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Aaron K. Vannucci, Ph.D.

EXPERIENCE

- Associate Professor** (June 2021 – present) University of South Carolina
- Assistant Professor** (Aug. 2014 – June 2021) University of South Carolina
- Postdoctoral Research Fellow** (Sept. 2010 – Aug. 2014) UNC Chapel Hill under Thomas J. Meyer
- Research/Teaching Assistant/Associate** (Aug. 2004 – Sept. 2010) The University of Arizona

EDUCATION

- The University of Arizona** Tucson, Arizona
 - Ph.D. in chemistry May 2009.
 - Advisor: Dennis L. Lichtenberger
 - Dissertation Title: Computational, Spectroscopic, and Electrochemical Studies of Molybdoenzyme and Hydrogenase Active Site Inspired Complexes
- The College of Wooster** Wooster, Ohio
 - B.A. in chemistry May 2004
 - American Chemical Society certified degree

AWARDS

- University of South Carolina Breakthrough Star Award (2021)
- Ada B. Thomas Outstanding Faculty Advisor Award, University of South Carolina (2020)
- ACS Green Chemistry Institute Ignition Award (2019)
- Postdoc Research Excellence Award, UNC Chapel Hill (2013)

FUNDING

- New Hybrid Catalysts for Sustainable Cross-Coupling Reactions: Using Atomic Layer Deposition to Immobilize and Enhance Molecular Catalysts (PI) – NSF Grant No. 1954850 – 7/20 - 6/23 – \$308,669.
- A New Approach to Catalyst Immobilization Research: Designing Molecular Catalysts for Heterogeneous Catalysis (PI) – ACS Green Chemistry Institute – 9/19 - 3/20 – \$25,000.
- Industrial Funding (PI) – PBI Performance Products Inc. – 5/19 - 6/23 – \$239,275.
- Development of Electrolysis Processes to Electrochemically Reduce Lignin Samples to Produce a Color Stable Lignin Product (PI) – Ingevity Corp. – 1/17 - 6/17 – \$10,000.
- Catalytic Carbon-Carbon Cross Coupling from a Heterogeneous Catalytic System Based on a Homogeneous Molecular Catalyst (co-PI) – NSF Industry/University CRC Grant No. 1464630 – 6/16 - 5/17 – \$54,000.
- Development of a Photocatalytic System for the Renewable Production of Hydrogen Fuel (PI) – University of South Carolina Office of the VP of Research – 8/16 – 8/17 - \$15,000.
- Catalysis for Renewables: Applications, Fundamentals and Technologies (CRAFT) (funded collaborator) – NSF EPSCoR RII Track-2 Grant No. 1539105 – 8/15 - 8/19 – \$4,000,000 (12.5%).

PUBLICATIONS

During Independent Career at the University of South Carolina

**indicates corresponding author*

29. Siter, J. D.; Lemus-Rivera, E. E.; *Vannucci, A. K. "Insights into Reactivity Trends for Electrochemical C-N Bond Formations" *Org. Biomol. Chem.* **2023**, *21*, 4290-4296.
28. Ayare, P. J.; Watson, N.; Helton, M. R.; Warner, M. J.; Dilbeck, T.; Hanson, K.; *Vannucci, A. K. "Molecular Z-scheme for solar fuel production via dual photocatalytic cycles" *J. Am. Chem. Soc.* **2022**, *144*, 21568-21575. DOI: 10.1021/jacs.2c08462
27. Martin, C. R.; Park, K. C.; Leith, G. A.; Yu, J.; Mathur, A.; Wilson, G. R.; Gange, G. B.; Barth, E. L.; Ly, R. T.; Manley, O. M.; Forrester, K. L.; Karakalos, S. G.; Smith, M. D.; Makris, T. M.; Vannucci, A. K.; Peryshkov, D. V.; Shustova, N. B. "Stimuli-Modulated Metal Oxidation States in Photochromic MOFs" *J. Am. Chem. Soc.* **2022**, *144*, 4457-4468. DOI: 10.1021/jacs.1c11984
26. Dickerson, S. D.; Ayare, P. J.; Vannucci, A. K.; Wiskur, S. L. "Exploration of silicon phthalocyanines as viable photocatalysts for organic transformations" *J. Photochem. Photobiol. A*, **2022**, *422*, 113547-113553. DOI: 10.1016/j.jphotochem.2021.113547
25. Ayare, P. J.; Gregory, S. A.; Key, R. J.; Short, A. E.; Tillou, J. G.; Sitter, J. D.; Yom, T.; Goodlett, D. W.; Lee, D.-C.; Alamgir, F. M.; Losego, M. D.; *Vannucci, A. K. "Immobilization of Molecular Catalysts on Solid Supports via Atomic Layer Deposition for Chemical Synthesis in Green Solvents" *Green Chem.* **2021**, *13*, 9523-9533. DOI: 10.1039/d1gc02024b
24. Islam, M. F.; Sindt, A. J.; Hossain, M. S.; Ayare, P. J.; Smith, M. D.; Vannucci, A. K.; Garashchuk, S.; Shimizu, L. S. "Assembled triphenylamine bis-urea macrocycles: Exploring photodriven electron transfer from host to guests" *Phys. Chem. Chem. Phys.* **2021**, DOI: 10.1039/D1CP03000K
23. Bobo, M. V.; Kuchta III, J. J.; *Vannucci, A. K. "Recent Advancements in the Development of Molecular Organic Photocatalysts" *Org. Biomol. Chem.* **2021**, *19*, 4816-4834. DOI:10.1039/D1OB00396H
22. Tillou, J. D.; *Vannucci, A. K. "Determining the Active Catalytic Palladium Species Under Hydrodeoxygenation Conditions" *J. Organomet. Chem.* **2021**, *944*, 121848-121853. DOI: 10.1016/j.jorganchem.2021.121848
21. Leith, G. A.; Rice, A. M.; Yarbrough, B. J.; Kittikhunnatham, P.; Mathur, A.; Morris, N. A.; Francis, M. J.; Berseneva, A. A.; Dhull, P.; Adams, R. D.; Bobo, M. V.; Vannucci, A. K.; Smith, M. D.; Garashchuk, S.; Shustova, N. B. "Broken-hearted Carbon Bowl via Electron Shuttle Reaction: Energetics and Electron Coupling" *Chem. Sci.* **2021**, *12*, 6600-6606. DOI: 10.1039/D0SC06755E
20. Sitter, J. D.; *Vannucci, A. K. "Photocatalytic Oxidative Coupling of Arylamines for the Synthesis of Azoaromatics and the Role of O₂ in the Mechanism" *J. Am. Chem. Soc.* **2021**, *143*, 2938-2943. DOI: 10.1021/jacs.0c13101
19. Bobo, M. V.; Arcidiacono, A. M.; Ayare, P. J.; Reed, J. C.; Helton, M. R.; Ngo, T.; Hanson, K.; *Vannucci, A. K. "A Series of Green Light Absorbing Organic Photosensitizers Capable of Oxidative Quenching Photocatalysis" *ChemPhotoChem*, **2021**, *5*, 51-57. DOI: 10.1002/cptc.202000153
18. Bobo, M. V.; Paul, A.; Reed, J.; Ngo, T.; Arcidiacono, A. M.; Smith, M. D.; Hanson, K.; *Vannucci, A. K. "Synthesis and Characterization of bis-Cyclometalated Iridium Complexes Containing (4,4'-bis(phosphonomethyl)-2,2'-bipyridine) Ligands" *Inorg. Chem.* **2020**, *59*, 6351-6358. DOI: 10.1021/acs/inorgchem.0c00456
17. Yao, W.; Das, S.; DeLucia, N. A.; Boudreaux, C. M.; Qu, F.; *Vannucci, A. K.; *Papish, E. T. "Determining the Catalyst Properties that Lead to High Activity and Selectivity for Catalytic Hydrodeoxygenation with Ruthenium Pincer Complexes" *Organometallics*, **2020**, *39*, 662-669. DOI: 10.1021/acs.organomet.9b00816
16. Leith, G. A.; Rice, A. M.; Yarbrough, B. J.; Berseneva, A. A.; Ly, R. T.; Buck III, C. N.; Chusov, D.; Brandt, A. J.; Chen, D. A.; Lamm, B. W.; Stefik, M.; Stephenson, K. S.; Smith, M. D.; Vannucci, A. K.; Pellechia, P. J.; Garashchuk, S.; Shustova, N. B. "A Dual Threat: Redox Activity and Electronic Structures of Well-Defined Donor-Acceptor Fulleretic Covalent-Organic Materials" *Angew. Chem. Int. Ed.* **2020**, *59*, 2-9. DOI: 10.1002/anie.201914233
15. Zhu, T.; Sha, Y.; Firouzjaie, H. A.; Peng, X.; Cha, Y. Dissanayake, D. M. M. M.; Smith, M. D.; Vannucci, A. K.;

- Mustain, W. E.; Tang, C. "Rational Synthesis of Metallo-Cations Toward Redox- and Alkaline-Stable Metallo-Polyelectrolytes" *J. Am. Chem. Soc.* **2020**, *142*, 1083-1089 DOI: 10.1021/jacs.9b12051
14. Sindt, Ammon J.; DeHaven, B. A.; Goodlett, D. W.; Hartel, J. O.; Ayare, P. J.; Du, Y.; Smith, M. D.; Mehta, A. K.; Brugh, A. M.; Forbes, M. D. E.; Bowers, C. R.; Vannucci, A. K.; Shimizu, L. S. "Guest Inclusion Modulates Concentration and Persistence of Photogenerated Radicals in Assembled Triphenylamine Macrocycles" *J. Am. Chem. Soc.* **2020**, *142*, 502-511. DOI: 10.1021/jacs.9b1151
 13. DeLucia, N. A.; Jystad, A.; Vander Laan, K.; Tengco, J. M. M.; Caricato, M.; *Vannucci, A. K. "Silica Supported Molecular Palladium Catalyst for Selective Hydrodeoxygenation of Aromatic Compounds under Mild Conditions" *ACS Catal.* **2019**, *9*, 9060-9071. DOI: 10.1021/acscatal.9b02460
 12. Dissanayake, D. M. M. M.; Melville, A. D.; *Vannucci, A. K. "Electrochemical Anion Pool Synthesis of Amides with Concurrent Benzyl Ester Synthesis" *Green Chem.* **2019**, *21*, 3165-3171 DOI: 10.1039/C9GC00707E
 11. Key, R. J.; Smith, M. D.; *Vannucci, A. K. "A Molecular/Heterogeneous Nickel Catalyst for Suzuki-Miyaura Coupling" *Organometallics*, **2019**, *35*, 2007-2014. DOI: 10.1021/acs.organomet.9b00082
 10. Dissanayake, D. M. M. M.; *Vannucci, A. K. "Selective N1-Acylation of Indazoles with Acid Anhydrides using an Electrochemical Approach" *Org. Lett.* **2019**, *21*, 457-460. DOI: 10.1021/acs.orglett.8b03683
 9. Sindt, A. J.; DeHaven, B. A.; McEachern Jr., D. F.; Dissanayake, D. M. M. M.; Smith, M. D.; Vannucci, A. K.; Shimizu, L. S. "UV-irradiation of self-assembled triphenylamines affords persistent and regenerable radicals" *Chem. Sci.* **2019**, *10*, 2670-2677. DOI: 10.1039/C8SC04607G
 8. Key, R. J.; *Vannucci, A. K. "Nickel Dual Photoredox Catalysis for the Synthesis of Aryl Amines" *Organometallics*, **2018**, *37*, 1468-1472. DOI: 10.1021/acs.organomet.8b00121
 7. DeLucia, N. A.; Das, N.; *Vannucci, A. K. "Mild Synthesis of Silyl Ethers via Potassium Carbonate Catalyzed Reactions between Alcohols and Hydrosilanes" *Org. Biomol. Chem.* **2018**, *16*, 3415-3418. DOI: 10.1039/C8OB00464A.
 6. DeLucia, N. A.; Das, N.; Overa, S.; Paul, A.; *Vannucci, A. K. "Low temperature selective hydrodeoxygenation of model lignin monomers from a homogeneous palladium catalyst" *Catal. Today* **2018**, *302*, 146-150. DOI: 10.1016/j.cattod.2017.05.050
 5. Dissanayake, D. M. M. M.; *Vannucci, A. K. "Transition-Metal-Free and Base-Free Electrosynthesis of 1H-Substituted Benzimidazoles" *ACS Sustainable Chem. Eng.* **2017**, *6*, 690-695. DOI: 10.1021/acssuschemeng.7b03029
 4. Paul, A.; Smith, M. D.; *Vannucci, A. K. "Photoredox-Assisted Reductive Cross-Coupling: Mechanistic Insight into Catalytic Aryl-Alkyl Cross-Coupling" *J. Org. Chem.* **2017**, *82*, 1996-2003. DOI: 10.1021/acs.joc.6b02830
 3. Rice, A. M.; Fellows, W. B.; Dolgoplova, E. A.; Greytak, A. B.; Vannucci, A. K.; Smith, M. D.; Karakalos, S. G.; Krause, J. A.; Avdoshenko, S. M.; Popov, A. A.; Shustova, N. B. "Hierarchical Corannulene- Based Materials: Energy Transfer and Solid-State Photophysics" *Angew. Chem. Int. Ed.* **2017**, *56*, 4525.
 2. Salapage, S. R.; Paul, A.; Banerjee, T.; Hanson, K.; Smith, M. D.; Vannucci, A. K.; Shimizu, L. S. "Structure, Electrochemistry and Photophysical Properties of an Exocyclic Di-Ruthenium Complex and its Application as a Photosensitizer" *Dalton Trans.* **2016**, *45*, 9601.
 1. Fellows, W. B.; Rice, A. M.; Williams, D. E.; Dolgoplova, E. A.; Vannucci, A. K.; Pellechia, P. J. Smith, M. D.; Krause, J. A.; Shustova, N. B. "Redox-Active Corannulene Buckybowls in a Crystalline Hybrid Scaffold" *Angew. Chem. Int. Ed.* **2015**, *55*, 2195.

Previous to independent career

- Hyde, J. T.; Hanson, K.; Vannucci, A. K.; Lapidés, A. M.; Alibabaei, L.; Norris, M. R.; Meyer, T. J.; Harrison, D. P. *ACS Appl. Mater. Interfaces* **2015**, *7*, 9554.
- Ashford, D. L.; Gish, M. K.; Vannucci, A. K.; Brennaman, M. K.; Templeton, J. L.; Papanikolas, J. M.; Meyer, T. *J. Chem. Rev.* **2015**, *115*, 9554.
- Song, N.; Concepcion, J. J.; Binstead, R. A.; Rudd, J.; Vannucci, A. K.; Dares, C. J.; Coggins, M. K.; Meyer, T. J. *Proc. Natl. Acad. Sci.* **2015** *112*, 4935-4940.
- Song, W.; Vannucci, A. K.; Farnum, B. H.; Brennaman, M. K.; Lapidés, A. M.; Kalanyan, B.; Alibabaei, L.; Concepcion, J. J.; Losego, M. D.; Parsons, G. N.; Meyer, T. J. *J. Am. Chem. Soc.* **2014**, *136*, 9773.

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Ashford, D. L.; Lapidés, A. M.; Vannucci, A. K.; Hanson, K.; Torelli, D. A.; Harrison, D. P.; Templeton, J. L.; Meyer, T. J. *J. Am. Chem. Soc.* **2014**, *136*, 6578.

Coggins, M. K. Zhang, M. T.; Vannucci, A. K.; Dares, C. J.; Meyer, T. J. *J. Am. Chem. Soc.* **2014**, *136*, 5531.

de la Cruz Cruz, J. I.; Juárez-Saavedra, P.; Paz-Michel, B.; Leyva-Ramírez, M. A.; Rajapakshe, A.; Vannucci, A. K.; Lichtenberger, D. L.; Paz-Sandoval, M. A. *Organometallics* **2014**, *33*, 278

Vannucci, A. K.; Alibabaei, L.; Losego, M. D.; Concepcion, J. J.; Kalanyan, B.; Parsons, G. N.; Meyer, T. J. *Proc. Natl. Acad. Sci.* **2013**, *110*, 20918.

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Glasson, C. R. K.; Song, W.; Ashford, D. L.; Vannucci, A. K.; Chen, Z.; Concepcion, J. J.; Holland, P. L.; Meyer, T. J. *Inorg. Chem.* **2012**, *51*, 8637

Vannucci, A. K.; Chen, Z.; Concepcion, J. J.; Meyer, T. J. *ACS Catal.* **2012**, *2*, 716.

Gagliardi, C. J.; Vannucci, A. K.; Concepcion, J. J.; Chen, Z.; Meyer, T. J. *Energy Environ. Sci.* **2012**, *5*, 7704.

Vannucci, A. K.; Hull, J. F.; Chen, Z.; Binstead, R. A.; Concepcion, J. J.; Meyer, T. J. *J. Am. Chem. Soc.* **2012**, *134*, 3972.

Chen, Z.; Vannucci, A. K.; Concepcion, J. J.; Jurss, J. W.; Meyer, T. J. *Proc. Natl. Acad. Sci. USA* **2011**, *108*, E1461.

Estes, D. P.; Vannucci, A. K.; Hall, A. R.; Lichtenberger, D. L.; Norton, J. R. *Organometallics*, **2011**, *30*, 3444.

Chen, J.; Vannucci, A. K.; Mebi, C. A.; Okumura, N.; Borowski, S. C.; Lockett, L. T.; Lichtenberger, D. L.; Evans, D. H.; Glass, R. S. *Organometallics*, **2010**, *29*, 5330.

Vannucci, A. K.; Wang, S.; Nichol, G. S.; Lichtenberger, D. L.; Evans, D. H.; Glass, R. S. *Dalton Trans.* **2010**, *39*, 2671.

Vannucci, A. K.; Snyder, R. A.; Gruhn, N. E.; Lichtenberger, D. L.; Enemark, J. H. *Inorg. Chem.* **2009**, *48*, 8856.

Felton, G. A. N.; Mebi, C. A.; Petro, B. J.; Vannucci, A. K.; Evans, D. H.; Glass, R. S.; Lichtenberger, D. L. *J. Organomet. Chem.* **2009**, *694*, 2681.

Felton, G. A. N.; Vannucci, A. K.; Okumura, N.; Lockett, L. T.; Evans, D. H.; Glass, R. S.; Lichtenberger, D. L. *Organometallics* **2008**, *27*, 4671.

Petro, B. J.; Vannucci, A. K.; Lockett, L. T.; Mebi, C.; Kottani, R.; Gruhn, N. E.; Nichol, G. S.; Evans, D. H.; Glass, R. S.; Lichtenberger, D. L. *J. Mol. Struct.* **2008**, *890*, 281.

Felton, G. A. N.; Vannucci, A. K.; Chen, J.; Lockett, L. T.; Okumura, N.; Petro, B. J.; Zakai, U. I.; Evans, D. H.; Glass, R. S.; Lichtenberger, D. L. *J. Am. Chem. Soc.* **2007**, *129*, 12521.

TEACHING

- CHEM 112 – General Chemistry II
- CHEM 511 – Inorganic Chemistry
- CHEM 719 – Special Topics in Inorganic Chemistry: Catalysis

COMMITTEES

- Undergraduate American Chemical Society Chapter co-advisor (2020 – 2023)
- Ada B. Thomas Outstanding Advisor Award Selection Committee (2020 – present, Chair: 2022)
- Department of Chemistry and Biochemistry Awards Committee (2020 – present)
- Department of Chemistry and Biochemistry Recruiting Committee (2019 – present, Chair: 2022-2023)
- Department of Chemistry and Biochemistry Computing Committee (2019 – present)
- University Heterogeneous High Performance Computing Committee (2017 – 2019)
- NMR Facilities Committee University of South Carolina (2017 – present)
- Curriculum Committee University of South Carolina (2016 – present)
- Bouknight Scholarship Committee University of South Carolina (2014 – 2020)

ORGANIZED MEETINGS/SYMPOSIA

NC Photochem 2022 – October 7th-8th, 2022 – Columbia, SC. Lead-Organizer of conference.

NC Photochem 2021 – October 22nd- 23rd, 2021 – Chapel Hill, NC. Co-Organizer of conference.

NC Photochem 2020 – October 8th – 9th, 2020 – virtual conference. Co-Organizer of conference.

SERMACS 2016 – October 23rd – 26th, 2016 – Columbia, SC. Organizer of Electrocatalysis symposium.

SEMINAR PRESENTATIONS (20+ invited seminars given)

email yannucci@mailbox.sc.edu for complete list of presented seminars.