

KAREN MCFARLANE HOLMAN

Professor of Chemistry

Department of Chemistry, Willamette University

EDUCATION

Ph.D. University of California, Santa Barbara, Inorganic Chemistry, 1996. Advisor: Peter C. Ford.
Dissertation: *Structural and Mechanistic Investigations of Reactive Iron Carbonyl Intermediates Relevant to Migratory Insertion Reactions.*

B.A. Willamette University, Salem, OR, Chemistry, 1990.

PROFESSIONAL HISTORY

Professor, Department of Chemistry, Willamette University, Salem, OR 2011 – present.

Chair, Department of Chemistry, Willamette University, Salem, OR, 2009 – 2012.

Associate Professor, Dept. of Chemistry, Willamette University, Salem, OR, 2005 – 2011.

Assistant Professor, Dept. of Chemistry, Willamette University, Salem, OR, 2001 – 2005.

Assistant Professor, Dept. of Chemistry, Northern Arizona University, Flagstaff, AZ, 2000 – 2001.

Postdoctoral Fellow, Lawrence Berkeley National Laboratory, Physical Biosciences Division,
University of California, Berkeley, CA, 1998 – 2000.

Technical Consultant, Lumen Intellectual Property Services, Palo Alto, CA, 1997 – 1998.

Lecturer, Dept. of Chemistry, University of California, Santa Barbara, CA, 1997.

Instructor, Dept. of Chemistry, Santa Barbara City College, Santa Barbara, CA, 1997.

Graduate Student Researcher, Teaching Assistant, Head Teaching Assistant, Dept. of Chemistry and
Biochemistry, University of California, Santa Barbara, CA, 1990 – 1996.

Separations Chemist, Molecular Probes (Now ThermoFisher), Eugene, OR, 1990.

TEACHING

Chemical Concepts and Applications

General Chemistry I & II

Inorganic Chemistry

Experimental Chemistry I & II

Experimental Biochemistry I & II

Senior Research Projects I & II

Advanced Topics in Chemistry

Advanced Topics in Biochemistry

College Colloquium

Chemistry of Renewable Energy

61 Undergraduate research projects supervised since 2002.

8 Research students are co-authors on peer-reviewed publications.

24 Research students are presenters or co-authors at regional, national, or international conferences.

AWARDS

Oregon Professor of the Year, Carnegie Foundation for the Advancement of Teaching and the Council
for Advancement and Support of Education (CASE) U.S. Professors of the Year Program, 2010.

Faculty Achievement Award for Teaching and Service, Willamette University, 2008.

Faculty Achievement Award for Teaching and Professional Development, Willamette University, 2004.

PUBLICATIONS

Journal Articles (‡ = *undergraduate student*):

1. S. Hinton,‡ E. Corpuz,‡ K. L. McFarlane Holman, S. Meyer. “A Split β -Lactamase Sensor for the Detection of DNA Modification by Cisplatin and Ruthenium-Based Chemotherapeutic Drugs”, Under review, *J. Inorg. Biochem.* (Manuscript ID: JINORGBIO-D-21-00654)
2. B. G. Dwyer,‡ E. Johnson,‡ E. Cazares,‡ K. L. McFarlane Holman, S. R. Kirk. “Ruthenium anticancer agent KP1019 binds more tightly than NAMI-A to tRNA^{Phe}”, *J. Inorg. Biochem.* **2018**, *182*, 177-183.
3. T. P. Silverstein, S. R. Kirk, S. Meyer, K. L. McFarlane Holman. “Myoglobin structure and function: A multi-week biochemistry laboratory project”, *Biochem. Mol. Biol. Educ.* **2015**, *43*, 181-188.
4. T. P. Silverstein, K. L. McFarlane Holman, J. C. Williamson. “Undergraduate Research and the Chemistry Major Capstone Experience at Willamette University”, *CUR Quarterly*, **2014**.
5. A. A. Hostetter, M. L. Miranda,‡ V. J. DeRose and K. L. McFarlane Holman. “Ru binding to RNA following treatment with the antimetastatic prodrug NAMI-A in *Saccharomyces cerevisiae* and in vitro”, *J. Biol. Inorg. Chem.* **2011**, *16*, 1177-1185.
6. T.V. Harris,‡ R. K. Szilagyi, K. L. McFarlane Holman. “Electronic Structural Investigations of Ru-containing Compounds and Anticancer Prodrugs”, *J. Biol. Inorg. Chem.* **2009**, *14*, 891-898.
7. S. R. Kirk, T. P. Silverstein, K. L. McFarlane Holman, B. H. Taylor.‡ “Probing Changes in the Conformation of tRNA^{Phe}: An Integrated Biochemistry Laboratory Course”, *J. Chem. Educ.* **2008**, *85*, 666-673.
8. S. R. Kirk, T. P. Silverstein, K. L. McFarlane Holman. “UV Thermal Melting Curves of tRNA^{Phe} in the Presence of Ligands”, *J. Chem. Educ.* **2008**, *85*, 674-675.
9. S. R. Kirk, T. P. Silverstein, K. L. McFarlane Holman. “Metal-Catalyzed Cleavage of tRNA^{Phe}”, *J. Chem. . Educ.* **2008**, *85*, 676-677.
10. S. R. Kirk, T. P. Silverstein, K. L. McFarlane Holman. “Fluorescence Spectroscopy of tRNA^{Phe} Y Base in the Presence of Mg²⁺ and Small Molecule Ligands”, *J. Chem. Educ.* **2008**, *85*, 678-679.
11. R. M. Cinco, J. H. Robblee, J. Messinger, C. Fernandez, K. L. M. Holman, K. Sauer and V. K. Yachandra. “Polarized Strontium EXAFS of Photosystem II Membranes Reveals the Orientation of the Calcium Cofactor in the Oxygen-Evolving Complex”, *Biochemistry* **2004**, *43*, 13271-13282.
12. K. L. McFarlane Holman, M. J. Latimer and V. K. Yachandra. “A Liquid Helium Cryostat with Internal Fluorescence Detection for X-ray Absorption Studies in the 2-6 keV Energy Region”, *Rev. Sci. Inst.* **2004**, *75*, 2056-2060. This publication was also selected to appear in the June 2004 issue of *Virtual Journal of Biological Physics Research*.

13. R. M. Cinco, K. L. McFarlane Holman, J. H. Robblee, J. Yano, S. A. Pizarro, E. Bellacchio, K. Sauer and V. K. Yachandra. "Calcium EXAFS Establishes the Mn-Ca Cluster in the Oxygen-Evolving Complex of Photosystem II", *Biochemistry* **2002**, *41*, 12928-12933.
14. J. H. Robblee, J. Messinger, R. M. Cinco, K. L. McFarlane, C. Fernandez, S. A. Pizarro, K. Sauer, V. K. Yachandra. "The Mn Cluster in the S-0 State of the Oxygen-Evolving Complex of Photosystem II Studied by EXAFS Spectroscopy: Are There Three di- μ -oxo-bridged Mn-2 Moieties in the Tetranuclear Mn Complex?" *J. Am. Chem. Soc.* **2002**, *124*, 7459-7471.
15. J. Messinger, J. H. Robblee, U. Bergmann, C. Fernandez, P. Glatzel, H. Visser, R. M. Cinco, K. L. McFarlane, E. Bellacchio, S. A. Pizarro, S. P. Cramer, K. Sauer, M. P. Klein, and V. K. Yachandra. "Absence of Mn-Centered Oxidation in the S₂ to S₃ Transition: Implications for the Mechanism of Photosynthetic Water Oxidation" *J. Am. Chem. Soc.* **2001**, *123*, 7804-7820.
16. E. Bellacchio, K. L. McFarlane, A. Rompel, J. H. Robblee, R. M. Cinco, K. Sauer, M. P. Klein, and V. K. Yachandra. "Counting the Number of Disulfides and Thiol Groups in Proteins and a Novel Approach for Determining the Local pKa for Cysteine Groups in Proteins in vivo", *J. Synchrotron Rad.* **2001**, *8*, 1056-1058.
17. A. Rompel, R. M. Cinco, J. H. Robblee, M. J. Latimer, K. L. McFarlane, J. Huang, M. A. Walters, and V. K. Yachandra. "S K- and Mo L-Edge X-Ray Absorption Spectroscopy to Determine Metal-Ligand Charge Distribution in Molybdenum-Sulfur Compounds", *J. Synchrotron Rad.* **2001**, *8*, 1006-1008.
18. U. Bergmann, P. Glatzel, J. H. Robblee, J. Messinger, C. Fernandez, R. Cinco, H. Visser, K. McFarlane, E. Bellacchio, S. Pizarro, K. Sauer, V. K. Yachandra, M. P. Klein, B. L. Cox, K. H. Nealon, S. P. Cramer. "High-resolution X-ray spectroscopy of rare events: a different look at local structure and chemistry", *J. Synchrotron Rad.* **2001**, *8*, 199-203.
19. J. H. Robblee, J. Messinger, C. Fernandez, R. M. Cinco, H. Visser, K. L. McFarlane, U. Bergmann, P. Glatzel., S. P. Cramer, K. Sauer., V. K. Yachandra, M. P. Klein "Oxidation states of the Mn cluster in the S-states of the oxygen-evolving complex of PSII", *J. Inorg. Biochem.* **1999**, *74*, 278.
20. K. L. McFarlane, B. Lee, W. Fu, R. van Eldik, and P. C. Ford. "Reactive Intermediates in the Photodecarbonylation of the Cyclopentadienyl and Indenyl Complexes CpFe(CO)₂(C(O)CH₃) and IndFe(CO)₂(C(O)CH₃) (Cp = η^5 -C₅H₅; Ind = η^5 -C₉H₇)", *Organometallics* **1998**, *17*, 1826-1834.
21. K. L. McFarlane and P. C. Ford. "Room Temperature Reactions of the Intermediate(s) Generated by Flash Photolysis of (η^5 -C₅H₅)Fe(CO)CH₃", *Organometallics* **1998**, *17*, 1166-1168.
22. K. L. McFarlane, B. Lee, J. S. Bridgewater and P. C. Ford. "Time Resolved Infrared Spectroscopy as a Technique to Study Reactive Organometallic Intermediates", *J. Organomet. Chem.* **1998**, *554*, 49-61.
23. W. T. Boese, K. L. McFarlane, B. Lee, J. Rabor and P. C. Ford. "Photochemistry as a Tool for Elucidating Organometallic Reaction Mechanisms", *Coord. Chem. Rev.* **1997**, *159*, 135-151.

Invited Chapters in Books:

1. R. M. Cinco, C. Fernandez, J. Messinger, J. H. Robblee, H. Visser, K. L. McFarlane, U. Bergmann, P. Glatzel, S. P. Cramer, K. Sauer, V. K. Yachandra and M. P. Klein. "Refined Model of the Oxidation States and Structures of the Mn/Ca/Cl Cluster of the Oxygen Evolving Complex of Photosystem II", *Photosynthesis: Mechanisms and Effects, Vol. II*, G. Garab, Ed.; Kluwer Acad. Publishers, The Netherlands, 1998; pp. 1273-1278.
2. P. C. Ford, W. T. Boese, B. Lee and K. L. McFarlane. "Photocatalysis Involving Metal Carbonyls", Chapter 12 in *Photosensitization and Photocatalysis by Inorganic and Organometallic Compounds*, M. Graetzel and K. Kalyanasundaram, Eds.; Kluwer Acad. Publishers, The Netherlands, 1993.

EXTERNAL GRANTS

1. Principal Investigator, Jean Dreyfus Lectureship for Undergraduate Institutions, Camille and Henry Dreyfus Foundation, 2022-2024, \$18,500.
2. Collaborator, NSF-TUES Grant: "X-Ray Crystallography for Transforming Undergraduate Instruction at PUIs in the Pacific Northwest" (Louis Kuo, PI; Edward Valente, co-PI); \$200,000; funded, 2012-2013.
3. Senior Personnel, NSF-TUES Grant: "TUES: An Integrated, Instrument Intensive Project-Based Biochemistry Laboratory for Enhanced Student Learning and Research" (Todd P. Silverstein and Sarah Kirk, co-PIs); \$199,046; funded, 2011-2013.
4. Partner, W.M. Keck Foundation Grant: "iScience: Advancing Interdisciplinarity and Quantitative Literacy in Liberal Arts Science Education" (Mark Stewart and Stasinos Stavrianeas, co-PIs); funded, 2011-13. My part of the project involved changing CHEM 110 to have a focus on Renewable Energy and incorporated more student-led projects and labs.
5. Principal Investigator, Research Proposal Extension for Beamtime at Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory, "Metal (Ru) and Ligand K-edges (S, Cl) and Metal L-edge (Ru) Investigation of Ruthenium-based Anticancer Metallodrugs" (SSRL-3137), received 1.7 ("Excellent") rating by the SSRL Proposal Review Panel. Proposal active through 12/31/11 (accepted).
6. M.J. Murdock Charitable Trust Research Startup Grants for New Faculty in Sciences, \$25,000, 2010-11.
7. Principal Investigator, Research Proposal for Beamtime at the Advanced Light Source, Lawrence Berkeley National Laboratory, "XANES studies of ruthenium anti-cancer drugs at the Cl, S K-edges and Ru L-edge" (ALS-03361), Received "Excellent" rating in peer review, 2008-2010.
8. Principal Investigator, Research Proposal for Beamtime at Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory (~\$90,000 value), "Metal (Ru) and Ligand K-edges (S, Cl) and Metal L-edge (Ru) Investigation of Ruthenium-based Anticancer Metallodrugs" (SSRL-3137), submitted Nov. 2007, Received 1.8 ("Excellent") rating in peer review; Six separate beamtime allotments were granted in 2009-10.
9. Principal Investigator, Research Proposal for Beamtime at the Advanced Light Source, Lawrence Berkeley National Laboratory (~\$20,000 value), "Electron Distribution in Chlorine-Ruthenium

Bonds via Cl K-edge XANES” (ALS-01462), Two separate beamtime allocations were granted in 2005-06.

INTERNAL GRANTS

1. Learning by Creating Curriculum Development Award (\$1990), “New Frontiers in Chemistry: Radio Broadcasts and Mini-Podcasts”, Willamette University, Fall 2017.
2. Atkinson Faculty Development Award (\$1,500), “Training in Materials Chemistry and Studies of Electrocatalytic Materials with Applications to Renewable Energy Resources”, Willamette University, 2017-18.
3. Presidential Discretionary Fund Award (\$3,750), “Retention of students university-wide and within STEM by establishing cohort connections in Introductory Chemistry I”, Willamette University, jointly held with Profs. Brandy Fox and Alison Fisher, 2016.
4. Atkinson Faculty Development Award (\$2,500), “Nuclear Magnetic Resonance Studies of Ruthenium-Based Prodrug Reactions”, Willamette University, 2015-16.
5. Atkinson Faculty Development Award (\$1,550), “Chemical Dynamics of Ruthenium Compounds”, Willamette University, 2013-14.
6. Hewlett Grant (\$4,087), “Optical Polarization Experiments in Chemistry and Physics”, Willamette University, jointly held with Profs. Chuck Williamson and Michaela Kleinert, 2010.
7. Atkinson Faculty Development Award (\$2,500), “Determination of Ruthenium Drug Binding to Subcellular Components in Yeast via ICP-MS”, Willamette University, 2009-10 (Funded). **A research article was published as a direct result of these funds** (*J. Biol. Inorg. Chem.* **2011**, *16*, 1177-1185).
8. Sustainability Council Grant (\$500), “Solar Energy Workshop for Middle School Girls”, Willamette University, 2008-09.
9. Faculty Research Funds (\$1,500), “Low Temperature X-ray Studies of Ruthenium Anticancer Agents in Solution at Stanford Synchrotron Radiation Lightsource”, Willamette University, 2008-09.
10. Hewlett Grant (\$5,000), “Biochemistry Track Laboratory Design and Implementation”, Willamette University, jointly held with Profs. Chuck Williamson, Todd Silverstein, Sarah Kirk, David Goodney, and Andrew Duncan, Summer 2008.
11. Atkinson Faculty Development Award (\$2,500), “Interactions between the Hammerhead Ribozyme and Ruthenium Anti-Cancer Drugs”, Willamette University, 2008-09.
12. Hewlett Grant (\$5,000), “Biochemistry Track Assessment and Curricular Revision”, Willamette University, jointly held with Profs. Chuck Williamson, Todd Silverstein, Sarah Kirk, and Andrew Duncan, Summer 2007.
13. Faculty Research Funds (\$1,500), “X-ray studies of Ruthenium Isomers at the Advanced Light Source Beamline 9.3.1”, Willamette University, 2006-07. **A research article was published as a direct result of these funds** (*J. Biol. Inorg. Chem.* **2009**, *14*, 891-898).
14. Atkinson Faculty Development Award (\$2,000), “Learning Density Functional Calculations as They Apply to X-ray Absorption Spectroscopy”, Willamette University, 2006-07.
15. Faculty Research Funds (\$750), “X-ray studies of Ruthenium Isomers at the Advanced Light Source Beamline 9.3.1”, Willamette University, 2005-06.

16. Hewlett Grant (\$7,000), "Continuation of an Advanced Biochemistry Laboratory for CHEM 431", Willamette University, jointly held with Prof. Sarah Kirk and Prof. Todd Silverstein, Summer 2005. **Four pedagogical articles were published as a direct result of these funds and the previous year's Hewlett Grant on this topic** (*J. Chem. Educ.* **2008**, *85*, 666-673; *J. Chem. Educ.* **2008**, *85*, 674-675; *J. Chem. Educ.* **2008**, *85*, 676-677; *J. Chem. Educ.* **2008**, *85*, 678-679).
17. Atkinson Faculty Development Award (\$2,500), "X-ray Spectroscopy of Anti-Cancer Drug Molecules at Lawrence Berkeley National Laboratory", Willamette University, 2005-06.
18. Faculty Research Funds (\$1,500), "Studies of Ruthenium Anti-Cancer Compounds Using Laser and Electrochemical Techniques", Willamette University, 2004.
19. Hewlett Grant (\$7,000), "Development of an Advanced Biochemistry Laboratory for CHEM 431", Willamette University, jointly held with Prof. Sarah Kirk and Prof. Todd Silverstein, Summer 2004.
20. Atkinson Faculty Development Award (\$2,500), "X-ray Studies of Ruthenium Anti-Cancer Drugs at Lawrence Berkeley National Laboratory's Particle Accelerator", Willamette University, 2003-04.
21. Faculty Research Funds (\$1,200), "Expert Assistance for the Setup and Implementation of an ATR-IR Spectroelectrochemical Cell", Willamette University, 2002.
22. Intramural Research Program Grant (\$13,500), "Fundamental Chemistry of Ruthenium Based Anti-Cancer Drugs", Northern Arizona University, 2001 (Transferred funds when I moved from NAU to Willamette).
23. Instructional Development Project Grant (\$2,000), "A Multimedia Tutorial of the Wave-Particle Duality of Light and Matter for General Chemistry Students", University of California, Santa Barbara, 1994.
24. Instructional Development Project Grant (\$2,000 each), "A Head Teaching Assistant to Lead Teaching Assistant Instruction Improvements in the Chemistry Department", University of California, Santa Barbara, 1992-93 and 1993-94.

PRESENTATIONS

Invited Talks

1. “Ruthenium-Based Anti-Cancer Drugs: Fundamental Chemistry and Biological Targets”, Peter C. Ford Inorganic Chemistry Symposium, UC Santa Barbara Department of Chemistry and Biochemistry, Sept. 16, 2017.
2. “You Don’t Have to be a Scientist to Cure Cancer”, TEDxSalem, Jan. 7, 2017.
<https://youtu.be/SZ9s5ZEucwM>
3. “Ruthenium anti-cancer drugs”, Biochemistry Seminar Series at Lewis and Clark College, Portland, OR, March 11, 2015.
4. “Spectroscopic techniques at national synchrotron radiation sources: Opportunities for enhancing your undergraduate research program” (INOR-924), 225th National Meeting of the ACS, New Orleans, LA, April 2008.
5. “XAS Studies of Ru Anti-Cancer Complexes”, Panel on Scientific Advances on Beamline 9.3.1, Advanced Light Source Users’ Meeting, Lawrence Berkeley National Laboratory, Berkeley, CA, October 2005.
6. “Refining Experimental Chambers for Sulfur XAS Experiments on Biological Samples”, Sulfur X-Ray Absorption Spectroscopy Workshop, Stanford Synchrotron Radiation Laboratory Users’ Meeting, Stanford University, October 2000.
7. “Sulfur K-Edge X-Ray Absorption Spectroscopy of Glutathione *In Vivo*”, Inorganic Chemistry Seminar, Department of Chemistry and Biochemistry, UC Santa Barbara, January 2000.
8. “Sulfur K-Edge Spectroscopy of Biomolecules”, Advanced Light Source Users’ Meeting, Lawrence Berkeley National Laboratory, Berkeley, CA, October 1999.
9. “Photochemistry as a Tool for Elucidating Organometallic Reaction Mechanisms”, Inorganic Chemistry Seminar, Institute for Inorganic Chemistry, University of Erlangen-Nürnberg, Germany, March 1996.

Conference Presentations (‡ = *undergraduate student co-author*)

1. “NAMI-A binding interactions with RNA and DNA” (INOR-656) Rebecca Josephson‡, Wes Wenzel‡, Efren Cazares‡, Sarah R. Kirk, Karen L. McFarlane Holman, 248th National Meeting of the ACS, San Francisco, CA, August 2014.
2. “Interactions of NAMI-A with tRNA” (NA-9, Poster), Karen L. McFarlane Holman, Emily Johnson‡, Efren Cazares‡, Rebecca Josephson‡, Sarah R. Kirk, 16th International Conference of Biological Inorganic Chemistry (ICBIC), Grenoble, France, July 22-26, 2013.
3. “Examination of the binding interactions of tRNA^{Phe} and NAMI-A in the presence and absence of ascorbate” (INOR-969, Poster; selected for Sci-Mix), Emily Johnson‡, Efren Cazares‡, Raquel Bell‡, Katerina Zappas‡, Karen L. McFarlane Holman, Sarah R. Kirk, 245th National Meeting of the ACS, New Orleans, LA, April 2013.
4. “Ru binding to RNA in NAMI-A treated yeast cells and RNA oligomers” (Poster), Alethia A. Hostetter, Michelle L. Miranda‡, Victoria J. DeRose and Karen L. McFarlane Holman, 15th International Conference of Bioinorganic Chemistry (ICBIC), Vancouver, B.C., Canada, August 6-12, 2011.

5. "Raman investigations of the aquation reactions of the anti-cancer prodrug NAMI-A" (INOR-215, Poster), Jon David Sumega‡, Simon Currie‡, Ryan McClintic‡, Karen L. McFarlane Holman, and J. Charles Williamson, 239th National Meeting of the ACS, San Francisco, CA, March 2010.
6. "Spectroscopic and Theoretical Studies of Metal-Ligand Bonds in Ruthenium Anti-Cancer Drugs" (Poster), Karen L. McFarlane Holman, Travis V. Harris‡, Robert K. Szilagyi, Metals in Biology Gordon Research Conference, Ventura, CA, January 2009.
7. "X-ray and Density Functional Studies of Ruthenium Anti-Cancer Drugs" (Poster), Karen McFarlane Holman, Travis V. Harris‡, Robert K. Szilagyi, 33rd Annual Users' Conference of the Stanford Synchrotron Radiation Laboratory, Stanford, CA, October 2006.
8. "Investigations of Metal-Ligand Bonding in Ruthenium Anti-Cancer Drugs using Cl K-edge XANES and IR Spectroelectrochemistry" (Poster), Karen McFarlane Holman, Jerry LaRue‡, Marcella Orwick‡ and Christopher Foot‡, 59th Northwest/Rocky Mountain Regional Meeting of the ACS, Logan, UT, June 2004.
9. "Correlations Between Reduction Potential and Ligand Charge Density of Metal-Sulfur Proteins as Studied by Sulfur K-Edge Spectroscopy" (INOR-072, Oral Presentation), Karen L. McFarlane, Emmanuele Bellacchio, Annette Rompel, Roehl M. Cinco, Don Low, Matthew J. Latimer, J. Huang, Marc Walters, Ken Sauer, Vittal K. Yachandra and Melvin P. Klein, 219th National Meeting of the ACS, San Francisco, CA, March 2000.
10. "The Role of Chloride in the Oxygen-Evolving Complex: Cl K-edge XANES Studies of Photosystem II" (Poster), Karen L. McFarlane, Emmanuele Bellacchio, Roehl M. Cinco, Henk Visser, John Robblee, Ken Sauer, Vittal K. Yachandra and Melvin P. Klein, Gordon Conference on Photosynthesis, Asilomar, CA, March 2000.
11. "An Endstation for Soft X-Ray Absorption Spectroscopy of Biological Samples in a Controlled Environment" (Poster), Karen L. McFarlane, Matt Swanson‡, Neil Hartman‡, Zahid Hussain, Vittal K. Yachandra and Melvin P. Klein, Advanced Light Source Users' Meeting, Berkeley, CA, October 1998.
12. "Spectroscopic Investigations of Reactive Intermediates in the Photodecarbonylation of Cyclopentadienyl and Indenyl Iron Compounds" (Oral Presentation), Karen L. McFarlane, Brian Lee and Peter C. Ford, 209th ACS National Meeting, Anaheim, CA, March 1995.
13. "Structures and Reactions of Intermediates Generated by the Photodecarbonylation of Acyl and Methyl Iron Compounds" (Poster), Karen L. McFarlane, Brian Lee and Peter C. Ford, 207th ACS National Meeting, San Diego, CA, March 1994.
14. "Photodecarbonylation of Iron Acetyl Compounds as Studied by Time-Resolved Infrared Spectroscopy" (Poster), Karen L. McFarlane, Brian Lee and Peter C. Ford, 10th International Symposium on the Photochemistry and Photophysics of Coordination Compounds, Sendai, Japan, July 1993.
15. "Photodecarbonylation of $\text{CpFe}(\text{CO})_2\text{C}(\text{O})\text{CF}_3$ as Studied by Time-Resolved Infrared Spectroscopy" (Oral Presentation), Karen L. McFarlane, Brian Lee and Peter C. Ford, 203rd ACS National Meeting, Denver, CO, March 1992.

Student/Collaborator Conference Presentations
(*underlined = presenter; ‡ = undergraduate student*)

1. “Binding interactions of ruthenium-based prodrugs with tRNA” (INORG-1260, Poster), Brendan Dwyer,‡ Rebecca Josephson,‡ Emily Johnson,‡ Sarah R. Kirk, Karen McFarlane Holman, Pacificchem 2015, Honolulu, HI, December 2015.
2. “Examination of the Binding Interactions of tRNA^{Phe} and NAMI-A in the Presence and Absence of Ascorbate”, Efren Cazares,‡ Sarah R. Kirk, Karen L. McFarlane Holman, Oregon Academy of Sciences Conference, Salem, OR, March 2013.
3. “XAS/DFT investigation of the serum-protein binding site for anticancer compound KP1019” (INOR-548, Oral), Jeffrey K. Weber,‡ and Karen L. McFarlane Holman, 239th National Meeting of the ACS, San Francisco, CA, March 2010.
4. “Year-long integrated biochemistry laboratory: An instrument-intensive approach to the study of biomolecules” (CHED-98, Poster) Sarah R. Kirk, Todd P. Silverstein, J. Charles Williamson, David E. Goodney, Karen L. McFarlane Holman, Andrew P. Duncan, 239th National Meeting of the ACS, San Francisco, CA, March 2010.
5. “Electronic structural investigations of Ru-containing anticancer prodrugs using XANES and DFT” (INOR-796) Travis V. Harris,‡ Robert K. Szilagyi, Karen L. McFarlane Holman, 237th National Meeting of the ACS, Salt Lake City, UT, March 2009.
6. “FTIR Spectroelectrochemical Investigations of the Anti-Cancer Drug NAMI-A” (INOR-, Meredith Roberts,‡ Rachele Fryd,‡ Lea Witkowsky‡ and Karen McFarlane Holman, 235th National Meeting of the ACS, New Orleans, LA, April 2008.
7. “X-ray Absorption and Density Functional Study of the Anticancer Drug NAMI-A and Related Compounds” (CHED-1292), Travis Harris,‡ Karen McFarlane Holman, Robert K. Szilagyi, 233rd ACS National Meeting, Chicago, IL, March 25-29, 2007 and at the ACS Montana Section Meeting, Butte, MT, April 14, 2007.
8. “Integrated Advanced Biochemistry Laboratory: A Case Study Using tRNA(Phe)” (Oral presentation, CHED-262), Sarah R. Kirk, Karen M. Holman, Todd P. Silverstein, 229th ACS National Meeting, San Diego, CA, March 2005.
9. “Using Case Studies of Chemistry in the Real World to Teach Second Semester Introductory Chemistry” (Poster, CHED-252), D.E. Goodney, T.P. Silverstein, K.M. Holman, S.R. Kirk, J.J. Willemsen, and J.C. Williamson, 229th ACS National Meeting, San Diego, CA, March 2005.
10. “Spectroscopic Investigations of Ruthenium Anti-Cancer Drugs” (Poster), Marcella Orwick,‡ Jerry LaRue‡ and Karen McFarlane Holman, 228th ACS National Meeting, Philadelphia, PA, August 2004.
11. “Spectroscopic Investigations of Ruthenium Anti-Cancer Drugs” (Poster), Jerry LaRue,‡ Marcella Orwick‡ and Karen McFarlane Holman, Murdock Regional Undergraduate Research Conference, Tacoma, WA, November 2003.

SERVICE

University Service

Faculty Council (elected), 2021-2023
Interviewer/host for STEM alumni guest on *WU Stream* university podcast, 2020
University Accreditation Committee, 2018-2019
General Chemistry Coordinator, 2018-2019
Institutional Review Board, 2017-2018
Student Scholarship Recognition Day Organizing Committee, 2018
Co-Chair, Departmental Search Committee for Tenure-Track faculty position, 2017
Academic Council (elected), 2015-2016
Chair, Departmental Search Committee for Continuing Non-Tenure Track faculty position, 2015
Standards for Space Committee, 2015
Institutional Marketing Committee, 2014-15
Board of Trustees CLA Committee, 2013-14
Chemistry Department Tenure-track Faculty Search Committee, 2013
Admission Committee, 2012-13
Chemistry Department Chair, 2009-12
Review Committee for tenure denial case (elected), 2012
Keck Fellow, Willamette University, 2011-2013
Willamette University Representative, Faculty Roundtable on Best Pedagogical Practices, supported by the Andrew Mellon Foundation, Reed College, January 21-22, 2011
Faculty Mentor to Assistant Professor Brianne Davila, Sociology, 2011-12
University Accreditation Steering Committee, Representative for Sciences, 2009-11
Advisor to Student Affiliates of the American Chemical Society (Chem Club), 2004-present
Faculty Staff Campaign Committee, 2010
Chemistry Department Tenure-track Faculty Search Committee, 2009-10
Faculty Mentor to Assistant Professor Kathryn Nyman, Mathematics, 2009-10
Economics Department Tenure-track Faculty Search Committee, 2008-09
Diversity Advisor to Physics Department Tenure-Track position searches, 2007-08 and 2008-09
Chair, Faculty Resources Committee, 2007-08
Co-chair, Faculty and Staff Campaign, 2007-08
Faculty Mentor to Assistant Professor Melissa Witkow, Psychology, 2007-08
Session Moderator, Student Scholarship Recognition Day, 2007
Commission on Academic Excellence, 2005-06
Speaker at Willamette's Nike *Encore!* Event, April 2006
Faculty Mentor to Assistant Professor Joyce Millen, Anthropology, 2005-06
Organic Chemistry Tenure-track Faculty Search Committee, 2005-06
First-Year Seminar Disappearing Task Force, 2005
University Librarian Search Committee, 2004
Faculty Resources Committee member, August 2002 – December 2003
Contributor to the development of a grant proposal to the Howard Hughes Medical Institute, "HHMI Program in Integrated Molecular Biosciences" (\$1.3 million; Not funded), 2003

Mini-University lecture, “Metals in the Kettle”, Parent’s Weekend, October 2003
Guest speaker/discussion leader for a Residence Life evening with students, March 2003
Hosted a “Hearth Talk”: an evening with chemistry students, November 2002
Organic Chemistry Tenure-track Faculty Search Committee, 2001-02

Professional Service

GRE Chemistry Subject Test question writer, Educational Testing Service, 2019-present
External Evaluator for the promotion to Full Professor for an Associate Professor of Chemistry at Ursinus College, 2022
Selected as a “VIPER Fellow” as part of an NSF-funded program to create innovative teaching models in Inorganic Chemistry (2020-2023)
Scholarship Review team for the Portland ACS local section (2017-present)
External Evaluator for the tenure and promotion review of an Assistant Professor of Chemistry at Colorado College, 2019
Manuscript Reviewer for submissions to *Inorganic Chemistry*, *Journal of Physical Chemistry*, *Chemistry – A European Journal*, and *Photosynthesis Research*
Grant Reviewer: National Science Foundation and ACS-Petroleum Research Fund
Invited Speaker, “Teaching Science to Girls in Saudi Arabia”, Wallowology Speaker Series, Joseph, OR, January 2017
Invited Panelist, “Teaching STEM in Saudi Arabia”, Middle East Studies Symposium, Lewis & Clark College, Portland, OR, April 2016
First-Week Professor at RSI (Research Science Initiative) program at the University of Dammam, Saudi Arabia, through the Center for Excellence in Education, June 2015 and July 2016
Invited Panelist, Puget Sound Women Chemists Retreat, University of Washington Pack Forest Conference Center, May 2013
External Evaluator for the tenure and promotion review of an Assistant Professor of Chemistry at Lawrence University, Appleton, WI, 2012
Selection Panel, U.S. Professors of the Year Award Program, 2011 and 2012
Research Proposal Reviewer, Stanford Synchrotron Radiation Lightsource at SLAC
Textbook Reviewer, Prentice Hall Publishers
External Evaluator for the tenure and promotion review of an Assistant Professor of Chemistry at St. Lawrence University, Canton, NY, 2009
Contributor, Interactive Online Network of Inorganic Chemists, 2009 to present
Executive Committee Member (elected position), Stanford Synchrotron Radiation Lightsource Users’ Organization, 2006 – 2009
Workshop Organizer (*Introduction to Synchrotron Radiation Workshop*) and Master of Ceremonies for the Poster Presentation Blitz at the Stanford Synchrotron Radiation Lightsource Users’ Conference, Sept. 30 – Oct. 1, 2007

Professional Memberships

Member, Sigma Xi, 2018 – present
Member, Society of Biological Inorganic Chemistry, 2013 – present

Member, Interactive Online Network of Inorganic Chemists, 2008 – present

Member, American Chemical Society, 1990 – present

Community Service

Invited Speaker, “Brilliance in Dark Times: Innovations in Science and Technology during the Great Depression”, Tacoma Art Museum and Hallie Ford Museum of Art, February 2021

Taught free online science camps for elementary school children, September and October 2020

Speaker Coach, TEDxSalem, 2017-18

Invited Co-Presenter, “The Chemistry of Sustainability”, Adult Science Night Series, Gilbert House Children’s Museum, Salem, OR, June 2017

Invited Speaker, “Teaching Girls Science in Saudi Arabia”, Joseph High School, January 2017

Invited Speaker, “Teaching Girls Science in Saudi Arabia”, Enterprise High School, January 2017

TEDxSalem, Breakout Session Presenter, “Fearless Chemistry”, Salem, OR, Oct. 3, 2015

Board member and Volunteer, Howard Street Charter School, 2013 – 2016

Advisory Council (2018-present), Board member (2010-2015), President of the Board (2010-2012), and Founder (2010) of Willamette Information News and Entertainment Service, nonprofit community media group

Community radio programmer and volunteer, KMUZ 88.5 and 100.7 FM, 2006 – present

Volunteer, McKinley Elementary School, 2008 – 2015

Workshop organizer and leader, AAUW-sponsored “Expanding Your Horizons” program for middle school girls to explore careers in science and math, 2009, 2010, 2011

Volunteer, Leslie Middle School Science Mentor Day, 2006, 2007, 2008, 2010

Volunteer, Baker Charter School, 2007 – 2008

Workshop organizer and leader, Houck Middle School Science Outreach Program, 2005, 2006