

CHRISTOPHER E. THOMAS

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PROFESSIONAL OVERVIEW

Master's degree in Organic Chemistry with experience and interest in:

- Designing synthetic strategies for the preparation of challenging organic molecules.
- Improving efficiency through rigorous evaluation of reaction conditions and components.
- Constructing and evaluating biologically active compounds.
- Obtaining analytically pure compounds using: HPLC, GPC, column chromatography, and recrystallization strategies.
- Identifying and characterizing isolated compounds using NMR spectroscopy and GC/MS data.
- *In vitro* experimentation with synthetically prepared compounds.
- Working alongside a diverse team of researchers in a multistage synthetic project idealizing key step reaction conditions.
- Collaborating in multidisciplinary groups developing novel labelling experiments for intracellular targets.
- Creating new, cost effective, catalytic methods to achieve biologically useful precursors.
- Systematically interrogating experimental inconsistencies to identify and, ultimately, resolve.

EXPERIENCE SUMMARY

Chemistry Research

- Led the development of a novel synthesis strategy for catalytically aminating aryl-halide, culminating with a publication in the *Journal of Organic Chemistry* (2015).
- Total synthesis of (-) - indolactam V, with a 50% reduction in required reaction steps.
- Prepared sensitive carbon 13 probes for use in hyper-polarized metabolic imaging studies published in the *Journal of the American Chemical Society* (2017).
- Developed large supramolecular probes used in anion sensing electronic devices.
- Initiated hydrosulfide anion linear free energy study resulting in a fundamental directional change in the established protocol.

Biological Investigations

- Initiated a collaborative effort to create an unprecedented bioorthogonal strategy for copper-free “click” labeling of DNA for experiments both *in vitro* and *in vivo*.
- Designed and prepared a cyclopropene equipped organometallic compounds that heralded the way for new for DNA labeling.
- Performed and analyzed *in vitro* DNA labeling experiments by culturing, permeabilizing, labeling, and evaluating cells with confocal fluorescence microscopy.
- Prepared a comprehensive review of relevant bioorthogonal labeling literature, which is the current foundational literature in the DeRose Research Group.
- Created the standard operating procedure for the HPLC reverse phase purification of peptides.

Collaboration

- My 2015 published research involved several undergraduate researchers under a primary investigator. I was successful in not only achieving the largest quantity of research, but also assisting peers develop superior laboratory techniques and grow in chemical understanding. Additionally, I was the first point of contact for all questions and complications regarding research and lab operations.

- In an interdisciplinary team of four researchers overseen by two professors, we developed a cellular labeling strategy for potential use *in vivo*. As the lead synthetic chemist, I, with input from each discipline, outlined the project schedule and initiated regular progress reports to ensure communication with the overseeing professors, as well as the group.
- I worked in parallel with a team of four researchers to develop a novel supramolecular approach to quantitatively analyze anion concentration in soil. In addition to my assigned investigation, I took it upon myself to assist fellow researchers by developing a large-scale synthesis of three key reactants to ensure we all had a shared surplus and could submit our final products much sooner.

RESEARCH EXPERIENCE

Researcher in Organic Synthesis. University of Oregon (August 2016-present)

- Prepared novel organic compounds for use in biological studies.
- Performed and analyzed *in vitro* DNA labeling experiments by culturing, permeabilizing, labeling, and evaluating cells with confocal fluorescence microscopy.
- Introduced a formidable investigation to determine experimentally the binding affinity of the physiologically significant hydrogen sulfide anion.
- Employed computational and graphical tools for the analysis of supramolecular phenomena.

Researcher in Organic Synthesis. San Francisco State University (February 2014-August 2016)

- Devised synthetic strategies for aminating aryl-halide, culminating with its publication in the *Journal of Organic Chemistry*.
- Developed synthesis protocols by optimizing and idealizing reaction conditions.
- Recruited and implemented an enriching schedule and training program for incoming Billingsley Research Assistants.

TEACHING EXPERIENCE

Instructor. University of Oregon (September 2016-present)

- Multiple sections of Organic Chemistry and Organic Chemistry Lab. One quarter General Chemistry Lab.

Organic Chemistry Teaching Assistant. San Francisco State University (September 2015-May 2016)

- Collaborated with faculty and taught students individually to improve their academics performance.

Peer Tutor. San Francisco State University (August 2013-August 2014)

- Successful as a peer tutor while providing a healthy learning environment for culturally diverse students.

Peer Tutor. Sacramento City College (June 2012-August 2013)

- Coordinated and conducted independent and group tutoring sessions leading to an average increase of 25% points in students' subsequent examinations.
- Collaborated with Professors and students to determine and create specific tutoring curriculum.

ACTIVITIES

Intern. The Share Institute Fair Oaks, California (January 2010-December 2012)

- Collectively developed and participated in SHARE's science initiative to teach STEM education throughout Title 1 public schools.

Paramedic. American Medical Response (April 2006 - November 2009)

- Directed and managed a diverse team of Emergency Medical Technicians in high pressure situations.

EDUCATION

University of Oregon

M.S. Organic Chemistry, 2017

PhD Organic Chemistry, 2021 (expected)

San Francisco State University

B.S. Chemistry, 2016

AWARDS

UO Graduate Department First Year Research Award (2017),

SFSU Department of Chemistry Achievement Award (2015),

College of Science and Engineering Department Award for Academic Excellence (2014),

SFSU Dean's List (2014-2016),

Sacramento City College Highest Honors (2012, 2013).

PUBLICATIONS

Thomas, C.; Wu, M.; & Billingsley, K. L. (2016). Amination-Oxidation Strategy for the Copper-Catalyzed Synthesis of Monoarylamines. *Journal of Organic Chemistry*, 81(1), 330-335.

Park, J. M.; Wu, M.; Datta, K.; Spielman, D. M.; Billingsley, K. L. *et al* (2017). Hyperpolarized Sodium [1-13C]-Glycerate as a Probe for Assessing Glycolysis In Vivo. *Journal of the American Chemical Society* 139 (19), 6629-6634

SKILLS

NMR Spectroscopy, Flash Column Chromatography, Gel Permeation Chromatography, HPLC, GC/MS, UV-Vis, FAAS, Gaussian 09, IGOR pro, MatLab, Mathematica, Microsoft Office