

Amanda Alker

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San Diego, Ca

[Shikuma Lab website](#)
[Personal Website](#)

EDUCATION

San Diego State University /University of California, San Diego (Joint Doctoral Program)
Ph.D. in Biology; Cell and Molecular Biology Program Area Aug. 2016- May 2022
Advisor: Dr. Nicholas Shikuma

Harriet L. Wilkes Honors College at Florida Atlantic University
Bachelor of Arts with Honors in Biology- Marine Science concentration Aug. 2011- May 2015
Advisor: Dr. Joshua Voss

RESEARCH EXPERIENCE

Research Specialist | San Diego State University (SDSU) Sept. 2022- Dec. 2022
San Diego, CA

Mentor: Nicholas Shikuma | Synthetic biology tool development in marine bacteria

Project: Adaptation and development of modular tools to enable genetics in marine bacteria

- Designed, tested and applied new plasmid tools for stable integration and random transposon mutagenesis in non-model marine bacteria
- Co-inventor on a provisional patent and assisted in developing Metamorphotech, a genetic engineering core facility at San Diego State University

Graduate Student Researcher | SDSU Sept. 2016- Sept. 2022
San Diego, CA

Mentor: Nicholas Shikuma | Bacterial genetics for beneficial host-microbe interactions

Project(s): Genetic interrogation of bacterial settlement signals in marine invertebrates

- Performed bacterial genetics on model and non-model bacteria to interrogate the role of chemicals, proteins, and other products capable of inducing metamorphosis in animals
- Cultured tubeworm, *Hydractinia*, and coral larvae and performed metamorphosis assays
- Investigated the genomics of marine bacteria including synteny, phylogenomic and other sequence-based analyses

Graduate Research Intern | Smithsonian Research Station May 2021- June 2021
Graduate Research Internship Program funded by NSF
Fort Pierce, FL

Mentor(s): Valerie Paul & Jennifer Sneed | Chemical ecology and coral probiotics

Project: The genetic investigation of protein and chemical bacterial settlement cues and their influence on coral metamorphosis

- Generated tractable strain of *Pseudoalteromonas* bacteria (induces coral metamorphosis) and a knockout strain of tetrabromopyrrole (did not induce metamorphosis) and confirmed strains with LC-MS/MS
- Cultured coral larvae (*Porites astreoides* and *Diploria labyrinthiformes*) and performed biofilm metamorphosis assays

Lab Technician | Harbor Branch Oceanographic Institute Jan. 2013- June 2016
Fort Pierce, FL

Mentor: Joshua Voss | Coral reef health and molecular ecology

Project: Investigating the bacterial communities in the mucus of diseased and healthy corals in the Flower Garden Banks National Marine Sanctuary

- Collected and processed coral samples including preparation for RNA sequencing, extraction of zooxanthellae, chlorophyll analysis and bacterial DNA extraction from coral mucus

Intern | Bermuda Institute of Ocean Sciences

Aug. 2013- Nov. 2013

NSF Research Experience for Undergraduates (REU)

St. George's, Bermuda

Mentor: Rachel Parsons

Project title: Investigating antibiotic resistance in bacteria near a sewage outfall in Bermuda

- Utilized classic microbiological techniques and PCR screening to analyze water samples

PUBLICATIONS

Lima L.F.O, **Alker A.T.**, Papudeshi B., Morris M.M., Edwards R.A., De Putron S.J., Dinsdale E.A. Coral and seawater metagenomes reveal key microbial functions to coral health and ecosystem functioning shaped at reef scale. *Microbial Ecology*. August 2022. 1:1-16. **DOI:** 10.1007/s00248-022-02094-6.

Alker A.T., et al. Draft Genome Sequence of *Nereida* sp. MMG025 Isolated from Giant Kelp. *Microbiology Resource Announcements*. May 2022. 11(6):e0012222. **DOI:** 10.1128/mra.00122-22.

Malter K.E., Esmerode M., Damba M., **Alker A.T.**, Forsberg E.M., Shikuma N.J. Lipidomics of Tubeworm Metamorphosis in Response to Bacteria Reveals a Role of Diacylglycerol, Protein Kinase C and MAPK Signaling. *Developmental Biology*. April 2022, 487: 99-109. **DOI:** 10.1016/j.ydbio.2022.04.009

Alker A.T. et al. Draft genome sequences of ten bacteria from the marine *Pseudoalteromonas* group. *Microbiology Resource Announcements*. August 2021, 10 (32) e00404-21 **DOI:** 10.1128/MRA.00404-21

Alker A.T., Delherbe N., Purdy T.N., Moore B.S., Shikuma N.J. Genetic examination of the marine bacterium *Pseudoalteromonas luteoviolacea* and effects of its metamorphosis-inducing factors. *Environmental Microbiology*. August 2020; **DOI:** 10.1111/1462-2920.15211

Cavalcanti G.S., **Alker A.T.**, Delherbe N., Malter K., Shikuma N.J. The Influence of Bacteria on Animal Metamorphosis. *Annual Reviews of Microbiology*. September 2020, 74:1, 137-158; **DOI:** 10.1146/annurev-micro-011320-012753

Rojas* M.I., Cavalcanti* G.S., McNair K., Benler S., **Alker A.T.**, Cobián-Güemes A.G., Giluso M., Levi K., Rohwer F.L., Bailey B.A., Beyhan S., Edwards R.A., Shikuma N.J. A Distinct Contractile Injection System Found in a Majority of Adult Human Microbiomes. *mSystems*. July 2020, 5 (4) e00648-20; **DOI:**10.1128/mSystems.00648-20

Lima L.F.O., Weissman M., Reed M., Bhavya N.P., **Alker A.T.**, Morris M.M., Edwards R.A., de Putron S., Vaidya N.K., Dinsdale E.A. Modeling of the Coral Microbiome: the Influence of

Temperature and Microbial Network. *mBio*. March 2020, 11 (2) e02691-19; DOI: 10.1128/mBio.02691-19

MANUSCRIPTS IN PREPARATION AND UNDER REVIEW

Alker AT, Demko AM, Moore BS, Paul VJ, Purdy TN, Sneed JM, Shikuma NJ. Bacterial genetics links chemical biosynthesis genes to coral metamorphosis. (*In Preparation*).

Alker AT, Apiras A, Dunbar TL, Fedoriouk A, Farrell M, Shikuma NJ. A modular plasmid toolkit to explore function in symbiotic marine bacteria (*In Preparation*).

FELLOWSHIPS AND AWARDS

National Science Foundation Graduate Research Fellow	2017-2022
ARCs Merit Scholar	2020-2022
1 st Place CSU Student Research Symposium	2022
President's Award SDSU Student Research Symposium	2022
NSF Graduate Research Internship Award (GRIP)	2020-2021
International Coral Reef Society Student Travel Award	2020
2 nd Place SDSU CMB Three Minute Thesis Event	2019
Bermuda Institute of Ocean Sciences BIOS Grants-in-Aid	2017
SDSU Graduate Student Travel Fund	2017
SDSU Viral Information Institute Scholarship	2016
SDSU Elliot Family Fund Scholarship	2016
BIOS NSF OCE-REU Travel Award	2015

SELECTED PRESENTATIONS

Alker AT, Aspiras AE, Demko A, Dunbar TL, Farrell M, Fedoriouk A, Sneed JM, Purdy TN, Moore BS, Paul VJ, Shikuma NJ. Genetic tools to explore function in marine symbiotic bacteria. Invited seminar at the Innovative Genomics Institute (University of California, Berkeley). July 2022.

Alker AT, Aspiras AE, Dunbar TL, Farrell M, Fedoriouk A, Shikuma NJ. A modular plasmid toolkit to explore function in symbiotic marine bacteria. Gordon Research Conference Marine Microbes. Les Diablerets, Switzerland. May 2022.

Alker AT, Demko A, Farrell M, Sneed JM, Purdy TN, Moore BS, Paul VJ, Shikuma NJ. Bacterial genetics links chemical biosynthesis genes to coral metamorphosis. Gordon Research Seminar Marine Microbes. Les Diablerets, Switzerland. May 2022.

Alker AT, Sneed JM, Purdy TN, Demko A, Moore BS, Paul VJ, Shikuma NJ. Coral settlement cues from bacteria. Marine Microbial Chemical Communication (M2C2 Webinar Series). Virtual presentation. Jan. 2022.

Alker AT, Sneed JM, Delherbe N, Purdy TN, Demko A, Moore BS, Paul VJ, Shikuma NJ. The influence of bacterial settlement cues on animal metamorphosis. Invited talk at Carnegie Institution for Science (Johns Hopkins University). Baltimore, MD. Oct. 2021.

Alker AT, Sneed JM, Delherbe N, Purdy TN, Demko A, Moore BS, Paul VJ, Shikuma NJ. *A marine bacterium produces different factors that stimulate animal metamorphosis*. Oral Presentation. International Coral Reef Symposium (Virtual). July 2021.

Alker AT, Delherbe N, Purdy T, Little M, Rohwer F, Wegley-Kelly L, Moore B, Shikuma N. *A marine bacterium produces three distinct factors that stimulate animal metamorphosis*. Poster presentation and lightning talk. Ocean Sciences Meeting. San Diego, Ca. Feb. 2020.

Alker AT, Delherbe N, Purdy T, Moore B, and Shikuma N. *Investigating the genetics and function of two bacterial factors that induce marine invertebrate metamorphosis*. Seminar at Marine invertebrate Cell Biology Meeting. Scripps Institute of Oceanography. Aug. 2019.

PROFESSIONAL MEMBERSHIPS

International Coral Reef Society (Member)	2019-present
SDSU Biology Graduate Student Association (Founder & President)	2019-2022
SDSU College of Sciences Student Council (Research Chair)	2020-2021
American Society for Microbiology (Member)	2017-2021
Divers Alert Network (Member)	2014-2021
The Oceanography Society (Member)	2019-2020
American Academy of Underwater Sciences Scientific Diver (Certification)	2014-present

TEACHING & MENTORSHIP

Teaching Associate | San Diego State University

San Diego, CA

Marine Microbial Genomics Laboratory (Biol567L)

Jan. 2021-Dec. 2021

- Published a peer-reviewed Microbial Resource Announcement (Alker et al. 2021) with all students in the class
- Developed curriculum and content for inaugural class in Spring 2021 (virtual) and adapted classroom material for the Fall 2021 class (in-person)
- Isolated, cultured, sequenced and analyzed 15 microbial genomes using PATRIC

Mentorship

- Mentor for undergraduates in Shikuma Lab | Alpher Aspiras, Cierra Chevalier, Jeffrey Jones, Rosaurio Laxina, Sama Mikhail and Gabriella Salcedo (2021-2022); Milagros Esmerode, Sara Ito, Jonah Faye Longares & Iman Shaikh (2019-2020)
- Mentor for rotation PhD students | Morgan Farrell (2022), Taylor Darby (2020) and Zachary Quinlan (2018)
- Mentor for students applying to graduate school and fellowships
 - Picking a Fellowship. CMB Grad Student Seminar (2021)
 - Tips for Making a CV. CHOC Internship Virtual Workshop (2020)
 - SDSU BGSA Getting into Grad School Workshop (2020)
 - SDSU Women in Science Society (2017-2019)
 - PhD panel Q & A. 2018.
- Association of Women in Science Greater San Diego Science Fair Judge (2018)

Leadership

- President & Co-Founder Biology Graduate Student Association (2019- 2022)
 - Wrote and distributed a graduate student climate survey to generate data and identify inequities in the department
 - Compiled and generated financial and other resources for graduate students in the department
 - Submitted a formal inquiry to the University Senate regarding racial minority student harassment by an Emeritus Faculty member
- Member of the SDSU Department of Biology Diversity, Equity and Inclusion Committee (2019-2021)
- Cell and Molecular Biology Graduate Student Representative (2017-2020)
 - Organized a program-wide Three Minute Thesis Event (2018)
 - Organized the Graduate Student Seminar (2017-2019)
 - Organized the Graduate Student Symposium (2017-2019)