine matrices. American Society of Limnology and Oceanography Ocean Sciences Meeting.
- Neibauer, J.; Bridoux, M. C.; Ingalls, A. E.; Nunn, B. L.; Keil, R.; (2012) Comparative metaproteomics characterization of marine particulate proteins in productive shelf waters and oligotrophic offshore waters. American Society of Limnology and Oceanography Ocean Sciences Meeting.
- Nunn, B. L.; Moore, E. K.; Faux, J.; Goodlett, D. R.; Harvey, H. R.; (2012) From Bloom to Bust to the Bottom of the Ocean: Proteins that survive the journey and why. American Society of Limnology and Oceanography Ocean Sciences Meeting.
- Nunn BL; Cameron, K; Junge K. (2011) Protein expression in a polar marine bacterium at subzero temperatures. Poster presentation at Gordon Conference.
- Nunn BL, Ting Y, Moore E, Goodlett DR, Harvey RH (2010) What the Muck: Identifying preserved microbial proteins from Bering Sea Sediments. ISME Conference.
- Junge K.; Nunn BL; Christner B. Swanson BD. (2010). Examination of Immersion Freezing of Polar Marine Bacteria and Snow through Novel Techniques with Implications for Sea- and Tropospheric-Ice Formation and Life in Frozen Environments. Poster presentation at ASM Conference.
- Ting Y, Mooris RM, Rocap G, Goodlett DR, Nunn BL. (2010) Simplifying searches on environmental data sets: Finding protein functions from an ocean of unknowns. ISME Conference.
- Rocap G, Nunn BL, Reistetter EN, Callnan K, Krumhardt K, Roache Johnson K, Goodlett DR, Morris RM, Moore LR. (2010) Phosphorus stress in *Prochlorococcus*: Physiology, gene expression and proteomics. ISME Conference.
- Nunn, BL, Strzepek RF, Tsai YS, Ting Y; Goodlett DR. (2009) Mapping out the biochemical pathways of diatoms under iron limitation: Quantitative proteomic mass spectrometry. ASLO 2009 Aquatic Sciences Meeting.
- Morris RM, Nunn BL., Frazar C., Goodlett DR, Rocap G. (2009) The Microbial membrane meta-proteome reveals diverse patterns of protein expression in the South Atlantic Ocean. ASLO 2009 Aquatic Sciences Meeting.
- Rocap G., Nunn BL, Goodlett DR. et al. (2009) Phosphorus stress in *Prochlorococcus*: Physiology, gene expression and proteomics. ASLO 2009 Aquatic Sciences Meeting.
- Moore E, Nunn BL, Goodlett DR, Harvey RH. (2009) When Diatom Blooms Die: Tracking Proteins From Traps to Sediments in the Bering Sea Using Proteomic Mass Spectrometry. ASLO 2009 Aquatic Sciences Meeting.
- Rocap G, Nunn BL, Reistetter EN, Callnan K, Krumhardt K, Roache Johnson K, Goodlett DR, Morris RM, Moore LR. (2010) Phosphorus stress in *Prochlorococcus*: Physiology, gene expression and proteomics. Poster presented at ASLO Ocean Sciences Meeting Feb 22-26, Portland OR
- Morris RM, Nunn, BL; Frazar C Goodlett DR, Rocap G. (2009) The microbial membrane meta-proteome reveals diverse patterns of proteins expression in the South Atlantic Ocean. American Society of Limnology and Oceanography Aquatic Sciences Meeting
- Nunn BL, Freeman TL, Goodlett DR. (2008) Single-hit and biochemical pathway directed proteomic profiling. American Society of Mass Spectrometry conference, Denver, CO.
- Freeman TL, Nunn BL, Goodlett DR. (2008) Identification of biochemical pathway activity using mass spectrometry and probabilistic methods. American Society of Mass Spectrometry conference, Denver, CO.

COLLABORATORS (2019-2022)

Rodger Harvey (Old Dominion University, Ocean, Earth Atmospheric Sciences), Phillip W. Boyd (University of Tasmania, Marine and Antarctic Dept.), Tatiana Rynearson (Univ. of Rhode Island), Julia Kubanek (Georgia Tech), Jaqueline Padilla Gamillo (Univ. of Washington, Fisheries), Steven Roberts (Univ. of Washington, Fisheries), Robert Strzepeck (University of Tasmania, Marine and Antarctic Dept.), Karen Junge (Univ. of Washington, APL: Polar Programs), Kristen Whalen (Haverford College, Biochemistry Dept.), Bonnie Light (Univ. of Washington), Jennifer Glass (Georgia Tech., Earth and Atmospheric Sciences), Elizabeth Harvey (Univ. of New Hampshire), Pratik Jagtap (Univ. of Michigan), Bill Noble (Univ. of Washington, Dept of Genome Sciences), Robert Richmond (Univ. of Hawaii, Kewalo Marine Lab)