

CONTACT INFORMATION	University of California, Irvine Chemistry Dept., Natural Sciences II Irvine, CA 92617	Voice: (616) 920-2679 E-mail: crathbun@uci.edu
EDUCATION	University of California, Irvine, Irvine, CA Ph.D., Organic Chemistry, September 2012 – May 2018 (anticipated) <ul style="list-style-type: none">• Thesis Advisor: Associate Professor Jennifer Prescher Hope College, Holland, MI, USA B.S., Chemistry (A.C.S. Certified), Minor in Mathematics, May, 2012 <ul style="list-style-type: none">• Thesis Advisor: Professor Jeffrey B. Johnson• 3.99 cumulative GPA	
RESEARCH EXPERIENCE	University of California, Irvine, Irvine, CA Under Professor Jennifer A. Prescher May 2014 – Present <ul style="list-style-type: none">• <i>Building better bioluminescent reporters via ab initio calculations</i> (2014)• <i>Orthogonal luciferase–luciferin pairs for bioluminescence imaging</i> (February 2015 – November 2016)• <i>Engineering mutually orthogonal enzyme-substrate pairs for bioluminescence imaging</i> (November 2016 – Present) Under Professor Vy M. Dong December 2012 – May 2014 <ul style="list-style-type: none">• <i>Mechanistic study of a metal-catalyzed, regioselective carbohydrate acylation reaction</i> (2013)• <i>Rhodium-catalyzed retrohydroformylation</i> (January 2014 – May 2014) Hope College, Holland, MI Under Professor Jeffrey B. Johnson 2010 – 2012 <ul style="list-style-type: none">• <i>Kinetic investigation of C-C bond activation in quinolinyll ketones</i> (2010)• <i>Observing the effects of ligand modification on C-C bond activation</i> (2011)• <i>C-C bond activation promoted by an imine directing group</i> (Summer 2012) University of Buenos Aires, Buenos Aires, Argentina Under Professor Fabio Doctorovich Summer 2011 <ul style="list-style-type: none">• <i>Synthesis of an electron-poor, water-soluble porphyrin for the isolation of HNO</i>	
SELECTED HONORS & AWARDS	National Science Foundation <ul style="list-style-type: none">• Graduate Research Fellowship (2012)• International Research Experience for Undergraduates (2011) Barry M. Goldwater Scholarship Foundation <ul style="list-style-type: none">• Barry M. Goldwater Scholarship (2011) University of California, Irvine <ul style="list-style-type: none">• Allergan Graduate Fellowship (2017 – 2018)• Grad Slam Campus-Wide Finalist (2017)• UCI NSF GRFP Symposium 3rd-Place Presentation (2017)• AGS Symposium Judges' Winner (2016)	

Hope College

- **Presidential Scholarship** (2008)
- **Chemistry Department Jaeker Scholarship** (2009)
- **Chemistry Department John H. Kleinheksel Award** (2009)
- **Alcor Chapter Mortar Board** (2011 – 2012)

PEER-REVIEWED
PUBLICATIONS

8. Rathbun, C. M.*; Porterfield, W. B.*; Jones, K. A.*; Sagoe, M. J.; Reyes, M. R.; Hua, C. T.; Prescher, J. A. "Parallel screening for rapid identification of orthogonal bioluminescent tools." *ACS Cent. Sci.*, **2017**, 3, 1254.
7. Rathbun, C. M.; Prescher, J. A. "Bioluminescent Probes for Imaging Biology Beyond the Culture Dish." *Biochemistry*, **2017**, 56, 5178. *Invited review*.
6. Rathbun, C. M.*; Jones, K. A.*; Porterfield, W. B.*; McCutcheon, D. C.; Paley, M. A.; Prescher, J. A. "Orthogonal Luciferase-Luciferin Pairs for Bioluminescence Imaging." *J. Am. Chem. Soc.*, **2017**, 139, 2351.
5. Steinhardt, R. C.; Rathbun, C. M.; Krull, B. T.; Yu, J. M.; Yang Y.; Nguyen, B. D.; Kwon, J.; McCutcheon, D. C.; Jones, K. A.; Furche, F.; Prescher, J. A. "Brominated Luciferins are Versatile Bioluminescent Probes." *ChemBioChem*, **2016**, 18, 96.
4. Steinhardt, R. C.; O'Neill, J. M.; Rathbun, C. M.; McCutcheon, D. C.; Paley, M. A.; Prescher, J. A. "Design and Synthesis of an Alkynyl Luciferin Analogue for Bioluminescence Imaging." *Chem. Eur. J.*, **2016**, 22, 3671.
3. Chen, I. H.; Kou, K. G. M.; Le, D. N.; Rathbun, C. M.; Dong, V. M. "Recognition and Site-Selective Transformation of Monosaccharides by Using Copper(II) Catalysis." *Chem. Eur. J.*, **2014**, 20, 5013.
2. Lutz, J. P.; Rathbun, C. M.; Stevenson, S. M.; Powell, B. M.; Boman, T. S.; Baxter, C. E.; Zona, J. M.; Johnson, J. B. "Rate-Limiting Step of the Rh-Catalyzed Carboacylation of Alkenes: C-C Bond Activation or Migratory Insertion?" *J. Am. Chem. Soc.*, **2012**, 134, 715.
1. Rathbun, C. M.; Johnson, J. B. "Rhodium-Catalyzed Acylation of Quinoliny Ketones: Carbon-Carbon Single Bond Activation as the Turnover Limiting Step of Catalysis." *J. Am. Chem. Soc.*, **2011**, 133, 2031.

PRESENTATIONS

- Rathbun, C. M. *Engineered luciferase-luciferin pairs for multicomponent bioluminescence imaging*. Janelia, Andover, NH, June 11–16, 2017. (poster)
- Rathbun, C. M. *Engineered luciferase-luciferin pairs for multicomponent bioluminescence imaging*. Gordon Research Conference: Bioorganic Chemistry, Andover, NH, June 11–16, 2017. (poster)
- Rathbun, C. M. *Using the firefly to illuminate cancer*. Grad Slam Finals Competition (T.E.D.-style talk), U.C. Irvine, April 11, 2017. (oral)
- Rathbun, C. M. *Constructing new bioluminescent tools with minimally perturbed luciferins*. Vertex Day, U.C. Irvine, March 11, 2016. (oral)
- Rathbun, C. M. *Constructing new bioluminescent tools with minimally perturbed luciferins*. ACS National Meeting, San Diego, CA, March 14–17, 2016. (oral)
- Rathbun, C. M. *Mechanistic study of a metal-catalyzed, regioselective carbohydrate acylation reaction*. ACS National Meeting, Indianapolis, IN, September 9–12, 2013. (poster)

TEACHING
EXPERIENCE**University of California, Irvine, Irvine, CA***Mentor to Undergraduate Researchers***January 2015 – Present**

- Oversaw undergraduate Yuhang Yang in synthesis and cross-coupling of brominated luciferins.
- Currently mentoring Yusef Ibrehith in screening a luciferase library for deep mutational scanning analysis.

*Graduate Chemical Biology Teaching Assistant***January – March 2017**

- Lead weekly workshops and helped draft problem sets and exams for a graduate-level chemical biology course lead by Jennifer Prescher.
- Participated in **GetFIT** program for prospective faculty, which included giving a lecture and soliciting feedback from a faculty mentor.

*Organic Chemistry Teaching Assistant***September 2012 – May 2013**

- Oversaw undergraduates in general and organic chemistry labs. Lead workshops for organic chemistry lecture classes.

Hope College, Holland, MI*Teaching Assistant***2009 – 2012**

- Oversaw undergraduates in general and organic chemistry labs. Lead workshops for organic and physical chemistry lecture classes.

PROGRAMMING
LANGUAGES

Python: Data mining and analysis with Numpy. Algorithms for parallel processing with supercomputing clusters.

HTML/CSS: Developed static lab group website from the ground-up. Implemented liquid templating engine for easy future updates.

L^AT_EX: Used for all major long-form graduate school documents.

Java: Working knowledge.

Basic knowledge: JavaScript, Unix Shell, Ruby.

LANGUAGES

English (native speaker)

Spanish: Conversational. Intermediate classes in college as well as 2011 summer research experience in Buenos Aires, Argentina.

RECREATIONAL
INTERESTS

- Enjoy cycling, rock climbing, and hiking.
- Homebrewing and cooking.
- Keyboardist and vocalist.