

SHELLY A. WANAMAKER, Ph.D.

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SUMMARY

Molecular Systems Biology researcher passionate about applying cross-disciplinary strategies to solve sustainability challenges. I am driven by relationships with diverse groups focused on common goals, and I seek to inspire the next generation of doers through science communication, outreach, and research. With 13+ years of experience leading biotechnology and genomics research, I am a team builder and program manager that innovates molecular tools and big data analysis methods to tease out drivers of resilience in marine organisms.

EXPERIENCE

Gloucester Marine Genomics Institute, Gloucester, MA

Research Scientist Mar 2021 - Present

- Develop strategic plan and financial model for fisheries and ocean health research center with a >\$2.5M budget
- Independently develop and manage climate resiliency research program with project budgets > \$200K
- Supervised and mentored 2 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), served as a manuscript peer-reviewer (6) and as a fellowship juror (1)
- Delivered guest lectures at schools and presentations at national and international conferences, planned and led meetings and workshops

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

Postdoctoral Fellow Sept 2018 - Feb 2021

- Led research projects on live shellfish investigating environmental impact on physiology
- Supervised and mentored 2 undergraduate and 3 graduate students at University of Washington
- Developed computational tools to run statistical analyses on complex 'omic datasets
- Led collaborations with Jamestown-S'klallam 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>)
- 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

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

NSF Graduate Research Internship Program Fellow Jun 2017 - May 2018

- 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>)

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 Jan 2010 - Oct 2011

- 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)

ADDITIONAL EXPERIENCE

Leadership: Conflict resolution course (2024), Positively Partners DEI training (2023-4), MASS AWIS Leadership Program (Jan-Apr 2022)

Data analytics: Project management software (Airtable, TeamGantt, LabArchives), Google Suite, Microsoft Office, Linux/Mac/Windows OS, Bash, NextFlow, Python, R, high performance computing, GitHub, ‘omics data analysis, data reduction and integration, multivariate statistics, network analysis

Outdoors: 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

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

1. YR Venkataraman, AS Huffmyer, SJ White, A Downey-Wall, J Ashley, 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>
2. 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>
3. HM Putnam*, **Shelly A. Wanamaker***, [9 others], and SB Roberts. (2024) Dynamic DNA methylation contributes to carryover effects and beneficial acclimatization in geoduck clams. *Proceedings of the Royal Society B*. In review. Preprint: <https://doi.org/10.1101/2022.06.24.497506>. *Contributed equally
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. (2024) 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. (2024) LAMP-based portable diagnostic outperforms PCR for rapid viral detection in aquaculture. *BioTechniques*.

SELECT PRESENTATIONS

Mar 2025. Aquaculture Genomics Session, Aquaculture Triennial. New Orleans, LA

Jan 2025. 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
Jun 2024. Innovation Session, Shrimp Summit. Chennai, India.
May 2024. 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. 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 mentor, Summer STEM University of Connecticut	2024
Guest lecture, AP Environmental Science, Gloucester High School	05/2023
Guest lecture, Ecological and Evolutionary Genomics, Northeastern University	03/2022-23
Co-teacher, Integrative Environmental Physiology, University of Washington	03/2020-06/2020
Co-teacher, Bioinformatics for Environmental Sciences. University of Washington	09/2020-12/2020
Evidence-Based Teaching and Learning in Biological Sciences course, UC San Diego	01/2017-03/2017
Head Instructional Assistant, Regulation of Eukaryotic Gene Expression, UC San Diego	01/2017-03/2017
Introduction to College Biology Education course, UC San Diego	03/2016-06/2016
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, Simmons College	01/2010-05/2010
Teaching Assistant, Organic Chemistry I and II, Simmons College	09/2008-05/2009
Teaching Assistant, General Chemistry, Simmons College	01/2008-04/2010