

Kyle M. Lambert

Assistant Professor
Old Dominion University
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EDUCATION/ PROFESSIONAL EXPERIENCE

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- | | |
|--|------------------------------|
| Assistant Professor of Chemistry
<i>Old Dominion University, Norfolk, VA</i>
<i>Research Focus:</i> Synthetic Method Development and Organic Synthesis | July 2020 – Present |
| NIH Ruth L. Kirschstein Postdoctoral Fellow
<i>Baylor University, Waco, TX</i>
<i>Advisor:</i> Dr. John L. Wood
<i>Research Areas:</i> Complex Natural Product Synthesis; Synthetic Method Development | June 2017 – July 2020 |
| Ph. D. in Chemistry
<i>University of Connecticut, Storrs, CT</i>
<i>Advisor:</i> Dr. William F. Bailey | May 2017 |
| Bachelor of Science – Chemistry
<i>University of New Haven, West Haven, CT</i> | May 2012 |
| Bachelor of Science – Forensic Science
<i>University of New Haven, West Haven, CT</i> | May 2012 |

AWARDS/ FELLOWSHIPS

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- 2021 ODU Faculty Proposal Preparation Award (\$4,000)
2021 Program for Undergraduate Research and Scholarship Award (\$10,000)
2018–2020 National Institutes of Health Ruth Kirschstein Postdoctoral Fellowship
2017 Connecticut Chemistry Research Award
2017 ACS Division of Organic Chemistry Travel Award
2016 UCONN Doctoral Fellowship
2014 William L. Masterton Award for Outstanding Teaching
2013 Thomas Chu Fellowship
2012 Walter B. Jewell Award for Outstanding Academic Achievement
2012 Henry C. Lee Forensic Science Award

PEER-REVIEWED PUBLICATIONS

*mentored undergraduate coauthors are highlighted in green; graduate coauthors are highlighted in blue

ODU AFFILIATED:

22. Weierbach, S. M.; Reynolds, R. P.; Stephens, S. M.; Vlasakakis, K. V.; Ritter, R. T.; White, O. M.; Patel, N. H.; Hayes, E. C.; Dunmire, S.; Lambert, K. M.* “Chemoselective Oxidation of Thiols with Oxoammonium Cations” *J. Org. Chem.* **2022**, Accepted 7/26/2022.
21. Lambert, K. M.*; Kelly, C. B.*; Milligan, J. A.*; Tilley, L. J.*; Reynolds, R. P.; McGuire, K. P.; Anzalone, L.; Del Sesto, K. E.; Walsh, S. “A Practical Oxidation Experiment for Undergraduate Students: Bobbitt’s Salt as a “Green” Alternative” *J. Chem. Educ.* **2022**, DOI: [10.1021/acs.jchemed.2c00236](https://doi.org/10.1021/acs.jchemed.2c00236).
20. Kaetzel, N. D.; Lambert, K. M.*; Kelly, C. B. “Oxidation of Aldehydes to Nitriles with an Oxoammonium Salt: Preparation of Piperonylnitrile” *Org. Synth.* **2020**, 97, 294–313. [[Link](#)]

PRIOR TO ODU:

19. Jackson, A. C.; Olsen, J. T.; Sundstrom, S.; Lambert, K. M.; Wood, J. L. “A Ring Expansion Approach To N-oxy-2,5-diketopiperazines” *Tetrahedron Lett.* **2022**, 99, 153851–153853. [[Link](#)]
18. Komine, K.; Lambert, K. M.; Savage, Q. R.; Cox, J. B.; Wood, J. L. “Synthetic Studies Toward Longercemine: A SmI₂-mediated Spirocyclization and Rearrangement Cascade to Construct the 2-Azabicyclo[2.2.1]heptane Framework” *Chem. Sci.* **2020**, 11, 9488–9493. [[Link](#)]
17. Lambert, K. M.; Cox, J. B.; Liu, L.; Jackson, A. C.; Yruegas, S.; Wiberg, K. B.; Wood, J. L. “Total Synthesis of (±)-Phyllanthidine: Development and Mechanistic Evaluation of a Ring Expansion for Installation of Embedded Nitrogen-Oxygen Bonds” *Angew. Chem. Int. Ed.* **2020**, 59, 9757–9766. [[Link](#)]

16. Lambert, K. M.*; Medley, A. W.; Jackson, A. C.; Markham, L. E.; Wood, J. L. "Synthesis of Chiral Tetramic Acids: Preparation of (S)-5-Benzylpyrrolidine-2,4-dione from L-phenylalanine Methyl Ester Hydrochloride" *Org. Synth.* **2019**, 96, 528–585. [\[Link\]](#)
15. Gayler, K. M.; Lambert, K. M.; Wood, J. L. "Synthetic studies towards the penicisulfuranols: Synthesis of an advanced spirocyclic diketopiperazine intermediate" *Tetrahedron* **2019**, 75, 3154–3159. [\[Link\]](#)
14. Wiberg, K. B.; Bailey, W. F.; Lambert, K. M. "Unrecognized Intramolecular and Intermolecular Attractive Interactions between Fluorine-Containing Motifs and Ether, Carbonyl, and Amino Moieties" *J. Org. Chem.* **2019**, 84, 15463–15469. [\[Link\]](#)
13. Lambert, K. M.; Eldirany, S. A.; Bobbitt, J. M.; Bailey, W. F. "Catalytic, Metal-Free Oxidation of Primary Amines to Nitriles" *Org. Synth.* **2018**, 95, 60–79. [\[Link\]](#)
12. Wiberg, K. B.; Bailey, W. F.; Lambert, K. M.; Stempel, Z. D. "The Anomeric Effect: It's Complicated" *J. Org. Chem.* **2018**, 83, 5242–5255. [\[Link\]](#)
11. Lambert, K. M.; Stempel, Z. D.; Wiberg, K. B.; Bailey, W. F. "Experimental Demonstration of a Sizeable Nonclassical CH \cdots G Hydrogen Bond in Cyclohexane Derivatives: Stabilization of an Axial Cyano Group" *Org. Lett.* **2017**, 19, 6408–6411. [\[Link\]](#)
10. Bailey, W. F.; Lambert, K. M. "The Importance of Electrostatic Interactions on the Conformational Behavior of Substituted 1,3-Dioxanes: The Case of 5-Phenyl-1,3-dioxane." In *Stereochemistry and Global Connectivity: The Legacy of Ernest L. Eliel Volume 2*; Cheng, H. N.; Maryanoff, C. A.; Miller, B. D.; Schmidt, D. G., Eds.; ACS Symposium Series Vol. 1258; American Chemical Society: Washington, DC, **2017**; Chapter 2, pp 19–26. [\[Link\]](#)
9. Lambert, K. M.*; Stempel, Z. D.; Kiendzior, S. M.; Bartelson, A. L.; Bailey, W. F. "Enhancement of the Oxidizing Power of an Oxoammonium Salt by Modification of a Distal Group" *J. Org. Chem.* **2017**, 82, 11440–11446. [\[Link\]](#)
8. Bailey, W. F.; Lambert, K. M.; Stempel, Z. D.; Wiberg, K. B.; Mercado, B. Q. "Controlling the Conformational Energy of a Phenyl Group by Tuning the Strength of a Nonclassical CH \cdots O Hydrogen Bond: The Case of 5-Phenyl-1,3-dioxane" *J. Org. Chem.* **2016**, 81, 12116–12127. [\[Link\]](#)
7. Bartelson, A. L.; Lambert, K. M.; Bobbitt, J. M.; Bailey, W. F. "Recent Developments in the Nitroxide-Catalyzed Oxidation of Amines: Preparation of Imines and Nitriles" *Chem. Cat. Chem.* **2016**, 8, 3421–3430. [\[Link\]](#)
6. Lambert, K. M.; Bobbitt, J. M.; Eldirany, S. E.; Kissane, L. E.; Sheridan, R. K.; Stempel, Z. D.; Sternberg, F. H.; Bailey, W. F. "Metal-Free Oxidation of Primary Amines to Nitriles through Coupled Catalytic Cycles." *Chem. Eur. J.* **2016**, 22, 5156–5159. [\[Link\]](#) *This work was featured in Synform 2016, 07, A100–A103.* [\[Link\]](#)
5. Wiberg, K. B.; Lambert, K. M.; Bailey, W. F.; "The Role of CH \cdots O Coulombic Interactions in Determining Rotameric Conformations of Phenyl Substituted 1,3-Dioxanes and Tetrahydropyrans." *J. Org. Chem.* **2015**, 80, 7884–7889. [\[Link\]](#)
4. Bailey, W. F.; Lambert, K. M.; Wiberg, K. B.; Mercado, B. Q. "Effect of Remote Aryl Substituents on the Conformational Equilibria of 2,2-Diaryl-1,3-dioxanes: Importance of Electrostatic Interactions." *J. Org. Chem.* **2015**, 80, 4108–4115. [\[Link\]](#)
3. Kelly, C. B.; Lambert, K. M.; Mercadante, M. A.; Ovian, J. M.; Bailey, W. F.; Leadbeater, N. E. "Access to Nitriles from Aldehydes Mediated by an Oxoammonium Salt." *Angew. Chem. Int. Ed.* **2015**, 54, 4241–4245. [\[Link\]](#)
2. Wiberg, K. B.; Lambert, K. M.; Bailey, W. F. "Rotamers of Phenyl Substituted 1,3-Dioxanes and Tetrahydropyrans: Importance of CH \cdots O Coulombic Interactions." *Tetrahedron Lett.* **2015**, 56, 3438–3440. [\[Link\]](#)
1. Lambert, K. M.; Bobbitt, J. M.; Eldirany, S. A.; Wiberg, K. B.; Bailey, W. F. "Facile Oxidation of Primary Amines to Nitriles Using an Oxoammonium Salt." *Org. Lett.* **2014**, 16, 6484–6487. [\[Link\]](#)

SELECTED PRESENTATIONS

*mentored undergraduate coauthors are highlighted in green; graduate coauthors are highlighted in blue

21. "Insight into the Regioselectivity of C-H Borylations Employing Classification Machine Learning Models" Presented at Old Dominion University, VA, April 15, 2022. Oral Presentation
20. "How conditions influence the reactivity and selectivity of oxoammonium salt-based oxidants" Lambert, K. M. Presented at the 2022 Presented at the 263rd National Meeting of the American Chemical Society, San Diego, CA, March 2022, ORGN 3661799. Oral Presentation.
19. "Chemoselective Oxidation of Thiols to Disulfides with Bobbitt's Salt" Weierbach, S. M.; Reynolds, R. P.; Weaver, S. M.; Ritter, R. T.; Vlasakakis, K. V.; Patel, N. H.; White, O. M.; Hayes, E. C.; Dunmire, S.; Lambert, K. M. Presented at the 263rd National Meeting of the American Chemical Society, San Diego, CA, March 2022, ORGN 3661034. Poster Presentation.

18. *"Insight into the regioselectivity of C-H borylations employing classification machine learning models"* **Weaver, S. M.**; **Lambert, K. M.** Presented at the 263rd National Meeting of the American Chemical Society, San Diego, CA, March 2022, ORGN 3655727. Sci-Mix Poster Presentation.
17. *"Access to the cyclicomorphins A-E and other nitrogen heterocycles via borrowing hydrogen catalysis"* **McGuire, K. P.**; **Reynolds, R. P.**; **Lambert, K. M.** Presented at the 263rd National Meeting of the American Chemical Society, San Diego, CA, March 2022, ORGN 3660726. Sci-Mix Poster Presentation.
16. *"Borrowing Hydrogen: An Undergraduate Synthetic Research Experience"* **Reynolds, R. P.**; **Lambert, K. M.** Presented at Old Dominion University, VA, February 10, 2022. Oral Presentation.
15. *"New Synthetic and Predictive Methods to Improve Access to Natural Products"* **Lambert, K. M.** Presented at Old Dominion University, VA, February 4, 2022. Oral Presentation.

PRIOR TO ODU:

14. *"Accessing N-Hydroxydiketopiperazine Natural Products"* **Lambert, K. M.**; **Jackson, A. C.**; Wood, J. L. Presented at the 46th National Organic Chemistry Symposium, Indiana University, Bloomington, IN, June 23-27th, 2019. Poster Presentation.
13. *"The Total Synthesis of (±)-Phyllantidine and Efforts Towards Natural Products Containing a N-O Bond"* **Lambert, K. M.**; **Cox, J. B.**; **Jackson, A. C.**; Wood, J. L. Presented at the 2019 Heterocyclic Compounds Gordon Research Conference, Salve Regina University, Newport, RI, June 16-21st, 2019. Poster Presentation.
12. *"Accessing N-Hydroxydiketopiperazine Natural Products"* **Lambert, K. M.**; **Jackson, A. C.**; **Medley, A. W.**; **Markham, L. E.**; Wood, J. L. Presented at the 2019 TexSyn IV Conference, Baylor University, Waco, TX, May 24th, 2019. Poster Presentation.
11. *"A Ring Expansion Strategy Toward the Securinega Alkaloids"* **Cox, J. B.**; **Liu, L.**; **Lambert, K. M.**; Yruegas, S.; Wood, J. L. Presented at the 2019 TexSyn IV Conference, Baylor University, Waco, TX, May 24th, 2019. Poster Presentation.
10. *"Synthetic Studies Towards the Penicisulfuranols: Synthesis of an Advanced Spirocyclic Diketopiperazine intermediate."* **Gaylor, K. M.**; **Lambert, K. M.**; Wood, J. L. Presented at the 2019 TexSyn IV Conference, Baylor University, Waco, TX, May 24th, 2019. Poster Presentation.
9. *"Accessing N-Hydroxydiketopiperazine Natural Products"* **Lambert, K. M.**; Wood, J. L. Presented at the 2018 Organic Reactions and Processes Gordon Research Conference, Stonehill College, Easton, MA, July 15-20th, 2018. Poster Presentation.
8. *"Tuning the conformational equilibria in saturated heterocycles through the manipulation of a non-classical CH---O hydrogen bond: The importance of electrostatic interactions within small molecules"* **Lambert, K. M.**; Bailey, W. F.; **Stempel, Z. D.**; Wiberg, K. B.; Mercado, B. Q. Presented at the 253rd National Meeting of the American Chemical Society, San Francisco, CA, April 2017, ORGN 782. Poster Presentation.
7. *"Conformational Studies of Saturated Heterocycles: The Importance of Electrostatic Interactions"* **Lambert, K. M.** Presented at the University of New Haven, West Haven, CT, February 19th 2016. Invited Lecture.
6. *"Oxoammonium salts: Powerful yet practical reagents for oxidation and oxidative functionalization in chemistry"* **Ovian, J.**; Kelly, C. B.; Hamlin, T.; **Lambert, K. M.**; Loman, J.; Mercadante, M. A.; Bailey, W. F.; Tilley, L. J.; Leadbeater, N. E. Presented at the 252nd National Meeting of the American Chemical Society, Philadelphia, PA, August 2016, ORGN 715. Poster Presentation.
5. *"Access to Nitriles Mediated by Bobbitt's Salt, an Environmentally Benign and Recyclable Oxidant"* **Lambert, K. M.**; **Eldirany, S. A.**; Bailey, W. F. Presented at the 250th National Meeting of the American Chemical Society, Boston, MA, August 2015, ORGN 596. Oral Presentation.
4. *"Conformational Control by Remote Substituents in 2,2-Diaryl-1,3-dioxanes: The Importance of Electrostatic Interactions"* **Lambert, K. M.**; Bailey, W. F. Presented at the 38th R.T. Major Symposium of the University of Connecticut, Storrs, CT, April 6th 2015. Poster Presentation.
3. *"Bobbitt's Salt as a Mild Oxidant to Access the Nitrile Functionality"* **Eldirany, S. A.**; **Lambert, K. M.**; Bailey, W. F.; Leadbeater, N. E.; Bobbitt, J. M.; Wiberg, K. B.; Kelly, C. B.; Mercadante, M. A.; **Ovian, J. M.** Presented at the 38th R.T. Major Symposium of the University of Connecticut, Storrs, CT, April 6th 2015. Poster Presentation.
2. *"4-Acetamido-2,2,6,6-tetramethylpiperidine-1-oxoammonium tetrafluoroborate as a Mild Oxidant to Access the Nitrile Functionality"* **Lambert, K. M.** Presented at the University of New Haven, West Haven, CT, February 20th 2015. Invited Lecture.
1. *"Conformational Control by Remote Substituents in 2,2-Diaryl-1,3-dioxanes: The Importance of Electrostatic Interactions"* **Lambert, K. M.**; Bailey, W. F.; Wiberg, K. B. Presented at the 248th National Meeting of the American Chemical Society, San Francisco, CA, August 2014, ORGN 748. Poster Presentation.

RECENT TEACHING EXPERIENCE

Department of Chemistry and Biochemistry, Old Dominion University

2020–present

Assistant Professor of Chemistry

Introduction to Organic Synthesis – CHEM 736/836 (Fall 2021)

Instructed a graduate-level course examining key organic reactions to construct molecules, covering topics that included: stereochemical control, oxidations/reductions, organometallics, molecular rearrangements, pericyclic reactions, protecting group strategies, and other contemporary methods.

Modern Synthetic Organic Chemistry – CHEM 723/823 (Fall 2020)

Instructed a graduate-level course examining the design of complex organic molecules, covering topics that include retrosynthetic analysis, stereochemical control, and contemporary methods.

Advanced Undergraduate Organic Chemistry Laboratory – CHEM 216 (Spring 2021)

Instructed an advanced undergraduate-level lab course which taught valuable laboratory skills and students conducted original research.

Organic Reactions – CHEM 736/836 (Fall 2021)

Instructed a graduate-level course introducing key organic reactions, stereochemical outcomes, and their importance in constructing complex molecules.

MENTORING IN RESEARCH

Mentored 22 undergraduates, 14 graduate students, and 1 postdoctoral researcher at the University of Connecticut, Baylor University, and Old Dominion University in independent organic chemistry research resulting in 13 peer-reviewed publications with mentees as co-authors.

2022

- Current research group at ODU consists of 1 postdoctoral researcher, 3 graduate students, and 7 undergraduates
- 5 Undergraduates conducted summer research from May 2022-August 2022.
- Jennifer Burdette conducted research in the summer of 2022 as an NSF-REU student
- Kosta Vlasakakis was awarded a Research & Creativity Fellowship Grant Summer 2022 (\$3000)
- Robert Reynolds graduated in Spring 2021 and is pursuing a PhD in Chemistry at Northwestern University
- Shannon Stephens, Kellen McGuire, and Robert Reynolds presented Sci-Mix posters at the Spring ACS 2022 conference in San Diego

2021

- Research group at ODU consisted of 3 graduate students and 8 undergraduates
- Robert Reynolds received one out of the 14 awarded 2021 ACS Summer Research Fellowships at the national level (\$5000) [[Link](#)]
- Nishi Patel conducted research in the summer of 2021 as an NSF-REU student
- Olivia White and Kosta Vlasakakis conducted summer research under the PURS funding
- Stephonda Lewis was awarded an M-MARC fellowship and is conducting a medicinal chemistry research project this summer

PROFESSIONAL AFFILIATIONS/CERTIFICATIONS/ SERVICE

1. Member of the American Chemical Society – Organic and Medicinal Chemistry Divisions (2011-present)
2. Peer Reviewer for: Tetrahedron Letters, Tetrahedron, Journal of Organic Chemistry, ACS Sustainable Chemistry & Engineering, ACS Applied Bio Materials, ACS Journals

FUNDED EXTERNAL GRANTS AND INTERNAL APPLICATIONS:

1. **Agency:** ODU PURS; **Title:** “Metal-Free and Environmentally Benign Oxidants for Disulfide Bond Formation”; **Amount Requested:** \$10,000; **Projected Start and End Date:** May 15th, 2021 through May 14th, 2022.
2. **Agency:** Faculty Proposal Preparation Program (FP3); **Title:** “New Synthetic Methods to Access Natural Products Possessing Unique and Challenging Architectures of Biological Relevance”; **Amount Requested:** \$4,000; **Projected Start and End Date:** January 1st, 2022 through May 15th, 2022.

SUBMITTED EXTERNAL GRANTS AND INTERNAL APPLICATIONS:

1. **Agency:** National Science Foundation NSF; **Title:** “Harnessing Machine Learning: Development of New Catalysts, Reagents, and Systems for Applications in Organic Synthesis”; **Amount Requested:** \$450,000; **Projected Start and End Date:** April 1st, 2021 through April 1st, 2024.
2. **Agency:** ACS Petroleum Research Fund; **Title:** “Modification of Poorly Suited Dienes for [4+2] Cycloaddition reactions”; **Amount Requested:** \$110,000; **Projected Start and End Date:** September 1st, 2021 through September 1st, 2023.
3. **Agency:** NASA Virginia Space Consortium; **Title:** “Stable Organic Oxidants for Ammonia Oxidation and Nitrogen Gas Production”; **Amount Requested:** \$20,000; **Projected Start and End Date:** March 1st, 2021 – February 25th, 2022
4. **Agency:** NIH R21; **Title:** “New Synthetic Methods and Technologies to Access Medicinally Relevant Compounds”; **Amount Requested:** \$405,447; **Projected Start and End Date:** September 1st, 2021 through August 31st, 2023.
5. **Agency:** ODURF SFRP; **Title:** “Borrowing Hydrogen Catalysis to Access Nitrogen Heterocycles And Natural Products Employing Fe(III)/Co(III) Complexes”; **Amount Requested:** \$7,000; **Projected Start and End Date:** May 11th, 2021 through July 3rd, 2021.
6. **Agency:** ODU PURS; **Title:** “Metal-Free and Environmentally Benign Oxidants for Disulfide Bond Formation”; **Amount Requested:** \$10,000; **Projected Start and End Date:** May 15th, 2021 through May 14th, 2022.
7. **Agency:** Faculty Proposal Preparation Program (FP3); **Title:** “New Synthetic Methods to Access Natural Products Possessing Unique and Challenging Architectures of Biological Relevance”; **Amount Requested:** \$4,000; **Projected Start and End Date:** January 1st, 2022 through May 15th, 2022.