**Sierra J. Williams**

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Professional Experience

Keck Science Department, Claremont, CA 2021 – Present

Claremont McKenna, Pitzer, and Scripps Colleges

Assistant Professor of Chemistry

* Understanding and improving potential protein therapeutics to combat harmful bacteria.

Education

University of California, Irvine, Irvine, CA 2016 – 2021

School of Physical Sciences

Ph.D. Candidate*,* Chemistry

Temple University, Philadelphia, PA 2013 – 2016

College of Science and Technology

*B.S.*, Chemistry

Graduated *cum laude* with honors in Chemistry

SUNY College of Environmental Science and Forestry, Syracuse, NY 2012 – 2013

Major:Chemistry

Publications

8. Williams, S. J.; Brennan, C. K.; Torrey, Z. R.; Prescher, J. A. Data-driven development of bioluminescent probes. *Manuscript in preparation*.

7. Williams, S. J.; Gewing-Mullins, J. A.; Lieberman, W. K.; Burgess, H. M.; Ornelas, M. Y; Reid-McLaughlin, E. S.; Prescher, J. A; Leconte, A, M. Biochemical analysis and optimization of orthogonal bioluminescent tools. *Manuscript in preparation*.

6. Williams, S. J.; Hwang, C. S.; Prescher, J. A. Orthogonal Bioluminescent Probes with Disubstituted Luciferins. *Biochemistry*, **2021**, *60*, 563–572.

5. Hutchinson, M. A.; Deeyaa, B. D.; Byrne, S. R.; Williams, S. J.; Rokita, S. E. Directing Quinone Methide-Dependent Alkylation and Cross-Linking of Nucleic Acids with Quaternary Amines. *Bioconjugate Chem.* 2020, *31*, 1486–1496.

4. Williams, S. J.; Prescher, J. A. Building Biological Flashlights: Orthogonal Luciferases and Luciferins for In Vivo Imaging. *Acc. Chem. Res.* 2019, *52*, 3039–3050.

3. Streifel, B. C.; Lundin, J. G.; Sanders, A. M.; Gold, K. A.; Wilems, T. S.; Williams, S. J.; Cosgriff-Hernandez, E.; Wynne, J. H. Hemostatic and Absorbent PolyHIPE-Kaolin Composites for 3D Printable Wound Dressing Materials. *Macromol. Biosci.* 2018, *18*, e1700414.

2. Streifel, B. C.; Parker, J. F.; Giles, S. L.; Williams, S. J.; Duncan, J. H.; Wynne, J. Porosity Control in High Internal Phase Emulsion Templated Polyelectrolytes via Ionic Crosslinking. *J. Polym. Sci. Part A: Polym. Chem.* 2016, *54*, 2486–2492*.*

1. Steele, A. D.; Keohane, C. E.; Knouse, K. W.; Rossiter, S. E.; Williams, S. J.; Wuest, W. M. Diverted Total Synthesis of Promysalin Analogs Demonstrates that an Iron-Binding Motif is Responsible for its Narrow-Spectrum Antibacterial Activity. *J. Am. Chem. Soc.* 2016, *138*, 5833–5836.

Research Experience

University of California, Irvine (UCI), Irvine, CA 2016 – 2021

Graduate Researcher

Advisor: Professor Jennifer A. Prescher

* *Project 1:* Developed novel bioluminescent tools for multicomponent imaging. Synthesized 2 chemically unique luciferin substrates and identified substrate specific luciferase enzymes via screening >200 mutants.
* *Project 2:* Generated caged bioluminescent probes for imaging cellular interactions. Synthesized 4 amide luciferin analogs and assessed activity with native luciferase.
* *Project 3:* Evaluated activity of luciferin analogs with mutant luciferases to gain mechanistic insight into substrate selectivity. Tested the selectivity and thermostability of 10 mutants with 2 luciferins.
* *Project 4:* Analyzed luciferin analogs using machine learning to discover new compound classes. Screened 22 compounds with 144 mutants and identified key residues for luciferin classes.
* *Lab Jobs*: Responsible for ordering and restocking biological consumables and maintaining the Tecan Spark plate reader.

Naval Research Laboratory (NRL), Washington, DC Summer 2015, Summer 2016

Summer Intern

Advisor: James H. Wynne

* *Project:* Optimized hydrogel composition for incorporation into a multi-functional combat bandage. Synthesized particles with different swelling properties and measured their ability to absorb large quantities of fluids.

Temple University (TU), Philadelphia, PA 2014 – 2016

Undergraduate Researcher

Advisor: Professor William M. Wuest

* *Project 1:* Evaluated the biofilm eradicating properties of 14 quaternary ammonium cations (QACs). Synthesized key intermediates *en route* to a member of the QACs.
* *Project 2:* Assessed structural features that were key to the antimicrobial activity of promysalin. Completed an 8-step synthesis towards an analog of the natural product.

Johns Hopkins University (JHU), Baltimore, MD 2014

Summer Intern

Advisor: Professor Steven E. Rokita

* *Project:* Synthesized quinone methide intermediates with a positively charged polyamine linker to assist in delivery to the major groove of DNA.

Selected Honors and Awards

Dean’s Recent Alumni Fellowship (UCI) 2021

* Awarded to graduating students to ease the transition from graduate school

into full-time careers either in academia or other industries.

Jacqueline Smitrovich Prize (UCI) 2021

* High departmental honor for a graduate student researcher performing

outstanding research and significant department or community service.

Graduate Award for Departmental Mentorship (UCI) 2021

* Awarded for extraordinary efforts in Departmental service in support of

teaching, research, or administration.

Runner Up for Best Talk at the Association for Graduate Students (AGS) Research

Symposium 2019

University of California Chemical Symposium Best Poster Award in Chemical Biology 2019

National Science Foundation Graduate Research Fellowship Program (NSF GRFP) 2018 – present

National Science Foundation Biophotonics Across Energy, Space, and Time

Integrative Graduate Education and Research Traineeship (NSF BEST IGERT) 2017 – 2018

American Chemical Society (ACS) Undergraduate Research Award in Organic

Chemistry (TU) 2016

Shirley and Bernard Brown Chemistry Scholarship (TU) 2015

* Awarded to junior and senior chemistry students who have demonstrated

outstanding academic achievement.

Maximizing Access to Research Careers (MARC) U-Star Program (TU) 2014 – 2016

American Chemical Society (ACS) Scholar’s Program 2013 – 2016

Selected Presentations

*Developing New Imaging Probes using Nature’s Light Emitting Chemistry* (Invited Oral) 2020

Haverford College, Haverford, PA

*Orthogonal Bioluminescent Probes from Hybrid Luciferins* (Poster) 2019

Chemical Biology and Physiology Conference, Portland, OR

*Orthogonal Bioluminescent Probes from Hybrid Luciferins* (Poster) 2019

Greater Los Angeles Chemical Biology Symposium, Los Angeles, CA

*Orthogonal Bioluminescent Probes from Hybrid Luciferins* (Poster) 2019

University of California Chemical Symposium, Lake Arrowhead, CA

*Using “Fireflies” to Spy on Cancer* (Oral) 2019

Association for Graduate Students (AGS) Research Symposium (UCI), Irvine, CA

*Disubstituted Luciferins as Orthogonal Bioluminescent Probes* (Oral) 2018

265th National Meeting of the American Chemical Society (ACS), Boston, MA

*Novel Luciferase-Luciferin Probes for Multicomponent Imaging* (Oral) 2018

Graduate Student and Postdoctoral Symposium (UCI), Irvine, CA

Teaching Experience

*Mentor to Undergraduate and Graduate Researchers* 2018 – 2020

* Oversaw undergraduates Landon Taylor and Buvan Sathishkumar in computational studies of luciferase-luciferin pairs.
* Oversaw undergraduate Clare Hwang in biochemical analysis of luciferin analogs for multicomponent imaging.
* Oversaw summer student Marya Ornelas in screening luciferase library for mechanistic studies.
* Mentored rotation student Martin Amezcua in synthesis of novel luciferins.

*General Chemistry, Chemical Biology, and Organic Chemistry Lab Teaching Assistant* 2016-2017

* Created pre-laboratory lectures for ~90 undergraduates and provided feedback on lab techniques and scientific writing.

Professional Service

Advanced Science Course, Claremont Colleges Keck Science Department 2021

* *Invited Guest*: Discussed my work on disubstituted luciferins with 4 students and shared my career journey.

The National Organization for the Professional Advancement of Black Chemists and

Engineers (NOBCChE) at UCI 2020-present

* *Student Chapter Founder and Organizer*: Created a Student Chapter for black students and postdoctoral scholars in chemistry, chemical engineering, and related fields.

Chem 11 Chemistry Course, UCI 2019

* *Guest Speaker*: Discussed undergraduate research in the Prescher lab to a classroom of ~100 students to encourage participation.

First Generation Faculty Initiative Workshop 2019

* *Panelist:* Discussed my college journey to ~20 faculty on campus, and provided feedback on how they can support students with first-generation backgrounds.

Reed College UCI Visit 2019

* *Panelist:* Discussed my journey to graduate school and my current experience with 8 students from Reed College.

Diverse Educational Community and Doctoral Experience (DECADE) PLUS 2018 – 2021

* *Leadership Coach:* Mentored 12 undergraduate students with first-generation, low-income, and/or underrepresented backgrounds to help them excel in the college environment.

Graduate Student and Postdoctoral Symposium 2018 – 2019

* *Coordinator:* Managed funding to provide food during seminars for ~100 people. Advertised the monthly talks to the department and introduced the speakers.

Laboratory Experiments and Activities in Physical Sciences (LEAPS) 2018 – 2019

* *Volunteer:* Facilitated hands-on science activities for ~30 local middle school students from underrepresented backgrounds.

Synthetic and Chemical Biology Club 2018 – 2019

* *Social Events Coordinator:* Organized poster sessions and monthly gatherings for ~100 students and faculty. Managed the budget for refreshments.

United Cerebral Palsy Science Demos 2017

* *Volunteer:* Facilitated hands-on science activities for ~20 students with disabilities.

Certificate Programs (UCI)

Business Concepts for STEM Scientists 2019

SciPhD: The Business of Science 2018

Effective Communication for Scientists 2018

Mentoring Excellence Program 2018