

KEVIN H. SHAUGHNESSY
Associate Professor and Chair

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Education:

B. S. with Honors and Highest Distinction: Chemistry, University of Nebraska-Lincoln, 1992

Ph.D.: Organic Chemistry, Stanford University, 1998. Dissertation: "Synthetic and Mechanistic Studies of Metal-Catalyzed Diene Cyclizations"
Advisor: Prof. Robert M. Waymouth

Professional Experience:

2009-present	Chair, Department of Chemistry, The University of Alabama
2007-2009	Director of Undergraduate Studies in Chemistry, The University of Alabama
2005-present	Associate Professor of Chemistry, The University of Alabama
1999-2005	Assistant Professor of Chemistry, The University of Alabama
1999-present	Faculty Member, Center for Green Manufacturing, The University of Alabama
1997-1999	Postdoctoral Associate, Prof. John F. Hartwig, Yale University

Teaching Experience:

1999-present	Faculty member, The University of Alabama <u>Undergraduate Classes:</u> Organic Chemistry I and II, Organic Chemistry Laboratory I and II, Spectroscopic Techniques in Organic Chemistry, Intermediate Organic Chemistry <u>Graduate Classes:</u> Organometallic Chemistry, Spectroscopic Techniques in Organic Chemistry, Physical Organic Chemistry
1992-1997	Graduate Teaching Assistant in Organic Chemistry, Stanford University
1990-1992	Undergraduate Teaching Assistant for General and Organic Chemistry lab classes, University of Nebraska.

University Service:

2009-2012	Undergraduate Program and Services Committee, University of Alabama
2007-present	Alabama Science in Motion Steering Committee
2007-present	Chemistry Department, Gamma Sigma Epsilon Faculty Advisor
2002-present	Chair, Chemistry Department Web Site Committee
2007-2010	Distinguished Teaching Fellow, College of Arts & Sciences
2008-2009	Department of Biological Sciences Chair Search Committee
2007-2009	Chair, Undergraduate Curriculum Committee
2007-2009	Student Affiliates of the American Chemical Society, Faculty Advisor
2007-2009	Chemistry Department, Arduengo Lecture Series Committee
2006-2009	Chair, Chemistry Department Seminar Committee
2007-2008	UA Scholarship of Teaching Team

2007-2008	Chemistry Department, Alternative Energy Faculty Search Committee
2006-2007	University Lab Safety and Environmental Compliance Committee
2006-2007	New College, Science Faculty Search Committee
2005-2007	College of Arts and Sciences, Tenure and Promotion Committee
2002-2007	Chemistry Department, Undergraduate Curriculum Committee
1999-2007	Chemistry Department, Graduate Recruiting Committee
2004-2005	College of Arts and Sciences, Ramsay Chair Search Committee
2003-2004	College of Arts and Sciences, Technology Committee
2000-2003	Chemistry Department, Organic Faculty Search Committee
2000-2002	Chemistry Department, Web Site Subcommittee

Other Professional Activities:

- Editorial Board Member, 23rd Organic Reactions Catalysis Society Conference (2010)
- Award Committee Chairman, Alabama Section of the American Chemical Society (2007-present)
- Reviewer for *Journal of the American Chemical Society*, *Angewandte Chemie*, *Journal of Organic Chemistry*, *Organic Letters*, *Organometallics*, and many other journals.
- Panel review for the National Science Foundation: STEP, Technology for a Sustainable Environment and Course, Curriculum, and Laboratory Improvement programs.
- Proposal review for private and government agencies, including the National Science Foundation, NSERC (Canada), Petroleum Research Fund, Office of Army Research, and Research Corporation.
- Content provider for companion websites to *Organic Chemistry* by Paula Y. Bruice and *Organic Chemistry* by L. G. Wade, Jr.

Professional Societies and Honors:

- College of Arts & Sciences Distinguished Teaching Fellow (2007-2010)
- UA Alumni Association, Outstanding Commitment to Teaching Award (2007)
- Research Innovation Award, Research Corporation (2001)
- Phi Beta Kappa, University of Nebraska-Lincoln Chapter (1992)
- Phi Lambda Upsilon, Rho Chapter, University of Nebraska-Lincoln (Chemistry Honorary Society, 1992)
- Regents Scholar, University of Nebraska (1988-1992)
- National Merit Scholar (1988)
- Member American Chemical Society (Divisions of Organic and Inorganic Chemistry)
- Member Alabama Academy of Science

Research Interests:

Organometallic Catalysis: organometallic reaction mechanisms; metal-catalyzed reactions, stereoselective catalysts, ligand design, alternative reaction media, environmentally benign catalyst systems, alternative energy generation and storage systems

Publications:

Peer-Reviewed Publications

Publications at The University of Alabama

39. Vongsutilers, V.; Phillips, D. J.; Train, B. C.; McKelvey, G. R.; Thomsen, N. M.; Shaughnessy, K. H.; Lewis, J. P.; Gannett, P. M. "The Conformational Effect of para-

- Substituted C8-Arylguanine Adducts on the B/Z-DNA Equilibrium," *Biophys. Chem.*, **2011**, *154*, 41-48. DOI: 10.1016/j.bpc.2010.12.006
38. Hill, L. L.; Crowell, J. L.; Tutwiler, S. L., Massie, N. L., Hines, C. C.; Griffin, S. T.; Rogers, R. D.; Shaughnessy, K. H.; Grasa, G. A.; Johansson Seechurn, C. C. C.; Li, H.; Colacot, T. J.; Chou, J.; Woltermann, C. J. "Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentylphosphine (DTBNpP) in the Arylation of Amines and Ketones," *J. Org. Chem.* **2010**, *75*, 6477–6488. DOI: 10.1021/jo101187q
37. Cho, J. H.; Prickett, C. D.; Shaughnessy, K. H. "Efficient Sonogashira Coupling of Unprotected Halonucleosides in Aqueous Solvents Using Water-Soluble Palladium Catalysts," *Eur. J. Org. Chem.* **2010**, 3678-3683. DOI: 10.1002/ejoc.201000313
36. Craciun, R.; Vincent, A. J.; Shaughnessy, K. H.; Dixon, D. A. "Prediction of Reliable Metal–PH₃ Bond Energies for Ni, Pd, and Pt in the 0 and +2 Oxidation States" *Inorg. Chem.*, **2010**, *49*, 5546-5553. DOI: 10.1021/ic1004853
35. Vongsutilers, V.; Daft, J. R.; Shaughnessy, K. H.; Gannett, P. M. "A General Synthesis of C8-Arylpurine Phosphoramidites," *Molecules*, **2009**, *14*, 3339-3352. DOI: 10.3390/molecules14093339
34. Shaughnessy, K. H. "Hydrophilic Ligands and Their Application in Aqueous-Phase Metal-Catalyzed Reactions," *Chem. Rev.* **2009**, *109*, 643-710. DOI: 10.1021/cr800403r. Invited review for Special Thematic Issue on Facilitated Chemical Synthesis.
33. Brown, W. S.; Boykin, D. D.; Sonnier, M. Q., Jr.; Clark, W. D.; Brown, F. V.; Shaughnessy, K. H. "Sterically-Demanding, Zwitterionic Trialkylphosphonium Sulfonates as Air-Stable Ligand Precursors for Efficient Palladium-Catalyzed Cross-Couplings of Aryl Bromides and Chlorides," *Synthesis*, **2008**, 1965-1970. DOI: 10.1055/s-2008-1067095. Invited manuscript.
32. Hill, L. L.; Smith, J. M.; Brown, W. S.; Moore, L. R.; Guevara, P. J.; Pair, E. S.; Porter, J. E.; Chou, J.; Woltermann, C. J.; Craciun, R.; Dixon, D. A.; Shaughnessy, K. H. "Neopentylphosphines as effective ligands in palladium-catalyzed cross-couplings of aryl bromides and chlorides" *Tetrahedron*, **2008**, *64*, 6920-6934. DOI: 10.1016/j.tet.2008.02.037. Invited manuscript.
31. Moore, L. R.; Western, E. C.; Craciun, R.; Spruell, J. M.; Dixon, D. A.; O'Halloran, K. P.; Shaughnessy, K. H. "Sterically Demanding, Sulfonated, Triarylphosphines: Application to Palladium-Catalyzed Cross-Coupling, Steric and Electronic Properties, and Coordination Chemistry," *Organometallics*, **2008**, *27*, 576-593. DOI: 10.1021/om7008606
30. Cho, J. H.; Brown, F. V.; Shaughnessy, K. H. "A Selective and Tin-Free Pd-Catalyzed Phenylselenylation of Aryl Bromides" *Main Group Chem.* **2007**, *6*, 201-214. DOI: 10.1080/10241220801967367. Invited symposium paper.
29. Moore, L. R.; Cooks, S. M.; Anderson, M. S.; Schanz, H.-J.; Griffin, S. T.; Rogers, R. D.; Kirk, M. C.; Shaughnessy, K. H. "Synthesis and Characterization of Water-Soluble Silver and Palladium Imidazol-2-ylidene Complexes with Non-Coordinated Anionic Substituents," *Organometallics*, **2006**, *25*, 5151-5158. DOI: 10.1021/om050442b
28. Huang, R. and Shaughnessy, K. H. "Water-Soluble Palladacycles as Precursors to Highly Recyclable Catalysts for the Suzuki Coupling of Aryl Bromides in Aqueous Solvents," *Organometallics*, **2006**, *25*, 4105-4112. DOI: 10.1021/om050940y (#2 top downloaded *Organometallics* article, 3rd quarter 2006)

27. Hill, L. L.; Moore, L. R.; Huang, R.; Craciun, R.; Vincent, A. J.; Dixon, D. A.; Chou, J.; Woltermann, C. J.; Shaughnessy, K. H. "Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides," *J. Org. Chem.* **2006**, *71*, 5117-5125. DOI: 10.1021/jo060303x
26. Shaughnessy, K. H. "Beyond TPPTS: New Approaches to the Development of Efficient Palladium-Catalyzed Aqueous-Phase Cross-Coupling Reactions," *Eur. J. Org. Chem.* **2006**, 1827-1835. DOI: 10.1002/ejoc.200500972 Invited review. Cover graphic. Among 10 most cited *EJOC* articles from 2006.
25. Huang, R.; Shaughnessy, K. H. "*t*-Bu-Amphos-RhCl₃·3H₂O: A Highly Recyclable Catalyst System for the Cross-Coupling of Aldehydes and Aryl- and Vinylboronic Acids in Aqueous Solvents," *Chem. Commun.* **2005**, 4484-4486. DOI: 10.1039/b509406b
24. Western, E. C.; Shaughnessy, K. H. "Inhibitory Effects of the Guanine Moiety on Suzuki Couplings of Unprotected Nucleosides in Aqueous Media," *J. Org. Chem.* **2005**, *70*, 3678-3688. DOI: 10.1016/jo0508321
23. Klingshirn, M. A.; Rogers, R. D.; Shaughnessy, K. H. "Palladium-Catalyzed Hydroesterification of Styrene Derivatives in the Presence of Ionic Liquids," *J. Organomet. Chem.* **2005**, *690*, 3620-3626. DOI: 10.1016/j.jorganchem.2005.05.031 Special Issue on Ionic Liquids #25 most downloaded article, 3rd quarter 2005.
22. Sliger, M. D.; P'Pool, S. J.; Traylor, R. K.; McNeill, J., III; Young, S. H.; Hoffman, N. W.; Klingshirn, M. A.; Rogers, R. D.; Shaughnessy, K. H. "Promoting Effect of Ionic Liquids on Ligand Substitution Reactions." *J. Organomet. Chem.*, **2005**, *690*, 3540-3545. DOI: 10.1016/j.jorganchem.2005.02.018 Special issue on Ionic Liquids
21. P'Pool, S. J.; Klingshirn, M. A.; Rogers, R. D.; Shaughnessy, K. H. "Kinetic Study of the Oxidative Addition of Methyl Iodide to Vaska's Complex in Ionic Liquids," *J. Organomet. Chem.* **2005**, *690*, 3522-3528. DOI: 10.1016/j.jorganchem.2005.02.024 Special issue on Ionic Liquids
20. Shaughnessy, K. H.; DeVasher, R. B. "Palladium-Catalyzed Cross-Coupling in Aqueous Media: Recent Progress and Current Applications." *Curr. Org. Chem.* **2005**, *9*, 585-604. Invited review.
19. Sliger, M. D.; Shaughnessy, K. H.; Broker, G. A.; Griffin, S. T.; Rogers, R. D. "Di-*t*-butyl(ferrocenylmethyl)phosphine: air-stability, structural characterization, coordination chemistry, and application to palladium-catalyzed cross-coupling reactions." *J. Organomet. Chem.*, **2005**, *690*, 1478-1486. DOI: 10.1016/j.jorganchem.2004.12.022. #7 most downloaded article, 1st quarter 2005.
18. DeVasher, R. B.; Spruell, J. M.; Dixon, D. A.; Broker, G. A.; Griffin, S. T.; Rogers, R. D.; Shaughnessy, K. H. "Experimental and Computational Study of Steric and Electronic Effects on the Coordination of Sterically Demanding, Water-Soluble Alkylphosphines to Palladium under Reducing Conditions: Correlation to Catalytic Activity." *Organometallics*, **2005**, *24*, 962-971. DOI: 10.1021/om049241w
17. DeVasher, R. B.; Moore, L. R.; Shaughnessy, K. H. "Aqueous-Phase, Palladium-Catalyzed Cross-Couplings of Aryl Bromides Under Mild Conditions Using Water-Soluble, Sterically Demanding Alkylphosphines." *J. Org. Chem.* **2004**, *69*, 7919-7927. DOI: 10.1021/jo048910c
16. Moore, L. R. and Shaughnessy, K. H. "Efficient Aqueous-Phase Heck and Suzuki Couplings of Aryl Bromides using Tri(4,6-dimethyl-3-sulfonatophenyl)phosphine Trisodium Salt (TXPTS)." *Org. Lett.* **2004**, *6*, 225-228. DOI: 10.1021/o10360288

15. Gannett, P. M.; Heavner, S.; Daft, J. R. Shaughnessy, K. H.; Epperson, J. D.; Greenbaum, N. L. "Synthesis, Properties and NMR Studies of a C8-Phenylguanidine Modified Oligonucleotide that Preferentially Adopts the Z-DNA Conformation." *Chem. Res. Tox.* **2003**, *16*, 1384-1395. DOI: 10.1021/tx034023d
14. Shaughnessy, K.H.; Klingshirn, M. A.; P'Pool, S. J.; Holbrey, J. D.; Rogers, R. D. "Polar, Non-Coordinating Ionic Liquids as Solvents for Coordination Polymerization of Olefins," in *Ionic Liquid as Green Solvents: Progress and Prospects*, Rogers, R. D.; Seddon, K. R. Eds., **2003**, pp 300-313, American Chemical Society Symposium Series 856, Washington, DC.
13. Western, E. C.; Daft, J. R.; Johnson, E. M., II; Gannett, P. M.; Shaughnessy, K. H. "Efficient One-Step Suzuki Arylation of Unprotected Halonucleosides using Water-Soluble Palladium Catalysts," *J. Org. Chem.*, **2003**, *68*, 6767-6774. DOI: 10.1021/jo034289p
12. Shaughnessy, K. H.; Huang, R. "Acid-Mediated, Chromium-Catalyzed Allylation of Aldehydes," *Synth. Comm.* **2002**, *32*, 1923-1928. DOI: 10.1081/SCC-120004841
11. Klingshirn, M. A.; Broker, G. A.; Holbrey, J. D.; Shaughnessy, K. H.; Rogers, R. D. "Polar, Non-Coordinating Ionic Liquids as Solvents for the Alternating Copolymerization of Styrene and CO Catalyzed by Cationic Palladium Catalysts," *Chem. Commun*, **2002**, 1394-1395. DOI: 10.1039/b203367d
10. Shaughnessy, K. H.; Booth, R. S. "Sterically Demanding, Water-Soluble Alkylphosphines as Ligands for High Activity Suzuki Couplings in Aqueous Solvents," *Org. Lett*, **2001**, *3*, 2757-2759. DOI: 10.1021/ol10163629

Post-Doctoral Publications and Patents

9. Stambuli, J.P; Stauffer, S. R.; Shaughnessy, K. H.; Hartwig, J. F. "Screening of Homogeneous Catalysts by Fluorescence Resonance Energy Transfer. Identification of Catalysts for Room Temperature Heck Reactions," *J. Am. Chem. Soc.*, **2001**, *123*, 2677-2678. DOI: 10.1021/ja0058435
8. Hartwig, J. F.; Kawatsura, M.; Hauck, S. I.; Shaughnessy, K. H.; Alcazar-Roman, L. M. "Transition metal-catalyzed process or preparing N-aryl compounds," (Yale University), US Patent 6,100,398 (2000)
7. Hartwig, J. F.; Kawatsura, M.; Hauck, S. I.; Shaughnessy, K. H.; Alcazar-Roman, L. M. "Room temperature palladium-catalyzed amination of aryl bromides and chlorides and extended scope of aromatic C-N bond formation with a commercial ligand." *J. Org. Chem.*, **1999**, *64*, 5575-5580. DOI: 10.1021/jo990408i
6. Shaughnessy, K. H.; Kim, P.; Hartwig, J. F. "A fluorescence assay for high-throughput screening of coupling reactions. Application to Heck coupling processes." *J. Am. Chem. Soc.* **1999**, *121*, 2123-2131. DOI: 10.1021/ja983419m
5. Shaughnessy, K. H.; Hamann, B. C.; Hartwig, J. F. "Palladium catalyzed inter- and intramolecular α -arylation of amides. Application of intramolecular amide arylation to the synthesis of oxindoles." *J. Org. Chem.*, **1998**, *63*, 6546-6553. DOI: 10.1021/jo980611y

Ph.D. Publications

4. Shaughnessy, K. H.; Waymouth, R. M. "Enantio- and diastereoselective catalytic carboalumination of 1-alkenes and α,ω -dienes with cationic zirconocenes: scope and mechanism." *Organometallics*, **1998**, *17*, 5728-5745. DOI: 10.1021/om9807811
3. Shaughnessy, K. H.; Waymouth, R. M. "Highly regioselective cyclocarboxylation of nonconjugated dienes catalyzed by palladium." *Organometallics*, **1997**, *16*, 1001-1007. DOI: 10.1021/om9607513

2. Shaughnessy, K. H.; Waymouth, R. M. "Carbometalation of α,ω -dienes and olefins catalyzed by zirconocenes." *J. Am. Chem. Soc.* **1995**, *117*, 5873-5874. DOI: 10.1021/ja00126a036

Undergraduate Publications

1. Zhu, L-S.; Shaughnessy, K. H.; Rieke, R. D. "A facile method for the preparation of functionalized 2-halo-1-olefins." *Synth. Comm.*, **1993**, *23*, 525-529. DOI: 10.1080/00397919308009808

Non-Peer-Reviewed Publications

8. Shaughnessy, K. H. "Bis(1,1-dimethylethyl)2,2-dimethylpropylphosphine," *Electronic Encyclopedia of Reagents for Organic Synthesis (e-EROS)*, **2010**. DOI: 10.1002/047084289X.rn01224
7. Shaughnessy, K. H. "2-(Pentafluorophenyl)-1,3-bis(2,4,6-trimethylphenyl)-imidazolidine," *Electronic Encyclopedia of Reagents for Organic Synthesis (e-EROS)*, **2008**. DOI: 10.1002/047084289X.rn00907
6. Shaughnessy, K. H. "Tri-*tert*-butylphosphine tetrafluoroborate," *e-EROS*. **2008**. DOI: 10.1002/047084289X.rn00869
5. Shaughnessy, K. H. "Palladium, bis(tris-(1,1-dimethylethyl)phosphine)," *e-EROS*, **2008**. DOI: 10.1002/047084289X.rn00776
4. Shaughnessy, K. H. "On *Comprehensive Organic Reactions in Aqueous Media* by Chao-Jun Li and Tak-Hang Chan" *Angew. Chem. Int. Ed.* **2008**, *47*, 1988. DOI: 10.1002/anie.200785542. (Book Review)
3. Shaughnessy, K. H. "Tri-*tert*-butylphosphine," *e-EROS*. **2007**. DOI: 10.1002/9780470842898.rn00703
2. Shaughnessy, K. H.; P'Pool, S. J.; Klingshirn, M. A.; Rogers, R. D. "Coordination Polymerization of Alkenes in Ionic Liquids." *Polymer Prepr.* **2004**, *45*, 317-318.
1. Holbrey, J. D.; Shaughnessy, K. H.; Klinshirn, M. A.; Broker, G. A.; Rogers, R. D. "Transition Metal Catalyzed CO/Olefin Co-Polymerization in Room Temperature Ionic Liquids," in *Molten Salts XIII*, Delong, H. C.; Bradshaw, R. W.; Matsunaga, M.; Stafford, G. R.; Trulove, P. C. Eds. **2002**, *2002-19*, pp 213-223, The Electrochemical Society Proceedings Series, Pennington, NJ.

Presentations at Regional, National and International Meetings: (since joining UA faculty)

Invited Talks

14. "Design and Application of Recoverable Aqueous-Phase Catalysts for Cross-Coupling Reactions," Shaughnessy, K. H.; 241st National Meeting of the American Chemical Society, San Francisco, CA, March 21-25th, 2010. I&EC 115.
13. "Aqueous-Phase Palladium-Catalyzed Cross-Coupling: Seeking Highly Active, Easily Recovered, and Recyclable Catalyst Systems," Shaughnessy, K. H., Green Chemistry Symposium, 39th Central Regional Meeting of the American Chemical Society, Columbus, OH, June 12th, 2008, Paper #241.
12. "Effects of Ligand Steric and Electronic Properties on Metal-Catalyzed Cross-Coupling Reactions," Shaughnessy, K. H., Homogeneous Catalysis Symposium, 39th Central Regional Meeting of the American Chemical Society, Columbus, OH, June 11th, 2008, Paper #106.
11. "Aqueous-Phase Palladium-Catalyzed Cross-Coupling: Seeking Highly Active, Easily Recovered, and Recyclable Catalyst Systems," Shaughnessy, K. H., 2nd International Symposium on Green Processing in the Pharmaceutical and Fine Chemical Industries, New Haven, CT May 29th, 2008.

10. "Effects of Ligand Steric and Electronic Properties on Metal-Catalyzed Cross-Coupling Reactions," Shaughnessy, K. H., Organometallics in the Southeast Symposium, 59th Southeastern Regional Meeting of the American Chemical Society, Greenville, SC, October 26th, 2007, Paper #448.
9. "Development of a Palladium-Catalyzed Coupling of Aryl Halides and in situ-Generated Aryl Chalcogenides," Shaughnessy, K. H.; Cho, J.-H., S and Se in the Southeast Symposium, 59th Southeastern Regional Meeting of the American Chemical Society, Greenville, SC, October 25th, 2007, Paper #94.
8. "Organometallic Reaction Mechanisms in Non-Traditional Solvents: Fundamental Studies and Applications to Catalysis," Shaughnessy, K. H., Gordon Research Conference on Inorganic Reaction Mechanisms, Ventura, CA, February 21st, 2007.
7. "Steric and Electronic Properties of Sterically Hindered Hydrophilic Phosphines, Their Coordination Chemistry, and Catalytic Applications." Shaughnessy, K. H., Organometallic Reaction Mechanisms Symposium Honoring Jack Norton, Northwest Regional Meeting of the American Chemical Society, Reno, NV, June, 28th, 2006. Paper #81.
6. "Ionic Liquid Solvent Effects on Fundamental Organometallic Reactions." Shaughnessy, K. H., Ionic Liquids: Perspectives on the Present, Visions for the Future (Symposium #170), International Chemical Congress of Pacific Basin Societies, Honolulu Hawaii, December 18th, 2005, ENV-421
5. "Ionic Liquid Solvent Effects on the Rate and Mechanism of Fundamental Organometallic Reactions." Shaughnessy, K. H., Symposium on the Use of N-Heterocyclic Carbenes in Catalysis, 228th National Meeting of the ACS, Philadelphia, PA, August 25th, 2004. INOR-634.
4. "Coordination Polymerization of Alkenes in Ionic Liquid Solvents." Shaughnessy, K. H.; P'Pool, S. J.; Klingshirn, M. A.; Rogers, R. D., Ionic Liquids in Polymer Systems Symposium, 227th National Meeting of the ACS, Anaheim, CA, March 31st, 2004, POLY-600.
3. "Homogeneous Catalysis in Alternative Reaction Media: Applications and Mechanistic Studies." Shaughnessy, K. H., Organometallic and Materials Chemistry in the Southeast Symposium, 55th Southeast Regional Meeting of the ACS, Atlanta, GA, November 18th, 2003, Paper #460.
2. "Fundamental Studies and Applications of Alternative Reaction Media in Metal-Catalyzed Reactions," Shaughnessy, K. H., Organometallic Chemistry Symposium, 54th Southeast Regional Meeting of the ACS, Charleston, SC, November 15th, 2002, Paper 0588.
1. "Polar, Non-Coordinating Ionic Liquids as Solvents for Coordination Polymerization of Olefins," Shaughnessy, K.H.; Klingshirn, M. A.; P'Pool, S. J.; Holbrey, J. D.; Rogers, Robin D., Symposium on Ionic liquids as Green Solvents: Progress and Prospects, 224th National Meeting of the American Chemical Society (ACS), Boston, MA, August 21st, 2002, IEC-121.

Contributed Talks

23. "Conformationally Flexible Phosphine Ligands in Palladium-Catalyzed cross-Coupling Reactions," Shaughnessy, K. H.; 241st National Meeting of the American Chemical Society, San Francisco, CA, March 21-25th, 2010. ORGN 99.
22. "Phosphine Steric and Electronic Effects on Pd-Catalysis: Reconciling Computational and Experimental Results," Shaughnessy, K. H., Gordon Research Conference on Organometallic Chemistry, Newport, RI, July 13th, 2009.

21. "The Role of Ligand Steric and Electronic Properties in Coordination Chemistry and Metal-Catalyzed Cross-Coupling Reactions," Shaughnessy, K. H., Gordon Research Conference on Organometallic Chemistry, Newport, RI, July 10th, 2007.
20. "Ligand Steric and Electronic effects on Catalyst Activity in Cross-Coupling Reactions," Shaughnessy, K. H., National Meeting of the American Chemical Society, Chicago IL, March 25th, 2007, INOR-59
19. "Steric and Electronic Properties of Sterically Hindered Hydrophilic Phosphines, Their Coordination Chemistry, and Catalytic Applications." Shaughnessy, K. H., National Meeting of the American Chemical Society, Atlanta, GA, March 26th, 2006, INOR-90.
18. "Efficient and Recyclable Catalysts for Palladium- and Rhodium-Catalyzed Cross-Coupling Reactions in Aqueous Solvents." Shaughnessy, K. H., Organic Reactions in Neoteric Media (Symposium #38), International Chemical Congress of Pacific Basin Societies, Honolulu Hawaii, December 18th, 2005, ORG-1368.
17. "Hydrophilic Catalysts for Cross-Coupling Reactions: Catalyst Development and Mechanistic Studies," Shaughnessy, K. H., Organometallic Gordon Conference (Poster), Newport, RI, July 13th-14th, 2005.
16. "New Ligands for Aqueous-Phase, Palladium-Catalyzed Cross-Coupling: Catalyst Activity and Application to Nucleoside Modification." Shaughnessy, K. H.; DeVasher, R. B.; Moore, L. R.; Western, E. C.; Cho, J.-H. 228th National Meeting of the ACS, Philadelphia, PA, August 25th, 2004. ORGN-67
15. "Sterically Demanding, Water-Soluble Alkylphosphines: Coordination Chemistry and Applications to Pd-Catalyzed Cross-Coupling," Shaughnessy, K. H.; Booth, R. S.; Moore, L. R., 14th International Symposium on Homogeneous Catalysis, Munich, Germany, July 5-9th, 2004, P-0154.
14. "Ionic Liquid Solvent Effects on Fundamental Organometallic Reactions." Shaughnessy, K. H.; P'Pool, S. J.; Sliger, M. D., 14th International Symposium on Homogeneous Catalysis, Munich, Germany, July 5-9th, 2004, P-0153.
13. "Ionic Liquid Solvent Effects on Fundamental Organometallic Reactions." Shaughnessy, K. H.; P'Pool, S. J.; Sliger, M. D., 227th National Meeting of the ACS, Anaheim, CA, April 1st, 2004, INOR-943.
12. "Sterically Demanding, Water-Soluble Alkylphosphines: Coordination Chemistry and Applications to Pd-Catalyzed Cross-Coupling." Shaughnessy, K. H.; Booth, R. S., 227th National Meeting of the ACS, Anaheim, CA, March 31st, 2004, INOR-826.
11. "Sterically Demanding, Water-Soluble Alkylphosphines: Fundamental Studies and Applications," Shaughnessy, K. H., Organometallic Gordon Conference (Poster), Newport, RI, July 23rd-24th, 2003.
10. "Ionic Liquid Solvent Effect on Organometallic Reactions," Shaughnessy, K. H., Organometallic Gordon Conference (Poster), Newport, RI, July 23rd-24th, 2003.
9. "New Ligands for Aqueous-Phase Palladium Catalyzed Cross-Couplings: Catalytic Activity and Applications to Biomolecule Modification." Shaughnessy, K. H.; Booth, R. S.; Western, E. C.; Sliger, M. D.; Moore, L. R. 225th ACS National Meeting, New Orleans, LA, March 23rd, 2003, ORGN-55.
8. "Metal-Catalyzed Olefin Polymerization in Polar, Non-Coordinating Ionic Liquids," Shaughnessy, K. H.; P'Pool, S. J.; Klingshirn, M. A.; Holbrey, J. D.; Rogers, R. D. 224th ACS National Meeting, Boston, MA, August 20th, 2002, INOR-524.
7. "Modification of Unprotected Nucleosides using Water-Soluble Palladium Catalysts," Shaughnessy, K. H.; Western, E. C.; Gannett, P. M.; Daft, J. R.; Johnson II, E. M. 224th ACS National Meeting, Boston, MA, August 20th, 2002, ORGN-649.

6. "Synthesis of Bulky, Water-Soluble Alkylphosphines: Properties and Application to Palladium-Catalyzed Coupling Reactions." Shaughnessy, K. H.; Booth, R. S., and Ricketts, J. I., 53rd Southeast ACS Regional Meeting, Savannah, GA, September 2001, Paper 288.
5. "Bulky Water-Soluble Alkylphosphines for High-Activity Palladium-Catalyzed Coupling Reactions in Aqueous Solvents." Shaughnessy, K. H.; Booth, R. S.; and Ricketts, J. I., 53rd Southeast ACS Regional Meeting, Savannah, GA, September 2001, Paper 408.
4. "Bulky Water-Soluble Alkylphosphines for High-Activity Palladium-Catalyzed Coupling Reactions in Aqueous Solvents." Shaughnessy, K. H. and Booth, R. S., 222nd ACS National Meeting, Chicago, IL, August 2001, ORGN-604.
3. "Synthesis, Reactivity, and Application of Bulky, Water-Soluble Alkylphosphines." Shaughnessy, K. H. and Booth, R. S., 222nd ACS National Meeting, Chicago, IL, August 2001, INOR-477.
2. "Palladium Complexes of Water-Soluble Sterically Demanding Alkylphosphines: Structure and Aqueous-Phase Catalytic Activity." Shaughnessy, K. H. and Booth, R. S., Organometallic Gordon Research Conference, Newport, RI, July 2001.
1. "Synthesis and Application of Bulky, Water-Soluble Trialkylphosphines to Palladium-Catalyzed C-C Bond Forming Reactions." Shaughnessy, K. H., 52nd Southeast/56th Southwest Combined ACS Regional Meeting, New Orleans, LA, December 2000.

Contributed Talks Presented by Student Co-Authors:

50. "Use of neopentylphosphines as efficient ligands in the palladium-catalyzed a-arylation of aryl bromides and chlorides with ketones," Raders, S. J.; Jones, J. M.; Shaughnessy, K. H.*, 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, AL, November 30th-December 1st, 2010. Talk # 634
49. "Use of trineopentylphosphine in the formation of sterically hindered diaryl amines in the Buchwald-Hartwig amination," Raders, S. J.; Parks, J. K.; Leißing, T. M.; Shaughnessy, K. H.*, 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, AL, November 30th-December 1st, 2010. Talk # 633
48. "Suzuki coupling of sterically hindered substrates using alkyl phosphine ligands: How conformational flexibility and steric factors can influence catalytic ability," Moore, J. N.; Shaughnessy, K. H.*, 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, AL, November 30th-December 1st, 2010. Poster # 543
47. "Syntheses of organometallic complexes that model the semiconductor interface of TiO₂ based dye-sensitized solar cells" Fraser, D. D.; Shaughnessy, K. H.*, 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, AL, November 30th-December 1st, 2010. Poster # 542
46. "Synthesis and Reactivity of Neopentylphosphine Palladium Dichloride Dimers," Welch, C. N.; Shaughnessy, K. H.*, 66th Southwest and 62nd Southeast Regional Meeting of the American Chemical Society, New Orleans, AL, November 30th-December 1st, 2010. Poster # 237
45. "Development of highly active palladium complexes for organic cross-coupling reactions" Corbin, W. C.; Shaughnessy, K. H.*, 239th National Meeting of the American Chemical Society, San Francisco, CA, March 21-25th, 2010. CHED-815
44. "Palladium-Catalyzed Carbonylation of Trifluoromethylated Arenes and Heteroarenes using an Water-Soluble, Air-Stable Phosphine Ligand System," Hennek, M. D.; Brown, W. S.; Pair, E. S.; Sonnier, M. Q.; Khan, M.; Thrasher, J. S.; Shaughnessy, K. H.* 19th

- International Symposium on Fluorine Chemistry, Jackson Hole, WY, August 26th, 2009.
43. "Synthesis of Water-Soluble Phosphines and Their Application to Recyclable, Aqueous-Phase Palladium Catalysts," Box, H. K.; Shaughnessy, K. H.* 86th Annual Meeting of the Alabama Academy of Science, Livingston, AL, March 25th-27th, 2009. **1st Place, Undergraduate Poster Competition, Chemistry Division.**
 42. "The cyanation of aryl halides under mild conditions using bulky neopentyl phosphine ligands," Hill, L. L.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 9th, 2008, ORGN 692.
 41. "Palladium catalyzed carbonylation with neopentyl phosphine and water-soluble phosphine ligands to promote activation of aryl halides," Brown, W. S.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 9th, 2008, ORGN 637.
 40. "Palladium/phosphine catalyzed coupling of aryl bromides with phenyl selenolates: Synthesis of asymmetric diaryl selenides," Brown, F. V.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 7th, 2008, CHED 572.
 39. "Palladium catalyzed Suzuki coupling with water-soluble phosphine ligands to promote activation of aryl halides," Sonnier, M. Q.; Brown, W. S.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 7th, 2008, CHED 569.
 38. "Palladium catalyzed Sonogashira coupling with water-soluble phosphine ligands to promote activation of aryl halides," Boykin, D. D.; Brown, W. S.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 7th, 2008, CHED 568.
 37. "Palladium catalyzed coupling reactions using water-soluble phosphine ligands: DTBPSP and DAPSP and their ability to promote coupling reactions," Killian, M. E.; McLendon, S. E.; Brown, W. S.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 7th, 2008, CHED 567.
 36. "Investigations of Hartwig-Buchwald amination reactions in air with new bulky neopentyl phosphine palladium catalysts," Crowell, J. L.; Tutwiler, S.; Hill, L. L.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 7th, 2008, CHED 537.
 35. "Palladium catalyzed coupling reactions using water-soluble phosphine ligands: DTBPSP and DAPSP and their ability to promote Suzuki-Miyaura, Heck, Sonogashira, and Carbonylation reactions," Brown, W. S.; Sonnier, M. Q.; Killian, M. E.; McLendon, S. E.; Boykin, D. D.; Shaughnessy, K. H.* 235th National Meeting of the American Chemical Society, New Orleans, LA, April 7th, 2008, ORGN 253.
 34. "Palladium catalyzed Suzuki coupling with water-soluble phosphine ligands to promote activation of aryl halides," Sonnier, M. Q.; Shaughnessy, K. H.* 85th Alabama Academy of Science Meeting, Birmingham, AL, March 20th, 2008. **1st Place, Undergraduate Paper Competition.**
 33. "Synthesis and characterization of new palladium complexes containing neopentyl phosphine ligands," Hill, L. L.; Shaughnessy, K. H.* 85th Alabama Academy of Science Meeting, Birmingham, AL, March 20th, 2008. **2nd Place, Poster Competition**
 32. "Palladium catalyzed coupling reactions using water-soluble phosphine ligands: DTBPSP and DAPSP and their ability to promote Suzuki-Miyaura, Heck, Sonogashira, and Carbonylation reactions," Brown, W. S.; Sonnier, M. Q.; Killian, M. E.; McLendon, S. E.; Boykin, D. D.; Shaughnessy, K. H.* 85th Alabama Academy of Science Meeting, Birmingham, AL, March 20th, 2008.

31. "Palladium catalyzed coupling reactions using water-soluble phosphine ligands: DTBPSP and DAPSP and their ability to promote coupling reactions," Killian, M. E.; McLendon, S. E.; Brown, W. S.; Shaughnessy, K. H.* 85th Alabama Academy of Science Meeting, Birmingham, AL, March 20th, 2008.
30. "Investigations of cross coupling reactions using new bulky neopentylphosphine ligands," Hill, L. L.; Shaughnessy, K. H.* 234th National Meeting of the American Chemical Society, Boston, MA, August 19-23rd, 2007.
29. "Synthesis and Characterization of New Palladium Complexes Containing Neopentylphosphine Ligands," Hill, L. L.; Shaughnessy, K. H.* 233rd National Meeting of the American Chemical Society, Chicago, IL, March 26th, 2007, INOR-949.
28. "Mechanistic Insight into the Rhodium/Phosphine Catalyzed Coupling of Aldehydes and Phenylboronic Acid Derivatives," Brown, W. S.; Shaughnessy, K. H.* 233rd National Meeting of the American Chemical Society, Chicago, IL, March 26th, 2007, INOR-612.
27. "Palladium-Catalyzed Coupling of Amines and Aryl Halides Using Functionalized Neopentylphosphines," Smith, J. M.; Shaughnessy, K. H.* 233rd National Meeting of the American Chemical Society, Chicago, IL, March 26th, 2007, CHED-767.
26. "Palladium-Catalyzed Suzuki-Miyaura Coupling Reactions using Neopentylphosphines," Brown, W. S.; Pair, E.; Sonnier, M. Q.; Khan, M.; Shaughnessy, K. H.* 233rd National Meeting of the American Chemical Society, Chicago, IL, March 25th, 2007, ORGN-149.
25. "Hartwig-Buchwald Amination under Mild Conditions using Neopentyl Alkylphosphine Ligands." Hill, L. L.; Moore, L. R.; Huang, R.; Shaughnessy, K. H.* 231st National Meeting of the American Chemical Society, Atlanta, GA, March 27th, 2006, ORGN-561.
24. "Design and Applications of Water-Soluble Ligands for Coupling Reactions." Moore, L. R. and Shaughnessy, K. H.* 231st National Meeting of the American Chemical Society, Atlanta, GA, March 27th, 2006, ORGN-453.
23. "Effects of ionic liquids on Oxidative Addition to Square Planar Iridium and Rhodium Complexes." P'Pool, S. J. and Shaughnessy, K. H.* 231st National Meeting of the American Chemical Society, Atlanta, GA, March 29th, 2006, INOR-648.
22. "Studies on the TXPTS-Pd Aqueous-Phase Catalyst System." O'Halloran, K. P. and Shaughnessy, K. H.* 231st National Meeting of the American Chemical Society, Atlanta, GA, March 27th, 2006, CHED-951.
21. "Palladium-Catalyzed Reactions for Nucleoside Modification." Prickett, C. D.; Cho, J.-H.; and Shaughnessy, K. H.* 231st National Meeting of the American Chemical Society, Atlanta, GA, March 27th, 2006, CHED-453.
20. "Evaluation of a Cellulose Supported Palladium Catalyst." Carmichael, F. T. and Shaughnessy, K. H.* 231st National Meeting of the American Chemical Society, Atlanta, GA, March 27th, 2006, CHED-392.
19. "Palladium-Catalyzed Reactions for Nucleoside Modification." Prickett, C. D.; Cho, J.-H.; and Shaughnessy, K. H.* 83rd Meeting of the Alabama Academy of Science, Troy, AL, March 16th, 2006, Chemistry, Section II, #11. **First place, student poster competition.**
18. "Evaluation of a Cellulose Supported Palladium Catalyst." Carmichael, F. T. and Shaughnessy, K. H.* 83rd Meeting of the Alabama Academy of Science, Troy, AL, March 16th, 2006, Chemistry, Section II, #9.
17. "Synthesis of New Water-Soluble Metal-*N*-Heterocyclic Carbene Complexes," Cooks, S. M.; Moore, L. R.; Shaughnessy, K. H.* 229th National Meeting of the American Chemical Society, San Diego, CA, March 14th, 2005.

16. "Synthesis of New Water-Soluble Metal-*N*-Heterocyclic Carbene Complexes," Cooks, S. M.; Moore, L. R.; Shaughnessy, K. H.* 56th Southeast Regional Meeting of the American Chemical Society, Research Park Triangle, NC, November 14th, 2004, Paper #714.
15. "Palladium-Catalyzed Hydroesterification of Styrene in Ionic Liquids." Klingshirn, M. A.; P'Pool, S. J.; Shaughnessy, K. H.*; Rogers, R. D.*, 227th National Meeting of the ACS, Anaheim, CA, March 30th, 2004, INOR-770.
14. "Efficient Palladium-Catalyzed Cross-Coupling Reactions of Halonucleosides in Aqueous Media using Water-Soluble Phosphines." Western, E. C. and Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 18th, 2003, Paper #686.
13. "Water-Soluble Palladacycles for Suzuki-Miyaura Cross-Couplings in Water." Huang, R. and Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 18th, 2003, Paper #660.
12. "New Applications for Water-Soluble Alkylphosphine Ligands in Palladium-Catalyzed Cross-Coupling Reactions." Booth, R. S. and Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 18th, 2003, Paper #654.
11. "Kinetic Study of Oxidative Addition in Ionic Liquids." P'Pool, S. J. and Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 18th, 2003, Paper #634.
10. "Palladium-Catalyzed Cross-Coupling Reactions using Water-Soluble, Ortho-Substituted Arylphosphine Ligands." Moore, L. R. and Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 18th, 2003, Paper #630.
9. "Structural Investigation of Water-Soluble Alkylphosphines Palladium Catalysts and Applications for Cross-Coupling Reactions." Booth, R. S. and Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 17th, 2003, Paper #382.
8. "Di-*tert*-butyl(ferrocenylmethyl)phosphine: Properties and use in Palladium-Catalyzed Cross-Coupling Reactions." Sliger, M. D. and Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 17th, 2003, Paper #381.
7. "Synthesis of Novel Chelating Water-Soluble Diphosphines." Sandrock, D. L.; Sliger, M. D.; Shaughnessy, K. H.*, 55th Regional Meeting of the ACS, Atlanta, GA, November 16th, 2003, Paper #935.
6. "Polar, Non-Coordination Ionic Liquids as Solvents for Coordination Polymerization of Olefins," P'Pool, S. J.; Klingshirn, M. A.; Holbrey, J. D.; Rogers, R. D., Shaughnessy, K. H.*, 225th ACS National Meeting, New Orleans, LA, March 23rd, 2003, ORGN-57.
5. "Efficient One-Step Suzuki Arylation of Unprotected Bromonucleosides using Water-soluble Palladium Catalysts," Western, E. C.; Shaughnessy, K. H.*, 225th ACS National Meeting, New Orleans, LA, March 23rd, 2003, ORGN-56.
4. "Water-Soluble Alkylphosphines Ligands for Palladium-Catalyzed Cross-Coupling Reactions," Booth, R. S.; Moore, L. R.; Shaughnessy, K. H.*, 54th Southeast Regional Meeting of the ACS, Charleston, SC, November 14th, 2002, Paper 0277.
3. "Polar, Non-Coordinating Ionic Liquids as Novel Solvents for Coordination Polymerization of Olefins," P'Pool, S. J.; Klingshirn, M. A.; Holbrey, J. D.; Rogers, R. D.; Shaughnessy, K. H.*, 54th Southeast Regional Meeting of the ACS, Charleston, SC, November 14th, 2002, Paper 0275.
2. "Palladium-Catalyzed Cross-Coupling Reactions of Unprotected Halonucleosides using Water-Soluble Phosphines," Western, E. C.; Shaughnessy, K. H.*, 54th Southeast Regional Meeting of the American Chemical Society (ACS), Charleston, SC, November 14th, 2002, Paper 0270.
1. "Palladium-Catalyzed CO/Alkene Copolymerization in Room-Temperature Ionic Liquids." Rogers, R. D.; Klingshirn, M. A.; Broker, G. A.; Holbrey, J. D.; Shaughnessy, K. H.*, 222nd ACS National Meeting, August 2001, Chicago, IL, IEC-21.

Presenting author is underlined and principle investigator is indicated with an asterisk.

General Interest Talks:

1. "Chemistry's Role in a Sustainable Future: How to Make the Things We Need With Minimal Environmental Impact," Meeting of the Alabama Section of the American Chemical Society, Birmingham, AL, November 7th, 2007.

Invited Seminars:

36. Auburn University, November 2010
35. University of Mississippi, April 2010
34. Hitachi Maxell, July 2010
33. Mitsubishi Chemical Corporation, July 2010
32. University of Missouri-St. Louis, March 2010
31. Murray State University, February 2010
30. Mercer University, January 2009
29. CCNY-CUNY, October 2008
28. Tennessee State University, March 2008
27. Rose-Hulmann Institute of Technology, October 2007
26. University of Illinois-Springfield, October 2007
25. FMC, Lithium Division, September 2007
24. University of Tennessee-Chattanooga, February 2007
23. Union University, April 2006
22. University of Alabama at Huntsville, December 2005
21. Mississippi State University, April 2005
20. University of Delaware, March 2005
19. Shippensburg State University, March 2005
18. Texas A&M University, February 2005
17. University of Kansas, January 2005
16. FMC Lithium Division, November 2004
15. University of Utah, October 2004
14. University of Kansas, October 2004
13. University of Alabama at Birmingham, October 2004
12. University of Southern Mississippi, September 2004
11. College of William and Mary, April 2004
10. Virginia Commonwealth University, April 2004
9. U.S. Naval Academy, April 2004
8. West Virginia University, October 2003
7. University of Nevada-Reno, October 2003
6. University of Nebraska, September 2003
5. The Ohio State University, May 2003
4. Auburn University, November 2002
3. University of Mississippi, October 2002
2. University of South Alabama, October 2001
1. University of Tennessee-Chattanooga, January 2000

Current and Pending Support:

- NSF, "Experimental and Theoretical Study of Ligand Steric Effects in Catalysis," PI (co-PI, David Dixon), \$450,000, 1/1/11-12/31/13, pending

- NSF, RUI: Synthesis of Single Geometric Isomers of N-Substituted Ketimines: Starting Materials for the Synthesis of Asymmetric Amines, co-PI (PI, Debra Doliver, SE Louisiana U), \$285,091, 5/1/11 – 4/31/14, pending.
- NSF, Understanding the Organic/semiconductor Interface: Modeling and Characterization of Functionalized Titanium Dioxide," co-PI (PI, Shane Street), \$815,231, 6/1/11-5/31/14, pending
- NSF, NEB: Organic Nanoelectronics Group," co-PI (PI, Robert Metzger, \$2,000,000, 10/1/11 – 9/30/16, pending
- NSF, "Robert Noyce Teacher Scholarship Program," co-PI (PI, Dennis Sunal), \$1,500,000, 1/2/12-1/1/16, pending

Prior Research Support:

- College Academy for Research and Creative Activity, "Model Study of Dye-TiO₂ Interactions in Dye-Sensitized Solar Cells," PI, \$11,400.
- College Academy for Improving Student Success, "Pilot Study of Peer-Led Mentoring in CH 101," PI (co-PIs Joseph Thrasher, Thomas Vaid), \$9,000
- NSF-MRI, "Acquisition of a Liquid Chromatograph-Mass Spectrometer," co-PI (PI, Carolyn Cassady), \$348,093, 02/01/07-01/31/09.
- NSF, "REU Site: Research Experiences for Undergraduates in Chemistry at the University of Alabama," program committee (PD, John Vincent and Stephen Woski), \$567,385, 02/01/07 – 01/31/10.
- FMC, Lithium Division, "Synthesis and Catalytic Application of Sterically Demanding, Chelating Diphosphines and Water-Soluble Phosphines," PI, \$49,500, 2/1/08-12/31/09, current.
- FMC, Lithium Division, "Functionalized Neopentylphosphines as Ligands in Pd-Catalyzed Coupling Reactions," PI, \$22,623, 12/1/06-12/31/07
- UA, Research Activity Council, "Metal-Catalyzed Electrophilic Aromatic Fluorination", PI, \$5,000, 5/1/2006 – 4/31/2008
- NSF—Course, Curriculum, and Laboratory Improvement, "NMR Spectroscopy as a Cornerstone Technique in the Undergraduate Chemistry Curriculum," PI (co-PI, Russell Timkovich), \$120,728, 9/1/03 – 8/31/06.
- FMC, Lithium Division, "Evaluation of Neopentylphosphines as Ligands in Pd-Catalyzed Cross-Coupling Reactions," PI, \$19,500, 8/15/05 – 1/31/06.
- ACS-PRF "Ionic Liquid Solvent Effects on Fundamental Organometallic Transformations," PI, \$40,000, 5/1/04 – 8/31/05
- NSF—Technologies for a Sustainable Environment, "High Activity Catalysts for Carbon-Carbon Bond Formation in Water Based on Bulky Water-Soluble Alkylphosphines," PI, \$5,100 (REU supplement), 6/1/03-8/15/03.
- NSF—Technologies for a Sustainable Environment, "High Activity Catalysts for Carbon-Carbon Bond Formation in Water Based on Bulky Water-Soluble Alkylphosphines," PI, \$5,100 (REU supplement), 6/1/04-8/15/04.
- NSF—Technologies for a Sustainable Environment, "High Activity Catalysts for Carbon-Carbon Bond Formation in Water Based on Bulky Water-Soluble Alkylphosphines," PI, \$336,000, 1/01/02 - 12/31/04.
- Research Corporation, Research Innovation Awards, "Development, and Application to Catalyst Discovery, of a Parallel, High Throughput Assay for Measuring Reaction Yield and Enantioselectivity," PI, \$34,549, 5/1/01-12/31/03.
- University of Alabama—Innovative Instructional Development Program, "Development of Web-Based, Interactive Organic Reaction Mechanism Tutorials," PI, \$4,970, 1/103-8/15/03.

- University of Alabama— School of Mines and Energy Development, "Development of new catalysts for environmentally benign, aqueous-phase reactions," PI, \$19,783, 5/1/01-4/30/02.
- DuPont Corporation, Aid to Education Grant, PI, \$10,000, 5/1/01.
- The University of Alabama Research Activity Council, "Development of a Fluorometric, High-Throughput Assay for Determination of Activity and Enantioselectivity in Metal-Catalyzed Reactions," PI, \$4,790, 4/1/00-3/31/02

Collaborators:

- Silas C. Blackstock, Department of Chemistry, The University of Alabama
- Thomas Colacot, Johnson-Matthey
- James H. Davis, Jr., Department of Chemistry, University of South Alabama
- David A. Dixon, Dept. of Chemistry, The University of Alabama
- Peter M. Gannett, Dept. of Basic and Pharmaceutical Sciences, West Virginia University
- Nancy L. Greenbaum, Dept. of Chemistry and Biochemistry, Florida State University
- Norris W. Hoffman, Department of Chemistry, University of South Alabama
- Marion C. Kirk, Comprehensive Cancer Center, University of Alabama, Birmingham
- David Lederman, Dept. of Physics, West Virginia University
- James Lewis, Dept. of Physics, West Virginia University
- Robert M. Metzger, Department of Chemistry, The University of Alabama
- Robin D. Rogers, Dept. of Chemistry, The University of Alabama
- Hans-Jörg Schanz, Department of Chemistry, University of Southern Mississippi
- Shane C. Street, Department of Chemistry, The University of Alabama
- Joseph S. Thrasher, Dept. of Chemistry, The University of Alabama
- Christopher J. Woltermann, FMC Lithium, Bessemer City, NC

Students Mentored:

Current:

Post-Doctoral Associate (1): Steven Raders (2010-present)

Graduate (3): Jane Moore (2nd year), Dayne Fraser (3rd year), Nigel Welch (3rd year)

Undergraduate (6): Ashley Miller (2009-present), Jessica Jones (2010-present), Luke Brechtelsbauer (2011-present), Emma Catt (2011-present), Aaron Coleman (2011-present), Kali Coleman (2011-present).

Former

- Post-doctoral Associate (1):
 - Dr. Michael Sliger (2002-2004): Duracell, Bethell, CT.
- Graduate (8):
 - William Scott Brown, PhD (2004-2009): Assistant Professor, Murray State University
 - *Design and Synthesis of Phosphine Ligands for Palladium-Catalyzed Coupling Reactions*
 - Lensey L. Hill, PhD (2004-2009): Senior Scientist, Nexolve
 - *Investigations of Cross Coupling Reactions: Synthesis and Scope of New Neopentyl Phosphine Ligands and Pre-formed Palladium Catalysts*
 - Joon-Hyung Cho, PhD (2002-2007): Postdoctoral associate, University of Houston
 - Dissertation Title: *Part I. Palladium -Catalyzed Alkenylation and Alkynylation of Nucleosides in Aqueous Media. Part II. Palladium-Catalyzed Carbon-Selenium Bond formation for Unsymmetrical Diselenides*

- Lucas R. Moore, PhD (2002-2006): Polymer Research Chemist, Kemira Chemicals
 - Dissertation Title: *Ligand Design and Application Toward Palladium-Catalyzed Cross-Coupling Reactions*
 - S. Justin P'Pool, PhD (2001-2006): Adjunct Professor, University of Indianapolis
 - Dissertation Title: *Polar, Weakly Coordinating Ionic Liquids as Solvents for Fundamental Organometallic Reactions*
 - Elizabeth Western, MS, PhD (2001-2005): Family medicine intern, DCH Hospital
 - Thesis Title: *Efficient Modification of Halonucleosides Using Suzuki-Miyaura Coupling in Aqueous Media*
 - **College of Arts & Sciences Outstanding Thesis, 2004**
 - Dissertation Title: *Palladium-Catalyzed Modification of Halonucleosides: Methodology Development and Mechanism Determination*
 - **University of Alabama Outstanding Dissertation Award, 2007**
 - Rongcai Huang, MS, PhD (2000-2005): Research Scientist, J&W Phamalab, LLC
 - Dissertation Title: *Part I. Asymmetric Hydrosilylation of Acetophenone Using Titanium Catalysts; Part II. Synthesis of Water-Soluble Palladacycles and Their Applications to the Suzuki Reaction; Part III. Rhodium-Catalyzed Addition of Aryl and Alkenylboronic Acids to Aldehydes*
 - Rebecca B. DeVasher, PhD (2000-2004): Assistant Professor, Rose-Hulman Institute, Terre Haute, IN
 - Dissertation Title: *Water-Soluble Alkylphosphines as Ligands in Palladium-Catalyzed Aqueous-Phase Cross-Coupling Reactions: Mechanistic Advances and Catalytic Activity*
- Undergraduate (51):
 1. Michael Palmer (2000): Earned MD from UA School of Medicine. Completed residency in internal medicine at Tulane. Currently on fellowship to study gastroenterology at Tulane.
 2. Julie Pigza (2000 REU student): PhD candidate at Indiana University with Prof. Jeffrey Johnston
 3. Andrew Reed (2001): Earned masters degree at UA with Prof. Michael Jennings, currently in Naval Officer's Training
 4. Carrie Freeman (2001): Earned MD at UA School of Medicine. Currently a resident at the University of Arkansas School of Medicine.
 5. Jennifer Ricketts (2001 REU student): Phillip Morris USA, Richmond, VA
 6. Ashlie Wrenne (2002 REU student): Earned MS at University of Kentucky, currently teaching at the St. Paul School for Girls in Brooklandville, MD
 7. Bret Lague (2003): Pursuing MBA at University of South Alabama.
 8. Heather Scott (2003): Attending University of Alabama School of Medicine
 9. Deidre Sandrock (2003 REU student): Graduate student in chemistry at the University of Pennsylvania working under Prof. Gary Molander.
 10. Marne Harris (2003-2004): Earned chemistry degree from UA
 11. Jason Spruell (2004): NSF Pre-Doctoral fellow at Northwestern working with Prof. Fraser Stoddart
 12. Alan Allgood (2004): Attending University of Alabama, School of Dentistry
 13. Sheritta Cooks (2004 REU student): Graduate student in chemistry at the University of Alabama-Birmingham
 14. Patricia Moore (2004-2005): Earned chemistry degree at UA in 2007.
 15. Kevin O'Halloran (2005 REU student): PhD candidate in chemistry at Emory University

16. Benjamin Self (2005): Unknown
17. Fatima Carmichael (2005-2006): High school chemistry teacher
18. Maryam Khan (2005-2006): Attending PA school at University of Oklahoma
19. Emily Pair (2005-2006): Completed biology degree at UA, applying to med school
20. Jake Porter (2006): Employed by Pine Cove Christian Camps
21. Brent Graves (2006): Entered Pikeville School of Osteopathic Medicine
22. Joanna Smith (2006-2007, 2006 REU): Attending pharmacy school at Samford University
23. Caitlin Prickett (2004-2007): Student in the graduate program in Biomedical Sciences at Philadelphia College of Osteopathic Medicine in Atlanta
24. Paul Guevara (2007): Attending MBA program at UA
25. Jason Crowell (2007-2008): Completing BS degree in math at UA
26. Ellie Killian (2007-2008): Attending UA School of Medicine
27. Strudwick Tutwiler (2007-2008): Attending UA School of Dentistry
28. Nick Massie (2008): Attending Harrison School of Pharmacy at Auburn
29. Jane Moore (2008 REU student): Entered PhD program in chemistry at UA
30. Quentin Sonnier (2006-2008): Student in the graduate program in Biomedical Sciences at Philadelphia College of Osteopathic Medicine in Atlanta
31. Fallon Brown (2006-2008): Accepted to DO program at Philadelphia College of Medicine, Atlanta
32. Sarabeth McLendon (2007-2008): Graduated with chemistry degree at UA
33. William Clark (2008): unknown
34. Denise Boykin (2007-2009): Attending UASOM in Birmingham
35. Joel Schoenberg (2008-2009): Graduated with Biology degree, spring 2009
36. Tyler James (2008-2009): Graduated with Biology degree, spring 2009
37. Dana Suich (2009): Attending Eastern Tennessee U School of Pharmacy
38. Cody Corbin (REU 2009): PhD candidate, University of Arizona Chemistry Dept.
39. Emily Wayman (2008-2009): Completing chemistry degree at UA
40. Austin Doss (2009): Earned biology degree at UA, applying to medical school
41. Jordan Entrekin (2009): PhD student in chemistry at UA.
42. Hannah Box (2008-2010): PhD student chemistry at Mississippi State
43. Zachary Hawkins (2008-2010): Completing chemistry degree at UA
44. Jackie Parks (2009-2010): Graduated with Biology degree, spring 2010
45. Hanna Welch (2009-2010): Completing chemistry degree at UA
46. Zane Hyde (2009-2010): Completing chemistry degree at UA
47. David Beasley (2009-2010): Completing chemistry degree at UA
48. Thomas Leibing (2010, DAAD RISE): Completing chemistry degree at TU-Munich
49. Duncan Harmon (2009-2010): Completing Chemistry major at UA
50. Joseph Randall (2009): Completing Chemistry/Biology double major at UA
51. Kristy Bearden (2009-2010): Completing Chemistry major at UA