J. Will Medlin

Site Director, Colorado Center for Biorefining and Biofuels
Fellow, Renewable and Sustainable Energy Institute
Associate Professor and Associate Chair
Department of Chemical & Biological Engineering
University of Colorado
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EDUCATION: University of Delaware
Ph.D. in Chemical Engineering, May 2001
Advisor: Prof. Mark Barteau

Clemson University
B.S. in Chemical Engineering, May 1996

APPOINTMENTS:

University of Colorado, Dept. of Chemical and Biological Engineering, Boulder, CO
Associate Professor, 2010-present
Associate Chair, July 2012-present
Associate Department Chair, 2012-present
Assistant Professor, 2003-2010

Swiss Federal Institute of Technology, Zurich, Switzerland
Visiting Professor, 2010-2011

Sandia National Laboratories, Livermore, CA
Postdoctoral Fellow, 2001-03

Eastman Chemical Company; Kingsport, Tennessee
Co-op and summer technical employee, 1992-96

HONORS AND AWARDS:

- College of Engineering Hutchinson Teaching Award, 2009
- Boulder Faculty Assembly Teaching Excellence Award, 2009
- Dept. of Chemical and Biological Eng. Undergraduate Teaching Award, 2009 and 2006
- Dept. of Chemical and Biological Eng. Graduate Teaching Award, 2012
- Provost's Faculty Achievement Award, 2008
- ConocoPhillips Faculty Fellowship, 2008-2011
- College of Engineering and Applied Science Junior Faculty Award, 2006
- Patten Fellowship, 2005-2009
- National Science Foundation CAREER Award, 2004
- Office of Naval Research Young Investigator Award, 2004
- Junior Faculty Development Award, University of Colorado, 2004
- Allan P. Colburn Prize for Outstanding Dissertation in the Mathematical Sciences and Engineering, University of Delaware, 2001
- National Science Foundation Graduate Fellowship, 1997-2000
- AIChE Catalysis and Reaction Engineering Travel Award, 2000
- First Place, Philadelphia Catalysis Club Poster Competition, 2000
- Robert L. Pigford Teaching Assistant Award, 1999
- Garrett Reed Cantwell Graduate Scholarship, 1998

- Robert L. Pigford Graduate Fellowship, 1996-97

INDEPENDENT REFEREED RESEARCH ARTICLES:
Corresponding author underlined, undergraduate trainee indicated by *

1. C.A. Schoenbaum, D.K. Schwartz, J.W. Medlin, "Controlling Surface Crowding on a Pd Catalyst with Thiolate Self-Assembled Monolayers", *Journal of Catalysis*, in review (2013).
2. T.D. Gould, A.M. Lubers, B. Neltner, J.V. Carrier, A.W. Weimer, J.L. Falconer, J.W. Medlin, "Synthesis of Supported Ni Catalysts by Atomic Layer Deposition", *Journal of Catalysis*, in review (2013).
3. M. Montemore, J.W. Medlin, "A Simple, Accurate Model for Alkyl Adsorption on Late Transition Metals", *Journal of Physical Chemistry C*, in review (2013).
4. T. Tauer, R. O'Hayre, J.W. Medlin, "Computational investigation of defect segregation at the (001) surface of $BaCeO_3$ and $BaZrO_3$: the role of metal–oxygen bond strength in controlling vacancy segregation", *Journal of Materials Chemistry A*, in press (2013).
5. K.R. Kahsar, D.K. Schwartz, J.W. Medlin, "Liquid- and Vapor-Phase Hydrogenation of 1-Epoxy-3-butene Using Self-Assembled Monolayer Coated Palladium and Platinum Catalysts", *Applied Catalysis A: Chemical*, 445-446 (2012) 102-106.
6. M. Makosch, V. Bumbálek, J. Sá, W.-I. Lin, M. Rovezzi, J.W. Medlin, K. Hungerbühler, J.A. van Bokhoven, "Organic thiol modified Pt/TiO_2 catalysts to control chemoselective hydrogenation of substituted nitroarenes", *ACS Catalysis* 2 (2012) 2079-2081.
7. S.H. Pang, A.M. Roman*, J.W. Medlin, "Adsorption Orientation Induced Selectivity Control of Reactions of Benzyl Alcohol on Pd(111)", *Journal of Physical Chemistry C*, 116 (2012) 4201-4208.
8. M.M. Montemore, J.W. Medlin, "A Density Functional Study of C_1-C_4 Alkyl Adsorption on Cu(111)", *Journal of Chemical Physics*, 136 (2012) 204710 (9 pages).
9. M. Rangan, M.M. Yung, J.W. Medlin, "Characterization of Ni-W/Al_2O_3 catalysts for ethylene reforming in the presence of sulfur", *Catalysis Letters*, 142 (2012) 718-727.
10. M.B. Griffin, S.H. Pang, J.W. Medlin, "The Surface Chemistry of 2-Iodoethanol on Pd(111): Orientation of Surface-bound Alcohol Controls Selectivity", *Journal of Physical Chemistry C* 116 (2012) 4201-4208.
11. T. Tauer, R. O'Hayre, J.W. Medlin, "A theoretical study of the influence of dopant concentration on the hydration properties of yttrium-doped barium cerate", *Solid State Ionics*, 204-206 (2011) 27-34.
12. J.W. Medlin, "Understanding and controlling reactivity of unsaturated oxygenates and polyols on metal catalysts", *ACS Catalysis*, 1 (2011) 1284-1297.
13. S.T. Marshall, J.W. Medlin, "Surface-level mechanistic studies of adsorbate–adsorbate interactions in heterogeneous catalysis by metals", *Surface Science Reports*, 66 (2011) 173-184.
14. S.H. Pang, J.W. Medlin, "Adsorption and Reaction of Furfural and Furfuryl Alcohol on Pd(111): Unique Reaction Pathways for Multifunctional Reagents", *ACS Catalysis,* 1 (2011) 1272-1283.
15. M. Rangan, M.M. Yung, J.W. Medlin, "Experimental and computational investigations of sulfur-resistant bimetallic catalysts for reforming of biomass tar components", *Journal of Catalysis*, 282 (2011) 249-257.
16. S.T. Marshall, D.K. Schwartz, J.W. Medlin, "Adsorption of Oxygenates on Alkanethiol-Functionalized Pd(111) Surfaces: Mechanistic Insights into the Role of Self-Assembled Monolayers on Catalysis", *Langmuir*, 27 (2011) 6731-6737.

17. K.L. Miller, E. Morrison*, S.T. Marshall, J.W. Medlin, "Experimental and modeling studies of acetylene detection in hydrogen/acetylene mixtures on PdM bimetallic metal–insulator–semiconductor devices", *Sensors and Actuators B*, 156 (2011) 924-931.
18. K.L. Miller, J.L. Falconer, J.W. Medlin, "Effect of water on the adsorbed structure of formic acid on TiO_2 anatase (101)", *Journal of Catalysis*, 278 (2011) 321-328.
19. K.L. Miller, C.B. Musgrave, J.L. Falconer, J.W. Medlin, "Effects of Water and Formic Acid Adsorption on the Electronic Structure of Anatase TiO_2(101)", *Journal of Physical Chemistry C*, 115 (2011) 2738-2749.
20. S.T. Marshall, M. O'Brien, B. Oetter*, A. Corpuz, R.M. Richards, D.K. Schwartz, J.W. Medlin, "Controlled selectivity for palladium catalysts using self-assembled monolayers", *Nature Materials*, 9 (2010) 853-858.
21. K.L. Miller, C.W. Lee, J.L. Falconer, J.W. Medlin, "Effect of Water on Formic Acid Photocatalytic Decomposition on TiO_2 and Pt/TiO_2", *Journal of Catalysis*, 275 (2010) 294-299.
22. C.M. Horiuchi, J.W. Medlin, "Adsorption and Reactivity of 2,3-Dihydrofuran and 2,5-Dihydrofuran on Pd(111): Influence of the C═C Position on the Reactivity of Cyclic Ethers", *Langmuir*, 26 (2010) 13320–13332.
23. M.B. Griffin, E.L. Jorgensen*, J.W. Medlin, "The adsorption and reaction of ethylene glycol and 1,2-propanediol on Pd(111): A TPD and HREELS study", *Surface Science*, 604 (2010) 1558-1564.
24. J.W. Medlin, C.M. Horiuchi, M. Rangan, "Effects of ring structure on the reaction pathways of cyclic esters and ethers on Pd(111)", *Topics in Catalysis*, 53 (2010) 1179-1184.
25. C.M. Horiuchi, J.W. Medlin, "Adsorption and decomposition of γ-butyrolactone on Pd(111) and Pt(111)", *Surface Science*, 604 (2010) 98-105.
26. C.M. Horiuchi, M. Rangan, B. Israel*, J.W. Medlin, "Adsorption and ring-opening of 2,5(H)-furanone on the (111) surfaces of Pd and Pt: Implication for selectivity in reactions of unsaturated cyclic oxygenates", *Journal of Physical Chemistry C*, 113 (2009) 14900-14907.
27. M.T. Schaal, M.P. Hyman, M. Rangan, S. Ma, C.T. Williams, J.R. Monnier, and J.W. Medlin, "Theoretical and experimental studies of Ag-Pt Interactions for supported Ag-Pt bimetallic catalysts", *Surface Science* 603 (2009) 690-696.
28. S.T. Marshall, D.K. Schwartz, J.W. Medlin, "Selective Acetylene Detection through Surface Modification of Metal-Insulator-Semiconductor Sensors with Alkanethiolate Monolayers", *Sensors and Actuators B* 136 (2009) 315-319.
29. S.T. Marshall, C.M. Horiuchi, W. Zhang*, J.W. Medlin, "Common Decomposition Pathways for 1-Epoxy-3-butene and 2-Butenal on Pd(111)", *Journal of Physical Chemistry C* 112 (2008) 20406-20412.
30. D.C. Kershner, W. Zhang*, J.W. Medlin, "Investigation of submonolayer SiO_X species formed from oxidation of silane on Pt(111)", *Surface Science* 602 (2008) 3225-3231.
31. D.C. Kershner, M.P. Hyman, J.W. Medin, "DFT study of the oxidation of silicon on Pd(111) and Pt(111)", *Surface Science* 602 (2008) 3603-3610.
32. S.T. Marshall, S.K. Satija, B.D. Vogt, J.W. Medlin, "Profiling of Hydrogen in Metal-Insulator-Semiconductor Sensors using Neutron Reflectivity", *Applied Physics Letters* 92 (2008) art. no. 153503.
33. A.S. Loh, S.W. Davis*, J.W. Medlin, "Adsorption and Reaction of 1-Epoxy-3-butene on Pt(111): Implications for Selectivity in Conversions of Unsaturated Oxygenates", *Journal of the American Chemical Society* 130 (2008) 5507-5514.
34. D.C. Kershner, J.W. Medlin, "Adsorption and Decomposition of Silane on Pd(111)", *Surface Science* 602 (2008) 693-701.
35. D.C. Kershner, J.W. Medlin, "Adsorption and Reaction of Silane and Oxygen on Pd(111)", *Surface Science* 602 (2008) 786-794.

36. M.P. Hyman, J.W. Medlin, "The Effects of Electronic Structure Modifications on the Adsorption of Oxygen Reduction Reaction Intermediates on Model Pt(111)-Alloy Surfaces", *Journal of Physical Chemistry C* 111 (2007) 17052-17060.
37. M.P. Hyman, B.T. Loveless*, J.W. Medlin, "A Density Functional Theory Study of H_2S Decomposition on the (111) Surfaces of Model Pd-alloys", *Surface Science* 601 (2007) 5383-5394.
38. M.P. Hyman, J.W. Medlin, "A Mechanistic Study of the Electrochemical Oxygen Reduction Reaction on Pt(111) Using Density Functional Theory", *Journal of Physical Chemistry B* 110 (2006) 15338-15344.
39. D. Li, R. Bastasz, and J.W. Medlin, "Application of Polymer-Coated MIS Sensors in Detection of Dissolved Hydrogen", *Applied Physics Letters* 88 (2006) art. no. 233507.
40. D. Li , A.H. McDaniel, R. Bastasz, J.W. Medlin, "Effects of a Polyimide Coating on the Hydrogen Selectivity of MIS Sensors", *Sensors and Actuators B* 115 (2006) 86-92.
41. M.P. Hyman, J.W. Medlin, "Effect of Applied Electric Fields on Oxygen Dissociation on Pt(111)", *Journal of Physical Chemistry B* 109 (2005) 6304-6310.
42. J.W. Medlin, R. Bastasz, A.H. McDaniel, "Hydrocarbon detection via ion implantation in metal-insulator-semiconductor devices," *Applied Physics Letters* 85 (2004) 5457-5459.
43. R. Bastasz, J. W. Medlin, J. A. Whaley, R. Beikler, E. Taglauer, "Deuterium adsorption on W(100) studied by LEIS and DRS," *Surface Science* 571 (2004) 31-40.
44. J.W. Medlin, A.E. Lutz, R. Bastasz, A.H. McDaniel, "The response of palladium metal-insulator-semiconductor devices to hydrogen-oxygen mixtures: Comparisons between kinetic models and experiment", *Sensors and Actuators B* 96 (2003) 290-297.
45. J.W. Medlin, A.H. McDaniel, M.D. Allendorf, R. Bastasz, "Effects of competitive carbon monoxide adsorption on the hydrogen response of MIS sensors: The role of metal film morphology", *Journal of Applied Physics,* 93 (2003) 2267-2274.
46. J.W. Medlin, M.D. Allendorf, "Theoretical study of the adsorption of acetylene on the (111) surfaces of Pd, Pt, Ni, and Rh", *Journal of Physical Chemistry B*, 107 (2003) 217-223.
47. S. Linic, J.W. Medlin, M.A. Barteau, "Synthesis of oxametallacycles from iodoethanol on Ag(111) and the structure dependence of their reactivity", *Langmuir*, 18 (2002) 5197-5204.
48. J.W. Medlin, M.A. Barteau, "The reaction of 1-chloro-2-methyl-2-propanol on oxygen-covered Ag(110): Epoxide formation via a surface chlorohydrin reaction", *Surface Science*, 506 (2002) 105-118.
49. J.W. Medlin, J.R. Monnier, M.A. Barteau, "Deuterium kinetic isotope effects in butadiene epoxidation over unpromoted and Cs-promoted silver catalysts", *Journal of Catalysis*, 204 (2001) 71-76.
50. J.W. Medlin, M.A. Barteau, "The formation of epoxides from reaction of oxametallacycles on Ag(110): A density functional theory study", *Journal of Physical Chemistry B*, 105 (2001) 10054-10061.
51. J.R. Monnier, J.W. Medlin, M.A. Barteau, "Use of oxygen-18 to determine kinetics of butadiene epoxidation over Cs-promoted, Ag catalysts", *Journal of Catalysis*, 203 (2001) 362-368.
52. A.B. Sherrill, J.W. Medlin, J.G. Chen, M.A. Barteau, "NEXAFS investigations of cyclooctatetraene on TiO_2(001)", *Surface Science*, 492 (2001) 203-213.
53. H. Ihm, J.W. Medlin, M.A. Barteau, J.M. White, "Thermal activation of *tert*-butyl nitrite on Pt(111): *tert*-butoxy dehydrogenation and oxametallacycle formation", *Langmuir*, 17 (2001) 798-806.
54. J.W. Medlin, A.B. Sherrill, J.G. Chen, M.A. Barteau, "Experimental and theoretical probes of the structure of oxametallacycle intermediates derived from 1-epoxy-3-butene on Ag(110)", *Journal of Physical Chemistry B,* 105 (2001) 3769-3775.
55. J.W. Medlin, M.A. Barteau, J.M. Vohs, "Oxametallacycle formation via ring-opening of 1-epoxy-3-butene on Ag(110): A combined experimental/theoretical approach", *Journal of Molecular Catalysis A*, 163 (2000) 129-145.

56. J.R. Monnier, J.W. Medlin, Y.-J. Kuo, "The selective isomerisation of 2,5-dihydrofuran to 2,3-dihydrofuran using CO-modified, supported Pd catalysts", *Applied Catalysis A,* 194-195 (2000) 463-474.
57. J.W. Medlin, M. Mavrikakis, M.A. Barteau, "Stabilities of substituted oxametallacycle intermediates: Implications for regioselectivity of epoxide ring-opening and olefin epoxidation", *Journal of Physical Chemistry B,* 103 (1999) 11169-11175.

REVIEWED BOOK CHAPTERS (independent contributions from U. of Colorado):

58. J.W. Medlin, "Surface science studies relevant for metal-catalyzed biorefining reactions", in *Chemical and Biochemical Catalysis for Next Generation Biofuels*, edited by Blake A. Simmons (2011), Royal Society of Chemistry.
59. M.P. Hyman and J.W. Medlin, "Mechanistic Studies of Electrocatalytic Reactions", in *Catalysis* (volume 20) pp. 309-337, edited by J.J. Spivey and K.M. Dooley. Royal Society of Chemistry (2007).
60. J.W. Medlin, "Metal-Insulator-Semiconductor Gas Sensors", in *Encyclopedia of Sensors*, edited by C.A. Grimes, E.C. Dickey, and M.V. Pishko. American Scientific Publishers (2005).

PEER-REVIEWED EDUCATION ARTICLES

61. "Chemical Engineering Screencasts", J.L. Falconer, J. deGrazia, J.W. Medlin, M.P. Holmberg, *Chemical Engineering Education* 46 (2012) 58-62.
62. "Using Screencasts in Chemical Engineering Courses", J.L. Falconer, J. deGrazia, J.W. Medlin, M.P. Holmberg, *Chemical Engineering Education* (2009).

CONFERENCE PRESENTATIONS (LAST FOUR YEARS)
Presenter underlined.

1. "Atomic layer deposition as a catalyst synthesis technique for nickel nanoparticles", Troy Gould, Al Weimer, John Falconer, and Will Medlin, AIChE National Meeting, Pittsburgh; October 2012.
2. "Controlling reactivity and selectivity using self-assembled monolayers on Pd catalysts", Carolyn Schoenbaum, Dan Schwartz, Will Medlin, AIChE National Meeting, Pittsburgh; October 2012.
3. "Quantum mechanical study of doping and hydration at the surface of yttrium-doped barium cerate", Tania Tauer, Ryan O'Hayre, Will Medlin, AIChE National Meeting, Pittsburgh; October 2012.
4. "Determining the effects of oxygen on the surface chemistry of multifunctional alcohols on Pd(111)", Rhea Williams, Will Medlin, ACS Fall National Meeting, Philadelphia; August 2012.
5. "Density functional theory studies of alkyl adsorption and solvation on transition metals", Matthew Montemore, Will Medlin, ACS Fall National Meeting, Philadelphia; August 2012.
6. "Adsorption orientation and surface coverage effects on reactions of multifunctional oxygenates on Pd(111)", Mike Griffin, Will Medlin, ACS Fall National Meeting, Philadelphia; August 2012.
7. "Relationship between adsorption geometry and reactivity of multifunctional alcohols on Pd(111)", Simon Pang, Will Medlin, ACS Fall National Meeting, Philadelphia; August 2012.
8. "Promoting selectivity in reactions of unsaturated oxygenates with self-assembled monolayers", Will Medlin. ACS Spring National Meeting, San Diego; March 2012.
9. "Controlled Selectivity of Liquid Phase Hydrogenation Over Self-Assembled Monolayer Coated Palladium Catalysts", Rudy Kahsar, Dan Schwartz, Will Medlin. Western States Catalysis Club Symposium, Boulder; March 2012.
10. "Investigations of Synergistic Chemistry and Coverage Effects on the Reactions of Sugar- and Lignin-Derived Aromatic Compounds", Simon Pang, Will Medlin. Western States Catalysis Club Symposium, Boulder; March 2012.

11. "The Surface Chemistry of Polyols and Bifunctional Alcohols on Pd(111): How the Adsorption and Orientation of Multifunctional Oxygenates Controls Reactivity", Michael Griffin, Will Medlin. Western States Catalysis Club Symposium, Boulder; March 2012.
12. "Synergistic Effects In Reactions of Functionalized Alcohols On Pd(111)", Michael Griffin, Simon Pang, Rhea Williams, and Will Medlin. AIChE National Meeting, Minneapolis; October 2011.
13. "Promoting Selectivity In Heterogeneous Catalysis with Self-Assembled Monolayers", Carolyn Schoenbaum, Steve Marshall, Dan Schwartz, and Will Medlin. AIChE National Meeting, Minneapolis; October 2011.
14. "New Techniques for Just-In-Time Teaching of Chemical Engineering", Will Medlin. AIChE National Meeting, Minneapolis; October 2011.
15. "Surface chemistry of biomass-derived multifunctional oxygenates on Pd(111)", Simon Pang and Will Medlin, ACS Fall National Meeting, Denver; August 2011
16. "DFT study of alkyl adsorption and solvation on Cu(111)", Matthew Montemore and Will Medlin, ACS Fall National Meeting, Denver; August 2011
17. "Surface chemisty of polyols and bifunctional alcohols on Pd(111)", Mike Griffin, Erica Jorgensen, Will Medlin, ACS Fall National Meeting, Denver; August 2011
18. "Influence of dopant concentration on hydration properties of yttrium-doped barium cerate: A density functional study", Tania Tauer, Ryan O'Hayre, Will Medlin, ACS Fall National Meeting, Denver; August 2011
19. "Surface chemistry of 1,2-propanediol on oxygen-covered Pd(111)", Rhea Williams, Will Medlin, ACS Fall National Meeting, Denver; August 2011
20. "Selectivity control using self-assembled monolayers on Pd catalysts", Carolyn Schoenbaum, Dan Schwartz, Will Medlin, ACS Fall National Meeting, Denver; August 2011
21. "An in silico study of the hydration properties of Y-doped barium cerate", Tania Tauer, Will Medlin, Ryan O'Hayre, 18th Conference on Solid State Ionics, Warsaw, Poland; July 2011
22. "Surface Chemistry of Furanic Compounds on the Pd(111) Surface: A Combined Experimental and Computational Approach", Simon Pang and Will Medlin, 22nd North American Catalysis Society meeting, Detroit; June 2011
23. "Selectivity Control Using Self-Assembled Monolayers on Pd Catalysts", Carolyn Schoenbaum and Will Medlin, 22nd North American Catalysis Society meeting, Detroit; June 2011.
24. "DFT Study of Alkyl Adsorption and Solvation on Cu(111)", Matthew Montemore and Will Medlin, 22nd North American Catalysis Society meeting, Detroit; June 2011.
25. "Surface Chemistry of 1,2-Propanediol on Oxygen-Covered Pd(111)", Rhea Williams and Will Medlin, 22nd North American Catalysis Society meeting, Detroit; June 2011.
26. "The Surface Chemistry of Polyols and Bifunctional Alcohols on Pd(111)", Mike Griffin and Will Medlin, 22nd North American Catalysis Society meeting, Detroit; June 2011.
27. "Experimental and computational investigations of bimetallic catalysts for reforming biomass tars", Mike Meghana Rangan, Matt Yung, and Will Medlin, 22nd North American Catalysis Society meeting, Detroit; June 2011.
28. "Controlling catalytic chemistry on metal surfaces with self-assembled monolayers", Will Medlin, 18th Interdisciplinary Surface Science Conference, Warwick, England; April 2011.
29. "Selectivity Control by Modification of Supported Metal Catalysts with Alkanethiol Monolayers," Carolyn Schoenbaum, Stephen Marshall, Daniel Schwartz and Will Medlin, AIChE Annual Meeting, Salt Lake City; November 2010.
30. "The Reactivity of Polyols On Pd(111)," Michael Griffin and Will Medlin, AIChE Annual Meeting, Salt Lake City; November 2010.
31. "Screencasts in Chemical Engineering Courses," John L. Falconer, Will Medlin, Janet Degrazia, Garret Nicodemus, AIChE Annual Meeting, Salt Lake City; November 2010.
32. "Surface Chemistry of Furanic Species On the (111) Surfaces of Pd and Pt," Simon H. Pang, Clay M. Horiuchi and J.Will Medlin, AIChE Annual Meeting, Salt Lake City; November 2010.
33. "Computational Study of Proton Behavior in Yttrium-Doped Barium Cerate," Tania Tauer and J.W. Medlin, AIChE Annual Meeting, Salt Lake City; November 2010.
34. "Selectivity Control with Self-assembled Monolayers on Pd Catalysts," Stephen T. Marshall, Carolyn Schoenbaum, J. Will Medlin, AIChE Annual Meeting, Salt Lake City; November 2010.
35. "Surface reactions for renewable energy applications" (INVITED), J.W. Medlin, Complex Interactions & Mechanisms in Organic Photovoltaics (CIMOPV), Sydney, Australia; June 2010.

36. "Surface science directed design of biorefining catalysts" (INVITED), J.W. Medlin, ACS National Meeting, San Francisco; March 2010.
37. "Surface level studies for biorefining catalyst design", J.W. Medlin, Organic Reactions Catalysis Society Meeting, Monterey, CA; March 2010.
38. "Bimetallic Catalysts for Selective Reactions of Unsaturated Oxygenates," B.L. Hassler, J.W. Medlin, Western States Catalysis Club Annual Symposium, Provo, UT; February 2010.
39. "The Reactions of 1,2-Propanediol and Ethylene Glycol on Pd(111): Steps Towards the Development of Catalysts for Biorefining Applications," M.B. Griffin, J.W. Medlin, Western States Catalysis Club Annual Symposium, Provo, UT; February 2010.
40. "Selectivity Control by Modification of Supported Metal Catalysts with Organic Ligands," Carolyn Schoenbaum, J.W. Medlin, Western States Catalysis Club Annual Symposium, Provo, UT; February 2010.
41. "Modification of metal catalysts by alkanethiol functionalization", S.T. Marshall, D.K. Schwartz, J.W. Medlin, AIChE Annual Meeting, Nashville; November 2009.
42. "Catalyst Design Strategies for Sulfur-Tolerant Tar Reforming Catalysts", M. Rangan, M. Yung, J.W. Medlin, AIChE Annual Meeting, Nashville; November 2009.
43. "Developing Catalyst Design Strategies for Reactions of Multifunctional Oxygenates", J.W. Medlin, C.M. Horiuchi, M. Griffin AIChE Annual Meeting, Nashville; November 2009.
44. "Effect of Water On Photocatalytic Decomposition of Tetrahydrofuran and Formic Acid On Pt/TiO2", K. Pelz, M. Mogaka, J.L. Falconer, J.W. Medlin, AIChE Annual Meeting, Nashville; November 2009.
45. "Investigating Catalyst Design Strategies for Selective Reaction of Cyclic C4 Oxygenates from Biomass", C.M. Horiuchi, J.W. Medlin, 21st North American Catalysis Society Meeting, San Francisco; June 2009.
46. "Surface Studies of H_2S Adsorption On Bimetallic NiM(111) Surfaces", Meghana Rangan, Matt Yung, Kim Magrini, J.W. Medlin, 21st North American Catalysis Society Meeting, San Francisco; June 2009
47. "Effect of gas phase water on formic and acetic acid decomposition on anatase TiO2", Kristi Pelz, J.L. Falconer, J.W. Medlin, 21st North American Catalysis Society Meeting, San Francisco; June 2009.
48. "Effect of alkanethiol functionalization on surface reactivity in catalytic sensors", Stephen T. Marshall, Daniel K. Schwartz, J.W. Medlin, 21st North American Catalysis Society Meeting, San Francisco; June 2009.
49. "Effect of water on photocatalytic decomposition of tetrahydrofuran on TiO2", Mogi Mogaka, J.L. Falconer, J.W. Medlin, 21st North American Catalysis Society Meeting, San Francisco; June 2009.
50. "Investigating catalyst design strategies for C4 cyclic oxygenates", Clay M. Horiuchi, J.W. Medlin, ACS National Meeting, Salt Lake City; March 2009.
51. "Characterizing and designing bimetallic catalysts for selective reactions of oxygenates", J.W. Medlin, ACS National Meeting, Salt Lake City; March 2009.
52. "Investigating Adsorbate Structures of Cyclic C4 Oxygenates from Biomass on Catalytic Metal Surfaces Using Spectroscopic Techniques", Clay M. Horiuchi, Stephen T. Marshall, Andrea S. Loh, J. Will Medlin, AIChE Annual Meeting, Philadelphia; November 2008.
53. "Experimental and Computational Studies of Si-O Bonding Structures Formed by Submonolayer Coverages of Si and O on Metal Surfaces", Dylan C. Kershner, J. Will Medlin, AIChE Annual Meeting, Philadelphia; November 2008.
54. "Reactions of Unsaturated Oxygenates on Metal Surfaces", J. Will Medlin, ACS Green Chemistry Conference, Washington DC; June 2008.
55. "Capturing the Bioenergy Opportunity" (INVITED), J. Will Medlin, Atlantic BioEnergy Conference, Saint John, Canada; April 2008.
56. "Identification of surface intermediates through the combined use of molecular modeling and vibrational spectroscopy" (INVITED), J. Will Medlin, ACS National Meeting, New Orleans, LA; April 2008.

INVITED SEMINARS:

"Controlling Selectivity in Heterogeneous Catalysis with Self-assembled Monolayers"
University of Wyoming, Dept. of Chemical Engineering, January 2013

"Controlling Selectivity in Heterogeneous Catalysis with Self-assembled Monolayers"
Notre Dame University, Dept. of Chemical Engineering, November 2012

"Controlling Selectivity in Heterogeneous Catalysis of Biomass Derived Oxygenates"
University of South Carolina, September 2012

"Controlling Selectivity in Heterogeneous Catalysis of Biomass Derived Oxygenates"
National Renewable Energy Laboratory, September 2012

"Controlling Selectivity in Heterogeneous Catalysis with Self-assembled Monolayers"
Pennsylvania State University, Dept. of Chemical Engineering, September 2012

"Controlling chemoselectivity in heterogeneous catalysis with self-assembled monolayers and other modifiers"
Seminar at Pacific Northwest National Laboratories, May 2012.

"Controlling Selectivity in Heterogeneous Catalysis with Self-assembled Monolayers"
Seminar at University of Michigan, Dept. of Chemical Engineering, September 2011.

"Controlling Selectivity in Heterogeneous Catalysis with Self-assembled Monolayers"
Seminar at Paul Scherrer Institute, February 2011.

"Controlling Selectivity in Heterogeneous Catalysis with Self-assembled Monolayers"
Seminar at ETH-Zurich, October 2010.

"Surface Science Approaches for Catalyst Design: Selectivity through Precise Poisoning"
ETH Symposium for Japanese-Swiss Cooperation, August 2010.

“Surface Studies for Design of Biorefining Catalysts”
Center for Catalytic Science and Technology, University of Delaware, May 2010

“Surface Studies of Conversions of Biorefining Intermediates”
Chem. Eng. Dept., University of Oklahoma, October 2009

“Surface studies of conversions of biomass-derived intermediates”
Oak Ridge National Laboratory, June 2009

“Studies of surface reaction pathways for design of heterogeneous catalysts”
Chem. Eng. Dept., Brigham Young University, November 2008
Chem./Bio. Eng. Dept., Colorado State University, November 2008

“Model Studies of Complex Interfaces”
Chem. Eng. Dept., Arizona State University, September 2007

“Model Studies of Complex Catalytic Interfaces”
Brookhaven National Laboratories, October 2006
Chem. Eng. Dept., University of South Carolina, October 2006

“Toward Understanding and Manipulating Chemistry and Complex Interfaces”
Pacific Northwest National Laboratories, Richland, WA, February 2006

“Toward Controlling Selectivity in Solid State Sensors”

Chem. Eng. Dept., University of Washington, Seattle, WA, February 2006

"Experimental/Theoretical Approaches to Modeling Complex Interfaces"
Chemistry Dept., Colorado School of Mines, Golden, CO, September 2005

"Solid-State Hydrogen Sensors: From First Principles to Applications"
Chem. Eng. Dept., Colorado School of Mines, Golden, CO, April 2004

"Effects of Competitive Surface Processes on the Performance of Chemical Sensors with Catalytic Metal Gates"
Eastman Chemical Company, Kingsport, TN, February 2003

"Metal-Coated Gas Sensors: Trying to Design for Selectivity"
Keynote address, Student Annual Research Symposium, University of Colorado, February 2003

"MIS Sensors for Hydrogen Detection"
EPRI Transformer Diagnostics Meeting, Oklahoma City, October 2003

"Probing the Mechanism of Silver-Catalyzed Olefin Epoxidation: A Combined Experimental/Theoretical Approach"
North Carolina State University, March 2001
Pacific Northwest National Laboratory, March 2001
Sandia National Laboratories, California, March 2001
University of Colorado - Boulder, February 2001
University of Massachusetts - Amherst, February 2001
University of California - Los Angeles, February 2001
University of Cincinnati, February 2001
University of Michigan, January 2001

PATENTS:

A.H. McDaniel, J.W. Medlin, and R. Bastasz, "Carbon Monoxide Sensor and Method of Use Thereof", US Patent 7,264,778 (issued 2007).

D. Li, J.W. Medlin, A.H. McDaniel, and R. Bastasz, "MIS-Based Sensors with Hydrogen Selectivity", US Patent 7,340,938 (issued 2008).

S.T. Marshall, D.K. Schwartz, J.W. Medlin, "Modification of catalysts with self-assembled monolayers" full patent filed (2012).

K.L. Miller, S.T. Marshall, J.W. Medlin, "Field effect sensors for acetylene detection in hydrogen-containing streams", full patent filed (2012).

COURSES TAUGHT:

CHEN 2120: Material and Energy Balances, Spring 2009
CHEN 3320: Chemical engineering thermodynamics (undergraduate), Fall 2004, Fall 2008-09, Fall 2011
CHEN 4330: Chemical engineering reaction kinetics (undergraduate), Spring 2003-08
CHEN 5360: Catalysis and kinetics (graduate), Fall 2005 and Fall 2007
CHEN 5390: Chemical reaction engineering (graduate), Fall 2009, Fall 2011
CHEN 5333: Research methods (graduate), Fall 2005 (with co-instructor Ryan Gill)
CHEG 342: Heat and mass transfer, Spring 2000 (University of Delaware).

CENTER DIRECTORSHIP

Colorado Center for Biorefining and Biofuels (C2B2)
Co-founder and CU Site Director
Center was initiated by Ryan T. Gill and JWM, who recruited Al Weimer as Center Executive Director. Gill, Weimer, and JWM were then responsible for recruiting sponsors, identifying PIs, organizing center structure across the four state Energy Collaboratory institutions (CU, Colorado State University, Colorado School of Mines, and the National Renewable Energy Laboratory), etc.

INTERNAL SERVICE ACTIVITIES

- CBEN seminar coordinator, 2003-2004
- Undergraduate student advisor, 2004-present
- Chair of graduate committee, 2006-07
- Chair of graduate recruiting, 2006-09
- Graduate committee member, 2004-06
- Co-director, GAANN program for Chemical and Biological Sensors, 2006-present
- Co-director, GAANN program for Renewable and Sustainable Energy, 2007-present
- Co-instructor, annual Teaching Workshop for new Engineering faculty, 2008-09
- Omega Chi Epsilon Advisor, 2004-2006
- Coordinator for complete overhaul of departmental website, 2005-2006
- Faculty search committee, 2005-2006
- Member of campus Conflict of Interest Committee, 2009-present
- Department teaching committee, 2008-present
- Faculty search committee, 2011-present

Department Curriculum Development

- CHEN 5333: redesigned the course to include multiple research rotations so that entering students could gain an understanding of diverse research areas(2005)
- Incorporation of 3-week segment on molecular modeling methods in CHEN 5360.
- Incorporation of just-in-time teaching methods to CHEN 4330, with required online quizzes (including required questions on the material from the students) submitted on the assigned reading prior to each class. Methods have been communicated to, adopted by, and improved upon by other faculty in the department.
- Added computational chemistry component using packages Gaussian and Spartan to both CHEN 4330 and CHEN 3320
- Developed substantial database of "Conceptest" questions (to be used as "clicker questions" and reading quiz questions) for CHEN 4330, 3320, and 2120.

PROFESSIONAL ACTIVITIES:

- President, Western States Division of the North American Catalysis Society, 2005-09
- National Representative for the Western States Division of NACS, 2009-present
- Member of Organizing Committee for 2008 ACS/RSC/GDCh Frontiers of Chemistry Symposium, Cranage, UK
- Member of Organizing Committee and Program Chair for Surface Science, 2006 ACS Conference for Colloids and Surface Science (June 2006; Boulder, CO)
- Organizer of 2006 Western States Catalysis Club Annual Symposium (Feb, 2006; Boulder, CO)
- Organizer of 2007 Western States Catalysis Club Annual Symposium (Feb, 2007; Salt Lake City, UT)

- Chair/Vice-chair for Program Area 20c (Catalysis and Reaction Engineering Topical) of the AIChE Annual Meeting, 2005-2007
- Panelist for NSF Graduate Research Fellowship Program, 2007-2008
- Panelist for NSF Proposal Reviews (3 panels in 2009, 2 panels in 2007, 2 in 2005)
- National meeting session chair or co-chair:
  - "Surface Science of Catalysis" (4 sessions), 2011 ACS Annual Meeting
  - "Fundamentals of surface reactivity I", 2008 AIChE Meeting, Philadelphia
  - "Fundamentals of surface reactivity II", 2008 AIChE Meeting, Philadelphia
  - "Green Catalysis", 2008 Green Chemistry Conference, Washington, DC
  - "Chiral Catalysis Topical Keynote Session", 2007 AIChE Meeting, Salt Lake City
  - "Fundamentals of surface reactivity I", 2007 AIChE Annual Meeting, Salt Lake City
  - "Fundamentals of surface reactivity II", 2007 AIChE Annual Meeting, Salt Lake City
  - "Electrocatalysis fundamentals", 2007 AIChE Annual Meeting, Salt Lake City
  - "Fundamentals of surface reactivity," 2006 AIChE Annual Meeting, San Francisco
  - "Computational Catalysis III", 2006 AIChE Annual Meeting, San Francisco
  - "Surface science and catalysis" (2 sessions), 2006 ACS Colloid and Surface Science Symposium
  - "Fundamentals of Surface Reactivity from Surface Spectroscopy", 2005 AIChE Annual Meeting, Cincinnati, OH
  - "Fundamentals of Environmental Catalysis I", 2005 AICHE Annual Meeting, Cincinnati, OH
  - "Fundamentals of Environmental Catalysis II", 2005 AICHE Annual Meeting, Cincinnati, OH
  - "Theory and Computation", 19th North American Catalysis Society Meeting, Philadelphia, PA (2005)
  - "Selective Catalytic Oxidation", 19th North American Catalysis Society Meeting, Philadelphia, PA (2005)
- Member AIChE, North American Catalysis Society, ACS
- Reviewer: National Science Foundation, ACS Petroleum Research Fund, Surface Science, Langmuir, Journal of Physical Chemistry, Journal of the American Chemical Society, Journal of Catalysis, IEEE Sensors Journal, Sensors and Actuators, AIChE Journal, Electrochimica Acta, Journal of the Electrochemical Society, Journal of Applied Physics, Journal of Materials Science, IEEE Electron Device Letters, Topics in Catalysis.
- Workshop participant:
  - Workshop on Fuel Cell Technologies, sponsored by NSF, Arlington, VA (June 2005).
  - National Effective Teaching Institute Workshop of the ASEE, Portland, OR (June 2005).
  - Workshop on Hydrogen Separation Technologies, DOE, Arlington, VA (September 2004).
  - Chemical Engineering Summer School, Pullman, WA (July 2007)
- Consultant: Sandia National Laboratories, 2003-2008

OUTREACH ACTIVITIES:

- Presenter at High School Honors Institute, 2004-2005.
- Presenter at Engineering Open House, 2003-2004
- Presenter at Parents' Weekend Fall Convocation, 2008
- Presenter at SWE Regional meeting, Boulder, CO, 2008

- Presenter at Engineering College Homecoming 2009 Celebration
- Faculty organizer of two GAANN retreats devoted to development of outreach modules for presentation at local high schools and demonstration of those materials in Spring 2009; program is ongoing, with scheduled visits for Medlin and GAANN students at Westminster Academy to deliver demonstrations throughout 2009-2010.
- Co-director of C2B2 Undergraduate Research Program

ADVISEES:

Graduate Students: Matthew Hyman (PhD 2007, currently at Intel), Dylan Kershner (PhD 2008, currently at ITN Energy Systems), Clay Horiuchi (PhD 2010, currently at LUM Technologies), Stephen Marshall (PhD 2010, now at Phillips66), Andrea Loh (MS 2007, currently a high school teacher at Westminster Academy), Kristi Miller (PhD 2010, currently at Colorado Mountain College), Meghana Rangan (PhD 2011, now at Intel), Anna Pickerell (MS 2009), Michael Griffin, Tania Tauer, Troy Gould (coadvised with Al Weimer and John Falconer), Simon Pang, Rhea Williams, Matthew Montemore, Carolyn Schoenbaum (coadvised with Dan Schwartz), Rudy Kahsar (coadvised with Dan Schwartz), Allison Robinson.

Undergraduate Students advised: Anthony Goodrow (REU), Douglas Wildemuth (REU), Brett Loveless (REU), Ben Laurent (REU), Paul Siebert (REU), Jonathan Chang, Eric Karp, Katie Barney, Nathan Johns, Melissa Farbod, Scott Davis, Hanna Sudzilouskaya, Freya Kugler, Brittany Lancaster (REU), Sean Arendell, Kevin Donahoe, Michael Kerins, Matthew McCoy, Siris Laursen, Laura Richards, Wenyu Zhang, Keith Beers, Amanda Parker, Eva Krauss, Brian Kay, David Baker, KJ Swadley, Chi Lo, Jeff Kessler, Nicholas Witte, Marykate O'Brien, Drew Mogck, Ben Israel (REU), June Naiki (REU), Marty Witt (REU), Erica Jorgensen, Elizabeth Morrison, Stephen Rowell, Sarah Daniels (REU), Alex Roman (REU), Stacy Glance (REU), Alexander Savello (REU), Stephanie Johnson (REU), Lukas Campolo (REU), Jake Carrier, Nigel Wang, Charles Hartman, Sarah Waldner.

High School Student advised: Ian Donaldson

Postdoctoral Fellows: Dongmei Li (Intel Corp.), Esther Wilcox (Range Fuels), Brian Hassler (Ohio University), April Corpuz (current).