

Kristen E. Whalen

Curriculum Vitae

Haverford College
370 Lancaster Ave
Haverford, PA 19041

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Education

- 2008 **Ph.D., Biological Oceanography**, Massachusetts Institute of Technology/ Woods Hole Oceanographic Institution.
Dissertation: *Functional characterization and expression of molluscan detoxification enzymes and transporters involved in dietary allelochemical resistance*.
Advisor: Dr. Mark E. Hahn
- 2001 **B.S., Marine Biology**, University of North Carolina-Wilmington. Honors in Biology, *Summa cum laude*. Thesis title: *Antifouling activity of Caribbean sponge extracts*.
Advisor: Dr. Joseph Pawlik

Positions Held/Research Experience

- 2016-present **Assistant Professor** of Biology, Haverford College
- Reappointed, July 2019
 - Dependent Care Leave (FMLA), Fall 2019
 - Junior Leave, Spring 2020/Fall 2020
- 2013 – 2016 **Research Associate III**, Woods Hole Oceanographic Institution, Woods Hole, MA
Marine natural product drug discovery; metabolomics; multidrug resistance.
- 2010 – 2012 **Sempra Postdoctoral Fellow**, Scripps Institution of Oceanography, La Jolla, CA
Cell/Developmental Biology; Advisor: Dr. Amro Hamdoun
- 2008 – 2010 **National Science Foundation International Postdoctoral Fellow**, University of New South Wales, Sydney, Australia & University of California, Santa Barbara, Santa Barbara, CA. Ecological Genomics. Advisors: Drs. Peter Steinberg and Gretchen Hofmann
- 2008 – 2012 **Guest Investigator**, Biology Department, Woods Hole Oceanographic Institution
- 2006 – 2008 **Graduate Research Assistant**, MIT/WHOI Joint Program
- 2003 – 2006 **National Science Foundation Graduate Research Fellow**
- 2002 **Research Assistant**, Georgia Institute of Technology, Supervisor: Dr. Julia Kubanek
- 2001 **Summer Student Fellow**, Woods Hole Oceanographic Institution. Supervisor: Dr. Mark Hahn

Fellowships

- 2010 – 2012 Scripps Institution of Oceanography - Sempra Postdoctoral Fellowship
- 2008 – 2010 National Science Foundation – International Postdoctoral Research Fellowship
- 2003 – 2006 National Science Foundation - Graduate Research Fellowship

Grants Authored in Support of Research

- 2021 Recipient of the Henry Dreyfus Teacher-Scholar Award in Chemistry, **\$75,000**
PI, Charles E. Kaufman Foundation, Integrated Research-Education Grant: Elucidating the protective role of bacterial signals in algal host-virus dynamics; **\$100,000**
Lead PI; (NSF 2041748); National Science Foundation, Biology Directorate Symbiosis Infection & Immunity; Collaborative Research: RUI: Implications of bacterially driven cross-kingdom chemical interactions; 2021-2024; Total = \$1,215,132 (**\$374,267 to PI Whalen at Haverford College**)
- 2020 PI; Faculty Research Grant; “Bacterial signals interfere with host-viral interactions”; **\$6000**
- 2019 Co-PI, National Science Foundation, Biological Oceanography; Collaborative Research: Building a framework for the role of bacterial-derived chemical signals in mediating phytoplankton population dynamics. Supplemental funding, **\$22,914.00.**
- 2018 PI; Faculty Research Grant; “Employing discovery-driven proteomics to understand physiological vulnerability of phytoplankton to quorum sensing cues”; **\$4500**
- 2017 PI; Faculty Research Grant; “PharmEcology: Mining Marine Microbes for Efflux Pump Inhibitors”; **\$6,000**
- 2017 Co-PI (NSF 1657808); National Science Foundation, Biological Oceanography; Collaborative Research: Building a framework for the role of bacterial-derived chemical signals in mediating phytoplankton population dynamics; 2017- 2020; Total = \$904,200 (**\$356,028.00 to Co-PI Whalen at Haverford College**)
- 2016 Mellon Tri-College Faculty Brainstorming Grant to examine the Philosophy of Science in Teaching and Research with Professors Collin Rice; Alan Baker; Gregory Davis.
- 2015 Co-Investigator; R21 – NIH, National Institute of Allergy and Infectious Disease (AI119311-01); “Discovery and development of RND pump inhibitors from marine microbial sources” – 2015-2017; \$357,368.00. Lead author of the proposal. (**\$100,000 subaward to Haverford College**)
- 2013 Co-PI; WHOI Ignition Grant – “Ecological leads: Mining microbes for novel therapeutics to combat multidrug resistance in bacteria.” Co-PI with Tracy Mincer, WHOI; **\$50,000**
- 2008 National Science Foundation – International Postdoctoral Research Fellowship (NSF0754319) entitled “Profiling Marine Herbivore Gene Expression in Response to Algal Chemical Defenses”; **\$181,660.00**
- 2006 Lead PI.-Ocean Life Institute (WHOI) -Tropical Research Initiative Award, Grant entitled “Biochemical Ecology on Coral Reefs” (2006 – 2008); **\$74,923.00**
- 2005 Lead PI.-Ocean Ventures Fund, Grant entitled “Characterization of Detoxification Enzymes in the Marine Gastropod (*Cyphoma gibbosum*) in Response to a Gorgonian Diet (2005 – 2007); **\$14,960.00**
- 2004 Conchologists of America, Student award, Grant entitled “Detoxification and Transport of Dietary Metabolites in Marine Molluscs”; **\$1,476.04**
- 2004 SEASPACE Student Scholarship; **\$2,000.00**

- 2003 Lead PI.- Perry Institute of Marine Science/Caribbean Marine Research Center, National Undersea Research Center, Grant entitled “Physiological fate of dietary allelochemicals in generalist and specialist marine molluscs”; **\$7,520.00**

Awards

- 2015 Robert R. Whelan Award in Chemistry - Woods Hole Oceanographic Institution
- 2012 ABC2012 Young Investigator Award, 4th FEBS Special Meeting – ATP-Binding Cassette Proteins, Innsbruck, Austria
- 2011 Best Poster Award, Developmental Biology of Sea Urchin Meeting XX, Woods Hole, MA
- 2001 UNC-Wilmington Undergraduate Student Research & Travel Award
- 2001 Biology Achievement Award, UNCW
- 2001, 2000 Charles and Kay Bolles Marine Biology Scholarship, UNCW
- 2000 DeLoach Scholarship – Excellence in Organic Chemistry, UNCW
- 2001 - 1998 Chancellor’s Achievement Award of Excellence, UNCW
- 2001 - 1999 Glaxo-Wellcome ‘Women in Science’ Scholarship
- 1999 Outstanding General Chemistry Student Award, UNCW

Patents

- 2017 - USSN: 14/797,951; Mincer, T.J. and Whalen, K.E., entitled “Methods and Compositions for Increasing Antibiotic Activity”, Woods Hole Oceanographic Institution; GT Ref: 168111.010301
- Dr. Whalen conceived and performed all experiments described in the patent and assisted writing the provisional patent with members of the WHOI Office of Technology Transfer

Publications in Peer Reviewed Journals

*denotes shared lead authorship; undergraduate student co-authors are underlined

20. 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*. 12;6(3):e00009-21. (doi:10.1128/mSphere.00009-21)
19. Keller, A.G., Apprill, A., Labaron, P., Robbins, J., Romano, T. A., Overton, E., Rong, Y., Yuan, R., Pollara, S., and **Whalen, K.E.**, (2021) Characterizing the culturable surface microbiomes of diverse animals. *FEMS Microbiology Ecology*. (https://doi.org/10.1093/femsec/fiab040)
18. Deering, R. W.*, **Whalen, K.E.***, Alvarez, I., Daffinee, K., Beganovic, M., LaPlante, K.L., Kishore, S., Zhao, S., Cezairliyan, B., Yu, S., Rosario, M., Mincer, T. J., Rowley, D.C., (2021) Identification of a bacteria-produced benzisoxazole with antibiotic activity against multi-drug resistant *Acinetobacter baumannii*. *The Journal of Antibiotics*. 1-11. (https://doi.org/10.1038/s41429-021-00412-7)
17. **Whalen, K.E.**, Becker, J.W., Schrecengost, A., Gao, Y., Giannetti, N., and Harvey, E.L., (2019) Bacterial alkylquinolone signaling contributes to structuring microbial communities in the ocean. *Microbiome*. 7:93
16. **Whalen, K.E.**, Kirby, C., Nicholson, R.M., O’Reilly, M., Moore, B.S., and Harvey, E.L., (2018) The chemical cue tetrabromopyrrole induces rapid cellular stress and mortality in phytoplankton. *Scientific Reports*. 8:15498. doi:10.1038/s41598-018-33945-3

15. Lamborg, C., Mincer, T., Buchanan, W., Collins, C., Swarr, G., Ganguli, P., **Whalen, K.**, Bothner, M., & Valiela, I., (2018) Mercury Speciation and Retention in a Salt Marsh Undergoing Long-term Fertilization. *Estuarine Coastal and Shelf Science* 218: 188-196. doi: 10.1016/j.ecss.2018.11.031
14. Harvey, E.L.* , Deering, R.W., Rowley, D.C., El Gamal, A., Schorn, M., Moore, B.S., Johnson, M., Mincer, T., **Whalen, K.E.***, (2016) A bacterial quorum-sensing precursor induces mortality in the marine coccolithophore, *Emiliana huxleyi*. *Frontiers in Microbiology*. 7:59 (doi: 10.3389/fmicb.2016.00059)
13. El Gamal, A., Agarwal, V., Siethelm, S., Rahman, I., Schorn, M., Sneed, J.M., Louie, G.V., **Whalen, K.E.**, Mincer, T.J., Noel, J.P., Paul, V.J., and Moore, B. S., (2016) A biogenetic and structural basis for the synthesis of a highly brominated microbial coral chemical cue. *Proceedings of the National Academy of Sciences* (doi:10.1073/pnas.1519695113).
12. **Whalen, K.E.**, Poulson, K.L., Deering, R.W., Rowley, D.C., Mincer, T.J., (2015) Enhancement of antibiotic activity against multidrug resistant bacteria by efflux pump inhibitor, 3,4-dibromo-2,5-dione, isolated from a *Pseudoalteromonas* sp. *Journal of Natural Products*. 73 (3): 402-412.
11. **Whalen, K.E.**, Reitzel, A. and Hamdoun, A., (2012) Actin polymerization controls the activation of multidrug efflux at fertilization by translocation and fine-scale positioning of ABCB1a on microvilli. *Molecular Biology of the Cell*. 22(18):3663-3672.
 - a. Selected for consideration for MBoC Paper of the Year.
 - b. Awarded the journal cover for MBoC
10. **Whalen, K.E.**, Starczak, V.R., Nelson, D.R., Goldstone, J.V, and Hahn, M.E., (2010) Gorgonian host-inducible cytochrome P450s from the predatory gastropod *Cyphoma gibbosum*: evolution and function. *BMC Ecology* 10: 24 (doi:10.1186/1472-6785-10-24)
9. **Whalen, K.E.**, Sotka, E.E., Goldstone, J.V. and Hahn, M.E., (2010) The role of multixenobiotic transporters in molluscan predators as counter-defense mechanisms against dietary chemical stress. *Comparative Biochemistry and Physiology, Part C* 152(3): 288-300.
8. **Whalen, K.E.**, Lane, A.L, Kubanek, J. and Hahn, M.E., (2010) Biochemical warfare on the reef: the role of glutathione transferases in consumer tolerance of dietary prostaglandins. *PLoS One* 5(1): e8537.
7. Sotka, E.E.* , Forbey, J., Horn, M., Poore, A.G.B., Raubenheimer, D., and **Whalen, K.E.***, (2009) The emerging role of pharmacology in aquatic plant-herbivore interactions. *Integrative and Comparative Biology* 49: 291-313.
6. **Whalen, K.E.**, Morin, D., Lin, C.Y., Tjeerdema, R., Goldstone, J.V., Hahn, M.E., (2008) Proteomic characterization and cDNA cloning of glutathione S-transferases from the generalist marine gastropod, *Cyphoma gibbosum*. *Archives of Biochemistry and Biophysics* 478: 7-17.
5. **Whalen, K.E.**, Carvan, M.J., Hestermann, E.V., Jensen, B.A., Hahn, M.E., (2004) Structure-activity relationships for polychlorinated biphenyl binding to the aryl hydrocarbon receptor in a Dolphin kidney cell line. *Marine Environmental Research*. 58:131-141. (Abstract)
4. Hahn, M.E., Jensen, B.A., Kim, E-Y., Karchner, S.I., Franks, D.G., Lapseritis, J.M., **Whalen, K.E.**, Carvan, M.J., (2003) Molecular and cellular approaches to understanding the sensitivity of marine mammals to persistent organic pollutants. *Organohalogen Compounds*. 62:253-256.
3. Kubanek, J., **Whalen, K.E.**, Engel, S., Kelly, S., Henkel, T.P., Fenical, W., and Pawlik,

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J.R., (2001) Multiple defensive roles for triterpene glycosides from two Caribbean sponges. *Oecologia*. 131:125-136.

Book Chapters

2. Sotka, E.E. and **Whalen, K.E.**, (2008) Herbivore offense in the sea: the detoxification and transport of secondary metabolites, Algal Chemical Ecology, Amsler, C.D. Editor, Springer, New York, pp. 203-221.

Feature Articles

1. **Whalen, K.E.**, (2008) *Biochemical Warfare on the Reef*. Oceanus Magazine, Woods Hole Oceanographic Institution Vol 47, pp. 13-15.

Teaching

Courses Taught

BIOL201 Molecules, Cells, and Organisms (Spring 2017, 2018, 2019, 2023)
BIOL201 Introduction to Biology Laboratory (Spring 2017, Spring 2019)
BIOL300 Advanced Laboratory in Biology (Spring 2018, Fall 2018, 2021, 2022)
BIOL303 Structure and Function of Macromolecules (Fall 2016)
BIOL326 Biochemical Adaptations (Fall 2017, Spring 2021, Spring 2022)
BIOL456 Advanced Topics in Biology of Marine Life (Fall 2017, Fall 2018, Fall 2021)
BIOL415 Senior Tutorial in Marine Natural Product Drug Discovery (2016-2022)
BIOL380 Independent Study in Biology at Haverford (13 students; 2016-2022)
BIOL495 Crafting an Inclusive Biology Curriculum (DEI effort) (105 students; Fall 2020)

Guest Lecturing/Outreach

Guest Lecture, BIOL325 – Marine Biology, University of Pennsylvania; 2017, 2019.

Guest Lecturer, Roger Williams University, NATSC 204 Principles of Oceanography, (Spring 2015)

Course Instructor at High Tech Middle School, Chula Vista, CA for an afterschool program for 7-8th grade girls in Science Immersion Program (Spring 2012) for underrepresented identities.

Guest Lecturer, Chemical Ecology, San Diego State University, Course Biol 596, Lecture entitled – PharmEcology: a physiological understanding of marine consumer-prey interactions (Fall 2010)

Instructor for the BE WiSE Education Program in Oncofertility, which engages young women in science, technology, engineering and math (STEM) learning experiences in collaboration with UC San Diego Health Sciences (Summer 2010)

Guest Lecturer, Endangered Waters – Human Interaction with Ocean Ecosystems, Tufts University Experimental College, Medford, MA. Lecture – Emerging threats to coral reefs: are we already at the ‘tipping point’ (Fall 2007)

Guest Lecturer, Biological Oceanography (Graduate Level), WHOI/MIT Course 7.47, Lecture entitled – Introduction to Coral Reefs: Biology, Ecology & Global Threats (Feb - June 2006)

Ocean Sciences Enrichment Teacher (K-5), Mullen Hall Elementary, Falmouth, MA; participant in a educational outreach program funded by NSF in collaboration with the Centers of Ocean Sciences Education Excellence (COSEE) program of New England; developed lesson plans to promote ocean science literacy in the classroom (Feb – June 2006)

Kristen Whalen, CV

Falmouth High School Science Fair Judge, Falmouth, MA (2006) and Lawrence Middle School Science Mentor, Falmouth, MA (2005)

Volunteer for the Marine Mammal Standing Network, Wilmington, NC (1998-2001)

Professional Service and Affiliations

Session Chair; Aquatic Sciences/ASLO Meeting, February 23-March 2, 2019

Session Co-chair, Ocean Sciences/AGU, February 26-March 3, 2017

Beckman Scholar Mentor (2018 – 2023)

- Beckman Scholars Supervised: Megan Coolahan (2021-2022); Oscar Garrett (2022-2023)

Reviewer for the following peer reviewed journals and funding agencies:

- National Science Foundation - Integrative Organismal Systems
- National Science Foundation – Biological Oceanography
- National Science Foundation – Graduate Research Fellowship Program
- National Science Foundation – Understanding the Rules of Life: Emergent Networks
- National Oceanic and Atmospheric Administration (NOAA) – Office of Ocean Exploration and Research
- California Sea Grant
- CalFed-Delta Science Program
- Journals: *Proceedings of the National Academy of Sciences*, *Nature Communications*, *Science Advances*, *Journal of Chemical Ecology*, *Natural Product Reports*, *Frontiers in Microbiology*, *Environmental Microbiology*, *PLoS One*, *Aquatic Toxicology*, *Gene*, *Marine Biotechnology*, *Marine Drugs*, *Comparative Biochemistry and Physiology*, *Ecotoxicology*, *Developmental and Comparative Immunology*, *Molecular Ecology*, *Journal of Shellfish Research*, *Open Marine Biology Journal*.

Invited Editor in *Frontiers of Microbiology: Antimicrobials, Resistance and Chemotherapy*

Member of the Scientific diving team at the University of New South Wales, Sydney, Australia (2008-2010)

American Academy of Underwater Sciences (AAUS) Diving Control Board Member for Woods Hole Oceanographic Institution (2004 – 2008)

Science Judge, National Ocean Sciences Bowl, MIT, (January 2007)

SCUBA certifications: PADI Open water certification; NAUI Nitrox and Dry Suit certification; AAUS scientific diving certification (1999 – present) Over 400 research dives logged.

Advanced First Aid, CPR, and DAN oxygen administration certified

Professional memberships: AAAS, American Chemical Society; Society for Integrative and Comparative Biology, American Society of Limnology and Oceanography

Committee and Administrative Responsibilities at Haverford College

- Faculty representative, Pre-Health Advisor (2018-2019, 2021-2023)
- Faculty representative, Center for Peace and Global Citizenship (2018-2019)
- Faculty representative, KINSC Steering Committee (2017-2018, 2021-2023)
- Advisor: Biology majors, undeclared sophomores and freshman (2016 – present)

- Study Abroad Coordinator, Biology Department Representative (2017 – 2019)

Mentoring

Postdoctoral advisor

- Dr. Amanda Platt, Postdoctoral Investigator, Haverford College (2021 – present)
- Dr. Jamie W. Becker, Postdoctoral Investigator, Haverford College (2017 – 2019), *currently an Assistant Professor at Alvernia University*

Mentoring in Course-based Undergraduate Research Experience (CURE) in BIO300/301

- Dr. Hannah Reich, University of New Hampshire (Fall 2022)
- Dr. Sveinn Einarsson, Haverford College (Fall 2021)

Research Assistant

- Scott Pollara, Haverford College (2019 – 2020)

Current Undergraduates Researchers – senior thesis students indicated with asterisk (*)

1. ***Carlos Muniz** '23, Biology Major, Chesick Scholar, PENN PASS Fellow, Beckman Finalist
2. ***Isha Upender** '23, Biology Major, Health Studies Minor, Neuroscience Minor
3. ***Oscar Garrett** '23, Biology Major, ENVS Minor, Biochemistry Concentrator; KINSC Summer Scholar ('21)
4. ***Olivia Yoshida** '23, Biology Major, KINSC Summer Scholar ('22)
5. ***Claire Cywes** '23, Biology Major, Health Studies Minor
6. **Hannah Ivester** '24, Biology Major
7. **Marta Wilbrink** '25

Lab Alumni – Former Undergraduates Researchers in the Whalen Lab at Haverford – title of thesis indicated for 23 senior thesis students

1. **Megan Coolahan** ('22). Thesis title: “*Effects of the bacterial signaling molecule 2-heptyl-4-quinolone (HHQ) on DNA repair and virus-induced mortality in the marine phytoplankton in *Emiliana huxleyi*.*” B.S. Biology/Environmental Studies Minor and Spanish Minor with High Honors, *summa cum laude*. 20-21 Beckman Scholar, Ariel G. Loewy Prize for Senior Research in Biology. Planning on attending medical school.
 - i. First author review in preparation
 - ii. Presented at the 2022 Ocean Sciences Meeting in Honolulu, Hawaii
2. **Genevieve Dallmeyer-Drennen** ('22). Thesis title: “*Investigating the physiological effects of a bacterial signaling molecule, 2-heptyl-4-quinolone on viral infection in *Emiliana huxleyi*.*” B.S. Biology/Environmental Studies Minor, Velay Summer Scholar ('21). Currently a graduate student in marine biology at James Cook University, Australia.
 - i. Presented at the 2022 Ocean Sciences Meeting in Honolulu, Hawaii
3. **Eleanor Greene** ('22). Thesis title: “*Investigating a chemically mediated algal-bacterial interaction on microscopic and macroscopic scale.*” B.S. Biology/Environmental Studies Minor. Planning on attending graduate school in environmental conservation and sustainability.
 - i. Presented at the 2022 Ocean Sciences Meeting in Honolulu, Hawaii
4. **Naomi Fukuda** ('22). Thesis title: “*A bacterial signal protects phytoplankton from viral mortality: direct targeting of the virus or a result of triggering a physiological cascade?*” B.S. Biology/Environmental Studies Minor. Planning on attending dental school.
5. **Sijing “Lucy” Zhao** ('22). Thesis title: “*Investigating the antibacterial mechanism of a marine-bacterially derived fatty acid.*” B.S. Biology, Velay Summer Scholar ('20), Beckman Finalist, *magna cum laude*. Currently a Ph.D. student in Biology at Harvard University.
 - i. Co-author on Deering et al. 2021, *J. of Antibiotics*
6. **Isabelle Johnson** ('22), B.S. Biology/Biochemistry Concentration; KINSC Summer Scholar ('19). Current a research technician at the University of Pennsylvania

- i. Presented at 2020 Ocean Sciences Meeting in San Diego, CA.
7. **Emma Castiblanco** ('21). Thesis title: "*Quantifying viral infection in globally important algal species exposed to quorum sensing signals.*" B.S. Biology/Environmental Studies Minor. Currently employed at Green Iowa AmeriCorps.
8. **Shreya Kishore** ('21). Thesis title: "*Mining the marine microbial environment to discover novel antibiotics and antibiotic adjuvants against multi-drug resistant pathogens.*" B.S. Chemistry/Biochemistry Concentration/Health Studies Minor, High Honors in Chemistry, *summa cum laude*, American Institute of Chemists Award, Kovaric Fellow ('18), KINSC Summer Scholar ('19). Currently a Ph.D. student in Chemical and Systems Biology at Stanford University.
 - i. Co-author on Deering et al. 2021, *J. of Antibiotics*
9. **Han Yang** ('21). Thesis title: "*Investigating the physiological impacts of a bacterial-signaling molecule that mediates marine phytoplankton-virus interactions.*" B.S. Biology, Ariel G. Loewy Prize for Senior Research in Biology, *cum laude*. Currently a post-graduate researcher at Yale University and planning to attend graduate school in cell biology.
10. **Rebecca Boden** ('21). B.S. Biology/Environmental Studies Double Major. Currently in a Masters program in Environmental Science with a concentration in Wildlife and Biodiversity at the University of Freiburg, Germany.
11. **Davis Chase** ('21). B.S. Chemistry/Biochemistry Concentration, KINSC Summer Scholar ('18). Currently a Ph.D. student in Chemistry at Yale University
 - i. Co-author on Pollara et al. 2021, *mSphere*
12. **Yuying Rong** ('21). B.S. Biology
 - i. Co-author on Keller et al. 2021, *FEMS Microbiology Ecology*
13. **Yongjie "Jason" Gao** ('20). Thesis title: "*Effects of 2-heptyl-4-quinolone (HHQ) on *Emiliana huxleyi* cell physiology and marine bacteria community dynamics.*" B.S. Biology/Neuroscience Minor, *magna cum laude*, High Honors in Biology, Ariel G. Loewy Prize for Senior Research in Biology. Currently a Ph.D. student in Neuroscience at Cornell.
 - i. Co-author on Pollara et al. 2021, *mSphere*
 - ii. Presented at 2020 Ocean Sciences Meeting in San Diego, CA.
14. **Carlotta Pazzi** ('20). Thesis title: "*Verifying marine bacteria metabolites for treatment of neurodegenerative diseases in *Caenorhabditis elegans*.*" B.S. Biology/Health Studies Minor/Italian and Italian Studies Minor, Honors in Biology, Marian E. Koshland Prize in Biology. Currently a medical student at the Sidney Kimmel Medical College at Thomas Jefferson University.
15. **Daniel Joffe** ('19). Thesis title: "*Investigating the effects of (Z)-14-methyltetra-4-decenoic acid on multidrug resistant Gram-negative bacteria.*" B.S. Biology, Honors in Biology. Currently a medical student at the Sidney Kimmel Medical College at Thomas Jefferson University.
16. **Ellysia Overton** ('19). Thesis title: "*Exploring the physiological response of phytoplankton to bacterially derived marine natural products.*" B.S. Biology/Environmental Studies Minor, Velay Summer Scholar ('18). Currently a Ph.D. student at Princeton University in Chemistry.
 - i. Co-author on Keller et al. 2021, *FEMS Microbiology Ecology*
 - ii. Presented at 2019 Aquatic Sciences/ASLO Meeting in Puerto Rico, USA.
17. **Scott Pollara** ('19). Thesis title: "*Chemically-mediated control: molecular and physiological impacts of exposure to bacteria-derived infochemicals tetrabromopyrrole and 2-heptyl-4-quinolone on *Emiliana huxleyi*.*" B.S. Biology/Biochemistry Concentration/Global Asia Minor, High Honors in Biology, *magna cum laude*, Beckman Scholar Finalist, KINSC Summer Scholar ('18), Ariel G. Loewy Prize for Senior Research in Biology. Currently a Ph.D. student in Biological Oceanography at Dalhousie University.
 - i. First author on Pollara et al. 2021, *mSphere*

- ii. Presented at 2019 Aquatic Sciences/ASLO meeting in Puerto Rico, USA and 2020 Ocean Sciences Meeting in San Diego, CA.
18. **Ruiyi Yuan** ('19). Thesis title: "*From Ocean to Neurodegenerative Disease Treatment: Drug discovery from marine bacteria for tauopathy using Caenorhabditis elegans.*" B.S. Biology/Statistics Minor/Health Studies Minor, *cum laude*, High Honors in Biology, Mayo Clinic Undergraduate Fellowship, Ariel G. Loewy Prize for Senior Research in Biology. Currently a medical student at the University of Rochester.
 - i. Co-author on Keller et al. 2021, *FEMS Microbiology Ecology*
19. **Grayton Downing** ('18). Thesis title: "*Chemically Induced Death: Determining the underlying physiological and transcriptional changes in Emiliania huxleyi after 2-heptyl-4-quinolone (HHQ) induced cellular death.*" B.S. Biology/ Psychology Minor, Honors in Biology. Currently a medical student at the Sidney Kimmel Medical College at Thomas Jefferson University.
 - i. Co-author on Pollara et al. 2021, *mSphere*
20. **Nicole Giannetti** ('18). Thesis title: "*Response of heterotrophic bacterioplankton to HHQ: a quorum-sensing molecule with algicidal properties.*" B.S. Biology, Honors in Biology. Currently a medical student at SUNY Upstate.
 - i. Co-author on Whalen et al. 2019, *Microbiome*
21. **Russell Nicholson** ('18). Thesis title: "*The Battle in the Bloom: Diverse marine bacteria produce algicidal secondary metabolites that induce phytoplankton mortality through multiple mechanisms of action.*" B.S. Biology/Environmental Studies Minor, KINSC Summer Scholar, Summer research at Woods Hole Oceanographic Institution with Kristen in Summer 2016, NOAA Fisheries Observer, Scallop research at Virginia Institute of Marine Science.
 - i. Presented at 2018 Ocean Sciences Meeting in Portland, OR.
 - ii. Co-author on Whalen et al. 2018, *Scientific Reports*
22. **Mia O'Reilly** ('18). Thesis title: "*Screening for exometabolomes of Photobacterium halotolerans isolates for novel efflux pump inhibitors to combat antibiotic resistance.*" B.S. Biology/Neuroscience Minor, Honors in Biology, EMT. Currently research assistant at Penn Medicine.
 - i. Co-author on Whalen et al. 2018, *Scientific Reports*
23. **Anna Schrecengost** ('18). Thesis title: "*Mining the marine environment for antibiotic adjuvants: discovery and characterization of novel antibiotic compounds isolated from marine bacteria.*" B.S. Biology/Biochemistry Concentration, Velay Summer Scholar ('17), Irving Finger Award in Biology. Currently a Ph.D. student at the Graduate School of Oceanography at the University of Rhode Island.
 - i. Undergraduate research assistant with Kristen in Bergen, Norway at the Mesocosm Center.
 - ii. Co-author on Whalen et al. 2019, *Microbiome*
 - iii. Presented at 2017 American Society of Microbiology meeting in New Orleans, LA.
24. **Abigail Keller** ('17). Thesis title: "*Exploring biological and chemical diversity in the culturable surface microbiomes of marine eukaryotes.*" B.S. Biology/Environmental Studies Minor, KINSC Summer Scholar ('16), Irving Finger Award in Biology, Summer research at Woods Hole Oceanographic Institution with Kristen in Summer 2016. Completed a Masters of Marine Affairs at the University of Washington and currently a Ph.D. student in Environmental Science Policy & Management at the University of California Berkeley.
 - i. Presented at the 2017 Aquatic Sciences/ASLO Meeting in Honolulu, Hawaii
 - ii. First author on Keller et al. 2021, *FEMS Microbiology Ecology*
25. **Karyn Sheline** ('17). Thesis title: "*The search for novel antibiotics and efflux pump inhibitors in the fight against multidrug resistance in Gram-negative bacteria.*" B.S. Biology/Psychology Minor, Honors in Biology, *cum laude*. Currently a medical student at UCSD medical school.

26. **Kathryn Sommer** ('17). Thesis title: "*The fight against multi-drug resistant pathogens: searching for an antibiotic or efflux pump inhibitor synthesized by marine Pseudomonas aeruginosa.*" B.S. Biology/Anthropology Minor. Honors in Biology. Currently a medical student at the Sidney Kimmel Medical College at Thomas Jefferson University.
27. **Koji Shimomura** ('17). Thesis title: "*Bioassay-guided fractionation of Tenacibaculum skagerrakense exudate.*" B.S. Biology, NIH postbaccalaureate program

Woods Hole Oceanographic Institution

28. **Elena Perry**, undergraduate at Yale University. Fulbright Scholar. Currently pursuing a Ph.D. at Caltech.
29. **Caroline Collins**, undergraduate at Connecticut College. Currently pursuing a MPH at UC Berkeley School of Public Health.

Scripps Institution of Oceanography

30. **Julia Roche**, high school student, presented summer research project at Scripps to Senior White House Officials in Washington, D.C., Currently a Technical Development Program Engineer at Edwards Lifesciences.
31. **Amber Merrill**, undergraduate at UCSD.
32. **Annalisa Carson**, undergraduate at Wheaton College.
33. **Kazuya Koda**, undergraduate at UCSD, currently a manufacturing specialist at Gilead Sciences.

University of New South Wales

34. **Sarah Graham**, Honors student, School of Biological, Earth and Environmental Sciences, UNSW, (2008-10). Thesis title: *Chemical defenses and metals: effects on feeding preferences of a common marine consumer.*

Presentations

2022 - Invited talk entitled "Bacterial Quorum Sensing Signal Interferes with Viral Replication Not Infection in *Emiliana huxleyi*," at Ocean Sciences Meeting, Virtual, Feb 28-March 4, 2022.

2020 – Invited speaker, Bio & Geo Microbial Interactions Group, Weizmann Institute of Science, November 2020.

Invited poster entitled "Bacterial quorum sensing signal arrests phytoplankton cell division and protects against virus-induced mortality," at Ocean Sciences Meeting, San Diego, CA, Feb 18 – 22, 2020

Invited speaker, Department of Biology, James Madison University in Harrisonburg, VA.

2019 - Invited speaker, Department of Ocean, Earth, and Atmospheric Sciences, Old Dominion University, Norfolk, VA.

Invited talk entitled "Deciphering the ocean's chemoinformatic landscape: a tale of two molecules," at Aquatic Sciences Meeting/ASLO, Puerto Rico, February 27 – March 3, 2019.

Invited speaker, University of Alabama, Department of Biology

Invited speaker, University of Pennsylvania, Department of Microbiology

2018 - Invited speaker, Temple University, Biology Department

Invited speaker, St. Josephs University, Biology Department

Invited poster entitled "Listening In: How Bacterial Signaling Molecules Influence Microbial Community Composition and Phytoplankton Physiology", Gordon Research Conference in Marine Microbes, Tuscany, Italy, July 1 – 6, 2018

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2017 - Invited talk entitled "Battle in the Bloom: Bacterial regulation of algal community structure in the ocean", Ocean Sciences Meeting/AGU, Honolulu, Hawaii, February 26-March 3, 2017

2016 - Invited speaker, entitled "PharmEcology: decoding the ocean's chemoinformatic landscape", Bryn Mawr College, Biology Department; October 24, 2016

Invited speaker, oral presentation entitled "Microbial signaling in a vast ocean: the varied roles of small molecules", Woods Hole Oceanographic Institution, Biology Department; June 30, 2016.

Invited speaker, entitled "Battling the Superbugs: New Drugs from the Sea", Massachusetts Association of Public Health Nurses, Cape Cod Chapter – 20th Annual Conference, Ocean Edge Resort, Brewster, MA; April 13-14, 2016

Invited speaker, entitled "Louder than Words: Bacterial cell signals are drivers of algal lysis", Gordon Research Conference in Marine Natural Products, Ventura, CA; March 6-11, 2016

Invited poster presentation at Ocean Sciences Meeting/AGU, New Orleans, February 21-26, 2016. Entitled "Bacterial infochemicals are drivers of algal lysis."

Invited speaker, Villanova University, Biology Department; January 14, 2016

2015 - Invited speaker, Central Michigan University, Biology Department; December 7, 2015

Invited speaker, Haverford College, Biology Department; November 19, 2015

Invited speaker, Woods Hole Oceanographic Institution Reception for Community Volunteers, - Highlighting my work in marine biology and drug discovery; September 24, 2015

Invited speaker, Science Made Public Lecture Series, Woods Hole Oceanographic Institution, July 28, 2015.

Interviewed on Living Lab on the Point with Dr. Heather Goldstone, WCAI, Cape and Islands NPR. May 19, 2015. Discussing my work in marine natural products drug discovery.

Invited presenter at the Early Stage Life Sciences Technology Conference XI. Merck Research Laboratories, April 8, 2015. A showcase of 16 life sciences technologies developed at research institutions and recently formed companies to an audience of angel investors, venture capitalists and corporate investors.

Invited speaker, Roger Williams University, Department of Biology, Marine Biology and Environmental Science, March 17, 2015.

Invited speaker, University of Rhode Island, College of Pharmacy, February 11, 2015.

2014 - Poster presentation at American Society of Microbiology, General Meeting, May 2014. Entitled "Identification of Novel Small Molecules Secreted by Marine Bacteria with Bactericidal Activity Against Multi-Drug Resistant Gram-Negative Pathogens."

Invited Speaker, Bigelow Laboratory for Ocean Sciences, February 12, 2014

2013 - Oral presentation, Marine Chemistry & Geochemistry, Woods Hole Oceanographic Institution, November 12, 2013. Entitled: "PharmEcology: Mining marine bugs for new drugs."

2012 - Oral presentation at the Developmental Biology of Sea Urchin XXI Meeting, Woods Hole, MA, October 24-27, 2012. Entitled: "Activation of multidrug efflux transport by microvillar tip localization."

- Invited speaker, Webinar hosted by the journal *Cellular Signaling* on Sept. 20, 2012. Entitled: "Exploring cellular processes with super-resolution microscopy".
- Invited speaker, Presentation at the 4th Federation of European Biochemical Society on ATP-Binding Cassette (ABC) Proteins: From Multidrug Resistance to Genetic Diseases, Innsbruck, Austria, March 3-9, 2012. Entitled: "Actin-dependent translocation of ABCB1a during early embryogenesis revealed by 3D-structured illumination microscopy."
- 2011 - Invited Speaker, Biology Department, San Diego State University, San Diego, CA, Sept. 26, 2011. Entitled: "Investigating chemical defense mechanisms in marine invertebrates: Merging genomics and cell biology"
- Oral presentation at Pollution Response in Marine Organisms Meeting, Long Beach, CA, May 15-18, 2011. Entitled: "Cellular defense mechanisms: merging genomics and cell biology."
- Invited Speaker, Director's Circle Gala, Scripps Institution of Oceanography, La Jolla, CA; May 12, 2011. Entitled: "Survival at Sea: Imaging embryo cellular defenses."
- Poster presentation at the Developmental Biology of Sea Urchin XX Meeting, Woods Hole, MA, April 27-May 1, 2011. Entitled: "Just a few microns can make all the difference: implications of membrane reorganization on multidrug efflux activity at fertilization."
- Invited Speaker, Scripps Institution of Oceanography 2011 Science Showcase, January 20, 2011. Entitled: "The Art of Chemical Conversation in the Sea."
- 2010 - Invited Speaker, Marine Biology Research Division, Scripps Institution of Oceanography/UC-San Diego, April 26, 2010. Entitled: "Ecological genomics of consumer-prey interactions: from genes to communities."
- Invited Speaker, Environmental, Earth and Ocean Sciences, University of Massachusetts-Boston, April 6th, 2010. Entitled: "Ecological genomics of consumer-prey interactions: from genes to communities."
- Invited Speaker; Interdepartmental Graduate Program in Marine Science, UC-Santa Barbara, Winter Colloquium, February 16, 2010. Entitled: "Consumer offense: biochemical strategies for coping in a chemical defended world."
- 2009 - Poster presentation at the Gordon Research Conference: Evolutionary and Ecological Functional Genomics, July 12-17, 2009, Tilton, NH. Entitled: "A transcriptomic fingerprint of life in the sea: understanding allelochemical tolerance in the sea urchin."
- Invited Speaker; Society of Integrative and Comparative Biology (SICB) 2009 Meeting, January 3-7, 2009, Boston, MA. Entitled: "Transcriptome profiling in the sea urchin: understanding allelochemical modes of action and marine herbivore cellular defenses."
- 2007 - Poster presentation at 24th Annual Meeting of the New England Membrane Enzyme Group, October 14-16, 2007, Woods Hole, MA. Entitled: "Effects of gorgonian secondary metabolites on marine consumer detoxification enzymes."
- Oral presentation at the 36th Annual Benthic Ecology Meeting, March 21-25, 2007; Atlanta, GA. *Session Chair*: Consumer-Prey Interactions. Entitled: "A proteomic and molecular approach to chemical ecology: Identifying detoxification enzymes possibly involved in allelochemical resistance."
- 2006 - Oral presentation at the Woods Hole Oceanographic Institution, October 26, 2006, Woods Hole, MA. Entitled: "When corals leave a bad taste in your mouth: Understanding molluscan detoxification of gorgonian chemical defenses".

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- 2005 - Poster presentation at 22nd Annual Meeting of the New England Membrane Enzyme Group, November 7-8, 2005, Sturbridge, MA. Entitled: "Detoxification enzymes and transporters in marine molluscs: An evolutionary answer to gorgonian chemical defenses?"
- Poster presentation at 34th Annual Benthic Ecology Meeting, April 6-10, 2005; Williamsburg, VA. Entitled: "Detoxification enzymes and transporters in marine molluscs: An evolutionary answer to gorgonian chemical defenses?"
- 2003 - Poster presentation at the Pollution Response in Marine Organisms Meeting, May, 2003; Tampa, Florida. Entitled: "Structure-activity relationships for polychlorinated biphenyl binding to the aryl hydrocarbon receptor in a dolphin kidney cell line."
- 2002 - Oral presentation at the 31st Annual Benthic Ecology Meeting, March 21- 24, 2002; Orlando, Florida. Entitled: "Localization of ecologically active secondary metabolites in two Caribbean sponges."
- 2001- Oral presentation of summer research project at Woods Hole Oceanographic Institution, Summer 2001, Entitled: "Are bottlenose dolphins (*Tursiops truncatus*) susceptible to polychlorinated biphenyls". Summer Student Fellowship, Woods Hole Oceanographic Institution
- Poster presentation at the 18th International Society of Chemical Ecology Meeting, July 7-12, 2001; North Lake Tahoe, CA. Entitled: "More bang for your buck: Multiple defenses roles of triterpene glycosides in marine sponges."
- 2000 - Oral presentation at the 29th Annual Benthic Ecology Meeting/ Marine Chemical Ecology Symposium, March 9-12, 2000; University of North Carolina at Wilmington. Entitled: "Antifouling activity of Caribbean sponge extracts."

Contributed presentations

Undergraduate researcher underlined

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- 2022 - Coolahan, M., and **K.E. Whalen**, entitled "Bacterial signaling molecule may inhibit a master regulator of DNA repair in phytoplankton", Ocean Sciences Meeting, Virtual, February 28-March 4, 2022.
- Garrett, O., and **K.E. Whalen**, entitled "Probing the biomolecular mechanism of bacterial alkylquinolone-induced viral protection in *Emiliana huxleyi*," Ocean Sciences Meeting, Virtual, February 28-March 4, 2022.
- Dallmeyer-Drennan, G., Greene, E., Harvey, E.L., and **K.E. Whalen**, entitled "Exploring the Physiological Effects of the Marine Bacterial Signaling Molecule, 2-Heptyl-4-Quinolone, on Viral Infection in Globally Abundant Phytoplankton *Emiliana huxleyi*." Ocean Sciences Meeting, Virtual, February 28 – March 4, 2022.
- 2020 - Gao, Y., Becker, J., Schrecengost, A., Giannetti, N., Harvey, E., **K.E. Whalen**, entitled "The quorum sensing molecule 2-heptyl-4-quinolone (HHQ) influences the community composition of marine microbes", Ocean Sciences Meeting, San Diego, CA, February 18-22, 2020.
- Pollara, S., Becker, J., Nunn, B., Downing, G., Overton, E., Chase, D., Harvey, E., and **K.E. Whalen**, entitled "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?" Ocean Sciences Meeting, San Diego, CA, February 18-22, 2020.
- Johnson, I., Harvey, E., **K.E. Whalen**, entitled "The bacterial signal HHQ disrupts phytoplankton-virus interactions," Ocean Sciences Meeting, San Diego, CA, February 18-22, 2020.

- 2019 - Pollara, S., Becker, J., Nunn, B., Whalen, K.E., entitled “Investigating chemically induced stasis in marine coccolithophore *Emiliania huxleyi* following exposure to the bacterial signaling molecule, HHQ.” Aquatic Sciences Meeting, Puerto Rico, February 23 – March 2, 2019.
- 2018 - Nicholson, R.M., Harvey, E.L., Kirby, C., Moore, B.S., and **K.E. Whalen**, entitled “Deducing the Mechanism of Algicidal Activity of the Bacterial Metabolite, Tetrabromopyrrole”, Ocean Sciences Meeting, Portland, OR, February 11-16, 2018
- 2018 - Harvey, E.L., Schrecengost, A., and **K.E. Whalen**, entitled “Sedating the bloom: the impact of a bacterial quorum-sensing compound on phytoplankton population dynamics”, Ocean Sciences Meeting, Portland, OR, February 11-16, 2018
- 2017 - Harvey, E.L., Kirby, C., Mincer, T.J., Moore, B., **K.E. Whalen**, entitled “A White Walker? Tetrabromopyrrole causes rapid phytoplankton mortality”, Ocean Sciences Meeting/AGU, Honolulu, Hawaii, February 26-March 3, 2017
- Keller, A., Apprill, A., Lebaron, P., Robbins, J., **K.E. Whalen**, entitled “Isolating diverse microorganisms via targeted cultivation of marine animal microbes”, Ocean Sciences Meeting/AGU, Honolulu, Hawaii, February 26-March 3, 2017
- 2016 - Mincer, T.J., **Whalen, K.E.**, Flynn-Carroll, A., Canadian Society for Chemistry (CSC) 2016 Conference, Halifax “Taking a closer look at phytoplankton interactions with heterotrophic bacteria: Basic science complementing discovery of pharmacologically relevant metabolites.” June 5-9, 2016.
- 2014 - Collins, C., **Whalen, K.**, Lamborg, C., Mincer, T., et al., Mercury speciation, retention and genomics in fertilized salt marsh sediments. American Geophysical Union, San Francisco, CA.
- 2012 - Hamdoun, A., Campanale, J., and **Whalen, K.** Membrane dynamics and the control of multidrug efflux transport activity in sea urchin development. American Society of Cell Biology.
- 2011 - Hamdoun, A., Campanale, J., Gokirmak, T., Shipp, L., **Whalen, K.** Ontogenetic switches in activity and location of multidrug efflux transporters during embryonic development. American Association for Cancer Research, San Francisco, CA.
- 2002 - Kubanek, J., **Whalen, K.**, Pawlik, J.R., Fenical, W., Naar, J., Weidner, A., Bourdelais, A.J., Baden, D.G., Steidinger, K., Felwelling, L. Multiple functions and ecological consequences of chemical signals in the sea. Gordon Research Conference on Marine Natural Products, Ventura, CA.

Scientific Cruises & Field Work

- 2017 Co-PI, Examining community shifts in phytoplankton and bacterial populations upon exposure to bacterial signaling molecules; Mesocosm Centre at the Espeyrennd Marine Biological Station, University of Bergen, Norway
- 2008-2009 Principle Investigator, collection of invertebrates and macroalgae from Sydney Harbor and surrounding waters, Sydney Institute of Marine Science, Australia
- 2006, 2004 Principle Investigator studying natural product detoxification in coral reef invertebrates, Perry Institute for Marine Science, Lee Stocking Island, Bahamas
- 2005 SUNY-Buffalo/U of Miami cruise; Research Scientist aboard the R/V Walton Smith, Bahamas, investigating coral recruitment on Grand Bahama Bank, H. Lasker (lead PI.-SUNY Buffalo)

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- 2004 Research Assistant under the direction of A. Tarrant (lead PI-WHOI), studying endocrine disruption in scleractinian corals, Perry Institute for Marine Science, Lee Stocking Island, Bahamas
- 2004 WHOI Research Scientist studying nudibranch and coral abundance at the Liquid Jungle Lab located on the island of Canales de Tierra, Veraguas province of Panama
- 2001, 2000 National Science Foundation – Chemical Ecology Cruise; Research Scientist and Dive Team Member aboard the R/V Seaward Johnson investigating chemical defense in coral reef invertebrates, Bahamas, J. Pawlik (lead PI.-UNCW)
- 1999-2001 Research Dive Team member, investigating sponge health and ecology in Key Largo, FL in conjunction with the National Undersea Research Center and Center for Marine Science, UNCW, J.Pawlik (lead PI.-UNCW)
- 2001-2003 Cape Cod Stranding Network Volunteer under the direction of M. Moore (WHOI); assisted in marine mammal necropsies
- 1999-2001 UNCW Stranding Team Member Volunteer under the direction of A. Pabst (UNCW); assisted in marine mammal necropsies
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