May 31, 2019

MONICA KIEWIT SANCHEZ

1515 Dickey Drive ● Atlanta, GA 30322
Monica.Kiewit.Sanchez@outlook.com

Education:

Emory University	PhD	Chemistry	Spring 2020 (expected)
University of Texas at San Antonio	B.S.and B.A.	Chemistry and Philosophy	May 2015

PhD Thesis:

Unravelling the Mechanistic Details of [FeFe] Hydrogenase and other Oxidoreductase Enzymes using Transient Absorbance Spectroscopy: We have developed a system for rapid initiation of hydrogenase affording mechanistic insight into the catalytic cycle of this enzyme using CdSe/CdS nanorods and a redox mediator.

Undergraduate Honors Thesis:

Synthesis of Transition Metal Complexes containing the 7-Azaindole Ligand: A series of first row transition metal complexes was fully synthesized and characterized, with emphasis on understanding electronic characteristics.

Professional Experience:

Emory University — Atlanta, GA

2015-Present Graduate Research Assistant
Laney Graduate Diversity Fellow

University of Texas at San Antonio — San Antonio, TX

2013-2015 Undergraduate Research Assistant
MARC U*STAR Honors Research Training Program
Center for Research and Training in the Sciences

Research Projects:

Dr. R. Brian Dyer Emory University 2017-2020

Title: "Nanorod-enzyme hybrid complexes for photoinitiated turnover of [FeFe] Hydrogenase and other Oxidoreductase Enzymes"

Purpose: We developed a technique for rapidly initiating turnover of [FeFe] hydrogenase using nanorods and an electron shuttle. This method combined with transient absorbance spectroscopies allow us to monitor kinetics of intermediates related to the catalytic cycle of this enzyme. With these measurements we were able to propose unique catalytic cycles for *Chlamydomonas Reinhardtii (CrHydA1)* [FeFe] hydrogenase and *Desulfovibrio Desulfuricans (DdHydAB)* [FeFe] Hydrogenase.

Dr. R. Brian Dyer Emory University 2016-2017

Title: "Optimizing Electron Transfer from CdSe QDs to Hydrogenase for Photocatalytic H_2 Production"

Purpose: We have characterized a series of structurally and electronically unique redox mediators and incorporated this series of redox mediators in photocatalytic systems for photo-driven hydrogen production. We found that the observed rate and mechanism of electron transfer are heavily influenced by the structural properties of this class of mediators.

Dr. Zachary J. Tonzetich University of Texas at San Antonio 2013- 2015

Title: "Synthesis of novel transition metal complexes containing the 7-azaindole ligand"

Purpose: We synthesized and characterized a series of transition-metal complexes with the 7-azaindole molecule as it is pertinent in many biological systems but its reactive nature hardly explored. The implications of this work produces a complete picture of the reactive and electronic nature of 7-azaindole in coordination chemistry.

Research Interests:

The investigation of electron transfer events mediated by redox active molecules in photocatalytic systems with unique properties with eventual focus on the development of new avenues for renewable energy.

Publications:

Sanchez MLK, Wu Perry, Adams, MWW, Dyer, RB. "Optimizing Electron Transfer from CdSe QDs to Hydrogenase for Photocatalytic H_2 Production " *Chem. Comm.* **2019**, *55*, 5579-5582

Kiewit ML*, Przyojski JA*, Fillman KL, Arman HD, Tonzetich ZJ. "Homoleptic transition metal complexes of the 7-azaindolide ligand featuring κ1-N1 coordination" *Inorg. Chem.* **2015,** *54*, 9637-9645

*Indicates these authors contributed equally

Seminars and Oral and Poster Presentations:

"Nanorod Enzyme Conjugates for Photoinduced Turnover of [FeFe] Hydrogenase."-*Oral* 2019
American Chemical Society National Meeting, Orlando, FL

"Nanorod Enzyme Conjugates for Photoinduced Turnover of [FeFe] Hydrogenase."-*Seminar* 2018
University of Texas-San Antonio, San Antonio, TX

"Nanorod Enzyme Conjugates for Photoinduced Turnover of [FeFe] Hydrogenase."-*Oral* 2018
Proton Coupled Electron Transfer, Blowing Rock, NC

"Photoinduced Turnover of [FeFe] Hydrogenase for Mechanistic Studies."-*Oral* 2018
Gordon Research Seminar, Ventura, CA

"Probing the Electron Transfer Mechanism at the Quantum dot Mediator Interface."-*Oral* 2017
Society for the Advancement of Chicanos and Native Americans in STEM Conference, Salt Lake City, UT

"Probing the Electron Transfer Mechanism at the Quantum dot Mediator Interface." -*Poster* 2016
Solar Energy Research Center Conference, Chapel Hill, NC

Fellowships, Honors and Awards:

Laney Graduate School Diversity Fellow: *Competitive Laney Graduate School fellowship* 2015-Present

Eugene Gangarosa Mentorship Fellow: *Competitive Laney Graduate School fellowship*

Quayle Travel Award: *Competitive Departmental Travel Award* Fall 2018

MARC-U*STAR Undergraduate Research Scholar: *NIH supported undergraduate research fellow* 2013-2015

UTSA, College of Science Deans Fund for Excellence Award: *Competitive Departmental Award* Spring 2015

Professional Affiliations:

Society for Advancement of Chicanos and Native Americans in Science at Emory Spring 2016-present
Founding Member and Treasurer

American Chemical Society 2018-present
Member

Course Instruction Experience:

General Chemistry Teaching Assistant 2015-Fall 2016

Continuing Education and Workshops:

TATT 600: Summer 2015

JPE 600: Departmental Seminar series on scholarly integrity and ethics in research Summer 2015

JPE 606: Ethics in Chemistry Summer 2017

JPE 610: Workshop series on ethics in research Fall 2016-Fall 2019

Software Carpentry Fall 2018

Skills:

Hazard and Safety analysis for nanomaterial synthesis protocols and chemical waste management and inventory for EHSO and University Compliance

Scientific Conferences Attended:

American Chemical Society National Conference, Orlando, FL	Apr..…	2019
Society for the Advance of Chicanos and Native Americans in Science, San Antonio, TX	Oct.	2018
Proton Coupled Electron Transfer	June	2018
Gordon Research Conference: Metals in Biology	Jan.	2018
Gordon Research Seminar: Bioinorganic Chemistry	Jan.	2018
Society for the Advance of Chicanos and Native Americans in Science, Salt Lake City, UT	Oct.	2017
Solar Energy Research Center Conference, Chapel Hill, NC	Oct.	2016

Leadership Roles:

Chemical Safety Officer, *Dyer Lab* — Summer 2017- Summer 2019
Responsibility: Managed chemical safety and ensured compliance with University and EHSO.

Treasurer and Founding Member, *SACNAS at Emory* — Spring 2017- Present
Responsibility: Managed multiple funding agencies and bookkeeping for organization.

Treasurer, *Pi Alpha Chemical Society* — 2016-2017
Responsibility: Managed funding agencies and bookkeeping for organization.

Community Service:

Judge and Mentor, Undergraduate Poster Session, *Society for the Advancement of Chicanos and Native Americans Conference, San Antonio, TX* — Fall 2018

Member, *Graduate School Prep Club, Emory University, Atlanta, GA* — 2017-2018
I have served on panels and critiqued application documents for students from Morehouse, Agnes Scott and Clark Atlanta University

Mathcounts Club Leader*, KIPP WAYS Academy, Atlanta, GA* — 2015-2016
Led and developed an afterschool club based on math-oriented activities the aim of which was to encourage 7th and 8th grade students from underserved communities to develop a passion for math and interest in science.

Mentees:

Sarah Narehood, Emory University, *Undergraduate Researcher*	Fall 2018-Present
James Chen, *Visiting High School Researcher*	Summer 2019
Sara Konecny, Emory University *Junior Graduate Student*	Summer 2018-Present
Tiffany Trieu, Emory University, *Junior Graduate Student*	Spring 2019-Present
Hannah Martin, Agnes Scott University, *Undergraduate Student*	Fall 2017-Spring 2018

References:

Dr. R. Brian Dyer, *PhD Research Advisor*	404-727-6637	Full Professor, Emory University
Dr. Zachary J. Tonzetich*, Undergraduate Research Advisor*	210-458-5465	Associate Professor, University of Texas a San Antonio
Dr. James Birrell, *Collaborator*		Group Leader Max Planck Institute for Chemical Energy Conversion
Dr. Craig Hill, *PhD committee Member*	404-727-6611	Full Professor, Emory