Mark J. Waner

Associate Professor of Chemistry, Director Woodrow Wilson Ohio Teaching Fellowship Program
John Carroll University
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Education:

1998 Ph.D. Physical Chemistry Michigan State University
Imaging the Molecular Dimensions and Oligomerization of Proteins at Liquid/Solid Interfaces
1993 M.S. Physical Chemistry Michigan State University
Characterization of the Sol-Gel and MOCVD Processes for the Deposition of Aluminum Oxide Thin Films
1991 B.S. Chemistry John Carroll University

Academic Positions:

2010-present	Director, Woodrow Wilson Ohio Teaching Fellowship Program JCU	
2009-2010	Director, Center for Faculty Development	John Carroll University
2008-present	Associate Professor	John Carroll University
1999-2008	Assistant Professor	John Carroll University
1998-1999	Assistant Professor	Spring Hill College

Chemistry courses taught: General Chemistry, Chemical Principles (Honors), Physical Chemistry, Chemical Kinetics, Chemistry in Society.

Courses for pre-service and in-service teachers: Interdisciplinary Science (pre-service, early childhood), Science & Technology (in-service, middle school teachers), Explorations in Science Content & Pedagogy, Professional Development Seminar (student teaching).

Other Employment Experience:

2000-present	Science Education & Outreach Consultant	
1998	Asst. Cross Country Coach	Spring Hill College
1991-1997	Teaching Assistant	Michigan State University
1991-1995	Substitute Teacher	L.M. Powers Catholic High School
1990-1991	Lab Technician	Buick-Olds-Cadillac Group
1989-1990	Lab Technician	Glidden Co.

Awards & Honors:

2009	Technical Achievement Award, Cleveland Technical Societies Council
2007	American Chemical Society (ACS), Cleveland section Salutes to Excellence for service to National Chemistry Week (NCW) activities.
2006	Lucrezia Culicchia Award for Teaching Excellence, College of Arts & Sciences, John Carroll University (JCU).
2006	Excellence in Ohio Education Memorable Educators, Ohio Magazine
2003	Cleveland ACS Salutes to Excellence Award for contributions to NCW. Presented to myself and the JCU ACS Student Affiliates.
2002	Northern Ohio Live Achievement Awards finalist for Community Service.
2000	Honorable mention, JCU ACS Student Affiliates Chapter (co-advisor).
1998	Tracy A. Hammer Graduate Student Award for Professional Development, College of Natural Science, Michigan State University (MSU)
1998	Excellence-in-Teaching Award, College of Natural Science, MSU
1998	Continuing Fellowship, College of Natural Science, MSU
1998	Walter and Margaret Yates Memorial Scholarship, Dept. of Chemistry, MSU
1994-1997	Merit Level Teaching Assistant, Dept. of Chemistry, MSU

Peer-Reviewed Publications:

2010 Mascotti, D.P.; Waner, M.J., *Complementary Spectroscopic Assays for Investigating Protein-Ligand Binding Activity: A Project for the Advanced Chemistry Laboratory*, J. Chem. Educ., 87 (7), 735–738. (DOI: 10.1021/ed100199j).

2010 Nichols, M.A., Waner, M.J., *Kinetic and Mechanistic Studies of the Deuterium Exchange in Classical Keto-Enol Tautomeric Equilibrium Reactions*, J. Chem. Educ., *87* (9), 952–955 (DOI: 10.1021/ed100292r).

2010 Waner, M.J., *Particulate Pictures and Kinetic Molecular Theory Concepts: Seizing an Opportunity*, J. Chem. Educ., 87 (9), 924–927 (DOI: 10.1021/ed100304q).

2008 Waner, M.J., Mascotti, D.P. *A Simple Spectrophotometric Streptavidin-Biotin Binding Assay Utilizing Biotin-4-Fluorescein*, J. Biochem. Biophys. Methods, 70, 873-877. (DOI 10.1016/j.jbbm.2007.06.001).

2004 Waner, M.J., Navrotskaya, I., Bain, A. Oldham, E. D. and Mascotti, D. P., *Thermal and sodium dodecylsulfate induced transitions of Streptavidin*, Biophys. J., 83, 2701-2713.

1998 Choi, K., -S., Patschke, R., Billinge, S. J. L., Waner, M. J., Dantus, M. and Kanatzidis, M., G., *Charge density wave caused by reducing $ThSe_3$ by one electron. Superstructure and Short-Range Order in ATh_2Se_6 (A=K,Rb) Studied by X-ray Diffraction, Electron Diffraction and Diffuse Scattering*, J. Am. Chem. Soc., 120(41), 10706-10714.

1998 Waner, M.J., Gilchrist, M., Schindler, M., Dantus, M. *Imaging the molecular dimensions and oligomerization of proteins at liquid/solid interfaces*, J. Phys. Chem. B, 102, 1649-1657.

Scholarly Presentations:

2011 Malfouz, G., Waner, M.J., Nichols, M.A. *Solvent and Concentration Effects on the Thermodynamics of the Keto-Enol Equilibrium of Ethyl Acetoacetate and Acetylacetone*, OFIC Undergraduate Research Symposium, Columbus, OH, Feb. 16.

2009 Nichols, M.A., Waner, M.J. *Kinetic and Mechanistic Studies of the Deuterium Exchange in Classical Keto-Enol Tautomeric Equilibrium Reactions*, ACS Central Regional Meeting, Cleveland, OH, May 20-23.

2008 Waner, M.J., Mascotti, D.P. *Novel protein-ligand assay as the basis for an advanced laboratory project* 236th American Chemical Society National Meeting, Philadelphia, PA, August 17.

2008 Waner, M.J., Nichols, M.A. *Kinetic and Mechanistic Studies of β-Dicarbonyls Undergoing Deuterium Exchange with CD_3OD: Classical Keto-Enol Tautomerism Revisited* 236th American Chemical Society National Meeting, Philadelphia, PA, August 17.

2008 Ponyik, C., Waner, M.J. *Is the Binding of Biotin to Streptavidin Cooperative?*, Cleveland ACS Meeting in Miniature, March 19.

2007 Nichols, M.A., Waner, M.J. *Kinetic and Mechanistic Studies of the Deuterium Exchange in Classical Keto-Enol Tautomerism Equilibrium Reactions* ACS Central Regional Meeting, Covington, KY, May 20-23.

2006 Mustovich, A.T., Patel, S., Waner, M.J. and Mascotti, D.P. *Intrinsic Tryptophan Fluorescence as a Structural Probe of the Streptavidin-Biotin System*, ACS Central Regional Meeting and 39th Silicon Symposium, Frankenmuth, MI, May 16-21.

2006 Mustovich, A.T., Patel, S., Waner, M.J. and Mascotti, D.P. *Intrinsic Tryptophan Fluorescence as a Structural Probe of the Streptavidin-Biotin Interaction*, Cleveland ACS Meeting in Miniature, Cleveland State University, March 15.

2003 Waner, M.J., *Streptavidin: A New Look at an Important Biotechnology Tool*, Chemistry Department seminar, University of Detroit-Mercy, Nov. 10.

2003 Waner, M.J., *Reversibility of Thermal Denaturation of Streptavidin in the Presence of SDS***,** 35th Great Lakes Regional Meeting of the American Chemical Society, Loyola University of Chicago (May).

2002 Waner, M.J., *Examining Protein Structure and Orientation at the Solid/Liquid Interface Using Atomic Force Microscopy*, Department of Physiology & Biophysics, Case Western Reserve University, Sept. 30.

2002 Oldham, E.D., Waner, M.J. and Mascotti, D.P. *Thermodynamics of Streptavidin***,** Ohio-Michigan NSF-REU Undergraduate Research Poster Session, Kent State University.

2002 Sterk, L. and Waner, M.J. *Analysis of Valerate modified aluminum isopropoxide as a precursor for sol-gel formation of alumina films*, Meeting in Miniature, Cleveland Section of the American Chemical Society, Case Western Reserve University.

2002 Kopp, K. and Waner, M.J. *Examination of the Sol-Gel Process Using Carboxylate Modified Aluminum Isopropoxide Precursors*, Meeting in Miniature, Cleveland Section of the American Chemical Society, Case Western Reserve University.

2001 Shami, N. and Waner, M.J. *Analysis of Lysozyme Thin-films at the Solid/Liquid Interface***,** Ohio-Michigan NSF-REU Undergraduate Research Poster Session, John Carroll University.

2001 Bain, A., Waner, M.J. and Mascotti, D.P. *Identifying the Heterogeneity in Commercial Preparations of Streptavidin Using Polyacrylamide Gel Electrophoresis (PAGE),* Ohio-Michigan NSF-REU Undergraduate Research Poster Session, John Carroll University.

2001 Navrotskaya, I., Waner, M.J. and Mascotti, D.P. *Imaging Streptavidin at the Mica/Water Interface by Atomic Force Microscopy*, Meeting in Miniature, Cleveland Section of the American Chemical Society, Ursuline College.

2001 Polyvos, D., Waner, M.J. and Mascotti, D.P. *Imaging the Molecular Dimensions of Lysozyme at the Solid/Liquid Interface by Atomic Force Microscopy***,** Meeting in Miniature, Cleveland Section of the American Chemical Society, Ursuline College.

2001 Bellar, J. and Waner, M.J. *Measurement of Concanavalin A Structure at the Solid/Liquid Interface***,** Meeting in Miniature, Cleveland Section of the American Chemical Society, Ursuline College.

2000 Bellar, J. and Waner, M.J. *Imaging the Molecular Dimensions of Concanavalin A at the Solid/Liquid Interface by Atomic Force Microscopy*, Fall Science and Mathematics Research Poster Session, JCU.

2000 Navrotskaya, I., Waner, M.J. *Imaging Streptavidin at the Mica/Aqueous Interface by Atomic Force Microscopy*, Fall Science and Mathematics Research Poster Session, JCU.

2000 Polyvos, D., Waner, M.J. *Imaging the Molecular Dimensions of Lysozyme at the Solid/Liquid Interface by Atomic Force Microscopy*, Fall Science and Mathematics Research Poster Session, JCU.

2000 Bellar, J., Waner, M.J., *Examination of Concanavalin A Structure at the Solid/Liquid Interface by Atomic Force Microscopy*, NSF-REU poster session at 16th BCCE, University of Michigan, Ann Arbor, MI.

1998 Waner, M.J., Schindler, M., Dantus, M. *Imaging the molecular dimensions and oligomerization of proteins at liquid/solid interfaces*, American Chemical Society National Meeting, Dallas, TX.

1997 Waner, M.J., Schindler, M., Dantus, M. *Investigation of protein structure at the solid/liquid interface with AFM*, Microscopy & Microanalysis '97, Cleveland, OH.

1996 Waner, M.J., Dantus, M. *Electrodeposition enhancement of sample adsorption for atomic force microscopy*, Center for Fundamental Materials Research Symposium, Michigan State University.

1995 Askeland, P.A., Waner, M.J., Ledford, J.S. *Synthesis and characterization of organically modified aluminum thin films*, American Vacuum Society Regional Meeting, Ann Arbor, MI.

1995 Stanley, J.G., Waner, M.J., Dantus, M. *Design and evaluation of a near-field scanning optical microscope (NSOM)*, Center for Fundamental Materials Research Symposium, Michigan State University.

1995 Stanley, J.G., Waner, M.J., Gilchrist, M., Dantus, M. *Design of a near-field optical scanning microscope using atomic force microscope cantilever probes*, International Symposium on Molecular Spectroscopy, The Ohio State University.

1994 Waner, M.J., Gilchrist, M., Stanley, J.G., Dantus, M. *Atomic force microscopy and confocal microscopy of inorganic/organic mayered materials*, Center for Fundamental Materials Research Symposium, Michigan State University.

1990 Waner, M.J., Harvath, P. *Analysis of water for trace organic pollutants*, General Motors Materials Analysis Committee Conference.

Other Science Education Publications & Presentations:

2010-2011 Waner, M.J. *The Nature of Matter: What a Gas*, Invited workshop at Science Education Summit at Ideastream, Cleveland, OH, Oct. 21 & .

2010 Panel Discussion of the new Ohio K-12 Science Standards, invited panelist, Science Education Summit at Ideastream, Cleveland, OH, Oct. 21.

2007 Waner, M.J. *What a Gas! Getting at the Nature of Science through Data, Demonstration and Historical Context*, Invited keynote at Cleveland Regional Council of Science Teachers Fall Conference, Oct. 13.

2006 Whitworth, F.A. and Waner, M.J., *DNA Analysis laboratory workshop*, Forensic Science Teachers Symposium at the Cleveland Museum of Natural History.

2003 Wollyung, K. , Fox, P.G., and Waner, M.J., *The Chemistry of the Earth's Atmosphere and Beyond*, Cleveland Regional Council of Science Teachers Fall Conference, Cleveland Botanical Gardens.

2002 Wollyung, K., Kuhns, L. and Waner, M. J.*: Rub-A-Dub Chemistry in the Tub: A Hands-on Program*, Cleveland Regional Council of Science Teachers Fall Conference, Great Lakes Science Center.

2001 Waner, M.J. *What Everyone Should Know About Science: Some Thoughts on Science Literacy*, Keynote Address, Bridging Junior High and High School Science, Diocese of Cleveland.

2001 Waner, M.J. *Connections Between Chemistry and Biology*, Cleveland Regional Council of Science Teachers Fall Conference, Cleveland Museum of Natural History.

2001 Fox, P.G., Waner, M.J. and Kuhns, L. *State of the Art Chemistry: A Hands-on Experience*, Cleveland Regional Council of Science Teachers Fall Conference, Cleveland Museum of Natural History.

2002-07 Waner, M.J. and Nichols, M.A. *Polymers: A Hands-on experience*, Science Saturday, Shaker Heights Middle School.

2001-02 Waner, M.J. and Ruhoff, P. *Polymers: A Hands-on experience*, Science Saturday, Shaker Heights Middle School.

1998 Waner, M.J., Bier, J., Lavine', G., Martin, R., Marcus, R.S. *A Hands-on DNA Workshop for High School Students*, American Chemical Society National Meeting, Dallas, TX.

1998 Uzelmeier, C.E. Bercik, D., Lavine, G., Marcus, R.S., Waner, M.J. *Science Theatre: A Student Outreach Organization***,** American Chemical Society National Meeting, Dallas, TX.

1998 Waner, M.J., Brown, E.J. *Science Theatre a Resource for the Community*, Michigan Science Teachers Association Conference, Detroit, MI.

1997 Marcus, R.S., Uzelmeier, C.E., Waner, M.J. *Demonstrations for Outreach*, Great Lakes College Chemistry Conference, East Lansing, MI.

1997 Waner, M.J., Wilkinson, C., Snyder, E.J., Dewees, S., Li, J., Duggan-Haas, D. *Light, lasers and optics workshop*, CLONLARA National Home School Conference, East Lansing, MI.

1996 Abbett, W.P., Batch, D., Gardner, M.T., Heese-Peck, A., Snyder, S., Uzelemeier, C., Waner, M.J. *From Stardust to Life: a Cosmic Journey*, multimedia planetarium show tracing the history of DNA. Released internationally in 1998.

1996 Waner, M.J., Miller, C., Uzelmeier, C., Pasco, S. *Polymers workshop*, CLONLARA National Home School Conference, East Lansing, MI.

1996 Gardner, M.T., Miller, C., Waner, M.J. *Getting your hands into science: presenting science to all ages*, Michigan Science Teachers Association Annual Meeting, Lansing, MI.

Numerous demonstration and hands-on presentations to K-12 students since 1994

Funded Grants:

2008 Waner, M.J. and Student Affiliates of the ACS at JCU, *Undergraduate Programming at Regional Meetings grant for the 41st Central Regional Meeting*, $2800 from the American Chemical Society.

2001 Mascotti, D.P., Nichols, M.A., Waner, M.J., *Acquisition of Isothermal Titration and Differential Scanning Calorimetry Instruments*, $97,378 from the Major Research Instrumentation program of the National Science Foundation.

2001 Waner, M.J., Mascotti, D.P. *Integration of fluorescence spectroscopy into chemistry teaching and research*, $20,000 from the Camille and Henry Dreyfus Special Grant Program in the Chemical Sciences.

2000 & 2001 Summer Research Fellowship, The Graduate School, John Carroll University, $5000 each of two summers.

Other Technical Skills:

In my teaching and research I've utilized a wide range of instrumentation, including: AFM, electrophoresis, DSC, FTIR, NMR, UV-vis and fluorescence spectroscopy, and GC.

I have administered a web server and maintained a 20 PC computer lab as well as various instruments. I have experience using Office 2007 products, Canvas, Origin, Gaussian 98, and Spartan, and programming in Fortran and Visual Basic.

Consulting and Related Activities:

2008	**Writer**, electricity and magnetism chapter for a middle school text book for Holt McDougal.
2008-2009	**Facilitator**, online professional development course for 6-8th grade science teachers through iDiscovery project at Miami University.
2007	**Scientific expert and presenter**, series of three online workshops for high school teachers, Education Development Center, Inc.
2006-2009	**Planning team member, presenter**, Partnering for Success 6-8th grade science professional development program. Collaboration between Cleveland State University, Case Western Reserve University and John Carroll University.
2005-2011	**Science fair project mentor**, >8 local H.S. and middle school students
2002-present	**Presenter**, of professional development for K-12 science teachers.
2000-2007	**Textbook/supplement reviewer**, McGraw Hill, Prentice Hall and Thomson-Brooks/Cole.
1998-present	**Science Fair Judge**, local schools, regional and international competitions
1997-2002	**Reviewer of Tested Demonstrations,** Journal of Chemical Education
1996-97	**Undergraduate Chemistry and Laboratory Policies Committee**, MSU.
1996	**Computer Animation Producer,** planetarium show (see other publications)
1991-98	**Assistant**, Chemistry lab competition, Science Olympiad State Finals (MI).

Other Significant University Activities:

2011-2013 **Ignatian Colleagues Program**, 18 month program exploring and learning about Jesuit education and spirituality. Participants are invited to the program by the president of the university.

2009-present **Member**, Rank, Tenure and Promotion committee.

2009-present **Chair**, Advisory board for Center for Mathematics & Science Education Teaching & Technology.

2008-2011 **Member**, Committee on Undergraduate Enrollment.

2007-2008 **Secretary and Divisional Representative**, Faculty Council JCU.

2006-2007 **Member**, Faculty Forum ad hoc committee on Academic Advising

2005-2006 **Faculty representative,** Vice President for Enrollment search committee

2001-2002 **Chair**, Huntington Summer Undergraduate Research committee.

2003-2008 **Member**, Advisory board for Center for Teaching and Learning.

2002-2009 **Member**, Advisory board for Center for Mathematics & Science Education Teaching & Technology.

2002-2003 Played a key role in development and initial planning of JCU science portion of NSF-MSP grant with CMSD, CWRU and CSU.

2002 **Co-PI**, NSF Research Experience for Undergraduates supplement grant for scientific ethics. Administered program involving development for faculty and training of students.

2001-2007 **Invited Attendee**, Mission and Identity focused conferences: three Heartland-Delta Faculty Conversations, Heartland-Delta IV and V and Collegium.

1999-2009 **Co-advisor**, JCU Student Affiliates of the American Chemical Society

1999-present **Admissions office support**, Substantive participation in efforts to recruit students..

1999-present **Academic advising**, New student orientation, Freshman-sophomore and transfer students as well as chemistry majors.

1992, 97-98 **Dept. of Chemistry Advisory Committee**, Michigan State University

1995-96 **Chemistry Director, Science Theatre**, Michigan State University

1992 **President, Chemistry graduate student council**, Michigan State University

Professional Affiliations:

American Chemical Society (ACS)

2011-present **Director**, Cleveland section

2008-2010 **Alternate Councilor**, Cleveland section

2008-2009 **Undergraduate Program Chair**, Central Regional Meeting of the ACS (CERMACS).

2008-2009 **Co- Chair Poster Sessions**, CERMACS.

2003-present **Webmaster,** Cleveland section

2003 **Secretary,** Cleveland section

2000-present **National Chemistry Week Committee**, Cleveland Section

2000-2009 **Student Affiliates Chair**, Cleveland Section

Cleveland Regional Council of Science Teachers (CRCST)

2009-2010 **President**

2008-2009 **President elect**

2000-present **Board Member**

Council of Undergraduate Research (CUR)

National Science Teachers Association (NSTA)