

Clemson University
Departments of Chemistry
& Materials Science and Engineering
483 Hunter Labs
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Center for Optical Materials Science
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91 Technology Drive
Anderson, SC 29625
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1. EDUCATION

Ph.D., Massachusetts Institute of Technology Bioinorganic Chemistry 2008

Dissertation title: "The Detection of Nitric Oxide and its Reactivity with Transition
Metal Thiolate Complexes"

Ph.D. advisor: Stephen J. Lippard

S.M., University of Chicago Inorganic Chemistry 2003

S.B. with Honors, University of Chicago Chemistry 2003

Thesis title: "The Synthesis, Characterization and Reactivity of Nickel(I) and
Nickel(II) Chalcogenide Complexes"

S.M. / S.B. advisor: Gregory L. Hillhouse

2. PROFESSIONAL EXPERIENCE

2020-present NASEM NRC Senior Research Associate, US Air Force Academy
2017-present Associate Professor with Tenure, Clemson University
2010-present Member, Center for Optical Materials Science and Engineering Technologies
2012-2017 Assistant Professor of Materials Science and Engineering, Clemson University
2010-2017 Assistant Professor of Chemistry, Clemson University
2008-2010 Postdoctoral Fellow, Department of Chemistry, University of Texas at Austin

3. HONORS AND AWARDS

2020-present NASEM NRC Senior Research Associateship
2016-present NSF CAREER Award
2018 Board of Trustees Award for Excellence
2003 NSF Graduate Research Fellowship
2003 Sigma Xi Best Thesis Award
2002 Barry M. Goldwater Scholarship
2002 N. H. Nachtrieb Award for Excellence in Undergraduate Studies of Chemistry
2002 Sigma Xi Grant in Aid of Research
2001 C. W. Chang Book Prize for Undergraduate Studies in Chemistry
2000 Roger B. Chaffee Scholarship

4. PROFESSIONAL AFFILIATIONS

2018 Society for Radical Biology and Medicine
2016 Society for Biological Inorganic Chemistry
2001 American Chemical Society
2001 Sigma Xi

5. PUBLICATIONS

a. Peer-Reviewed Journal Articles

Independent Career

- (38) "Durable, Thermally-Recyclable Materials from Agricultural and Petrochemical Wastes." Moira K. Lauer, Tatiana Estrada, George P. Chumanov, Rhett C. Smith,* and **Andrew G. Tennyson***. *Adv. Sust. Sys.*, **2019**, In Press.
- (37) "Combining Agriculture and Energy Industry Waste Products to Yield Recyclable, Thermally-Healable Copolymers of Elemental Sulfur and Oleic Acid." Ashlyn D. Smith, Timmy Thiounn, Elliott W. Lyles, Emily K. Kibler, Rhett C. Smith,* and **Andrew G. Tennyson***. *J. Polym. Sci. A*, **2019**, Early View. [DOI](https://doi.org/10.1002/pola.29436): 10.1002/pola.29436.
- (36) "Valorisation of Waste to Yield Recyclable Composites of Elemental Sulfur and Lignin." Menisha S. Karunaratna, Moira K. Lauer, Timmy Thiounn, Rhett C. Smith,* and **Andrew G. Tennyson***. *J. Mater. Chem. A*, **2019**, 7(26), 15683–15690. [DOI](https://doi.org/10.1039/C9TA03222C): 10.1039/C9TA03222C.
- (35) "Hydrogen Peroxide as a Hydride Donor and Biologically-Relevant Reductant." Yamin Htet, Zhuomin Lu, Sunia A. Trauger, and **Andrew G. Tennyson***. *Chem. Sci.*, **2019**, 10, 2025–2033. [DOI](https://doi.org/10.1039/C8SC05418E): 10.1039/C8SC05418E. [PMID](https://pubmed.ncbi.nlm.nih.gov/30881631/): 30881631.
- (34) "Thermally-Healable Network Solids of Sulfur-Crosslinked Poly(4-allyloxystyrene)." Timmy Thiounn, Monte S. Bedford, Moira K. Lauer, Rhett C. Smith*, and **Andrew G. Tennyson***. *RSC Adv.*, **2018**, 8, 39074–39082. [DOI](https://doi.org/10.1039/C8RA06847J): 10.1039/C8RA06847J.
- (33) "NAD⁺ as a Hydride Donor and Reductant." Yamin Htet and **Andrew G. Tennyson***. *J. Am. Chem. Soc.*, **2016**, 138(49), 15833–15836. [DOI](https://doi.org/10.1021/jacs.6b10451): 10.1021/jacs.6b10451. [PMID](https://pubmed.ncbi.nlm.nih.gov/27960347/): 27960347.
- (32) "Catalytic Radical Reduction in Aqueous Solution by a Ruthenium Hydride Intermediate." Yamin Htet and **Andrew G. Tennyson***. *Angew. Chem., Int. Ed.*, **2016**, 55(30), 8556–8560. [DOI](https://doi.org/10.1002/anie.201601887): 10.1002/anie.201601887. [PMID](https://pubmed.ncbi.nlm.nih.gov/27254303/): 27254303.
- (31) "Catalytic radical reduction in aqueous solution via oxidation of biologically-relevant alcohols." Yamin Htet and **Andrew G. Tennyson***. *Chem. Sci.*, **2016**, 7(7), 4052–4058. [DOI](https://doi.org/10.1039/C6SC00651E): 10.1039/C6SC00651E. [PMID](https://pubmed.ncbi.nlm.nih.gov/30155048/): 30155048
- (30) "Redox-Active Ligands: An Advanced Tool to Modulate Polyethylene Microstructure." W. Curtis Anderson Jr., Jennifer L. Rhinehart, **Andrew G. Tennyson**, and Brian K. Long*. *J. Am. Chem. Soc.*, **2016**, 138(3), 774–777. [DOI](https://doi.org/10.1021/jacs.5b12322): 10.1021/jacs.5b12322. [PMID](https://pubmed.ncbi.nlm.nih.gov/26722675/): 26722675.
- (29) "Net Charge Effects in N-Heterocyclic Carbene–Ruthenium Complexes with Similar Oxidation States and Coordination Geometries." Anshuman Mangalum, Yamin Htet, Dallas A. Roe, Colin D. McMillen, and **Andrew G. Tennyson***. *Inorg. Chim. Acta*, **2015**, 435, 320–326. [DOI](https://doi.org/10.1016/j.ica.2015.06.025): 10.1016/j.ica.2015.06.025.

- (28) "Synthesis, coordination chemistry and reactivity of transition metal complexes supported by a chelating benzimidazolylidene carboxylate ligand." Anshuman Mangalum, Colin D. McMillen, and **Andrew G. Tennyson***. *Inorg. Chim. Acta*, **2015**, *426*, 29–38. [DOI](https://doi.org/10.1016/j.ica.2014.11.003): 10.1016/j.ica.2014.11.003.
- (27) "Preparation of poly(p-phenylene vinylene) derivatives by a debromination-chain polymerization-debromination sequence." Brynna J. Laughlin, Yamin Htet, Susan He, Tyler L. Duniho, Samantha J. El Homs, **Andrew G. Tennyson**, and Rhett C. Smith*. *Eur. Polym. J.*, **2015**, *70*, 197–202. [DOI](https://doi.org/10.1016/j.eurpolymj.2015.05.012): 10.1016/j.eurpolymj.2015.05.012.
- (26) "Conjugated Polymers with m-Pyridine Linkages: Synthesis, Photophysics, Solution Structure and Film Morphology." Ashley A. Buelt, Naresh C. Osti, Yamin Htet, Catherine A. Conrad, Mina F. Shehata, Ruttayapon Potai, **Andrew G. Tennyson***, Dvora Perahia*, and Rhett C. Smith*. *J. Mater. Chem. C*, **2014**, *2*(38), 8113–8121. [DOI](https://doi.org/10.1039/c4tc00419a): 10.1039/c4tc00419a.
- (25) "Donor-Acceptor 1,4-Fluorenylene Chromophores: Photophysics, Electrochemistry and Synthesis via a New Route for Asymmetric Chromophore Assembly." Brynna J. Laughlin, Mary K. Burdette, Chadwick R. Powell, Benjamin E. Levy, **Andrew G. Tennyson***, and Rhett C. Smith*. *Eur. J. Org. Chem.*, **2014**, (27), 5998–6009. [DOI](https://doi.org/10.1002/ejoc.201402181): 10.1002/ejoc.201402181.
- (24) "Conjugated Polymers Featuring Oxacyclophane-Scaffolded π -Stacking Interactions." Anshuman Mangalum, Brad P. Morgan, **Andrew G. Tennyson**, and Rhett C. Smith*. *Macromol. Chem. Phys.*, **2014**, *215*(4), 351–357. [DOI](https://doi.org/10.1002/macp.201300630): 10.1002/macp.201300630.
- (23) "Bipyridyl-modified phosphonium conjugated polyelectrolytes: Synthesis, photophysics, metal ion coordination and layer-by-layer assembly with anionic conjugated polymers." Samantha L. Kristufek, Thora R. Maltais, Eleanor G. Tennyson, Naresh C. Osti, Dvora Perahia, **Andrew G. Tennyson**, and Rhett C. Smith*. *Polym. Chem.*, **2013**, *4*(21), 5387–5394. [DOI](https://doi.org/10.1039/c3py20765j): 10.1039/c3py20765j.
- Cover of Issue 21, Volume 4 of *Polym. Chem.*
- (22) "Comparison of 1,4-distyrylfluorene and 1,4-distyrylbenzene models of conjugated polymers: synthesis, structure, electrochemistry and photophysics." Brynna J. Laughlin, Tyler L. Duniho, Samantha J. El Homs, Benjamin E. Levy, Nihal Deligonul, Joshua R. Gaffen, John D. Protasiewicz, **Andrew G. Tennyson***, and Rhett C. Smith*. *Org. Biomol. Chem.*, **2013**, *11*(33), 5425–5434. [DOI](https://doi.org/10.1039/c3ob40580j): 10.1039/c3ob40580j. [PMID](https://pubmed.ncbi.nlm.nih.gov/23863862/): 23863862.
- Cover of Issue 33, Volume 11 of *Org. Biomol. Chem.*
- (21) "Synthesis, Photophysical and Electrochemical Properties of Conjugated Polymers Incorporating 9,9-Dialkyl-1,4-Fluorenylene Units with Thiophene, Carbazole and Triarylamine Comonomers." Brynna J. Laughlin, William F. Baker, Tyler L. Duniho, Samantha J. El Homs, **Andrew G. Tennyson***, and Rhett C. Smith*. *Polym. Chem.*, **2012**, *3*(12), 3318–3323. [DOI](https://doi.org/10.1039/c2py20493b): 10.1039/c2py20493b.
- (20) "Sterically encumbered bipyridyl-derivatized conjugated polymers and metallopolymers incorporating phenylenevinylene, phenyleneethynylene and fluorenylene segments." Susan He, Ashley A. Buelt, Jessica M. Hanley, Brad P. Morgan, **Andrew G. Tennyson***, and Rhett C. Smith*. *Macromolecules*, **2012**, *45*(16), 6344–6352. [DOI](https://doi.org/10.1021/ma2025144): 10.1021/ma2025144.

- (19) "Generation, Translocation, and Action of Nitric Oxide in Living Systems." **Andrew G. Tennyson** and Stephen J. Lippard*. *Chemistry & Biology*, **2011**, 18(10), 1211–1220.
DOI: 10.1016/j.chembiol.2011.09.009. PMID: 22035790.

Graduate and Postdoctoral Research

- (18) "Advances in bis(N-heterocyclic carbene) chemistry: new classes of structurally dynamic materials." Bethany M. Neilson, **Andrew G. Tennyson**, and Christopher W. Bielawski. *J. Phys. Org. Chem.*, **2012**, 25(7), 531–543. DOI: 10.1002/poc.1961.
- (17) "A Seven-Membered N,N'-Diamidocarbene." Todd W. Hudnall, **Andrew G. Tennyson**, and Christopher W. Bielawski. *Organometallics*, **2010**, 29(20), 4569–4578. DOI: 10.1021/om1007665.
- Highlighted in *Chem. Eng. News*, **2010**, 88, 26.
- (16) "Methylation of Ylidene–Triazenes: Insight and Guidance for 1,3-Dipolar Cycloaddition Reactions." **Andrew G. Tennyson**, Eric J. Moorhead, Brian L. Madison, Joyce A. V. Er, Vincent M. Lynch, and Christopher W. Bielawski. *Eur. J. Org. Chem.*, **2010**, (32), 6277–6282.
DOI: 10.1002/ejoc.201000939.
- (15) "Structurally Dynamic Conjugated Polymers." **Andrew G. Tennyson**, Brent C. Norris, and Christopher W. Bielawski. *Macromolecules*, **2010**, 43(17), 6923–6935. DOI: 10.1021/ma101198z.
- Cover of Issue 18, Volume 43 of *Macromolecules*.
- (14) "Arrested Catalysis: Controlling Kumada Coupling Activity via a Redox-Active N-Heterocyclic Carbene." **Andrew G. Tennyson**, Vincent M. Lynch, and Christopher W. Bielawski. *J. Am. Chem. Soc.*, **2010**, 132(27), 9420–9429. DOI: 10.1021/ja102686u. PMID: 20560593.
- (13) "Quinobis(imidazolylidene): Synthesis and Study of an Electron-Configurable Bis(N-Heterocyclic Carbene) and Its Bimetallic Complexes." **Andrew G. Tennyson**, Robert J. Ono, Todd W. Hudnall, Dimitri M. Khramov, Joyce A. V. Er, Justin W. Kamplain, Vincent M. Lynch, Jonathan L. Sessler, and Christopher W. Bielawski. *Chem.—Eur. J.*, **2010**, 16(1), 304–315.
DOI: 10.1002/chem.200901883. PMID: 19946903.
- (12) "Redox Active N-Heterocyclic Carbenes: Design, Synthesis, and Evaluation of Their Electronic Properties." Evelyn L. Rosen, C. Daniel Varnado Jr., **Andrew G. Tennyson**, Dimitri M. Khramov, Justin W. Kamplain, Philip T. Creswell, Daphne H. Sung, Vincent M. Lynch and Christopher W. Bielawski. *Organometallics*, **2009**, 28(23), 6695–6706. DOI: 10.1021/om900698x.
- (11) "Indirectly Connected Bis(N-Heterocyclic Carbene) Bimetallic Complexes: Dependence of Metal-Metal Communication on Linker Geometry." **Andrew G. Tennyson**, Dimitri M. Khramov, C. Daniel Varnado Jr., Philip T. Creswell, Justin W. Kamplain, Vincent M. Lynch, and Christopher W. Bielawski. *Organometallics*, **2009**, 28(17), 5142–5147. DOI: 10.1021/om9004109.
- (10) "Bimetallic N-Heterocyclic Carbene–Iridium Complexes: Investigating Metal-Metal and Metal-Ligand Communication via Electrochemistry and Phosphorescence Spectroscopy." **Andrew G. Tennyson**, Evelyn L. Rosen, Mary S. Collins, Vincent M. Lynch, and Christopher W. Bielawski. *Inorg. Chem.*, **2009**, 48(14), 6924–6933. DOI: 10.1021/ic900391q. PMID: 19537803.

- (9) "Adapting N-Heterocyclic Carbene/Azide Coupling Chemistry for Polymer Synthesis: Enabling Access to Aromatic Polytriazenes." Daniel J. Coady, Dmitri M. Khramov, Brent C. Norris, **Andrew G. Tennyson**, and Christopher W. Bielawski. *Angew. Chem., Int. Ed.*, **2009**, 48(28), 5187–5190. DOI: 10.1002/anie.200901046. PMID: 19496098.
- (8) "Oxidation of poly(enetetraamine)s: A new synthetic strategy for conjugated polyelectrolytes." **Andrew G. Tennyson**, Justin W. Kamplain, and Christopher W. Bielawski. *Chem. Commun.*, **2009**, (16), 2124–2126. DOI: 10.1039/b902030f. PMID: 19360167.
- (7) "Synthesis and Study of 5,5'-Bibenzimidazolylidenes and Their Bimetallic Complexes." Joyce A. V. Er, **Andrew G. Tennyson**, Justin W. Kamplain, Vincent M. Lynch, and Christopher W. Bielawski. *Eur. J. Inorg. Chem.*, **2009**, (13), 1729–1738. DOI: 10.1002/ejic.200801188.
- Cover of Issue 13, Volume 2009 of *Eur. J. Inorg. Chem.*
- (6) "Synthesis and Characterization of {Ni(NO)}¹⁰ and {Co(NO)₂}¹⁰ Complexes Supported by Thiolate Ligands." **Andrew G. Tennyson**, Shanta Dhar, and Stephen J. Lippard. *J. Am. Chem. Soc.*, **2008**, 130(45), 15087–15098. DOI: 10.1021/ja803992y. PMID: 18928257.
- (5) "Selective Fluorescence Detection of Nitroxyl over Nitric Oxide in Buffered Aqueous Solution using a Conjugated Metallopolymer." **Andrew G. Tennyson**, Rhett C. Smith, and Stephen J. Lippard. *Polyhedron*, **2007**, 26(16), 4625–4630. DOI: 10.1016/j.poly.2007.04.003.
- (4) "Conjugated Metallopolymers for Fluorescent Turn-On Detection of Nitric Oxide." Rhett C. Smith, **Andrew G. Tennyson**, Annie C. Won, and Stephen J. Lippard. *Inorg. Chem.*, **2006**, 45(23), 9367–9373. DOI: 10.1021/ic061099z. PMID: 17083235.
- (3) "Luminescent Properties of Water-Soluble Conjugated Metallopolymers and Their Application to Fluorescent Nitric Oxide Detection." Loi Do, Rhett C. Smith, **Andrew G. Tennyson**, and Stephen J. Lippard. *Inorg. Chem.*, **2006**, 45(22), 8998–9005. DOI: 10.1021/ic060998k. PMID: 17054360.
- (2) "Polymer-Bound Dirhodium Tetracarboxylate Films for Fluorescent Detection of Nitric Oxide." Rhett C. Smith, **Andrew G. Tennyson**, and Stephen J. Lippard. *Inorg. Chem.*, **2006**, 45(16), 6222–6226. DOI: 10.1021/ic060070s. PMID: 16878931.
- (1) "Conjugated Polymer-Based Fluorescence Turn-On Sensor for Nitric Oxide." Rhett C. Smith, **Andrew G. Tennyson**, Mi Hee Lim, and Stephen J. Lippard. *Org. Lett.*, **2005**, 7(16), 3573–3575. DOI: 10.1021/ol0513903. PMID: 16048345.

b. Patents

- (3) "Free Fatty Acid-Based Composites for Biomaterial Applications" **Andrew G. Tennyson*** and Rhett C. Smith. US Provisional Patent Application filed on December 4, 2018.
- (2) "Covalently Cross-Linked Lignocellulosic Composites and Applications Thereof." **Andrew G. Tennyson** and Rhett C. Smith*. US Patent Application No 62/511,713. Filed on May 26, 2017.

- (1) "Self-Regenerating Antioxidant Catalysts and Methods of Using the Same." **Andrew G. Tennyson***, Yamin Htet, and Anshuman Mangalum. US Patent No US2016151773 (A1). Application filed on December 1, 2015; Granted on July 26, 2017.

c. Other Scholarly Works

- (2) **Andrew G. Tennyson**, Tania Houjeiry, and Rhett C. Smith. *Organic Chemistry 2 – A Primer*. IQPG, 2018. ISBN: 978-0999167212
- (1) **Andrew G. Tennyson** and Rhett C. Smith. *Organic Chemistry 1 – A Primer*. IQPG, 2017. ISBN: 978-0999167205

6. PRESENTATIONS

a. Invited Seminars

- (29) The University of Tennessee at Knoxville; Knoxville, TN (April 13, 2017).
- (28) National Tsing Hua University; Hsinchu, Taiwan (January 11, 2017).
- (27) Case Western Reserve University; Cleveland, OH (December 1, 2016).
- (26) National Taiwan University; Taipei, Taiwan (September 29, 2016).
- (25) National Chiao Tung University; Hsinchu, Taiwan (September 28, 2016).
- (24) National Central University; Taoyuan, Taiwan (September 27, 2016).
- (23) Brown University; Providence, RI (September 16, 2016).
- (22) Savannah River Scholars Program (NSF S-STEM) Seminar Series; Georgia Regents University, Augusta, GA (April 18, 2014).
- (21) The University of Tennessee at Chattanooga; Chattanooga, TN (March 28, 2014).
- (20) Tri-County Technical College; Pendleton, SC (October 16, 2013).

b. Scientific Conferences

- (19) "Converting Low-Value Animal Rendering Co-Products into Durable, Thermally-Recyclable Materials." 2019 Biomass to Biobased Chemicals and Materials Gordon Research Conference; Newry, ME (July 14-19, 2019).
- (18) "Hydrogen Peroxide as a Hydride Donor and Reductant under Biologically Relevant Conditions." 15th International Symposium on Applied Bioinorganic Chemistry; Nara, Japan (June 2-5, 2019).
- (17) "Hydrogen peroxide as a hydride donor and reductant under biologically relevant conditions." 257th National Meeting of the American Chemical Society; Orlando, FL (March 31-April 4, 2019).
- Session chair: Inorganic Chemistry.

- (16) "Hydrogen Peroxide as a Hydride Donor and Reductant under Biologically Relevant Conditions." 2019 Inorganic Reaction Mechanism Gordon Research Conference; Galveston, TX (March 10-15, 2019).
- (15) "Hydrogen Peroxide as a Biologically-Relevant Reductant and Hydride Donor." 9th Asian Biological Inorganic Chemistry Conference; Singapore (December 9-14, 2018).
- (14) "Biologically Relevant Radical Reduction by a Ruthenium Catalyst." 25th Annual Meeting of the Society for Radical Biology and Medicine; Chicago, IL (November 14-17, 2018).
- (13) "Catalytic radical reduction under biologically-relevant conditions by an organoruthenium complex." 70th Southeastern Regional Meeting of the American Chemical Society; Augusta, GA (October 31-November 1, 2018).
- Session chair: Inorganic Chemistry.
- (12) "Catalytic radical reduction by a ruthenium–hydride intermediate." 69th Southeastern Regional Meeting of the American Chemical Society; Charlotte, NC (November 8-11, 2017).
- Session chair: Inorganic Chemistry.
- (11) "Hydride donation by NAD⁺ in biologically-relevant redox catalysis." 254th National Meeting of the American Chemical Society; Washington, DC (August 20-24, 2017).
- Session chair: DNA, RNA & Bioinorganic Drugs.
- (10) "Formation of a ruthenium–hydride intermediate and its ability to catalyze radical reduction in aerobic, aqueous solution." 254th National Meeting of the American Chemical Society; Washington, DC (August 20-24, 2017).
- Session chair: Catalysis–Late Transition Metals.
- (9) "Bioorganometallic Redox Catalysis." 68th Southeastern Regional Meeting of the American Chemical Society; Columbia, SC (October 23-26, 2016).
- (8) "Catalytic radical degradation by N-heterocyclic carbene–ruthenium complexes via a transfer hydrogenation-like process." The 2015 International Chemical Congress of Pacific Basin Society; Honolulu, HI (December 15-20, 2015).
- (7) "An N-Heterocyclic Carbene–Ruthenium Complex that Catalyzes the Reduction of Radicals in Aqueous Solutions." 67th Southeastern / 71st Southwestern Regional Meeting of the American Chemical Society; Memphis, TN (November 4-7, 2015).
- (6) "Ruthenium-based self-regenerating antioxidant catalysts and materials." 250th National Meeting of the American Chemical Society; Boston, MA (August 16-20, 2015).
- (5) "Catalytic Radical Reduction by a Transfer Hydrogenation-Like Process." 2015 Gordon Research Conference on Organometallic Chemistry; Salve Regina, RI (July 12-17, 2015).
- (4) "Ruthenium-based Self-regenerating Antioxidant Catalysts and Materials." 98th Canadian Chemistry Conference and Exhibition; Ottawa, ON (June 13-17, 2015).

- (3) "Redox Active N-Heterocyclic Carbenes and Complexes." 2010 Gordon Research Conference on Organometallic Chemistry; Salve Regina, RI (July 11-16, 2010).

c. Workshops

- (2) "NSF CAREER Program." 2019 SC INBRE and SC EPSCoR Academic Leadership and Career Development Workshop; Columbia, SC (June 17-18, 2019).
- (1) "Principles and Practice of Inorganic and Organometallic Electroanalytical Methods." The University of Tennessee at Knoxville; Knoxville, TN (June 5-7, 2011).

7. SPONSORED RESEARCH

a. Ongoing

- (9) **Fats & Proteins Research Foundation (\$97,309).** Andrew G. Tennyson (PI) 07/01/18-06/30/20
and Rhett C. Smith (Co-PI). "Free Fatty Acid-Based Composites for Biomaterial Applications."
- (8) **CHE-1708844, NSF (\$315,000).** Rhett C. Smith (PI) and Andrew G. 07/01/17-06/30/20
Tennyson (Co-PI). "SusChEM: Sustainable Chemistry from Combined Inorganic and Organic Waste Precursors."
- (7) **DMR-1555224, NSF (\$500,000).** Andrew G. Tennyson (PI). "CAREER: Self- 07/01/16-06/30/21
Protecting Artificial Implants and Invigorating the STEM Education Pipeline with Biomaterials."
- "Clemson Researchers Working on Rejection-Resistant Coating for Artificial Joints." *ASEE First Bell*, May 24, 2016.
 - "Clemson research could revolutionize joint replacements." Liv Osby, *The Greenville News*, May 24, 2016.
 - "Federal grant for Clemson prof could help transplant patients." Mike Eads, *The Independent Mail*, May 17, 2016.
 - "Clemson medical implant research gets \$500K grant." *GSA Business Report*, May 17, 2016.

b. Completed

- (6) **GE Global Research Corporation (\$15,000).** Andrew G. Tennyson (PI). 11/14/14-10/15/15
"Novel Synthetic Strategies for the Preparation of PET Bioimaging Agents."
- (5) **Eureka Program, Clemson University.** Andrew G. Tennyson (PI). 2013-2015
"Organometallic Medicinal Chemistry."
- (4) **Creative Inquiry Program, Clemson University.** Andrew G. Tennyson (PI). 2012-2016
"Organometallic Medicinal Chemistry."

- (3) **University Research Grants Committee, Clemson University.** Andrew G. Tennyson (PI). "Enhancing Charge Pair Dissociation in Organic Semiconducting Materials with Ferroelectric Nanoparticles." 2012-2013
- (2) **Summer Program for Research Interns, Clemson University.** Andrew G. Tennyson (PI). "Redox-Active Azo Dyes for Bioimaging and Photovoltaic Applications." 2011
- (1) **Startup Funds, Clemson University.** Andrew G. Tennyson (PI). 07/01/10-08/31/15

8. RESEARCH ADVISING

a. Postdoctoral Scholars

Current

- (2) **L. Taylor Elrod** (Ph.D. from Brown University) 2018-

Former

- (1) **Anshuman Mangalum** (Ph.D. from Clemson University) 2014-2016
- Current Position: Senior Synthetic Chemist, Moses Lake Industries (Moses Lake, WA)

b. Graduate Students

Current

- (6) **Ashlyn D. Smith** (USA). Chemistry, 1st year. May 2022
- (5) **Zhuomin Luo** (China). Chemistry, 3rd year. May 2021

Former

- (4) **Christian U. Rausch** (Germany). Ph.D., Chemistry. "Synthesis and Electrochemistry of Tungsten and Molybdenum Isocyanide Complexes." May 2019
- (3) **Hamidou Keita** (Ethiopia). Ph.D., Chemistry. "Supramolecular Immobilizable Ruthenium- (N-Heterocyclic Carbene) Complexes for Biomedical and Olefin Metathesis Applications." December 2018
- (2) **Qingzhao An** (China). Ph.D., Chemistry. "Synthesis and Applications of 1,4-Naphthoquinone Derivatives." December 2018
- (1) **Yamin Htet** (Burma). Ph.D., Chemistry. "Antioxidant Catalysis via Organoruthenium-Catalyzed β -Hydride Elimination." May 2017
- Honors and Awards: Clemson University Distinguished Graduate Fellowship, Graduate Teaching Award, Graduate Research Award, GlaxoSmithKline Internship (Boston, MA)

- Postgraduate Employment: Wyss Institute for Biologically Inspired Engineering, Harvard University (Boston, MA)
- Current Position: Chemistry Analyst II, Waters Corporation.

9. REVIEWING

a. Funding Agencies, Review Panel Member

2019 American Heart Association, Transformative Project Award
 2018 American Heart Association, Transformative Project Award
 2018 American Association for the Advancement of Science, Research Competitiveness Program
 2016 National Science Foundation + Food & Drug Administration, Scholars-In-Residence Program

b. Funding Agencies, Ad-Hoc Reviewer

2017 American Chemical Society, Petroleum Research Fund
 2017 Army Research Office
 2016 American Chemical Society, Petroleum Research Fund
 2014 American Chemical Society, Petroleum Research Fund
 2013 American Chemical Society, Petroleum Research Fund
 2013 National Science Foundation, Division of Materials Research
 2012 National Science Foundation, Division of Materials Research
 2012 Department of Energy, Office of Science, Graduate Fellowship
 2011 Research Grants Council of Hong Kong

c. Journals, Peer Reviewer

Applied Organometallic Chemistry
European Journal of Medicinal Chemistry
Inorganic Chemistry
Inorganica Chimica Acta
International Journal of Chemical Kinetics
Journal of the American Chemical Society
Journal of Inorganic Biochemistry
Journal of Organic Chemistry
Journal of Polymer Science A: Polymer Chemistry
Materials Chemistry Frontiers
Molecules
Organometallics

d. Textbooks, Peer Reviewer

Organometallic Chemistry, 4th Edition. Spessard & Miessler

10. TEACHING

a. Curriculum Development

(5) **Advanced Synthetic Techniques**

- *Description:* Introduction to advanced laboratory techniques in synthesis and characterization of inorganic and organic compounds. Laboratory sessions consist of a set of eight experiments in modern fields of chemistry, including superconductivity, buckminsterfullerene, bioinorganic chemistry, medicinal chemistry, asymmetric synthesis, and polymer chemistry.
- *Developed:* Spring 2020 (new curriculum)

(4) **An Introduction to Chemistry**

- *Description:* This course features common chemicals and concepts and their application in making and testing products. Specific experiments will interest those with little or no science experience and challenge those who have already taken a physical science course. Although strict safety rules are enforced, this course offers a friendly, relaxed atmosphere to explore chemical reactivity. Learn about the mole, percent composition, polymers and acid/base titration. Enjoy activities such as acid-etching glass, preparing and testing aspirin, making organic lip balm and the paint required to paint a Clemson Tiger Paw.
- *Developed:* Summer 2015

(3) **Better Lives and Living through Chemistry**

- *Description:* Life in the modern era as we know it would not exist without the advances in medicine and technology that began with the dawn of the First Industrial Revolution. In turn, these advances would not have been possible without understanding how properties at the molecular level can produce macroscopic impacts in human health and industry. This course will distill these macroscopic impacts down to intuitively accessible fundamental chemical concepts, such as Coulombic forces and symmetry. Furthermore, lecture topics will specifically address all Indicators for SC Chemistry Standard C-3, and lab experiments will emphasize the “additional content and depth” Indicators.
- *Developed:* Summer 2014

(2) **Foundations of Organic Chemistry**

- *Description:* Organic molecules exhibit a vast range of chemical properties and reactions, yet this enormous variety can be understood and explained with a small common set of intuitive fundamental concepts. In particular, the attraction and repulsion of oppositely- and similarly-charged species are crucial principles for describing and predicting the properties and reactivity of organic compounds. Lecture topics will specifically address all Indicators for SC Chemistry Standard C-3, and lab experiments will emphasize the “additional content and depth” Indicators. Selected topics from the other Chemistry Standards will also be discussed.
- *Developed:* Summer 2013

(1) **Organometallic Chemistry**

- Description: Organometallic compounds are useful in applications ranging from large-scale industrial reactions to antibiotics, and this versatility arises from the chemically unique metal–carbon bond. Course begins with fundamental coordination chemistry, then progresses through ligand substitution, oxidative addition/reductive elimination, catalytic transformations and polymerization reactions.
- Developed: Fall 2013

b. Courses Taught

(8) **Advanced Synthetic Techniques**

- Course Number: CH 4030
- Taught: Fall 2011, Fall 2012, Fall 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017, Spring 2018, Spring 2019

(7) **Organometallic Chemistry**

- Course Number: CH 4010 / CH 4010 HON / CH 6010
- Taught: Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2019

(6) **Organic Chemistry 1**

- Course Number: CH 2230
- Taught: Fall 2010, Spring 2012, Summer 2016, Summer 2017, Summer 2018

(5) **An Introduction to Chemistry**

- Course Number: BIOSC 7300
- Developed: Summer 2015

(4) **Better Lives and Living through Chemistry**

- Course Number: BIOSC 7300
- Taught: Summer 2014

(3) **Foundations of Organic Chemistry**

- Course Number: BIOSC 7300
- Taught: Summer 2013

(2) **Introduction to Inorganic Chemistry**

- Course Number: CH 2050
- Taught: Spring 2013

(1) **Organic/Inorganic Student Seminar**

- Course Number: CH 8510
- Taught: Spring 2011, Fall 2011