

SHELLY A. WANAMAKER, Ph.D.

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SUMMARY

Systems Biologist with 7+ years post-Ph.D. experience including 3 years of postdoctoral research and 4 years leading an independent research program. My research intersects biotechnology, genomics, and marine ecology to innovate methods for optimizing conservation and aquaculture practices. I'm passionate about applying cross-disciplinary strategies to solve sustainability challenges through research and outreach initiatives. I am driven by collaborating with diverse groups and leveraging common goals.

CORE COMPETENCIES

Leadership and Teaching: Conflict resolution course (2024), Positively Partners DEI training (2023-2024), MASS AWIS Leadership Program (Jan-Apr 2022), Project Management training Dec 2023, Evidence-Based Teaching and Learning in Biological Sciences graduate course UC San Diego (2017), Introduction to College Biology Education graduate course UC San Diego (2016)

Data analytics: Instructional course management software (BlackBoard), Project management software (Github, MS Planner, TeamGantt, LabArchives), Google Suite, Microsoft Office, Linux/Mac/Windows OS, Bash, NextFlow, Python, R, high performance computing, GitHub, 'omics data analysis, DNA sequence analysis (Sanger, Illumina, ONT), data reduction and integration, multivariate statistics, network analysis

Biology: Design and development of molecular diagnostics, genomic assays, Illumina sequencing (WGS, Bisulfite Sequencing, RNAseq), CRISPR diagnostics, isothermal amplification (LAMP, RPA), PCR, qPCR, ELISA, recombinant DNA techniques, *in vitro* transcription and translation, nucleic acid and protein purification, microscopy, histology, cell culture, transfection, immuno-blotting and precipitation, chromatography, spectrophotometry, liquid handlers (Tecan, Biomek, EpiMotion), plate readers, titrators, shellfish aquaculture, on- and offshore field sampling, flow-through seawater systems for aquatic animal rearing (automated feeding, monitoring, water chemistry control), seawater chemistry analysis, respirometry

Outdoors: EMT-B certified (anticipated August 2025), Wilderness First Responder certified (Jan 2024), trail running, fly-fishing, boating, hiking, snowboarding, rock climbing, 30-day backpacking trek in Patagonia, John Muir Trail, Grand Teton, 8-day Grand Canyon white water raft trip, backcountry navigation class (July 2015)

Other: DIY projects and repairs (automotive, machinery, electronics, wood), residential electrical work, food service

EXPERIENCE

School of Aquatic and Fishery Sciences, University of Washington (remote from Gloucester, MA)

Research Scientist IV (Principal Investigator) Mar 2025 – present

- Lead climate resiliency program and manage independent research projects with budgets > \$200K involving resilience biomarker discovery through meta-analysis of marine 'omics datasets and molecular assay development for monitoring shellfish health and harmful algae
- Supervise one Research Scientist and one volunteer bioinformatician
- Mentor 2 graduate students, 1 undergraduate, and 1 Gloucester Biotechnology Academy student
- Lead collaborations with biotech, government, and non-profit entities
- Author grant proposals, original research articles, and technical reports, perform scientific and administrative reviews of manuscripts (peer-reviewer)
- Present at national and international conferences, plan and lead meetings and workshops, deliver guest lectures

Gloucester Marine Genomics Institute, Gloucester, MA

Research Scientist II (Principal Investigator) Mar 2021 - Mar 2025

- Developed strategic plan and financial model for fisheries and ocean health research center with a >\$2.5M budget
- Developed climate resiliency program and managed independent research projects with budgets > \$200K involving molecular assay development for monitoring shellfish pathogens and harmful algae, and resilience biomarker discovery through meta-analysis of shellfish 'omics datasets
- Supervised and mentored 3 research assistants, 1 postdoc, 2 undergraduates, and 5 Gloucester Biotechnology Academy students

- Secured > \$1 M in federal grant funding within one year
- Led collaborations with biotech, government, and non-profit entities
- Authored and edited grant and fellowship proposals (7), original research articles (5), and technical reports (7), performed scientific and administrative reviews of manuscripts as a peer-reviewer (6), of grant proposals (2) at the request of USDA program managers, and served as a fellowship juror (1)
- Presented at national and international conferences, served as an expert panelist, planned and led meetings and workshops, delivered guest lectures

School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA

Postdoctoral Fellow Sept 2018 - Feb 2021

- Led independent research projects on live shellfish investigating environmental impact on physiology, proteome, and epigenome
- Supervised and mentored 2 undergraduate and 3 graduate students at University of Washington
- Authored and edited 4 grant and 4 fellowship proposals, 5 original research articles, 3 technical reports, and peer-reviewed 1 manuscript, delivered presentations at national and international conferences
- Developed computational tools to run statistical analyses on complex 'omic datasets
- Led collaborations with Jamestown-S'kallam Tribe Fisheries Division, Taylor Shellfish Hatchery, and NOAA Conservation Biology
- Developed curriculum and ran workshop for professional website design and blogging (<https://github.com/OARS-SAFS/Website-Design>)

NOAA Northwest Fisheries Science Center, Conservation Biology, Seattle, WA

NSF Graduate Research Internship Program Fellow Jun 2017 - May 2018 (40+ hours/week)

- Led research projects investigating ocean acidification impact on Dungeness crab physiology involving field collection and laboratory rearing of larvae, juveniles and adults and metabolomics analysis
- Supervised 1 undergraduate student
- Led the production of multimedia ocean acidification curriculum in collaboration with National Marine Sanctuaries (<https://sanctuaries.noaa.gov/education/crab-toolkit.html>)

NOAA West Coast National Marine Sanctuaries, Seattle, WA

Communications Intern Jul – Sept 2017 (16+ hours/week)

- Led the production of a multimedia communication toolkit (<https://sanctuaries.noaa.gov/education/crab-toolkit.html>) for teaching about the impact of ocean acidification on Dungeness crab in collaboration with National Marine Sanctuaries
- Delivered webinar for educators and stakeholders to demonstrate toolkit use for teaching others about ocean acidification and Dungeness crab, how this is currently being investigated, and resources to get more involved

Salk Institute for Biological Studies, Genomic Analysis Lab, La Jolla, CA

Graduate Student Researcher Aug 2013 - Sept 2018

Research Assistant II Jul 2012 - Aug 2013

Research Assistant I Nov 2011 - Jun 2012

- Developed an Illumina sequencing-based massively multiplexed protein interaction screening method involving high throughput cloning and yeast culture
- Built a custom bioinformatics pipeline and did quality control, statistical models, network simulations, data integration, and functional analysis of protein interaction data
- Supervised 2 research assistants, 2 lab technicians, and mentored 2 graduate students

Dana Farber Cancer Institute, Center for Cancer Systems Biology, Boston, MA

Research Technician Aug 2010 - Oct 2011

Research Trainee Jan 2010 – Aug 2010

- Facilitated large-scale human and disease protein interaction mapping using high throughput molecular methods (yeast two-hybrid, protein complementation assay, and well-nucleic-acid-programmable-protein-array assay)

EDUCATION

University of California San Diego	Biological Sciences	Ph.D., 2018	<i>magna cum laude</i>
Simmons College	Biochemistry	B.S., 2010	<i>magna cum laude</i>

AWARDED GRANTS AND FELLOWSHIPS

- USDA NIFA grant: A framework for integrating multi-omics data for biomarker discovery to improve resilience in aquaculture (**PI**; \$240K), 2024-2026

- NOAA MERHAB grant: Employing a novel molecular toolbox for rapid, sensitive detection of toxic *Pseudo-nitzschia* species (**Co-PI**; \$800K), 2023-2026
- USDA SBIR Phase I grant: Field-Deployable Crispr-Based Diagnostics For Improved Biosecurity In Aquaculture (**Lead author and Key Personnel**; \$175K), 2023-2024
- USDA NRSP8 Small Funding Possibilities for US Aquaculture Groups Award: Comparative Epigenomic Analyses across Bivalve Genome Resources (CEABiGR) (**Co-PI**; \$10K), 2020
- USDA NRSP8 PAGXXVIII Aquaculture Travel Award (\$1K), 2020
- UW Data Science Postdoctoral Fellowship (\$7K), 2019 - 2021
- UW College of the Environment Travel Award (\$1K), 2019
- NSF GRIP Fellowship with NOAA Northwest Fisheries Science Center (\$5K), 2017- 2018
- NSF PAMP EAGER grant: Using novel, clone-free sequencing methods to discover host-microbe protein-protein interactions (**Co-author and Key Personnel**; \$300K), 2016
- NSF Graduate Research Fellowship (\$138K), 2014-2018

PUBLICATIONS

ORCID ID: 0000-0001-6904-4149

1. HM Putnam*, **Shelly A. Wanamaker***, [9 others], and SB Roberts. (2025) Dynamic DNA methylation contributes to carryover effects and beneficial acclimatization in geoduck clams. *Environmental Epigenetics*. In review. Preprint: <https://doi.org/10.1101/2022.06.24.497506>. *Contributed equally
2. YR Venkataraman, AS Huffmyer, SJ White, A Downey-Wall, J Ashey, DM Becker, Z Bengtsson, HM Putnam, E Strand, JA Rodríguez-Casariago, **Shelly A. Wanamaker**, KE Lotterhos, and SB Roberts. (2024) DNA methylation correlates with transcriptional noise in response to elevated pCO₂ in the eastern oyster (*Crassostrea virginica*). *Environmental Epigenomics*. dvae018. <https://doi.org/10.1093/eep/dvae018>
3. V Velenzuela-Munoz, **Shelly A. Wanamaker**, G Nunez-Acuna, D Valenzuela-Miranda, A Garcia, JA Valdes, SB Roberts, and C Gallardo-Escarate. (2024) Environmental influence on the Atlantic salmon transcriptome and methylome during sea lice infestations. *Fish and Shellfish Immunology*. <https://doi.org/10.1016/j.fsi.2024.109692>
4. SR Major, MJ Harke, R Cruz-Flores, AK Dhar, AG Bodnar, and **Shelly A. Wanamaker**. (2023) Rapid detection of DNA and RNA shrimp viruses using CRISPR-based diagnostics. *Applied and Environmental Microbiology*. <https://doi.org/10.1128/aem.02151-22>
5. SJ Gurr, **Shelly A. Wanamaker**, B Vadopalas, SB Roberts, and HM Putnam. (2021) Acclimatory gene expression of primed clams enhances robustness to elevated pCO₂. *Molecular Ecology*. <https://doi.org/10.1111/mec.16644>
6. ET Montaña, [37 others], **Shelly A. Wanamaker**, K Pogliano, and J Pogliano. (2022) Isolation and characterization of Streptomyces bacteriophages and Streptomyces strains encoding biosynthetic arsenals. *PLoS ONE* 17(1):e0262354. <https://doi.org/10.1371/journal.pone.0262354>
7. **Shelly A. Wanamaker***, YR Venkataraman*, MR Gavery, SB Roberts, D Bhattacharya, A Downey-Wall, JM Eirin-Lopez, KM Johnson, KE Lotterhos, JR Puritz, and HM Putnam. (2021) Invertebrate methylomes provide insight into mechanisms of environmental tolerance and reveal methodological biases. *Molecular Ecology Resources*. <https://doi.org/10.1111/1755-0998.13542>. *Contributed equally
8. SJ Gurr, **Shelly A. Wanamaker**, B Vadopalas, SB Roberts, and HM Putnam. (2021) Repeat exposure to hypercapnic seawater modifies growth and oxidative status in a tolerant burrowing clam. *Journal of Experimental Biology*. 224(13): jeb233932. <https://doi.org/10.1242/jeb.233932>
9. BC Willige, M Zander, CY Yoo, A Phan, RM Garza, **Shelly A. Wanamaker**, Y He, JR Nery, H Chen, M Chen, JR Ecker, and J Chory. (2021) Phytochrome-interacting factors trigger environmentally responsive chromatin dynamics in plants. *Nature Genetics*. 53:955-961. <https://doi.org/10.1038/s41588-021-00882-3>
10. **Shelly A. Wanamaker**, KM Mitchell, R Elliot, B Eudeline, B Vadopalas, EB Timmins-Schiffman, SB Roberts. (2020) Temporal proteomic profiling reveals insight into critical developmental processes and temperature-influenced physiological response differences in a bivalve mollusc. *BMC Genomics*. <https://doi.org/10.1186/s12864-02007127-3>
11. **Shelly A. Wanamaker**, P McElhany, M Maher, D Perez, DS Busch, and KM Nichols. (2019) Uncovering mechanisms of global ocean change effects on Dungeness crab (*Cancer magister*) through metabolomics analysis. *Scientific Reports*. <https://doi.org/10.1101/574798>

12. **Shelly A. Wanamaker**. (2018) High-resolution molecular networks from novel ‘omics’ approaches elucidate survival strategies in organisms from land to sea. *UC San Diego*. ProQuest ID: Trigg_ucsd_0033D_17575. <https://escholarship.org/uc/item/0491n31k>
13. **Shelly A. Wanamaker**, RM Garza, A MacWilliams, JR Nery, A Bartlett, R Castanon, A Goubil, J Feeney, R O’Malley, SC Huang, ZZ Zhang, M Galli, and JR Ecker (2017) CrY2H-seq interactome screening. *Protocol Exchange*. <https://doi.org/10.1038/protex.2017.058>
14. **Shelly A. Wanamaker**, RM Garza, A MacWilliams, JR Nery, A Bartlett, R Castanon, A Goubil, J Feeney, R O’Malley, SC Huang, ZZ Zhang, M Galli, and JR Ecker (2017) CrY2H-seq: a massively multiplexed assay for deep coverage interactome mapping. *Nature Methods*. 14(8):819-825. <https://doi.org/10.1038/nmeth.4343>
15. X Yang, [15 others], **Shelly A. Wanamaker**, [20 others], and M Vidal. (2016) Widespread expansion of protein interaction capabilities by alternative splicing. *Cell*. 164(4):805-817. <https://doi.org/10.1016/j.cell.2016.01.029>
16. T Rolland, [53 others], **Shelly A. Wanamaker**, [14 others], and M Vidal. (2014) A proteome-scale map of the human interactome network. *Cell*. 159(5):1212-1226. <https://doi.org/10.1016/j.cell.2014.10.050>
17. R Corominas, [8 others], **Shelly A. Wanamaker**, [18 others], M Vidal, and LM Iakoucheva. (2014) Protein interaction network of alternatively spliced isoforms from brain links genetic risk factors for autism. *Nature communications*. 5:3650. <https://doi.org/10.1038/ncomms4650>
18. Rozenblatt-Rosen, [36 others], **Shelly Wanamaker**, [13 others], and M Vidal. (2012) Interpreting cancer genomes using systematic host network perturbations by tumour virus proteins. *Nature*. 487(7408):491-495. <https://doi.org/10.1038/nature11288>

In preparation

1. **Shelly A. Wanamaker**, AA Bender, Y Gao, A DeSmidt, C Chadwick, T Gibson, K Hubbard, and MJ Harke. (2025) CRISPR-based diagnostic for rapid detection of harmful *Pseudo-nitzschia* species. *Harmful Algae*.
2. **Shelly A. Wanamaker**, MC Moore, K Shytle, AG Bodnar, and M Wilson. (2025) LAMP-based portable diagnostic outperforms PCR for rapid viral detection in aquaculture. *BioTechniques*.

SELECT PRESENTATIONS

Mar 2025. Mining omics datasets for resilience biomarkers to improve oyster breeding and management strategies. Aquaculture Genomics Session, Aquaculture Triennial. New Orleans, LA

Jan 2025. A Framework for Integrating Multi-Omics Data for Biomarker Discovery to Improve Resilience in Aquaculture. Aquaculture Session, 32 Plant Animal Genome conference. San Diego, CA

Nov 2024. Harmful algae diagnostic hands-on workshop, 12th US Symposium on Harmful Algae. Portland, ME

Nov 2024. Panelist, Coastal Acidification Round Table, Gloucester, MA

Jun 2024. Rapid molecular diagnostics for shrimp aquaculture. Innovation Session, Shrimp Summit. Chennai, India.

May 2024. Genetic diagnostics for rapid detection of domoic acid-producing *Pseudo-nitzschia* species Biology Seminar Series, Woods Hole Oceanographic Institute. Woods Hole, MA

May 2024. Panelist, Pathways to Industry. College of the Environment University of Washington. Seattle, WA

Mar 2024. Harmful algae diagnostic workshop, Gulf of Maine HAB Science Symposium. Portsmouth, NH

Jan 2024. New England BioLabs Industry Workshop, 31 Plant Animal Genome conference. San Diego, CA

Jan 2024. Aquaculture Session, 31 Plant Animal Genome conference. San Diego, CA

Oct 2023. Rapid CRISPR-based diagnostics for detecting marine genomic signatures in animals and the environment. GMGI Science Forum. Gloucester, MA

Mar 2023. Molecular tools for *Pseudo-nitzschia* identification and quantification. Gulf of Maine HAB Science Symposium. Portsmouth, NH

Oct 2022. Environmental impact on sea lice-challenged epigenomes, EPIMAR. Marine Biological Labs. Woods Hole, MA.

April 2022. Biology Seminar Series, Bigelow Laboratory for Ocean Sciences. Boothbay, ME

Jan 2022. Shrimp Session, Aquaculture Triennial. San Diego, CA

May 2021. Diversity in animal response to environmental change. Data Science Coast to Coast Seminar Series, Academic Data Science Alliance. Virtual

Jan 2021. Exploring the tolerance of Pacific geoduck to low pH through comparative physiology, genomics, and DNA methylation. The Society for Integrative and Comparative Biology Annual Meeting. Virtual

April 2020. Searching for signs of resilience in over-wintering juvenile pteropods to ocean acidification and deoxygenation. NOAA Northwest Fisheries Science Center Mini Symposium. Virtual

Jan 2020. Influence of ocean acidification on DNA methylation patterns in geoduck. Aquaculture Workshop, Plant Animal Genome conference. San Diego, CA

Nov 2019. Environmental influence on the Atlantic salmon epigenome during sea lice infestation, International Conference on Integrative Salmonid Biology. Edinburgh, Scotland

Sept 2019. A protein inventory reveals mechanisms of temperature impact on oyster development, Pacific Coast Shellfish Growers Association. Vancouver, WA.

May 2019. Ocean Acidification Science Symposium, Washington Ocean Acidification Center Symposium, Seattle, WA

Mar 2019. Temperature-influenced protein network differences in the Pacific Oyster (*Crassostrea gigas*) during larval development, Network Biology conference. Cold Spring Harbor, NY

EDITORIAL AND PROFESSIONAL SERVICE

Adhoc reviews for scientific journals 2020-present

L'Oreal Women in Science Postdoctoral Fellowship review panelist and juror, 2024

USDA AFRI proposal reviewer, 2024

Staff Council member, GMGI, 2022-2024

Communications Committee Co-chair, MASS AWIS, 2022 - 2023

Postdoctoral representative of UW SAFS Communications Committee, 2018 - 2021

Chair of UC San Diego Biology Department Peer Mentoring Committee, 2015-2016

Member of the Salk Institute Partnerships in Science committee 2014-2016

Member of UC San Diego STEM Education and Diversity group 2014-2016

Member of AWIS San Diego Outreach Committee, 2012-2016

EDUCATION OUTREACH

Gloucester Power of Play Science presenter	2024
Salish Sea Expeditions Training workshop presenter	2020
UW SAFS Open House shellfish and ocean acidification presenter	2019
National Marine Sanctuaries ocean acidification multimedia toolkit development	2017-2018
Salk Institute Education Outreach plant biology video media development	2016
Salk Institute AAAS New Frontiers in Science Education curriculum developer	2014-2017
UC San Diego Undergraduate Biology Showcase poster judge	2015-2016
Reuben H. Fleet Science Center #2Scientists program	2014-2016
Expanding Your Horizons San Diego AWIS presenter	2013-2015
AWIS San Diego undergraduate career panel coordinator	09/2014
Albert Einstein Academy Family Science Night presenter	04/2014
ACS Chemistry Expo AWIS presenter, San Diego	10/2013
Greater San Diego Science Festival Expo Day presenter	2013-2014
Greater San Diego Science Festival poster judge	2013-2014

TEACHING EXPERIENCE AND COURSEWORK

iGEM advisor and undergraduate mentor, University of Connecticut	2024 - present
Guest lecture, Ecological and Evolutionary Genomics, Northeastern University	03/22,03/23,03/25
Guest lecture, AP Environmental Science, Gloucester High School	05/2023
Co-teacher, Integrative Enviro Physiology graduate course, U of Washington	03/2020-06/2020
Co-teacher, Bioinformatics for Enviro Sciences graduate course. U of Washington	09/2020-12/2020
Head Instructional Assistant, Regulation of Eukaryotic Gene Expression, UC San Diego	01/2017-03/2017
Instructional Assistant, Genomics Research Initiative Lab, UC San Diego	03/2016-06/2016
Student Instructor, Quantitative Biology graduate seminar, UC San Diego	09/2015-08/2016
Instructional Assistant, Biochemical Techniques Lab, UC San Diego	09/2014-12/2014
Teaching Assistant, Biochemistry II Lab, Simmons College	01/2010-05/2010
Teaching Assistant, Organic Chemistry I and II Labs, Simmons College	09/2008-05/2009
Teaching Assistant, General Chemistry Lab, Simmons College	01/2008-04/2010