

# Kristen E. Whalen

## Curriculum Vitae

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Haverford College  
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Haverford, PA 19041

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## Education

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- 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

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- 2016-present    **Assistant Professor** of Biology, Haverford College
- 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

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- 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

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- 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

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2015 Robert R. Whelan Award in Chemistry - Woods Hole Oceanographic Institution  
2012 ABC2012 Young Investigator Award, 4<sup>th</sup> 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

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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

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2021 - 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.**, 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)

Keller, A.G., Apprill, A., Labaron, P., Robbins, J., Romano, T. A., Overton, E., Rong, Y., Yuan, R., Pollara, S., and **Whalen, K.E.**, Characterizing the culturable surface microbiomes of diverse animals. *FEMS Microbiology Ecology*. (<https://doi.org/10.1093/femsec/fiab040>)

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., 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>)

2019 – **Whalen, K.E.**, Becker, J.W., Schrecengost, A., Gao, Y., Giannetti, N., and Harvey, E.L., Bacterial alkylquinolone signaling contributes to structuring microbial communities in the ocean. *Microbiome*. 7:93

- 2018 – **Whalen, K.E.**, Kirby, C., Nicholson, R.M., O'Reilly, M., Moore, B.S., and Harvey, E.L., The chemical cue tetrabromopyrrole induces rapid cellular stress and mortality in phytoplankton. *Scientific Reports*. 8:15498. doi:10.1038/s41598-018-33945-3
- Lamborg, C., Mincer, T., Buchanan, W., Collins, C., Swarr, G., Ganguli, P., **Whalen, K.**, Bothner, M., & Valiela, I., 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
- 2016 - Harvey, E.L.\* , Deering, R.W., Rowley, D.C., El Gamal, A., Schorn, M., Moore, B.S., Johnson, M., Mincer, T., **Whalen, K.E.\***, A bacterial quorum-sensing precursor induces mortality in the marine coccolithophore, *Emiliana huxleyi*. *Frontiers in Microbiology*. 7:59 (doi: 10.3389/fmicb.2016.00059)
- 2016 - 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. 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).
- 2015 - **Whalen, K.E.**, Poulson, K.L., Deering, R.W., Rowley, D.C., Mincer, T.J., 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
- 2012 - **Whalen, K.E.**, Reitzel, A. and Hamdoun, A., 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.
- Selected for consideration for MBoC Paper of the Year.
  - Awarded the journal cover for MBoC
- 2010 - **Whalen, K.E.**, Starczak, V.R., Nelson, D.R., Goldstone, J.V, and Hahn, M.E., 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)
- 2010 - **Whalen, K.E.**, Sotka, E.E., Goldstone, J.V. and Hahn, M.E., 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.
- 2010 - **Whalen, K.E.**, Lane, A.L, Kubanek, J. and Hahn, M.E., Biochemical warfare on the reef: the role of glutathione transferases in consumer tolerance of dietary prostaglandins. *PLoS One* 5(1): e8537.
- 2009 - Sotka, E.E.\* , Forbey, J., Horn, M., Poore, A.G.B., Raubenheimer, D., and **Whalen, K.E.\***, The emerging role of pharmacology in aquatic plant-herbivore interactions. *Integrative and Comparative Biology* 49: 291-313.
- 2008 - **Whalen, K.E.**, Morin, D., Lin, C.Y., Tjeerdema, R., Goldstone, J.V., Hahn, M.E., Proteomic characterization and cDNA cloning of glutathione S-transferases from the generalist marine gastropod, *Cyphoma gibbosum*. *Archives of Biochemistry and Biophysics* 478: 7-17.
- 2004 - **Whalen, K.E.**, Carvan, M.J., Hestermann, E.V., Jensen, B.A., Hahn, M.E., 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)
- 2003 - Hahn, M.E., Jensen, B.A., Kim, E-Y., Karchner, S.I., Franks, D.G., Lapsieritis, J.M., **Whalen, K.E.**, Carvan, M.J., Molecular and cellular approaches to understanding the

sensitivity of marine mammals to persistent organic pollutants. *Organohalogen Compounds*. 62:253-256.

2001 - Kubanek, J., **Whalen, K.E.**, Engel, S., Kelly, S., Henkel, T.P., Fenical, W., and Pawlik, J.R., Multiple defensive roles for triterpene glycosides from two Caribbean sponges. *Oecologia*. 131:125-136.

## Book Chapters

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2008 - Sotka, E.E. and **Whalen, K.E.**, 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

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

## Teaching

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### Courses Taught

BIOL201 Molecules, Cells, and Organisms (Spring 2017, 2018, 2019)  
BIOL201 Introduction to Biology Laboratory (Spring 2017, Spring 2019)  
BIOL300 SuperLab (Spring 2018, Fall 2018, Fall 2021)  
BIOL303 Structure and Function of Macromolecules (Fall 2016)  
BIOL326 Biochemical Adaptations (Fall 2017, Spring 2021)  
BIOL356 Advanced Topics in Biology of Marine Life (Fall 2017, 2018, 2021)  
BIOL415 Senior Tutorial in Marine Natural Product Drug Discovery (2016-2021)  
BIOL380 Independent Study in Biology at Haverford (11 students; 2016-2021)  
BIOL495 Crafting an Inclusive Biology Curriculum (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 7-8<sup>th</sup> grade girls in Science Immersion Program (Spring 2012).

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)

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**

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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 – 2021)

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
- NOAA – Office of Ocean Exploration and Research
- California Sea Grant
- CalFed-Delta Science Program
- Journals: *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

## **Service at Haverford College**

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Faculty representative, Pre-Health Advisor (2018-2019)

Faculty representative, Center for Peace and Global Citizenship (2018-2019)

Faculty representative, KINSC Steering Committee (2017-2018)

Advisor: Biology majors, undeclared sophomores and freshman (2016 – present)

Study Abroad Coordinator, Biology Department Representative (2017 – present)

## **Mentoring**

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### ***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*

### ***Research Assistant***

- Scott Pollara, Haverford College (2019 – 2020)

### ***Current Undergraduates***

1. **Megan Coolahan** '22, Biology Major, Beckman Scholar (20-21)
2. **Sijing “Lucy” Zhao** '22, Biology Major, Velay Summer Scholar ('20), Beckman Finalist, attending Harvard Immunology Summer Program in 2021.
3. **Genevieve Dallmeyer-Drennen** '22, Biology Major; Velay Summer Scholar ('21)
4. **Eleanor Greene** '22, Biology Major
5. **Carlos Muniz** '23, Biology Major, Chesick Scholar, PENN PASS Fellow, Beckman Finalist
6. **Isha Upender** '23, Biology Major
7. **Oscar Garrett** '23, Biology Major, Biochemistry Concentrator; KINSC Summer Scholar ('21)

### ***Lab Alumni – Former Undergraduates Researchers***

1. **Han Yang** '21, Senior Thesis Student, Biology Major; Lowey Award in Biology; Research Technician at Yale University
2. **Emma Castiblanco** '21, Senior Thesis Student, Biology Major
3. **Shreya Kishore** '21, Senior Thesis Student; Chemistry Major, Biochemistry Concentration, High Honors in Chemistry. Summa cum laude. American Institute of Chemists Award; Kovaric Fellow ('18); KINSC Summer scholar. Ph.D. student in Chemical and Systems Biology at Stanford University.
4. **Isabelle Johnson** '22, Biology Major, Biochemistry Concentration; KINSC Summer Scholar ('19)
5. **Yongjie ‘Jason’ Gao** '20, Senior Thesis Student; Biology Major, Neuroscience Minor, Lowey Award in Biology; High Honors in Biology, Ph.D. Student at Cornell in Neuroscience.
6. **Carlotta Pazzi** '20, Senior Thesis Student; Biology Major, Health Studies, Italian Minor, Koshland Award in Biology; Honors in Biology, Medical Student at Sidney Kimmel Medical College at Thomas Jefferson University
7. **Rebecca Boden** '21, Biology and Environmental Studies Double Major
8. **Davis Chase** '21, Chemistry Major, KINSC Summer Scholar ('18)
9. **Yuying Rong** '20, Biology Major
10. **Scott Pollara** '19, Senior Thesis Student, Biology Major, Biochemistry Concentration. Beckman Finalist ('18). KINSC Summer Scholar ('18). Lowey Award in Biology. High Honors. Ph.D. student at Dalhousie University in Biological Oceanography.
11. **Ellysia Overton** '19, Senior Thesis Student. Biology Major. Velay Summer Scholar ('18), Ph.D. student at Princeton in Chemistry
12. **Ruiyi Yuan** '19, Senior Thesis Student. Biology Major, Mayo Clinic Undergraduate Fellowship, Lowey Award in Biology, High Honors in Biology, Medical student at the University of Rochester
13. **Daniel Joffe** '19, Biology Major, Honors in Biology, Medical student at Sidney Kimmel Medical College at Thomas Jefferson University

14. **Anna Schrecengost** '18, Senior Thesis Student. Biology Major. Velay Summer Scholar ('18), Irving Finger Award in Biology, Graduate student at the University of Rhode Island (Graduate School of Oceanography)
15. **Grayton Downing** '18, Senior Thesis Student. Honors in Biology, Medical student at Sidney Kimmel Medical College at Thomas Jefferson University
16. **Mia O'Reilly** '18, Senior Thesis Student. Biology Major. Honors in Biology, EMT
17. **Nicole Giannetti** '18, Senior Thesis Student. Biology Major. Honors in Biology, Medical student at SUNY Upstate
18. **Russell Nicholson** '18, Senior Thesis Student. Biology Major, NOAA Fisheries Observer
19. **Abigail Keller** '17, Senior Thesis Student. Biology Major, KINSC Summer Scholar, Irving Finger Award in Biology, Graduate Student at the University of Washington (Marine policy/conservation focus).
20. **Karyn Sheline** '17 Senior Thesis Student. Biology Major, Honors in Biology, Medical student at UCSD Medical School
21. **Kathryn Sommer** '17, Senior Thesis Student. Biology Major, Honors in Biology, Medical Student at Jefferson/Sidney Kimmel Medical School
22. **Koji Shimomura** '17, Senior Thesis Student. Biology Major, NIH postbaccalaureate program

#### **Woods Hole Oceanographic Institution**

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

#### **Scripps Institution of Oceanography**

25. **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
26. **Amber Merrill**, undergraduate at UCSD
27. **Annalisa Carson**, undergraduate at Wheaton College
28. **Kazuya Koda**, undergraduate at UCSD, currently a manufacturing specialist at Gilead Sciences

#### **University of New South Wales**

29. **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**

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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.



- Oral presentation 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
- 2017 - Invited Presentation 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 – 20<sup>th</sup> 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
- 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 6<sup>th</sup>, 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 24<sup>th</sup> 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 36<sup>th</sup> 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".
- 2005 - Poster presentation at 22<sup>nd</sup> 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 34<sup>th</sup> 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 31<sup>st</sup> 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 18<sup>th</sup> 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 29<sup>th</sup> 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

\* indicates undergraduate researcher

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- 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 *Emiliania 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 *Emiliana 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

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- 2017 Co-PI, Examining community shifts in phytoplankton and bacterial populations upon exposure to bacterial signaling molecules; Mesocosm Centre at the Espegrend 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)
- 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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