

Laura Bancroft

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Education:

Northwestern University, Evanston IL

Ph.D. Physical Organic Chemistry: June 2022

Thesis title: "Fundamental Electron Transfer and Spin Dynamics in Organic Donor-Acceptor Systems for Quantum Information Science Applications"

Advisor: Prof. Michael R. Wasielewski

Wellesley College, Wellesley MA

B.A. in Chemistry with Honors, May 2017

Thesis title: "Syntheses of Methylisoquinoline Derivatives for Incorporation into Photolabile Aryl Azide T-0632 Analogs to Explore the GLP-1R Active Site"

Advisor: Prof. David R. Haines

Research and Work Positions:

Visiting Assistant Professor of Chemistry and Biochemistry, Bates College, Lewiston, ME (August 2022-Present)

Doctoral Student, Chemistry Department, Northwestern University, Evanston, IL. Advisor: Prof. Michael R. Wasielewski (September 2017-June 2022)

Bleed Technician, Associates of Cape Cod, Falmouth, MA (Summer 2013, 2017)

Undergraduate Research Assistant, Chemistry Department, Wellesley College, Wellesley, MA. Advisor: Prof. David R. Haines (Fall 2015-Spring 2017)

Summer Student Research Fellow, CRISP/SURF NSF REU, Chemical and Environmental Engineering Department, Yale University, New Haven, CT. Advisor: Prof. Chinedum Osuji (Summer 2016)

Summer Student Research Fellow, NSF REU, Chemistry Department, University of Montana/Rivertop @ Renewables, Missoula, MT (Summer 2015)

Undergraduate Research Assistant, Chemistry Department, Wellesley College, Wellesley, MA. Advisor: Dr. Adrian Huang (Spring-Fall 2014)

Teaching and Mentoring:

Teaching Positions, Northwestern University, Evanston, IL

WCAS/TGS Teaching Fellowship (Spring 2021)

Instructor of record for an undergraduate first-year seminar course of my own design. The course, titled The Quantum World from the Ground Up, approached quantum mechanics from

historical, conceptual, ethical, and critical-thinking perspectives. This discussion-based class of 15 students was synchronous and virtual.

Massively Open Online Course (MOOC)-Centered Learning Community (MCLC) Peer Leader (Fall 2020)

Formulated and led activities and facilitated discussions related to the “An Introduction to Evidence-Based Undergraduate STEM Teaching” MOOC. Course consisted of graduate students and postdoctoral scholars interested in learning more about teaching in STEM fields.

Chemistry 110 Super Teaching Assistant (Fall 2017, 2018)

Duties for this brand-new course included: organizing recitation teaching assistants, forming course assessments, acting as a liaison between students and the professor, holding office hours, grading student work.

Chemistry 141 Laboratory Teaching Assistant (Winter 2018, 2020)

Duties included: ensuring student safety, engaging students in actively learning laboratory techniques, connecting laboratory work to classroom work, holding office hours, grading student work.

One-on-One Mentoring

Served as a mentor through Wellesley College’s Senior Support Network program. Met regularly with undergraduate mentees Claire Hayhow (December 2020-July 2021) and Lucille Tsao (January-July 2021). We discussed students’ thoughts and plans for after graduation in an increasingly uncertain world and answered questions about post-graduation life.

Hosted a Literature Exploration Internship in the summer of 2020 for 4 Wellesley College undergraduate students: Helena Hu, McKenna Montminy, Suchin Yang, and Cookie Uberoy. During this 12-week internship project, I (virtually) met with each student 1-on-1 once per week or once every other week depending on student preference to discuss scientific literature within the broad realm of chemistry. We each picked a paper for each meeting and discussed comments, questions, critiques, or proposed future directions of the papers. The internship culminated in a Final Meeting Palooza where the students held 10-minute presentations given to the 5 of us on 2 papers of their choice from their summer readings followed by questions from the audience. The skills we focused on depended on the individual student, but included critical and individual thinking, data analysis and visualization, clear writing and communication in science, and the broader impacts of research.

Served as a CHEMUnity Mentor to incoming chemistry graduate students at Northwestern University through the in-house program. Mentored Subeen Kim (2021) Dylan J Bardgett (2020), Elisabeth Latawiec (2020), James O’Connor (2019), and Emmaline Lorenzo (2018). Mentoring included meeting occasionally for casual conversations about the transition to graduate school as well as participating in specific CHEMUnity social events for mentors and mentees.

Mentored Northwestern University undergraduate Lillian Nemeth for 8 weeks during the summer of 2019. Mentorship focused on building skills in the areas of organic synthesis, proper documentation of experiments, basic spectroscopy, and confidence.

Chemistry Teaching Assistant Training Program at Northwestern University, Evanston, IL
Safety in the Teaching Labs – Workshop Designer and Leader (September 2019)

Designed original workshop, “Safety in the Teaching Lab,” for 50 incoming graduate student teaching assistants. Established learning objectives for the workshop in conjunction with chemistry faculty and a co-facilitator. Developed and actuated 60 minutes of focused active learning activities including Think-Pair-Share work.

Mock Laboratory Session – Workshop Facilitator (September 2018, 2019)

Facilitated the mock laboratory workshop for new graduate students. Translated personal developments from teaching experiences to live demonstrations concerning teaching in a laboratory setting.

Teaching Assistant Panel – Workshop Facilitator (September 2019)

Facilitated workshop focused on developing incoming graduate students as teaching assistants. Offered advice and answered questions on teaching strategies on a panel of experienced teaching assistants.

Teaching-Focused Education

Teaching Certificate Program, Northwestern University, Evanston, IL (2020)

Participated in teaching-focused seminars and workshops as well as small group peer discussion. Faculty mentor Katherine A. Moga Gesmundo also aided in my development of a teaching statement and course design project for my first-year seminar course covering quantum mechanics throughout history into today.

Mentored Discussions of Teaching (MDT), Northwestern University, Evanston, IL (Spring 2020)

Observed Professor Mitra Hartmann’s remote Fluid Mechanics course in the biomedical and mechanical engineering departments. Participated in discussions about pedagogy with Professor Hartmann and other MDT participants.

Massively Open Online Courses (MOOCs):

Advanced Learning Through Evidence-Based STEM Teaching (Winter 2020)

An Introduction to Evidence-Based Undergraduate STEM Teaching (Fall 2019)

Publications:

Mayländer, M.; Nolden, O.; Franz, M.; Chen, S.; **Bancroft, L.**; Qiu, F.; Wasielewski, M. R.; Gilch, P.; Richert, S. Accessing the triplet state of perylene diimide by radical-enhanced intersystem crossing. *Chem. Sci.* **2022**, *13*, 6732-6743.

Wu, Y.; Qiu, Y.; Weber, J. A.; Young, R. M.; **Bancroft, L.**; Chen, H.; Song, B.; Liu, W.; Feng, Y.; Zhao, X.; Li, X.; Zhang, L.; Jiao, Y.; Chen, X.; Li, H.; Wasielewski, M. R.; Guo, Q.;

Stoddart, J. F. Syntheses of three-dimensional catenanes under kinetic control. *PNAS* **2022**, *119* (12).

Bancroft, L.; Qiu, Y.; Krzyaniak, M. D.; Wasielewski, M. R. Effect of Time Delay between Spin State Preparation and Measurement on Electron Spin Teleportation in Covalent Donor-Acceptor-Radical System. *J. Phys. Chem. Lett.* **2022**, *13*, 156-160.

Bancroft, L.; Zhang, J.; Harvey, S. M.; Krzyaniak, M. D.; Zhang, P.; Schaller, R. D.; Beratan, D. N.; Young, R. M.; Wasielewski, M. R. Charge Transfer and Spin Dynamics in a Zinc Porphyrin Donor Covalently Linked to One or Two Naphthalenediimide Acceptors. *J. Phys. Chem. A* **2021**, *125* (3), 825-834.

Wood-Black, F.; Blayney, M. B.; Reid, M.; Montes, I.; Bayoumi, A. E.; Sloan, L.; Rothbaum, J. O.; Koudehi, M. F.; Zibaseresht, R.; **Bancroft, L.** Highlights: Multilingual Safety Resources, Pd-Catalyzed Cross-Coupling Reactions, Ethylene Glycol Purification, and More. *ACS Chem. Health Saf.* **2020**, *27* (6), 313-315.

Blayney, M. B.; **Bancroft, L.**; Wasson, M. C.; and Williams, B. Literature Highlights. *ACS Chem. Health Saf.* **2020**, *27* (1), 60-62.

Huang, A.; Wo, K.; Lee, S. Y. C.; Kneitschel, N.; Chang, J.; Zhu, K.; Mello, T.; **Bancroft, L.**; Norman, N. J.; Zheng, S. Regioselective Synthesis, NMR, and Crystallographic Analysis of N1-Substituted Pyrazoles. *J. Org. Chem.* **2017**, *82* (17), 8864-8872.

Fellowships and Awards:

Northwestern University Research Safety Leadership Award (2022)

Northwestern University Graduate Teaching Fellowship (2021-2022 Academic Year, withdrew October 2021)

WCAS/TGS Teaching Fellowship (Spring 2021)

Northwestern University Fellowship in Leadership (2020)

Member of Phi Beta Kappa (Spring 2017)

Nominated for Membership in Sigma Xi (Spring 2017)

Jean V. Crawford Prize in Chemistry (Spring 2017)

NEWMAC Academic All-Conference Team, Wellesley College Crew (Spring 2015, 2016)

Outstanding Achievement Award: Chemistry 120 (Fall 2013)

Leadership Roles and Opportunities:

Wasielewski Lab Safety Designate, Northwestern University, Evanston, IL (January 2018 – Present)

Vice President of Research Safety Student Initiative (RSSI), Northwestern University, Evanston, IL (Winter 2019 – Fall 2021)

Coachee Leadership Coaching Program, Center for Leadership, Northwestern University, Evanston, IL (Fall 2019)

Volunteering and Outreach:

Science with Seniors, Evanston, IL (March 2020)

Gave an interactive presentation titled “Radiation: Friend or Foe?” to senior citizens at the Levy Center, Evanston, IL. Topic covered the electromagnetic radiation spectrum and how electromagnetic radiation plays into everyday life.

Lab Tour Leader “Career Day for Girls,” Northwestern University, Evanston, IL (February 2019, 2020)

Led middle-school girls around the Wasielewski group’s lab spaces explaining day-to-day research, larger applications of our group’s work, and careers that are based in physical organic chemistry.

Workshop Creator and Leader “Expanding Your Horizons,” Northwestern University, Evanston, IL (December 2019)

Designed and led two 45-minute workshops teaching middle-school girls basic modular arithmetic and cryptography through a series of puzzles and mysteries.

Correspondent for Wellesley College’s Analytical Chemistry Course, Northwestern University, Evanston, IL (Fall 2018)

Showed students (via FaceTime) the Wasielewski group’s transient absorption spectroscopy laser system while collecting data. Answered questions about spectroscopy and graduate school.

Research Presentations:

Chemistry Department Invited Speaker, Wellesley College, Wellesley, MA (Fall 2020)

Virtual oral presentation on graduate research work involving electron spin teleportation, “Trials and Tribulations of Teleportation.”

Ruhlman Conference, Wellesley College, Wellesley, MA (Spring 2017)

Oral presentation on thesis work with fellow lab members, “The Haines Lab: Applications of Organic Chemistry to the Development of Novel Therapeutics.”

ACS National Meeting, San Francisco, CA (Spring 2017)

Poster presentation on thesis work, “Syntheses of Methylisoquinoline Derivatives for Incorporation into Photolabile Aryl Azide T-0632 Analogs to Explore the GLP-1R Active Site.”

Leadership Alliance National Symposium, Stamford, CT (Summer 2016)

Oral presentation on Yale CRISP/SURF NSF REU work, “Synthesis of Thermotropic, Hexagonal Columnar Liquid Crystalline Acceptor Molecules for Photon Upconversion.”

Other Learning Experiences and Skills:

Soldering Class (October 2019)

LabVIEW Class: “An Introductory Course for Research Students” (May 2019)

Machine Shop Class (Summer 2018)

Basic/Intermediate MATLAB skills