

SHEILA A. KITCHEN, Ph.D.

200 Seawolf Parkway • Galveston, TX 77554 • 409-740-4454 • kitchens@tamug.edu • www.sheilakitchen.com

RESEARCH INTEREST

I am molecular ecologist that integrates field, laboratory and computational tools to address fundamental questions surrounding interspecies interactions and their persistence in a changing world. My goal is to transform these results into applied solutions for conservation.

PROFESSIONAL APPOINTMENTS

- 2023-Present Assistant Professor, Department of Marine Biology, Texas A&M University Galveston
- 2018-2022 Postdoctoral Fellow, Division of Biology and Biological Engineering, Caltech
- 2016-2018 Postdoctoral Researcher, Department of Biology, The Pennsylvania State University

EDUCATION

- 2010-2016 Ph.D. Zoology, Oregon State University
- 2008-2010 M.S. Marine Biology, UNC Wilmington
- 2004-2007 B.S. Marine Biology with Honors, UNC Wilmington

PUBLICATIONS

Co-first authors #; Mentored graduate student * or undergraduate student ^

Published Manuscripts

21. Ashley, I.A.*, S.A. **Kitchen**, L.M. Gorman, A.R. Grossman, C.A. Oakley, D.J. Suggett, V.M. Weis, S.L. Rosset, S.K. Davy. (2023) Genomic conservation and putative downstream functionality of the phosphatidylinositol signalling pathway in cnidarian-dinoflagellate symbiosis. *Frontiers in Microbiology*, 13:1094255.
20. **Kitchen**, S.A., D. Jiang, S. Harii, N. Satoh, V.M. Weis, and C. Shinzato. (2022) Coral larvae suppress the heat stress response during the onset of symbiosis thereby decreasing their odds of survival. *Molecular Ecology*, 31(22):5813-5830.
19. García-Urueña, R., S.A. **Kitchen**, N. Sckizas. (2022) Fine scale population structure of *Acropora palmata* and *A. cervicornis* in the Colombian Caribbean. *PeerJ*, 10:e13854.
18. Vasquez Kuntz, K.L.*#, S.A. **Kitchen**#, T.L. Conn*, S.A. Vohsen*, A.N. Chan*, M.J.A. Vermeij, C. Page, K.L. Marhaver, I.B. Baums. (2022) Inheritance of somatic mutations by animal offspring. *Science Advances*, 8(35):eabn0707.
 - Online Press: "Corals are first animals seen to pass on mutations acquired as adults" *New Scientist* (<https://bit.ly/2UihBG9>)
 - Online Press: "Corals pass mutations acquired during their lifetimes to offspring" Penn State (<https://bit.ly/3ROzPuL>)
17. **Kitchen**, S.A., C.C. Osborne*, N.D. Fogarty and I.B. Baums. (2022) Morphotype is not linked to mitochondrial haplogroups of Caribbean acroporid hybrids. *Coral Reefs*, 41: 829–836.
16. Brückner, A., A.A. Barnett, P. Bhat, I.A. Antoshechkin and S.A. **Kitchen**. (2022) Molecular evolutionary trends and biosynthesis pathways in the Oribatida revealed by the genome of *Archezogetes longisetosus*. *Acarologia*, 62(3):532-573.

15. Baker, L.J., H.G. Reich, S.A. **Kitchen**, J.G. Klinges, H.R. Koch, I.B. Baums, E. Muller, and R. Vega Thurber. (2022) The coral symbiont *Candidatus Aquarickettsia* is variably abundant in threatened Caribbean acroporids and transmitted horizontally. *The ISME Journal*, 16: 400–411.
14. Brückner, A., J.M. Badroos, R.W. Learsch, M. Yousefelahiyeh, S.A. **Kitchen**, and J. Parker. (2021) Evolutionary assembly of cooperating cell types in a multi-compound chemical defense system. *Cell*, 184(25): 6138-6156.e28
 - Online Press: “Toxic beetle’s genetics reveals how evolution makes new organs” *New Scientist* (<https://bit.ly/2U3Tmyj>)
 - Online Press: “A Beetle Gland Illustrates How New Organs Evolve” *The Caltech Weekly*
13. Reich, H.G.*, S.A. **Kitchen**, K.H. Stankiewicz*, M.K. Devlin-Durante, N.D. Fogarty, and I.B. Baums. (2021) Genomic variation of an endosymbiotic dinoflagellate (*Symbiodinium ‘fitti’*) among closely related coral hosts. *Molecular Ecology*, 30: 3500-3514.
 - Online Press: “Reef-building corals and microscopic algae within their cells evolve together” *Penn State Eberly College of Science News* (<https://bit.ly/3zV1NfQ>)
12. Gorman, L.M.*, S.P. Wilkinson, S.A. **Kitchen**, C.A. Oakley, A.R. Grossman, V.M. Weis, and S.K. Davy. (2020) Phylogenetic analysis of cell-cycle regulatory proteins within the Symbiodiniaceae. *Scientific Reports*, 10: 20473.
11. **Kitchen**, S.A., G. Von Kuster, K.L. Vasquez Kuntz*, H.G. Reich*, W. Miller, S. Griffin, N.D. Fogarty and I.B. Baums. (2020) STAGdb: a 30K SNP genotyping array and Science Gateway for *Acropora* corals and their dinoflagellate symbionts. *Scientific Reports*, 10: 12488.
 - Online Press: National Science Foundation’s, “4 Awesome Discoveries You Probably Didn’t Hear About”, October 2020 episode (<https://bit.ly/2H9bKjy>)
 - Online Press: “New tool for identifying endangered corals could aid conservation efforts” *Penn State Eberly College of Science News* (<https://bit.ly/2YyRrv>)
10. Parkinson, J.E., A.C. Baker, I.B. Baums, S.W. Davies, A. Grottoli, S.A. **Kitchen**, T.C. LaJeunesse, M.V. Matz, M.W. Miller, A.A. Shantz, and C.D. Kenkel. (2020) Molecular tools for coral reef restoration: beyond biomarker discovery. *Conservation Letters*, e12687.
9. Baums, I.B., A.C. Baker, S.W. Davies, A. Grottoli, C.D. Kenkel, S.A. **Kitchen**, I.B. Kuffner, T.C. LaJeunesse, M.V. Matz, M.W. Miller, J.E. Parkinson, and A.A. Shantz. (2019) Considerations for maximizing the adaptive potential of restored coral populations in the western Atlantic. *Ecological Applications*, e01978.
 - Online Press: “How to restore a coral reef: New guidelines for helping corals adapt to changing environment”, *Penn State Eberly College of Science News*. (<https://bit.ly/2SOoT2V>)
 - Voted top 15 Coral Reef Research Contributors of 2020 in *Environment Coastal and Offshore Magazine* (<https://bit.ly/3n7Q72T>)
8. **Kitchen**[#], S.A., A. Ratan[#], O.C. Bedoya-Renia, R. Burhans, N.D. Fogarty, W. Miller, and I.B. Baums. (2019) Genomic variants among threatened *Acropora* corals. *G3: Genes/Genomes/Genetics*, 9(5): 1633-1646.
7. Kramer, B., A.J. Bourdelais, S.A. **Kitchen**, and A.R. Taylor. (2019) Uptake and localization of fluorescently-labeled *Karenia brevis* metabolites in marine microbial taxa. *Journal of Phycology*, 55: 47-59.
6. **Kitchen**, S.A., A.J. Bourdelais, and A.R. Taylor. (2018) Interaction of a dinoflagellate neurotoxin with voltage-activated ion channels in a marine diatom. *PeerJ*, 6: e4533.

5. Sproles*, A.E., N.L. Kirk, S.A. **Kitchen**, C.A. Oakley, A.R. Grossman, V.M. Weis, and S.K. Davy. (2018) Phylogenetic characterization of transporter proteins in the cnidarian-dinoflagellate symbiosis. *Molecular Phylogenetics and Evolution*, 120: 307-320.
4. **Kitchen**, S.A., A.Z. Poole, and V.M. Weis. (2017) Sphingolipid metabolism of a sea anemone is altered by the presence of dinoflagellate symbionts. *The Biological Bulletin*, 233(3): 242-254.
3. **Kitchen**, S.A. and V.M. Weis. (2017) The sphingosine rheostat is involved in the cnidarian heat stress response but not necessarily in bleaching. *Journal of Experimental Biology*, 220: 1709-1720.
2. Poole, A.Z., S.A. **Kitchen**, and V.M. Weis. (2016) The role of complement in cnidarian-dinoflagellate symbiosis and immune challenge in the sea anemone *Aiptasia pallida*. *Frontiers in Microbiology*, 7: 519.
1. **Kitchen**[#] S.A., C.M. Crowder[#], A.Z. Poole, V.M. Weis, and E. Meyer. (2015) *De novo* assembly and characterization of four Anthozoan (phylum Cnidaria) transcriptomes. *G3: Genes/Genomes/Genetics*, 5(11): 2441-2452.

Papers in Review/Pre-print

4. Baums, I.B., A.C. Baker, S.W. Davies, A. Grottoli, C.D. Kenkel, S.A. **Kitchen**, I.B. Kuffner, M.V. Matz, M.W. Miller, J.E. Parkinson, C. Prada, and A.A. Shantz. (*in review*) Managing expectations for breeding of “super corals”. *PNAS*
3. Blanco-Pimentel M., C.D. Kenkel, S.A. **Kitchen**, I.B. Baums, J. Calle-Triviño, C. Cortés-Useche, M.K. Morikawa. (*in review*) Overcoming barriers to reef restoration: field-based method for approximate genotyping of *Acropora cervicornis*.
2. Ohdera, A.H., J. Darymple, V Avila-Magaña, V. Sharp, K. Watson, M. McCauley, B. Steinworth, E.M. Diaz-Almeyda, S.A. **Kitchen**, A.Z. Poole, A. Bellantuono, S. Haridas, I.V. Grigoriev, L. Goentoro, E. Vallen, D.M. Baker, T.C. LaJeunesse, S. Loesgen, M.Q. Martindale, M. DeGennaro, W.K. Fitt, M. Medina (*bioRxiv*) Symbiosis-driven development in an early branching metazoan. <https://doi.org/10.1101/2022.07.21.500558>
1. Davies, S.W., ... (**60 co-authors**) (*in revision*) Building consensus around the assessment and interpretation of Symbiodiniaceae diversity. *PeerJ*, doi: 10.20944/preprints202206.0284.v1

Papers in Preparation

6. Stankiewicz, K. H. *, N. Guiglielmoni, S.A. **Kitchen**, J.F. Flot, K. Barrot, S.W. Davies, J. Finnerty, S. Grace, L. Kaufman, H. Putnam, R. Rotjan, K. Sharp, I.B. Baums. (*in preparation*) The genome of the temperate coral *Astrangia poculata* uncovers secrets of winter quiescence in corals. For *GigaScience*
5. Stankiewicz, K. H. *, S.A. **Kitchen**, T.L. Conn, C.C. Osborne, Z. Dellaert, H. Elder, H. Koch, I.B. Baums. (*in preparation*) Construction of genetic linkage maps for Caribbean coral *Acropora palmata*. For *BMC Genomics*
4. **Kitchen**, S.A., I. Yang[^], S. Siozios, G. D. Hurst, M. Kaltenpoth and J. Parker. (*in preparation*) Degenerate genome evolution in an army ant myrmecophile facilitated by horizontal acquisition of a nutritional endosymbiont. For *Current Biology*
3. **Kitchen**, S.A., T.H. Naragon*, A. Brückner, S.A. Quinodoz, J.M. Badroos*, M.S. Ladinsky, J.M. Wagner*, D.R. Miller*, M. Yousefelahiyeh, I.A. Antoshechkin, S. Pirro, M. Guttman, M.L. Aardema, S. Davis and J. Parker. (*in preparation*) Genomic and biosynthetic evolution of a chemical key innovation in rove beetles.
2. **Kitchen**, S.A., A.Z. Poole, K. Turnham*, S.B. Piorkowski[^], M. Medina, and A.H. Ohdera (*in preparation*) Inhibition of sphingosine kinase disrupts symbiosis of two cnidarian model systems. For *Journal of Experimental Biology*

1. **Kitchen**, S.A, K.H. Stankiewicz*, C.C. Osborne*, M.K. Devlin-Durante, A. Chan*, B. Kamel, S.B. Piorkowski^, H.G. Reich*, S. Vohsen*, W. Miller, N.D. Fogarty, and I.B. Baums (*in preparation*) Genomic signatures of biased introgression in F1 coral hybrids.

Other Media Coverage

2018 Print: "Racing to save Florida's coral from climate change, scientists turn to a once-unthinkable strategy: 'assisted evolution'", *Los Angeles Times* (<https://lat.ms/2Ckaqoz>)

2015 Print: "Lab Studies Coral, Anemones", *The Daily Barometer*, OSU (<https://bit.ly/2YkxpHI>)

2010 Print: "Tiny but deadly: *Karenia brevis*' method for poisoning", *Re:Search, a Journal of Intellectual Inquiry*, UNCW (<https://bit.ly/2Y64rjI>)

INVITED SEMINARS

- 2022 Texas A&M University Galveston; "Adaptive potential of endangered corals and their symbionts to a changing climate"
- 2022 Tulane University; "Evolving together: genomic insights of two symbioses at different time scales"
- 2021 Wellcome Sanger Institute; "Evolving together: genomic insights of two symbioses at different time scales"
- 2021 Lehigh University; "Adaptive potential and limits in Caribbean acroporid corals"
- 2020 Thermo Fisher Scientific webinar; "STAG: Standard tools for acroporid genotyping"
- 2019 University of Southern California; "Adaptive potential and limits of the Caribbean acroporid corals"
- 2019 Chen Institute, California Institute of Technology; "Developing genomic resources for an emerging model of social and symbiotic evolution"
- 2018 California Institute of Technology; "Revisiting contemporary hybridization between Caribbean corals *Acropora palmata* and *Acropora cervicornis*"
- 2018 University of Guelph; "Revisiting contemporary hybridization between Caribbean corals *Acropora palmata* and *Acropora cervicornis*"
- 2015 The Pennsylvania State University; "Determinants and consequences of cnidarian-dinoflagellate symbiosis in a changing world through a host-centric lens"
- 2015 Northeastern University; "Determinants and consequences of cnidarian-dinoflagellate symbiosis in a changing world through a host-centric lens"
- 2013 Tropical Biosphere Research Center at the University of Ryukyus; "NSF EAPSI Summer Program: Impacts of Hyperthermal Stress on Coral Larvae Undergoing Symbiont Colonization"

SELECT ORAL PRESENTATIONS

17. **Kitchen** S.A., R. Hall^, J.M. Wagner, T.H. Naragon, D.R. Miller, A. Harvard^, Caltech Bi160 class^, J. Parker (2023) Is Genetic Differentiation of Symbiotic Beetles Tied to Their Host Ant? *Society for Integrative and Comparative Biology final program and abstracts, Austin, TX, January 3-7.*
16. **Kitchen**, S.A., T.H. Naragon*, A. Brückner, S.A. Quinodoz, J.M. Badroos*, M.S. Ladinsky, J.M. Wagner*, D.R. Miller*, M. Yousefelahiyeh, I.A. Antoshechkin, S. Pirro, M. Guttman, M.L. Aardema, S. Davis and J. Parker. (2022) Genomic and biosynthetic evolution of a chemical key innovation in rove beetles. *Biodiversity Genomics 2022 Conference, October 3-7.* ONLINE
15. **Kitchen** S.A., R. Garcia, N.D. Fogarty and I.B. Baums. (2021) Applications of the acroporid SNP array beyond genotyping. *14th International Coral Reef Symposium, July 19-23.* ONLINE

14. **Kitchen** S.A., A. Brückner, Y. Kishi*, D.R. Miller*, T. Naragon*, J. Wagner*, and J. Parker. (2020) Genomic insights into gland development of rove beetles. *Society for Integrative and Comparative Biology final program and abstracts, Austin, TX, January 3-7.*
13. **Kitchen** S.A., A. Brückner, Y. Kishi*, D.R. Miller*, T. Naragon*, J. Wagner*, and J. Parker. (2019) Rove beetle genomes provide insight into lineage hyperdiversification. *Entomological Society of America Annual Meeting, St. Louis, MO, November 17-20.*
12. **Kitchen** S.A. and I.B. Baums (2018) Demonstration on SNP array data use for standardized acroporid genotyping. *Reef Futures 2018, Key Largo, Florida. December 10-14.*
11. **Kitchen** S.A., M.K. Devlin-Durante, K. Stankiewicz*, A. Ratan, N.D. Fogarty, W. Miller, I.B. Baums. (2018) Revisiting contemporary hybridization between Caribbean acroporids. *Third Global Invertebrate Genomics Alliance Research Conference and Workshop, Curacao. October 19-21.*
10. **Kitchen**, S.A., A.Z. Poole, K. Turnham*, S.B. Piorkowski^, M. Medina, A.H. Ohdera (2018) Inhibition of sphingosine kinase reduces symbiont colonization in two symbiotic model cnidarians, the sea anemone *Exaiptasia pallida* and jellyfish *Cassiopea xamachana*. *The 9th Congress of the International Symbiosis Society at Oregon State University, Corvallis, Oregon. July 15-20.*
9. **Kitchen**, S.A. (2018) Genetic diversity of breeding programs and nurseries: Determining genetic and genotypic diversity of host and symbionts. *Coral Restoration Consortium Genetic Working Group, Pennsylvania State University, April 27.*
8. **Kitchen**, S.A., H.G. Reich*, M.K. Devlin-Durante, K. Stankiewicz*, T.C. LaJeunesse, I.B. Baums. (2018) Whole genome data resolves strain-specific associations of *Symbiodinium 'fitti'* with Caribbean *Acropora* species. *Symbiofest, Athens, GA. April 20.*
7. **Kitchen**, S.A., A. Ratan, W. Miller, and I.B. Baums. (2018) Genome synteny, divergence and introgression between Caribbean Acroporids. *Society for Integrative and Comparative Biology final program and abstracts, San Francisco, CA. January 3-7.*
6. **Kitchen**, S.A., M.K. Devlin-Durante, R.S. Harris, A. Ratan, N.D. Fogarty, W. Miller, and I.B. Baums. (2017) Genomic evidence of complex hybridization in Caribbean acroporids. *Society for Integrative and Comparative Biology final program and abstracts, New Orleans, LA. January 4-8.*
5. **Kitchen**, S.A., D. Jiang, S. Harii, N. Satoh, V.M. Weis, and C. Shinzato. (2016) Hyperthermal stress alters transcriptomic response of coral larvae at the onset of symbiosis. *13th International Coral Reef Symposium, Honolulu, HI. June 19-24.*
4. **Kitchen**, S.A., A.Z. Poole, and V.M. Weis. (2016) Modulation of cnidarian sphingosine rheostat during symbiosis onset and breakdown. *Society for Integrative and Comparative Biology final program and abstracts, Portland, OR. January 3-7.*
3. **Kitchen**, S.A., C. Shinzato, S. Harii, N. Satoh, and V.M Weis. (2015) Consequence of hyperthermal stress on larvae undergoing symbiont colonization. *Society for Integrative and Comparative Biology final program and abstracts, West Palm Beach, FL. January 3-7.*
2. **Kitchen**, S.A. and V.M. Weis. (2012) Impacts of thermal stress on sphingolipid metabolism in *Aiptasia pallida*. *12th International Coral Reef Symposium, Cairns, Australia. July 9-13.*
1. **Kitchen**, S.A. and A.R. Taylor. (2011) Brevetoxin interaction with voltage-activated ionic currents of a marine diatom. *Journal of Phycology*, 47: S26.

SELECT POSTER PRESENTATIONS

8. Yang^, I, J. Parker, S.A. **Kitchen** (2022) Degenerate genome evolution in Mimecitini army ant myrmecophiles. *Society for Integrative and Comparative Biology final program and abstracts, Phoenix, AZ. January 3-7. ONLINE*

7. **Kitchen, S.A., D.R. Miller*, J. Kanwal, H. Kim*, J.M. Wagner*, J. Parker (2022)** Novel roles of lineage-specific odorant receptors in rove beetles. *Society for Integrative and Comparative Biology final program and abstracts, Phoenix, AZ. January 3-7. ONLINE*
6. **Kitchen, S.A., G. Von Kuster, W. Miller and I.B. Baums (2018)** STAG: Standard Tools for Acroporid Genotyping. *Society for Integrative and Comparative Biology final program and abstracts, San Francisco, CA. January 3-7.*
5. **Kitchen, S.A., A.Z. Poole, and V.M. Weis. (2015)** Sphingolipids in cnidarian-dinoflagellate interactions: investigating the role of the sphingosine rheostat during symbiont colonization. *The 8th Congress of the International Symbiosis Society at University of Lisbon, Lisbon, Portugal. July 12-18.*
4. **Kitchen, S.A., C. Shinzato, S.Harii, N. Satoh, and V.M. Weis. (2014)** Consequence of hyperthermal stress on larvae undergoing symbiont colonization. *5th Multidisciplinary Science Forum of the US Japan Society of Promotion of Science Fellows Alumni Association, Gainesville, FL. November 7-8.*
3. **Kitchen, S.A., A.Z. Poole, C.M. Crowder, V.M. Weis, and E. Meyer. (2014)** De novo assembly and characterization of four anthozoan transcriptomes. *Center for Genome Research and Biocomputing Fall Conference, Oregon State University, Corvallis, OR. September 12.*
2. **Kitchen, S.A., C.W. Paxton, A.Z. Poole, C.M. Crowder, J.J. McGraw^, B. Haslam, J. Flesher^ and V.M. Weis. (2011)** The study of cnidarian-dinoflagellate symbiosis at OSU. *Center for Genome Research and Biocomputing Fall Conference, Oregon State University, Corvallis, OR. September 18-19.*
1. **Kitchen, S.A., A.J. Bourdelais, C. Tomas, and A.R. Taylor. An electrophysiological investigation of Karenia brevis. (2009)** *1st North America Section Meeting. The International Society of Protistologist, Bristol, Rhode Island. June 11-13.*

GRANTS, FELLOWSHIPS & AWARDS (Total \$242,127 USD)

Grants and Fellowships:

- \$19,000 Caltech Center for Environmental Microbial Interactions, “Horizontal transmission of an insect primary endosymbiont”, Co-PI with J. Parker, 2020
- \$118,000 Biology and Biological Engineering Postdoctoral Fellow, Caltech, 2020-2022
- \$70,392 NOAA Domestic Coral Reef Conservation Grant Program. “Building a genetic and bioinformatic analysis pipeline for genotyping of Caribbean corals”, Co-PI with I.B. Baums, funded 2017-2019 (NA17NOS4820083)
- \$ 6,225 Dovetail Genomics EOY Matching Funds Grant, 2017
- \$ 3,610 PADI Foundation Grant, 2014
- \$ 500 SIGMA XI Grants in Aid of Research, 2014
- \$11,000 NSF East Asia and Pacific Summer Institutes (EAPSI, OISE #1311087)/ Japanese Society for Promotion of Science (SP #13027) - Japan, 2013

Awards:

- NOAA travel support to Reef Futures Conference, FL 2018
- NSF travel support to GIGA III workshop, Curacao 2018
- \$200 Travel Award from the Office of Postdoctoral Affairs, Penn State, 2016
- \$1,950 Oregon State University Libraries & Press Open Access Fund, 2015
- \$400 ZoRF Funds from the Dept. of Integrative Biology at OSU, 2015
- \$250 College of Science Student Travel Award at OSU, 2014
- SICB Charlotte Mangum Student Support Program, Housing, 2014
- \$400 ZoRF Funds from the Dept. of Integrative Biology at OSU, 2014
- \$400 ZoRF Funds from the Dept. of Integrative Biology at OSU, 2013
- \$400 College of Science Student Travel Award at OSU, 2012

- \$400 ZoRF Funds from the Dept. of Integrative Biology at OSU, 2012
- \$900 ZoRF Funds from the Dept. of Integrative Biology at OSU, 2011
- \$300 Poster presentation at International Society of Protistologist conference received Third Place Honors, 2009
- \$7,800 UNCW Merit Scholarship, 2005-2007

TEACHING EXPERIENCE

Course Development

- 2019/ **Molecular Basis of Animal Evolution Laboratory (Bi 160), Caltech**
- 2022 Developed a laboratory course on population genomic analysis in collaboration with Dr. Joseph Parker. Included labs for field collection, sequencing library preparation, variant calling, population structure, and positive selection detection.
Mentor teaching assistants: David Miller (2019), Tom Naragon (2019), Hannah Ryon (2022) and Vera Beilinson (2022).
- 2013 **Invertebrate Zoology Laboratory (Z 362), Oregon State University**
Co-wrote and redesigned 10 laboratory classes to incorporate active learning exercises broadly covering animal physiology and behavior, ecology, evolution and molecular biology using key invertebrate model organisms throughout the course. In 2014, we received OSU Institutional Review Board (#6225) approval to collect data from our students that will be used to publish selected labs.

Guest Lectures

- 2017 **Coastal Biology, Pennsylvania State University** – lecture on benthic life habits

Teaching Assistant, Department of Integrative Biology, Oregon State University, Corvallis, OR

- 2016 **Data analysis: Human Anatomy and Introductory Biology series, 1 quarter**
Pre- and post-survey data was collected from undergraduate for attitudes about learning science, science identity, attitudes about in-class activities, and learning assistance. The goals of the program were to improve student learning and learning experiences in undergraduate STEM courses. I analyzed the data and drafted the report. IRB #6750.
- 2015 **Lecture: Symbiosis in the Environment (Bi 358), 1 quarter**
Lecture class on beneficial symbioses in the environment. I presented half the lectures, developed group activities, prepared quizzes and test material.
- 2015 **Lab: Human Anatomy and Physiology Laboratory, (Bi 343), 2 quarters**
Present lectures, prepare quizzes, engage critical thinking skills on circulatory, respiratory, urinary, and digestive systems
Mentor teaching intern: James Bonar (2015)
- 2012- **Lab: Human Anatomy and Physiology Laboratory (Bi 341), 5 quarters**
- 2015 Present lectures, prepare quizzes, and engage critical thinking skills on bones and muscles
Mentor teaching interns: Nathan Hanson (2012), Hannah Niestrad (2012), Charles Braugh (2013), Brooke Mischkot (2014), Miguel Garcia (2014), Matt W (2015), Danielle H (2015) Austin C (2015), Erik G (2015)
- 2012- **Lab: Human Anatomy and Physiology Laboratory, (Bi 342), 3 quarters**
- 2014 Present lectures, prepare quizzes, and engage critical thinking skills on nervous, reproductive and endocrine systems
Mentor teaching intern: Emily Monroe (2014)
- 2011- **Lab: Invertebrate Zoology Laboratory (Z 362), 4 quarters**
- 2014 Present lectures, prepare labs, quizzes and exams, and coordinate field trips
Mentor teaching intern: Emily Nicholson (2011), Ediyana Daniel (2012), Jamie Jo McGraw (2013), Maria Lorenz (2014), Jocelyn Powell (2014)
- 2011 **Lab: Principles of Biology Laboratory (Bi 212), 1 quarter**

- Present lectures, prepare quizzes, and lead online discussion boards on origins of life, energy transformation, plant and animal diversity
- 2010 **Lab: Principles of Biology Laboratory (Bi 211), 1 quarter**
Present lectures, prepare quizzes, and lead online discussion boards on cell biology, organ systems, plant and animal physiology

Teaching Assistant, Department of Biology, UNC Wilmington, Wilmington, NC

- 2008- **Lab: Principles of Biology: Cell Laboratory (Bio 201), 2 semesters**
2009 Present lectures and prepare quizzes on cellular and molecular basis of life and the transmission of genetic information

Marine Science Instructor, Marine Quest, UNC Wilmington, Wilmington, NC

- 2007- **Ocean Lab lead instructor, 3 summers**
2010 Developed curriculum for middle school aged children (13-14yrs) in weeklong programs centered on physical, chemical, and biological oceanography topics. http://uncw.edu/marinequest/ocean_lab.html

PROFESSIONAL DEVELOPMENT AND TRAINING

- 2022 **5th International *Cassiopea* Workshop** (virtual)
2021 **Reef Futures** (virtual)
2021 **4th International *Cassiopea* Workshop** (virtual)
2021 **Genomes of Animals and Plants Conference** (virtual), Dovetail Genomics
2020 **Equity Training**, Caltech
2019 **Chen Institute Workshop on Genomic Neuroscience**, Caltech
2018 **PSU Bootcamp on Reproducible Research**, Pennsylvania State University
2018 **Molecular Mechanisms of Adaptation- 32nd Mini Symposium**, Carnegie Institution for Science
2018 **Anatomy of a Chalk Talk**, Pennsylvania State University
2017 **Global Biodiversity Genomics Conference**, Smithsonian National Museum of Natural History
2016 **How to be Your Own Best Mentor**, Pennsylvania State University
2016 **Broader Impacts Workshop**, Pennsylvania State University
2014 **Structuring Classrooms for Engaged and Active Learning**, Oregon State University
2014 **Center for Genome Research and Biocomputing Fall Conference**, Oregon State University
2011 **Center for Genome Research and Biocomputing Fall Conference**, Oregon State University
2011 **Seeing is Believing: Advances in Live Imaging in Optogenetics**, University of Oregon
2010 **Center for Genome Research and Biocomputing Fall Conference**, Oregon State University

OUTREACH, SERVICE AND MENTORING

Professional:

- 2021 **Co-chair of evolutionary ecology session at International Coral Research Symposium**
2018 **Workshop lead on SNPchip demonstration (70 participants)**, Reef Futures 2018
2018-2022 ***Acropora* Recovery Implementation Team Database Working Group**, NOAA
2018 **Instructor of SNP analysis for Conservation Genomics workshop (35 participants)**, Third Global Invertebrate Genomics Alliance Research Conference and Workshop
2017-2023 **Caribbean Coral Restoration Genetics Working Group**, NOAA
2016 **Co-chair Symbiosis Session**, SICB

Department and University:

- 2021-2022 **BBE DEI Representative**, Caltech
2017-2018 **Postdoc Committee of the PSU Microbiome Center**, organize seminar series at PSU
2017-2018 **NSF Includes USVI Summer Program**, taught visiting students for two weeks at PSU
2016-2017 **Symbiosis Reading Group**, founder of multi-department monthly reading group at PSU
2015 **OSU Molecular and Cellular Biology Discussion Panel Member**

2014 **Fundraising committee**, Dept. of Integrative Biology
2012-2013 **Biology Graduate Student Symposium**, Food Fundraising and Service
2011-2012 **Biology Graduate Student Symposium**, Fundraising and Publicity Rep.

Community:

2017 **WPSU Eventapalooza**, coral activities designed for children 4-7 years old at PSU
2016 **ECOGIG Ocean Discovery Zone**, volunteer for Penn State outreach event
2013 **Winter Wonderings**, classroom activities for 3rd -4th graders
2009 **Blue Heron Bowl**, volunteer the National Ocean Sciences Bowl

Graduate Students Mentored: Joani Viliunas- Caltech (2022), Hayley Smihula – Caltech (2022), Marina Lecoecuche- Caltech (2022), Immy Ashley- Victoria University of Wellington, New Zealand (2021-2022), C. Cornelia Osborne - Pennsylvania State University (2020-2022), Lucy Gorman- Victoria University of Wellington, New Zealand (2020), Jean Badroos- Caltech (2019-2022), Tom Naragon- Caltech (2018-2022), Yuriko Kishi- Caltech (2018-2022), Kira Turnham- Pennsylvania State University (2018), Kathryn Stankiewicz- Pennsylvania State University (2017-2022), Kate Vasquez Kuntz - Pennsylvania State University (2017-2020), Andrea Chan- Pennsylvania State University (2016-2018), Hannah Reich- Pennsylvania State University (2016-2020), Jeremy Berthelie- Aix Marseille University, France (2015), Ashely Sproles- Victoria University of Wellington, New Zealand (2015)

Undergraduate Students Mentored: Robert Hall- University of Wisconsin-Madison (2022), Isabell Yang- Caltech (2021-2022), Austin Harvard- Caltech (2019), Sam Piorkowski- Pennsylvania State University (2017-2018), Macklin Elder- Pennsylvania State University (2016-2017), Kristin Brandon- Oregon State University (2014-2015), Jessica Flesher- Oregon State University (2012-2013), Ariana Meltvedt- Oregon State University (2011-2012), Jamie Jo McGraw- Oregon State University (2011), Sam Kelly- Quattrocchi- Oregon State University (2011)

Thesis review: University of Melbourne (2022)

Peer Review for: *Aquatic Conservation: Marine and Freshwater Ecosystems* (1), *The Biological Bulletin* (1), *BMC Genomics* (1), *Communications Biology* (1), *Conservation Genetic Resources* (1), *Coral Reefs* (2), *Frontiers* (3), *G3* (1), *GigaScience* (2), *Global Change Biology* (1), *Journal of Experimental Marine Biology and Ecology* (1), *Marine Genomics* (1), *Molecular Biology and Evolution* (1), *Molecular and Cellular Toxicology* (1), *Molecular Ecology* (1), *Nature Climate Change* (1), *Scientific Reports* (1), *The ISME Journal* (1) and National Science Foundation (3 ad hoc, 1 panel review)

Society memberships: Global Invertebrate Genomics Alliance (2021-2023), Entomological Society of America (2019-2020), International Society for Reef Studies (2015-2021), International Symbiosis Society (2015-2018), Society for Integrative and Comparative Biology (2014-2023), Sigma Xi (2010, 2014), The International Society of Protistologists (2009-2011)

PROFESSIONAL CERTIFICATIONS

2016 NAUI Diver (nitrox, rescue and advanced)/2010 SDI Scuba Certification (open water)
2016 First Aid and CPR
2015 Blood Borne Pathogen Training, OSU
2013 Sea Safety & Survival Training Class, OSU

PROFESSIONAL REFERENCES

1. **Dr. Joseph Parker**, Caltech, phone: 626-395-8729, email: joep@caltech.edu
2. **Dr. Iliana Baums**, Pennsylvania State University, phone: 814-867-0492, email: baums@psu.edu
3. **Dr. Virginia Weis**, Oregon State University, phone: 541-737-4359, email: weisv@oregonstate.edu

4. **Dr. Alison Taylor**, University of North Carolina Wilmington, phone: 910-962-2176 , email: taylora@uncw.edu

COLLABORATORS

1. **Dr. Rocío García-Urueña** - Universidad del Magdalena, Colombia
2. **Dr. Simon Davy** - Victoria University of Wellington, New Zealand
3. **Dr. Chuya Shinzato** - University of Tokyo, Japan
4. **Dr. Nori Satoh** – Okinawa Institute of Science and Technology, Japan
5. **Dr. Saki Harii** – University of the Ryukyus, Japan
6. **Dr. Angela Poole** – Berry College, Georgia, USA
7. **Dr. Monica Medina** – Pennsylvania State University, Pennsylvania, USA
8. **Dr. Aki Ohdera** – California Institute of Science and Technology, California, USA
9. **Dr. Dustin Kemp** – University of Alabama Birmingham, Alabama, USA
10. **Dr. Bill Fitt**- University of Georgia, Georgia, USA
11. **Dr. Michael Abrams**- UC Berkeley, California, USA