

MARIE CUEVAS HEFFERN

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EDUCATION

Ph.D. Northwestern University (June 2014)

Inorganic Chemistry, Subfield: Life Processes (June 2014)

Thesis: "Cobalt(III) Schiff Base Complexes as Inhibitors of Proteins Involved in Disease Progression"

B.S./B.A., University of Southern California (May 2009)

Dual Degree: Chemistry, B.S; Religion, B.A.;

Ancient Religions and Classical Languages, Minor

RESEARCH EXPERIENCE AND POSITIONS

University of California, Davis (July 2017 – Present)

Objective: Investigate the bioinorganic chemistry of the endocrine system through discovering metal-dependent peptide hormones, generating in vivo imaging tools, and exploring metal complexes as therapies for diabetes.

University of California, Berkeley (January 2015 – June 2017)

UC President's Postdoctoral Fellow (July 2015 – June 2017)

Advisor: Prof. Christopher J. Chang, Department of Chemistry

Objective: Develop molecular imaging probes for investigating redox-active metals in disease pathology

Northwestern University (December 2009 – November 2014)

NSF Graduate Research Fellow (June 2011 – June 2014)

Advisor: Prof. Thomas J. Meade, Department of Chemistry

Objective: Develop cobalt(III) Schiff base complexes as inhibitors of metal-protein interactions relevant to development, cancer, and neurodegeneration

University of Southern California (January 2008 – May 2009)

WiSE Undergraduate Research Fellow (January 2008 – December 2008)

Advisor: Prof. Richard L. Brutchey, Department of Chemistry

Objective: Develop facile low-temperature synthetic routes to perovskite nanocrystals

PEER-REVIEWED PUBLICATIONS

<http://tinyurl.com/MCHscholar>

* Maiden Name – Cuevas, Marie A.

Heffern, M.C.,[†] Park, H.,[†] Au-Yeung, H.,[†] Van de Bittner, G. C., Ackerman C. M.; Stahl, A., Chang, C. J. In vivo bioluminescence reveals copper deficiency in a murine model of non-alcoholic fatty liver disease. *Proc. Natl. Acad. Sci.*, 2016, 113, 14219-14224. ([†] Denotes equal contribution). **Featured in C&E News.**

Heffern, M.C.,[†] Reichova, V.,[†] Coomes, J. L., Harney, A. S., Bajema, E.; Meade, T. J. Tuning Cobalt(III) Schiff Base Complexes as Activated Protein Inhibitors. *Inorg. Chem.*, 2015, 18, 9066-74. ([†] Denotes equal contribution)

Heffern, M. C., Velasco, P. T., Matosziuk, L. M., Coomes, J. L., Karras, C., Eckermann, A. L., Klein, W. B., Meade, T. J. Modulation of Amyloid- β Oligomerization by Co(III) Schiff Base Complexes. *ChemBioChem*, 2014, 15, 1584-1589.

Heffern, M. C.,[†] Matosziuk, L. M.,[†] Meade, T. J. Lanthanide Probes for Bioresponsive Imaging. *Chem. Rev.*, 2014, 114, 4496-4539. ([†] Denotes equal contribution). **>250 Citations to date.**

Heffern, M. C.; Kurutz, J.; Meade, T. J. Spectroscopic Elucidation of the Inhibitory Mechanism of Cys₂His₂ Zinc Finger Transcription Factors by Cobalt(III) Schiff Base Complexes. *Chem. Eur. J.*, 2013, 19, 17043-17053. **Featured Key Article by Global Medical Discovery (June 2014).**

Heffern, M. C.; Yamamoto, N.; Holbrook, R. J.; Eckermann, A. E.; Meade, T. J. Cobalt Complexes as Promising Therapeutic Agents. *Curr. Opin. Chem Biol.* 2013, 17, 189-196.

Matosziuk, L.M.; Leibowitz, J. H.; **Heffern, M. C.**; Macrenaris, K. W.; Ratner, M. A.; Meade, T. J. Structural Optimization of Zn(II) Activated MR Imaging Probes. *Inorg. Chem.*, 2013, 52, 12250-12261.

Manus, L. M.; Holbrook, R. J.; Atesin, T. A.; **Heffern, M. C.**; Harney, A. S.; Eckermann, A. E.; Meade, T. J. Axial Ligand exchange of N-heterocyclic Cobalt(III) Schiff Base Complexes: Molecular Structure and NMR Solution Dynamics. *Inorg. Chem.*, 2013, 52, 1069-1076.

Matosziuk, L. M.; Holbrook, R. J.; Manus, L. M.; **Heffern, M. C.**; Ratner, M. A.; Meade, T. J. Rational Design of [Co(acacen)L₂]⁺ Inhibitors of Biological Activity. *Dalton Trans.*, 2013, 42, 4002-12.

Velasco, P. T.; **Heffern, M. C.**; Sebollela, A.; Popova, I. A.; Lacor, P. N.; Lee, K. B.; Zun, X.; Tiano, B. N.; Viola, K. L.; Eckermann, A. L.; Meade, T. J.; Klein, W. L. Synapse-Binding Subpopulations of A β Oligomers Sensitive to Peptide Assembly Blockers and scFv Antibodies. *ACS Chem. Neurosci.*, 2012, 3, 972-981.

Hurtado, R.; Harney, A. S.; **Heffern, M. C.**; Holbrook, R. J.; Holmgren, R.; Meade, T. J. Specific inhibition of the transcription factor Ci by a Cobalt(III)-Schiff base-DNA conjugate. *Mol. Pharm.*, 2012, 9, 325-333.

Beier, C. W.; **Cuevas, M. A.***; Brutchey, R. L. Low-Temperature Synthesis of Solid-Solution Ba_xSr_{1-x}TiO₃ Nanocrystals. *J. Mater. Chem.*, 2010, 20, 5074-5079.

Beier, C. W.; **Cuevas, M. A.***; Brutchey, R. L. Effect of Surface Modification on the Dielectric Properties of BaTiO₃ Nanocrystals. *Langmuir*, 2010, 26, 5067-5071.

Beier, C. W.; **Cuevas, M. A.***; Brutchey, R. L. Room-Temperature Synthetic Pathways to Barium Titanate Nanocrystals. *Small*, 2008, 4, 2102-2106. **Most Accessed List for November and December 2008.**

In Revision: Aron, A. T.,[†] **Heffern, M.C.**,[†] Lonergan, H.,[†] Vander Wal, M. N., Baker, B. R.,[†] Spangler, B., Zhang, Y., Park, H., Stahl, A., Renslo, A. R., Skaar, E. P., Chang, C. J. In vivo bioluminescence imaging of labile iron accumulation in a murine model of *Acinetobacter baumannii* infection. In revision with *Proc. Natl. Acad. Sci.*

SEMINARS PRESENTATIONS

Invited Seminars and Conference Talks

- Invited Talk for UC President's and UC Davis Chancellor's Post-doctoral Fellows Special Seminar Series. Davis, CA. 2017 April 10. *Invited Seminar by the College of Agriculture and Environmental Sciences, hosted by the Department of Nutrition.*
- Gordon Research Conference: Metals Medicine. Andover, NH. 2016 June 26-July 1. *Selected among poster presenters for talk.*
- Gordon Research Seminar: Bioinorganic Chemistry. Ventura, CA. 2014 Jan 31-Feb 2.
- Great Lakes Regional ACS Meeting: Bioinorganic Chemistry Symposium. La Crosse, WI. 2013 June 5-8.
- Gordon Research Conference: Metals in Medicine. Andover, NH. 2012 June 24-29. *Selected among poster presenters for talk; Awarded for outstanding oral presentation.*
- Zing Conference: Coordination Chemistry. Xcaret, Mexico. 2012 Dec 9-13. Talk.
- ACS Southern California Undergraduate Research Conference. Los Angeles, CA. 2009 Apr 25. Talk.

Conference Poster Presentations

- Gordon Research Conference: Metals in Biology. Ventura, CA. 2017 Jan 22 – 27.
- Gordon Research Conference: Metals Medicine. Andover, NH. 2016 June 26-July 1.
- Gordon Research Conference: Metals in Biology. Ventura, CA. 2014 Jan 25 – 31.
- Imaging in 2020. Jackson, WY. 2012 Sept 30-Oct 4.
- Gordon Research Conference: Metals in Medicine. Andover, NH. 2012 June 24-29. *Awarded for outstanding poster.*
- Midwest/Great Lakes Joint Regional ACS Meeting. St. Louis, MO. 2011 Oct 19-22. *Selected for Sci-Mix Poster Session.*

Internal/Departmental Presentations

- UC President's Postdoctoral Fellowship Program Spring Academic Retreat. Lake Arrowhead, CA. 2016 April 15-17. Talk.
- Biochemistry, Biophysics, and Structural Biology Conference and Retreat UC Berkeley Divisional Retreat, Department of Molecular and Cell Biology. Pacific Grove, CA. 2016 Jan 10-12. Talk.
- Basolo-Ibers-Pearson Lecture at Northwestern University. Evanston, IL. 2011 Oct 8. Oral.
- Introduction to Graduate Education at Northwestern Days. Evanston, IL. 2013 April 11. Poster. *Outreach program to introduce faculty and selected students from minority-serving institutions to graduate research primarily in the STEM fields.*
- Basolo-Ibers-Pearson Lecture at Northwestern University. Evanston, IL. 2014 Mar 10. Talk. *Selected speaker for Prospective Student Visit Weekend.*
- Biophysics Divisional Seminar at Northwestern University. Evanston, IL. 2012 Jan 18. Talk.
- Basolo-Ibers-Pearson Lecture at Northwestern University. Evanston, IL. 2011 Oct 8. Talk.
- University of Southern California Undergraduate Research Symposium. Los Angeles, CA. 2009 Apr 15. Poster.
- John Stauffer Symposium USC Department of Chemistry. Los Angeles, CA. 2009 Apr 7. Poster.
- University of Southern California Undergraduate Research Symposium. Los Angeles, CA. 2009 Apr 9. Poster.

SELECTED HONORS AND AWARDS

Fellowships

- University of California President's Postdoctoral Fellowship (2015-2017): *Awarded to 3-5% of all applicants across the ten University of California campuses*
- National Science Foundation Graduate Research Fellowship (2011-2014)
- National Institute of Health Ruth Kirschstein Pre-doctoral National Research Service Award (Awarded 2011; Declined)
- Women in Science and Engineering Undergraduate Research Award (2008)
- Undergraduate Associates Research Fellowship (2008)

Selected Honors

- Commendation for Excellence in Graduate Research (2015)
- Gelewitz Award: *Awarded to two senior graduate students for excellence in research and service* (2013)
- Presidential Fellowship Nominee for the Department of Chemistry (2013)
- USC Chemistry and Biochemistry Outstanding Undergraduate Research Award (2009)
- Undergraduate Research Symposium Prize Winner (2009): *1st Place Physical Sciences and Most Innovative*

- Discovery Scholar and Prize Finalist: *Awarded to 25 graduating seniors for excellence in innovation and research* (USC, 2009)
- Renaissance Scholar and Prize Winner: *Awarded to top 10 graduating seniors recognized for excellence in widely separate fields* (USC, 2009)

TEACHING EXPERIENCE

Teaching Assistant

General Chemistry (June – August 2010)

Organic Chemistry September 2009 – June 2010)

Guest Lecturer

Summer Fuel Program for Advanced High School Students, UC Berkeley (July 2016)

Biochemistry, Northwestern University (February 2014)

Research Mentor:

Meade Lab: 4 graduate, 3 undergraduate, 3 high school students (2009-2014)

Chang Lab: 1 undergraduate student (2016)

Fellowship and Grant Workshop Leader

NIH/NSF Fellowships, Meade Lab (2012-2014)

NSF Graduate Research Fellowship, Department of Chemistry (2012)

SELECTED LEADERSHIP EXPERIENCE AND PROFESSIONAL SERVICE

Journal Reviewer for *Scientific Reports* (2017)

Alumni Advisory Board Member Northwestern University, Department of Chemistry (2015 – Present)

Women in Science and Engineering, Founding Board Member Northwestern University and Evanston Township High School (2013-2014)

Niles West STEM Mentorship Program, Board Member Northwestern University (2013 – 2014)

Phi Lambda Upsilon Chemistry Honor Society President Northwestern University (2012-2013)

Phi Lambda Upsilon Chemistry Honor Society Service Chair Northwestern University (2011-2012)

Chemistry Recruitment Video Planning Committee Member Department of Chemistry (2012)

First-Year Student Orientation Planning Committee Member Department of Chemistry (2012): *Lead Organizer of the "Graduate Student Handbook: Answers to FAQs and Tips"*

SELECTED OUTREACH ACTIVITIES

Panelist for the Northern California Diversity Forum in Graduate Education (2016)

Niles West High School (2011-2014):

- Research Mentor from 2011 – 2013; Student Mentee in 2011-2012 achieved gold medals in both the regional and state science fairs

- Board member from 2013 – 2014 to expand mentorship opportunities for Northwestern University graduate students beyond Niles West High School

Women in Science and Engineering with Evanston Township High School (2011-2014):

- Founding board member:: coordinated and developed the program aimed at empowering young women in Evanston Township High School to continue pursuing advanced education in science and engineering

Kits & Cats Day at Northwestern University for Evanston Township High School (2013)

- Volunteer for “Day in the Life” targeted at students in the academic low-middle range; intended to attract students who may be on the fence about college for economic or cultural reasons.

Outreach Activities with Phi Lambda Upsilon Graduate Chemistry Honor Society:

President (2012-2013):

- Established partnership with Mather High School Mentorship Program
- Initiated service grants for which members can apply to receive funding for service initiatives
- Co-hosted the regional *National You Be the Chemist Challenge* for middle school students

PLU Service Chair (2011-2012)

- Achievements in the *Science in the Classroom* Program
 - Assembled the *first* Spanish-speaking team to work with the ESL 3rd grade class
 - Coordinated a field trip to Northwestern University for a science show
 - Initiated partnership with MRSEC to receive funding through NSF

Science in the Classroom (2010-2014),

- Demonstration Leader (2012, 2014), Team Leader (2011-2012), Team Member (3rd grade 2010-2011, Bilingual 3rd grade class 2012-2014)

Panelist for Career Day at Chicago Hope Academy (2012)

“Seeing is Believing” Demonstrator (2012)

- Program in Northwestern’s Center for Molecular Imaging for high school students to educate them on the role of chemistry in diagnosis and on imaging techniques such as MRI

Untamed Chemistry Project (2011-2012)

- Team of scientists aiming to produce short educational videos to make chemistry accessible to high school