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Ocean Chemistry & Ecosystems Division  
Atlantic Oceanographic and Meteorological Laboratory  
Oceanic and Atmospheric Research  
National Oceanic and Atmospheric Administration  
Stationed at Southwest Fisheries Science Center, La Jolla, CA

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**RESEARCH INTERESTS**

Marine microbial ecology, genomics and metagenomics, bioinformatics, climate change ecology

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**EDUCATION AND PROFESSIONAL EXPERIENCE**

National Oceanographic and Atmospheric Administration  
Postdoctoral Researcher at the University of Miami/AOML  
Advisor: Kelly Goodwin  
Aug. 2020 - present

Georgia Institute of Technology  
Postdoctoral researcher  
Advisor: Frank Stewart  
Co-advisor: Kostas Konstantinidis (as of February 2019)  
2016 – Aug. 2020

Scripps Institution of Oceanography, University of California, San Diego  
Ph.D. in Marine Biology  
Advisor: Paul Jensen  
2011 – 2016

San Francisco State University  
M.S. in Marine Biology  
Advisor: Frances Wilkerson  
Co-advisor: Matthew Ashby  
2009 – 2011

Stanford University  
B.S. in Biological Sciences, minor in French.  
2004 –2008

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**PUBLICATIONS**

**Patin NV**, Goodwin KD. Capturing Marine Microbiomes: A field sampling guide. *In preparation for Frontiers in Marine Microbiology.*

**Patin NV**, Jesser KJ, Peña-Gonzalez A, Hatt JK, Trueba G, Levy K, Konstantinidis KT. Comparison of metagenomic and traditional methods for diagnosis of *E. coli* enteric infections. *Submitted to mBio.*

Truelove N, **Patin NV**, Min M, Pitz K, Chavez F, Goodwin K. Expanding the scale of environmental DNA research with autonomous sampling. *In preparation for Methods in Ecology and Evolution.*

- Thompson LR, Anderson SR, Den Uyl PA, **Patin NV**, Sanderson G, Goodwin KD. Tourmaline: a workflow for rapid and reproducible amplicon sequence analysis using QIIME 2 and Snakemake. *Submitted to GigaScience*.
- Demko A, **Patin NV**, Jensen PR. 2021. Culture-dependent and culture-independent microbial diversity in tropical marine sediments. *BioRxiv*. doi: 10.1101/2021.02.27.433211. *Under review at Environmental Microbiology*.
- Caughman A, Pratte ZA, **Patin NV**, Stewart PJ. 2021. Coral microbiome changes over the day-night cycle. *Coral Reefs*. <https://doi.org/10.1007/s00338-021-02097-8>
- Patin NV**, Dietrich ZA, Stancil A, Quinan M, Beckler JS, Hall ER, Culter J, Smith CG, Taillefert M, Stewart FJ. 2021. Gulf of Mexico blue hole harbors high levels of novel microbial lineages. *The ISME Journal*. doi: s41396-021-00917-x
- Abdelrahman SM, **Patin NV**, Hanora AM, Aboseidah AA, Desoky SM, Desoky FG, Stewart FJ, Lopanik NB. 2021. The natural product biosynthetic potential of Red Sea nudibranch microbiomes. *PeerJ* 9:e10525. doi: 10.7717/peerj.10525
- Patin NV**, Peña-Gonzalez A, Hatt J, Moe C, Kirby A, Konstantinidis K. 2020. The role of the gut microbiome in resisting norovirus infection as revealed by a human challenge study. *mBio*. 11 (6) e02634-20. doi: 10.1128/mBio.02634-20.
- Patin NV**, Brown E, Garfield C, Chebli G, Kubanek J, Stewart FJ. 2020. Microbial and chemical dynamics of a toxic dinoflagellate bloom. *PeerJ*. 8:e9493. doi: 10.7717/peerj.9493
- Thamdrup B, Steinsdottir HGR, Bertagnolli AD, Padilla CC, **Patin NV**, Garcia-Robledo E, Bristow L, Stewart FJ. 2018. Anaerobic methane oxidation is an important sink for methane in the ocean's largest oxygen minimum zone. *Limnology and Oceanography* 9999: 1-17. doi: 10.1002/lno.11235
- Patin NV**, Locklear S, Stewart FJ, Lopanik NB. 2018. Symbiont frequency predicts microbiome composition in a model bacterial-bryozoan symbiosis. *Aquatic Microbial Ecology* 83: 1-13. doi:10.3354/ame01901
- Tuttle RN, Demko A, **Patin NV**, Kapon C, Dorrestein PC, Jensen PR. 2018. The detection of specialized metabolites and their producers in ocean sediments. *Applied and Environmental Microbiology*. doi:10.1128/AEM.02830-18
- Pratte ZA, **Patin NV**, McWhirt M, Caughman A, Stewart FJ. 2018. Association with a sea anemone alters the skin microbiome of clownfish. *Coral Reefs*. doi:10.1007/s00338-018-01750-z
- Patin NV**, Floros D, Dorrestein PC, Hughes C, Jensen PR. 2018. The role of inter-species interactions in *Salinispora* specialized metabolite production. *Microbiology*. 164(7): 946-955.
- Patin NV**, Pratte ZA, Regensburger M, Gilde K, Hall E, Dove ADM, Stewart FJ. 2018. Microbiome dynamics in a large artificial seawater aquarium. *Applied and Environmental Microbiology*. 84(10): e00179-18.
- Patin NV**, Schorn MA, Aguinaldo K, Lincecum T, Moore BS, Jensen PR. 2016. Effects of actinomycete secondary metabolites on sediment microbial communities. *Applied and Environmental Microbiology*. 83(4): e02676-16.

Schorn MA, Alanjary MM, Aguinaldo K, Korobeynikov A, Podell S, **Patin NV**, Lincecum T, Jensen PR, Ziemert N, Moore BS. 2016. Sequencing rare marine actinomycete genomes reveals high density of unique natural product biosynthetic gene clusters. *Microbiology*. 162(12): 2075-2086.

**Patin NV**, Duncan K, Dorrestein PC, Jensen PR. 2016. Competitive strategies differentiate closely related species of marine actinobacteria. *The ISME Journal*. 10: 478-490.

Wietz M, Duncan K, **Patin NV**, Jensen PR. 2013. Antagonistic interactions mediated by marine bacteria: The role of small molecules. *Journal of Chemical Ecology*. 9: 879-891.

**Patin NV**, Kunin V, Lidström U, Ashby M. 2012. Effects of OTU clustering and PCR artifacts on microbial diversity estimates. *Microbial Ecology*. 65(3): 709-19.

Bagulayan A, Bartlett-Roa JN, Carter AL, Inman BG, Keen EM, Orenstein EC, **Patin NV**, Sato KNS, Sibert EC, Simonis AE, Van Cise AM, Franks PJS. 2012. Journey to the center of the gyre: The fate of the Tohoku Tsunami debris field. *Oceanography* 25(2): 200–207.

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## CURRENT RESEARCH PROJECTS

Detecting changes in the Georgia Aquarium *Ocean Voyager* water column microbiome and virome over a 3-year time period.

Comparing marine microbial communities in the California Current sampled by an autonomous environmental sampler compared to manual bottle sampling using shotgun metagenomics.

Characterizing California Current microbiomes over temporal, spatial, and oceanographic scales using shotgun metagenomics.

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## AWARDS, HONORS, AND RESEARCH SUPPORT

Peggy Cotter Travel Award, American Society for Microbiology	2019
Best Talk, Georgia Tech Postdoctoral Symposium	2017
Edward A. Frieman Director's Prize for Excellence in Graduate Student Research <i>Awarded for the 2016 ISMEJ publication listed above.</i>	2016
International Society for Microbial Ecology Student Travel Grant	2014, 2016
SIO Department Graduate Student Excellence Travel Award	2014, 2016
San Francisco Bay Scholarship	2009
DAAD Research Internship in Science and Engineering Fellowship	2007
Stanford Undergraduate Research Grant	2006

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## PRESENTATIONS AND INVITED TALKS

**Patin NV**, Pitz K, Truelove N, Chavez F, Goodwin K. Comparing microbial eDNA 2021

captured by automated and manual sampling methods. Oral presentation at NCCOS-AOML Symposium.

- Patin NV**, Dietrich Z, Beckler J, Hall E, Stewart FJ. Metagenome-assembled genomes of the rare and enigmatic Woese archaeota inform their role in blue hole biogeochemistry. Oral presentation at Ocean Sciences Meeting 2020. 2020
- Patin NV**, Brown E, Chebli G, Garfield C, Kubanek J, Stewart FJ. Microbial and chemical dynamics of a toxic dinoflagellate bloom. Oral presentation at 10<sup>th</sup> US Symposium on Harmful Algae. 2019
- Patin NV**, Pratte ZA, Regensburger M, Gilde K, Hall E, Dove ADM, Stewart FJ. The *Ocean Voyager* Microbiome. Poster. American Society for Microbiology Microbe 2019 Conference. 2019
- Patin NV**. Chemical Ecology in the Age of Microbiome Science and Big Data. **Invited Talk**. 35<sup>th</sup> annual meeting of the International Society of Chemical Ecology. Atlanta, GA. 2019
- Patin NV**, Pratte ZA, Regensburger M, Gilde K, Hall E, Dove ADM, Stewart FJ. The *Ocean Voyager* Microbiome. **Invited Talk**. Kennesaw State University. 2018
- Patin NV**, Pratte ZA, Regensburger M, Gilde K, Hall E, Dove ADM, Stewart FJ. The *Ocean Voyager* Microbiome. **Invited Talk**. Astrobiology Graduate Conference, Georgia Institute of Technology. 2018
- Patin NV**, Locklear S, Stewart FJ, Lopanik NB. The microbiome of the bryozoan *Bugula neritina* is shaped by a cytotoxin-producing symbiont. Poster. 7<sup>th</sup> Conference on Beneficial Microbes. 2018
- Patin NV**, Pratte ZA, Regensburger M, Gilde K, Hall E, Dove ADM, Stewart FJ. The *Ocean Voyager* Microbiome. Poster. 11<sup>th</sup> Georgia Tech Bioinformatic Conference. 2017
- Patin NV**, Pratte ZA, Regensburger M, Gilde K, Hall E, Dove ADM, Stewart FJ. The *Ocean Voyager* Microbiome. Talk. Georgia Tech Postdoctoral Symposium. 2017
- Patin NV**, Schorn M, Aguinaldo K, Lincecum T, Moore BS, Jensen PR. Effects of actinomycete secondary metabolites on sediment microbial communities. Poster. International Society for Microbial Ecology-16 Conference. 2016
- Patin NV**, Duncan K, Dorrestein PC, Jensen PR. Competitive strategies differentiate closely related species of marine actinobacteria. Poster. International Society for Microbial Ecology-15 Conference. 2014
- Patin NV**, Kunin V, Lidström U, Ashby M. Effects of OTU clustering and PCR artifacts on microbial diversity estimates. Poster. International Society for Microbial Ecology-13 Conference. 2010

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## SERVICE, OUTREACH, AND MEDIA

- Invited Member**, NOAA 'Omics Working Group Subcommittee on bioinformatics and data management 07/2021

**Author, *It's the little things: Studying marine microbes.*** 02/2021  
 Blog post: Cooperative Institute for Marine and Atmospheric Sciences, Rosenstiel School For Marine and Atmospheric Sciences.  
<https://cimas.rsmas.miami.edu/news-events/cimas-blog/little-things/index.html>

**Author, *Diving for microbes: journey into a blue hole.*** 02/2021  
 Nature Microbiology: Behind the Paper. <https://naturemicrobiologycommunity.nature.com/posts/diving-for-microbes-journey-into-a-blue-hole>

**Founder and Organizer, Georgia Tech Bioinformatics User Group (GT-BUG)** 2017-present  
 Established a regular meeting of students, postdoc, and faculty interested in bioinformatics for discussions, tutorials, and invited speakers in order to address community needs in sharing knowledge and experience among scientists from Georgia Tech, Emory University, the Centers for Disease Control and Prevention, and Georgia State University.

**Co-organizer, Summer Workshop in Marine Science (SWiMS)** 2017, 2018  
 Helped developed tutorials on incorporating marine science into high school lesson plans and delivered tutorials to workshop attendees (high school teachers).

Visiting speaker, Gwinnett High School. 2018  
 Spent a day giving short talks and interactive lessons on ocean pollution to 9<sup>th</sup> graders.

Judge, Morningside Elementary School Science Fair 2017, 2018  
 Assessed and ranked the quality of 3<sup>rd</sup>-5<sup>th</sup> grade science fair projects.

Visiting speaker, Northwestern Middle School March 2017  
 Presented short talks and interactive lessons on microbiology to 6<sup>th</sup> and 7<sup>th</sup> graders.

**Co-coordinator, Scripps Community Outreach Program for Education** 2013 – 2016  
 Facilitated educational outreach opportunities at SIO and volunteered for these opportunities.

Student Representative, SIO Heritage Committee 2015 - 2016  
 Generated recommendations to the UC San Diego administration for the upkeep and preservation of historical buildings, facilities, and other resources.

Organizer, Microbial Oceanography Journal Club 2012 –2014  
 Organized monthly paper discussions for graduate students and postdocs.

Member, Marine Biology Curricular Group Student Committee 2012, 2013  
 Wrote evaluations for SIO faculty members based on course evaluations, instructor evaluations, and student feedback.

Volunteer, Sea Lion Bowl, National Ocean Sciences Bowl 2009, 2010  
 Assisted with preparation and logistics of two annual high school marine science quiz bowls.

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**FIELD EXPERIENCE**

Mote Marine Lab, Sarasota, Florida 2019, 2020

Led the microbial sampling of blue hole formations in the Gulf of Mexico over three expeditions. Collected water and sediment samples via SCUBA diving and robotic lander deployment, in collaboration with Mote Marine Laboratory and Florida Atlantic University. Two expeditions sampling included mentorship of students who gained valuable field experience and one of whom is a co-author the resulting publication.	field
Mote Marine Lab, Sarasota, Florida Organized and led a field collection experiment to the southwest coast of Florida with two undergraduate students. Collected water samples from twelve sites and size-fractionated for particle-associated and free-living microbial community analyses. Taught all methods to the accompanying students and included them as co-authors on a pending publication.	2018
Gump Research Station, Mo'orea, French Polynesia Collected crabs for gut microbiome analyses. Conducted feeding experiments on crabs for gut transcriptome analyses. Collected seaweeds for study on nutrient loads and algal microbiomes. Sampled coral over a 48-hour period for diel microbiome study.	2017
Institute of Marine Sciences, Morehead City, North Carolina Collected colonies of the bryozoan <i>Bugula neritina</i> for a study on microbiome structure, function, and biogeography. Assisted with ecological experiments assessing predation levels in different <i>B. neritina</i> habitats.	2017
Carrie Bow Cay Field Station, Belize Conducted <i>in situ</i> experiments to detect microbial bioactive compounds in marine sediments and to assess effects of actinomycete compounds on natural communities.	2014, 2015
Viti Levu, Fiji Conducted <i>in situ</i> experiments on microbial chemical competition. Collected sediment samples for cultivation of actinomycete bacteria.	2014
UNOLS cruise, Bahamas Collected sediment samples for cultivation of actinomycete bacteria and culture-independent sediment community analyses.	2013
UNOLS cruise, Yucatán Peninsula, Mexico Collected sediment, algal, and invertebrate samples for cultivation of actinomycete bacteria.	2012

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## TEACHING AND MENTORING EXPERIENCE

<b>Mentor</b> , Zoë Dietrich (summer REU student, fall field assistant) Guided student through sample processing and analysis of marine water column and sediment samples obtained from a blue hole field expedition. By the end of the summer the student had produced high-quality amplicon sequence data and interpreted the results in oral presentation, poster, and written report formats. The student participated in the second sampling trip and contributed substantially to sample collection and processing. She is anticipated to be a co-author on future publications describing our results.	summer 2019
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**Mentor**, Chloe Pryor (undergraduate) fall 2018-present  
Taught molecular biology laboratory skills to a first-year undergraduate, leading to the generation of high-throughput sequencing data set. Currently teaching basic bioinformatic data analysis methods (quality control, taxonomic assignment, and ecological statistics).

**Mentor**, Claire Garfield and Gabriella Chebli (summer REU students) summer 2018  
Developed a summer research project incorporating field collections, molecular biology, and metabolomic data generation and analyses for two undergraduate students. Guided students through all components of the project including a 4-day field trip to Florida as the single head scientist in charge of all aspects of the trip (scientific, educational, and logistical). By the end of the summer students had generated two major preliminary data sets that were used in an NSF grant proposal. They also presented their results as a poster and a paper at the Georgia Tech REU Research Symposium.

**Organizer/lecturer**, Georgia Tech Bioinformatics User Group 2017 - present  
Conducting tutorials on basic bioinformatic programs and skills on topics including amplicon and metagenome sequencing data analysis, phylogenetics, and ecological statistics.

**Mentor**, Doug Sweeney (undergraduate) 2015 - 2016  
Taught microbiology and molecular biology techniques to an undergraduate student, leading to an independent research project and his ultimately joining the lab as a PhD student.

**Teaching Assistant**, SIO282: Microbial Life in Extreme Environments, UCSD 2016  
Prof. Doug Bartlett  
Graded exams and conducted exam review sessions. Designed and presented a lecture on microbial symbiosis.

**Teaching Assistant**, GES56: Changes in the Coastal Ocean, Stanford, CA 2008  
Prof. Rob Dunbar  
Provided teaching support for class on the science and policy of the California coast. Created and executed lesson plan about the Channel Islands marine reserve.

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## PROFESSIONAL ASSOCIATIONS

American Association for the Advancement of Science  
The American Society of Microbiology

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## OTHER

Citizenship: United States and Switzerland  
Languages: Proficient in French and German, some knowledge of Spanish  
Society Memberships: Union of Concerned Scientists, 500 Women Scientists, Sierra Club, Surfrider Foundation  
Other: AAUS Scientific Diver, PADI Divemaster