Alyssa DeLucia, PhD

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- **Goal:** Researcher trained in inorganic synthetic chemistry and spectroscopy (NMR, FTIR, XRD, Echem) who is actively seeking opportunities in industrial R&D and government laboratories
- **Industry Experience:** Interned at 3M R&D where I created methodology for fundamental NMR studies and transferred insights to product engineers for potential changes for structural adhesive formulation
- **Effective Communicator and Collaborator:** published 3 first author papers, presented at 8 conferences, and have seamlessly worked on diverse teams at 3M, in academia, and planning committees

EDUCATION

PhD in Chemistry *December 2023*
University of Illinois, Champaign, IL (Advisor: Dr. Lisa Olshansky)
Thesis: Modeling Metallo-oxidoreductase Active Site Dynamics with Bis(μ-hydroxo)Dicobalt Complexes

B.A. in Chemistry (Summa Cum Laude) *May 2018*
Rollins College, Winter Park, FL (Advisor: Dr. Laurel Goj Habgood)
Thesis: Developing Iron Catalysts for Organic Reactions

RESEARCH EXPERIENCE

Doctoral Research *November 2018 – December 2023*
University of Illinois, Champaign, IL
Advisor: Dr. Lisa Olshansky

- Synthesized biomimetic bis(μ-hydroxo)dicobalt complexes in which substituents on various ligands were modified to control the intramolecular hydrogen bonding network and subsequent proton transfer and carboxylate shift capabilities
- Characterized complexes with 1D and 2D NMR, FT-IR, EPR, and UV-vis spectroscopies and X-ray Crystallography, mass spectrometry and elemental analysis
- Elucidated carboxylate shift mechanism of bis(μ-hydroxo)dicobalt complexes through ^{1}H-NMR spectroscopic kinetic and mechanistic studies
- Trained in variable temperature NMR, Stopped-flow UV-vis spectroscopies, and electrochemical methods
- As a founding member, mentored 5 graduate and 3 undergraduate students, aided in creation of laboratory policies, heavily assisted in setup of new equipment and wrote general operating protocols

3M Research and Development Intern *Summer 2022*
Corporate Research Analytical Lab, Maplewood, MN
Supervisor: Dr. Wayne Maurer Mentors: Dr. Gereon Yee and Dr. Mark McCormick

- Investigated the reaction mechanism of a redox mediated polymerization process found in numerous 3M structural adhesives primarily using NMR techniques (^{1}H, ^{13}C, ^{15}N, DOSY, NOESY, HMBC, HSQC)
- Collaborated with product developers to transfer the findings of these fundamental studies into potential changes for the formulation of those structural adhesives
- Disseminated findings through internal written report, poster, and presented to 50 coworkers

Undergraduate Research *Fall 2016 – Spring 2018*
Rollins College, Winter Park, FL
Advisor: Dr. Laurel Goj Habgood

- Analyzed catalytic activity of synthesized iron complexes for cross-coupling reactions utilizing air-free (Schlenk and glove-box) techniques, FT-IR and ^{1}H-NMR spectroscopies, and gas chromatography

Georgia Tech Research Experience for Undergraduates *Summer 2017*
Georgia Institute of Technology, Atlanta, GA
Advisor: Dr. Joseph Sadighi Mentor: Dr. Kevin Omolo

- Synthesized and characterized cobalt and palladium PNP pincer complexes for nitrogen fixation utilizing air-free (Schlenk and glove-box) techniques and ^{1}H-NMR, ^{31}P-NMR and FT-IR spectroscopies

Summer Program for the Advancement of Research Knowledge *Summer 2016*
Moffitt Cancer Center, Tampa, FL
Advisor: Dr. Jin Q. Cheng Mentor: Dr. Yajuan Li

- Screened small molecules to determine their ability to inhibit miR-155, a microRNA linked to cancer, on lung cancer cell lines using MTT assays, western blots, luciferase assays, and cell migration assays

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SELECTED PUBLICATIONS (3 of 4)

- **Alyssa A. DeLucia**††, Khadanand KC††, and Lisa Olshansky. These †† authors contributed equally to the work. Impact of Hydrogen-Bonding Interactions on the Properties of Bis(μ-hydroxo)dicobalt Complexes. *Inorganica Chimica Acta* ***2024****, 564, 121931*.
- **Alyssa A. DeLucia** and Lisa Olshansky. Carboxylate Shift Dynamics in Biomimetic Bis(μ-hydroxo)dicobalt Complexes. *Inorganic Chemistry* **2024**, 63, 2, 1109−1118.
- **Alyssa A. DeLucia**††, Kimberly A. Kelly††, Kevin A. Herrera, Danielle L. Gray, and Lisa Olshansky. These †† authors contributed equally to the work. Intramolecular Hydrogen-Bond Interactions Tune Reactivity in Biomimetic Bis(μ-hydroxo)dicobalt Complexes. *Inorganic Chemistry* **2021**, *60*, 15599−15609.

SELECTED POSTERS AND PRESENTATIONS (4 of 8)

- **A. DeLucia,** "Carboxylate Shift Dynamics in Biomimetic Bis(μ-hydroxo)dicobalt Complexes" *Changwoo Park-Walter Klemperer Inorganic and Materials Allerton Conference, Monticello, IL,* ***2023****. Presentation.*
- **A. DeLucia,** "Modeling Oxidase Metalloenzymes with dicobalt bis(μ-hydroxo) complexes" *American Chemical Society National Meeting and Exposition*, Indianapolis, IN, **2023**. ABS #3820889. *Presentation*.
- **A. DeLucia**, K. Kelly, K.C. Khanadand, L. Olshansky. "Modeling Oxidase Metalloenzymes with dicobalt bis(μ-hydroxo) complexes" *Gordon Research Conference Bioinorganic Active Sites that Drive Challenging Chemical Conversions*, Newport, RI, **2022**. *Poster*.
- **A. DeLucia**, K. Omolo, J. Sadighi, L. Habgood. "Synthesis of Transition-Metal Catalysts with Diverse Potential Reactivity" *American Chemical Society National Meeting and Exposition*, New Orleans, LA, **2018**. ABS # 2867652. *Poster*.

SCIENCE EDUCATION OUTREACH, LEADERSHIP, AND MENTORSHIP

Private Tutor *Spring 2024 – Present*

- Provide one-on-one virtual assistance for high school and college level chemistry courses
- Tailor lesson plans to meet the needs of diverse clientele

St. Elmo Brady Academy Volunteer *Fall 2021 – Spring 2022*

Booker T. Washington Elementary School, Champaign, IL

- Worked closely with program leaders to plan and lead weekly hands-on science activities for third, fourth, and fifth grade classes (20 students per class)

Women in Chemistry Conference Planning Committee *Summer 2021*

University of Illinois, Champaign, IL

- Designed the conference goodie bags and worked closely with vendors in ordering the promotional items
- Co-planned, selected speakers, and hosted a career "speed dating" panel

Goldwater Ambassador Program Mentor *Summer 2022 – Present*

- Mentor undergraduates from colleges with limited STEM research resources in one-on-one meetings that focus on applying for scholarships, internships, and graduate school

Undergraduate Research Mentoring *Fall 2020 – Spring 2023*

University of Illinois, Champaign, IL

- Trained 3 undergraduate students on laboratory techniques relevant to my research and nontechnical skills involved with research such as maintaining a laboratory notebook, reading scientific literature, writing manuscripts, making presentations, and presenting

SELECTED AWARDS (4 of 13)

Phillip W. Rhymer Graduate Fellowship for Outstanding Inorganic Preliminary Exam and Research	*2021*
NSF Graduate Research Fellowships Program Honorable Mention	*2020*
American Institute of Chemists Outstanding Senior Chemistry Major Award, *Rollins College*	*2018*
Goldwater Scholar, *Barry Goldwater Scholarship and Excellence in Education Foundation*	*2017*