**Helen F. Fredricks, Research Specialist**

Department of Marine Chemistry and Geochemistry Tel: 508-289-3678

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**Professional Experience:**

Research Specialist, Dept. of Marine Chemistry and Geochemistry, WHOI, 11/2015 to present.

Research Associate III, Dept. of Marine Chemistry and Geochemistry, WHOI, 10/2010 to 11/2015.

Research Associate II, Dept. of Marine Chemistry and Geochemistry, WHOI, 12/2004 to10/2010.

**Education:**

**Postdoctoral Investigator**, Dept. of Geology and Geophysics, WHOI, 11/2001 to 12/2004.

**Postdoctoral Research Fellow**, Dept. of Env. Sciences, University of Plymouth, UK, 9/2000 - 9/2001.

**Doctor of Philosophy,** Organic Geochemistry, University of Plymouth, UK, 2000.

**Postgraduate Research Assistant**, Dept. of Env. Sciences, University of Plymouth, UK, 7/1998 to 9/1999. **B.Sc. (Hons.),** Analytical Science (1st Class Honors), University of Greenwich, UK, 1994.

**Research Interests**

Lipidomics: Discovery and structural identification of intact polar lipids, qualitative and quantitative lipidomic profiling of marine microorganisms in culture and communities in the wild.

**Professional activities**

Expanding the field of Marine Lipidomics. In 2016 we published a new tool for lipidomics the LOBSTAHS R package. I manage the daily operation of the lab, assist / train / mentor postdocs, visitors and other members of the Van Mooy lab group and wider WHOI community. Additionally, I operate and maintain our liquid- and gas-chromatograph - mass spectrometers.

**Professional Training**

Course in culturing techniques, NCMA (National Center for Marine Algae and Microbiota), Bigelow Laboratory or Ocean Sciences. East Boothbay, Maine. September 24-29th 2018.

“LC-MS techniques of electrospray, APCI and APPI.” 2-day course. American Society of Mass Spectrometry, St. Louis May 29th-30th 2015.

“Practical Course on Metabolomics Bioinformatics for Life Scientists.” 5-day course. Sponsored by European Molecular Biology Organization. European Bioinformatics Institute, Cambridge, UK, February 16th – 20th 2015. *1 of 30 attendees chosen from ~150 applicants.*

**Awards**

Technical Staff Training award #24142. $4,770 to attend culturing techniques course at the NCMA, Bigelow Laboratory for Ocean Sciences in 2018.

**Select relevant products. Co-author,** acknowledged.

**2021**

Bowman, J.S., Van Mooy, B.A., \*Lowenstein, D.P., \*Fredricks, H.F., Hansel, C.M., Gast, R., \*Collins, J.R., Couto, N., Ducklow, H.W., 2021. Whole Community Metatranscriptomes and Lipidomes Reveal Diverse Responses Among Antarctic Phytoplankton to Changing Ice Conditions. Front. Mar. Sci. 8, 119.

Hunter, J.E., \*Fredricks, H.F., Behrendt, L., Alcolombri, U., \*Bent, S.M., Stocker, R., Van Mooy, B.A.S., Submitted. Using high-sensitivity lipidomics to assess microscale heterogeneity in oceanic sinking particles and single phytoplankton cells. Environ. Sci. Tech.

Lowenstein, D.P., Mayers, K., \*Fredricks, H.F., \*Van Mooy, B.A.S., Submitted. Targeted and untargeted lipidomic analysis of haptophyte cultures reveals novel and divergent nutrient-stress adaptations. Org. Geochem.

**2020**

Miller, C.A., Holm, H.C., Horstman, L., George, J.C., **Fredricks**, H.F., Van Mooy, B.A.S., Apprill, A. 2020*.* Co-transformation of the gut microbiome and lipidome of bowhead whales provides novel insights into digestion. *ISME J.* 14 (3) 688-701

Becker, K.W., Harke, M.J., Mende, D.R., Muratore, D., Weitz, J.S., DeLong, E.F., Dyhrman, S.T., Van Mooy, B.A.S*., In press*. Combined pigment and metatranscriptomic analysis reveals highly synchronized diel patterns of phenotypic light response across domains in the open oligotrophic ocean. ISME J.

**2019**

Johns, C.T., Grubb, A., Nissimov, J.I., Natale, F., Knapp, V., Mui, A., **Fredricks**, H.F., Van Mooy, B.A.S., Bidle, K.D., 2019*.* The mutual interplay between calcification and coccolithovirus infection. *Environ. Microbiol.* 21, 1896-1915.

 Becker, K.W., Collins, J.R., Durham, B.P., Groussman, R.D., White, A.E., **Fredricks**, H.F., Ossolinski, J.E., Repeta, D.J., Carini, P., Armbrust, E.V., Van Mooy, B.A.S., 2018. Daily changes in phytoplankton lipidomes reveal mechanisms of energy storage in the open ocean. *Nat. Comm.*9, 5179.

**2018**

Collins, J.R., **Fredricks**, H.F., Bowman, J.S., Ward, C.P., Moreno, C., Longnecker, K., Marchetti, A., Hansel, C.M., Ducklow, H.W., Van Mooy, B.A.S., 2018. Geochimica et Cosmochimica Acta, 232, 244-264

Fulton, J.M., **Fredricks**, H.F., Van Mooy, B.A.S., 2017. Intact polar lipid export in the temperate western North Atlantic and Sargasso Sea. Org Geochem. 114,45-56.

**2016**

James R. Collins, Bethanie R. Edwards, Helen F. **Fredricks**, Benjamin A.S. Van Mooy. LOBSTAHS: An Adduct-Based Lipidomics Strategy for Discovery and Identification of Oxidative Stress Biomarkers. ANALYTICAL CHEMISTRY, 2016, 88(14) 7154-7162.

Jonathan E. Hunter, Miguel J. Frada, Helen F. **Fredricks**, Assaf Vardi and Benjamin A. S. Van Mooy. Targeted and untargeted lipidomics of Emiliania huxleyi viral infection and life cycle phases highlights molecular biomarkers of infection, susceptibility, and ploidy. FRONTIERS IN MARINE SCIENCE 2015, 2, p81

Collins, J. R., B. R. Edwards, H. F. **Fredricks**, and B. A. S. Van Mooy. LOBSTAHS: Lipid and Oxylipin Biomarker Screening through Adduct Hierarchy Sequences. 2016. R package version 0.99.8. Available via Bioconductor at <http://bioconductor.org/packages/LOBSTAHS>