Katherine C. Forbes

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EDUCATION

Doctor of Philosophy in Chemistry | Harvard University | August 2018–February 2023

GPA: 3.92/4.00

Bachelor of Arts with Honors in Chemistry | Occidental College | August 2014–May 2018

GPA: 3.96/4.00

RESEARCH EXPERIENCE

Postdoctoral Researcher | UC Berkeley | April 2024–present

Advisor: Professor F. Dean Toste

Researching the design and applications of supramolecular coordination cages as photocatalysts for new organic reactions.

Medicinal Chemistry Research Scientist | Vertex Pharmaceuticals | 2023–2024

Participated in lead optimization of small molecule compounds for identification of preclinical candidates.

Helped set up and introduce high-throughput experimentation as a platform for reaction development.

Graduate Student | Harvard University | 2018–2023

Advisor: Professor Eric Jacobsen

Developed enantioselective methodologies for synthesizing chiral phosphorus (V) compounds via hydrogen-bond-donor catalysis.

Undergraduate Researcher | Occidental College | 2016–2018

Advisor: Professor Jeffrey Cannon

Developed photoredox-catalyzed cyclization reactions.

Undergraduate Researcher | Northeastern University | 2016

Advisor: Professor Michael Pollastri

Synthesized functionalized azaindoles for the treatment for Human African Trypanosomiasis.

PUBLICATIONS

Enantioselective Hydrogen-Bond-Donor Catalysis to Access Diverse Stereogenic-at-P(V) Compounds.
Forbes, K. C.; Jacobsen, E. N. *Science* **2022**, *376* (6598), 1230–1236.

Photoredox-Catalyzed Oxidation of Anions for the Atom-Economical Hydro-, Amido-, and Dialkylation of Alkenes.
Forbes, K. C.; Crooke, A. M.; Lee, Y.; Kawada, M.; Shamskhou, K. M.; Zhang, R. A.; Cannon, J. S. *J. Org. Chem.* **2022**, *87* (5), 3498–3510.

Lead Optimization of 3,5-Disubstituted-7-Azaindoles for the Treatment of Human African Trypanosomiasis.
Klug, D. M.; Mavrogiannaki, E. M.; Forbes, K. C.; Silva, L.; Diaz-Gonzalez, R.; Pérez-Moreno, G.; Ceballos-Pérez, G.; Garcia-Hernández, R.; Bosch-Navarrete, C.; Cordón-Obras, C.; Gómez-Liñán, C.; Saura, A.; Momper, J. D.; Martinez-Martinez, M. S.; Manzano, P.; Syed, A.; El-Sakkary, N.; Caffrey, C. R.; Gamarro, F.; Ruiz-Perez, L. M.; Gonzalez Pacanowska, D.; Ferrins, L.; Navarro, M.; Pollastri, M. P. *J. Med. Chem.* **2021**, *64* (13), 9404–9430.

Dual Lewis Acid/Photoredox-Catalyzed Addition of Ketyl Radicals to Vinylogous Carbonates in the Synthesis of 2,6-Dioxabicyclo[3.3.0]Octan-3-Ones.
Foy, N. J.; Forbes, K. C.; Crooke, A. M.; Gruber, M. D.; Cannon, J. S. *Org. Lett.* **2018**, *20* (18), 5727–5731.

CONFERENCES AND INVITED LECTURES

Speaker | Bristol Myers-Squibb Chemistry Award Symposium | Lawrence Township, NJ | June 2023

Title: "Enantioselective Synthesis of Stereogenic-at-Phosphorus(V) Compounds via Hydrogen-Bond-Donor Catalysis"

Poster | Stereochemistry Gordon Research Conference | Salve Regina University, Newport, RI | July 2022

Poster: "Enantioselective Synthesis of Stereogenic-at-Phosphorus(V) Compounds via Hydrogen-Bond-Donor Catalysis"

Speaker | Genentech Graduate Student Symposium | San Francisco, CA | May 2022

Title: "Enantioselective Synthesis of Versatile Stereogenic-at-P(V) Building Blocks via Hydrogen-Bond-Donor Catalysis"

Speaker and Session Presider | American Chemical Society Research Conference | San Diego, CA | March 2022

Title: "Enantioselective Synthesis of Versatile Stereogenic-at-P(V) Building Blocks via Hydrogen-Bond-Donor Catalysis"

Poster | National Organic Symposium | UC Davis, Davis, CA | June 2017

Poster: "Synthesizing Furanolactone Motifs via Photoredox/Lewis acid-Catalyzed Ketyl Radical Cyclizations"

Poster | ACS DOC SURF Symposium | Merck Research Laboratories, Boston, MA | August 2017

Poster: "Synthesizing Furanolactone Motifs via Photoredox/Lewis acid-Catalyzed Ketyl Radical Cyclizations"

HONORS AND AWARDS

February 2023	Harvard Department of Chemistry and Chemical Biology Community Award
August 2022	E.J. Corey BMS Graduate Fellowship in Synthetic Organic Chemistry ($39,000)
May 2022	Genentech Graduate Student Symposium in Chemical Research ($1,000)
2019, 2020, 2021	Harvard University Certificate for Distinction in Teaching
May 2018	Occidental College Alumni Award for Outstanding Performance in Research
May 2018	Occidental College's Teaching Assistant of the Year
October 2017	Phi Beta Kappa
March 2017	ACS Division of Organic Chemistry Summer Research Fellowship ($5,000)
March 2017	Barry Goldwater Scholarship (Honorable Mention)
May 2016	Occidental College Award for Outstanding Performance in Organic Chemistry
May 2015	Occidental College Award for Outstanding Performance in General Chemistry

TEACHING EXPERIENCE

Teaching Fellow | Advanced Organic Chemistry | Harvard University | 2020

Head Instructor: Professor Eric Jacobsen

Taught Chem 105, a graduate-level organic chemistry course focused on physical organic chemistry.

Gave weekly literature presentations and held discussion sections focused on teaching students how to interpret contemporary chemistry literature and synthesize new ideas.

Hosted office hours during which I helped students understand course material and complete problem sets.

Designed, wrote, and graded problem sets/exams.

Teaching Fellow | Undergraduate Organic Chemistry Laboratory | Harvard University | 2018–2019

Supervisor: Joe Lavin

Conducted laboratory sections for Chem 20 and Chem 30 (Organic Chemistry I and II courses).

Performed laboratory demonstrations. Created, prepared, and gave lectures. Provided hands-on lab training.

Graded exams, quizzes, and lab reports.

Academic Mastery Program Facilitator | Occidental College | 2016–2018

Supervisor: Professor Linda Lasater

Facilitated group work workshops for chemistry students and provided tutoring services.

Created worksheets, exams, and study aids for students.

Teaching Assistant | Undergraduate Organic Chemistry Laboratory | Occidental College | 2016–2018

Supervisor: Professor Linda Lasater

Taught students laboratory skills, methods, and practices.

Ensured that proper safety precautions were taken and enforced safety regulations.

REVIEWING ACTIVITIES

Referee for the ***Journal of the American Chemical Society*** and ***Organic Letters***.

VOLUNTEER WORK AND EXTRACURRICULARS

Synthesis Workshop Advanced Organic Chemistry Course Lecturer | Synthesis Workshop | August 2024

Designed, wrote, and recorded a lecture on chemistry at Phosphorus(V) for an open-access advanced organic chemistry course hosted by Synthesis Workshop, which is available at https://www.youtube.com/watch?v=w6Ltqk4douM.

President of Graduate Student & Post-doc Council | Department of Chemistry and Chemical Biology | Harvard University | November 2021–February 2023

Organized meetings, guided discussions, and helped make final decisions on committees and events.

Led committees for Career Speaker Series and Student-Invited Speaker Series.

Poster Judge | National Collegiate Research Conference | Harvard University | January 2023

Attended poster presentations for five undergraduates at the National Collegiate Research Conference and engaged with student presenters about their research.

Evaluated posters based on experimental design, visual clarity and organization, potential for further development, quality of research, and effectiveness of presentation. Provided detailed written feedback to students.

Mentor | Health Professions Recruitment & Exposure Program | Harvard University | 2021

Mentored in Harvard Medical School's Health Professions Recruitment & Exposure Program **(**HPREP), a high school science enrichment program aimed at recruiting students from underserved/underrepresented backgrounds into science & medicine.

Helped students prepare personal statements/essays and provided advice about possible career paths.

Application Reader | Health Professions Recruitment & Exposure Program | Harvard University | 2021

Read and evaluated applications for high school students interested in participating in HPREP.

Evaluated the barriers applicants faced based on their racial/ethnic background, socioeconomic status, immigration status, and academic opportunities.