Charles C. L. McCrory, Ph.D.

Department of Chemistry, University of Michigan
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Professional Appointments

Assistant Professor, University of Michigan

- Assistant Professor of Chemistry 2015-present
- Assistant Professor of Macromolecular Science and Engineering 2017-present
- Dow Corning Assistant Professor of Chemistry 2017-2019

Scientist, California Institute of Technology

- Member of the Professional Staff, Division of Chemistry and Chemical Engineering 2014-2015
- Lead Scientist, Benchmarking Project, Joint Center for Artificial Photosynthesis 2014-2015
- Senior Scientist, Benchmarking Project, Joint Center for Artificial Photosynthesis 2011-2014

Academic and Professional Training

Postdoctoral Fellow, California Institute of Technology 2010-2011
Advisor: Jonas C. Peters, Division of Chemistry and Chemical Engineering
Project: Electrocatalytic Hydrogen Evolution by Molecular Co and Ni Complexes in Homogeneous Solution

Ph.D. in Chemistry, Stanford University 2010
Advisor: Christopher E. D. Chidsey, Department of Chemistry
Thesis: Electrocatalytic Dioxygen Reduction by Surface-Immobilized Molecular Copper Complexes

B.S. in Chemistry with Distinction and Departmental Honors, Indiana University 2004
B.S. in Mathematics with Distinction, Indiana University 2004
Advisor: George E. Ewing, Department of Chemistry
Thesis: Thin Film Water on NaCl(001)

Honors and Awards

Faculty:

DOE Early Career Research Program Award, *Department of Energy* 2021
Scialog Fellow, Negative Emissions Science, *Research Corporation for Science Advancement* 2020
Cottrell Scholar Award, *Research Corporation for Science Advancement* 2019-2022
Kavli Fellow, *National Academy of Sciences, Kavli Frontiers of Science Program* 2019
NSF CAREER Award, *National Science Foundation* 2018-2023
Nominated for Golden Apple Award, *Students of the University of Michigan* 2018, 2019
Dow Corning Assistant Professor of Chemistry, *University of Michigan* 2017-2019

Graduate:

Ford Foundation Dissertation Fellowship, *National Research Council* 2008
Centennial Teaching Assistant Award, *Stanford University* 2008
Daniel Cubicciotti Award, Honorable Mention, *Electrochemical Society, San Francisco Section* 2008

Franklin Veatch Memorial Fellowship, *Stanford University* 2006

Undergraduate:

Elected to Phi Beta Kappa 2004
Mathers Summer Scholarship, *Indiana University* 2003
William H. Bell Award in Chemistry, *Indiana University* 2002
Sigma Xi Undergraduate Researcher Award, *Sigma Xi, Indiana University Chapter* 2002
Votaw Summer Research Scholarship, *Indiana University* 2002
Honors Division Summer Research Scholarship, *Indiana University* 2002
COMAP Mathematical Contest in Modeling, Honorable Mention, 2001, 2002
R. J. Grim Scholarship, *Indiana University* 2001-2002
Harry G. Day Summer Scholarship, *Indiana University* 2000
Upjohn & Pharmacia Summer Research Scholarship, *Indiana University* 2000
Wells Scholarship, *Indiana University* 1999-2003

Publications

Total citations = 8426, *h*-index = 19 (Google Scholar)

Publications from Independent Career (17 published, 1 submitted)

McCrory Lab Undergraduate Author; †Equally Contributing Author; *Corresponding Author

37. Soucy, T. L.; Dean, W. S.; Zhou, J.; Rivera Cruz, K. E.; **McCrory, C. C. L.*** "Considering the Influence of Polymer-Catalyst Interactions on the Chemical Microenvironment of Electrocatalysts for the CO_2 Reduction Reaction." *submitted.*
36. Soucy, T. L.†; Liu, Y.†, Eisenberg, J. B.; **McCrory, C. C. L.*** "Enhancing Electrochemical CO_2 Reduction Activity of Polymer-Encapsulated Cobalt Phthalocyanine Films by Modulating the Loading of Catalysts, Polymers, and Carbon Supports." *ACS Applied Energy Materials*, **2021**, *accepted*. DOI: 10.1021/acsaem.1c02689
35. Rivera Cruz, K. E.†; Liu, Y.†; Soucy, T. L., Zimmerman, P. M.*; **McCrory, C. C. L.*** "Increasing the CO_2 Reduction Activity of a Cobalt Phthalocyanine by Modulating the σ-donor Strength of Axially-Coordinating Ligands." *ACS Catalysis*, **2021**, *11*, 13203-13216. DOI: 10.1021/acscatal.1c02379.
34. Nie, W.-X.; Tarnopol, D. E.; **McCrory, C. C. L.*** "Enhancing a Molecular Electrocatalyst's Activity for CO2 Reduction by Simultaneously Modulating Three Substituent Effects." *Journal of the American Chemical Society*, **2021**, *143*, 3764-3778, DOI: 10.1021/jacs.0c09357. IF = 15.419
33. Nie, W.-X.; Tarnopol, D. E.; **McCrory, C. C. L.*** "The Effect of Extended Conjugation on Electrocatalytic CO_2 Reduction by Molecular Catalysts and Macromolecular Structures." *Current Opinions in Electrochemistry*, **2021**, *28*, 100716. DOI: 10.1016/j.coelec.2021.100716. IF = 7.721
**Invited Contribution to themed issue "Innovative Methods in Electrochemistry."
32. Michaud, S. E.; Riehs, M. T.; Feng, W.-J.; Lin, C.-C.*; **McCrory, C. C. L.*** "A CoV_2O_4 Precatalyst for the Oxygen Evolution Reaction: Highlighting the Importance of Postmortem Catalyst Characterization." *Chemical Communications*, **2021**, *57*, 883-886. DOI: 10.1039/D0CC06513G. IF = 6.222
**Invited Contribution to RSC Themed Collection "(Photo)electrocatalysis for Renewable Energy."

31. Kallick, J. K.; Feng, W.-J.; **McCrory, C. C. L.*** "Controlled Growth of Multilayer Films of Discrete Molecular Catalysts using a Layer-by-Layer Growth Mechanism Based on Sequential Click Chemistry." *ACS Applied Energy Materials*, **2020,** *3*, 6222-6231. DOI: 10.1021/acsaem.0c00332. IF = 6.024

30. Liu, Y.[†]; Deb, A.[†]; Leung, K. Y.; Nie, W.-X.; Penner-Hahn, J. E.*, **McCrory, C. C. L.*** "Determining the Coordination Environment and Electronic Structure of Polymer-Encapsulted Cobalt Phthalocyanine under Electrocatalytic CO_2 Reduction Conditions using *in situ* X-ray Absorption Spectroscopy." *Dalton Transactions*, **2020**, *49*, 16329-16339. DOI: 10.1039/D0DT01288B. IF = 4.390 **Invited Contribution to New Talent: America issue. **Featured in RSC Themed Collection "Dalton Transactions HOT Articles."

29. Nie. W.-X.; Wang, Y.; Zheng, T.; Ibrahim, A., Xu, Z.; **McCrory, C. C. L.*** "Electrocatalytic CO_2 Reduction by Cobalt Bis(pyridylmonoimine) Complexes: Effect of Ligand Flexibility on Catalytic Activity." *ACS Catalysis*, **2020,** *10,* 4942-4959. DOI: 10.1021/acscatal.9b05513. IF = 13.084

28. Leung, K. Y.; **McCrory, C. C. L.*** "The Effect and Prevention of Trace Ag^+ Contamination from Ag/AgCl Reference Electrodes on CO_2 Reduction Product Distributions at Polycrystalline Copper Electrodes." *ACS Applied Energy Materials*, **2019**, *2*, 8283-8293. DOI: 10.1021/acsaem.9b01759. IF = 6.024

27. Liu, Y.; Leung, K. Y.; Michaud, S. E.; Soucy, T. L.; **McCrory, C. C. L.*** "Controlled Substrate Transport to Electrocatalyst Active Sites for Enhanced Selectivity in the Carbon Dioxide Reduction Reaction." *Comments on Inorganic Chemistry*, **2019**, *39*, 242-269. DOI: 10.1080/02603594.2019.1628025. IF = 4.533 **Invited Perspective/Review Article.

26. Liu, Y.; **McCrory, C. C. L.*** "Modulating the Electrocatalytic Mechanism of Selective CO_2 Reduction by Cobalt Phthalocyanine Through Polymer Coordination and Encapsulation." *Nature Communications*, **2019**, *10*, 1683. DOI: 10.1038/s41467-019-09626-8. IF = 14.919

25. McMillion, N. D.; Wilson, A. W.; McKenna, G. K.; Chang, M-C.; Lin, C-C.; Feng, W-J.; **Charles, C. C. L.**; Anderson, J. S.* "Imidazole for Pyridine Substitution Leads to Enhanced Activity Under Milder Conditions in Cobalt Water Oxidation Electrocatalysis." *Inorganic Chemistry*, **2019**, *58*, 1391-1397. DOI: 10.1021/acs.inorgchem.8b02942. IF = 5.165

24. **McCrory, C. C. L.***, Jung, S.; Kallick, J. "Evaluating Electrocatalysts for Solar Water-Splitting Reactions." In Integrated Solar Fuels Generators. Sharp, I; Lewerenz, H. J.; Atwater, H., Eds. Royal Society of Chemistry: London, **2019**, pp. 154-181. DOI: 10.1039/9781788010313-00154. **Invited Book Chapter.

23. Nie, W.-X.; **McCrory, C. C. L.*** "Electrocatalytic CO_2 Reduction by a Cobalt Bis(PyridylMonoimine) Complex: Effect of Acid Concentration on Catalyst Activity and Stability." *Chemical Communications*, **2018**, *54*, 1579-1582. DOI: 10.1039/C7CC08546J. IF = 6.222

22. Lin, C.-C.; **McCrory, C. C. L.*** "Effect of Chromium Doping on Electrochemical Water Oxidation Activity by $Co_{3-x}Cr_xO_4$ Spinel Catalysts." *ACS Catalysis*, **2017**, 7, 443-451. DOI: 10.1021/acscatal.6b02170. IF = 13.084

21. Jung, S.*; Kortlever, R.; Jones, R. J. R.; Lichterman, M. F.; Agapie, T.; **McCrory, C. C. L.***; Peters, J. C.* "Gastight Hydrodynamic Electrochemistry: Design for a Hermetically Sealed Rotating Disk Electrode Cell." *Analytical Chemistry*, **2017** *89*, 581-585. DOI: 10.1021/acs.analchem.6b04228. IF = 6.986

20. Kramer, W. W.; **McCrory, C. C. L.*** "Polymer Coordination Promotes Selective CO_2 Reduction by Cobalt Phthalocyanine." *Chemical Science*, **2016**, *7*, 2506-2515. DOI: 10.1039/C5SC04015A. IF = 9.825 **Cover Article – Inside Front Cover. **Featured in RSC Themed Collection "Global Energy Challenges: Fossil Fuels."

Publications Based on Prior Work

19. Jung, S.*; **McCrory, C. C. L.***; Ferrer, I. M.; Peters, J. C.*; Jaramillo, T. F.* "Benchmarking Nanoparticulate Metal Oxide Electrocatalysts for the Alkaline Water Oxidation Reaction." *Journal of Materials Chemistry A*, **2016**, *4*, 3068-3076. **Invited contribution for themed issue "Water Splitting and Photocatalysis." **Featured in RSC Themed Collection "2016 Journal of Materials Chemistry A Most Accessed Manuscripts."

18. **McCrory, C. C. L**.*; Szymczak, N. K.; Peters, J. C.* "Evaluating Activity for Hydrogen-Evolving Cobalt and Nickel Complexes at Elevated Pressures of Hydrogen and Carbon Dioxide." *Electrocatalysis*, **2016**, *7*, 87-96.

17. **McCrory, C. C. L.***; Jung, S.; Ferrer, I. M.; Chatman, S. M.; Peters, J. C.*; Jaramillo, T. F.* "Benchmarking Hydrogen Evolving Reaction and Oxygen Evolving Reaction Electrocatalysts for Solar Water Splitting Devices." *Journal of the American Chemical Society*, **2015**, *137*, 4347-4357.

16. Rittle, J.; **McCrory, C. C. L.**; Peters, J. C.* "A 10^6-fold Enhancement in N_2-Binding Affinity of an $Fe_2(\mu\text{-}H)_2$ Core upon Reduction to a Mixed-Valent $Fe^{II}Fe^{I}$ State." *Journal of the American Chemical Society*, **2014**, *136*, 13853-13862.

15. Saadi, F. H.; Carim, A. I.; Velazquez, J. M.; **McCrory, C. C. L.**; Soriaga, M. P.*; Lewis, N. S.* "Operando Synthesis of Macroporous Molybdenum Diselenide Films for the Electrocatalylsis fo the Hydrogen Evolution Reaction." *ACS Catalysis*, **2014**, 4, 2866-2873.

14. Lacy, D. C.; **McCrory, C. L.**; Peters, J. C.* "Studies of Cobalt-Mediate CO_2 Reduction using a Redox-Active Ligand." *Inorganic Chemistry*, **2014**, *53*, 4980-4988.

13. Hsieh, C.-H.; Erdem, O. F.; Ding, S.; Crouthers, D. J.; Liu, T.; **McCrory, C. C. L.**; Lubitz, W.; Popescu, C. V.; Reibenspies, J. H.; Hall, M. B.; Darensbourg, M. Y.*; "Redox Active Iron Nitrosyl Units in Proton Reduction Electrocatalysis." *Nature Communications*, **2014**, 5, 3684.

12. Baricuatro, J. H.; Kim, Y.-G.; Saadi, F.; **McCrory, C. C. L.**; Sanabria-Chinchilla, J.; Crouthers, D.; Darensbourg, M. Y.; Soriaga, M. P.* "Heterogenization of a Water-Insoluble Molecular Complex for Catalysis of the Proton-Reduction Reaction in Highly Acidic Aqueous Solutions." *Electrocatalysis*, **2014**, 5, 226-228.

11. **McCrory, C. C. L.***; Jung, S.; Peters, J. C.*; Jaramillo T. F.* "Benchmarking Heterogeneous Electrocatalysts for the Oxygen Evolution Reaction." *Journal of the American Chemical Society*, **2013,** *135*, 16977-16987. **Featured as Editor's Choice article in Science magazine. **Featured in ACS Select Virtual Issue on "Inorganic Chemistry Driving the Energy Sciences."

10. Suseno, S.; **McCrory, C. C. L.**; Tran, R.; Gul, S..; Yano, J.; Agapie, T.* "Molecular Mixed-Metal Manganese Oxido Cubanes as Precursors to Heterogeneous Oxygen Evolution Catalysts." *Chemistry, a European Journal*, **2015**, *21*, 13420-13430.

9. Luca, O. R.*; **McCrory, C. C. L.**; Dalleska, N. F.; Koval, C. A.* "The Selective Electrochemical Conversion of Preactivated CO_2 to Methane." *Journal of the Electrochemical Society*, **2015**, *162*, H473-H476.
8. Soriaga, M. P.*; Baricuatro, J. H.; Cummins, K. D.; Kim, Y.-G.; Saadi, F. H.; Sun, G.; **McCrory, C. C. L.**; McKone, J. R.; Velazquez, J. M.; Ferrer, I. M.; Carim, A. I.; Javier, A.; Chmielowiec, B.; Lacy, D. C.; Gregoire, J. M.; Sanabria-Chinchilla, J.; Amashukeli, X.; Royea, W. T.; Brunschwig, B. S.; Hemminger, J. C.; Lewis, N. S.; Stickney, J. L.; "Electrochemical Surface Science Twenty Years Later. Expeditions into the Elecrocatalysis of Reactions at the Core of Artificial Photosynthesis." *Surface Science*, **2015**, 641, 285-294.
7. Ni, K.-Y.; Lin, F.; Jung, S.*; Fang, L.; Nordlund, D.; **McCrory, C. C. L.**; Weng, T-C.; Ercius, P.; Doeff, M. M.; Zheng, H.*; "Tuning Complex Transition Metal Hydroxide Nanostructures as Active Catalysts for Water Oxidation by a Laser-Chemical Route." *Nano Letters*, **2015**, 15, 2498-2503
6. Brownell, K.; **McCrory, C. C. L.**; Chidsey, C. E. D.; Perry, R. H.; Zare, R. N.*; Waymouth, R. M.* "Electrooxidation of Alcohols Catalyzed by Amino Alcohol Ligated Ruthenium Complexes." *Journal of the American Chemical Society*, **2013,** *135*, 14299-14305.
5. **McCrory, C. C. L.**; Uyeda, C.; Peters, J. C.* "Electrocatalytic Hydrogen Evolution in Acidic Water with Molecular Cobalt Tetraazamacrocycles." *Journal of the American Chemical Society*, **2012**, *134*, 3164-3170.
4. **McCrory, C. C. L.**; Devadoss, A; Ottenwaelder, X; Lowe, R. D.; Stack, T. D. P.*; Chidsey, C. E. D.* "Electrocatalytic O_2 Reduction by Covalently Immobilized Copper(I) Complexes: Evidence for a Binuclear Cu_2O_2 Intermediate." *Journal of the American Chemical Society*, **2011**, *133*, 3696-3699.
3. **McCrory, C. C. L.**; Ottenwaleder, X.; Stack. T. D. P.*; Chidsey, C. E. D.*; "Mechanistic and Kinetic Studies of the Electrocatalytic Reduction of O_2 to H_2O with Mononuclear Cu Complexes of Substituted 1,10-Phenanthroline." *Journal of Physical Chemistry A*, **2007**, 111, 12641-12650.
2. Conley, N. R.; Pearson, D. M.; Labios, L. A.; **McCrory, C. C. L.**; Waymouth, R. M.* "Aerobic Alcohol Oxidation with a Cationic Palladium Complex: Insights into Catalyst Design and Decomposition." *Organometallics*, **2007**, 26, 5447-5453.
1. Cantrell, W.; **McCrory, C.**; Ewing, G. E.*; "Nucleated Deliquescence of Salt." *Journal of Chemical Physics*, **2002**, 116, 2116-2120.

United States Patents

McCrory, C.; Jung, S.; Jones, R. J. R.; Rotating Disk Electrode Cell, U.S. Patent 10,451,580 B2, Oct. 22, 2019.

Presentations

42 Total Invited Seminars and Conference Presentations as Faculty at U-M (42 delivered, 5 upcoming)

Invited Departmental Seminars:

As Faculty Member at UM (29 delivered, 2 upcoming)

31.	Virginia Clean Energy and Catalysis Club (***upcoming***) University of Virginia, Virginia Tech, and Virginia Commonwealth University	May 2022
30.	Stonybrook University, Department of Chemistry, Stony Brook, NY (***upcoming***)	March 2022
29.	Iowa State University, Department of Chemistry, Aames, IA	Oct. 2021
28.	California Institute of Technology, Division of Chemistry and Chemical Engineering, Pasadena, CA	Sep. 2021
27.	University of Southern California, Department of Chemistry, Los Angeles, CA	Sep. 2021
26.	Stanford University, Department of Chemistry, Stanford, CA	May 2021
25.	University of Zurich, Department of Chemistry, Zurich, Switzerland	May 2021
24.	University of Utah, Salt Lake City, UT	April 2021
23.	University of Rochester, Department of Chemistry, Rochester, NY	April 2021
22.	University of Illinois at Urbana-Champaign, Department of Chemistry, Urbana, IL	April 2021
21.	University of Illinois at Chicago, Chicago, IL	March 2021
20.	Yale University, Department of Chemistry, New Haven, CT	March 2021
19.	University of California Berkeley, College of Chemistry, Berkeley, CA	Jan. 2021
18.	University of Chicago, Department of Chemistry, Chicago, IL	Jan. 2021
17.	Virginia Tech University, Department of Chemistry, Blacksburg, VA	Dec. 2020
16.	University of Texas at Austin, Department of Chemistry, Austin, TX	Oct. 2020
15.	Texas A&M University, Department of Chemistry, College Station, TX	Oct. 2020
14.	Andrews University, Department of Chemistry and Biochemistry, Berrien, MI Dwain L Ford Guest Lecture Series	Feb. 2020
13.	Notre Dame University, Department of Chemistry, South Bend, IN	Nov. 2020
12.	Illinois Institute of Technology, Department of Chemistry, Chicago, IL	Oct. 2019
11.	Wayne State University, Department of Chemistry, Detroit, MI	Oct. 2019
10.	Michigan State University, Center of Research Excellence in Complex Materials, East Lansing, MI Renewable Energy Storage Seminar Series	Oct. 2019
9.	University of North Carolina Chapel Hill, Department of Chemistry, Chapel Hill, NC	Sep. 2019
8.	California Institute of Technology, Joint Center for Artificial Photosynthesis, Pasadena, CA	July 2018

7.	Dow Chemical Company, Midland, MI	Oct. 2017
6.	Shanghai Jiao Tong University, School of Chemistry and Chemical Engineering, Shanghai, China	May 2017
5.	University of Science and Technology of China, School of Chemistry and Materials, Heifei, China	May 2017
4.	Nanjing University, School of Chemistry and Chemical Engineering, Nanjing, China	May 2017
3.	Nankai University, College of Chemistry, Tianjin, China	May 2017
2.	University of the South, Department of Chemistry, Sewanee, TN	Dec. 2016
1.	Muhlenberg College, Department of Chemistry, Allentown, PA	Sep. 2015

Invited Conference Talks and Symposia:

As Faculty Member at UM (13 delivered, 3 upcoming)

16.	2022 Southeast Regional Meeting of the American Chemical Society (SERMACS), San Juan, Puerto Rico (***upcoming***) The Chemistry of Solar Fuels Symposium	Oct. 2022
15.	263rd ACS National Meeting, San Diego, CA (***upcoming*****)** The Role of Fundamental Interfacial Processes in Electrocatalysis	March 2022
14.	Pittcon Conference & Expo 2022, Atlanta, GA (***upcoming***) Spectroelectrochemical and Spectrochemical Detection of Electrocatalytic Small Molecule Reduction in Energy Relevant Reactions	March 2022
13.	262nd ACS National Meeting, Atlanta, GA New Methods in Nanocatalyst Development	Aug. 2021
12.	Telluride Science Research Center Workshop, Telluride, CO Platinum Group Metal-free and Advanced Platinum Group Metal Electrocatalysts: Small Molecules Activation and Conversion	Jan. 2020
11.	258th ACS National Meeting, San Diego, CA Charge and Substrate Transport in 3D Electrocatalytic Materials	Aug. 2019
10.	2019 Cottrell Scholars Conference, Tuscon, AZ	July 2019
9.	Telluride Science Research Center Workshop, Telluride, CO Platinum Group Metal-free Electrocatalysts: Structure-to-Property Relations, Materials Synthesis and Integration in Catalyst Layers	June 2019
8.	257th ACS National Meeting, Orlando, FL Sustainable Energy Conversion via Innovative Electrocatalysis and Photocatalysis Symposium	April 2019
7.	Telluride Science Research Center Workshop, Telluride, CO Interfacial Chemistry and Charge Transfer in Energy Storage and Conversion	July 2018

6.	CCI-Solar Fuels Capstone Meeting, Ventura, CA	July 2018
5.	2018 Gordon Research Conference on Electrochemistry, Ventura, CA Next Generation Electrocatalysts Session	Jan. 2018
4.	254th ACS National Meeting, Washington, DC Innovative Chemistry & Electrocatalysis for Low-Carbon Energy and Fuels Symposium	Aug. 2017
3.	ACS Central Regional Meeting, Dearborn, MI Catalysis by Metal Complexes and Nanomaterials Symposium	June 2017
2.	253rd ACS National Meeting, San Francisco, CA ACS Sustainability in Electrocatalytic Fuel and Chemical Production Symposium	April 2017
1.	253rd ACS National Meeting, San Francisco, CA Synthesis & Characterization of Materials for Energy Applications Symposium	April 2017

Active Research Support

Department of Energy Early Career Research Program (DE-SC0022019, PI) 2021-2026
Building from Discrete Molecular Electrocatalysts to Macromolecular Catalyst Architectures: the Effects of Charge Delocalization and Electronic Coupling on Electrocatalytic Activity

NSF CAREER Award (CHE-1751791, PI) 2018-2023
CAREER: Promoting Selective Electrochemical CO_2 Reduction by Controlling a Catalyst's Primary, Secondary, and Outer Coordination Spheres

NSF Standard Grant (CHE-2004035, PI) 2020-2023
Increasing the Reductive Stability of Self-Assembled Monolayers on Metallic Surfaces to Enable Reductive Electrocatalysis

Carbon Neutrality Acceleration Program, Graham Sustainability Institute, University of Michigan (CoPI) 2021-2023
Chemistry and Technology of CO_2 Capture and Conversion to Fuels

Cottrell Scholars Award, Research Corporation for Scientific Advancement (PI) 2019-2022
Selective Electrocatalysis by Polymer-Encapsulated Catalysts: the Role of Charge- and Substrate-Transport on Catalytic Efficiency

Teaching Experience

University of Michigan

Course Coordinator	Chem 130: General Chemistry	F 2021
Instructor	Chem 130: General Chemistry	W 2017, W 2018, W 2019, W 2020, F 2021
Instructor	Chem 510/MSE 511: Graduate Materials Chemistry	F 2015, F 2016, F 2017, F 2018

California Institute of Technology

Session Instructor	JCAP Winter School: Electrochemical Measurements	2013, 2014
Guest Lecturer	Ch 153B: Advanced Inorganic Chemistry	2011, 2012, 2013, 2015

Mentoring, Outreach, and Diversity, Equity, and Inclusion (DEI) Activities

Faculty Advisor for Student Groups at U-M:

NOBCCHE, U-M Chapter: *National Organization of Black Chemists and Chemical Engineers, University of Michigan Chapter* (2020-present)

commUNITY, *a student group focused on social and professional development of BIPOC students, faculty and staff at U-M* (2020-present)

ACS Polymer Division, *University of Michigan Chapte*r (2020-present)

Faculty Panelist for University of Michigan Newnan's Student Engagement Committee Workshop

Letters of Recommendation Workshop (March 2021)

Discussion on how students can build relationships with professors in virtual environments, especially for minoritized and/or traditionally marginalized students.

Faculty Presenter for NOBCChE, U-M Chapter Meeting

Navigating through Challenges as a Student in STEM (Dec. 2020)

Discussion based on my experiences as a student, postdoc, staff scientist, and educator, and focused on how to cope with feelings of isolation and "otherness" as a BIPOC student at primarily white institutions; strategies for coping with imposter syndrome; how to constructively handle (micro)aggressions, etc.

Faculty Panelist for commUNITY Workshop

Remote Learning & Success: Facilitated by U-M Counseling and Psychological Services (Nov. 2020)

Discussion on strategies for staying motivated during online learning, engaging with instructors and research advisors, accepting lower productivity due to the pandemic, and when and how to ask for help.

Presenter/Facilitator for UM Student Chapter of the American Chemical Society Workshop

Chemistry Graduate Student Admissions Workshop (Feb. 2020)

Focus of presentation was on addressing six general questions: "(1) Should I pursue a Ph.D.?; (2) How do I prepare <u>now</u> for grad school later?; (3) Where should I apply to Grad School?; (4) What's included in graduate applications?; (5) How and when (and from whom) do I request recommendation letters?; and (6) How are applications evaluated and what does 'holistic' review really mean?"

Faculty Mentor for D-Rise, *10-week paid summer research internship for underprivileged students at Cass Tech High School in Detroit, MI. Both students I hosted are now undergraduate students at the University of Michigan.* (Summer 2018, Summer 2019)

Panelist for CSE|UM: Chemical Sciences at the Interface of Education at University of Michigan, a *professional development student group.*

Industry to Academia Panel (Nov. 2019); Academic Laboratory Management Panel (March 2017); Early Faculty Careers Panel (Nov. 2016)

Faculty Mentor for M-CORE: Michigan chemistry Opportunities for Research and Education, *visit weekend to U-M Chemistry Department for senior undergraduate students from underrepresented groups featuring 1-on-1 meetings with faculty mentors and advising on graduate school applications*. (Fall 2015, 2016, 2018, 2019, 2020)

Faculty Mentor/Panelist for U-M NextProf Science, *multiday professional development workshop for senior graduate students and postdocs throughout the US from underrepresented background interested in faculty careers in STEM fields.*

Faculty Mentor in Chemistry including 1-on-1 meetings with participants, feedback and advice on research and teaching statements (Winter 2019, Winter 2020)

Panelist for Chemistry Career Discussion Panel (Winter 2016)

Poster Judge at Annual Biomedical Research Conference for Minority Student (ABRCMS) (Nov. 2019)

University of Michigan Museum of Natural History − Scientist Spotlight

McCrory Lab Interactive Exhibit: "Ready, Shine, Bubble!" (Oct. 2019)

Panelist at NSF CAREER Program Proposal Workshop at U-M, *focused on providing practical guidance to U-M early faculty on successfully applying to for the NSF CAREER Award*. (March 2018, March 2019)

Faculty Organizer for CHEM 801: Analytical Student Seminar Series (Fall 2018)

Faculty Mentor/Grader for MACRO 800: Research Seminars

Derek Frank, Matzger Group, Faculty Grader	(June 2019)
Taesu Kim, Goodson Group, Faculty Mentor	(Jan-March 2019)
Taeyong Ahn, Banaszak Holl Group, Faculty Mentor	(May-July 2018)

Forsythe Young Scientists' Expo featuring U-M Science Spotlight

McCrory Lab Interactive Exhibit: "Electrochemical Water Splitting" (March 2018)

Ann Arbor Hands-On Museum — Science for the Public Event

McCrory Lab Interactive Exhibit: "Will it Bubble" (April 2017)

Faculty Speaker for U-M Applied Physics Seminar (AP 514):

"Increasing Electrocatalytic Activity and Selectivity of Molecular Systems for Small Molecule Transformations." (March 2018)

"Electrocatalytic Transformations of Small Molecules for Renewable Energy Applications." (Oct. 2015)

Interview with *MiSciWriters* Blog: "Water Splitting Part II: Research at U-M." (Feb. 2016)

Speaker at Lightning Session for Water@Michigan Symposium

"Electrochemical Reduction of Groundwater Pollutants for Wastewater Remediation." (Jan. 2016)

Informal Mentoring/Advising of Students from Underrepresented Groups (2016-present)

Informal discussions with students from underrepresented groups about topics such as maintaining motivation, coping with "Imposter Syndrome" and "Survivor Guilt," learning from research failures, time management, handling (micro)aggressions, and effectively communicating with faculty mentors.

Academic Service

Proposal and Program Reviewer (2017-present)

Department of Energy, *Office of Energy Efficiency and Renewable Energy (EERE):* Bioenergy Technologies Office (BETO) 2021 Peer Review Panel, CO_2 Utilization Technology Area

Department of Energy: *Basic Energy Sciences (BES); Energy Efficiency and Renewable Energy (EERE)*

National Science Foundation: *Division of Chemistry (CHE); Division of Materials Research (DMR)*

American Chemical Society: *Petroleum Research Fund*

Research Corporation for Science Advancement: *Cottrell Scholars Program*

Others: *Royal Society of New Zealand, Netherlands Organization for Scientific Research, Reaxys PhD Prize*

Symposium Organizing/Planning:

3rd Japanese-American-German Kavli Frontiers of Science Symposium, Irvine, CA, *Small Molecule Transformations with Inorganic Compounds and Materials*, Planning Group Member, September 2022 (***upcoming***)

2022 Gordon Research Conference on Electrochemistry, Ventura, CA, *Complex Electrochemical Interfaces*, Discussion Leader, January 2022 (***upcoming***).

258th ACS National Meeting, San Diego, CA, *Charge and Substrate Transport in 3-D Electrocatalytic Materials*, Division of Inorganic Chemistry, Symposium Organizer, August 2019

University of Michigan/Departmental Service

Michigan Materials Characterization Center $(MC)^2$ Advisory Council (2019-2020)

Chemistry Diversity Committee (2016-2017, 2020-present)

Chemistry Undergraduate Advising Committee (2019-present)

Chemistry Safety Strategy Committee (2020-2021)

Chemistry Recruiting Committee (2015-2016, 2019-2020)

Chemistry Faculty Search Committee (2018-2019)

Chemistry Graduate Student Admissions Committee (2016-2019)

Professional Society Memberships and Affiliations:

American Chemical Society (**ACS**)

American Institute of Chemical Engineers (**AIChE**)

Electrochemical Society (**ECS**)

National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (**NOBCChE**)