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EDUCATION:

Ph.D., Chemistry June 2001
California Institute of Technology, Pasadena, CA
Thesis Title: *Synthetic and Mechanistic Investigations of Ruthenium Olefin Metathesis Catalysts*

B.S.; M.S. *cum laude* with Distinction in Chemistry June 1996
Yale University, New Haven, CT

CURRENT POSITION:

University of Michigan, Ann Arbor, MI
Moses Gomberg Distinguished University Professor of Chemistry September 2016 – present
Arthur F. Thurnau Professor of Chemistry July 2011 – present

PREVIOUS POSITIONS:

University of Michigan, Ann Arbor, MI
Moses Gomberg Collegiate Professor of Chemistry January 2012 – August 2016
Professor of Chemistry September 2010 – June 2011
Associate Professor of Chemistry May 2007 – August 2010
William R. Roush Assistant Professor of Chemistry October 2006 – May 2007
Assistant Professor of Chemistry July 2003 – October 2006

Princeton University, Princeton, NJ
NIH NRSA Postdoctoral Fellow August 2001 – June 2003
Advisor: Professor John T. Groves

California Institute of Technology, Pasadena, CA
Graduate Student August 1997 – July 2001
Advisor: Professor Robert H. Grubbs

Yale University, New Haven, CT
Undergraduate Student September 1994 – June 1996
Advisor: Professor Robert H. Crabtree

Naval Research Laboratory, Washington, DC
Summer Intern Summer 2003, 2004, 2005
Advisor: Dr. David W. Conrad

AWARDS:

ACS Fellow (2016); Distinguished University Professor (2016); Elected Member, National Academy of Sciences (2016); Elected Fellow, American Academy of Arts and Sciences (2016); SABIC Young Catalysis Investigator Award (2015); OMCOS Award (2015); UM Faculty Recognition Award (2014); ACS Sierra Nevada Section: Distinguished Chemist Award (2013); Raymond and Beverly Sackler Prize in Chemistry (2013); Tetrahedron Young Investigator Award in Synthetic Chemistry (2013); ACS Ipatieff Prize (2013); Thieme-IUPAC Prize (2012); Moses Gomberg Collegiate Chair (2012); Paul N. Rylander Award (2012); Classical High School Distinguished Alumni Award (2012); MacArthur Foundation Fellowship (2011); Royal Society of Chemistry Fluorine Prize

AWARDS (CONT):

(2011); Fellow of American Association for Advancement of Science (2011); ACS Award in Pure Chemistry (2011); Arthur F. Thurnau Professorship (2011); National Fresenius Award (2010); John Dewey Award for Undergraduate Education (2010); LSA Excellence in Teaching Award (2010); BASF Catalysis Award (2009); ACS Arthur C. Cope Scholar Award (2008); Dupont Young Investigator Award (2007); Roche Excellence in Chemistry Award (2007); GlaxoSmithKline Chemistry Scholars Award (2006); Abbott Young Investigator Award (2006); Presidential Early Career Award for Scientists and Engineers (2006); AstraZeneca Excellence in Chemistry Award (2006); Research Corporation Cottrell Scholar Award (2006); Alfred P. Sloan Research Fellow (2006); National Science Foundation CAREER Award (2006); Bristol Myers Squibb "Freedom to Discover" Award (2006); Eli Lilly Grantee Award (2005); Amgen Young Investigator Award (2005); Boehringer Ingelheim New Investigator Award in Organic Synthesis (2005); Beckman Young Investigator Award (2004); Camille and Henry Dreyfus Foundation New Faculty Award (2003); NIH NRSA Postdoctoral Fellowship (2001); Herbert Newby McCoy Award for Graduate Research (2001); Arthur Fleischer Award for Undergraduate Research (1996); East Coast Athletic Conference Scholar-Athlete Award (1996); National Science Scholar (1993); NCAA Gymnastics Academic All-American (1993-1996)

RESEARCH PUBLICATIONS

[*] represents independent publication

- *(150) Bour, J. R.; Kariofillis, S.; Sanford, M. S. "Synthesis, Reactivity, and Catalytic Applications of Isolable (NHC)CuCHF₂ Complexes," **2017**, manuscript submitted.
- *(149) Canty, A. J.; Camasso, N. M.; Higgs, A. T.; Yates, B. F.; Sanford, M. S. "Computational Study of C(sp³)-O Bond Formation at a Pd^{IV} Center," **2017**, manuscript submitted.
- *(148) Sevov, C. S.; Hickey, D. P.; Cook, M. E.; Robinson, S. G.; Barnett, S.; Minter, S. D.; Sigman, M. S.; Sanford, M. S. "A Physical Organic Approach to Persistent, Cyclable, Low-Potential Electrolytes for Flow Battery Applications," **2017**, manuscript submitted.
- *(147) Mossine, A. V.; Brooks, A. F.; Ichiishi, N.; Makavarage, K. J.; Sanford, M. S.; Scott, P. J. H. "Development of Customized [¹⁸F]Fluoride Elution Techniques for the Enhancement of Transition Metal Mediated Late-Stage Radiofluorination," *Sci. Rep.* **2017**, in press.
- *(146) Schimler, S. D.; Cismesia, M. A.; Hanley, P. S.; Froese, R. D.; Jansma, M. J.; Bland, D. C.; Sanford, M. S. "Nucleophilic Deoxyfluorination of Phenols via Arylfluorosulfonate Intermediates," *J. Am. Chem. Soc.* **2017**, in press.
- *(145) Lee, M. L.; Sanford, M. S. "Remote C(sp³)-H Oxygenation of Protonated Aliphatic Amines with Potassium Persulfate," *Org. Lett.* **2017**, 19, asap article.
- *(143) Meucci, E. A.; Camasso, N. M.; Sanford, M. S. "An Organometallic Ni^{IV} Complex that Participates in Competing Transmetalation and C(sp²)-O Bond-Forming Reductive Elimination Reactions," *Organometallics* **2017**, asap article.
- *(142) Sevov, C. S.; Samaroo, S. K.; Sanford, M. S. "Cyclopropenium Salts as Cyclable High Potential Catholytes in Non-Aqueous Media," *Adv. Energy Mat.* **2017**, 1602027.
- *(144) Lotz, M. D.; Camasso, N. M.; Canty, A. J.; Sanford, M. S. "Role of Silver Salts in Palladium-Catalyzed Arene and Heteroarene C-H Activation," *Organometallics* **2017**, 36, 165-171.
- *(141) Makaravage, K. J.; Brooks, A. F.; Mossine, A. V.; Sanford, M. S.; Scott, P. J. H. "Copper-Mediated Radiofluorination of Aryl Stannanes," *Org. Lett.* **2016**, 18, 5440-5443.
- *(140) Sevov, C. S.; Fisher, S. L.; Thompson, L. T.; Sanford, M. S. "Mechanism-Based Development of a Low Potential, Soluble, and Cyclable Multi-Electron Anolyte for Non-Aqueous Redox Flow Batteries," *J. Am. Chem. Soc.* **2016**, 138, 15378-15384.

- *(139) Bour, J. R.; Camasso, N. M.; Meucci, E.; Kampf, J. W.; Canty, A. J.; Sanford, M. S. "Carbon-Carbon Bond Forming Reductive Elimination from Isolated Nickel(III) Complexes," *J. Am. Chem. Soc.* **2016**, *138*, 16105-16111.
- *(138) Mbofana, C. T.; Chong, E.; Lawniczak, J.; Sanford, M. S. "Iron-Catalyzed Selective Oxyfunctionalization of Aliphatic Amines at Remote Benzylic Sites," *Org. Lett.* **2016**, *18*, 4258-4261.
- *(137) Rezayee, N. M.; Samblanet, D. M.; Sanford, M. S. "Iron-Catalyzed Hydrogenation of Amides to Alcohols and Amines," *ACS Catal.* **2016**, *6*, 6377-6383.
- *(136) Schimler, S. D.; Sanford, M. S. "Copper-Mediated Functionalization of Aryltrifluoroborates," *Synlett* **2016**, *27*, 2279-2284.
- *(135) Pendleton, I. M.; Perez-Temprano, M. H.; Sanford, M. S.; Zimmerman, P. M. "Experimental and Computational Assessment of Reactivity and Mechanism in C(sp³)-N Bond-Forming Reductive Elimination from Palladium(IV)," *J. Am. Chem. Soc.* **2016**, *138*, 6049-6060.
- *(134) Genna, D. G.; Pfund, L. Y.; Samblanet, D. C.; Wong-Foy, A. G.; Matzger, A. J.; Sanford, M. S. "Rhodium Hydrogenation Catalysts Supported in Metal Organic Frameworks: Influence of the Framework on Catalytic Activity and Selectivity," *ACS Catal.* **2016**, *6*, 3569-3574.
- *(133) Sanford, M.; Scott, P. "Moving Metal-Mediated ¹⁸F-Fluorination from Concept to Clinic," *ACS Central Sci.* **2016**, *2*, 128-130.
- *(132) Brewster, T. P.; Rezayee, N. M.; Culakova, Z.; Sanford, M. S.; Goldberg, K. I. "Base-Free Iridium-Catalyzed Hydrogenation of Esters and Lactones," *ACS Catal.* **2016**, *6*, 3113-3116.
- *(131) Cook, A. K.; Schimler, S. D.; Matzger, A. J.; Sanford, M. S. "Catalyst-Controlled Selectivity in the C-H Borylation of Methane and Ethane," *Science* **2016**, *351*, 1421-1424.
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- *(128) Mossine, A. V.; Brooks, A. F.; Makavarage, K.; Miller, J.; Ichiishi, N.; Sanford, M. S.; Scott, P. J. H. "Synthesis of [¹⁸F]Arenes via the Cu-Mediated [¹⁸F]Fluorination of Boronic Acids," *Org. Lett.* **2015**, *17*, 5780-5783.
- *(127) Cabrera, P. J.; Yang, X.; Sutil, J. A.; Brooner, R. E. M.; Thompson, L. T.; Sanford, M. S. "Evaluation of Tris-Bipyridine Chromium Complexes for Flow Battery Applications: Impact of Bipyridine Ligand Structure on Solubility and Electrochemistry," *Inorg. Chem.* **2015**, *54*, 10214-10223.
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- *(125) Lee, M.; Sanford, M. S. "Platinum Catalyzed Terminal-Selective C(sp³)-H Oxidation of Aliphatic Amines," *J. Am. Chem. Soc.* **2015**, *137*, 12796-12799.
- *(124) Bour, J. R.; Camasso, N. M.; Sanford, M. S. "Oxidation of Ni(II) to Ni(IV) with Aryl Electrophiles Enables Ni(IV)-Mediated Aryl-CF₃ Coupling," *J. Am. Chem. Soc.* **2015**, *137*, 8034-8037.
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- *(120) Cook, A. K.; Sanford, M. S. "On the Mechanism of the Palladium-Catalyzed Acetoxylation of C-H Bonds: A Comparison of Catalyst and Ligand Effects," *J. Am. Chem. Soc.* **2015**, *137*, 3109-3118
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- *(118) Rezayee, N. M.; Huff, C. A.; Sanford, M. S. "Tandem Amine and Ru Catalyzed Hydrogenation of CO₂ to Methanol," *J. Am. Chem. Soc.* **2015**, *137*, 1028-1031.
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- *(109) Maleckis, A.; Sanford, M. S. "A Catalytic Cycle for Pd-Catalyzed Trifluoromethylation using Trifluoroacetic Esters as a CF₃ Source," *Organometallics* **2014**, *33*, 2653-2660.
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- *(106) Wagner, A. M.; Sanford, M. S. "Transition Metal Free Acid Mediated Synthesis of Aryl Sulfides from Thiols or Thioethers," *J. Org. Chem.* **2014**, *79*, 2263-2267
- *(105) Allen, L. J.; Cabrera, P. J.; Lee, M.; Sanford, M. S. "Room Temperature C-H Amination of Arenes and Heteroarenes Using Visible Light Photoredox Catalysis," *J. Am. Chem. Soc.* **2014**, *136*, 5607-5610.

- *(104) Perez-Temprano, M. H.; Racowski, J. M.; Kampf, J. W.; Sanford, M. S. "Competition Between sp^3 -C–N and sp^3 -C–F Reductive Elimination from Palladium(IV) Complexes," *J. Am. Chem. Soc.* **2014**, *136*, 4097-4100.
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- *(102) Ye, Y.; Schimler, S. D.; Hanley, P. S.; Sanford, M. S. "Cu(OTf)₂-Mediated Fluorination of Aryltrifluoroborates with Potassium Fluoride," *J. Am. Chem. Soc.* **2013**, *135*, 16292-16295.
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- *(100) Huff, C. A.; Sanford, M. S. "Hydrogenation of CO₂ to Formate Catalyzed by a Ru Pincer Complex," *ACS Catal.* **2013**, *3*, 2412-2416.
- *(99) Ichiishi, N.; Canty, A. J.; Yates, B. F.; Sanford, M. S. "Cu-Catalyzed Fluorination of Diaryliodonium Salts with KF," *Org. Lett.* **2013**, *15*, 5134-5137.
- *(98) Lehman, M. C.; Gary, J. B.; Sanford, M. S.; Ison, E. A. "Effect of Solvent and Ligands on the Catalytic H/D Exchange Reactivity of CpIr(L) Complexes," *ACS Catal.* **2013**, *3*, 2304-2310.
- *(97) Huff, C. A.; Kampf, J. W.; Sanford, M. S. "Reversible Carbon-Carbon Bond Formation Between Carbonyl Compounds and a Ruthenium Pincer Complex," *Chem. Commun.* **2013**, *49*, 7147-7149.
- *(96) Seigerman, C. K.; Micyus, T. M.; Neufeldt, S. R.; Sanford, M. S. "Palladium-Catalyzed C–H Arylation Using Aryltrifluoroborates in Conjunction with a Mn(III) Oxidant Under Mild Conditions," *Tetrahedron* **2013**, *69*, 5580-5587.
- *(95) Sanhueza, I.; Wagner, A. M.; Sanford, M. S.; Schoenebeck, F. "On the Role of Anionic Ligands in the Site Selectivity of Oxidative C–H Functionalization Reactions of Arenes," *Chem. Sci.* **2013**, *4*, 2767-2775.
- *(94) Genna, D. T.; Wong-Foy, A. G.; Matzger, A. J.; Sanford, M. S. "Heterogenization of Homogeneous Catalysts in Metal Organic Frameworks via Cation Exchange," *J. Am. Chem. Soc.* **2013**, *135*, 10586-10589.
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- *(84) Ye, Y.; Sanford, M. S. "Investigations into Transition Metal Catalyzed Trifluoromethylation Reactions," *Synlett*, **2012**, *23*, 2005-2013.
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