

ALEJANDRO DE SANTIAGO

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GitHub: <https://github.com/alejandrosantiago>

EDUCATION

- | | |
|-------------|---|
| 2025 (exp.) | Ph.D. in Bioinformatics, Institute of Bioinformatics, University of Georgia
Advisor: Holly Bik |
| 2019 | Bachelor of Science in Microbiology, University of California, Riverside, CA |

PROFESSIONAL APPOINTMENTS

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| 2022 | Adjunct Professor
Department of Biology, Morehouse College, Atlanta, GA |
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RESEARCH EXPERIENCE

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| 2020 – 2025 | Graduate Research Assistant (Advisor: Holly Bik)
Institute of Bioinformatics, University of Georgia, Athens, GA |
| 2019 – 2020 | Technical Paraprofessional (Advisor: Holly Bik)
Department of Marine Sciences, University of Georgia |
| 2019 | Junior Research Specialist (Advisor: Holly Bik)
Department of Nematology, University of California – Riverside |
| SU 2018 | HHMI ExROP Summer Research Fellow (Advisor: Joseph Jez)
Department of Biology, Washington University in St. Louis |
| 2017 – 2019 | Research Assistant (Advisor: Holly Bik)
Department of Nematology, University of California – Riverside |
| SU 2017 | HHMI ExROP Summer Research Fellow (Advisor: Joseph Jez)
Department of Biology, Washington University in St. Louis |
| SU 2016 | Dynamic Genome Summer Research Fellow (Advisor: Susan Wessler)
Department of Botany & Plant Sciences, University of California – Riverside |

RESEARCH GRANTS

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| 2021 | University of Georgia Summer Research Grant for Doctoral Students (\$ <u>1,000</u> in support for a graduate research project) |
| 2018 | Undergraduate Education Minigrant, University of California – Riverside (\$ <u>750</u> in support for an undergraduate research project) |

FELLOWSHIPS, HONORS, AND AWARDS

Graduate Student

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| 2025 | 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 (\$ <u>2,500</u>) |
| 2024 | The Carl Storm Underrepresented Minority Fellowship – travel funding to attend the Marine Microbes Gordon Research Conference (\$ <u>1,000</u>) |

- 2024 Graduate School International Travel Award – travel funding to attend the Marine Microbes Gordon Research Conference (\$1,500)
- 2022 – 2023 UGA Graduate Fellowship in Open Sciences – recognizes doctoral students who incorporate Open Science principles in their research (\$2,500)
- 2021 – 2023 **UGA T32 Genetics Training Grant Awardee** – inter-departmental training program for graduate student who focus on genetics research (\$32,000/yr + tuition & fees)

Undergraduate Student

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

PUBLICATIONS – IN PREP & REVIEW (6)

- Kelliher J, Mirzayai C, Jackson S, Schriml L, Eloë-Fadrosch E, **STREAMS Consortium**. Standards for technical reporting in environmental and host-associated microbiome studies. Zenodo. [10.5281/zenodo.15014817](https://doi.org/10.5281/zenodo.15014817). In *Revisions at Nature Microbiology*
- **De Santiago A**, Pereira TJ, Marcelino-Barros M, Barnes S, Thrash JC, Bik HM. (2025) *Pseudoalteromonas* is a novel symbiont of marine invertebrates that exhibits broad patterns of phyllosymbiosis. *BioRxiv*. Submitted to *Nature Microbiology*.
- Serrano GA, **De Santiago A**, Pereira TJ, Marcelino-Barros M, Holt-Torres P, Bik HM. Environmental gradients and spatial patterns of benthic microbial diversity in a temperate estuarine ecosystem. In *Prep for mSphere*.
- **De Santiago A**, Pereira TJ, Marcelino-Barros M, Bik HM. A Snakemake workflow for the parallelized metagenomic analysis of meiofaunal genome and their microbiome facilitates studies of phyllosymbiosis in microbial invertebrates. In *Prep for PLoS Computational Biology*.
- **De Santiago A**, Pereira TJ, Marcelino-Barros M, Bik HM. Broad survey of novel nematode-associated bacterial lineages reveals impact of nematode microbiome on nutrient cycling. In *Prep*

PUBLICATIONS – PEER-REVIEWED RESEARCH ARTICLES

1. **De Santiago A**, Barnes SJ, Pereira TJ, Marcelino-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: e00419-25. <https://doi.org/10.1128/mra.00419-25>
[†]Joint corresponding authors

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>
*Joint first author
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 conjugate 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 & PRESPECTIVES

8. Probst AJ[‡], Hug LA[‡], Hatzenpichler R[‡], Moraru C[‡], Soares A[‡], Heyder A[‡], **The Data Reuse Consortium**, Meyer F[‡]. (2025) A roadmap for fair reuse of public microbiome data. *In Press at Nature Microbiology*. **Preprint:** <https://doi.org/10.1101/2024.06.21.599698>
[‡]Equal Contribution

PUBLICATIONS – TECHNICAL REPORTS

9. Kelliher J, Rodriguez F, Johnson LD, Prime K, Roux S, Eloë-Fadrosch E, Smith M, Clum A, **De Santiago A**, Gajigan A, Maher R, Hanson B, Robinson C, Betacurt-Anzola D, Skoog E, Cirolia G, Skeen H, Oduwale I, Kajihara K, Pham K, Camuy-Vélez L, Caesar L, Sierra M, McCauley M, Sieler M, Kriefall N, Sorensen P, Roesemann S, Alban V, Anthony W, Burcham Z, Hansen Z. (2024) NMDC Ambassador Training Materials [Slides]. U.S. Department of Energy Office of Scientific and Technical Information. <https://doi.org/10.2172/2386889>

CONFERENCES & SYMPOSIA – TALKS

- **De Santiago A**, 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**, 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**, 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*. 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*. Online due to COVID-19. February 27 – March 4, 2022.

CONFERENCES & SYMPOSIA – POSTER PRESENTATIONS

- **De Santiago A**, Pereira TJ, Barros MM, Barnes S, Thrash C, Bik HM. “Metabolic Diversity and Evolution of Marine Invertebrate-associated Bacteria” *American Society for Microbiology (ASM) Microbe Conference*. Los Angeles, California, USA. June 19 – 23, 2025.
- **De Santiago A**, Pereira TJ, Barros MM, 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, Barros MM, Barnes S, Thrash C, Bik HM. “The Metabolic Diversity and Evolution of Symbiotic and Free-living *Pseudoalteromonas*” *Marine Microbes Gordan 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.” *University of California – Riverside 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 varieties.” *University of California – Riverside Summer Symposium in Undergraduate Research in Science and Engineering (RISE)*. Riverside, CA, USA. August 24, 2016.

SCIENTIFIC PRODUCTS

- 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/alejandrosantiago>
 - **TaxonomyBenchmarking** – Repository for manuscript focused on benchmarking taxonomic assignment methods for 18S rRNA metabarcoding studies. The repository contains an open-source high-quality reference

databases that can be used for accurate and precise taxonomic assignments of 18S rRNA metabarcoding studies of marine and terrestrial nematodes.
https://github.com/alejandradesantiago/taxonomy_benchmarking

FORMAL TEACHING EXPERIENCE

Courses taught at the University of Georgia

S2025 **Teaching Assistant.** MARS 8180: Environmental Data Science in Genomics
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 (~15 students)

Courses taught at Morehouse College

F2022 **Instructor.** BIOL 114: Population, Community and Biosphere
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. (~50 students)

F2022 **Instructor.** BIOL 114L: Population, Community and Biosphere Lab
Required NSF-funded course-based undergraduate research experience (CURE) for biology majors. Students are introduced to the concept 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 (~10 students)

SOFTWARE CARPENTRIES WORKSHOPS

Lead or Co-instructor (certified software carpentries instructor)

S2024 **2-Day Core Software Carpentry Workshop**, University of Georgia. May 22-23
S2024 **Introduction to Git Workshop**, University of Georgia. March 26
S2024 **2-Day Core Software Carpentry Workshop**, University of Georgia. March 6-7
S2023 **Introduction to Genomics**, University of Georgia. May 23-25
SU2022 **2-Day Core Software Carpentry Workshop**, University of Georgia. July 20-21
SU2022 **2-Day Core Software Carpentry Workshop**, University of Georgia. June 16-17
SU2022 **Genomic Data Analysis**, University of Georgia. May 18-19

Facilitator or Teaching Assistant

F2023 **Version Control with Git**, University of Georgia. September 26
F2021 **R for Reproducible Scientific Analysis**, University of Georgia. October 29

OTHER WORKSHOP INSTRUCTIONS

2024 **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). June 13.

2024 **Facilitator.** Telling Stories Through Data Workshop. NSF-funded workshop hosted by Dr. Holly Bik at the University of Georgia for early-career scientists to foster practical skills in bioinformatics and data visualization for **eDNA metabarcoding** datasets. August 4 – 10.

2017 **Facilitator.** STEM DNA Pathway. Program funded by the HHMI to provide local community college students with research experience. Covered by local media – [Press-Enterprise](#)

MENTORSHIP EXPERIENCE

Undergraduate Students

F2024 – S2025	Paloma Carignano, Genetics Major, University of Georgia
S2024 – S2025	Gabriel Serrano, Genetics & Ocean Sciences Major, 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.*

LEADERSHIP & PROFESSIONAL SERVICES

Manuscript Reviewer (# manuscripts reviewed)

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

Departmental, College, or University Service

2024 – 2025	Member , Bioinformatics Seminar Organization Committee Institute of Bioinformatics, University of Georgia
2024	Member , Marine Sciences Research Symposium Organizing Committee Department of Marine Sciences, University of Georgia
2021 – 2025	Member , Diversity, Equity, and Inclusion Committee Institute of Bioinformatics, University of Georgia
2020 – 2021	Treasurer , Bioinformatics Graduate Student Association (BIGSA) Institute of Bioinformatics, University of Georgia

National/International

2025	Champion , National Microbiome Data Collaborative (NMDC) Lawrence Berkley National Laboratory
2024	Ambassador , National Microbiome Data Collaborative (NMDC) Lawrence Berkley National Laboratory

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. 21 Nov. 2024. *UGA Research News*. Article highlighting experience on a research cruise in Antarctica.
- Martínez, SB. Computers, Nematodes, and Curiosity. *UCR News*, 29 May 2019. Part of 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.*