

Leah M. Bouthillette

University of Utah College of Pharmacy

Department of Pharmacology and Toxicology

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EDUCATION

Postdoctoral Research Associate: Pharmacology and Toxicology

Nov. 2024 – Present

University of Utah (Salt Lake City, UT)

Ph.D. Chemistry and Biochemistry: Organic Chemistry

Sept. 2018 – Sept. 2024

University of California Santa Cruz (Santa Cruz, CA)

B.S. Chemistry

Aug. 2014 – May 2018

University of North Carolina Asheville (Asheville, NC)

RESEARCH EXPERIENCE

Postdoctoral Research Associate

Nov. 2024 – Present

Advisor: Jaclyn M. Winter, University of Utah

- Expression and purification of recombinant proteins for biochemical studies
- Characterization of enzymatic reactions involved in natural product biosynthesis
- Enrichment feeding to investigate precursor incorporation
- Genetic engineering to enhance substrate promiscuity and enable structural modifications
- Isolation, purification, and structural characterization of natural products from untapped environment

Graduate Student Researcher

Sept. 2018 – Sept. 2024

Advisor: John B. MacMillan, University of California Santa Cruz

- Isolation, purification, and structural characterization of a novel, selective Type III Secretion System inhibitor
- Isotopic labeling studies in microbial cultures to isolate, purify, and characterize novel natural products
- Real-time NMR monitoring of non-enzymatic cascading reactions
- Traditional organic synthesis and biomimetic synthesis of known natural products and novel analogs

Undergraduate Researcher / GlaxoSmithKline Research Scholar

Jan. 2015 – May 2018

Advisor: Amanda L. Wolfe

- Bioactivity guided isolation, purification, and structural determination of natural products
- Synthesis of natural product analogs to improve potency
- Evaluation of the antibacterial effect of isolated and synthesized compounds using in vitro assays
- Optimization of screening methods for identifying ideal growing conditions for a library of microbes

PUBLICATIONS

7. Braly, M.; **Bouthillette, L. M.**; MacMillan, J. B.; Auerbuch Stone, V. Isolation of a Novel Type III Secretion System Inhibitor against *Pseudomonas aeruginosa*. *Manuscript in preparation*.
6. **Bouthillette, L. M.**; Brumley, D.; Colosimo, D. A.; Ludwig, J.; MacMillan, J. B. Precursor Direct Identification of Natural Product Scaffolds. *Manuscript in preparation*.
5. Scott, A.F.; Jin, T.; Bring Horvath, E.R.; Krull, N.K.; Iizumi, R.; **Bouthillette, L.M.**; Bender, A.; Murphy, B.T.;

Fenical, W.; Winter, J.M. An extremophilic *Nocardiopsis* strain from Great Salt Lake expands the taxonomic range of mycolic acid biosynthesis. *Manuscript submitted for publication*. 2026.

4. Park, J.; Mahida, N.; Ho, G.; Pena, E.; Makabenta, J. M. V.; Aneke, S.; Jiang, M.; **Bouthillette, L. M.**; Holz, S. E.; Hassan, M.A.; et al. Integration of Antimicrobials and Delivery Systems Synergistic Antibiofilm Activity with Biodegradable Nanoemulsions Incorporating Pseudopyronine Analogs. *Antibiotics*. **2023**, 12, 1240.
3. **Bouthillette, L. M.**; Aniebok, V.; Colosimo, D. A.; Brumley, D.; MacMillan, J. B. Nonenzymatic Reactions in Natural Product Formation. *Chem. Rev.* **2022**, 122, 14815-14841.
2. Fields, L.; Craig, W. R.; Huffine, C. A.; Allen, C. F.; **Bouthillette, L. M.**; Chappell, J. C.; Shumate, J. T.; Wolfe, A. L. Short Chain α -pyrones Capable of Potentiating Penicillin G Against *Pseudomonas aeruginosa*. *Bioorg. Med. Chem. Lett.* **2020**, 30, 127301.
1. **Bouthillette, L. M.**; Darcey, C. A.; Handy, T. E.; Seaton, S. C.; Wolfe, A. L. Isolation of the Antibiotic Pseudopyronine B and SAR Evaluation of C3/C6 Alkyl Analogs. *Bioorg. Med. Chem. Lett.* **2017**, 27, 2762.

GRANTS AND RESEARCH FUNDING

Co-Investigator, **NIH R13AT012723** – *Marine Natural Product Gordon Research Conference and Gordon Research Seminar* 2024
 PI: Hendrik Luesch, National Center for Complementary and Integrative Health

PATENTS

Auerbuch, V.; MacMillan, J. B.; Braly, M.; **Bouthillette, L. M.** Using Class I Lasso Peptides to Inhibit the Bacterial Type III Secretion System. The Regents of the University of California, assignee. United States Patent pending, UC Case No. 2024-789-0. 2024

FELLOWSHIPS AND AWARDS

Postdoctoral Fellow, NIH NRSA Institutional Training Grant **T32TR004394** – CTSI STARS Program, University of Utah 2025 – 2026
Regents Fellowship, University of California Santa Cruz 2018 – 2020
American Chemical Society Outstanding Chemistry Senior, University of North Carolina Asheville 2018
GlaxoSmithKline Undergraduate Research Scholar, University of North Carolina Asheville 2017 – 2018
Mission Health Scholar, University of North Carolina Asheville 2017 – 2018

TRAINEE SUPERVISION

Graduate Students

Ruth Stuart, University of Utah 2026
 Georgia Morgan, University of Utah 2024 – present
 Abby Scott, University of Utah 2024 – present
 Justin Samford, University of California Santa Cruz 2023 – 2024
 Sean Carrick, University of California Santa Cruz 2023 – 2024
 Jaden Knight, University of California Santa Cruz 2022 – 2024

Jenny Cordoza, University of California Santa Cruz 2019 – 2020

Undergraduate Students

Ryan Overton, University of Utah 2025 – Present

Olivia Cruz, University of Utah 2025 – Present

Isobel Blue, University of California Santa Cruz 2021 – 2022

Felix Hubert, University of California Santa Cruz 2018

Jordan Hartig, University of North Carolina Asheville 2017 – 2018

High School Students

Jonathan Yu, University of California Santa Cruz 2023

Pamela Kyei, University of California Santa Cruz 2023

Evan Ji, University of California Santa Cruz 2023

Medha Yarlagadda, University of California Santa Cruz 2023

TEACHING AND PROFESSIONAL SERVICE

Teaching Assistant, BRIDGE UP R25 Program, University of Utah May 2026 – July 2026

Saturday Academy Workshop Leader, University of Utah Feb. 2025

Conference Chair, *Gordon Research Seminar on Marine Natural Products*,
Ventura, CA Mar. 2022 – Mar. 2024

Expanding Your Horizons Workshop Leader, University of California Santa Cruz Nov. 2023

Science Internship Program Mentor, University of California Santa Cruz Jun. 2023 – Aug. 2023

Laboratory Safety Representative, University of California Santa Cruz Jan. 2022 – Jul. 2024

Teaching Assistant, University of California Santa Cruz
General chemistry, Organic Chemistry, Organic Chemistry Laboratory Sept. 2018 – Mar. 2020

Course Student Instructor, University of North Carolina Asheville
General Chemistry and Organic Chemistry Jan. 2016 – Jan. 2017

PUBLIC PRESENTATIONS

Utah CTSI Translational Research Trainee Symposium, Salt Lake City, UT. *Poster presentation* Nov. 2025

20th International Symposium on the Biology of Actinomycetes, Egmond aan Zee, The Netherlands. *Poster presentation* Jun. 2025

Gordon Research Conference on Marine Natural Products. Ventura, CA. *Poster Presentation* Mar. 2022

Program in Biomedical Sciences and Engineering Fall Research Conference, Santa Cruz, CA. *Poster Presentation* Sept. 2021

University of California Santa Cruz Annual Chemistry and Biochemistry Fall Conference, Santa Cruz, CA. *Poster Presentation* Sept. 2021

Gordon Research Conference on Marine Natural Products, Ventura, CA. *Poster Presentation* Feb. 2020

University of California Santa Cruz Annual Chemistry and Biochemistry Fall Conference, Santa Cruz, CA. *Poster Presentation* Sept. 2019

Western Carolinas Local Section of the American Chemical Society Awards Banquet, Greenville SC. <i>Poster Presentation</i>	Apr. 2018
University of North Carolina Asheville Fall Symposium on Undergraduate Research and Community Engagement, Asheville, NC. <i>Oral Presentation</i>	Dec. 2017
254 th American Chemical Society National Meeting and Exposition, Undergraduate Research CHED, Washington, DC. <i>Oral Presentation</i>	Aug. 2017
254 th American Chemical Society National Meeting and Exposition, Sci-Mix Session, Washington, DC. <i>Poster Presentation, Invited</i>	Aug. 2017
68 th Southeastern Regional Meeting of the American Chemical Society, Biological Chemistry Division, Columbia, SC. <i>Poster Presentation</i>	Oct. 2016

PROFESSIONAL EXPERIENCE

Ph.D. Intern – Beauty Responsible Materials Innovation

Jun. 2022 – Aug. 2022

Internship Supervisors: Jennifer Marsh and Renee Bolden

- Developed a novel and efficient method to quantify product deposition on hair for optimal formulation
- Correlated deposition levels with consumer benefits (e.g., hair strength) across formulations and hair types
- Utilized NanoSIMS to assess product partitioning and distribution for enhanced performance

SKILLS AND TECHNIQUES

- **Organic Synthesis:** total and biomimetic synthesis of small molecules and novel analogs, structure activity relationship (SAR) evaluation
- **Analytical Methods:** multidimensional and multinuclear nuclear magnetic resonance (NMR) spectroscopy, normal and reverse phase flash column chromatography, high performance liquid chromatography (HPLC), liquid chromatography mass spectrometry (LC-MS), gas chromatography mass spectrometry (GC-MS), MALDI imaging mass spectrometry (IMS), nanoscale secondary ion mass spectrometry (Nano SIMS), thin layer chromatography (TLC)
- **Natural Product Microbiology:** microbial culturing and extraction, optimization of growing conditions, secondary metabolite isolation, structural determination, bioactivity screening, pathogenic microbes, enzymology, protein expression and purification
- **Collaboration:** Collaborated with multiple scientists in different fields across universities to develop novel methodologies, create timelines, and interpret experimental data. Balanced multiple projects and collaborations simultaneously, which led to strong time management skills. Currently have an intellectual property patent under review with collaborators on Type III Secretion System inhibitors.
- **Communication and Leadership:** Developed excellent communication skills that led to several presentations and leadership awards. Developed valuable leadership skills through extensive teaching experiences and training high school, undergraduate, and graduate students in a variety of laboratory techniques
- **Computer:** Microsoft Office, MestReNova, SnapGene, AntiSMASH, BLAST, HMMER, Literature Search (PubMed, Science Direct, Reaxys, SciFinder), Adobe Photoshop, ChemDraw, BioRender

REFERENCES

Jaclyn M. Winter, Ph.D.

Associate Professor, Postdoctoral Advisor

Email: jaclyn.winter@utah.edu

John B. MacMillan, Ph.D.

Professor, Ph.D. Advisor

Email: jomacmil@ucsc.edu

Amanda L. Wolfe, Ph.D.

Associate Professor, Undergraduate Advisor

Email: awolfe@unca.edu