

ALEJANDRO DE SANTIAGO

Institute of Bioinformatics
Department of Marine Sciences
University of Georgia
325 Sanford Drive, Athens GA 30602

Email: ad14556@uga.edu
ORCID: <https://orcid.org/0000-0001-9086-3050>
GitHub: <https://github.com/alejandrodesantiago>
Website: alejandrodesantiago.github.io

EDUCATION

2020 – 2025 Ph.D. in Bioinformatics, University of Georgia (Advisor: Dr. Holly Bik)
Dissertation: “Identification of novel nematode-associated symbionts by integrating pangenomic and single-specimen metagenomic datasets”

2015 – 2019 B.S. in Microbiology, University of California – Riverside

PROFESSIONAL APPOINTMENTS

2025 – present Postdoctoral Research Associate (Advisor: Dr. Holly Bik)
Institute of Bioinformatics, University of Georgia, Athens, GA

2022 Adjunct Professor, Department of Biology, Morehouse College, Atlanta, GA

OTHER RESEARCH EXPERIENCE

2020 – 2025 Graduate Research Assistant (Advisor: Dr. Holly Bik)
Institute of Bioinformatics, University of Georgia, Athens, GA

2019 – 2020 Technical Paraprofessional (Advisor: Dr. Holly Bik)
Department of Marine Sciences, University of Georgia, Athens, GA

2019 Junior Research Specialist (Advisor: Dr. Holly Bik)
Department of Nematology, University of California, Riverside, CA

SU2018 HHMI ExROP Summer Research Fellow (Advisor: Dr. Joseph Jez)
Department of Biology, Washington University in St. Louis

2017 – 2019 Undergraduate Research Assistant (Advisor: Dr. Holly Bik)
Department of Nematology, University of California, Riverside, CA

SU2017 HHMI ExROP Summer Research Fellow (Advisor: Dr. Joseph Jez)
Department of Biology, Washington University in St. Louis

SU2016 Dynamic Genome Summer Research Fellow (Advisor: Dr. Susan Wessler)
Department of Botany & Plant Sciences, University of California – Riverside

RESEARCH GRANTS

2021 University of Georgia Summer Research Grant for Doctoral Students (\$1,000 in support for a graduate research project)

2018 Undergraduate Education Minigrant, University of California – Riverside (\$750 in support for an undergraduate research project)

FELLOWSHIPS, HONORS, AND AWARDS

Graduate Student

2025 UGA Graduate School Domestic Travel Award – travel funding to attend the New Lineages of Life (NeLLi) Symposium (\$900)

2025	UGA Graduate School Domestic Travel Award – travel funding to attend the American Society for Microbiology (ASM) Microbe Conference (<u>\$1,200</u>)
2024	Harvard FAS Research and Academic Exchange – travel funding for a week-long research exchange program at the Girguis Lab at Harvard (<u>\$2,500</u>)
2024	The Carl Storm Underrepresented Minority Fellowship – travel funding to attend the Marine Microbes Gordan Research Conference (<u>\$1,000</u>)
2024	UGA Graduate School International Travel Award – travel funding to attend the Marine Microbes Gordan Research Conference (<u>\$1,500</u>)
2022 – 2023	UGA Graduate Fellowship in Open Sciences – recognizes doctoral students who incorporate Open Science principles in their research (<u>\$2,500</u>)
2021 – 2023	UGA T32 Genetics Training Grant Awardee – NIH-funded training program for graduate students who focus on genetics research (<u>\$32,000/yr + tuition & fees</u>)

Undergraduate Student

2019	University of California – Riverside Winter Quarter Dean's Honor List
2018	Howard Hughes Medical Institute (HHMI) ExROP Research Fellowship – summer funding to conduct research at the Jez Lab at Washington University in St. Louis (<u>\$8,000</u>)
2017	Segal AmeriCorps Education Award – educational award for completing AmeriCorps terms of service (<u>\$1,250</u>)
2017	Howard Hughes Medical Institute (HHMI) ExROP Research Fellowship – summer funding to conduct research at the Jez Lab at Washington University in St. Louis (<u>\$5,000</u>)
2016	Dynamic Genome Research Fellowship – summer funding to conduct research in the Department of Botany & Plant Sciences at the University of California Riverside (<u>\$5,000</u>)
2015 – 2019	Blair Family AvalonBay Scholarship – private scholarship for students that excel academically and are engaged in community activities (<u>\$20,000</u>)

PUBLICATIONS – IN PREP AND REVIEW

- **De Santiago A**, Barnes S, Pereira TJ, Marcellino-Barros M, Durden L, Han MK, Thrash JC, Bik HM. (2025) *Pseudoalteromonas* is a novel symbiont of marine invertebrates that exhibits broad patterns of phylosymbiosis. *BioRxiv*. <https://doi.org/10.1101/2025.08.22.671635>. *In Revisions at ISMEJ*.
- Serrano GA, **De Santiago A**, Pereira TJ, Marcellino-Barros M, Bik HM. Environmental gradients and spatial patterns of benthic microbial diversity in a temperate estuarine ecosystem. *In Prep*.
- **De Santiago A**, Marcellino-Barros M, Brito De Jesus S, Pereira TJ, Bik HM. Marine nematodes exhibit novel symbiosis and co-host predicted endosymbiont lineages. *In prep*.
- **De Santiago A**, Pereira TJ, Marcellino-Barros M, Bik HM. MeioBIOME: A snakemake workflow for the metagenomic analysis of meiofaunal genomes and their microbiome facilitates studies of phylosymbiosis in microbial invertebrates. *In prep*.

PUBLICATIONS – PEER-REVIEWED RESEARCH ARTICLE

1. **De Santiago A**, Barnes SJ, Pereira TJ, Marcellino-Barros M, Bik HM, Thrash JC. (2025) Complete genome sequences of two *Pseudoalteromonas undina* strains isolated from a marine nematode (Oncholaimidae) collected at Tybee Island. *Microbiology Resource Announcements*, 14(8): e00419-25. <https://doi.org/10.1128/mra.00419-25>
2. **De Santiago A**, Pereira TJ, Ferrero TF, Barnes N, Lallias D, Creer SM, Bik HM. (2025) Persistent gaps and errors in reference databases impede ecologically meaningful taxonomy assignments in 18S rRNA studies: a case study of terrestrial and marine nematodes. *Environmental DNA*, 7(2): e70080. <https://doi.org/10.1002/edn3.70080>
3. Pereira TJ, **De Santiago A**, Bik HM. (2024) Soil properties predict below-ground community structure, but not nematode microbiome patterns in semi-arid habitats. *Molecular Ecology*, 33: e17501. <https://doi.org/10.1111/mec.17501>
4. **De Santiago A***, Pereira TJ*, Hardy SM, Bik HM. (2022) Dataset complexity impacts both MOTU delimitation and biodiversity estimates in eukaryotic 18S rRNA metabarcoding studies. *Environmental DNA*, 4(2): 363-384. <https://doi.org/10.1002/edn3.255> *Equal contribution
5. Pereira TJ, **De Santiago A**, Schuelke T, Hardy SM, Bik HM. (2020) The impact of intragenomic rRNA variation on metabarcoding-derived diversity estimates: a case study of marine nematodes. *Environmental DNA*, 2(4): 519-534. <https://doi.org/10.1002/edn3.77>
6. Holland CK, Westfall CS, Schafer JE, **De Santiago A**, Zubieta C, Alvarez S, Jez JM. (2019) Brassicaceae-specific Gretchen Hagen 3 acyl acid amido synthetases conjugates amino acids to chorismate, a precursor to aromatic amino acids and salicylic acid. *Journal of Biological Chemistry*, 294(45): 16855-16864. <https://doi.org/10.1074/jbc.RA119.009949>
7. Zhou D, Feng H, Schuelke T, **De Santiago A**, Zhang Q, Zhang J, Luo C, Wei L. (2019) Rhizosphere microbiome from root-knot nematode non-infected plants suppress nematode infection. *Microbial Ecology*, 78(2): 470-481. <https://doi.org/10.1007/s00248-019-01319-5>

PUBLICATIONS – PEER-REVIEWED REVIEWS & PERSPECTIVES

8. Kelliher J, Mirzayai C, Bordenstein SR, Oliver A, Kellogg CA, Hatcher EL, Berg M, [...], **STREAMS Consortium**, Eloe-Fadrosh EA. (2025) STREAMS guidelines: Standards for technical reporting in environmental and host-associated microbiome studies. *Nature Microbiology*. <https://doi.org/10.1038/s41564-025-02186-2>
9. Hug LA, Hatzenpichler R, Moraru C, Soares AR, Meyer F, Heyder A, **The Data Reuse Consortium**, Probst AJ (2025) A roadmap for equitable reuse of public microbiome data. *Nature Microbiology*. <https://doi.org/10.1038/s41564-025-02116-2>

PUBLICATIONS – TECHNICAL REPORTS

10. Kelliher J, Rodriguez F, Johnson LD, Prime K, Roux S, Eloe-Fadrosh E, Smith M, Clum A, **De Santiago A**, et al. (2024) NMDC Ambassador Training Materials. *U.S. Department of Energy Office of Scientific and Technical Information*. <https://doi.org/10.2172/2386889>

GUEST COLUMNS & OTHER PUBLICATIONS

- Sheehan TN*, **De Santiago A***, DeMarco-Jacobson J*. (2024) GUEST COLUMN: UGA must pay graduate student workers a living wage. *The Red & Black*. *Equal contribution

CONFERENCES & SYMPOSIA

Oral Presentations

- **De Santiago A**, Pereira TJ, Marcellino-Barros M, Barnes S, Thrash C, Bik HM. "The intricate history of host switching and codivergence of the marine bacterial genus *Pseudoalteromonas*." Ecology, Diversity, Genetic, and Evolution (EDGE) Symposium. Athens, Georgia, USA. January 31, 2025.
- **De Santiago A**, Pereira TJ, Marcellino-Barros M, Barnes S, Thrash C, Bik HM. "Evidence of cophylogeny between Mollusca and nematode-associated *Pseudoalteromonas*." Southeastern Population, Ecology and Evolutionary Genetics (SEPEEG) Meeting. Clemson, South Carolina, USA. October 11–13, 2024.
- **De Santiago A**, Pereira TJ, Marcellino-Barros M, Barnes S, Thrash C, Bik HM. "Comparative pangenomic analysis of host-associated and environmental *Pseudoalteromonas*." University of Georgia Marine Science Student Research Symposium. Athens, Georgia, USA. May 16–18, 2024.
- **De Santiago A**, Bik HM. "Using single-worm metagenomics to assess the role of the nematode microbiome on biogeochemical processes." 18th International Meiofauna Conference. Conference moved online due to COVID-19. December 5–9, 2022.
- **De Santiago A**, Marcelino-Barros M, Bik HM. "Elucidating the taxonomic and functional profiles of nematode-associated microbes via single-worm sequencing." Ocean Sciences Meeting. Conference moved online due to COVID-19. February 27–March 4, 2022.

Poster Presentations

- **De Santiago A**, Marcellino-Barros M, Brito S, Pereira TJ, Bik HM. "Marine nematodes exhibit novel symbiosis with predicted endosymbiotic lineages." New Lineages of Life (NeLLi) Symposium. Las Vegas, Nevada, USA. November 4–7, 2025.
- **De Santiago A**, Pereira TJ, Marcellino-Barros M, Barnes S, Thrash C, Bik HM. "Metabolic Diversity and Evolution of Marine Invertebrate-associated Bacteria" ASM Microbe Conference. Los Angeles, California, USA. June 19–23, 2025. **Poster Selected for Lightning Talk.**
- **De Santiago A**, Pereira TJ, Marcellino-Barros M, Barnes S, Thrash C, Bik HM. "Marine Invertebrate-Associated Bacteria Exhibits Genomic Evidence of Nutritional Mutualism" University of Georgia Institute of Bioinformatics Symposium. Athens, Georgia, USA. April 18, 2025. **Awarded Best Poster Presentation.**
- **De Santiago A**, Pereira TJ, Marcellino-Barros M, Barnes S, Thrash C, Bik HM. "The Metabolic Diversity and Evolution of Symbiotic and Free-living *Pseudoalteromonas*" Marine Microbes Gordon Research Conference. Switzerland. June 9–14, 2024.
- **De Santiago A**, Holland CK, Jez JM. "Structural and biochemical investigation of plant-nematode interactions". Annual ExROP Meeting at HHMI Headquarters. Chevy Chase, MD, USA. May 16–18, 2018.
- **De Santiago A**, Bik HM. "Diversity and structure of meiofaunal and microbial communities in the Colville and Mackenzie River Plumes." University of California – Riverside Annual Undergraduate Research Symposium, Riverside, California, USA. May 7–8, 2018.
- **De Santiago A**, Holland CK, Jez JM. "Structural and biochemical investigation of plant-nematode interactions." Experimental Biology Conference. San Diego, CA, USA. April 21–25, 2018.

- Barnes A, **De Santiago A**, Miller S, Zavala J, Burnette J, Cortez A, Descalzo DM, Wessler S. "Protecting California's wine industry from Pierce's disease by producing genetically engineered resistant grapevines." UCR Summer Symposium in Undergraduate Research in Science and Engineering (RISE). Riverside, CA, USA. August 24, 2016.
- **De Santiago A**, Tejeda G, Zavala J, Burnette J, Chetty VJ, Cortez A, Descalzo DM, Wessler S. "Characterizing the CONSTANS gene family across citrus varietals." University of California – Riverside Summer Symposium in Undergraduate Research in Science and Engineering (RISE). Riverside, CA, USA. August 24, 2016.

OTHER SCIENTIFIC PUBLICATIONS

- Public GitHub repositories that contain reference databases, software workflows, and data for the reproducibility and replicability of analysis conducted in published manuscripts. Select repositories are described below – <https://github.com/alejandrodesantiago>
 - **TaxonomyBenchmarking** – Repository for a manuscript on benchmarking taxonomy assignment methods for 18S rRNA studies. Repository contains a high-quality reference database that can be used for accurate taxonomic assignments of nematodes using the 18S rRNA gene. https://github.com/alejandrodesantiago/taxonomy_benchmarking

FORMAL TEACHING EXPERIENCE

Courses taught at the University of Georgia

S2025	Teaching Assistant. <u>MARS 8180: Environmental Data Science in Genomics</u> Advanced graduate-level course on the genomics of marine microbes and integration of genomics concepts into marine ecology and biogeochemistry. Topics include experimental design, genomic analysis, and use of modern bioinformatics tools to analyze environmental genomics datasets (<u>~15 students</u>)
-------	--

Courses taught at Morehouse College

F2022	Instructor. <u>BIOL 114: Population, Community and Biosphere</u> Required introductory undergraduate ecology course for biology majors. Topics include ecology, evolution and natural selection, population growth dynamics, food webs, and global energy flow and climate. (<u>~50 students</u>)
F2022	Instructor. <u>BIOL 114L: Population, Community and Biosphere Lab</u> NSF-funded course-based undergraduate research experience (CURE) for biology majors. Students are introduced to concepts of host-microbe interactions using experimental approaches to study the microbiome of bean beetles. Students gain hands on wet-lab and bioinformatics experience by generating and analyzing a bean beetle microbiome metabarcoding dataset (<u>~10 students</u>)

SOFTWARE CARPENTRIES WORKSHOPS

Lead or Co-instructor (certified software carpentries instructor)

- **2-Day Core Software Carpentry Workshop**, University of Georgia. May 22–23, 2024.
- **Introduction to Git Workshop**, University of Georgia. March 26, 2024.
- **2-Day Core Software Carpentry Workshop**, University of Georgia. March 6–7, 2024.
- **Introduction to Genomics**, University of Georgia. May 23–25, 2023.
- **2-Day Core Software Carpentry Workshop**, University of Georgia. July 20–21, 2022.
- **2-Day Core Software Carpentry Workshop**, University of Georgia. June 16–17, 2022.
- **Genomic Data Analysis**, University of Georgia. May 18–19, 2022.

Facilitator or Teaching Assistant

- **Version Control with Git**, University of Georgia. September 26, 2023.
- **R for Reproducible Scientific Analysis**, University of Georgia. October 29, 2021.

OTHER WORKSHOP INSTRUCTION

- **Instructor**. The National Microbiome Data Collaborative (NMDC) Bioinformatics Workshop. Navigating the NMDC EDGE platform for -omics data analysis and metadata deposition. University of Georgia. Online. December 5, 2024.
- **Co-instructor**. Navigating the National Microbiome Data Collaborative (NMDC) platforms for -omics data analysis and data deposition. National Summer Undergraduate Research Project (NSURP). Online. June 13, 2024.
- **Facilitator**. Telling Stories Through Data Workshop. NSF-funded workshop hosted by Dr. Holly Bik at the UGA for early-career scientists to foster practical skills in bioinformatics and data visualization for eDNA metabarcoding datasets. August 4–10, 2024.
- **Facilitator**. STEM DNA Pathway. Program funded by the HHMI to provide local community college students with research experience. Covered by local media – Press-Enterprise. February 25, 2017.

MENTORSHIP EXPERIENCE

Graduate Students

F2024 – present Min Han, Ph.D. in Marine Sciences, University of Georgia

Undergraduate Students

F2025 – present	Ella Vered, B.S. in Wildlife Sciences, University of Georgia
F2025 – present	Cella Magliano, B.S. in Oceans Sciences, University of Georgia
F2025 – present	Sarah Hargadon, B.S. in Genetics, University of Georgia
F2024 – present	Paloma Carignano, B.S. in Genetics, University of Georgia
S2024 – SU2025	Gabriel Serrano, B.S. Genetics & Ocean Sciences, University of Georgia
SU2022	Jalen Scott, NSF-funded summer REU student, University of Georgia

PROFESSIONAL DEVELOPMENT

- The Gloucester Marine Genomics Institute (GMGI) Science Forum. Gloucester, MA, USA. October 24, 2024.
- AI and Deep Learning Applications in Bioinformatics. Institute of Bioinformatics, University of Georgia. October 16–17, 2023.
- Software Carpentries Instructor Training. Virtual Training. October 18–21, 2021.
- 10th Annual ANGUS Workshop: Analyzing high-throughput sequencing data. University of California – Davis. July 1–13, 2019.

PROFESSIONAL SERVICES

National/International

2025 – present **Champion**. National Microbiome Data Collaborative (NMDC)
Lawrence Berkley National Laboratory

2024 **Ambassador**. National Microbiome Data Collaborative (NMDC)
Lawrence Berkley National Laboratory

Departmental/University

2024 – present **Member.** Bioinformatics Seminar Organizing Committee
Institute of Bioinformatics, University of Georgia

2024 **Member.** Marine Sciences Research Symposium Organizing Committee
Department of Marine Sciences, University of Georgia

2021 – present **Member.** Diversity, Equity, and Inclusion Committee
Institute of Bioinformatics, University of Georgia

2020 – 2021 **Treasurer.** Bioinformatics Graduate Student Organization (BIGSA)
Institute of Bioinformatics, University of Georgia

Manuscript Reviewer

- *BMC Microbiology* (1), *Data in Brief* (1), *Environmental DNA* (2)

OUTREACH & BROADER IMPACTS

- Discussion Leader. “Mentoring and belonging in Science Series” – Leading a workshop discussion on succeeding in scientific careers for Summer Undergraduate Fellowships in Genetics (SUNFIG) students. July 8, 2024.
- Letters to a Pre-Scientist. Program dedicated to sending letters to middle school students expressing interest in science. August 2023–May 2024.
- Skype a Scientist. A program that connects scientists to K-12 classrooms throughout the United States. 2023–present.
- Discussion Leader. “Mentoring and belonging in Science Series” – Leading a workshop discussion on succeeding in scientific careers for Summer Undergraduate Fellowships in Genetics (SUNFIG) students. July 10, 2023.
- Contributing Scientist. Contributed to a blog about our scientific research cruise to Eastern Antarctica. Website: www.icyinverts.com. March 2023.
- Panelist. “Live from Antarctica: In search of worms and gooey invertebrates.” An NSF-funded webinar aimed at students from K-12th. March 14, 2023.
- Co-organizer. Graduate School Workshop - Facilitated discussion on navigating graduate school applications and interviews. Virtual. January 9, 2021.
- AmeriCorps Tutor. University Eastside Community Collaborative (UECC) AmeriCorps. Tutored elementary students performing below grade-level in language arts and math. August 2016–July 2017.

IN THE MEDIA

- Schutte, V. Science on the Southern Seas: A Journal. (2024). *UGA Research News*. Article highlighting experience on a research cruise in Antarctica.
- Martínez, SB. Computers, Nematodes, and Curiosity. (2019) *UCR News*. Series of interviews highlighting the 2019 graduating class at the University of California – Riverside.

OCEANOGRAPHIC RESEARCH CRUISES

- **Participating Scientist.** R/V Nathaniel B. Palmer, Antarctica. March 6–May 11, 2023.