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Formal Education

- 2002-2004 Camille and Henry Dreyfus Postdoctoral Fellow in the Scholar/Fellow Program for Undergraduate Institutions, Gonzaga University
Advisor: David A. Cleary
- 1995-2002 M.S. and Ph.D. Physical Chemistry, University of Oregon
Research Advisor: Geraldine L. Richmond
- 1991-1995 B. S. Chemistry, Physics, Mathematics, University of Wisconsin-Whitewater
Research Advisor: Kevin J. West
- 1986-1987 Chemistry, Normandale Community College, Bloomington MN
- 1984-1985 Chemistry, Normandale Community College, Bloomington MN
- 1982-1983 Biology, University of Wisconsin-Stevens Point

Professional Experience

- 2012- present Assistant Professor of Chemistry, Franciscan University of Steubenville
Teaching responsibilities include General Chemistry and Laboratory, Physical Chemistry and Laboratory, and development of the University Physics laboratory courses. Research Responsibilities include conducting an ongoing research program suitable for and involving undergraduates at all levels.
- 2012-present Chemical Hygiene Officer for Franciscan University of Steubenville
- 2005-present Reviewer for the Journal of Chemical Education.
- 2007-2012 Assistant Professor of Chemistry, Spring Hill College.
Teaching responsibilities include General Chemistry and Laboratory, Chemistry for non-majors, Physical Chemistry and Laboratory, Advanced Inorganic Chemistry and Laboratory, and Nursing Chemistry. Research Responsibilities include developing a research program suitable for undergraduates. I have had 8 students do work in my lab. One is in graduate school now. Maintain IR, NMR, UV-Vis and ultrapure water system. Member of the Core Development Committee 2008-2011. Faculty advisor for SAACS 2009-2010.
- 2008-2014 Collaborative Research projects with Boise Technology, Inc. Surface tension characterization of nerve agent simulants at liquid interfaces as part of a remediation/clean-up program. Characterization of molecular structure and orientation of polymer surfaces and the same surfaces in the presence of water vapor or nerve agent simulant.
- 2005-2014 Consultant for Boise Technology, Inc. Nonlinear optical spectroscopy at liquid and solid interfaces. Quantum chemical calculations of small molecules on polymer surfaces

- 2004-2007 Assistant Professor of Chemistry, Rocky Mountain College.
Teaching responsibilities included General Chemistry and Laboratory, Physical Chemistry and Laboratory, Analytical Chemistry and Laboratory, and Instrumental Chemistry and Laboratory. The Physical Chemistry sequence alternated with the Analytical/Instrumental sequence. Research Responsibilities included developing a research program suitable for undergraduates. I had two students doing work in my lab. One went on to Pharmacy school, the other to dental school.
- 2002-2004 Dreyfus Postdoctoral Fellow at Gonzaga University.
Teaching responsibilities included one year of physical chemistry (Kinetics, Thermodynamics, and Quantum Mechanics), general chemistry, and team teaching the second semester of the advanced laboratory course. Research included working with undergraduates and high school chemistry teachers in the summer and the development of my own research program in surface science throughout the academic year and summer. I had two students working under my direct supervision in Directed Research.
- 1995-2002 Graduate Research Assistant in Surface Nonlinear Spectroscopy
Includes experience working with picosecond and nanosecond pulsed laser systems to acquire vibrational sum frequency spectra and second harmonic generation data from liquid surfaces, use of optical parametric generation and optical parametric amplification to generate tunable infrared, and surface tension measurements to quantify molecular surface densities.
- 1999-2000 Graduate Teaching Assistant for Physical Chemistry Laboratory
Duties included full responsibility for a number of experiments each term which required extensive one on one interaction with each student, and the teaching of formal laboratory procedures and formal report writing.
- 1995-1996 Graduate Teaching Assistant for General Chemistry Laboratory
Duties included laboratory supervision and grading of reports, quizzes and exams.
- 1993-1995 Undergraduate Research in Synthesis and Characterization of a new Chelating Ligand. Characterization involved FTIR, NMR, and UV-Vis spectroscopies. The ligand was also examined for its sensitivity to, and selectivity for many transition metals.
- 1985 Co-operative education in Geography at The Science Museum of Minnesota for one quarter. Catalogued invertebrates from Dr. Samuel Eddy's collection and collected and identified invertebrates from the wild as part of a geographical survey of the invertebrates of Minnesota.

Education Conferences and Workshops Attended

Biennial Conference on Chemical Education (BCCE) Notre Dame IN August 2018.
5th Annual CSU Regional Chemistry Teaching Symposium, Cleveland OH, March 17 and 18, 2016

4th Annual CSU Regional Chemistry Teaching Symposium, Cleveland OH, March 12 and 13, 2015
 ACS Spring Meeting Dan Diego CA March 2012 (Symposia in the Division of Chemical Education).
 ACS Fall Meeting Denver CO August 2011 (Symposia in the Division of Chemical Education).
 ACS Spring Meeting Anaheim CA March 2011 (Symposia in the Division of Chemical Education).
 Biennial Conference on Chemical Education (BCCE) Denton TX August 2010.
 Biennial Conference on Chemical Education (BCCE) Bloomington IN July 2008.
 POGIL (Process Oriented Guided Inquiry Learning) one-day introductory workshop. Oxford MS May 2008.
 ACS Spring Meeting New Orleans LA April 2008 (Division of Chemical Education).
 One-day workshop on TEAM teaching. Biggio Center at Auburn University February 08, 2008.
 ICUC FYI Chem Conference May 2005 Champaign-Urbana IL. (The International Center for First-Year Undergraduate Chemistry Education)

Training Seminars and Workshops Attended

Educause 2017, Philadelphia PA, 10/31 – 11/3 2017
 EdSpaces 2016, Cincinnati OH, November 2-3, 2016
 Computational Biophysics Workshop sponsored by NSF, Beckmann Institute, University of Illinois at Urbana Champaign, Urbana IL, October 17-21, 2016
 "Hands-on" Workshop on Computational Biophysics sponsored by NSF, University of Pittsburgh, Pittsburgh, PA, June 1-5, 2015
 Grant Writing Institute Workshops (NSF and NIH) Cleveland OH, April 14 and 15, 2014
 Perkin Elmer Materials Characterization Workshop: Choosing the Right Instrument and Electronic Record Keeping, Baton Rouge, LA March 2012
 Grant Writing Institute Seminar Missoula MT Summer 2006
 2-D NMR Training Billerica MA summer 2005
 Department Chair Workshop, Murdoch Undergraduate Research Conference Northwest Nazarene Nampa ID Fall 2005
 NSF Grant Writing Workshop (one-day) Rapid City SD Fall 2004

Honors and Awards

Spectroscopy Society of Pittsburgh: College Equipment Grant. March 2017 \$6000 toward a new UV-Vis spectrometer.
 Spectroscopy Society of Pittsburgh: College Equipment Grant. March 2013 \$6000 toward a new NMR spectrometer.
 Summer Research proposal funded (\$6500) by the Faculty Development and Welfare Committee and a friend of the Department of Chemistry and Physics, Spring Hill College (Summer 2009)
 Course development proposal (\$2500) funded by the Faculty Development and Welfare Committee, Spring Hill College (Summer 2008)
 Camille and Henry Dreyfus Supplemental Award (\$10,000 for Research) under the Scholar Fellow Program 2005
 Camille and Henry Dreyfus Fellow 2002-2004.
 Travel scholarship to the Spring 2000 ACS National Meeting to present a poster.
 Travel scholarship to the 2000 Western Spectroscopy Association meeting to present a contributed paper.

Undergraduate research grant from the University of Wisconsin-Whitewater to purchase supplies and to attend NCUR 95.

Publications

- (1) "Probing Polymer/Vapor Interfaces with a Broad Bandwidth Vibrational Sum Frequency Spectrometer." Davis, P. H., Muñoz, B., McCann, C. P., Sluss, D. R. B., Watry, M. R., Scatena, L. F., Hill, M. W., *submitted to Applied Spectroscopy*
- (2) Revised "Beyond Our Solar System" in Earth Science 13th ed. Tarbuck, E. J., Lutgens, F. K., Pearson Education Inc., 2011.
- (3) Revised "The Nature of Our Solar System" and "Beyond Our Solar System" for Foundations of Earth Science 6th ed. Tarbuck, E. J., Lutgens, F. K., Pearson Education Inc., 2011.
- (4) Revised "Matter and Minerals" and "Planetary Geology" in Earth: An Introduction to Physical Geology 10th ed. Tarbuck, E. J., Lutgens, F. K., Pearson Education Inc., 2010.
- (5) Revised "Origins of Modern Astronomy," "Touring Our Solar System," "Light, Astronomical Observations, and the Sun," and "Beyond Our Solar System" in Earth Science 12th ed. Tarbuck, E. J., Lutgens, F. K., Pearson Education Inc., 2009.
- (6) Revised "Planetary Geology" in Earth: An Introduction to Physical Geology 9th ed. Tarbuck, E. J., Lutgens, F. K., Pearson Education Inc., 2008.
- (7) "Vibrational Sum-Frequency Spectroscopic Investigations of Molecular Interactions at Liquid/Liquid Interfaces" in Interfacial Nanochemistry. Watry, M. R., Richmond, G. L., Kluwer Academic/Plenum Publishers, H. Watarai, Ed. 2005, 25-58.
- (8) "Vibrational Sum-Frequency Studies of a Series of Phospholipid Monolayers and the Associated Water Structure at the Vapor/Water Interface." Watry, M. R., Tarbuck, T. L., Richmond, G. L., *J. Phys. Chem. B.* 107(2), (2003), 512-518.
- (9) "Orientation and Conformation of Amino Acids in Monolayers Adsorbed at an Oil/Water Interface As Determined by Vibrational Sum-Frequency Spectroscopy." Watry, M. R., Richmond, G. L., *J. Phys. Chem. B.* 106(48), (2002), 12517-12524.
- (10) "The Effects of Halothane on Phosphatidylcholine, -ethanolamine, -glycerol, and -serine Monolayer Order at a Liquid/Liquid Interface." Watry, M. R., Richmond, G. L., *Langmuir* 18(23); (2002) 8881-8887.
- (11) "Probing Molecular Structure at Liquid Surfaces with Vibrational Sum Frequency Spectroscopy." Watry, M. R., Brown, M. G., Richmond, G. L., *Appl. Spect.* (2001) 55(10), 321A-340A.
- (12) "Comparison of the Adsorption of Linear Alkanesulfonate and Linear Alkylbenzenesulfonate Surfactants at Liquid Interfaces." Watry, M. R., Richmond, G. L., *J. Am. Chem. Soc.* (2000), 122(5), 875-883.

Contributed Talks and Presentations on Research

“Vibrational Sum Frequency spectra of low concentrations of surfactant show large interference effects in the in the CH stretching region which suggests that acquiring a wide spectral range is necessary for accurate data analysis” M.R. Watry, B. Fellingner, 48th Central Regional Meeting of the American Chemical Society, Dearborn, MI, June 9th 2017.

“Vibrational Sum Frequency intensities from terminal methyl groups are significantly different in compact monolayers of long chain N-acylated (stearoyl) amino acids due to amino acid head-group effects on chain ordering” M.R. Watry, J. Fera, 48th Central Regional Meeting of the American Chemical Society, Dearborn, MI, June 9th 2017.

“The surface structure of PEG (polyethylene glycol) hydrogels and peptide functionalized hydrogels as examined by VSFG spectroscopy” M.R. Watry, J. McGee, R. Asawa, H. Baca, D. Schmitt, D. Doroski, 47th Central Regional Meeting of the American Chemical Society, Covington, KY, May 19th 2016.

“Using multiple Approaches to Meet Diverse Needs in the General Chemistry Lecture Course” M. R Watry; 5th Annual CSU Regional Chemistry Teaching Symposium, Cleveland, OH, March 18, 2016.

“Stem Cell Delivery from Poly(ethylene glycol) Dimethacrylate Hydrogels - A Band-Aid Approach” R. Asawa, J. McGee, D. Schmitt, H. Baca, M. R. Watry, D. Doroski; 2015 Biomedical Engineering Society Annual Meeting, Tampa FL October 2015.

“Transient Mesenchymal Stem Cell Adhesion To Poly(ethylene glycol) Dimethacrylate Hydrogels” J. McGee, R. Asawa, H. Baca, D. Schmitt, M. R. Watry, D. Doroski; 2015 Biomedical Engineering Society Annual Meeting, Tampa FL October 2015.

“Surface properties of long acyl chains with amino acid head groups at aqueous interfaces investigated with the Wilhelmy plate method and nonlinear optical spectroscopy” B. Sweeney, S. Wilson, M.R. Watry, Joint Great Lakes Central Regional Meeting of the American Chemical Society, Grand Rapids MI, May 29, 2015.

“Improving scientific thinking and writing in the general chemistry laboratory” M. R Watry; 4th Annual CSU Regional Chemistry Teaching Symposium, Cleveland, OH, March 12, 2015.

“Presentation of the peptide sequence, RGD, (arginine, glycine, aspartic acid) tethered to polyethylene glycol hydrogels as examined by VSFG spectroscopy” D. Schmitt, R. Asawa, J. McGee, H. Baca, D. Doroski, M. R. Watry; 45th Central Regional Meeting of the American Chemical Society, Pittsburgh, PA, October 2014.

“Effects of the inhalation anesthetic halothane on the conformation and orientation of lipids in lipid monolayers at water interfaces examined by VSFG spectroscopy” M. Williams, M. R. Watry; 45th Central Regional Meeting of the American Chemical Society, Pittsburgh, PA, October 2014.

“Orientation and conformation of surfactants with amino acid head groups at aqueous interfaces investigated with VSFG spectroscopy” S. Wilson, M. Silva, M. Williams, L. Clark, M. R. Watry; 45th Central Regional Meeting of the American Chemical Society, Pittsburgh, PA, October 2014.

“VSFG Spectra of Surfactants with Amino Acid Head Groups, and Lipids at Aqueous Interfaces,” Watry, M. R., Wilson, S., and Yeager, R., 246th National American Chemical Society Meeting, Indianapolis, IN, September 2013.

“Humidity-dependent surface structural changes of polyvinyl amine, polyvinyl alcohol, and polyvinyl chloride,” Scatena, L. F., Tarbuck, T. L., Watry, M. R., Hill, M. W., 245th National American Chemical Society Meeting, New Orleans, LA, April 2013.

“Properties of Novel Amino Acid Derivatives at the Air/Water and Oil/Water Interface,” Watry, M. R., Levi, Z., 227th National American Chemical Society Meeting, Anaheim, CA, March 2004.

“Fluorescence and X-ray Studies of Rare Earth Thiophosphates,” Watry, M. R., Jacobsen, C., Haag, J., Cleary, D., 51st Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 2004.

“The effects of halothane on phospholipids monolayer order at a liquid/liquid interface,” Watry, M. R., Richmond, G. L., 58th Northwest Regional American Chemical Society Meeting, Bozeman, MT, June 2003.

“The effects of halothane on model cell membranes composed of 1) zwitterionic phospholipids and 2) charged phospholipids,” Watry, M. R., Richmond, G. L., 50th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 2003.

“Vibrational Sum-Frequency Spectroscopic Studies of a Series of Phospholipid Monolayers and the Associated Water Structure at the Vapor/Water Interface,” Tarbuck, T. L., Watry, M. R., Richmond, G. L., 57th Northwest Regional American Chemical Society Meeting, Spokane, WA, June 2002.

“Conformation of Biologically Relevant Molecules at the Air/Water and Oil/Water Interfaces Determined by Vibrational Sum Frequency Spectroscopy”, Watry, M. R., Richmond, G. L., 49th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 2002.

“Conformation of Various Phospholipid Monolayers at the Air/Water Interface Probed by Vibrational Sum Frequency Spectroscopy”, Tarbuck, T. L.; Watry, M. R., Richmond, G. L., 49th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 2002.

“Nonlinear Optical Studies of Alkylbenzenesulfonate Adsorbed at Liquid/Liquid and Air/Liquid Interfaces”, Watry, M. R., Richmond, G. L., Gonzaga University, Spokane WA, February 2001.

“Vibrational Sum Frequency Spectroscopy Studies of Biological Molecules at an Oil/Water Interface”, Watry, M. R., Richmond, G. L., 48th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 2001.

“Vibrational Sum Frequency Spectroscopy Studies of Phospholipids at Liquid Surfaces”, Watry, M. R., Richmond, G. L., 219th National American Chemical Society Meeting, San Francisco, CA, March 2000.

“Monolayer Structure and Molecular Conformation of Sodium Dodecylbenzenesulfonate at Liquid Interfaces Investigated with Vibrational Sum-Frequency Spectroscopy”, Watry, M. R., Richmond, G. L., 47th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 2000.

“Nonlinear Optical Studies of Alkylbenzenesulfonate Adsorbed at Liquid/Liquid and Air/Liquid Interfaces”, Watry, M. R., Richmond, G. L., 54th Northwest Regional American Chemical Society Meeting, Portland, OR, June 1999.

“Nonlinear optical studies of alkylbenzenesulfonate adsorbed at liquid/liquid and air/liquid interfaces”, Watry, M. R., Richmond, G. L., 217th National American Chemical Society Meeting, Anaheim, CA, March 1999.

“Nonlinear Optical Studies of Alkylbenzenesulfonate Adsorbed at Liquid/Liquid Interfaces”, Watry, M. R., Richmond, G. L., 46th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 1999.

“Structure of Linear Dodecylbenzene Sulfonate at the Air/Water Interface as Probed by Sum Frequency Vibrational Spectroscopy”, Watry, M. R., Richmond, G. L., 45th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 1998.

“Adsorption of Sulfonate Surfactants at Liquid Interfaces”, Watry, M. R., Gragson, D. E., Walker, R.A., Richmond, G.L., 52th Northwest Regional American Chemical Society Meeting, Moscow, ID, June 1997.

“Structure of Linear Dodecylbenzene Sulfonate at the Air/Water Interface as Probed by Sum Frequency Vibrational Spectroscopy”, Watry, M. R., Richmond, G. L., 44th Annual Western Spectroscopy Association Meeting, Asilomar, CA, January 1997.

“Preparation and Preliminary Studies of 2,2'-Pyridil-Bis-((Carboxymethyl)Trimethylammonium Chloride Hydrazone) as a Transition Metal Ion Complexing Ligand”, Watry, M. R., West, K. J., 9th National Conference on Undergraduate Research, Schenectady, NY, April 1995.

“Preparation and Preliminary Studies of 2,2'-Pyridil-Bis-((Carboxymethyl)Trimethylammonium Chloride Hydrazone) as a Transition Metal Ion Complexing Ligand”, Watry, M. R., West, K. J., 24th Annual Wisconsin Undergraduate Research Symposium in Chemistry, Ripon, WI, April 1994.

Professional Societies and Community Involvement

American Chemical Society 20 years of service (also a member of the divisions of Physical Chemistry and Chemical Education)

Spectroscopy Society of Pittsburgh member from October 2014-present

Treasurer of the Mobile section of the American Chemical Society 2008–2012

Alternate Councilor for the Mobile section of the American Chemical Society January 2011–August 2012

Society of Physics Students member since 1993

American Association for the Advancement of Science 2011–Present

Boy Scouts of America

Cubmaster Pack 401, Holy Family Church, February 2015- present

Den Leader Pack 401, Holy Family Church, August 2014-present

Round Table Commissioner, Two Chief's District, Ohio River Valley Council, May 2016-present

Assistant Scoutmaster Troop 401, Holy Family Church, September 2016-present

District Committee member at large, Two Chief's District, Ohio River Valley Council, May 2016-present