

## CURRICULUM VITAE

### MATTHEW S. SIGMAN

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#### EDUCATION

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**1992**                    **B.S.**, Chemistry, Sonoma State University, California  
**1996**                    **Ph.D.**, Organometallic Chemistry, Washington State University  
**Thesis Advisor:** Professor Bruce E. Eaton  
**Title:** "Catalytic iron mediated [4 + 1] cycloadditions of allenyl substrates with carbon monoxide. Mechanism and scope of catalytic cobalt mediated cyclotrimerization of alkynes in aqueous media."

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#### PROFESSIONAL EXPERIENCE

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**2019 - present**        Chair, Department of Chemistry  
**2016 - present**        Distinguished Professor of Chemistry  
**2012 - present**        Peter J. Christine S. Stang Presidential Endowed Chair of Chemistry  
**2009 - 2010**          Visiting Professor, Huntsman Cancer Institute, University of Utah  
**2008 - 2016**          Professor of Chemistry, University of Utah  
**2004 - 2008**          Associate Professor of Chemistry, University of Utah  
**1999 - 2004**          Assistant Professor of Chemistry, University of Utah  
**1996 - 1999**          NIH Postdoctoral Research Associate, Harvard University  
**Mentor:** Professor Eric N. Jacobsen  
**1994 - 1995**          NeXstar Predoctoral Fellow, NeXstar Pharmaceuticals, Boulder, CO  
**1992 - 1996**          Graduate Student, Washington State University  
**1991**                    Undergraduate Research Fellow, Utah State University  
**Mentor:** Professor Michael E. Wright

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#### HONORS AND AWARDS

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**2021**                    University of Utah Distinguished Teaching Award  
**2019 - present**        Editorial Advisory Board, *Accounts for Chemical Research*  
**2018**                    Alexander von Humboldt Foundation Research Award  
**2017**                    Celebrate U "Top Researcher Honoree", University of Utah  
**2017**                    ACS Award for Creative Work in Synthetic Organic Chemistry  
**2016**                    Distinguished Professor of Chemistry  
**2016**                    Sigma Chi Outstanding Professor Award (student awarded)  
**2014-15**                Novartis Chemistry Lectureship  
**2013**                    Schulich Visiting Professor Lectureship, Technion, Israel  
**2012 - present**        Peter J. Christine S. Stang Presidential Endowed Chair of Chemistry  
**2012**                    Elected Fellow of the American Association for the Advancement of Science  
**2011**                    University of Utah Distinguished Scholarly and Creative Research Award  
**2011 - 2019**          Associate Editor, *Journal of the American Chemical Society*  
**2010 - 2012**          Editorial Advisory Board, *ACS Catalysis*  
**2010**                    Arthur C. Cope Scholar Award  
**2009**                    Robert W. Parry Teaching Award  
**2009 - present**        Editorial Advisory Board, *Journal of Organic Chemistry*  
**2008**                    University of Utah Distinguished Honors Professor (Teaching Award)  
**2004**                    Pfizer Award for Creativity in Organic Chemistry  
**2004**                    Camille and Henry Dreyfus Teacher Scholar Award  
**2002**                    National Science Foundation CAREER Award  
**2000**                    Research Innovation Award (Research Corporation)  
**1997 - 1999**          National Institutes of Health Postdoctoral Fellowship

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## CURRENT FUNDING

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National Institutes of Health (NIGMS # R01 GM63540)

**Role:** PI (**Effort 0.65 summer month**)

**Proposal Title:** Pd-Catalyzed Olefin Functionalization Reactions for Organic Synthesis

**Period:** 9/01/2016 to 8/31/2020 (**No Cost Extension**)

**Total Award Amount:** \$1,332,544 (total); \$215,000 direct/yr

National Science Foundation (CHE-1763436)

**Role:** PI (**Effort 0.35 summer month**)

**Proposal Title:** Modern Data Analysis Tools for Prediction and Understanding in Catalyst Discovery

**Period:** 09/01/2018-08/31/2021

**Total Award Amount:** \$ 451,980 (total); \$99,000 direct/yr

Argonne National Laboratory (DE-AC02-06CH11357)

**Role:** PI (co-PI Shelley Minteer) - this is a large consortium grant from the DoE administered by Argonne (**Effort: 0.3 summer month**)

**Period:** 7/1/2018- 6/30/2023

**Proposal Title:** "Joint Center for Energy Storage Research (JCESR2)"

**Total Award Amount:** \$752,275 (total); \$139,000 direct to MSS

**Active:** National Science Foundation (CHE-1925607)

**Role:** Co-PI (PI Olaf Wiest) (**Effort 0.3 summer month**)

**Proposal Title:** CCI Phase I: NSF Center for Computer Assisted Synthesis

**Period:** 9/01/2019 to 8/31/2022

**Total Award Amount to MSS** \$257,361; \$56,625 direct/yr

National Institutes of Health (MIRA) (1R35GM136271-01)

**Role:** PI (**Effort 1.55 summer month**)

**Period:** 03/01/2020-02/28/2025

**Proposal Title:** Data Science Guided Organic Reaction Development

**Total Award Amount:** \$2,238,448; \$147K direct/yr (1<sup>st</sup> year)

National Science Foundation (CHE-2002158)

**Role:** co-PI (**Effort 0.3 summer month**)

**Proposal Title:** Phase II, NSF Center for Synthetic Organic Electrochemistry

**Period:** 9/1/2020 - 8/31/2025

**Total Award Amount to MSS:** \$ 668,828; MSS: \$214,000 direct

National Science Foundation (CHE-1700982)

**Role:** co-PI (**Effort 0.2 summer month**)

**Proposal Title:** CCI Phase III: CCI Center in Selective C-H Functionalization

**Period:** 8/15/17-8/14/21 (Emory University (subcontract at University of Utah))

**Total Award Amount to MSS:** \$546,028; \$93,960 direct/yr

Genentech 2020 (50503771)

**Role:** PI (no effort)

**Period:** 6/17/2021-6/16/2023

**Proposal Title:** UTAH/GENENTECH COLLABORATION 2020

**Total Award Amount:** \$250K (total); \$82K direct/year

Genentech/Miller/Toste/Sigman (50503972)

**Role:** PI (no effort)

**Period:** 08/02/21-08/01/23  
**Proposal Title:** Genentech 2021  
**Total Award Amount:** \$250K (total); \$82K direct/year

GSK (3000036824 PO 6600089091)

**Role:** PI (Effort 0 summer months)  
**Period:** 11/02/2020-11/01/2022  
**Proposal Title:** UTAH/GSK COLLABORATION  
**Total Award Amount:** \$250K (total): \$81K direct (1<sup>st</sup> year)

Pfizer (PO8502291385/1400)

**Role:** PI (no effort)  
**Period:** 07/15/2019-07/14/2021 (no cost extension)  
**Proposal Title:** PREDICTING RELATIVE EFFICIENCY OF AMIDE BOND FORMATION USING MULTIVARIATE LINEAR REGRESSION  
**Total Award Amount:** \$99,999 (total), \$65,574 direct

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**PUBLICATIONS** (\*indicates corresponding author, <sup>§</sup>undergraduate coworker)

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244. Akita, S.; Guo, J.-Y.; Seidel, F. W.; Sigman, M. S.\*; Nozaki, K.\* "Statistical Analysis of Catalytic Performance in Ethylene/Methyl Acrylate Copolymerization Using Palladium/Phosphine-Sulfonate Catalysts," *submitted*
243. Clements, H. D.; Flynn, A. R.; Nicholls, B. T.; Grosheva, D.; Hyster, T. K.\*; Sigman, M. S.\* "Workflow for Biocatalytic Reaction Performance Prediction and Analysis," *in revision* (<https://doi.org/10.26434/chemrxiv-2021-9gd5m>)
242. Rein, J.; Meinhardt, J. M.; Julie L. Wahlman, J. L. H.; Sigman, M. S.\*; Lin, S.\* "An Explosophore-Based Approach Towards the Prediction of Energetic Material Sensitivity Properties," *in revision* (<https://chemrxiv.org/engage/chemrxiv/article-details/6111998fd800ad583442ec91>).
241. Malapit, C. A.; Tanwar, M.; Pendergast, A. D.; Udyavara, S.; Beck, W. D.; Smith, R. E.; Kadic, S.; Primo, T.; Wu, A. D.; Stone, T.; White, H. S.\*; Neurock, M.\*; Sigman, M. S.\*; Minteer, S. D.\* "Electrochemical Cobalt-Catalyzed Selective Carboxylation of Benzyl Halides with CO<sub>2</sub> Enabled by Low-Coordinate Cobalt Electrocatalysts," *in revision* (<https://chemrxiv.org/engage/chemrxiv/article-details/6184529f92abe08b7335483b>).
240. Tobias Gensch, T.\*; Smith, S. R.; Colacot, T. J.; Timsina, Y.; Xu, G.; Glasspoole, B. W.; Sigman, M. S.\* "Design and Application of a Screening Set for Monophosphine Ligands in Metal Catalysis," <https://doi.org/10.33774/chemrxiv-2021-fgm7v>
239. Haas, B. C.; Goetz, A. E.\*; Bahamonde, A.; McWilliams, J. C.; Sigman, M. S.\* "Predicting Relative Efficiency of Amide Bond Formation using Multivariate Linear Regression," *in revision*.
238. Crawford, J. M.; Gensch, T.; Sigman, M. S.\*; Elward, J. M.\*; Steves, J. E.\* "Implication of Phosphine Featurization Methods in the Design and Analysis of High-Throughput Experiments," *in revision*.
236. Tang, T.; Friede, N. C.; Minteer, S. D.\*; Sigman, M. S.\* "Comparing Halogen Atom Abstraction Mechanisms for Mn(I), Fe(I), and Co(I) Complexes by Combining Electroanalytical and Statistical Modeling," *submitted*
235. Kelly, S. P.; Shende, V. V.; Flynn, A. R.; Dan, Q.; Ye, Y.; Smith, J. L.; Tsukamoto, S.; Sigman, M. S.\*; Sherman, D. H.\* "Structural and Data Science-Driven Analysis to Assess Substrate Specificity of Diketopiperazine Reverse Prenyltransferase NotF: Cascade Biocatalytic Synthesis of (-)-Eurotiumin A," *in revision*. [10.33774/chemrxiv-2021-gmv5j](https://doi.org/10.33774/chemrxiv-2021-gmv5j)
234. Gnaim, S.; Bauer, A.; Zhang, H.-J.; Chen, L.; Gannet, C.; Malapit, C.; Hill, D.; Vogt, D.; Tang, T.; Daley, R.; Hao, W.; Quertenmont, M.; Beck, W. D.; Kandahari, E.; Vantourout, J. C.; Pierre-Georges Echeverria, P.-G.; Abruna, H.\*; Blackmond, D.\*; Minteer, S.\*; Reisman, S.\*; Sigman, M. S.\*; Baran, P. S.\* "Cobalt-Electrocatalytic Hydrogen Atom Transfer for Functionalization of Unsaturated C-C Bonds," *Nature*, *accepted* ([10.33774/chemrxiv-2021-b34zl](https://doi.org/10.33774/chemrxiv-2021-b34zl))

233. Cammarota, R. C.; Wenbin Liu, W.; Bacsa, J.; Davies, H. M. L.\*; Sigman, M. S.\* "A Mechanistically Guided Workflow for Relating Complex Reactive Site Topologies to Catalyst Performance in C–H Functionalization Reactions," *J. Am. Chem. Soc.* **2022**, *144*, ASAP.
232. Gensch, T.\*; dos Passos Gomes, G.; Friederich, P.; Peters, E.; Gaudin, T.; Pollice, R.; Jorner, K.; Nigam, A. Lindner-D'Addario; M.; Sigman, M. S.\*; Aspuru-Guzik, A.\* A Comprehensive Discovery Platform for Organophosphorus Ligands for Catalysis," *J. Am. Chem. Soc.* **2022**, *144*, 1205-1217.
231. Dotson, J. J.; Anslyn, E. V.\*; Sigman, M. S.\* "A Data-Driven Approach to the Development and Understanding of Chiroptical Sensors for Alcohols with Remote  $\gamma$ -Stereocenters," *J. Am. Chem. Soc.*, **2021**, *143*, 19187-19198.
230. Yan, Y.; Vogt, D. B.; Sigman, M. S.; Sanford, M. S.\* "Rational Design of a High Energy Capacity Catholyte for Long-Term Stable Cycling Nonaqueous Redox Flow Batteries," *Angew. Chem. Int. Ed.*, **2021**, *60*, 27039-27045.
229. Li, M.; Odom, S. A.\*; Robertson, L. A.; Vaid, T.; Pancoast, A. R.; Agarwal, G.; Doan, H. A.; Suduwella, T. M.; Bheemireddy, S. R.; Assary, R. S.; Zhang, L.; Sigman, M. S.; Minter, S. D.\* "Experimental Protocols for Studying Organic Non-Aqueous Redox Flow Batteries," *ACS Energy Lett.* **2021**, *6*, 3932-3943.
228. Zell, D.\*; Kingston, C.; Jermaks, J.; Smith, S. R.; Seeger, N.; Wassmer, J.; Sirois, L. E.; Han, C.; Zhang, H.; Sigman, M. S.\*; Gosselin, F., "Stereoconvergent and -divergent Synthesis of Tetrasubstituted Alkenes by Nickel-Catalyzed Cross-Couplings," *J. Am. Chem. Soc.* **2021**, *143*, 19078-19090.
227. De Jesus Silva, J.; Bartalucci, N.; Jelier, B.; Grosslight, S.; Gensch, T.; Schünemann, C.; Müller, B.; Kamer, P. C. J.; Copéret, C.\*; Sigman, M. S.\*; Togni, A.\* "Development and Molecular Understanding of a Pd-catalyzed Cyanation of Aryl Boronic Acids Enabled by High-Throughput Experimentation and Data Analysis," *Helv. Chim. Acta* **2021**, e2100200.
226. Dherange, B. D.; Kelly, P. Q.; Liles, J. P.; Sigman, M. S.; Levin, M. D.\* "Carbon Atom Insertion into Pyrroles and Indoles Promoted by Chlorodiazirines," *J. Am. Chem. Soc.* **2021**, *143*, 11337-11344.
225. Griffin, J. D.; Vogt, D. B.; Du Bois, J.\*; Sigman, M. S.\* "Mechanistic Guidance Leads to Enhanced Site-Selectivity in C–H Oxidation Reactions Catalyzed by Ruthenium bis(Bipyridine) Complexes," *ACS Catalysis* **2021**, *11*, 10479-10486.
224. Yichao Yan, Y.; Robinson, S. G.; Vaid, T. P.; Sigman, M. S.; Sanford, M. S.\* "Simultaneously Enhancing the Redox Potential and Stability of Multi-Redox Organic Catholytes by Incorporating Cyclopropenium Substituents," *J. Am. Chem. Soc.* **2021**, *143*, 13450-13459.
223. Williams, W. L.; Zeng, L.; ‡, Gensch, T.\*; Sigman, M. S.\*; Doyle, A. G.\*; Anslyn, E. V.\* "The Evolution of Data-Driven Modeling in Organic Chemistry," *ACS Central Science*, **2021**, *7*, 1622-1637.
222. Crawford, J. M.; Kingston, C.; Toste, F. D.\*; Sigman, M. S.\* "Data Science Meets Physical Organic Chemistry," *Acc. Chem. Res.* **2021**, *54*, 3136-3148.
221. Newman-Stonebraker, S. H.; Smith, S. R.; Borowski, J. E.; Gensch, T.; Peters, E. B.; Johnson, H. C.; Sigman, M. S.\*; Doyle, A. G.\* "Univariate Classification of Phosphine Ligation State and Reactivity in Cross-Coupling Catalysis," *Science* **2021**, *374*, 301-308.
220. Kulik, H. J.\*; Sigman, M. S.\* "Advancing Discovery in Chemistry with Artificial Intelligence: From Reaction Outcomes to New Materials and Catalysts," (editorial) *Acc. Chem. Res.* **2021**, *54*, 2335-2336.
219. Saito, M.; Kawamata, Y.; Meanwell, M.; Navratil, R.; Chiodi, D.; Carlson, E.; Hu, P.; Chen, L.; Udyavara, S.; Kingston, C.; Tanwar, M.; Tyagi, S.; McKillican, B. P.; Gichinga, M. G.; Schmidt, M. A.; Eastgate, M. D.; Lamberto, M.-L.; He, C.; Tang, T.; Malapit, C.; Sigman, M. S.; Minter, S. D.; Neurock, M.\*; Baran, P. S.\* "N-Ammonium Ylide Mediators for Electrochemical C–H Oxidation," *J. Am. Chem. Soc.* **2021**, *143*, 7859-7867.
218. Werth, J.; Sigman, M. S.\* "Linear Regression Model Development for Analysis of Asymmetric Copper-Bisoxazoline Catalysis," *ACS Catalysis* **2021**, *11*, 3916-3922.
217. Kraus, S. L.<sup>§</sup>; Ross, S. P.; Sigman, M. S.\* "Rate Profiling the Impact of Remote Functional Groups on the Redox-Relay Heck reaction," *Org. Lett.* **2021**, *23*, 2505-2509.
216. DeLano, T. J.; Dibrell, S. E.; Lacker, C. R.; Pancoast, A. R.; Poremba, K. E.; Cleary, L.; Sigman, M. S.; Reisman, S. E.\* "Nickel-Catalyzed Asymmetric Reductive Cross-Coupling of  $\alpha$ -Chloroesters with (Hetero)Aryl Iodides," *Chem. Sci.* **2021**, *12*, 7758-7762.

215. Griffin, J. D.; Pancoast, A. R.; Sigman, M. S.\* "Interrogation of 2,2'-Bipyrimidines as Low-Potential Two-Electron Electrolytes," *J. Am. Chem. Soc.* **2021**, *143*, 992-1004.
214. Christensen, M.; Yunker, L. P. E.; Adedeji, F.; Roch, L. M.; Gensch, T.; dos Passos Gomes, G.; Zepel, T.; Sigman, M. S.\*; Aspuru-Guzik, A.\*; Hein, J. E.\* "Data-science driven autonomous process optimization," *Commun Chem* **2021**, *4*, 112.
213. Tang, T.; Sandford, C.; Minter, S. D.\*; Sigman, M. S.\* "Analyzing Mechanisms in Co(I) Redox Catalysis Using a Pattern Recognition Platform," *Chem. Sci.* **2021**, *12*, 4771-4778.
212. Reisman, S. E.\*; Sarpong, R.\*; Sigman, M. S.\*; Yoon, T. P.\* "Organic Chemistry: A Call to Action for Diversity and Inclusion," *J. Org. Chem.* **2020**, *85*, 10287-10292; *Org. Lett.* **2020**, *22*, 6223-6228; *Organometallics* **2020**, *16*, 2931-2936; *ACS Central Sci.* **2020**, *6*, 1241-1247.
211. Werth, J.; Sigman, M. S.\* "Connecting and Analyzing Enantioselective Bifunctional Hydrogen Bond Donor Catalysis using Data Science Tools," *J. Am. Chem. Soc.* **2020**, *142*, 16382-16391.
210. De Jesus Silva, J.; Ferreira, M. A. B.; Fedorov, A.\*; Sigman, M. S.\*; Copéret, C.\* "Molecular-Level Insight in Supported Olefin Metathesis Catalysts by Combining Surface Organometallic Chemistry, High Throughput Experimentation, and Data Analysis," *Chem. Sci.* **2020**, *11*, 6717-6723.
209. Tsai, C.-C.; Sandford, C.; Wu, T.; Che, B.; Sigman, M. S.\*; Toste, F. D.\* "Enantioselective Intramolecular Allylic Substitution via Synergistic Palladium/Chiral Phosphoric Acid Catalysis: Insight into Stereoinduction through Statistical Modeling," *Angew. Chem. Int. Ed.*, **2020**, *59*, 14647-14655.
208. Levin, M. D.; Ovia, J. M.; Read, J. A.; Sigman, M. S.\*; Jacobsen, E. N. "Catalytic Enantioselective Synthesis of Difluorinated Alkyl Bromides," *J. Am. Chem. Soc.* **2020**, *142*, 14831-14837.
207. Robinson, S. G.; Mack, J. B. C.; Alektiar, S. N.<sup>§</sup>; Du Bois, J.\*; Sigman, M. S.\* "Electrochemical Ruthenium-Catalyzed C-H Hydroxylation of Amine Derivatives in Aqueous Acid," *Org. Lett.* **2020**, *18*, 7060-7063.
206. Ross, S. P.; Rahman, A. A.; Sigman, M. S.\* "Development and Mechanistic Interrogation of Interrupted Chain-Walking in the Enantioselective Relay Heck Reaction," *J. Am. Chem. Soc.* **2020**, *142*, 10516-10525.
205. Rosales, A. R.; Ross, S. P.; Helquist, P.; Norrby, P.-O.; Sigman, M. S.; Wiest, O.\* "Transition State Force Field for the Asymmetric Redox Relay Heck Reaction," *J. Am. Chem. Soc.* **2020**, *142*, 9700-9707.
204. Robinson, S. G.; Wu, X.; Sigman, M. S.\*; Lin, S.\* "Mechanistic Studies Inform Design of Improved Ti(salen) Catalysts for Enantioselective [3+2] Cycloaddition," *J. Am. Chem. Soc.* **2020**, *142*, 18471-1482.
203. Shrestha, A.; Hendriks, K. H.; Sigman, M. S.; Minter, S. D.; Sanford, M. S. "Realization of an Asymmetric Non-Aqueous Redox Flow Battery through Molecular Design to Minimize Active Species Decomposition and Crossover," *Chem. Eur. J.* **2020**, *26*, 5369-5373.
202. Reid, J. P.; Hu, M.; Itoh, S.; Huang, B.; Hong, C. M.; Xiang, H.; Sigman, M. S.\*; Toste, F. D.\* "Strategies for Remote Enantiocontrol in Chiral Gold(III) Complexes Applied to Catalytic Enantioselective  $\gamma$ ,  $\delta$ -Diels-Alder Reactions," *Chem. Sci.* **2020**, *11*, 6450-6456.
201. Miro, J.; Gensch, T.; Ellwart, M.; Han, S.-J.; Lin, H.-H.; Sigman, M. S.\*; Toste, F. D.\* "Enantioselective Allenolate-Claisen Rearrangement using Configurationally Flexible Chiral Phosphate Catalysts," *J. Am. Chem. Soc.* **2020**, *142*, 6390-6399.
200. Yuan, Q.; Prater, M. B.; Sigman, M. S.\* "Enantioselective Synthesis of  $\gamma$ -Functionalized Cyclopentenones and  $\delta$ -Functionalized Cycloheptenones Utilizing a Redox-Relay Heck Strategy," *Adv. Synth. Catal.* **2020**, *362*, 326-330. (Special issue honoring Eric Jacobsen on his 60<sup>th</sup> birthday).
199. Robinson, S. G.; Sigman, M. S.\* "Integrating Electrochemical and Statistical Analysis Tools for Molecular Design and Mechanistic Understanding," *Accounts of Chem. Res.* **2020**, *53*, 289-299.
198. Sandford, C.; Fries, L. R.<sup>§</sup>; Ball, T. E.<sup>§</sup>; Minter, S. D.\*; Sigman, M. S.\* "Mechanistic Studies into the Oxidative Addition of Co(I) Complexes: Combining Electroanalytical Techniques with Parameterization," *J. Am. Chem. Soc.* **2019**, *141*, 18877-18889.
197. Reid, J. P.; Proctor, R. S. J.; Sigman, M. S.\*; Phipps, R. J.\* "Predictive Multivariate Linear Regression Analysis Guides Successful Catalytic Enantioselective Minisci Reactions of Diazines," *J. Am. Chem. Soc.* **2019**, *141*, 19178-19185.

196. Li, J.; Grosslight, S.; Miller, S. J.\*; Sigman, M. S.\*; Toste, F. D.\* "Site-Selective Acylation of Natural Products with BINOL-Derived Phosphoric Acids," *ACS Catal.* **2019**, *9*, 9794-9799.
195. Prater, M. B.; Sigman, M. S.\* "Enantioselective Synthesis of Alkyl Allyl Ethers via Palladium-Catalyzed Redox-Relay Heck Alkenylation of O-Alkyl Enol Ethers," *Isr. J. Chem.* **2020**, *60*, 452-460. (Special issue honoring Steve Buchwald and John Hartwig)
194. Yan, Y.; Robinson, S. G.; Sigman, M. S.; Sanford, M. S.\* "Mechanism-based design of a high-potential catholyte enables a 3.2 V all-organic non-aqueous redox flow battery," *J. Am. Chem. Soc.* **2019**, *141*, 15301-15306.
193. Chen, Z.-M.; Liu, J.; Guo, J.-Y.; Loch, M.; DeLuca, R. J.; Sigman, M. S.\* "Palladium-catalyzed enantioselective alkenylation of alkenylbenzene derivatives," *Chem. Sci.* **2019**, *10*, 7246-7250.
192. Yuan, Q.; Sigman, M. S.\* "Palladium-Catalyzed Enantioselective Alkenylation of Enolactams using a Relay Heck Strategy," *Chem. Eur. J.* **2019**, *25*, 10823-10827.
191. Christian, A. H.; Jia, S.; Zhang, P.; Meza, A. T.; Sigman, M. S.; Chang, C. J.\*; Toste, F. D.\* "A Physical Organic Approach to Tuning Reagents for Selective and Stable Methionine Bioconjugation," *J. Am. Chem. Soc.* **2019**, *141*, 12657-12662.
190. Ferreira, M. A. B.\*; Silva, J. D. J.; Grosslight, S.; Fedorov, A.\*; Sigman, M. S.\*; Copéret, C.\* "Non-Covalent Interactions Drive the Efficiency of Molybdenum Imido Alkylidene Catalysts for Olefin Cross Metathesis," *J. Am. Chem. Soc.* **2019**, *141*, 10788-10800.
189. Robinson, S. G.; Yan, Y.; Hendriks, K. H.; Sanford, M. S.\*; Sigman, M. S.\* "Developing a Predictive Solubility Model for Monomeric and Oligomeric Flow Battery Electrolytes," *J. Am. Chem. Soc.* **2019**, *141*, 10171-10176.
188. Liu, J.; Yuan, Q.; Toste, F. D.; Sigman, M. S.\* "Enantioselective Construction of Remote Tertiary Carbon-Fluorine Bonds," *Nature Chem.* **2019**, *11*, 710-715.
187. Sandford, C.; Edwards, M. A.; Klunder, K. J.; Hcrwickey, D. P.; Li, M.; Sigman, M. S.\*; White, H. S.\*; Minter, S. D.\* "An Organic Chemist's Guide to Electroanalytical Tools for Studying Reaction Mechanisms," *Chem. Sci.* **2019**, *10*, 6404-6422.
186. Reid, J. P.; Sigman, M. S.\* "A Platform for Holistic Prediction of Enantioselectivity in Asymmetric Catalysis," *Nature*, **2019**, *571*, 343-348. News and Views: Norrby, P.-O. *Nature* **2019**, *571*, 332-333. [Press Release](#).
185. Bahamonde, A.; Al Rifaie, B.; Martín-Heras, V.; Allen, J. R.; Sigman, M. S.\* "Enantioselective Markovnikov Addition of Carbamates to Trisubstituted Allylic Alcohols for the Construction of  $\alpha$ -Tertiary Amines," *J. Am. Chem. Soc.* **2019**, *141*, 8708-8711
184. Allen, J. R.; Bahamonde, A.; Furukawa, Y.; Sigman, M. S.\* "Enantioselective N-alkylation of Indoles via an Intermolecular Aza-Wacker-Type Reaction," *J. Am. Chem. Soc.* **2019**, *141*, 8670-8674.
183. Kwon, Y.; Li, J.; Reid, J. P.; Crawford, J. M.; Jacob, R.; Sigman, M. S.\*; Toste, F. D.\*; Miller, S. J.\* "Disparate Catalytic Scaffolds for Atroposelective Cyclodehydration," *J. Am. Chem. Soc.* **2019**, *141*, 6698-6705.
182. Hickey, D. P.; Sandford, C.; Rhodes, Z.; Gensch, T.; Fries, L. R.<sup>§</sup>; Sigman, M. S.\*; Minter, S. D.\* "Investigating the Role of Ligand Electronics on Stabilizing Electrocatalytically Relevant Low Valent Co(I) Intermediates," *J. Am. Chem. Soc.* **2019**, *141*, 1382-1392.
181. Crawford, J. M.; Sigman, M. S.\* "Conformational Dynamics in Asymmetric Catalysis: Is Catalyst Flexibility a Design Element?," *Synthesis*, **2019**, *51*, 1021-1036.
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## PATENTS AND PENDING APPLICATIONS

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2. Eaton, B. E.; Sigman, M. S. "Method for the Cyclotrimerization of Alkynes in Aqueous Solutions." U. S. Patent No. 5,659,069.
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## INVITED RESEARCH LECTURES

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291. CHEM-Reaxys Symposia, October 22<sup>nd</sup>, 2021, "Using Data Science to Explore and Exploit Monodentate Phosphines in Catalysis," (Virtual)
290. Bayer Process Chemistry Conference, October 6<sup>th</sup>, 2021, "Using Data Science to Explore and Exploit Monodentate Phosphines in Catalysis," (Virtual)
289. Dow Seminar Series, 09/30, 2021, "Using Data Science to Explore and Exploit Monodentate Phosphines in Catalysis," (Virtual)
288. Award Symposium for Shannon Stahl, Fall ACS Meeting, 08/23/2021, "Using Data Science to Explore and Exploit Monodentate Phosphines in Catalysis," (Virtual)
287. Virtual Integration of Synthesis with Theory and AI, July 13, 2021, Data Science Meets Physical Organic Chemistry," (Virtual)
286. 2021 Scientific Advancement Seminar Program, Boehringer-Ingelheim, March 25<sup>th</sup>, 2021, "Data Science Meets Physical Organic Chemistry," (Virtual)
285. Center for Molecular Electrocatalysis Seminar, November 4<sup>th</sup>, 2020, "Data Science Meets Physical Organic Chemistry," (Virtual)
284. NSF-AI Institute Workshop, October 14, 2020, "Data Science Meets Physical Organic Chemistry," (Virtual)
283. ENJ @60, Harvard University, Feb. 2020
282. "Student Invite", Philadelphia Organic Chemists' Club, November 21, 2019, "Integrating Data Science Tools into Reaction Development"
281. Workshop on Electrochemistry, National Academy of Sciences, Nov. 2019, "Integrating Data Science Tools into Molecular Design in Electrocatalysis and Energy Applications"
280. "AbbVie Lecture", University of Chicago, Nov. 2019, "Integrating Data Science Tools into Reaction Development"
279. ACS Princeton Fall Organic Symposium, Princeton, NJ, Nov. 2019, "Data Science in Reaction Development using Physical Organic Chemistry"

278. Advancing of Molecular Sciences by Machine Learning and Quantum Chemistry, Emory University, Oct. 2019, "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
277. ORGANIC CHEMISTRY DAY @PAVIA, Pavia, Italy, September 30, 2019 "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
276. ICCOS, Moscow, Russia, September 2019, "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
275. Summer School on Dispersion, Paderborn, Germany, July 2019, "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
274. Canadian Chemistry Conference, "Emerging Tools Symposium", Quebec City, Canada, June 2019, "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
273. "Grad Program Distinguished Lecturer Series" The Scripps Research Institute, June 2019, "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
272. "Lectures in Modern Chemistry", University of British Columbia, April 2019, "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
271. ACS Meeting, James Flack Norris Symposium Honoring Eric Anslyn, April 2019, "Developing Modern Data Analysis Tools for Synthesis & Catalysis"
270. Indiana Organic Seminar Symposium, February 2019, "Data Intensive Physical Organic Chemistry"
269. "Novartis Lecture," California Institute of Technology, February 2019, "Data Intensive Physical Organic Chemistry"
268. The Hong Kong University of Science and Technology, "Enantioselective Formation of Remote Tertiary and Quaternary Chiral Centers," December 20<sup>th</sup>, 2018
267. 10th Singapore International Chemistry Conference, Singapore, "Developing modern physical organic analysis tools for synthesis, catalysis, and energy," Dec. 16, 2018
266. Merck, West Point, PA "Developing modern physical organic analysis tools for synthesis, catalysis, and energy," November 28, 2018
265. GlaxoSmithKline, Collegeville, PA "Developing modern physical organic analysis tools for synthesis, catalysis, and energy," November 27, 2018
264. Pfizer, Groton, CN "Short Course: Developing Modern Physical Organic Analysis Tools for Optimization, Analysis, and Molecular Design," November 16, 2018
263. Department Chemie Ludwig-Maximilians-Universität München, Developing modern physical organic analysis tools for synthesis, catalysis, and energy," November 6, 2018
262. Lehrstuhl für Organische Chemie, Technische Universität München, "Developing modern physical organic analysis tools for synthesis, catalysis, and energy," Germany, November 8, 2018
261. Frontiers in Chemistry: ArmChemFront, "Developing modern physical organic analysis tools for synthesis, catalysis, and energy," Yerevan, Armenia October 2018
260. 2018 Frontiers Symposium at the University of Illinois at Urbana-Champaign, "Enantioselective Formation of Remote Tertiary and Quaternary Chiral Centers," October 2018
259. Latin-American congress of Chemistry, Havana, Cuba, "Enantioselective Formation of Remote Tertiary and Quaternary Chiral Centers," October 9-12, 2018
258. University of Minnesota, Student Invited Seminar Series, "Developing modern physical organic analysis tools for synthesis, catalysis, and energy," September 2018
257. Stereochemistry Gordon Research Conference, Salve Regina, RI, "Data Driven Methods to Identify and Exploit Non Covalent Interactions in Asymmetric Catalysis," July 2018
256. Institut fuer Organische und Biomolekulare Chemie, Georg-August-Universität Göttingen, Germany, "Developing Modern Physical Organic Analysis Tools," July 2018
255. Bayer AG Research & Development, Pharmaceuticals, Wuppertal, Germany, "Developing Modern Physical Organic Analysis Tools," July 2018
254. RWTH Aachen University, Germany, "Enantioselective Formation of Remote Tertiary and Quaternary Chiral Centers," July 2018
253. Technische Universität Berlin, Germany, "Enantioselective Formation of Remote Tertiary and Quaternary Chiral Centers," July 2018
252. Novartis, Basel, Switzerland, "Developing Modern Physical Organic Analysis Tools," June 2018

251. Genentech, South San Francisco, CA, "Short Course on Multivariate Analysis in Catalysis," May 2018
250. City College of New York, Salzberg Chemistry Seminar, "Developing Modern Physical Organic Analysis Tools," May 2018
249. Organic Reactions Catalysis Society, San Diego, CA, "Enantioselective Formation of Remote Tertiary and Quaternary Chiral Centers," April 2018
248. University of Maryland, "Developing Modern Physical Organic Analysis Tools," April 2018
247. Spring ACS Meeting, New Orleans: James Flack Norris Award in Physical Organic Chemistry Honoring Cindy Burrows "Developing and Applying Modern Physical Organic Analysis Tools to Synthesis, Catalysis, and Energy," March 2018
246. Florida Heterocycles Conference, Gainesville Florida "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," March 2018
245. MilliporeSigma, Milwaukee, WI "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry," February 2018
244. "2018 Schleyer Lecture" University of Georgia "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry," February 2018
243. "Schulich Faculty Colloquium" Technion - Israel Institute of Technology Schulich Colloquium, Haifa, Israel, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," December 2017
242. Modern Trends in Inorganic Chemistry, Pune, India, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," December 2017
241. Indo-US Workshop on Organometallics, Lonavla, India, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry," December 2017
240. IIT Satellite Conference on Organometallic Chemistry, IIT Bombay, Mumbai, India "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," December 2017
239. Meeting of the Minds sponsored by Millipore, Cambridge, MA, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry," November 2017
238. SACNAS, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry," October 2017
237. Novartis, Cambridge, MA, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry," October 2017
236. "Summer School", ICIQ, Tarragona, Spain, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry", September 2017
235. "Summer School", ICIQ, Tarragona, Spain, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," September 2017
234. International Symposium - Catalysis for Sustainable Chemical Synthesis, Freiburg, Germany "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry", September 25, 2017
233. ICSN, Gif-sur-Yvette, France, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," September 2017
232. ACS DC, Symposium on Computational Approaches to Catalysis, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry", August 2017
231. AbbVie, Chicago, Illinois "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," August 2017
230. IUPAC Conference, Sao Paulo, Brazil, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," July 2017
229. CCHF Virtual Symposium "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry", July 2017
228. Seoul National University, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," May 2017
227. KAIST, South Korea, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," May 2017

226. KAIST, South Korea, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry", May 2017
225. University of Norte Dame, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," April 2017
224. University of Missouri Organic Chemistry Day, "Enantioselective formation of remote chiral centers through Pd-catalyzed alkene functionalization," April 2017
223. University of Missouri, "Bringing Modern Data Analysis Tools to Prediction and Understanding in Organic Chemistry", April 2017
222. ACS Symposium for ACS award for ACS Award for Creative Work in Synthetic Organic Chemistry, April 2017
221. West Virginia University, March 2017
221. 1<sup>st</sup> International Editor's symposium on chemistry (IESC), Seoul, Korea, December 2016
220. Southwestern Medical School, Dallas, Texas, December 2016
219. Symposium for Eric Jacobsen (2016 Award for Creativity in Molecular Design and Synthesis), New Jersey, December 2016
218. University of Münster, Germany, Nov. 2016
217. University of Münster, Germany, Nov. 2016
216. Max Plank Institute, Muelhiem, Germany, Nov. 2016
215. Boehringer Ingelheim, November 2016
214. New York University, October 2016
213. Merck (Rahway), October 2016
212. Bristol-Myers-Squibb (Process, New Brunswick) October 2016
211. Bristol-Myers-Squibb (Drug Discovery, New Brunswick), October 2016
210. *Liebig College Lectureship (Short Course)*, Giessen, Germany, August 2016
209. Keio University, Tokyo, Japan, July 2016
208. International symposium on homogeneous catalysis, Kyoto, Japan, July 2016
207. Elemento-Organic Chemistry Symposium, Nankai, China, July 2016
206. University of North Carolina, Wilmington, May 2016
205. North Carolina State, May 2016
204. University of Zurich, Switzerland, May 2016
203. *Semmelhack Lectureship*, Princeton University, May 2016
202. *Organic Reactions Lecture*, University of Michigan, May 2016
201. *Distinguished Colloquium*, University of Utah, April 2015
200. *Frontiers in Chemistry*, Lecture, Wayne State University, March 2016
199. *AbbVie Lecture*, Boston College, March 2016
198. Symposium honoring Scott Miller, San Diego ACS meeting, March 2016
197. *Aldrich Lectureship*, University of Nevada, Reno, Dec. 2015
196. Novartis (Singapore), Dec. 2015
195. Jiaotong University, Shanghai, China, Dec. 2015
194. Novartis (Shanghai) Dec. 2015
193. Shanghai institute of Organic Chemistry, Dec. 2015
192. *Queens University CREATE lectureship*, Canada, Nov. 2015
191. Pfizer (Groton), Nov. 2015
190. Banff Symposium on Organic Chemistry, Oct. 2015
189. Novartis, Basal, Switzerland, October 2015
188. *Molecular Science Forum Lecture*, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China
187. 11<sup>th</sup> National Conference on Physical Organic Chemistry, Beijing Municipal Tsinghua University
186. Symposium honoring Melanie Sanford, Boston ACS meeting, August 2015
185. Summer Symposium in Green Chemistry and Catalysis, UT Austin, July 2015
184. Millennium Pharmaceuticals, Cambridge, July 2015
183. ACS Division of Organic Chemistry Symposium (Austin, Texas), July 2015
182. Gordon Research Conference on Organometallic Chemistry (Rhode Island), July 2015

181. Division of Organic Chemistry Research Symposium, July 2015
180. *Bristol Myers Squibb Lecturer*, Columbia University, June 2015
179. *Student Invited Symposium*, Stanford University, May 2015
178. Janssen Sciences (Brussels, Belgium), May 2015
177. Harvard University, May 2015
176. Purdue University, April 2015
175. University of Indiana, April 2015
174. University of York, England, April 2015,
173. University of Bristol, England, April 2015
172. Bristol Synthesis Meeting, Bristol, England, April 2015
171. Denver ACS, Award Symposium for Abigail Doyle, March 2015
170. *2015 BMS-UCLA Lecturer*, University of California, Los Angeles, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," February 2015
169. *Centre in Green Chemistry and Catalysis Lecturer*, Sherbrooke University, Canada, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," December 2014
168. University of Montreal, Canada, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," December 2014
167. McGill University, Canada, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," December 2014
166. Abbvie Pharmaceuticals, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," Chicago, December 2014
165. Novartis (Boston), "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," November 2014
164. *Brown and Williamson Lecturer* University of Louisville, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," November 2014
163. Nagoya University, Japan, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," October 2014
162. 2nd International Conference on Organometallics and Catalysis, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," Nara, Japan, October 2014
161. Gilead Pharmaceuticals (San Francisco), "Controlling and Analyzing Selectivity in Asymmetric Catalysis," October 2014.
160. 18<sup>th</sup> National Symposium on Organometallic Chemistry, "Palladium-Catalyzed Alkene Functionalization Reactions for Synthesis," Lanzhou, China, August 2014
159. Gordon Research Conference on Reactions and Processes, July 2014
158. "The Future of Asymmetric Catalysis" Telluride Science Research conference, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," June 2014.
157. School of Organic Chemistry "Corbella", Italy, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," June 2014.
156. University California at Davis, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," May 2014.
155. University of Geneva, Switzerland, "Enantioselective Intermolecular Heck Reactions," May 2014
154. Burgenstock conference on stereochemistry, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," Switzerland, May 2014
153. *Aldrich Lecture*, SUNY Buffalo, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," April 2014
152. Netherlands' Catalysis and Chemistry Conference, "Enantioselective Intermolecular Heck Reactions," Noordwijkerhout, Netherlands, March 2014
151. University of California, Irvine, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," December 2013
150. Cornell University, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," November 2013
149. Janssen Pharmaceuticals, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," November 2013



148. Scripps Research Institute La Jolla, "Controlling and Analyzing Selectivity in Asymmetric Catalysis," November 2013
147. Amgen, San Francisco, "Catalytic Alkene Functionalization Reactions for Synthesis," October 2013
146. Nanjing University, China, "Catalytic Alkene Functionalization Reactions for Synthesis," October 2013
145. Shanghai Institute of Organic Chemistry, "Catalytic Alkene Functionalization Reactions for Synthesis," October 2013
144. Fujian Institute, CAS, China, "Catalytic Alkene Functionalization Reactions for Synthesis," October 2013
143. New Frontiers in Organic Chemistry, Beijing, China, "Catalytic Alkene Functionalization Reactions for Synthesis," October 2013
142. Georgia State University, "New Approaches to Asymmetric Catalyst Design and Optimization," September 2013
141. University of Wisconsin (department of pharmaceuticals), "Catalytic Alkene Functionalization Reactions for Synthesis," September 2013
140. *Aldrich Lecture in Synthesis and Catalysis*, "New Approaches to Asymmetric Catalyst Design and Optimization," University of Wisconsin, September 2013
139. ACS meeting symposium on aerobic oxidation, "Understanding and Exploiting Pd-alkyl Intermediates for New Reaction Development," Indianapolis, September 2013
138. Merck, Rahway, "Catalytic Alkene Functionalization Reactions for Synthesis," August 2013
137. Merck, Rahway, "New Approaches to Asymmetric Catalyst Design and Optimization," August 2013
136. OMCOS, Fort Collins, "Understanding and Exploiting Pd-alkyl Intermediates for New Reaction Development," July 2013
135. Symposium honoring Jin-Quan Yu, NORM, Corvallis, Oregon, "Understanding and Exploiting Pd-alkyl Intermediates for New Reaction Development," July 2013
134. Weizmann Institute, Israel, "New Approaches to Asymmetric Catalyst Design and Optimization," May 2013
133. Technion, Israel, "New Approaches to Asymmetric Catalyst Design and Optimization," May 2013
132. University of Tel Aviv, Israel, "New Approaches to Asymmetric Catalyst Design and Optimization," May 2013
131. *Organic Synthesis Lectureship*, Massachusetts Institute of Technology, "New Approaches to Asymmetric Catalyst Design and Optimization," April 2013
130. ACS New Orleans Symposium on Asymmetric Catalysis, "New Approaches to Asymmetric Catalyst Design and Optimization," April 2013
129. ACS New Orleans Symposium on C-H functionalization, "Understanding and Exploiting Pd-alkyl Intermediates," April 2013
128. Calvin College, "New Approaches to Asymmetric Catalyst Design and Optimization," March 2013
127. Hope College, "New Approaches to Asymmetric Catalyst Design and Optimization," March 2013
126. Student Invite Seminar Series: "New Approaches to Asymmetric Catalyst Design and Optimization," University of California at Berkeley, February 2013.
125. *Aldrich Lecture*, "New Approaches to Asymmetric Catalyst Design and Optimization," University of North Carolina, January 2013
124. NTU, Singapore, "New Approaches to Asymmetric Catalyst Design and Optimization," December 2012
123. National University of Singapore, "Understanding and Exploiting Pd-alkyl Intermediates," December 2012
122. National University of Singapore, "New Approaches to Asymmetric Catalyst Design and Optimization," December 2012
121. University of Iowa, "New Approaches to Asymmetric Catalyst Design and Optimization," September 2012
120. ADHOC "Understanding and Exploiting Pd-alkyl Intermediates," Jerusalem, Israel, September 2012

119. "Summer School" Tarragona, Spain, "Understanding and Exploiting Pd-alkyl Intermediates," July 2012.
118. "Summer School" Tarragona, Spain, "New Approaches to Asymmetric Catalyst Design and Optimization," July 2012.
117. Sunovion Pharmaceuticals, Marlborough MA, "New Approaches to Asymmetric Catalyst Design and Optimization," June 2012.
116. University of Stockholm, Sweden, "New Approaches to Asymmetric Catalyst Design and Optimization," May 2012.
115. Orsay (ICMMO), Paris, France, "New Approaches to Asymmetric Catalyst Design and Optimization," May 2012.
114. ICSN, Paris, France, "New Approaches to Asymmetric Catalyst Design and Optimization," May 2012.
113. Princeton University, *Abbott Symposium*, "New Approaches to Asymmetric Catalyst Design and Optimization," March 2012.
112. Western Washington University, "New Approaches to Asymmetric Catalyst Design and Optimization," February 2012.
111. 8<sup>th</sup> CRC International Symposium in Organometallic Chemistry, Toronto, February 2012
110. University of Illinois, *Eli Lilly Lectureship*, "New Approaches to Asymmetric Catalyst Design and Optimization," December 2011.
109. University of Delaware, "New Approaches to Asymmetric Catalyst Design and Optimization," October 2011
108. EPFL SB ISIC LCSO, Lausanne, Switzerland, "New Approaches to Asymmetric Catalyst Design and Optimization," October 2011.
107. ETH, Zurich Switzerland, "New Approaches to Asymmetric Catalyst Design and Optimization," October 2011.
106. New Frontiers in Organic Chemistry, Beijing, China "New Approaches to Asymmetric Catalyst Design and Optimization," September 2011.
105. Natural Products Gordon Conference, Rhode Island, "New Approaches to Asymmetric Catalyst Design and Optimization," July 2011.
104. Amgen, Boston, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," May 2011.
103. Boston University, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," May 2011.
102. Harvard University, *R.B. Woodward Lectureship*, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," May 2011.
101. Frontier Scientific "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," April 2011.
100. Anaheim ACS, Award Symposium for Melanie Sanford, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," March 2011.
99. Technion, Haifa, Israel, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," March 2011.
98. Weizmann Institute, Israel, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," March 2011.
97. Tel Aviv University, Israel, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," March 2011.
96. *BASF Lectureship*, Scripps Research Institute, La Jolla, CA. "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," February 2011.
95. University of South Carolina, "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," February 2011
94. Stockholm University, Sweden "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," October 2010.
93. University of Uppsala, Sweden "Metal-Catalyzed Alkene Functionalization Reactions for Organic Synthesis," October 2010.

92. Boston ACS, Cope Scholar Presentation, "Metal-Catalyzed Oxidations for Organic Synthesis," August 2010.
91. Stereochemistry Gordon Conference "New approaches to de novo Asymmetric Catalyst Design," August 2010
90. Amgen Pharmaceuticals, "Metal-Catalyzed Oxidations for Organic Synthesis," April 20<sup>th</sup>, 2010.
89. University of Illinois at Chicago, "Metal-Catalyzed Oxidations for Organic Synthesis," Chicago, April 13<sup>th</sup>, 2010.
88. Gonzaga University, "Metal-Catalyzed Oxidations for Organic Synthesis," November 13<sup>th</sup>, 2009.
87. Sonoma State University, "Metal-Catalyzed Oxidations for Organic Synthesis," November 9<sup>th</sup>, 2009
86. Queens University, "Metal-Catalyzed Oxidations for Organic Synthesis," October 30<sup>th</sup>, 2009.
85. University of Pennsylvania, "Metal-Catalyzed Oxidations for Organic Synthesis," October 12<sup>th</sup>, 2009.
84. Matteson Symposium, "Metal-Catalyzed Oxidations for Organic Synthesis," Washington State University, October 3<sup>rd</sup>, 2009.
83. Pfizer Global Process Symposium, Groton, CN, "Metal-Catalyzed Oxidations for Organic Synthesis," June 17<sup>th</sup>, 2009.
82. University of Rochester, "Metal-Catalyzed Oxidations for Organic Synthesis," May 8<sup>th</sup>, 2009.
81. California State University at Fullerton, "Metal-Catalyzed Oxidations for Organic Synthesis," November 13<sup>th</sup>, 2008.
80. Pfizer, St. Louis, "Metal-Catalyzed Oxidations for Organic Synthesis," November 3<sup>rd</sup>, 2008.
79. Yale University, "Metal-Catalyzed Oxidations for Organic Synthesis," October 29<sup>th</sup>, 2008.
78. BASF Symposium, Germany, "Metal-Catalyzed Oxidations for Organic Synthesis," Oct 4<sup>th</sup>-8<sup>th</sup>, 2008.
77. Symposium on C-C bond forming reactions in green chemistry, Austin, TX, July 11-12, 2008.
76. California Institute of Technology, "Metal-Catalyzed Oxidations for Organic Synthesis," March 2008
75. University of California at Irvine, "Metal-Catalyzed Oxidations for Organic Synthesis," March 2007
74. University of Pennsylvania (Student Seminar Series), "Metal-Catalyzed Oxidations for Organic Synthesis," February 2008
73. Indiana University, "Mechanistic Approaches to Catalyst Development," January 2008
72. Vanderbilt University, "Metal-Catalyzed Oxidations for Organic Synthesis," December 2007
71. Indiana University, "Metal-Catalyzed Oxidations for Organic Synthesis," November 2007
70. Symposium on Oxidation Catalysis Using Oxygen, "Metal-Catalyzed Oxidations for Organic Synthesis," Stuttgart, Germany, October 2007
69. Montana State University, "Metal-Catalyzed Oxidations for Organic Synthesis," September 2007
68. Emory University, "Metal-Catalyzed Oxidations for Organic Synthesis," May 2007
67. UC. San Diego, "Metal-Catalyzed Oxidations for Organic Synthesis," May 2007
66. University of Montana, "Metal-Catalyzed Oxidations for Organic Synthesis," April 2007
65. Willamette College, "Metal-Catalyzed Oxidations for Organic Synthesis," March 2007
64. Scripps Research Institute, "Metal-Catalyzed Oxidations for Organic Synthesis," January 2007
63. Gilead Pharmaceuticals, San Francisco, "Metal-Catalyzed Oxidations for Organic Synthesis," September 2006.
62. University of Houston, "Metal-Catalyzed Oxidations for Organic Synthesis," September 2006
61. Transatlantic Trends in Chemistry, New Hampshire, "Metal-Catalyzed Oxidations for Organic Synthesis," August 2006.
60. Aldrich Organic Synthesis Symposium, Milwaukee, WI "Metal-Catalyzed Oxidations for Organic Synthesis," June 2006.
59. University of Kansas, Lawrence, "Metal-Catalyzed Oxidations for Organic Synthesis," May 2006.
58. University of Michigan, Ann Arbor, "Metal-Catalyzed Oxidations for Organic Synthesis," April 2006.
57. University of Wisconsin, Madison, "Metal-Catalyzed Oxidations for Organic Synthesis," April 2006
56. Merck Inc., "Metal-Catalyzed Oxidations for Organic Synthesis," January 2006.
55. University of Oregon, "Metal-Catalyzed Oxidations for Organic Synthesis," December 2005.

54. Oregon State University, "Metal-Catalyzed Oxidations for Organic Synthesis," December 2005.
53. Trinity University, "Metal-Catalyzed Oxidations for Organic Synthesis," October 2005.
52. University of Toronto, "Metal-Catalyzed Oxidations for Organic Synthesis," November 2005.
51. University of California at Santa Barbara, "Metal-Catalyzed Oxidations for Organic Synthesis," August 2005.
50. Amgen Pharmaceuticals, "Metal-Catalyzed Oxidations for Organic Synthesis," August 2005.
49. International Symposium Activation of Dioxygen and Homogeneous Catalytic Oxidation, University of Cologne, Germany, July 25-29, 2005.
48. 39<sup>th</sup> National Organic Chemistry Symposium, "Metal-Catalyzed Oxidations for Organic Synthesis," Salt Lake City, UT. June 2005.
47. Stanford University, "Metal-Catalyzed Oxidation Reactions For Organic Synthesis," May 2005.
46. Santa Clara University, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," May 2005.
45. University of New Orleans, "Palladium-Catalyzed Oxidations for Organic Chemistry," April 2005.
44. Inorganic Reaction Mechanisms Gordon Conference, "Mechanistic Considerations in Palladium-Catalyzed Aerobic Alcohol Oxidation Reactions," February 2005.
43. University of Illinois, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," January 2005.
42. Columbia University, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," October 2004.
41. University of California at Berkeley, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," September 2004.
40. Cornell University, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," September 2004.
39. Abbott Pharmaceuticals, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," September 2004.
38. American Chemical Society Meeting, Philadelphia 2004, Symposium on the Use of N-Heterocyclic Carbene Ligands in Catalysis (Steven Nolan, Organizer).
37. 11<sup>th</sup> Symposium on the Latest Trends in Organic Synthesis, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," Ontario, Canada, August 11-14, 2004 (Tomas Hudlicky, Organizer).
36. Heterocyclic Chemistry Gordon Research Conference, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," July 2004 (Duane Burnett, Organizer).
35. The University of Texas Southwestern Medical Center at Dallas, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," May 18, 2004.
34. University of Washington, Seattle, Washington, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," May 11, 2004.
33. American Chemical Society Meeting, Anaheim, CA James Flack Norris award symposium honoring Professor Dale Poulter (Robert Coates, Organizer) "Physical Organic Chemistry as a Tool Catalyst Design and Development," March 2004.
32. American Chemical Society Meeting, Anaheim, CA, Symposium on Mechanistic Studies of Asymmetric Catalytic Reactions (Patrick Walsh, Organizer) "Enantioselective Aerobic Oxidations," March 2004.
31. Pfizer Pharmaceuticals, Groton, CN, "Aerobic Oxidations in Organic Synthesis," December 4, 2003.
30. Brigham Young University, Provo, Utah, "Aerobic Oxidations in Organic Synthesis," December 1, 2003.
29. University of Chicago, Chicago, Illinois, "Aerobic Oxidations in Organic Synthesis," November 14, 2003.
28. Northwestern University, Chicago, Illinois, "Aerobic Oxidations in Organic Synthesis," November 13, 2003.
27. University of Norte Dame, South Bend, Indiana, "Aerobic Oxidations in Organic Synthesis," November 12, 2003.
26. Colorado State University, Fort Collins, Colorado, "Aerobic Oxidations in Organic Synthesis," November 4, 2003.
25. University of Colorado, Boulder, Colorado, "Aerobic Oxidations in Organic Synthesis," November 3, 2003.
24. Princeton University, "Aerobic Oxidations in Organic Synthesis," October 30, 2003.
23. University of Delaware, "Aerobic Oxidations in Organic Synthesis," October 29, 2003.

22. University of Texas at Austin, "Aerobic Oxidations of Alcohols in Organic Synthesis," October 24, 2003.
21. Texas A&M, College Station, "Aerobic Oxidations of Alcohols in Organic Synthesis," TX, October 23, 2003.
20. Eli Lilly, Indianapolis, "Aerobic Oxidations of Alcohols in Organic Synthesis," IN, August 15, 2003.
19. National Science Foundation Workshop on Natural Product Synthesis, Monterrey, CA, "Aerobic Oxidations of Alcohols in Organic Synthesis," July 10-14, 2003.
18. Pennsylvania State University, State College, PA, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," May 2003.
17. University of Pittsburgh, Pittsburgh, PA, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," May 2003.
16. Ohio State University, Columbus, OH, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," May 2003.
15. Boston College, Boston, MA, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," April 2003.
14. University of Pennsylvania, Philadelphia, PA, "Aerobic Oxidations in Organic Synthesis," April 2003.
13. Bristol-Myers Squibb, Princeton site, NJ, "Enantioselective Aerobic Oxidations of Alcohols," March 2003.
12. University of North Carolina, Chapel Hill, NC, "Aerobic Oxidation in Organic Synthesis," February 2003.
11. North Carolina State University, Raleigh, NC, "Aerobic Oxidation in Organic Synthesis," February 2003.
10. Los Alamos National Labs, New Mexico, "Metal-Catalyzed Aerobic Oxidations in Organic Synthesis," December 2002.
9. Bristol-Myers Squibb, Wallingford site, CN, "Enantioselective Aerobic Oxidations of Alcohols," November 2002.
8. Bristol-Myers Squibb, New Brunswick site, NJ, "Enantioselective Aerobic Oxidations of Alcohols," November 2002.
7. University of Alberta, "Enantioselective Aerobic Oxidations of Alcohols," October 2002.
6. Stereochemistry Gordon Research Conference, Rhode Island, "Catalytic Enantioselective Oxidations using Molecular Oxygen," June 2002.
5. Boise State University, ID "Aerobic Oxidations of Alcohols in Organic Synthesis," December 2001.
4. Boston University, Boston, MA, "Aerobic Oxidations of Alcohols in Organic Synthesis," November 2001.
3. ACS Northwest Regional Meeting, Organometallic Colloquium, Seattle, WA, "Palladium-Catalyzed Enantioselective Oxidations of Alcohols Using Molecular Oxygen," June 2001.
2. ASI Applied Systems 4<sup>th</sup> International Users Meeting, Annapolis, MD, "Catalytic Asymmetric Strecker Reaction," June 1998.
1. NeXstar Pharmaceuticals, Boulder, CO, "Two Approaches to the Discovery and Optimization of Catalysts for the Asymmetric Hydrocyanation of Imines," November 1997.

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## SERVICE

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### Professional Service and Community Outreach

- **2013-2015** Member at large, Division of Organic Chemistry ACS
- **2009** Member, Editorial Board, *Journal of Organic Chemistry*
- **2008** Presenter at **Science Day at the U** (November)
- **2008** **Science Night Live** (April)
- **2005** Organizer for 2005 39<sup>th</sup> National Organic Symposium (in Salt Lake City)
- **2005** Academic Employment Initiative Committee (ACS, San Diego, Spring 2005)
- **2003-2007** Adhoc Associate Editor for *The Journal of Organic Chemistry* (Dale Poulter)

➤ **2004** Presenter at **Science Day at the U** (November)

**University of Utah Service**

- 2020-2021** University of Utah Presidential Search Committee  
**Department Chair\***  
College of Science Executive Committee  
Executive Committee Chair  
Alumni Relations & Development member  
Space & Renovation Committee member
- 2019-2020** **Department Chair\***  
College of Science Executive Committee  
Executive Committee Chair  
Alumni Relations & Development member  
Space & Renovation Committee member
- 2018-2019** Alumni Relations & Development member  
Faculty Award Committee member  
Graduate Recruiting Committee member
- 2016-2017** Sabbatical
- 2016-2017** Faculty Search Committee Chair
- 2015-2016** Faculty Search Committee co-chair (Organic)  
RPT subcommittee member
- 2014-2015** Retention, Promotion and Tenure Committee (College of Science, Chair)  
Faculty Awards Committee member  
Graduate Admission Recruiting subcommittee member
- 2013-2014** Retention, Promotion and Tenure Committee (College of Science, Chair)  
MUSE (my signature U experience) Advisory Board  
University Research Committee  
Safety and Sustainability Committee (Department of Chemistry, Chair)  
Department of Chemistry Awards Committee  
Faculty Mentor (Jen Heemstra, Mark Ji)
- 2012-2013** Retention, Promotion and Tenure Committee (Department of Chemistry, Chair)  
MUSE (my signature U experience) Advisory Board  
Sciences Area Curriculum Committee  
University Research Committee  
College of Science Board (tech transfer liaison)  
ChemSac Advisor (Department of Chemistry)  
Department of Chemistry Awards Committee  
Faculty Mentor (Jen Heemstra, Mark Ji)
- 2011-2012** MUSE (my signature U experience) Advisory Board  
Sciences Area Curriculum Committee  
University Research Committee  
College of Science Kitchen Cabinet  
College of Science Board (tech transfer liaison)



	ChemSac Advisor (Department of Chemistry) Department of Chemistry Awards Committee Faculty Mentor (Vale Molinero, Jen Heemstra, Mark Ji)
<b>2010-2011</b>	MUSE Advisory Board College of Science Kitchen Cabinet Department of Chemistry Awards Committee Faculty Mentor (Vale Molinero, Jen Heemstra, Mark Ji)
<b>2009-2010</b>	Retention, Promotion and Tenure Committee (Chair) Faculty Mentor (Vale Molinero) Undergraduate Curriculum Committee Director of Exceptional Student Experience Search Committee
<b>2008-2009</b>	Faculty Search Committee (Chair) University Research Committee (2008-2010) Faculty Mentor (Ilya Zharov, Vale Molinero) NMR Staff Search Committee Undergraduate Curriculum Committee
<b>2007-2008</b>	Faculty Mentor (Ilya Zharov, Vale Molinero) Graduate Admissions Committee (Chair) Chair of Organic Division
<b>2006-2007</b>	Faculty Mentor (Ilya Zharov) Graduate Admissions Committee (Chair) Chair of Organic Division
<b>2005-2006</b>	Faculty Mentor (Ilya Zharov) ChemSAC Advisor Space Coordinator Graduate Admissions Committee (Publicity Chair) College of Science Council (2004-2006) Undergraduate Research Scholar Designation Committee
<b>2004-2005</b>	Graduate Education Committee (Organic and Inorganic liaison) Graduate Admissions Committee (Publicity Chair) Marriot Library Director Search College of Science Council (2004-2006) Undergraduate Research Scholar Designation Committee
<b>2003-2004</b>	Chair Organic Faculty Search Committee Graduate Admissions Committee (Publicity Chair)
<b>2001-2002</b>	Graduate Admissions Committee (Publicity Chair) Technical Support Committee (NMR Liaison) Chemistry New Website Design (with Professor Chuck Wight) Organic Division Seminar Coordinator
<b>2000-2001</b>	Graduate Admissions Committee (Organic Student Admissions) Graduate Recruiting Weekend Organizer Organic Faculty Search Committee

Organic Division Seminar Coordinator

1999-2000

Graduate Admissions Committee (Organic Student Admissions)  
Analytical Faculty Search Committee

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**TEACHING**

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<b>Spring 2021</b>	Chemistry 7160 (Organometallic Chemistry),
<b>Spring 2020</b>	Chemistry 7160 (Organometallic Chemistry), 16 students
<b>Fall 2019</b>	Chemistry 7240 (Physical Organic Chemistry), 29 students
<b>Spring 2019</b>	Chemistry 2321 (Honors Organic Chemistry II), 21 students
<b>Fall 2018</b>	Chemistry 7240 (Physical Organic Chemistry), 21 students
<b>Spring 2017</b>	Chem 2320 (Organic Chemistry II), 111 students
<b>Fall 2016</b>	Chemistry 7240 (Physical Organic Chemistry), 22 students
<b>Spring 2016</b>	Chemistry 2320 (Organic Chemistry II) 178 students
<b>Fall 2015</b>	Chemistry 7240 (Physical Organic Chemistry I), 35 students
<b>Spring 2015</b>	Chemistry 2320 (Organic Chemistry II) 190 students
<b>Fall 2014</b>	Chemistry 7240 (Physical Organic Chemistry I), 21 students
<b>Spring 2014</b>	Chemistry 7160 (Organometallic Chemistry), 18 students
<b>Spring 2014</b>	Chemistry 2320 (Organic Chemistry II) 190 students
<b>Spring 2013</b>	Chemistry 2321 (Honors Organic Chemistry II), 28 students
<b>Fall 2012</b>	Chemistry 7160 (Organometallic Chemistry), 22 students
<b>Spring 2012</b>	Chemistry 2321 (Honors Organic Chemistry II), 28 students
<b>Fall 2011</b>	Chemistry 7160 (Organometallic Chemistry), 18 students
<b>Fall 2010</b>	Chemistry 7160 (Organometallic Chemistry), 27 students
<b>Fall 2010</b>	Chemistry 2320 (Organic Chemistry II) 156 students
<b>Fall 2009</b>	Chemistry 7240 (Physical Organic Chemistry I), 23 students
<b>Spring 2009</b>	Chemistry 2320 (Organic Chemistry II) 224 students
<b>Fall 2008</b>	Chemistry 7240 (Physical Organic Chemistry I), 24 students
<b>Spring 2007</b>	Chemistry 2321 (Honors Organic Chemistry II), 24 students
<b>Fall 2007</b>	Chemistry 7240 (Physical Organic Chemistry I), 27 students
<b>Spring 2007</b>	Chemistry 2321 (Honors Organic Chemistry II), 17 students
<b>Fall 2006</b>	Chemistry 7200 (Synthesis I), 21 students
<b>Spring 2006</b>	Chemistry 2321 (Honors Organic Chemistry II), 24 students
<b>Fall 2005</b>	Chemistry 7200 (Synthesis I), 13 students
<b>Spring 2005</b>	Chemistry 2321 (Honors Organic Chemistry II), 29 students
<b>Fall 2004</b>	Chemistry 7200 (Synthesis I), 25 students
<b>Spring 2003</b>	Chemistry 2321 (Honors Organic Chemistry II), 27 students
<b>Fall 2002</b>	Chemistry 7240 (Physical Organic Chemistry I), 27 students
<b>Fall 2001</b>	Chemistry 7240 (Physical Organic Chemistry I), 31 students
<b>Fall 2001</b>	Chemistry 7200 (Synthesis I), 12 students
<b>Spring 2001</b>	Chemistry 2321 (Honors Organic Chemistry II), 27 students
<b>Fall 2000</b>	Chemistry 6240 (Physical Organic Chemistry I), 40 students
<b>Fall 2000</b>	Chemistry 6200 (Synthesis I), 20 students
<b>Fall 1999</b>	Chemistry 6240 (Physical Organic Chemistry I), 29 students
<b>Fall 1999</b>	Chemistry 6200 (Synthesis I), 18 students

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**LABORATORY PERSONNEL**

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Current Group: <https://chem.utah.edu/directory/sigman/research-group/people/index.php>

Group Alumni: <https://chem.utah.edu/directory/sigman/research-group/people/alumni.php>

