

Allea Caulan

Curriculum Vitae

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Education

University of Maryland Global Campus (2021–2023)

Master of Science in Biotechnology – Bioinformatics Specialization

Capstone Project: Deciphering the Fentanyl Epidemic Through Bioinformatics

GPA: 4.0

California State University, Northridge (CSUN) (2020–2022)

Master of Science in Biology

Thesis: Identification of Endogenous Substrates of the AcrAB-TolC Pump in *Escherichia coli*

GPA: 4.0 - with distinction

California State University, Northridge (2014–2018)

Bachelor of Science, Honors in Microbiology, Honors in Cell and Molecular Biology

Minor in Chemistry

Summa Cum Laude

Honors Thesis: "Exploration of the Relationship Between Cellular Metabolism and the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli*"

Teaching and Mentorship Experience (continues to next page)

Full-Time Tenure Track Faculty (2024–present)

Los Angeles Mission College (LAMC), Department of Life Sciences

Courses: Introduction to Biology Lecture and Lab (BIOLOGY 003), General Biology 1 Lecture and Lab (BIOLOGY 006), General Microbiology Lecture and Lab (MICRO 020), Biotechnology 1 Lab (BIOTECH 002)

Mentorship: Biotechnology Club Advisor, Women in Engineering, Math and Science (WEMS) Club Advisor

Part-Time Faculty (2022–2024)

California State University, Northridge, Department of Biology, Department of Child and Adolescent Development, Department of Academic First Year Experiences

Courses: Principles of Microbiology Lecture and Lab (BIOL 315/L), Introduction to Biology Lecture (BIOL 100), Statistics in Applied Developmental Science (CADV 180), Methods of Child and Adolescent Study I (CADV 380/L), Freshman Seminar (UNIV 100)

Mentorship: CSUN Women in Science Club Advisor

Course Development Contractor (2021–present)

Casa Loma College, Sherman Oaks

Courses taught/developed: Anatomy and Physiology for MRI (ANA 200), Anatomy and Physiology for MRAD (ANA 210), Medical Terminology for MRAD students (BIO 125), Anatomy and Physiology I for Nursing (ANA 210A), Anatomy and Physiology II for Nursing (ANA 210B), Microbiology (BIO 220)

Updated 6-March-2026

Teaching and Mentorship Experience (continued from previous page)

Adjunct Instructor (2022–2025), Assistant Academic Lead (2023–2024)

Southern California University of Health Sciences, Accelerated Sciences Department

Course development and maintenance for all life science courses. Managed all life science instructors through our 5-week accelerated courses. Collaborated with the academic lead on determining course schedules and teaching appointments. Developed in-person laboratory curriculum for Anatomy, Physiology, and Microbiology courses. Managed and trained laboratory technicians.

Adjunct Biology Instructor (2023–2024)

Los Angeles Mission College (LAMC), Department of Life Sciences

Courses: General Biology 1 Lecture and Lab (BIOLOGY 6)

Adjunct Biology Instructor (2019–2023)

East Los Angeles College (ELAC), Department of Life Sciences

Courses: Introduction to Biology Lecture and Lab (BIOLOGY 003), General Microbiology Lab (MICRO 020), Introduction to Human Anatomy (ANATOMY 001), Biological Molecules: Proteins and Nucleic Acids Lecture and Lab (BIOTECH 101), Chromatography and Biomanufacturing Lecture and Lab (BIOTECH 103)

HyFlex Graduate Teaching Assistant (2021–2022)

California State University, Northridge

Provided technical and pedagogical assistance for the HyFlex pilot program. Monitored engagement of students both in-person and on ZOOM.

Courses: Management: Science Curriculum Methods (EED 565S), Selected Topics in Management (MGMT 668), Selected Topics in Criminology and Justice (CJS 452MH)

Teaching Associate (2020–2021)

California State University, Northridge. Department of Biology

Courses: Principles of Microbiology Lab for upper division Biology majors (BIOL 315L), Human Physiology Lab (BIOL 282)

Graduate Assistant (2020–2022)

California State University, Northridge. Department of Biology

Courses: Principles of Microbiology Lab (BIOL 315L), Medical Microbiology Lab (BIOL 410L), Microbial Physiology Lab (BIOL 417L), Bacterial Genetics Lab (BIOL 467L), Life in the Sea (BIOL 325L), URIS Molecular Biology Boot Camp (Summer 2021)

Remote Biology Instructor (2020–2021, 2023)

BioScience Program, Boston, Massachusetts

Courses: Summer Virology (10 days 3-hours each), Winter Virology (8 days 2-hours each), Winter Scientific Manuscript Writing (4 days 1.5 hours each), Scientific Journalism (8 days, 2 hours each)

Professional Development (continues to next page)

Winter PlayLab AI Academy (January 2026)

Los Angeles Mission College

Workshop/training to learn about and develop higher education chatbots within the PlayLab space. PlayLab is a platform that allows users to create chatbots and agents to help with administrative and academic tasks without any coding. These chatbots can then be shared with coworkers and students.

Tiny Earth Partner Instructor (TEPI) Training (January 2026)

Training to learn about the Tiny Earth CURE and become a Certified Tiny Earth Partner Instructor. Tiny Earth Partner Instructors (TEPIs) teach Tiny Earth students all over the globe to develop and test hypotheses, collect soil, isolate bacteria, screen for antibiotic activity, and log data in the Tiny Earth Discovery Database.

ALRISE Alliance Team Member (Fall 2024–present)

Los Angeles Mission College + Arizona State University

A national Networked Improvement Community (NIC) of local and regional HSI/eHSI members, their educators and community partners who collaborate to accelerate Latinx representation in STEM education. Current ALRISE Project: Design a mini-CURE to support students taking microbiology.

Winter 2025 Redesign Lab: Reimagining Education with Diversity, Equity, Solidarity, Inclusion & Guidance Networks (January 2025)

Los Angeles Mission College

Winter workshop to redesign courses and curriculum to increase equity in the classroom based on LACCD equity dashboard data. Redesigned syllabi, assessment methods, and course outline of records. The workshop also discussed the use of AI tools for both course design, course accessibility, and implementation of AI in class assignments.

Team F.U.N. - Faculty United Network (Fall 2024)

Los Angeles Community College District

A district-wide three-part professional learning opportunity to improve outcomes for disproportionately impacted students in Biology. Explored the LACCD equity dashboard data to understand student needs and address equity in the classroom.

Association of College and University Educators (ACUE) (Fall 2023–Spring 2024)

Effective Classroom Teaching Program: A one-year long asynchronous program that introduces faculty to various pedagogical techniques which are then implemented. Faculty in the same cohort share their experience implementing these techniques.

ISSUES-X 2023 CSU Faculty Learning Community (Spring–Fall 2023)

California State University System

A one-year long program that brings STEM faculty from across the California State University system to investigate and implement evidence-based teaching practices in their courses and to disseminate the results in a culminating project. Culminating Project: “Learning to Learn”

Professional Development (continued from previous page)

Los Angeles Community College District Professional Development (2020–present)

Courses and Workshops: Introduction to Teaching with Canvas, Introduction to Online Teaching and Learning, Growth Mindset Strategies in the STEM Classroom, Humanizing Online Learning, Equity in Online Teaching, Creating Accessible Course Content, Advanced Equity in Online Teaching, Assessment in Digital Learning, 10-10-10 Communication that Matters

Institute for Transformative Teaching and Learning (Fall 2022)

California State University, Northridge FacDev

A semester-long program which provides an opportunity for faculty to collaborate in a multidisciplinary group to learn about and apply evidence-based practices aimed at closing race equity gaps in the teaching and learning experience.

Get Up to Speed with Online Teaching with Unconscious Bias (Fall 2022)

California State University, Northridge FacDev

A self-paced, asynchronous program that will enable you to develop foundational knowledge about unconscious bias around race and ethnicity and the ways it appears in the teaching and learning process.

Teaching Assistant Fellowship (Fall 2021)

California State University, Northridge

Semester-long program designed to prepare graduate students to be exceptional candidates for doctoral Teaching Assistant and Community College teaching positions. Fellows are selected through a competitive application and interview process. Upon completion of the program, Fellows are awarded the fellowship and receive a Certificate of Teaching.

Professional Development for STEM Teaching (Spring 2021)

California State University, Northridge

Semester-long seminar course based on the “Transforming STEM Teaching (TST) Faculty Learning Program” created by the UC Berkeley Center for Teaching and Learning.

NASA/JPL Virtual Opportunities for Bioinformatics Research (VOICES) Workshop (Spring 2021)

Seminar and Workshop series held by NASA/JPL on planetary protection and the use of bioinformatics on current/future planetary protection developments.

Research and Industry Experience (continues to next page)

Research Assistant (2022–present)

Ruiz Rueda Lab, Department of Biology, California State University, Northridge

- Project: Assessment of Endogenous Metabolites on their Effect on AcrAB-TolC mediated efflux as well as the effect on antimicrobial resistance.

Research and Industry Experience (continued from previous page)

Research Assistant (2022–2023)

David Bermudes Lab, Department of Biology, California State University, Northridge

- Project: Assessed the depletion of Tryptophan by a Tumor-Targeted *Salmonella* and assessed the effect of Tryptophan depletion on the growth of tumor cells and the production of Kynurenine

Graduate Laboratory Researcher (2020–2022)

Ruiz Rueda Lab, Department of Biology, California State University, Northridge

- Project: Protein-ligand binding analysis of AcrB using Fluorescence Polarization
- Funding/Salary through NSF MCB Grant 2019614

Lead Microbiologist – Quality Control and Quality Assurance (2018–2019)

Encore Labs LLC., Pasadena, CA

- Developed standard operating procedures (SOPs) following GLP, EPA, and DCC regulations.
- Method development and validation of microbial/fungal detection, moisture, and water activity (Aw) assays for *cannabis* products
- Prepared samples for HPLC and GC analysis, HPLC data analysis
- Coordinated with other leads to obtain ISO 17025 accreditation for the company/lab

Microbiologist – Quality Control (2018)

Aerotek LLC; Micro Quality Labs, Burbank, CA

- Preparing cosmetic products for total plate counts (TPC), total yeast/mold count (TYMC), and preservative efficiency testing (PET) and following Standard Operating Procedures (SOPs)

Undergraduate Laboratory Researcher (2015–2018)

Ruiz Rueda Lab, Department of Biology, California State University Northridge, Northridge, CA

- Project: Gene Expression and Metabolomic analysis of the AcrAB-TolC multidrug efflux pump in *Escherichia coli*.
- Funding/Stipend by BUILD PODER/NIH

Maximizing Access to Research Careers; Research Initiative for Scientific Enhancement (MARC/RISE) Summer Research Boot Camp (2015)

Department of Biology, California State University, Northridge

- Mentors: Ray Hong; Kerry Cooper; Gilberto Flores; Jeanne Robertson
- Project: Molecular analysis of summer beetles and the nematodes and microorganisms that are affiliated with them.
- Funding/Stipend by MARC/RISE (\$500)

Professional Service (continues to next page)

CSUN Microbiology Student Association Career Panel Guest Speaker (March 2026)

- Spoke in a panel, answering questions about STEM career paths.

Nursing Advisory Board – Glendale Community College, Legacy Education(2025-2026)

- Provided advice on distance education, LMS platforms, and online exam proctoring.

CSUN Microbiology Student Association Club Workshop/Guest Speaker (2023–2024)

- Presented during the club meeting on finding and identifying wild mushrooms in California, then held a short mushroom walk around campus.

Professional Service (continued from previous page)

CSUN Behavior, Ecology, and Evolution Research (BEER) Club Guest Speaker (2023)

- Presented during the club meeting on finding and identifying wild mushrooms in California

Phi Kappa Phi CSUN Chapter Initiation Ceremony Officer (2022–current)

- Assisted with other Phi Kappa Phi officers in the Fall service projects
- Assisting other Phi Kappa Phi officers in planning the Spring Initiation Ceremonies

Science Fair Judge at Portola Highly Gifted Magnet Middle School (2021, 2022, 2025, 2026)

- Volunteered to judge 7th and 8th grade science fair projects
- Science fair was held virtually for both years

Southern California *Cannabis* Business Investment Group (SCCBIG) Meeting Guest Speaker (2019)

- Presented on the science of *cannabis* and *cannabis* testing
- Outreach to cannabis investors on the importance of cannabis science and testing

K-12 STEM Outreach through BUILD PODER at PUC Nueva Esperanza Middle School (2017)

- Taught 4th grade students on basic biomedical modules
- Advised students on creating and presenting scientific posters

I Heart Science Volunteer at California State University, Northridge (2016)

- Taught middle school students basic science modules
- Gained teaching and classroom management skills

Awards and Honors (continues to next page)

2022	Nathan O. Freedman Outstanding Graduate Student Award (honorary) (\$1000)
2022	CSUNposium 10-minute oral presentation 1 st place in group (\$300)
2021	Virtual SoCal American Society for Microbiology Symposium 3 rd place presentation
2021	Teaching Assistant Fellowship, CSUN (\$500)
2021	Donald E. Bianchi Outstanding Graduate Teaching Award, CSUN (\$200)
2021	21 st Annual Sigma Xi Student Research Symposium 2 nd place in group
2021	CSUNposium Poster 1 st place in group
2021	Spring 2021 Teaching Associate Tuition Waiver. CSUN (\$3588)
2020	Graduate Equity Fellowship, CSUN (\$2,000)
2020	Donald E. Bianchi Outstanding Graduate Teaching Award, CSUN (\$400)
2020	Spring and Fall 2020 Teaching Associate Tuition Waiver. CSUN (\$7176)
2018	Matador Rising Scholar. CSUN
2017-2018	Presidential Scholar Award. CSUN (\$10,000)
2017	Sigma Xi Symposium Abstract Winner. CSUN (\$100)
2016-2017	Presidential Scholar Award, CSUN (\$10,000)
2016-2017	University Scholar Award. CSUN (\$7,500) - declined
2016-2018	Building Infrastructure Leading to Diversity; Promoting Opportunities for Diversity in Education and Research (BUILD PODER) Scholar; Funded by the National Institute of Health (NIH) (\$40,000)

Professional Affiliations

2016 – Present	American Society for Microbiology
2016 – 2023	Golden Key International Honor Society
2021 – Present	Phi Kappa Phi Honor Society
2022 – Present	Los Angeles Mycological Society

Professional Presentations (continues to next page) *presenting author

- Cauilan A***, Ruiz C. 2025. Identification of Endogenous Inhibitors of the AcrAB-TolC Multidrug Efflux Pump of *Escherichia coli*. American Society for Microbiology Microbe Conference, Los Angeles, CA. [poster].
- Cauilan A***, Ruiz C. 2024. Identification of Endogenous Metabolic Substrates of the AcrABZ-TolC Multidrug Efflux Pump of *Escherichia coli*. California State University 36th Annual Biotechnology Symposium, Santa Clara, California [poster].
- Cauilan A***, Quintero D, Bermudes D. 2023. Tryptophanase Expressed by Tumor-Targeted *Salmonella* Halts Breast Cancer Cell Growth *In Vitro* and May Inhibit Production of Kynurenine. California State University 35th Annual Biotechnology Symposium, Santa Clara, California [poster].
- Cauilan A***, Harmon DE, Ruiz C. 2022. Identification of Endogenous Substrates of the AcrAB-TolC Multidrug Efflux Pump of *Escherichia coli*. American Society for Microbiology Microbe Conference, Washington D.C. [poster].
- Cauilan A***, Harmon DE, Ruiz C. 2022. Identification of Endogenous Substrates of the AcrAB-TolC pump in *Escherichia coli*. 22nd Annual Sigma Xi Student Research Symposium. [oral].
- Cauilan A***. 2022. Identification of Endogenous Substrates of the AcrAB-TolC Pump in *Escherichia coli*. Master's Thesis Defense [oral].
- Cauilan A***, Harmon DE, Ruiz C. 2022. Identification of Endogenous Substrates of the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli* using Ethidium Bromide Accumulation. California State University, Northridge, 26th Annual Student Research and Creative Works Symposium [oral].
- Cauilan A***, Harmon DE, Ruiz C. 2021. Identification of Endogenous Substrates of the AcrAB-TolC Multidrug Efflux Pump of *Escherichia coli* using Fluorescence Polarization. Virtual SoCal American Society for Microbiology Student and Educator Symposium [oral].
- Cauilan A***, Bursalyan D, Harmon DE, Ruiz C. 2021. Identification of Endogenous Substrates of the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli*. World Microbe Forum [eposter].
- Cauilan A***, Harmon DE, Ruiz C. 2021. Identification of Endogenous Substrates of the AcrAB-TolC pump in *Escherichia coli*. 21st Annual Sigma Xi Student Research Symposium. [oral].
- Cauilan A***, Bursalyan D, Harmon DE, Ruiz C. 2021. Identification of Endogenous Substrates of the AcrAB-TolC Pump of *Escherichia coli*. California State University, Northridge 25th Annual Student Research and Creative Works Symposium, [eposter].
- Cauilan A***. 2020. Detection of Microorganisms Required for California Cannabis Testing Using an In-house developed Real-Time PCR Method. American Society for Microbiology Microbe Conference, Online Conference [eposter].

Professional Presentations (continued from previous page) *presenting author

- Cauilan A***. 2019. Cost Effective, Next-Day, Multiplex Real-Time PCR Detection of Microbial Organisms Required for California Cannabis Testing Using an In-House Developed Method. Cannabis Science Conference West, Portland, Oregon [poster].
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2018. Cellular Metabolites and Inhibition of the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli*. Sigma Xi Symposium, California State University, Northridge, [oral].
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2018. Cellular Metabolism and the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli*. Presidential Scholars Exhibit of Poster Presentations, California State University, Northridge [poster].
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2018. Cellular Metabolites and Inhibition of the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli*. American Society for Biochemistry and Molecular Biology Regional Meeting, California State University, Northridge [oral].
- Ramos K*, **Cauilan A***, Harmon DE, Ruiz C. 2018. Deletion of the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli* Leads to the Intracellular Accumulation of Gluconeogenesis Intermediaries. California State University 30th Annual Biotechnology Symposium, Santa Clara, California [poster]
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2017. Deletion of the AcrAB-TolC Multidrug Efflux Pump in *Escherichia coli* Leads to the Accumulation of Tricarboxylic Acid Cycle and Amino Acid Intermediaries. Society for Advancement of Chicano/Hispanics and Native Americans in Science (SACNAS) Conference, Salt Lake City, Utah [poster]
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2017. Intracellular Accumulation of Amino Acids in *Escherichia coli* Mutants Lacking the AcrAB-TolC Multidrug Efflux Pump. BUILD PODER Summer Jumpstart, California State University, Northridge [poster].
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2017. Intracellular Accumulation of Amino Acids and Tricarboxylic Acid Cycle Intermediaries in *Escherichia coli* Mutants Lacking the AcrAB-TolC Multidrug Efflux Pump. American Society for Microbiology Microbe Conference, New Orleans, Louisiana [poster].
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2017. Deletion of the AcrAB-TolC Multidrug Efflux Pump Leads to Accumulation of Tricarboxylic Acid Cycle and Amino Acid Intermediaries in *Escherichia coli*. Sigma Xi Symposium, California State University, Northridge, [oral].
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2017. Deletion of the AcrAB-TolC Multidrug Efflux Pump Leads to Accumulation of Tricarboxylic Acid Cycle and Amino Acid Intermediaries in *Escherichia coli*. Presidential Scholars Exhibit, California State University, Northridge, [oral].
- Cauilan A***, Ramos K, Harmon DE, Ruiz C. 2017. Intracellular Accumulation of Amino Acids in *Escherichia coli* Mutants Lacking the AcrAB-TolC Multidrug Efflux Pump. California State University, Northridge 21st Annual Student Research and Creative Works Symposium, [oral].

Publications

Hababag EAC, **Cauilan A**, Quintero D, Bermudes D. 2023. Tryptophanase Expressed by *Salmonella* Halts Breast Cancer Cell Growth In Vitro and Inhibits Production of Immunosuppressive Kynurenine. *Microorganisms*. 11(5), 1355.

Cauilan A, & Ruiz C, 2022. Sodium Malonate Inhibits the AcrAB-TolC Multidrug Efflux Pump of *Escherichia coli* and Increases Antibiotic Efficacy. *Pathogens*, 11(12), 1409.

Cauilan A, Ramos K, Harmon DE, Ruiz C. 2019. Global effect of the AcrAB–TolC Multidrug Efflux Pump of *Escherichia coli* in Cell Metabolism Revealed by Untargeted Metabolomics. *International Journal of Antimicrobial Agents* 54:105–107.