

Alyssa DeLucia, PhD

aadelucia1@gmail.com | alyssadelucia.com | 772-872-2548

PROFESSIONAL SUMMARY

- **Goal:** Researcher trained in inorganic synthetic chemistry and spectroscopy (NMR, FTIR, XRD, Echem) who is actively seeking opportunities to expand skill set into materials, nuclear energy, and renewable energy applications
- **Effective Communicator and Collaborator:** published 3 papers during PhD (2 co-first and 1 first author), presented findings at 8 conferences, and have seamlessly worked on teams at 3M (15 people), academia (10 people), and planning committees (7 people)
- **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

EDUCATION

PhD in Chemistry

December 2023

University of Illinois at Urbana-Champaign, Champaign, IL

Thesis: Modeling Metallo-oxidoreductase Active Site Dynamics with Bis(μ -hydroxo)Dicobalt Complexes

Advisor: Dr. Lisa Olshansky

B.A. in Chemistry (Summa Cum Laude)

May 2018

Rollins College, Winter Park, FL

Thesis: Developing Iron Catalysts for Organic Reactions

Advisor: Dr. Laurel Goj Habgood

RESEARCH EXPERIENCE

Doctoral Research

November 2018 –

University of Illinois at Urbana-Champaign, Champaign, IL

December 2023

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 $^1\text{H-NMR}$ spectroscopic kinetic and mechanistic studies
- Trained in air-free (Schlenk and glovebox) techniques, variable temperature NMR, Stopped-flow UV-vis spectroscopies, and electrochemical methods
- As a founding member, mentored 5 graduate students, aided in creation of laboratory policies, heavily assisted in setup of new equipment and crafted general operating protocols for gloveboxes and electrochemistry equipment

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
- 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

- Synthesized iron-NHC complexes using air-free techniques and characterized with FTIR and $^1\text{H-NMR}$
- Analyzed their catalytic activity in cross-coupling reactions utilizing gas chromatography and $^1\text{H-NMR}$

RESEARCH EXPERIENCE CONT.

Georgia Tech Research Experience for Undergraduates

Summer 2017

Georgia Institute of Technology, Atlanta, GA

Advisor: Dr. Joseph Sadighi Mentor: Dr. Kevin Omolo

- Synthesized PNP pincer ligands and formation of complexes with palladium and cobalt utilizing air-free techniques and $^1\text{H-NMR}$, $^{31}\text{P-NMR}$ and FT-IR spectroscopies for characterization

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 modified 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

PUBLICATIONS

1. **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.
2. **Alyssa A. DeLucia** and Lisa Olshansky. Carboxylate Shift Dynamics in Biomimetic Bis(μ -hydroxo)dicobalt Complexes. *Inorganic Chemistry* **2024**, 63, 2, 1109–1118.
3. **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.
4. Verónica A. Segarra, Alexandra A. DeLucia^{††}, **Alyssa A. DeLucia**^{††}, Renee Fonseca^{††}, Michael P. Penfold^{††}, Katlyn M. Sawyer^{††}, Cecelia M. Harold, Courtney Reddig, Ashima Singh, Ibrahim Musri, Jacqueline C. Wright, J. J. Leissing, Samantha Dennis, Mary Catherine Pflug, Niki Fogle, Monique Moore, Sade Sims, Kelsey Matteson, Meredith Hein. These ^{††} authors contributed equally to the work. Self-Driven Service Learning: Community-Student-Faculty Collaboratives Outside of the Classroom. *Journal of Microbiology & Biology Education*. **2015**, 16, 260-262.

POSTERS AND PRESENTATIONS

1. **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.
2. **A. DeLucia**, “Modeling Oxidase Metalloenzymes with dicobalt bis(μ -hydroxo) complexes” *American Chemical Society National Meeting and Exposition, Indianapolis, IN, 2023*. ABS #3820889. Presentation.
3. **A. DeLucia**, “Carboxylate Shift Dynamics in Biomimetic Bis(μ -hydroxo)dicobalt Complexes” *Gordon Research Conference Metals in Biology, Ventura, CA, 2023*. Poster.
4. **A. DeLucia**, G. Yee, M. McCormick. “Redox Mediated Polymerization of Structural Adhesives”. 3M, St Paul, MN. **2022**. 3M Internal Poster, Presentation, and Report.
5. **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.

POSTERS AND PRESENTATIONS CONT.

6. **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.
7. **A. DeLucia**, K. Omolo, J. Sadighi. "Synthesis of Unconstrained PNP Pincer Complexes for Potential use in Nitrogen Fixation" *Georgia Tech Research Experience for Undergraduates Symposium*, Atlanta, GA, 2017. Poster and Presentation.
8. **A. DeLucia**, Y. Li., J. Q. Cheng. "Analysis of Small Molecule Inhibitor of MicroRNA-155" *Moffitt Cancer Center Research Day*, Tampa, FL, **2016**. Presentation.

AWARDS

J.C. Martin Memorial Student Travel Award (through Women Chemists Committee)	2023
Phillip W. Rhymer Graduate Fellowship for Outstanding Inorganic Preliminary Exam and Research	2021
NSF Graduate Research Fellowships Program Honorable Mention	2020
Walter Burrows Brown Fellowship in Chemical Research	2020
Robert J. Morris Graduate Students in Inorganic Chemistry Travel Award	2020 and 2021
R. C. Fuson University of Illinois Graduate Fellowship	2019
Roger Adams University of Illinois Graduate Fellowship	2018
American Institute of Chemists Outstanding Senior Chemistry Major Award, <i>Rollins College</i>	2018
ACS Undergraduate Award in Analytical Chemistry, <i>Rollins College</i>	2018
Goldwater Scholar, <i>Barry Goldwater Scholarship and Excellence in Education Foundation</i>	2017
George Allen Award for Outstanding Undergraduate Research, <i>Rollins College</i>	2017
Thomas R. Baker Memorial Prize for Most Promising Junior in Chemistry, <i>Rollins College</i>	2017
ACS Undergraduate Award in Inorganic Chemistry, <i>Rollins College</i>	2017

MENTORSHIP

Certified Mentor by University of Illinois at Urbana-Champaign Graduate College

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

ADJUST Mentoring Program

Fall 2021

University of Illinois at Urbana-Champaign, Champaign, IL

- One-on-one bimonthly meetings with an assigned first-year Chemistry PhD student
- Aided in their adjustment from undergraduate to graduate school by discussing a range of topics from living situations to choosing a laboratory group

Undergraduate Research Mentoring

Fall 2020 – Spring 2023

University of Illinois at Urbana-Champaign, 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

MENTORSHIP CONT.

Women's Chemist Committee Mentor

Fall 2019

University of Illinois at Urbana-Champaign, Champaign, IL

- Met with younger women in the chemistry PhD program in a group setting to help their transition into graduate school

SCIENCE EDUCATION OUTREACH AND LEADERSHIP

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 at Urbana-Champaign, 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

Women's Chemist Committee Day Camp for Girls Station Leader

Summer 2019, December

University of Illinois at Urbana-Champaign, Champaign, IL

2020, and June 2021

- Planned and wrote procedures to lead middle school students through chemistry experiments over Zoom
- Ordered and prepared supplies for individual packaging to be shipped to participants' homes
- Experiments I led were voted as participate favorites

University of Illinois Virtual Undergraduate Research Symposium

April 2020

Judge

University of Illinois at Urbana-Champaign, Champaign, IL

- Assessed undergraduate virtual research presentations for whether they should be recommended for awards and provided detailed feedback

East Central Illinois ACS Undergraduate Research Conference

November 2019 and 2021

Judge

University of Illinois at Urbana-Champaign, Champaign, IL

- Assessed undergraduate presenters from various universities for whether they should be recommended for awards by asking probing questions and providing detailed feedback

Encouraging Tomorrow's Chemists

Spring 2018 – Fall 2019

University of Illinois at Urbana-Champaign, Champaign, IL

- Led interactive science demonstrations for middle school students in front of classes of 20 – 30 students

Student Affiliates of American Chemical Society Chapter (SAACS)

Fall 2016– Spring 2018

President

Rollins College, Winter Park, FL

- Founding member in reviving the club from its decade hiatus
- Led and planned interactive demonstrations for National Chemistry Week at Rollins College
- Planned professional development events for members
- Organized volunteers and planned a station at Rollins College's community Halloween festival in which we led children through making slime and coffee filter butterflies
- Organized volunteers to act as judges for a local middle school science fair

SCIENCE EDUCATION OUTREACH AND LEADERSHIP CONT.

Orlando Science Center Cell Day Station Leader

Spring 2015

Orlando Science Center, Winter Park, FL

- Prepared a presentation and materials for a station geared toward elementary and middle school children focused on fundamental cell functions in celebration of Cell Day
- Experience was reported in the *Journal of Microbiology & Biology Education*

TEACHING EXPERIENCE

Private Tutor

Spring 2024 – Present

Virtual

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

Inorganic Laboratory Teaching Assistant

Spring 2019 and 2020

University of Illinois at Urbana-Champaign, Champaign, IL

- Instructed class sections of 10-12 students each on fundamental inorganic synthetic techniques and instrumentation and scientific writing
- Created pre-laboratory quizzes and graded pre-laboratory assignments and post laboratory reports while providing detailed feedback for 36 students

Biophysics Experimental Bootcamp Instructor

Fall 2019 and 2021

University of Illinois at Urbana-Champaign, Champaign, IL

- Co-led incoming biophysics graduate students through a week-long kinetics experiment
- Optimized the experimental conditions and wrote detailed instructions for beginners on how to analyze kinetics data
- Taught 10 students with little experimental background the basics of working with proteins, making solutions, analyzing kinetic data using Origin software, and trained them on Stopped-Flow UV-vis spectroscopy

Inorganic Lecture Teaching Assistant

Fall 2019

University of Illinois at Urbana-Champaign, Champaign, IL

- Assisted students in a group setting with fundamental inorganic chemistry concepts
- Graded homework and exams for a class of 40 students
- Lectured in front of 40 students when professor was absent
- Led review sessions for students prior to exams
- Provided feedback to professor on student progress and ability to grasp concepts in class

General Chemistry Lecture Teaching Assistant

Fall 2018

University of Illinois at Urbana-Champaign, Champaign, IL

- Ranked as Excellent based on optional and anonymous student reviews
- Oversaw 100 students split across four class sections
- Designed short lectures to review concepts taught in the main lecture
- Graded weekly quizzes and homework
- Led review sessions for students prior to exams
- Provided feedback to professor on student progress and ability to grasp concepts in class

Tutor at Tutoring and Writing Center

Spring 2015 – Spring 2018

Rollins College, Winter Park, FL

- Selected as a tutor by professors at Rollins College for one-on-one tutoring
- Assisted students with general chemistry, organic chemistry, and physical chemistry lecture and laboratory courses