

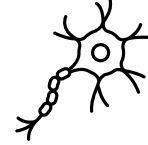
Amanda Carbajal, M.S. she/hers/ella

Ph.D. Candidate – University of California, Santa Cruz

Microbiologist | Adjunct Biology Professor | Artist – Dancer

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Who I Am

I am an ambitious, team-oriented scientist on the cusp of completing a PhD in Molecular, Cellular and Developmental Biology, specializing in mixed methods clinical microbiology with a focus on uropathogenic *E.coli* pathogenicity and mechanisms of antibiotic resistance against fluoroquinolones. I am motivated, curious, determined, resilient, and creative, in part to navigating academia as a first-generation daughter of immigrant's student. I have sought rigorous research training at NASA, UCSF, Genentech, hospitals, and Bay Area startups to expand my technical skills and develop a wholistic approach to problem solving. Beyond my passion and motivation to do good work, I find fulfillment as a dancer, a pursuit that complements success in science as it requires creativity, dedication, hard work, and problem solving as it is highly technical. I bring my technical skills, experience working in professional settings on collaborative teams, my strong sense of self, and soft skills like clear communication, empathy, and respect to all, with me to my next position. Science is an integral part of my identity. The opportunity to continue being a part of elucidating knowledge in a positive environment on a collaborative team, where I can continue to grow, is what I seek in my next position.

EDUCATION

PhD in Molecular, Cellular and Developmental Biology – University of California, Santa Cruz, Estimated graduation – Summer 2024

MS in Biology (Physiology & Human Behavior) - San Francisco State University, 2018

BS in Biology (Zoology Emphasis) - San Francisco State University, 2015

AS in Political Science, Creative Writing – Santa Barbara City College 2012

NOTABLE TECHNICAL SKILLS

Wetlab

- Microbiology Culturing
- Confocal, Live Cell, Microscopy
- Immunohistochemistry
- Antimicrobial sensitivity testing
- Amyloid fibril protein degradation
- Fluorescence Staining
- Mouse, zebrafish, insect husbandry
- Molecular Cloning
- Cell Culture (human, bacterial)
- Co-immunoprecipitation
- Mass spectrometry (LTQ software)
- Genetic Transformation with Plasmids in *E. coli*
- Optical density measurement on spectrometer
- DNA Sequencing (Mini-Prep)
- Inductively Coupled Plasma Optical Emission spectroscopy (ICP-OES)
- Field work- sample collection from environment, rodents, bats
- **Rx One Health Field** Perspective through UC Davis
- Site directed Mutagenesis
- Lambda Red homologous recombination for gene editing
- Working in BSL -2 and BSL -3 laboratories

Computational

- Basic Programming in Python, Excel, R
- PC and Macintosh iOS system experience
- Image J
- Jupyter Noteook, Quarto
- SnapGene proficiency
- NCBI Genome Browser
- Prism GraphPad
- Benchling Electronic Notebook
- Asana, Trello - task organizers
- Google Suite, Mail merge

RELEVANT RESEARCH EXPERIENCE - ACADEMIC & PAID

(excluding three Chemistry PhD rotations in 2018)

PhD Candidate, Graduate Student Researcher in Camps Lab

Microbiology and Environmental Toxicology Department

University of California, Santa Cruz

January 2021 to current, Advisor: Manel Camps, PhD

Thesis Committee: Manuel Ares, PhD, Joshua Arribere, PhD, Michael Stone, PhD, Valarie Cortes, PhD

PhD Thesis Project Title: Characterizing uropathogenic *E.coli* (UPEC) antimicrobial resistance (AMR) conferring mutations and effects on drug binding interactions of fluoroquinolones

Deliverables/ Outcomes:

- Identified mutation(s) profiles, specifically Quinolone Determining Region (QRDR) mutations in uropathogenic *E.* from whole genome sequencing data of clinical isolates
- Tested frequently observed genotypes against unique fluoroquinolone antibiotics spanning first, second, third and fourth generation, as well as novel compounds and other classes of antibiotics for antimicrobial resistance (AMR)
- Established AMR phenotypes from these mutant profiles
- Tested which mutant profile(s) are driving AMR by creating clean background strains that only have unique mutations in QRDR regions, as clinical isolates have various other genetic elements that could be contributing to AMR phenotypes
- Created a data analysis pipeline and optimized every method used within this project

- Trained and managed the lab as co- lab manager, trained and mentored undergrads, technicians and junior graduate students
- Publications in progress from this work

Contractor - Research Associate - Employment

Infinite Metals formerly Metalx Biocycle (hosted at accelerator Indie Bio)

San Francisco, CA

August 2022 to February 2023

Research Summary: Recruited by my former NASA colleagues to help launch their startup. I leveraged microbes to break down electronic waste, metals, and rare earth elements such as those found in electric vehicle batteries. Current methods for breaking down e-waste/EV battery waste is unsafe and harmful to the environment, so a more sustainable alternative is attractive. **Reprogramming bacteria to remove toxic electronic waste is affordable and safe and the reacquired elements can be repurposed.** Due to confidentiality, I cannot say more.

Deliverables/ Outcomes:

- Executed novel methods for working with extremophiles, measuring changes in oxidation of rare earth elements, how to cultivate fungi for filtration systems
- Extracted extremophile strains according to which metal(s) they can oxidize from field
- Optimized/helped design protocols never used before in this lab
- Helped develop and employ a proof-of-concept demo for investors
- Created/prepared samples, developed assays for testing oxidation rate of rare earth elements
- Organized inventory, maintained colonies of different strains (liquid cultures, agar plates)
- Worked on an interdisciplinary team of astronomers, bioinformaticians, inorganic chemists, biologists, organic chemists, astrobiologists, engineers
- Presented to stakeholders' proof of concepts, updates, and the science in lay terms

Graduate Student Summer Intern, Molecular and Chemical Engineering - Employment

CODEXIS Inc.

Redwood City, CA

June 2022 to September 2022

Research Summary: I characterized a myriad of candidates based on a T7 RNA Polymerase template to yield a more efficient mutant T7 RNA polymerase. Some qualities of this improved enzyme are higher capping rates, more versatility, more thermostability. This is an enzyme that could be utilized in mRNA based in vitro transcription therapies such as mRNA vaccines. **A more versatile, robust T7 RNA polymerase can withstand a myriad of conditions and improve capping thus increasing therapeutic impact.** Due to confidentiality, this is a suitable summary.

Deliverables/ Outcomes:

- Developed new assays for biochemical analysis, learned how to work with RNA, mRNA
- Optimized/helped design protocols never used before in this lab

- Conducted biochemical assays to test different combinations of factors to test versatility
- Was able to provide data to eliminate candidates that did not improve versatility
- Worked on an interdisciplinary team of medicinal chemists, bioinformaticians, chemists, biologists
- Gave a seminar at the end of my internship to the entire company

PhD Candidate, Graduate Student Researcher in Rothschild Lab

Synthetic Biology/Astrobiology - SSX Branch

NASA Ames Research Center- Mountain View, California

First half of PhD completed here prior to SARS - CoV2 Pandemic Lab Access Restrictions
February 2019 to January 2021, Advisors: Lynn J. Rothschild, PhD, David Deamer, PhD

PhD Thesis Project Title: Elucidating the highly conserved prion-amyloid phenotypes in microorganisms to uncover their potential roles in the early emergence, evolution and distribution of life on Earth

Deliverables/Outcomes:

- Worked with prion amyloids, yeast, archaea, bacteria
- Leveraged techniques to measure protein kinetics (ThT, Congo Red, protein purification)
- Utilized bioengineering techniques with plasmids, microscopy (Confocal, Bright Field)
- Optimized/helped design protocols never used before in this lab
- Selected candidates to test, distinguished which to eliminate, which to continue pursuing
- Presented research seminar at NASA, research seminar at UC Santa Cruz, and a poster at UC Santa Cruz
- Worked on an interdisciplinary team of astronomers, bioinformaticians, inorganic chemists, biologists, organic chemists, astrobiologists, engineers
- Trained and mentored undergrads, technicians, volunteers and helped coach the NASA IGEM team
- 3rd author in publication in **Molecular Biology and Evolution**

Summer Intern, Research and Development - Employment

Genentech, South San Francisco, California

June 2018 - September 2018

Research Summary: What are the binding partners of APOL 1? Which of these binding partners contributes to chronic kidney disease? **Understanding binding partners of APOL 1 could reveal another angle for developing an improved pharmaceutical therapeutic by way of providing a novel binding site to target.** I worked on elucidating protein partners of key kidney proteins implicated in chronic kidney disease to consider it as a novel therapeutic. Due to confidentiality, I am unable to speak in more detail regarding this project.

Deliverables/Outcomes:

- Performed protein purification tools, coimmunoprecipitation, Western Blot, mammalian cell culture of various cell types including PC3 cells, Podocytes, 293 cells
- Performed protein expression and protein level assays
- Gained deeper experience with collaborative work culture across departments not just interdisciplinary science collaboration

- Gained understanding of product workflow, expectations of industry and financial stakeholders
- Tested candidate proteins for binding to our initial protein of interest
- Gave a research seminar at the end of the internship to the department
- Worked on an interdisciplinary team of bioinformaticians, inorganic chemists, biologists, organic chemists, molecular biologists, pathologists

MS Graduate Student Researcher

Institute of Neurodegenerative Diseases, University of California, San Francisco

June 2016 - June 2018, Advisors: David Kokel, PhD & Michael J. Keiser, PhD

Master of Science Thesis Project Title: Leveraging behavioral phenotypes in zebrafish to elucidate novel druggable targets with potential to improve neuroactive ailments to reduce unwanted side effects

Deliverables/Outcomes:

- Screened over 12,000 compounds from chemical libraries across the world
- Established phenotypic profiles for every drug test included a null group
- Optimized/helped design protocols never used before in this lab
- Worked with bioinformaticians to develop workflows, transfer the data collected and phenotypes to train an AI/machine learning algorithm
- Zebrafish animal husbandry adhering to the IACUC standards
- Worked on an interdisciplinary team of medicinal chemists, bioinformaticians, chemists, biologists
- Gave seminar to the Institute of Neurodegenerative Diseases at UC San Francisco, San Francisco State University
- Worked on an interdisciplinary team of bioinformaticians, inorganic chemists, biologists, organic chemists, molecular biologists, physicians, neuroscientists
- Trained and mentor new grads, students, volunteers, 8th author on a publication in **Nature Communications**

Zebrafish Animal Technician I at UCSF Mission Bay - Employment

Institute of Neurodegenerative Diseases - University of California, San Francisco

May 2015- June 2016

I maintained thousands of unique (genotype/phenotype) zebrafish colonies for researchers at UC San Francisco at the Mission Bay Campus. I tracked the health and wellness of the fish meticulously in several ways.

Deliverables/Outcomes:

- Maintained zebrafish tanks several times a week by cleaning them checking water chemistry (pH and alkalinity levels are crucial for zebrafish homeostasis)
- Fed fish correct diet according to experimental needs
- Monitored and tracked their health and took out dead fish to avoid infections
- Took detailed notes to give updates to IACUC, the veterinarians and the researchers who relied on the fish for their experiments
- Coordinated matings for specific fish depending on their genetics
- Tracked fish growth from larvae to adult

Undergraduate Researcher

San Francisco State University

December 2012 - May 2016, Advisors: Christopher A. Moffatt, PhD & Megumi Fuse, PhD

Bachelor of Science Thesis Project Title: Elucidating the effects of caloric restriction, socialization on adult neurogenesis in *Acheta domestica*, The North American Cricket (hippocampus homologous anatomy)

Deliverables/Outcomes:

- Optimized protocols for brain extraction of the North American Cricket, *Acheta domestica*
- Optimized protocols for prepping tissues for BrdU injections, microscopy, and cryostat
- Optimized/helped design protocols never used before in this lab
- Conducted Insect Animal Husbandry, insect surgical methods, utilized cryostat slicing
- Sudan Black Staining, Immunohistochemistry of tissues to track cell proliferation.
- Learned basic Laboratory techniques for the first time
- Presented a poster at Society for Neuroscience 2015
- Trained and mentored junior students

SCIENTIFIC PUBLICATIONS

- “The hunt for ancient prions: Archaeal prion-like domains form amyloids and substitute for yeast prion domains” Tomasz Zajkowski, Michael Lee, **Amanda Carbajal**, Patrick Brennock, Jessica Snyder, Daniel Jarosz, Lynn Rothschild, January 2021, **Molecular Biology and Evolution**, Volume 38, Issue 5, Pages 2088-2103
- “Zebrafish behavioural profiling identifies GABA and serotonin receptor ligands related to sedation and paradoxical excitation”, Matthew McCarroll, Leo Genelev, Reid Kinser, Giancarlo Bruni, Jack Taylor, Douglas Myers- Turnbull, Cole Helsell, **Amanda Carbajal**, Randall T. Peterson, Michael J. Keiser, David Kokel, September 2019, **Nature Communications**, Volume 9, Issue 10, doi: 10.1038/s41467-019-11936w
- **Others in progress**, at least two to be submitted before the end of my PhD, and more to come after due to the foundation of work I've established during my PhD in Camps Lab

NOTABLE SCIENTIFIC PRESENTATIONS

- Society for the Advancement of Chicanos/Hispanics and Native Americans (SACNAS) **Speaker**, “Elucidating the Genetic Basis of Antibiotic Resistance in Uropathogenic *E.coli*” – Microbiology Session, Portland, Oregon, October 15th, 2023
- Seminar **Speaker** “Elucidating the Genetic Basis of Antibiotic Resistance in Uropathogenic *E.coli*”, Stanford School of Medicine, May 18, 2022
- Grad Slam Finalist “Leveraging biotechnology and basic science to stay one step ahead of the next Global Pandemic” – February 2022, **Speaker**
- NASA Ames Research Center Seminar **Speaker** in Exobiology (SSX) “The arms race between natural selection and drug design: investigating fluoroquinolone effectiveness against ciprofloxacin-resistant *E. coli*”, August 18th, 2021
- University of California, Santa Cruz, Molecular, Cellular, Developmental Biology Seminar **Speaker** “The arms race between natural selection and drug design: investigating fluoroquinolone effectiveness against ciprofloxacin-resistant *E. coli*” May 14th, 2021
- City of Hope Biomedical Research Graduate Student Symposium, Genome Stability Panel,

- August 28th, 2020 **Scientific Judge**
- Grad Slam Finalist “Prion Proteins and the Origins of Life”, UC Santa Cruz, March 6, 2020, **Speaker**
- Graduate Research Symposium at the University of California, Santa Cruz, April 2019, 2019, **Speaker**
- SFSU College of Science and Engineering Graduate Research Showcase, title of talk: “Novel Neuroactive Drug Discovery” Carbajal, A., Kokel, D., San Francisco, CA, May 2017, April 2018, **Speaker**
- CSU Research Competition, title of talk: “Behavior Based High Throughput Neuroactive Drug Discovery” Carbajal, A. San Francisco, CA, February 2017, February 2018, **Speaker**
- Society for Neuroscience **Poster** “The Effects of Caloric Restriction on Adult Neurogenesis in *Acheta domesticus*” Carbajal, A., Moffatt, C., Chicago, IL, October 2015

COLLEGE LEVEL TEACHING EXPERIENCE

Adjunct Lecturer in Biological Sciences

San Francisco State University

August 2021- present, semester, undergraduate courses

- Instructor of Record BIOL 231 - Biological Sciences Advising, BIOL 337- Evolution

Adjunct Lecturer in Biological Sciences

Santa Clara University

March 2022 - June 2022, quarter, undergraduate courses

- Instructor of Record BIOL 115 and 116- Medical Microbiology Lecture and Lab

Adjunct Lecturer in Biological Sciences

University of San Francisco

December 2020 to December 2020, semester, undergraduate courses

- Instructor of Record BIOL 115 - Human Physiology, BIOL 114 - Anatomy Lab, BIOL 106 - Human Physiology Lab

Teaching Assistant (TA as a graduate student supporting Professors)

University of California, Santa Cruz

January 2021- June 2021, quarter, undergraduate, various biology lecture and lab courses

RESEARCH AWARDS & HONORS

- California State University Pre-Professor Program (PREPP) Fellow 2023
- Achievement Rewards for College Scientists (ARCS) Foundation Fellowship 2023-2024
- Yale University Ciencia Initiative (YCA) Scholar and Fellow 2023 -2024
- UC- HIS- Doctoral Diversity Initiative Fellowship – IBSC at UC Santa Cruz 2023 - 2024
- Nucleate Fellowship 2022
- Rx One Health Field Institute Participant, UC Davis 2022
- Center for Innovations In Teaching and Learning (CITL) Instructional Support Fellow 2021

- Graduate Research **Contest Judge** at CSU East Bay for CSU Research Competition Spring 2021
- STARS Scholarship Recipient 2021
- California Doctoral Incentive Program (CDIP) Graduate Student Fellow 2020
- Graduate Research Contest Judge at CSU East Bay for CSU Research Competition Spring 2020
- IMSD Fellowship Recipient at UC Santa Cruz, September 2018 - December 2019
- WISE (Women in Science and Engineering) Scholarship recipient, San Francisco State University 2017
- Sally Casanova Pre-Doctoral Scholarship Recipient 2017-2018
- Irene and Eric Simon Brain Summer Research Fellowship Foundation Recipient, UCSF 2015
- HHMI Undergraduate researcher nominee at SFSU 2014, 2015, 2016, 2017, 2018
- Independent Research Award (IRA) Grant Awardee 2014, 2015, 2016, 2017, 2018
- NIH funded RISE Scholar, 2016, 2017, 2018

PROFESSIONAL DEVELOPMENT TRAINING

- Yale Ciencia Academy Professional Development Program, Yale University 2023-2024
- Professional Communication Certificate Program Division of Graduate Studies (Fall 2021)
- Preparing for Inclusive Teaching Workshop by CITL, UCSC, (Summer 2021)
- Antiracist Teaching Workshop by CITL, UCSC, Winter 2021)
- Mentoring Workshop by CITL, UCSC, Winter 2021)
- Training on Hate/Bias Program -Office of Diversity, Equity, and Inclusion (Winter 2021)
- Microaggressions Workshop (Winter 2020) by Office of Diversity, Equity, and Inclusion
- Course Design Certificate Program (Summer 2020) by CITL, UCSC
- Teaching in Tense Times: A Workshop on Academic Freedom, Inclusive Classrooms, and Some Challenges in College Teaching Today (Winter 2020) by CITL, UCSC
- Active Learning Workshop (Fall 2018) by Dr. Kimberly Tanner (SFSU)
- SEPAL Spectrum Scientist Program (2012-2013) by Dr. Kimberly Tanner (SFSU)

ADMINISTRATIVE & ORGANIZATIONAL ROLES TO SUPPORT STUDENT PROGRAMS

- **Currently:** Administrative Assistant, Project Manager at Ciencia Puerto Rico
- **Currently:** Administrative Assistant to Science Learning Institute (SLI) at Foothill College
- Science Support Network Graduate Student Mentor 2020, 2021, 2022, 2023
- Lead Graduate Student Mentor for the Graduate Program of UC Santa Cruz, 2022 - 2022
- Mentor to students via the Science Learning Institute, Foothill College 2021 - 2022
- UCSC's Womxn's Center MINT (Matriculating, Influencing, Networking, Triumphant) mentorship program - **Program Coordinator** 2021 - 2022
- Title IX Graduate Student Intern 2021, 2022, 2023, UC Santa Cruz
- Center for Innovations In Teaching and Learning (CITL) Support Fellow 2021
- Center for Innovations In Teaching and Learning (CITL)Teaching for Equity Certification 2021, 2022
- Title IX Graduate Student Advisory Board Member Representing UCSC 2021
- Anti-Racist Pedagogy Working Group Member, PBSE, UCSC 2020 - 2021
- Graduate student policy, advocacy, liaison to Dean of Science, UCSC 2020 - 2021
- Science Internship Program (SIP) Graduate Student Mentor, through UCSC 2020, 2021,

- 2022, 2023
- Tutor, Grad Student Mentor via Cultivamos Excelencia, San Jose City College 2019, 2020
 - Science Teacher (K-8th grade) at Celsius & Beyond, San Francisco 2018- 2019
 - K-12 STEM Curriculum Consultant at Saint Peter's School, San Francisco 2018 -2019
 - YMCA After School Program Teacher at Aptos Middle School, San Francisco 2014 - 2016
 - SEPAL Spectrum Program Balboa High School, San Francisco State University, San Francisco 2012 – 2013

REFERENCES (*more personal and professional references available upon request*)

1. Carmen Sandoval, PhD
Principal Scientific Researcher, Cellular and Tissue Genomics at Genentech
Email: Sandoval-Espinosa.camen@gene.com
Relationship: Former lab colleague at UCSF
2. Manel Camps, PhD, DVM
Professor and Principal Investigator at UC Santa Cruz
Email: mcamps@ucsc.edu
Relationship: Current PI, former professor at UCSC
3. Andro Rios, PhD, NASA Ames Research Center Senior Scientist,
Faculty at San Jose State University
Email: androrios@gmail.com
Relationship: former colleague at NASA, former mentor
4. Megumi Fuse, PhD, Biology Professor at San Francisco State University
Email: Fuse@sfsu.edu
Relationship: Former research mentor, current teaching and mentoring colleague at SFSU
5. Christina Egami, PhD Candidate, Camps Lab
Email: cegami@ucsc.edu
Relationship: Lab colleague for over 2.5 years
6. Caison Warner, PhD Candidate, Camps Lab
Email: cpwarner@ucsc.edu
Relationship: Lab colleague for over 2.5 years
7. Tomasz Zajkowski, PhD
NASA Ames Research Center, Senior Scientist – Currently at Switch Bio
Email: tomaszajkowski@gmail.com
Relationship: Former lab colleague at NASA (postdoc), former mentor
8. Austin Jelcick, PhD
Institute for the Biology of Stem Cells at UC Santa Cruz Program Manager
Email: ajelcick@ucsc.edu

Relationship: Mentor and colleague, have done outreach for first gen, LatinX students together

9. Cindy E. Liang PhD Candidate- Biomolecular Engineering Department
Brooks Lab, UC Santa Cruz
celiang@ucsc.edu

Relationship: colleague, former classmate, fellow PhD cohort mate at UCSC

10. Matthew McCarroll, PhD, UC San Francisco
Senior Scientist

Email: MatthewMccarroll@ucsf.edu

Relationship: Former Mentor, Postdoctoral Researcher in Kokel Lab

11. Robyn Stoddard, PhD, DVM
Scientist at the Centers for Disease and Control and Prevention
Email: Frd8@cdc.gov

Relationship: UC Davis One Health Institute Field Course colleague