

HENRY CAMERON HOLM, Ph.D.

Curriculum Vitae

New York, NY — hholm@ldeo.columbia.edu — (617) 281-6498 — henryholm.com

EDUCATION

Doctor of Philosophy

Year of completion: December 2023

MIT-WHOI Joint Program in Oceanography

MIT Dept. of Earth, Atmospheric, and Planetary Sciences, WHOI Dept. of Marine Chemistry and Geochemistry

Advisor: Dr. Benjamin A. S. Van Mooy

Bachelor of Arts

Year of completion: May 2016

Colorado College, Colorado Springs, CO

Major: Molecular and Cellular Biology

PROFESSIONAL EXPERIENCE

Postdoctoral Research Scientist

February 2024-Present

Lamont-Doherty Earth Observatory at Columbia University

Division of Biology & Paleo Environment

Research Assistant I

May 2017 - June 2018

Lab of Dr. Benjamin Van Mooy at Woods Hole Oceanographic Institution

Dept. of Marine Chemistry and Geochemistry

Guest Investigator

October 2016 - May 2017

Lab of Dr. Amy Apprill at Woods Hole Oceanographic Institution

Dept. of Marine Chemistry and Geochemistry

Lab Research Intern

July 2016

Lumio Health, Inc.

Allston, MA

PUBLICATIONS

Peer Reviewed Journal Articles

7. Weimin Liu, **Henry C Holm**, Julius S Lipp, Helen F Fredricks, Benjamin AS Van Mooy, Kai-Uwe Hinrichs, *Unraveling plankton adaptation in global oceans through the untargeted analysis of lipidomes* Science Advances. 11, eads4605 (2025).
6. Shavonna Bent, Daniel Muratore, Kevin W Becker, Benedetto Barone, Tara Clemente, Helen F Fredricks, **Henry C Holm**, David M Karl, Benjamin Van Mooy, *Lipid biochemical diversity and dynamics reveal phytoplankton nutrient-stress responses and carbon export mechanisms in mesoscale eddies in the North Pacific Subtropical Gyre* Frontiers in Marine Science. 11, 1427524 (2024).
5. **H. C. Holm**, H. F. Fredricks, S. M. Bent, D. P. Lowenstein, K. R Schrage, B. A. S. Van Mooy, *Lipid composition, caloric content, and novel oxidation products from microbial communities within seasonal pack ice cores*. Geochimica et Cosmochimica Acta. 368, 12-23 (2024).
4. **H. C. Holm**, H. F. Fredricks, S. M. Bent, D. P. Lowenstein, J. E. Ossolinski, K. W. Becker, W. M. Johnson, K. Schrage, B. A. S. V. Mooy, *Global ocean lipidomes show a universal relationship between temperature and lipid unsaturation*. Science. 376, 1487–1491 (2022).
3. A. Apprill, **H. Holm**, A. Santoro, C. Becker, M. Neave, K. Huguen, A. Richards Donà, G. Aeby, T. Work,

- L. Weber, S. McNally, *Microbial ecology of coral-dominated reefs in the Federated States of Micronesia*. *Aquat. Microb. Ecol.* 86, 115–136 (2021).
2. R. A. Glabonjat, G. Raber, **H. C. Holm**, B. A. S. Van Mooy, K. A. Francesconi, *Arsenolipids in Plankton from High- and Low-Nutrient Oceanic Waters Along a Transect in the North Atlantic*. *Environ. Sci. Technol.* 55, 5515–5524 (2021)
1. C. A. Miller, **H. C. Holm**, L. Horstmann, J. C. George, H. F. Fredricks, B. A. S. Van Mooy, A. Apprill, *Coordinated transformation of the gut microbiome and lipidome of bowhead whales provides novel insights into digestion*. *ISME J.* 14, 688–701 (2020)

In Review

Daniel Lowenstein, **Henry Holm**, Helen Fredricks, Benjamin Van Mooy, *Lipid stoichiometry and biomarkers reflect microbial acclimation and nutrient stress across the Atlantic Ocean*
Preprint: <https://doi.org/10.21203/rs.3.rs-8022751/v1>

Henry Holm, Helen Fredricks, Benjamin Van Mooy, *Glycerolipids track sinking particle sources and remineralization in two ocean basins*
Preprint: <https://doi.org/10.31223/X5QF72>

In Prep

Henry Holm, Abby P Shauma, Amanda Ellis, Ben Acosta, Anna Chen, Galen A. McKinley, Sonya T. Dyhrman, and Sarah J. Hurley, *Choosing phytoplankton experimental conditions for the future ocean with climate models*. For submission in 2026.

OCEANOGRAPHIC CRUISE AND FIELD WORK PARTICIPATIONS

LMG2301 - West Antarctic Peninsula; Southern Ocean. 2023. R/V Laurence M. Gould

EN667 - Gulf of Maine; North Atlantic. 2021. R/V Endeavor

SG2105 - North Atlantic. 2021. R/V Sarmiento de Gamboa

LMG1810 - West Antarctic Peninsula; Southern Ocean. 2018. R/V Laurence M. Gould

AR30-3 - Irminger Sea; North Atlantic. 2018. R/V Neil Armstrong

AE1812 - Sargasso Sea; North Atlantic. 2018. R/V Atlantic Explorer

Whale Microbiome Sampling - Cape Cod Bay. Spring 2017. R/V Rosita

AWARDS AND HONORS

NSF Antarctic Service Medal

Year: 2018

National Science Foundation

Alexandria, Virginia

GRANTS AND FELLOWSHIPS

C-CoMP Postdoctoral Fellowship

Year: 2024-2026

\$ 170,000.00

C-CoMP NSF Science and Technology Center, Woods Hole, MA

LDEO Climate Center Award (Vetlesen Foundation)

Year: 2023

\$ 21,968.00

Columbia University, New York, NY

Lamont-Doherty Earth Observatory Postdoctoral Fellowship

Year: 2023

\$ 147,500

Columbia University, New York, NY

INVITED TALKS

Membrane lipids in sea ice and beyond: Tracing microbial adaptations to the ocean environment

Date: April 28th, 2025

CU Boulder Institute of Arctic and Alpine Research (INSTAAR) Seminar. Boulder, CO.

Microbial glycerolipids in the global ocean: Environmental controls and sinking flux dynamics

Date: October 22th, 2024

DISCO XXIX, Dissertations Symposium in Chemical Oceanography. Lihue, HI.

Global ocean lipidome reveals compositional controls of temperature, depth, and inorganic nutrients.

Date: August 3rd, 2022

Gordon Research Conference - Organic Geochemistry. Holderness, NH.

The effects of temperature and depth on ocean planktonic glycerolipids.

Date: July 12th, 2022

International Symposium of Plant Lipids. Grenoble, France.

CONFERENCE ACTIVITY

Presentations

Sinking particle lipidomics tracks particle sources and remineralization in two ocean basins.

H. Holm, Helen F Fredricks, Margaret Estapa, Colleen Durkin, Benjamin AS Van Mooy

Date: Februray 22th, 2024

2024 AGU Ocean Sciences Meeting. New Orleans, LA.

Global ocean lipidome reveals a universal relationship between temperature and lipid unsaturation.

H. Holm, H.F. Fredricks, S.M. Bent, D.P. Lowenstein, J.E. Ossolinski, K.W. Becker, W.M. Johnson, K. Schrage, B.A.S. Van Mooy.

Date: Februray 28th, 2022

2022 AGU Ocean Sciences Meeting, Virtual Meeting.

Posters

Lipidomics of suspended and sinking POC during EXPORTS North Pacific.

B.A.S. Van Mooy and **H. Holm**

Date: 2019

EXPORTS PI Meeting. Williamsburg, VA.

Presentations by Coauthors

Floating fats from phytoplankton affect the fate of carbon.

B.A.S. Van Mooy, S.M. Bent, K.D. Bidle, H.F. Fredricks, **H. Holm**, Z. Girard, J.W. Krause, D.P. Lowenstein, M. Prakash, A.V. Subhas, K. Thamatrakoln

Date: Februray 19th, 2024

2024 AGU Ocean Sciences Meeting. New Orleans, LA.

Microbial lipid stoichiometry and biomarkers reflect geochemical gradients and community structure across the North and South Atlantic.

D.P. Lowenstein, H.F. Fredricks, **H.C. Holm**, B.A.S. Van Mooy

Date: Februray 22th, 2024

2024 AGU Ocean Sciences Meeting. New Orleans, LA.

Untargeted Lipidomic Study Reveals Temperature-Dependent Composition of Organic Compounds in the World's Oceans.

W. Liu, **H. Holm**, J. Lipp, B.A.S. Van Mooy, K. Hinrichs

Date: September 10th, 2023

IMOG 2023. Montpellier, France.

Microbes, lipids, and digesta: biogeography of the gut microbiome and lipidome of bowhead whales *Balaena mysticetus*.

C.A. Miller, Horstmann-Dehn, J.C. George, **H. Holm**, H.F. Fredricks, B.A.S. Van Mooy, A. Apprill.

Date: October 23 – 27, 2017.

Society for Marine Mammalogy. Halifax, Nova Scotia, Canada.

CAMPUS TALKS

Membranes and Adaptions to the Cellular Environment

Date: November 10th, 2024

LDEO 75th Anniversary Seminar, Lamont-Doherty Earth Observatory. Palisades, NY.

Using high-resolution lipidomics to reveal ocean microbe adaptions and organic matter fate in the surface ocean.

Date: April 1st, 2024

BPE Seminar, Lamont-Doherty Earth Observatory. Palisades, NY.

Glycerolipid diversity and dynamics in the global ocean

Date: July 26, 2022

MCG Seminar, Department of Marine Chemistry and Geochemistry, WHOI. Woods Hole, MA.

TEACHING, MENTORSHIP, and SUPERVISION

Guest Lecturer at Columbia University

Organic Geochemistry, Fall 2025

Microbial Oceanography, Fall 2025

Formal Mentorship

WHOI-MIT Joint Program Student Mentor - for Sabrina Elkassas, 2020-2022

C-CoMP Bridge-to-PhD Fellow Mentor - For Amanda Ellis, 2024-2025

Other Graduate Mentorship and Training of Undergraduates

WHOI Van Mooy Lab: Kelsey Perry (2019), Merissa Small (2019), Lisa Coe (2019), Noa Shevchuk (2022), Mackenzie Curtice (2022).

Application Mentor

WHOI JP-ASK program for multiple applicants, 2021-2023.

SERVICE TO PROFESSION

Participant - OCB Scoping Workshop

"Laying the foundation for a potential future BioGeoSCAPES program."

Year: 2021

Woods Hole Oceanographic

Core Student Committee - WHOI MCG Department Candidate Search

Year: 2020

Woods Hole Oceanographic

Manuscript Reviewer

Journals: *Marine Chemistry*, *Geochimica et Cosmochimica Acta*, *Polar Biology*

PROFESSIONAL MEMBERSHIPS

Association for the Sciences of Limnology and Oceanography
Member since 2022

American Association for the Advancement of Science
Member since 2022