

Erik John Alexanian

Department of Chemistry
University of North Carolina
Chapel Hill, NC 27599-3290

E-mail: ēja@email.unc.edu
Telephone: (919) 962-4976
Fax: (919) 962-2388

EDUCATION

Ph.D. Organic Chemistry; Princeton University, Princeton, NJ 2006
A.B. *cum laude* in Chemistry; Harvard University, Cambridge, MA 2001
High School graduation; Boston Latin School, Boston, MA 1997

APPOINTMENT

Professor of Chemistry, 2019 – present
University of North Carolina, Chapel Hill, NC

RESEARCH INTERESTS

Synthetic organic chemistry and organometallic catalysis; the development of enabling reaction methods that address important challenges ranging from the sustainable synthesis of small molecule therapeutics to the upcycling of post-consumer plastic waste.

EXPERIENCE

University of North Carolina, Chapel Hill, NC:

Associate Professor 2017 – 2019
Associate Professor of Chemistry and Director of Undergraduate Studies 2014 – 2017
Assistant Professor of Chemistry 2008 – 2014

*University of Illinois at Urbana-Champaign, Urbana, IL
and Yale University, New Haven, CT:* 2006 – 2008

Postdoctoral Research with Professor John F. Hartwig;
Synthetic and Mechanistic Studies of Transition Metal Enolates

Princeton University, Princeton, NJ 2001 – 2006

and The Scripps Research Institute, La Jolla, CA:

Graduate Research with Professor Erik J. Sorensen;
Synthesis of the Furanosteroid Viridin and New Metal-Catalyzed Alkene
Difunctionalizations

Boston College, Chestnut Hill, MA: 1999 – 2001

Undergraduate Research with Professor Amir Hoveyda;
Molybdenum-Catalyzed Enantioselective Alkene Metathesis

AWARDS

- NSF CAREER Award 2011 – 2016
- Thieme Chemistry Journal Award 2011
- National Institutes of Health Postdoctoral Fellowship 2006 – 2008

- ACS Division of Organic Chemistry Fellowship
Sponsored by GlaxoSmithKline 2004 – 2005
- Bristol-Myers Squibb Graduate Fellowship 2004 – 2005
- Hugh Stott Taylor Fellowship 2003
- Skaggs Predoctoral Fellowship 2002 – 2003
- James H. and Louise S. Hekimian Scholarship 1999 – 2001
- Harvard College Scholarship 1998 – 2001

INVITED LECTURES

- XXIII International Conference on Organic Synthesis (23-ICOS), Shanghai, 2023
- 28th Congress of the International Society of Heterocyclic Chemistry, Santa Barbara, 2022
- 3rd International Conference on Hydrogen Atom Transfer, Rome, 2022
- Justus Liebig University, Giessen, 2022
- Florida Heterocyclic Conference, Gainesville, 2020
- NC State University, 2019
- Workshop on the Future of C–H Functionalization, Telluride, 2019
- 14th Center for C–H Functionalization Virtual Symposium on Advances in C–H Functionalization, 2019
- 3rd International Conference on Proton-Coupled Electron Transfer, Blowing Rock, 2018
- *The Merck Lecture*, Columbia University, 2017
- Merck, Rahway, 2017
- 2nd International Conference on Hydrogen Atom Transfer, Rome, 2017
- Dartmouth College, 2017
- AbbVie, North Chicago, 2016
- Shanghai Institute of Organic Chemistry, 2016
- Peking University, Shenzhen Graduate School, 2016
- Peking University, 2016
- 3rd Annual Research Symposium, State Key Laboratory of Elemento-Organic Chemistry, Nankai University, 2016
- University of Ottawa, 2016
- University of North Carolina, Greensboro 2015
- 5th Symposium for Young Chemists on Molecular Activation, Aso (Japan), 2014
- Nagoya University, 2014
- Kyoto University, 2014
- Osaka University, 2014
- The University of California, Los Angeles, 2014
- Yale University, 2013
- Vanderbilt University, 2013
- American Chemical Society, National Meeting, Indianapolis, 2013
- 6th Pacific Symposium on Radical Chemistry, Vancouver, 2013
- Bristol-Myers Squibb, Lawrenceville, New Brunswick, and Wallingford, 2013
- University of California, Irvine, 2013
- California Institute of Technology, 2013

- Princeton University, 2013
- The University of Texas at Austin, 2013
- The University of Texas Southwestern Medical Center, 2013
- University of Wisconsin-Madison, 2013
- The Scripps Research Institute, 2013
- The University of Illinois, Urbana-Champaign, 2013
- University of California, Santa Barbara, 2013
- University of Michigan, 2013
- The Ohio State University, 2013
- University of California, Berkeley, 2013
- Colorado State University, 2012
- University of Pennsylvania, 2012
- Boston College, 2012
- Brandeis University, 2012
- Boston University, 2012
- Emory University, 2012
- American Chemical Society, National Meeting, Philadelphia, 2012
- Eli Lilly, Indianapolis, 2012
- Gordon Research Conference, Natural Products, 2012
- GlaxoSmithKline, Research Triangle Park, 2012
- Merck, Rahway, 2012
- American Chemical Society, National Meeting, San Diego, 2012
- University of North Carolina Wilmington, 2011
- Wake Forest University, 2010
- Appalachian State University, 2010

INDEPENDENT PUBLICATIONS at UNC

42. Veatch, A. M.; Liu, S.; Alexanian, E. J.* “Cobalt-Catalyzed Deaminative Amino- and Alkoxyacylation of Aryl Trialkylammonium Salts Promoted by Visible Light.” *Angew. Chem. Int. Ed.* **2022**, *61*, e202210772.
41. Miller, A. S.; Alexanian, E. J.* “Heteroarylation of Unactivated C–H Bonds Suitable for Late-Stage Functionalization.” *Chemical Science* **2022**, *13*, 11878–11882.
40. Fazekas, T. J.; Alty, J. W.; Neidhart, E. K.; Miller, A. S.; Leibfarth, F. A. ;* Alexanian, E. J.* “Diversification of Aliphatic C–H Bonds in Small Molecules and Polyolefins Through Radical Chain Transfer.” *Science* **2022**, *375*, 545–550.
39. Tercenio, Q. D.; Alexanian, E. J.* “Stereospecific Nickel-Catalyzed Reductive Cross-Coupling of Alkyl Tosylate and Allyl Alcohol Electrophiles.” *Org. Lett.* **2021**, *23*, 7215–7219.
38. Veatch, A. M.; Alexanian, E. J.* “Cobalt-Catalyzed Aminocarbonylation of (Hetero)Aryl Halides Promoted by Visible Light.” *Chemical Science* **2020**, *11*, 7210–7213.

37. Na, C. G.; Ravelli, D.; Alexanian, E. J.* “Direct Decarboxylative Functionalization of Carboxylic Acids via O–H Hydrogen Atom Transfer.” *J. Am. Chem. Soc.* **2020**, *142*, 44–49.
36. Tierney, M. M.; Crespi, S.; Ravelli, D.; Alexanian, E. J.* “Identifying Amidyl Radicals for Intermolecular C–H Functionalizations.” *J. Org. Chem.* **2019**, *84*, 12983–12991. (*special issue on C–H bond functionalization*)
35. Shenouda, H.; Alexanian, E. J.* “Manganese-Catalyzed Stereospecific Hydroxymethylation of Alkyl Tosylates.” *Org. Lett.* **2019**, *21*, 9268–9271.
34. Morton, C. M.; Zhu, Q.; Ripberger, H.; Troian-Gautier, L.; Toa, Z. S. D.; Knowles, R. R.;; Alexanian, E. J.* “C–H Alkylation via Multisite-Proton-Coupled Electron Transfer of an Aliphatic C–H Bond.” *J. Am. Chem. Soc.* **2019**, *141*, 13253–13260.
33. Williamson, J. B.; Na, C. G.; Johnson III, R. R.; Daniel, W. F. M.; Alexanian, E. J.;; Leibfarth, F. A.* “Chemo- and Regioselective Functionalization of Isotactic Polypropylene: A Mechanistic and Structure-Property Study.” *J. Am. Chem. Soc.* **2019**, *141*, 12815–12823.
32. Sargent, B. T.; Alexanian, E. J.* “Cobalt-Catalyzed Aminocarbonylation of Alkyl Tosylates: Stereospecific Synthesis of Amides.” *Angew. Chem. Int. Ed.* **2019**, *58*, 9533–9536.
31. Tercenio, Q. D.; Alexanian, E. J.* “Nickel-Catalyzed, Ring-Forming Aromatic C–H Alkylations with Unactivated Alkyl Halides.” *Tetrahedron* **2019**, *75*, 4143–4149. (*in honor of John Hartwig’s 2018 Tetrahedron Prize*)
30. Kwiatkowski, M. R.; Alexanian, E. J.* “Transition-Metal (Pd, Ni, Mn)-Catalyzed C–C Bond Constructions Involving Unactivated Alkyl Halides and Fundamental Synthetic Building Blocks.” *Acc. Chem. Res.* **2019**, *52*, 1134–1144.
29. Kwiatkowski, M. R.; Alexanian, E. J.* “Nickel-Catalyzed Mizoroki-Heck-Type Reactions of Unactivated Alkyl Bromides.” *Angew. Chem. Int. Ed.* **2018**, *57*, 16857–16860.
28. Na, C. G.; Alexanian, E. J.* “A General Approach to Site-Specific, Intramolecular C–H Functionalization Using Dithiocarbamates.” *Angew. Chem. Int. Ed.* **2018**, *57*, 13106–13109.
27. Carestia, A. M.; Ravelli, D.; Alexanian, E. J.* “Reagent-Dictated Site Selectivity in Intermolecular Aliphatic C–H Functionalizations Using Nitrogen-Centered Radicals.” *Chemical Science* **2018**, *9*, 5360–5365.
26. Williamson, J. B.; Czaplyski, W. L.; Alexanian, E. J.;; Leibfarth, F. A.* “Regioselective C–H Xanthylation as a Platform for Polyolefin Functionalization.” *Angew. Chem. Int. Ed.* **2018**, *57*, 6261–6265.
25. Margrey, K. A.; Czaplyski, W. L.; Nicewicz, D. A.;; Alexanian, E. J.* “A General Strategy for Aliphatic C–H Functionalization Enabled by Organic Photoredox Catalysis.” *J. Am. Chem. Soc.* **2018**, *140*, 4213–4217.

24. Sargent, B. T.; Alexanian, E. J.* “Cobalt-Catalyzed Carbonylative Cross-Coupling of Alkyl Tosylates and Dienes: Stereospecific Synthesis of Dienones at Low Pressure.” *J. Am. Chem. Soc.* **2017**, *139*, 12438–12440.
23. Venning, A. R. O. Kwiatkowski, M. R.; Roque Peña, J. E.; Lainhart, B. C.; Guruparan, A. A.; Alexanian, E. J.* “Palladium-Catalyzed Carbocyclizations of Unactivated Alkyl Bromides with Alkenes Involving Auto-tandem Catalysis.” *J. Am. Chem. Soc.* **2017**, *139*, 11595–11600.
22. Roque Peña, J. E.; Alexanian, E. J.* “Cobalt-Catalyzed Silylcarbonylation of Unactivated Secondary Alkyl Tosylates at Low Pressure.” *Org. Lett.* **2017**, *19*, 4413–4415.
21. Jenkins, E. N.; Czaplyski, W. L.; Alexanian, E. J.* “A General Approach to Quaternary Center Construction from Couplings of Unactivated Alkenes and Acyl Xanthates.” *Org. Lett.* **2017**, *19*, 2350–2353.
20. Czaplyski, W. L.; Na, C. G.; Alexanian, E. J.* “C–H Xanthylation: A Synthetic Platform for Alkane Functionalization.” *J. Am. Chem. Soc.* **2016**, *138*, 13854–13857.
19. McMahon, C. M.; Renn, M. S.; Alexanian, E. J.* “Manganese-Catalyzed Carboacylations of Alkenes with Alkyl Iodides.” *Org. Lett.* **2016**, *18*, 4148–4150.
18. Sargent, B. T.; Alexanian, E. J.* “Palladium-Catalyzed Alkoxy carbonylation of Unactivated Secondary Alkyl Bromides at Low Pressure.” *J. Am. Chem. Soc.* **2016**, *138*, 7520–7523.
17. Quinn, R. K.; Könst, Z. A.; Michalak, S. E.; Schmidt, Y.; Szklarski, A. R.; Flores, A. R.; Nam, S.; Horne, D. A.; Vanderwal, C. D.*; Alexanian, E. J.* “Site-Selective Aliphatic C–H Chlorination Using *N*-Chloroamides Enables a Synthesis of Chlorolissoclimide.” *J. Am. Chem. Soc.* **2016**, *138*, 696–702.
16. Venning, A. R. O.; Bohan, P. T.; Alexanian, E. J.* “Palladium-Catalyzed, Ring-Forming Aromatic C–H Alkylations with Unactivated Alkyl Halides.” *J. Am. Chem. Soc.* **2015**, *137*, 3731–3734.
15. Noucti, N. N.; Alexanian, E. J.* “Stereoselective Nickel-Catalyzed [2+2] Cycloadditions of Ene-Allenenes.” *Angew. Chem. Int. Ed.* **2015**, *54*, 5447–5450.
14. Lainhart, B. C.; Alexanian, E. J.* “Enantioselective Synthesis of *cis*-Fused Cyclooctanoids via Rhodium(I)-Catalyzed [4+2+2] Cycloadditions.” *Org. Lett.* **2015**, *17*, 1284–1287.
13. Schmidt, V. A.; Quinn, R. K.; Brusoe, A. T.; Alexanian, E. J.* “Site-Selective Aliphatic C–H Bromination Using *N*-Bromoamides and Visible Light.” *J. Am. Chem. Soc.* **2014**, *136*, 14389–14392.
12. Giglio, B. C.; Alexanian, E. J.* “Alkene Hydrofunctionalization Using Hydroxamic Acids; A Radical-Mediated Approach to Alkene Hydration.” *Org. Lett.* **2014**, *16*, 4304–4307.
11. McMahon, C. M.; Alexanian, E. J.* “Palladium-Catalyzed Heck-Type Cross-Couplings of Unactivated Alkyl Iodides.” *Angew. Chem. Int. Ed.* **2014**, *53*, 5974–5911.
10. Quinn, R. K.; Schmidt, V. A.; Alexanian, E. J.* “Radical Carboxygenations of Alkenes Using Hydroxamic Acids.” *Chem. Sci.* **2013**, *4*, 4030–4034.

9. Noucti, N. N.; Alexanian, E. J.* “Stereoselective Nickel-Catalyzed [2+2+2] Cycloadditions and Alkenylative Cyclizations of Ene-Allenenes and Alkenes.” *Angew. Chem. Int. Ed.* **2013**, *52*, 8424–8427.
8. Brusoe, A. T.; Edwankar, R. V.; Alexanian, E. J.* “Enantioselective Intermolecular [2+2+2] Cycloadditions of Ene-Allenenes with Allenates.” *Org. Lett.* **2012**, *14*, 6096–6099.
7. Schmidt, V. A.; Alexanian, E. J.* “Metal-Free, Aerobic Ketoxygenation of Alkenes Using Hydroxamic Acids.” *Chem. Sci.* **2012**, *3*, 1672–1674.
6. Bloome, K. S.; McMahan, R. L.; Alexanian, E. J.* “Palladium-Catalyzed Heck-Type Reactions of Alkyl Iodides.” *J. Am. Chem. Soc.* **2011**, *133*, 20146–20148.
5. Giglio, B. C.; Schmidt, V. A.; Alexanian, E. J.* “Metal-Free, Aerobic Dioxygenation of Alkenes Using Simple Hydroxamic Acid Derivatives.” *J. Am. Chem. Soc.* **2011**, *133*, 13320–13322.
4. Schmidt, V. A.; Alexanian, E. J.* “Metal-Free Oxyaminations of Alkenes Using Hydroxamic Acids.” *J. Am. Chem. Soc.* **2011**, *133*, 11402–11405.
3. Brusoe, A. T.; Alexanian, E. J.* “Rhodium(I)-Catalyzed Ene-Allene-Allene [2+2+2] Cycloadditions: Stereoselective Synthesis of Complex *trans*-Fused Carbocycles.” *Angew. Chem. Int. Ed.* **2011**, *50*, 6596–6600.
2. Bloome, K. S.; Alexanian, E. J.* “Palladium-Catalyzed Carbonylative Heck-Type Reactions of Alkyl Iodides.” *J. Am. Chem. Soc.* **2010**, *132*, 12823–12825.
1. Schmidt, V. A.; Alexanian, E. J.* “Metal-Free, Aerobic Dioxygenations of Alkenes Using Hydroxamic Acids.” *Angew. Chem. Int. Ed.* **2010**, *49*, 4491–4494.

PREVIOUS PUBLICATIONS

5. Alexanian, E. J.; Hartwig, J. F. “Mechanistic Study of β -Hydrogen Elimination from Organoplatinum(II) Enolate Complexes.” *J. Am. Chem. Soc.* **2008**, *130*, 15627–15635.
4. Alexanian, E.; Lee, C. “Selective Oxidative Functionalization of sp^2 and sp^3 C-H Bonds.” *Chemtracts* **2005**, *18*, 38–43.
3. Alexanian, E. J.; Lee, C.; Sorensen, E. J. “Palladium-Catalyzed Ring-Forming Aminoacetoxylation of Alkenes.” *J. Am. Chem. Soc.* **2005**, *127*, 7680–7681.
2. Anderson, E. A.; Alexanian, E. J.; Sorensen, E. J. “Synthesis of the Furanosteroidal Antibiotic Viridin.” *Angew. Chem. Int. Ed.* **2004**, *43*, 1998–2001.
1. Weatherhead, G. S.; Ford, G. J.; Alexanian, E. J.; Schrock, R. R.; Hoveyda, A. H. “Tandem Catalytic Ring-Opening Metathesis/Ring-Closing Metathesis.” *J. Am. Chem. Soc.* **2000**, *122*, 1828–1829.

AWARDED RESEARCH SUPPORT

- NIH NIGMS (R35) 2019 – 2024
- NIH NIGMS (RO1) 2016 – 2020
- NIH NIGMS (RO1) 2014 – 2019

- ACS PRF (ND) 2014 – 2016
- NSF CAREER Award 2011 – 2016
- ACS PRF (DNI) 2010 – 2012

TEACHING EXPERIENCE

Chemistry 261 – Introduction to Organic Chemistry I

Molecular structure and its determination by modern physical methods, correlation between structure and reactivity and the theoretical basis for these relationships, classification of reaction types exhibited by organic molecules using as examples molecules of biological importance.

Chemistry 466 – Advanced Organic Chemistry I

A survey of fundamental organic reactions including substitutions, additions, elimination, and rearrangements; static and dynamic stereochemistry; conformational analysis; molecular orbital concepts and orbital symmetry.

Chemistry 468 – Synthetic Aspects of Organic Chemistry

Modern synthetic methods and their application to the synthesis of complex molecules.

Chemistry 791 – Modern Free Radical Chemistry

Fundamentals of free radicals; organotin chemistry and radical-mediated group transfer; redox processes; photoinduced electron transfer; basic cyclic voltammetry.

updated 1/24/23