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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

EMPLOYMENT HISTORY:

University of Colorado, Dept. of Chemical and Biological Engineering, Boulder, CO
Assistant/Associate/Full Professor, 2003-present
Associate Department Chair, 2012-2016
Department Chair, 2020-present

Chalmers University of Technology, Gothenburg, Sweden
Visiting Professor, 2017-2018

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

Sandia National Laboratories, Livermore, CA
Postdoctoral Fellow, 2001-03; *Advisors: Mark Allendorf and Bob Bastasz*

SELECTED HONORS AND AWARDS:

- Dept. of Chemical and Biological Eng. Graduate Teaching Award, 2020 and 2012
- Dept. of Chemical and Biological Engineering Outstanding Service Award, 2016
- College of Engineering Dean's Outstanding Research Award, 2015
- AIChE Himmelblau Award for computer-based chemical engineering education, 2015 (shared with John Falconer, Janet Degrazia, Garret Nicodemus)
- Dept. of Chemical and Biological Engineering Graduate Teaching Excellence Award, 2015
- Denver Business Challenge Endowed Professorship, 2014-present
- Provost's Faculty Achievement Award, 2013 and 2008
- 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
- 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
- Colburn Prize for Outstanding Dissertation in the Math. Sci. and Eng., Univ. of Del., 2001
- National Science Foundation Graduate Fellowship, 1997-2000

INDEPENDENT REFEREED RESEARCH ARTICLES:
Corresponding author denoted with *.

1. A.H. Jenkins, E.E. Dunphy, M.F. Toney, C.B. Musgrave, J.W. Medlin*, "Tailoring the Near-Surface Environment of Rh Single-Atom Catalysts for Selective CO_2 Hydrogenation", *ACS Catal*. 13 (2023) 15340-15350; https://doi.org/10.1021/acscatal.3c03768
2. Z. Blanchette, D.K. Schwartz, J.W. Medlin*, "Directing Reaction Pathways on Supported Metal Catalysts with Low-Density Self-Assembled Monolayers", *ACS Appl. Nano Mater*. 6 (2023) 9059-9069; https://doi.org/10.1021/acsanm.3c01836
3. F.W.S. Lucas, N.C. Ramos, D.K. Schwartz, J.W. Medlin, A. Holewinski*, "Understanding reactivity of self-assembled monolayer-coated electrodes: SAM-induced surface reconstruction", *Electrochim. Acta* 459 (2023) 142586; https://doi.org/10.1016/j.electacta.2023.142586
4. F.M. Al Khulaifi, Y.A. Alsunni, C.B. Musgrave, A. Holewinski*, J.W. Medlin*, "Impact of pretreatment and thiol modifiers on the partial oxidation of glutaraldehyde using Pd/Al_2O_3", *Appl. Catal. A: Gen*. 661 (2023) 119229; https://doi.org/10.1016/j.apcata.2023.119229
5. N.C. Ramos, J.W. Medlin*, A. Holewinski*, "Electrochemical Stability of Thiolate Self-Assembled Monolayers on Au, Pt, and Cu", *ACS Appl. Mater. Interfaces* 15 (2023) 14470–14480; https://doi.org/10.1021/acsami.3c01224
6. J.K. Kenny, J.W. Medlin, G.T. Beckham*, "Quantification of Phenolic Hydroxyl Groups in Lignin via ^{19}F NMR Spectroscopy", *ACS Sustainable Chem. Eng*. 11 (2023) 5644-5655; https://doi.org/10.1021/acssuschemeng.3c00115
7. B. Greydanus, J.W. Medlin*, D.K. Schwartz*, "Elucidating the Influence of Metal Surface Composition on Organic Adsorbate Binding Using Active Particle Dynamics", *Journal of Physical Chemistry C*, 127 (2023) 1006-1014; https://doi.org/10.1021/acs.jpcc.2c05907.
8. D.R. Clark*, D.R. Diercks, S. Ricote, T.T. Dearden, N.P. Sullivan, J.W. Medlin, B.P. Gorman, R.P. O'Hayre*, "Understanding the effects of fabrication process on $BaZr_{0.9}Y_{0.1}O_{3-\delta}$ grain-boundary chemistry using atom probe tomography", *J. Mater. Chem. C* 15 (2023) 5082-5091; https://doi.org/10.1039/D2TC04093J
9. L. Chen, P. Moura, J.W. Medlin, H. Grönbeck*, "Multiple Roles of Alkanethiolate-Ligands in Direct Formation of H_2O_2 over Pd Nanoparticles", *Angewandte Chemie* 61 (2022) e202213113; https://doi.org/10.1002/ange.202213113
10. J.K. Kenny, D.G. Brandner, S.R. Neefe, W.E. Michener, Y. Román-Leshkov, G.T. Beckham*, J.W. Medlin*, "Catalyst choice impacts aromatic monomer yields and selectivity in hydrogen-free reductive catalytic fractionation", *Reaction Chemistry & Engineering* 7 (2022) 2527-2533; https://doi.org/10.1039/D2RE00275B
11. Z. Blanchette, J. Zhang, S. Yazdi, M.B. Griffin, D.K. Schwartz, J.W. Medlin*, "Investigating deposition sequence during synthesis of Pd/Al2O3 catalysts modified with organic monolayers", *Catalysis Science & Technology* 12 (2022) 2306-2314; https://doi.org/10.1039/D1CY02131A
12. E. Baghdady, D.K. Schwartz, J.W. Medlin*, "Effects of Surface Hydrophobicity on Catalytic Transfer Hydrogenation of Styrene with Formic Acid in a Biphasic Mixture", *ACS Applied Materials and Interfaces* 14 (2022) 33457; https://doi.org/10.1021/acsami.2c11732
13. X. Zhou, J.L. Falconer, J.W. Medlin*, "Mechanism of selectivity control for zeolites modified with organic monolayers", *Microporous and Mesoporous Materials* 337 (2022) 111913; https://doi.org/10.1016/j.micromeso.2022.111913
14. M.J. Rasmussen, S. Najmi, G. Innocenti, A.J. Medford*, C. Sievers*, J W. Medlin*, "Supported molybdenum oxides for the aldol condensation reaction of acetaldehyde", *Journal of Catalysis* 408 (2022) 216-226; https://doi.org/10.1016/j.jcat.2022.03.002

15. L.I. Paz Herrera, L. Freitas de Lima e Freitas, J. Hong, A.S. Hoffman, S.R. Bare, E. Nikolla*, J.W. Medlin*, "Reactivity of Pd-MO_2 encapsulated catalytic systems for CO oxidation", *Catalysis Science and Technology*, 12 (2022) 1476-1486; https://doi.org/10.1039/D1CY01916C
16. B. Greydanus, M. Saleheen, H. Wu, A. Heyden, J.W. Medlin, D.K. Schwartz*, "Probing surface-adsorbate interactions through active particle dynamics", *Journal of Colloid and Interface Science* 614 (2022) 425-435; https://doi.org/10.1016/j.jcis.2022.01.053
17. A.H. Jenkins, C.B. Musgrave*, and J.W. Medlin*, "Altering Linear Scaling Relationships on Metal Catalysts via Ligand–Adsorbate Hydrogen Bonding", *Journal of Physical Chemistry C*, 125 (2021) 23791-23802; https://doi.org/10.1021/acs.jpcc.1c07550
18. A.H. Jenkins, J.W. Medlin*, "Controlling Heterogeneous Catalysis with Organic Monolayers on Metal Oxides", *Accounts of Chemical Research*, 54 (2021) 4080-4090; https://doi.org/10.1021/acs.accounts.1c00469
19. P. Ranadive, Z. Blanchette, A.P. Spanos, J.W. Medlin, N. Brunelli*, "Scalable Synthesis of Selective Hydrodeoxygenation Inverted Pd@TiO2 Nanocatalysts", *Journal of Flow Chemistry* 11 (2021) 393-406; https://doi.org/10.1007/s41981-021-00171-4
20. J. Zhang, C. Asokan, G. Zakem, P. Christopher*, J.W. Medlin*, "Enhancing Sintering Resistance of Atomically Dispersed Catalysts in Reducing Environments with Organic Monolayers", *Green Energy & Environment*, in press (2021); https://doi.org/10.1016/j.gee.2021.01.022
21. P.D. Coan, C.A. Farberow, M.B. Griffin, J.W. Medlin*, "Organic Modifiers Promote Furfuryl Alcohol Ring Hydrogenation via Surface Hydrogen-Bonding Interactions", *ACS Catalysis* 11 (2021) 3730-3739; https://doi.org/10.1021/acscatal.0c04138
22. L. Chen, J.W. Medlin, H. Grönbeck*, "On the Reaction Mechanism of Direct H2O2 Formation over Pd Catalysts", *ACS Catalysis* 11 (2021) 2735-2745; https://doi.org/10.1021/acscatal.0c05548
23. L.O. Mark, W. Chen, C.N. Eads, D. Lu, J.A. Boscoboinik, D. Stacchiola, J.W. Medlin*, S.A. Tenney*, "Confinement Effects on Furfuryl Alcohol Reactions over Porous Bilayer Silica-Modified Pd(111)", Journal of Physical Chemistry C, 124 (2020) 25437-25446; https://doi.org/10.1021/acs.jpcc.0c09095
24. T.K. Slot, N. Riley, N.R. Shiju, J.W. Medlin, G. Rothenburg*, "An experimental approach for controlling confinement effects at catalyst interfaces", *Chemical Science*, 11 (2020) 11024-11029.
25. A.M. Román, N. Agrawal, J.C. Hasse, M.J. Janik, J.W. Medlin, A. Holewinski*, "Electro-oxidation of furfural on gold is limited by furoate self-assembly", *Journal of Catalysis*, 391 (2020) 327-335; https://doi.org/10.1016/j.jcat.2020.08.034
26. A.M. Román, T.D. Spivey, J.W. Medlin, A. Holewinski*, "Accelerating Electro-oxidation Turnover Rates via Potential-Modulated Stimulation of Electrocatalytic Activity", *Industrial Chemistry & Engineering Research*, 59 (2020) 19999-20010; https://doi.org/10.1021/acs.iecr.0c04414
27. S. Najmi, M. Rasmussen, G. Innocenti, C. Chang, E. Stavitski, S.R. Bare, A.J. Medford*, J.W. Medlin*, and C. Sievers*, "Pretreatment Effects on the Surface Chemistry of Small Oxygenates on Molybdenum Trioxide", *ACS Catalysis*, 10 (2020) 8187-8200; https://doi.org/10.1021/acscatal.0c01992.
28. L. Freitas de Lima e Freitas, B. Puértolas, J. Zhang, B. Wang, A.S. Hoffman, S.R. Bare, J. Pérez-Ramírez*, J.W. Medlin*, E. Nikolla*, "Tunable Catalytic Performance of Palladium Nanoparticles for H_2O_2 Direct Synthesis via Surface-Bonded Ligands", *ACS Catalysis*, 10 (2020) 5202-5207; https://doi.org/10.1021/acscatal.0c01517.

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30. J. Zhang, S. Deo, M.J. Janik, J.W. Medlin*, "Control of molecular bonding strength on metal catalysts with organic monolayers for CO_2 reduction", *J. Am. Chem. Soc*., 142 (2020) 5184-5193; DOI: 10.1021/jacs.9b12980.
31. L.D. Ellis, S. Parker, J. Hu, M. Dzara, H.H. Funke, C. Sievers, S. Pylypenko, J.L. Falconer, J.W. Medlin*, "Tuning gas adsorption selectivity and diffusion rates in zeolites with phosphonic acid monolayers", *Cell Rep. Phys. Sci*. 1 (2020) 100036; DOI: 10.1016/j.xcrp.2020.100036.
32. M.J. Rasmussen, J.W. Medlin*, "Role of tungsten modifiers in bimetallic catalysts for enhanced hydrodeoxygenation activity and selectivity", *Catal. Sci. Technol*., 10 (2020) 414-423; DOI: 10.1039/C9CY02240F.
33. B. Greydanus, D.K. Schwartz, J.W. Medlin*, "Controlling Catalyst-Phase Selectivity in Complex Mixtures with Amphiphilic Janus Particles", *ACS Appl. Mater. Interfaces*, 12 (2020) 2338-2345; DOI: 10.1021/acsami.9b16957.
34. L.O. Mark, N. Agrawal, A. Román, A. Holewinski, M.J. Janik, J.W. Medlin*, "Insight into the oxidation mechanism of furanic compounds on Pt(111)", *ACS Catalysis*, 9 (2019) 11360-11370; DOI: 10.1021/acscatal.9b03983.
35. A.H. Jenkins, C.B. Musgrave, J.W. Medlin*, "Enhancing Au/TiO_2 Catalyst Thermostability and Coking Resistance with Alkyl Phosphonic-Acid Self-Assembled Monolayers", *ACS Applied Materials & Interfaces* 11 (2019) 41289-41296. DOI: 10.1021/acsami.9b13170
36. A.M. Román, J.C. Hasse, J.W. Medlin, A. Holewinski*, "Elucidating Acidic Electro-Oxidation Pathways of Furfural on Platinum", *ACS Catalysis*, 9 (2019) 10305-10316, DOI: 10.1021/acscatal.9b02656.
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38. J. Ballesteros-Soberanas, L.D. Ellis, J.W. Medlin*, "Effects of Phosphonic Acid Monolayers on the Dehydration Mechanism of Aliphatic Alcohols on TiO_2", *ACS Catalysis*, 9 (2019) 7808-7816; DOI: 10.1021/acscatal.9b02082.
39. P.D. Coan, M.B. Griffin, P.N. Ciesielski, J.W. Medlin*, "Phosphonic acid modifiers for enhancing selective hydrodeoxygenation over Pt catalysts: The role of the catalyst support", *Journal of Catalysis*, 372 (2019) 311-320; DOI: 10.1016/j.jcat.2019.03.011.
40. B. Wang, J. Zhang, J.W. Medlin*, E. Nikolla*, "Fabrication of Inverted Pd@TiO_2 Nanostructures for Selective Catalysis", *Industrial & Chemistry Engineering Research*, 58 (2019) 4032-4041. DOI: 10.1021/acs.iecr.8b05896.
41. L.D. Ellis, J. Ballesteros-Soberanas, D.K. Schwartz, J.W. Medlin*, "Effects of metal oxide surface doping with phosphonic acid monolayers on alcohol dehydration activity and selectivity", *Applied Catalysis A: General*, 571 (2019) 102-105. DOI: 10.1016/j.apcata.2018.12.009
42. J. Zhang, L.D. Ellis, B. Wang, M.J. Dzara, C. Sievers, S. Pylypenko, E. Nikolla, J.W. Medlin* "Control of interfacial acid–metal catalysis with organic monolayers", *Nature Catalysis*, 1 (2018) 148-155; DOI: 10.1038/s41929-017-0019-8.

43. P. Hao, D.K. Schwartz, J.W. Medlin, "Effect of Surface Hydrophobicity of Pd/Al_2O_3 on Vanillin Hydrodeoxygenation in a Water/Oil System", *ACS Catalysis*, 8 (2018) 11165-11173.
44. G. Kumar, E. Nikolla, S. Linic, J.W. Medlin, M.J. Janik*, "Multicomponent Catalysts: Limitations and Prospects", *ACS Catalysis*, 8 (2018) 3202-3208.
45. J. Zhang, J.W. Medlin*, "Catalyst design using an inverse strategy: From mechanistic studies on inverted model catalysts to applications of oxide-coated metal nanoparticles", *Surface Science Reports*, 73 (2018) 117-152.
46. P. Hao, D.K. Schwartz, J.W. Medlin*, "Phosphonic acid promotion of supported Pd catalysts for low temperature vanillin hydrodeoxygenation in ethanol", *Applied Catalysis A: General*, 561 (2018) 1-6.
47. L.O. Mark, A.H. Jenkins, H. Heinz, J.W. Medlin*, "Furfuryl alcohol deoxygenation, decarbonylation, and ring-opening on Pt (111)", *Surface Science*, 677 (2018), 333-340. DOI: 10.1016/j.susc.2018.07.001.
48. P.D. Coan, L.D. Ellis, M.B. Griffin, D.K. Schwartz, J.W. Medlin*, "Enhancing Cooperativity in Bifunctional Acid-Pd Catalysts with Carboxylic Acid-Functionalized Organic Monolayers", *Journal of Physical Chemistry C*, 122 (2018) 6637-6647; DOI: 10.1021/acs.jpcc.7b12442.
49. T. Van Cleve, D. Underhill, M. Veiga Rodrigues, C. Sievers, J.W. Medlin*, "Enhanced Hydrothermal Stability of γ-Al_2O_3 Catalyst Supports with Alkyl Phosphonate Coatings", *Langmuir* 34 (2018) 3619-3625; DOI: 10.1021/acs.langmuir.8b00465.
50. G. Kumar, T. Van Cleve, J. Park, A. van Duin, J.W. Medlin, M.J. Janik*, "Thermodynamics of Alkanethiol Self-Assembled Monolayer Assembly on Pd Surfaces", *Langmuir*, 34 (2018) 6346-6357; DOI: 10.1021/acs.langmuir.7b04351.
51. J. Zhang, B. Wang, E. Nikolla*, J.W. Medlin*, "Directing Reaction Pathways through Controlled Reactant Binding at Pd–TiO_2 Interfaces", *Angewandte Chemie*, 129 (2017) 6694-6698.
52. L.D. Ellis, R.M. Trottier, C.B. Musgrave, D.K. Schwartz, J.W. Medlin*, "Controlling the Surface Reactivity of Titania via Electronic Tuning of Self-Assembled Monolayers", *ACS Catalysis*, 7 (2017) 8351-8357; DOI: 10.1021/acscatal.7b02789.
53. A.M. Robinson, L. Mark, M. Rasmussen, J.E. Hensley, J.W. Medlin*, "Surface Chemistry of Aromatic Reactants on Pt and Mo-Modified Pt Catalysts", *J. Phys. Chem. C*, 120 (2016) 26824–26833.
54. P. Hao, S. Pylypenko, D.K. Schwartz, J W. Medlin*, "Application of thiolate self-assembled monolayers in selective alcohol oxidation for suppression of Pd catalyst deactivation", *Journal of Catalysis*, 344 (2016) 722–728.
55. M.M. Montemore*, O. Andreussi, J.W. Medlin*, "Hydrocarbon adsorption in an aqueous environment: A computational study of alkyls on Cu(111)", *Journal of Chemical Physics*, 145 (2016) 074702.
56. A.M. Robinson, J. Hensley, J.W. Medlin*, "Bifunctional catalysts for upgrading of biomass-derived oxygenates: A Review", *ACS Catalysis* 6 (2016) 5026-5043.
57. G. Kumar, C.-H. Lien, M.J. Janik*, J.W. Medlin*, "Catalyst Site Selection via Control over Non-Covalent Interactions in Self-Assembled Monolayers", *ACS Catalysis* 6 (2016) 5086-5094.
58. C.-H. Lien, J.W. Medlin*, "Control of Pd catalyst selectivity with mixed thiolate monolayers", *Journal of Catalysis*, 339 (2016) 38-46.

59. A.M. Robinson, G. Ferguson, J. Gallagher, S. Cheah, G. Beckham, J. Schaidle*, J. Hensley, J.W. Medlin*, "Enhanced hydrodeoxygenation of m-cresol over bimetallic Pt-Mo catalysts through oxophilic metal-induced tautomerization pathway", *ACS Catal*. 6 (2016) 4356-4368.
60. L.D. Ellis, S. Pylypenko, S.R. Ayotte, D.K. Schwartz, J.W. Medlin*, "Trimethylsilyl functionalization of alumina (γ-Al_2O_3) increases activity for 1, 2-propanediol dehydration", *Catal. Sci. Technol*. 6 (2016) 5721-5728.
61. S.H. Pang, C.-H. Lien, J.W. Medlin*, "Control of surface alkyl catalysis with thiolate monolayers", *Catal. Sci. Technol*. 6 (2016) 2413-2418.
62. S.H. Pang, J.W. Medlin*, "Controlling Catalytic Selectivity via Adsorbate Surface Orientation: From Furfural Deoxygenation to Olefin Epoxidation", *J. Phys. Chem. Lett.* 6 (2015) 1348-1356.
63. T.D. Gould, A.M. Lubers, A.R. Corpuz, A.W. Weimer, J.L. Falconer, J.W. Medlin*, "Controlling nanoscale properties of supported platinum catalysts through atomic layer deposition", *ACS Catalysis*, 5 (2015) 1344-1352.
64. T.D. Gould, M.M. Montemore, A.M. Lubers, A.W. Weimer, J.L. Falconer, J.W. Medlin*, "Enhanced dry reforming of methane on Ni and NiPt catalysts synthesized by atomic layer deposition", *Applied Catalysis A: Chemical*, 492 (2015) 107-116.
65. K.R. Kahsar, D.K. Schwartz, J.W. Medlin*, "Stability of Self-Assembled Monolayer Coated Pt/Al_2O_3 Catalysts for Liquid Phase Hydrogenation", *Journal of Molecular Catalysis A: Chemical*, 396 (2015) 188-195.
66. S.H. Pang, N.E. Love, J.W. Medlin*, "Synergistic Effects of Alloying and Thiolate Modification in Furfural Hydrogenation over Cu-Based Catalysts", *J. Phys. Chem. Lett*., 5 (2014) 4110-4114.
67. R.M Williams, S.H. Pang, J.W. Medlin*, "Ring opening and oxidation pathways of furanic oxygenates on oxygen-precovered Pd(111)", *J. Phys. Chem. C*, 118 (2014) 27933-27943.
68. A.R. Corpuz, S.H. Pang, C.A. Schoenbaum, J.W. Medlin*, "Hydrogen Exposure Effects on Pt/Al_2O_3 Catalysts Coated with Thiolate Monolayers", *Langmuir*, 30 (2014) 14104-14110.
69. C.-H. Lien, J.W. Medlin*, "Promotion of Activity and Selectivity by Alkanethiol Monolayers for Pd-Catalyzed Benzyl Alcohol Hydrodeoxygenation", *Journal of Physical Chemistry C*, 118 (2014) 23783-23789.
70. K.R. Kahsar, S. Johnson, D.K. Schwartz, J.W. Medlin*, "Hydrogenation of cinnamaldehyde over Pd/Al_2O_3 catalysts modified with thiol monolayers", *Topics in Catalysis*, 57 (2014) 1505-1511.
71. T. Tauer, R. O'Hayre, J.W. Medlin*, "An ab initio investigation of proton stability at $BaZrO_3$ interfaces", *Chemistry of Materials*, 26 (2014) 4915-492.
72. M.M. Montemore, J.W. Medlin*, "Scaling Relations Between Adsorption Energies for Computational Screening and Design of Catalysts", *Catalysis Science and Technology*, 4 (2014) 3748-3761.
73. S.H. Pang, C.A. Schoenbaum, D.K. Schwartz, J.W. Medlin*, "Effects of Thiol Modifiers on the Kinetics of Furfural Hydrogenation over Pd Catalysts", *ACS Catal.*, 4 (2014) 3123-3131.
74. T.D. Gould, A. Izar, A.W. Weimer, J.L. Falconer, J.W. Medlin*, "Stabilizing Ni Catalysts by Molecular Layer Deposition for Harsh Dry Reforming Conditions", *ACS Catalysis*, 4 (2014) 2714-2717.
75. M.M. Montemore, J.W. Medlin*, "A Unified Picture of Adsorption on Transition Metals Through Different Atoms", *J. American Chemical Society*, 136 (2014) 9272-9275.

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77. R.M. Williams, J.W. Medlin*, "Benzyl alcohol oxidation on Pd(111): aromatic substituent effects on alcohol reactivity", *Langmuir*, 30 (2014) 4642-4653.
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80. R.M. Williams, S.H. Pang, J.W. Medlin*, "O-H versus C-H Bond Scission Sequence in Ethanol Decomposition on Pd(111)", *Surface Science* 619 (2014) 114-118.
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85. S.H. Pang, C.A. Schoenbaum, D.K. Schwartz, J.W. Medlin*, "Directing Reaction Pathways by Catalyst Active-Site Selection using Self-Assembled Monolayers", *Nature Communications* 4 (2013) 2448.
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89. M.M. Montemore, J.W. Medlin*, "A Simple, Accurate Model for Alkyl Adsorption on Transition Metals", *J. Phys. Chem. C*., 117 (2013) 2835-2843.
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96. 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.
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98. J.W. Medlin*, "Understanding and controlling reactivity of unsaturated oxygenates and polyols on metal catalysts", *ACS Catalysis*, 1 (2011) 1284-1297.
99. S.T. Marshall, J.W. Medlin*, "Surface-level mechanistic studies of adsorbate–adsorbate interactions in heterogeneous catalysis by metals", *Surface Science Rep.*, 66 (2011) 173-184.
100. 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.
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111. C.M. Horiuchi, J.W. Medlin*, "Adsorption and decomposition of gamma-butyrolactone on Pd(111) and Pt(111)", *Surface Science*, 604 (2010) 98-105.

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113. 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.
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120. D.C. Kershner, J.W. Medlin*, "Adsorption and Decomposition of Silane on Pd(111)", *Surface Science* 602 (2008) 693-701.
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132. 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.
133. 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.
134. 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.
135. 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.
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137. 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.
138. 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.
139. 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.
140. 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.
141. 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.
142. 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.
143. 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.

PEER-REVIEWED BOOK CHAPTERS

144. 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.
145. M.P. Hyman and J.W. Medlin*, "Mechanistic Studies of Electrocatalytic Reactions", in *Catalysis* (volume 20) pp. 309-337, edited by J.J. Spivey, K.M. Dooley. RSC (2007).

146. J.W. Medlin*, "Metal-Insulator-Semiconductor Gas Sensors", in *Encyclopedia of Sensors*, edited by C.A. Grimes, E.C. Dickey, M.V. Pishko. American Scientific Publishers (2005).

PEER-REVIEWED EDUCATION ARTICLES

147. J.L. Falconer*, J. DeGrazia, J.W. Medlin, K. McDanel, "Learnchem.com: Teaching/learning resources for chemical engineering", *Chemical Engineering Education*, 52 (2018) 176-180.
148. J.L. Falconer*, J. Will Medlin, G. Nicodemus, K. Hoeferkamp, J. deGrazia, "A Thermodynamics Course Package in OneNote", *Chemical Engineering Education* 48 (2014) 209-214.
149. "Chemical Engineering Screencasts", J.L. Falconer*, J. deGrazia, J.W. Medlin, M.P. Holmberg, *Chemical Engineering Education* 46 (2012) 58-62.
150. "Using Screencasts in Chemical Engineering Courses", J.L. Falconer*, J. deGrazia, J.W. Medlin, M.P. Holmberg, *Chemical Engineering Education* 43 (2009) 296-289.

NEWS AND VIEWS ARTICLE (Not peer-reviewed)

151. J.W. Medlin*, M.M. Montemore, "Heterogeneous catalysis: Scaling the rough heights", *Nature Chemistry*, 7 (2015) 378-380.

INVITED RESEARCH SEMINARS SINCE 2012:

1. Iowa State University, Chemical Engineering, October 2023
2. Virginia Commonwealth University, Chemical Engineering, September 2022
3. University of Alabama, Chemical Engineering, September 2022
4. Purdue University, Chemical Engineering, March 2022
5. University of Notre Dame, Chemical Engineering, February 2022
6. Colorado School of Mines, Chemical Engineering, January 2022
7. Clemson University, Chemical and Biomolecular Engineering, November 2021
8. Columbia University, Chemical Engineering, January 2021
9. Rice University, Chemical and Biomolecular Engineering, March 2019
10. Oklahoma State University, Chemical Engineering, February 2019
11. Los Alamos National Laboratory, February 2019
12. University of Delaware, Chemical Engineering, December 2018
13. Virginia Tech, Chemistry Department, September 2018
14. Ohio State University, Chemical and Biomolecular Engineering, September 2018
15. University of Pittsburgh, Chemical and Petroleum Engineering, September 2018
16. ETH-Zurich, Chemical and Biochemical Engineering, May 2018
17. Technical University of Munich, Institute for Advanced Study, November 2017
18. Technical University of Denmark, Chemistry Department, October 2017
19. Chalmers University of Technology, Competence Centre for Catalysis, September 2017
20. Missouri University of Science and Technology, Dept. of Chemical Engineering, April 2016
21. ExxonMobil Research and Engineering Company, Clinton, NJ, Sept. 2015
22. University of Pennsylvania, Dept. of Chem./Bio. Engineering, Sept. 2015
23. University of Amsterdam, Institute for Molecular Sciences, May 2015
24. Leiden University, Institute of Chemistry, May 2015
25. Michigan State University, Dept. of Chemical and Materials Engr., Feb. 2015
26. Michigan Catalysis Society, Feb. 2015
27. Wayne State University, Nanoscience Initiative, Feb. 2015
28. Georgia Institute of Technology, Dept. of Chemical and Biomol. Engr., Oct. 2014

29. University of California – Riverside, Dept. of Chem. and Environ. Engr., May 2014
30. University of Illinois – Chicago, Dept. of Chemical Engineering, December 2013
31. Chicago Catalysis Club, December 2013
32. Brookhaven National Laboratory, July 2013
33. University of Wyoming, Dept. of Chemical Engineering, January 2013
34. Notre Dame University, Dept. of Chemical Engineering, November 2012
35. University of South Carolina, September 2012
36. National Renewable Energy Laboratory, September 2012
37. Pennsylvania State University, Dept. of Chemical Engineering, September 2012
38. Pacific Northwest National Laboratories, May 2012

INVITED/KEYNOTE CONFERENCE PRESENTATIONS (SINCE 2013 ONLY)

1. "Controlling Selectivity in Reactions of Complex Oxygenates over Metal Catalysts", AIChE Annual Meeting, Nov 2022, Phoenix
2. "Interaction effects in multifunctional catalysts for selective C-O bond activation", ACS Fall 2022 National Meeting, Chicago, Aug 2022
3. "Controlling hydrogenation selectivity with hydrophobic and hydrophilic surface coatings", ACS Fall 2022 National Meeting, Chicago, Aug 2022
4. "Modification of catalyst supports with organic monolayers", 2021 ACS Fall Meeting, Atlanta, August 2021.
5. "Controlling catalysis on oxide-supported metals with organic monolayers", ACS Fall National Meeting, virtual, August 2020.
6. "Controlling catalysis on oxide-supported metals with organic monolayers", ACS Fall National Meeting, virtual, August 2020.
7. "Controlled Bifunctional Catalysis via Organic Modification of Oxide-Supported Metals", 26th North American Catalysis Society Meeting, Chicago, June 2019.
8. "Toward Surface Science-Informed Design of Bifunctional Deoxygenation Catalysts". American Vacuum Society National Meeting, Long Beach, CA, October 2018.
9. "Opportunities and limitations for surface science-informed design of deoxygenation catalysts", ACS National Fall Meeting, Boston, Fall 2018
10. "Controlling selectivity on metal nanoparticles with organic monolayers", ACS National Fall Meeting, Boston, Fall 2018
11. "Tuning the activity and selectivity of metal oxide catalysts with organic monolayers", ACS National Meeting; San Francisco, April 2017
12. "Control of catalyst performance using nanometer-scale thin films", ACS National Meeting; Boston, August 2015.
13. "Understanding and controlling reactivity in heterogeneous catalysis of oxygenates", Surface Analysis Conference; Golden, CO, June 2015.
14. "Understanding and controlling selectivity in heterogeneous catalysis of oxygenates", ACS National Meeting; Denver, March 2015.
15. "Controlling selectivity in heterogeneous catalysis by surface and near surface design", ACS National Meeting, San Francisco; August 2014.
16. "Design of active sites for selective reaction of highly functional oxygenates", ACS National Meeting, Indianapolis; September 2013.
17. "Surface-level studies of photocatalytic and electrocatalytic reactions", Israel Science Foundation Workshop on Liquid Fuels from Renewable Resources, February 2013.

18. "Adsorption and Reaction of Aromatic Oxygenates on Pd Surfaces and Catalysts", ACS National Meeting, New Orleans; April 2013.

COURSES TAUGHT:

CHEN 2120: Material and Energy Balances, Spring 2009
CHEN 3320: Chemical engineering thermodynamics (undergraduate), Fall 2004, 2008-09, 2011, 2019, 2022
CHEN 3660: Energy fundamentals, Spring 2019, 2020
CHEN 4330: Chemical Eng. reaction kinetics (undergraduate), Spring 2003-08, Spring 2013-14
CHEN 5360: Catalysis and kinetics (graduate), Fall 2005, Fall 2007, Spring 2016
CHEN 5390: Chemical reaction engineering (graduate), Fall 2009, 2011, 2014, 2018
CHEN 5333: Research methods (graduate), Fall 2005 (with co-instructor Ryan Gill)
ENEN 4321: Oil and gas processing, Spring 2016

CENTER DIRECTORSHIP

Colorado Center for Biorefining and Biofuels (C2B2)
Co-founder and CU Site Director, 2006-2017
Center was initiated by Ryan T. Gill and JWM, who recruited Al Weimer as Executive Director. Gill, Weimer, and JWM were 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.

EDUCATION OUTREACH

- Co-investigator on multiple grants to prepare screencasts on chemical engineering topics from 2009-present. Screencasts have been downloaded approximately 30 million times to date. See: http://learncheme.com
- Co-investigator on grant to provide easy-to-use active learning materials (course packages) for chemical engineering courses. A complete thermodynamics course was released in 2013 and utilized by dozens of faculty at other institutions.
- Presenter at 2012 Chemical Engineering Summer School at the University of Maine; the use of screencasts and course packages were discussed in a workshop that received the 2nd-highest ratings of the summer school.
- Co-instructor, annual Teaching Workshop for new Engineering faculty, 2008-11

PROFESSIONAL ACTIVITIES

- Associate Editor for Royal Society of Chemistry journal *Catalysis Science and Technology*, 2016-present.
- Chair-elect, ACS Catalysis Division, 2024-present. Will serve as Chair of the division 2026-2027.
- Member of ACS Board for Petroleum Research Fund, 2021-2023. Service on a 3-person board charged with evaluation of approximately 100 funding proposals per year.
- President/ President-Elect/ Past President, Organic Reactions Catalysis Society, 2013-2018
- Technical Program Chair, 25th North American Catalysis Society Meeting, Denver (2017): responsible for organizing program containing >1200 abstracts.
- Technical Program Co-Chair, 17th International Congress in Catalysis, San Diego (2020): responsible for programming for a meeting that drew approximately 2000 abstracts. (Meeting was canceled due to pandemic, though abstract book was published.)

- President, Rocky Mountain Division of the North American Catalysis Society, 2005-09
- National Representative for the Rocky Mountain Division of NACS, 2009-15
- Editorial Advisory Board for the journal *ACS Catalysis* (2016)
- Organizing Committee Member, 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)
- Chair/Vice-chair, Catalysis and Reaction Eng. Topical at AIChE Annual Meeting, 2005-2007
- Panelist for NSF Graduate Research Fellowship Program, 2007-2008, 2013
- Panelist for NSF Proposal Reviews (served on >15 panels)
- National meeting session chair or co-chair for total of >30 sessions at national meetings such as NACS, ORCS, AIChE, ACS.
- Reviewer: NSF, ACS Petroleum Research Fund, Dept. of Energy, US-Israel Binational Science Foundation, Swiss National Science Foundation, ACS Catalysis, Nature Chemistry, Nature Materials, Nature Communications, Nature Catalysis, Journal of the American Chemical Society, Journal of Physical Chemistry, Journal of Catalysis, >25 other scientific journals.

INTERNAL LEADERSHIP ACTIVITIES

- Department Chair, 2020-present
- Associate Department Chair, 2012-2016
- Leader, task force for creation of Energy Engineering Minor in College of Engineering and Applied Science, 2013-2014
- Chair of graduate recruiting, 2006-09
- Co-director, GAANN graduate training programs in Chemical and Biological Sensors, Renewable and Sustainable Energy, Catalysis and Biocatalyis (2005-present)
- Faculty search committee chair or co-chair, 2011-2019

ADVISEES (current affiliation indicated parenthetically for graduates):
PhD Students: Matt Hyman (Ph.D. 2007, now at Intel), Dylan Kershner (Ph.D. 2008, US Patent Office), Clay Horiuchi (Ph.D. 2010, Perfect Day Foods), Steve Marshall (Ph.D. 2010, Phillips66), Kristi Miller (Ph.D. 2010, Colorado Mountain College), Meghana Rangan (Ph.D. 2011, Intel), Mike Griffin (Ph.D. 2013, NREL), Tania Tauer (Ph.D. 2013, Boston Museum of Science / MIT), Troy Gould (Ph.D. 2014, BASF), Simon Pang (Ph.D. 2014, Lawrence Livermore National Laboratory), Rhea Williams (Ph.D. 2014, ACS Publications), Matt Montemore (Ph.D. 2014, Tulane Univ.), Carolyn Schoenbaum (Ph.D. 2014, University of Colorado-instructor), Rudy Kahsar (Ph.D. 2014, University of Colorado-ENVS), Ally Robinson (Ph.D. 2016, TDA Research), Chih-Heng Lien (Ph.D. 2017, Globalfoundries), Lucas Ellis (Ph.D. 2018, NREL), Pengxiao Hao (Ph.D. 2018, Northwestern University), Alex Román (2020, Pioneer Astronautics), Jordi Ballesteros (MS 2019, ITQ-Valencia), Lesli Mark (PhD 2020, Univ. of Wisconsin), Patrick Coan (PhD 2020), Mathew Rasmussen (PhD 2021, NREL), Ben Greydanus (PhD 2022, Global Thermostat), Alex Jenkins (PhD 2022, CU Boulder), Jake Kenny (PhD 2023, NREL). Current: Ashutosh Mishra, Faysal Kalaifi, Ezra Baghdady, Xinpei Zhou, Zack Blanchette, Laura Paz, Nathanael Ramos, Dami Akinneye, Erin Dunphy, Brandon Oliphant, Yiqi Xu, Marc Manye Ibanez, Júlia Callejon, Jesús Melendez Gil, Zachary Meduna, Zoe Benedict.

Postdoctoral Researchers: Dongmei Li (Univ. of Wyoming), Esther Wilcox (NREL), Brian Hassler (Elevance Renewable Sciences), April Corpuz (FuelCell Energy), Jing Zhang (East China University of Science and Technology), Tim Van Cleve (National Renewable Energy Laboratory), Jiajie Huo (Bristol Myers Squibb), Alex Jenkins (current).

More than 100 undergraduate and masters advisees have worked in the laboratory.