

# **Katherine C. Forbes**

kforbes96@gmail.com

## **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**

---

**Medicinal Chemistry Research Scientist | Vertex Pharmaceuticals | 2023–Present**

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.

Mentored and collaborated with a Harvard graduate researcher.

**Undergraduate Researcher | Occidental College | 2016–2018**

*Advisor: Professor Jeffrey Cannon*

Developed photoredox-catalyzed cyclization reactions.

Mentored three undergraduate researchers.

**Undergraduate Researcher | Northeastern University | 2016**

*Advisor: Professor Michael Pollastri*

Synthesized functionalized azaindoles for the treatment for Human African Trypanosomiasis.

## **PUBLICATIONS**

---

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

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

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.; Cerdón-Obras, C.; Gómez-Liñán, C.; Saura, A.; Momper, J. D.; Martínez-Martínez, 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. Lead Optimization of 3,5-Disubstituted-7-Azaindoles for the Treatment of Human African Trypanosomiasis. *J. Med. Chem.* **2021**, 64 (13), 9404–9430.

Foy, N. J.; **Forbes, K. C.**; Crooke, A. M.; Gruber, M. D.; Cannon, J. S. 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. *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 President | 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.

## **VOLUNTEER WORK AND EXTRACURRICULARS**

---

### **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.