

Research Goal:

Leverage physiology and genomics to improve predictions of marine microbial ecology in response to changing climate.

Education

Ph.D. 2015
Oceanography, University of Washington

Master of Science 2012
Oceanography, University of Washington

Bachelor of Science 2009
Chemistry, MIT

Awards

Dean A. McManus Excellence in Teaching Award 2013

NOAA Earnest F. Hollings Scholarship 2007-2009

Research Positions

Assistant Professor 2019 - present
College of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Postdoctoral Research Scientist 2016-2019
Biology and Paleo Environment, Lamont-Doherty Earth Observatory, Columbia University
Dyhrman Lab: The impact of climate change on marine microbial interactions

Visiting Scholar 2017-2019
Integrative Oceanography Division, Scripps Institution of Oceanography, UC San Diego
Barton Lab: Integrating genomics into ecological modeling frameworks

Graduate Research Assistant 2009-2015
Center for Environmental Genomics, University of Washington
Armbrust Lab: Mechanisms and drivers of phytoplankton acclimation to climate change

Research Assistant Feb-August 2009
Center for Ecology and Evolutionary Biology, University of Oregon
Wood Lab: Monitoring Oregon's coastal harmful algae

NOAA Earnest F. Hollings Intern June- August 2008
Ted Stevens Marine Research Institute, Juneau, Alaska
Nutritional Ecology Lab: Fatty acid analysis of whale blubber to determine diet

Undergraduate Researcher, May-August 2007

Whitehead Institute, Cambridge, Massachusetts

Ploegh Lab: Sortase enzyme as a molecular tool for modifying and labeling proteins

Undergraduate Researcher, Feb- June 2006

Chemistry Department, MIT

Drennan Lab: Elucidating the structure of a Ni hydrogenase with x-ray crystallography

Funding

NSF Biological Oceanography Grant- Collaborative Research: Ecology and Evolution of Microbial Interactions in a Changing Ocean

Principal Investigator: Gwenn Hennon, Co-Principal Investigator: Sonya Dyhrman.

Award amount: \$683,575, start date: March 1, 2019

Publications

(* Indicates student mentees)

Hennon, G. M. M.; Dyhrman, S. T., "Progress and promise of omics for predicting the impacts of climate change on harmful algal blooms" (2019) *Harmful Algae*

Hennon, G. M. M.; Williamson*, O. M.; Hernández Limón*, M.; Haley, S. T.; Dyhrman, S. T., "Non-linear physiology and gene expression responses of harmful alga *Heterosigma akashiwo* to rising CO₂" (2019) *Protist*, 170(1), 38-51, doi: 10.1016/j.protis.2018.10.002

Hennon, G. M. M.; Morris, J.J.; Haley, S.; Zinser, E. R.; Durrant, A., Entwistle, E.; Dokland, T.; Dyhrman, S. T.. "The impact of elevated CO₂ on *Prochlorococcus* and microbial interactions with 'helper' bacterium *Alteromonas*" (2018) *ISME Journal*, 12, 520-531, doi: 10.1038/ismej.2017.189

Hennon, G. M. M.; Hernández Limón*, M.; Haley, S. T.; Juhl, A.; Dyhrman, S. T., "Diverse CO₂-Induced Responses in Physiology and Gene Expression among Eukaryotic Phytoplankton" (2017) *Frontiers in Microbiology, Aquatic Microbiology*, 8 (2547), 1-14, doi: 10.3389/fmicb.2017.02547

Hamilton*, M.; **Hennon G. M. M.**; Needoba, J.; Maxey, K.; Morales, R.; Peterson, T. D.; Shatz, M.; Swalwell, J.; Zuber, P.; Armbrust, E.V.; Ribalet, F. "Dynamics of Teleaulax cryptophyte prey during red water blooms in the Columbia River Estuary" (2017) *Journal of Plankton Research*, 39(4), 589-599, doi: 10.1093/plankt/fbx029

Howard, E.; Durkin, C.; **Hennon, G. M. M.**; Ribalet, F.; Stanley, R., "Biological production, export, and phytoplankton communities across 8000 km of the South Atlantic: Basin scale similarity with mesoscale variability". (2017) *Global Biogeochemical Cycles*, 31(7), 1066-1088, doi: 10.1002/2016GB005488

Hennon G. M. M. "Uncovering Mechanisms of Phytoplankton Response to Climate Change" (2015) Ph.D. Dissertation, University of Washington

Hennon, G. M. M.; Ashworth, J.; Groussman*, Ryan D.; Berthiaume, C., Morales, R.; Baliga, N.; Orellana, M.; Armbrust, E.V.. "Diatom acclimation to elevated CO₂ via cAMP signalling and coordinated gene expression". (2015) *Nature Climate Change*, 5, 761-765, doi: 10.1038/nclimate2683

Hennon, G. M. M. ; Quay, P.; Morales, R. L.; Swanson*, L. M.; Armbrust, E. V. . "Acclimation conditions modify physiological response of the diatom *Thalassiosira pseudonana* to elevated CO₂ concentrations in a nitrate-limited chemostat" (2014) *Journal of Phycology*, 50, 243-253, doi: 10.1111/jpy.12156

Gwenn M. Miller Hennon

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Antos, J.M.; **Miller, G.M.**; Grotenbreg, G.M.; Ploegh, H.L.. Lipid Modification of Proteins through Sortase-Catalyzed Transpeptidation. (2008) *Journal of the American Chemical Society*, 130(48), 16338-16343, doi: 10.1021/ja806779e

**Publications
in prep**

Hennon, G. M. M.; Howard, E., Ribalet, F., Bhatia, M. P., Torres-Beltran, M., Hallam, S., Stanley, R., Armbrust, E.V., “High resolution picocyanobacterial physiology in the Atlantic Ocean: implications for primary production in a warming ocean”. (in prep) *Limnology and Oceanography*

Hernández Limón*, M. D.; **Hennon, G. M. M.**; Harke, M.; Frischkorn, K.; Haley, S.; Dyhrman, S. T., “Metatranscriptomes in the North Subtropical Pacific Gyre reveal patterns of diel gene expression in *Emiliania huxelyi*” (in revision) *Environmental Microbiology*

**Select
Presentations**

Hennon, G. M. M.; Morris, J. J.; Haley, S. T.; Zinser, E.; Durrant, A. R.; Entwistle, E.; Dokland, T. and Dyhrman, S. T.. “Elevated CO₂ alters the microbial interaction between *Prochlorococcus* and ‘helper’ bacterium *Alteromonas*” (2018) Ocean Sciences Meeting, Oral Presentation, Portland Oregon, USA

Hennon G. M. M. “CO₂ alters the interaction of a globally important phytoplankton and its helper bacterium” (2017) Invited Speaker, Ecology, Behavior and Evolution Seminar, University of California San Diego, USA

Hennon G. M. M. “Uncovering mechanisms of phytoplankton response to rising CO₂” (2017) Invited Speaker, Marine Sciences Seminar, University of Connecticut Avery Point, USA

Hennon G. M. M.; Haley, S.T.; Morris, J. J.; Zinser, E. R.; Dyhrman, S.T.. “Gene expression of a globally relevant marine bacteria model system in response to elevated CO₂” (2016) ISME, Montreal, Canada

Hennon G. M. M.; Howard, E.; Ribalet, F; Stanley, R.; Armbrust E.V.. Continuous flow cytometry and gas flux measurements across nutrient and temperature gradients in the Atlantic Ocean. (2015) ASLO Aquatic Sciences Meeting, Grenada, Spain

Hennon, G. M. M.; Ashworth J.; Morales, R.; Berthiaume, C.; Baliga, N.; Orellana, M.; Armbrust, E. V. “Gene expression reveals mechanisms of diatom acclimation to elevated CO₂”. (2014) Ocean Global Change Biology, Gordon Research Conference, Waterville Valley, New Hampshire, USA

Hennon, G. M.; Armbrust, E. V.; “Acclimated Physiology and Gene Expression of the Diatom *Thalassiosira pseudonana* under Elevated CO₂” (2013) ASLO Aquatic Sciences Meeting, New Orleans, LA, USA

Hennon, G.M.; Armbrust, E.V.; Ashworth, J.; Lee, A.; Orellana, M.V.; Baliga, N.S.; “Acclimated Physiology of the Diatom *Thalassiosira pseudonana* under Pre-Industrial and Future Levels of CO₂: Implications for Carbon Sequestration” (2011) PSA annual meeting, Seattle, WA, USA

Bowman, J; Chan, K. Y.; Durkin, C.; **Hennon, G.**; Smith, D.; Sullivan, B. “Is Diversity Related to Service Provision Across an Ecosystem?” (2011) World Conference on Marine Biodiversity, Aberdeen, Scotland

McKibben, SM; Strutton, PG; Wood, M; **Miller, G**; Eberhart, B; Trainer, V.

Gwenn M. Miller Hennon

ghennon@ideo.columbia.edu

“Development of a Predictive Model for In Situ Domoic Acid Concentrations off the Oregon Coast”. (2010) Ocean Sciences Meeting

Teaching

Guest Lecturer: Microbial Oceanography, Columbia University, December 2016
Mechanisms of microbial acclimation and adaptation to environmental change

Guest Workshop Leader: Communicating Earth and Environmental Science, Columbia University, September 2016.

Collaborated with a theater group to create a new workshop to teach graduate students effective communication techniques.

Teaching Assistant: Biological Oceanography, University of Washington, 2012
Received *Dean A. McManus Excellence in Teaching Award* 2013.

Wrote and graded problem-sets, lead the weekly review section, gave a lecture on ocean acidification.

Teaching Assistant: Introduction to Oceanography, University of Washington, 2011
Lead a weekly review section, graded homeworks and exams.

Guest Teacher: Mathematics, Engineering, Science Achievement (MESA), Seattle, 2010.
Made plankton nets, field trip to Golden Gardens beach Seattle, and microscopy unit with minority middle school students.

Teaching Assistant: Human Anatomy and Physiology, University of Alaska Southeast, 2001. Lead a weekly office hours, gave a lecture and assisted in human dissection.

Mentoring

Maria Hernandez Limon, Bridge to PhD Program Scholar 2016- 2018
Current graduate student at University of Chicago

Olivia Williamson, REU intern and Earth Institute Research Assistant 2016
Undergraduate Thesis Mentee, Barnard College 2017
Current graduate student at University of Miami, RSMAS

Ryan Groussman, Levinson Emerging Scholar, University of Washington 2014-2016
Current graduate student at University of Washington

Maria Hamilton, Initiative for Maximizing Student Diversity Program Scholar 2013-2015
Current graduate student at UC Santa Cruz, MBARI

Lyndsey (Sandwick) Swanson, Undergraduate School of Oceanography,
University of Washington, 2013-2014

Jenny Lai, Undergraduate School of Oceanography,
University of Washington, 2012

Programming Languages

R: scripting, stats and graphics

Python: scripting, parsing bioinformatics files, graphics

Unix: base functions, bioinformatics pipelines, supercomputing

Research Cruises

NGA-LTER June – July 2019
R/V Sikuliaq, Seward Alaska

MESO SCOPE June - July 2017
R/V Kilo Moana, Honolulu Hawaii to offshore mesoscale eddies

Deep Dissolved Organic Matter Cruise, March- May 2013
R/V Knorr, Montevideo Uruguay to Barbados

Geomics Cruise, May 2012
R/V Thomas G. Thompson, Seattle Washington to offshore on line P

Coastal Margin Observation and Prediction Cruise, May 2010
R/V Wecoma, Newport Oregon, Oregon Coast

Monitoring Oregon Coastal Harmful Algae Cruise, March 2009
R/V Elakha, Newport Oregon, Oregon Coast

Professional Societies and Service

Undergraduate Curricular Committee Member: 2014-2015
University of Washington, School of Oceanography

Future of Ice Hiring Committee Member: 2014-2015
University of Washington, College of the Environment

Peer Reviewer for:
Harmful Algae

Applied Microbiology and Biotechnology 2018- present

ISME Journal 2017- present

Marine Ecology Progress Series 2017-present

Philosophical Transactions B 2017-present

Genome Research 2016- present

PLoS ONE 2015-present

Molecular Ecology 2014-present

Society Member:

International Society for Microbial Ecology (ISME), 2015-present

Association for the Sciences of Limnology and Oceanography (ASLO) 2012-present

Psychological Society of America (PSA) 2010-present