

HUBERT MUCHALSKI

Department of Chemistry and
Biochemistry
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- APPOINTMENTS** Department of Chemistry and Biochemistry, Fresno State, Fresno, CA
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|---------------------|--------------|
| Associate Professor | 2021–PRESENT |
| Assistant Professor | 2015–2021 |
- Department of Chemistry, Vanderbilt University, Nashville, TN
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|---|-----------|
| Visiting Scholar | 2015–2021 |
| Postdoctoral Scholar (Advisor: Prof. Ned A. Porter) | 2012–2015 |
- EDUCATION** Vanderbilt University, Nashville, TN
- | | |
|---|------|
| Ph.D., Chemistry (Advisor: Prof. Jeffrey N. Johnston) | 2012 |
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- Wroclaw University of Technology, Wroclaw, Poland
- | | |
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| Magister, Chemistry (Advisor: Prof. Mirosław Giurg) | 2006 |
|---|------|
- PUBLICATIONS** *Refereed/Peer-Reviewed* (†undergraduate, ‡MS student)
1. Pisor, J.W.‡; Garcia, I. C.†; Mamo, K.†; **Muchalski, H.** Synthesis of benzofurans from THP acetals of 2-alkynylphenols catalyzed by gold(I)-NHC complexes *In Preparation*
 2. Le, Q.‡; Dillon, C. C.‡; Lichtenstein, D. A.†; Pisor, J.†; Closser, K. D. **Muchalski, H.** Gold(I)-NHC-catalysed synthesis of benzofurans via migratory cyclization of 2-alkynylaryl benzyl ethers *Org. Biomol. Chem.* **2020**, *28*, 8186–8191
<http://dx.doi.org/10.1039/d0ob01538e>
 3. Rajaram, P.‡; Rivera, A. M.‡; Muthima, K.‡ Olveda, N.‡; **Muchalski, H.**; and Chen, Q.-C. Second-Generation Androgen Receptor Antagonists as Hormonal Therapeutics for Three Forms of Prostate Cancer *Molecules* **2020**, *20*, 2448.
<https://doi.org/10.3390/molecules25102448>
 4. Dillon, C. C.†; Keophimphone, B.†; Sanchez, M.†; Kaur, P.†.; **Muchalski, H.** Synthesis of 2-substituted benzo[b]thiophenes via gold(I)-NHC- catalyzed cyclization of 2-alkynyl thioanisoles *Org. Biomol. Chem.* **2018**, *16*, 9279–9284.
<https://doi.org/10.1039/C8OB02196A>
Award: Selected as Department's *Outstanding Publication* for 2018–2019 AY
 5. Lamberson, C. R.; **Muchalski, H.**; McDuffee, K. B.†; Tallman, K. A.; Xu, L.; Porter, N. A.; Propagation rate constants for the peroxidation of sterols on the biosynthetic pathway to cholesterol *Chem. Phys. Lipids* **2017**, *207*, Part B, 51–58.
<http://dx.doi.org/10.1016/j.chemphyslip.2017.01.006>
 6. **Muchalski, H.**; Site-Specific Synthesis and Application of Deuterium-Labeled Sterols. *ARKIVOC* **2017** part ii, 507–533.
<https://doi.org/10.24820/ark.5550190.p009.755>
 7. **Muchalski, H.**; Levonyak, A. J.†; Xu, L.; Ingold, K. U.; Porter, N. A. Competition H(D) Kinetic Isotope Effects in the Autoxidation of Hydrocarbons. *J. Am. Chem.*

- Soc.* **2015**, *137*, 94–97.
<http://dx.doi.org/10.1021/ja511434j>
8. Muchalski, H.; Xu, L.; Porter, N. A. Tunneling in Tocopherol-Mediated Peroxidation of 7-Dehydrocholesterol. *Org. Biomol. Chem.* **2015**, *13*, 1249–1253.
<http://dx.doi.org/10.1039/C4OB02377C>
 9. Lamberson, C. R.; Xu, L.; Muchalski, H.; Montenegro-Burke, J.R.; Shmanai, V. V.; Bekish, A. V.; McLean, J. A.; Clarke, C. F.; Shchepinov, M. S.; Porter, N. A. Unusual Kinetic Isotope Effects of Deuterium Reinforced Polyunsaturated Fatty Acids in Tocopherol-Mediated Free Radical Chain Oxidations. *J. Am. Chem. Soc.* **2014**, *136*, 838–841.
<http://dx.doi.org/10.1021/ja410569g>
 10. Giurg, M.; Muchalski, H.; Kowal, E. A. Oxofunctionalized *trans*-2-Carboxy-cinnamic Acids by Catalytic Domino Oxidation of Naphthols and Hydronaphthoquinones. *Synth. Commun.* **2012**, *42*, 2526–2539.
<http://dx.doi.org/10.1080/00397911.2011.561945>
 11. Muchalski, H.; Johnston, J. N. Aziridination. In *Science of Synthesis: Stereoselective Synthesis*; de Vries, J. G., Ed.; Thieme: Stuttgart, **2011**; Vol. 1, pp 155–184
 12. Troyer, T. L.; Muchalski, H.; Hong, K. B.; Johnston, J. N. Origins of Selectivity in Brønsted Acid Promoted Diazoalkane–Azomethine Reactions (The aza-Darzens Aziridine Synthesis). *Org. Lett.* **2011**, *13*, 1790–1792.
<http://dx.doi.org/10.1021/ol200313m>
 13. Muchalski, H.; Hong, K. B.; Johnston, J. N. Brønsted acid-promoted azide-olefin [3 + 2] cycloadditions for the preparation of contiguous aminopolyols: the importance of disiloxane ring size to a diastereoselective, bidirectional approach to zwittermicin A. *Beilstein J. Org. Chem.* **2010**, *6*, 1206–1210.
<http://dx.doi.org/10.3762/bjoc.6.138>
 14. Muchalski, H.; Troyer, T. L.; Doody, A. B.; Johnston, J. N. Preparation of isopropyl 2-diazoacetyl-(phenyl)carbamate. *Org. Synth.* **2011**, Vol. 88, 212–223.
 15. Johnston, J. N.; Muchalski, H.; Troyer, T. L. Protonate or Alkylate: Stereoselective Brønsted Acid Catalysis of C–C Bond Formation Using Diazoalkanes. *Angew. Chem. Int. Ed.* **2010**, *49*, 2290–2298.
 16. Troyer, T. L.; Muchalski, H.; Johnston, J. N. Brønsted acid activation of α -diazo imide: a *syn*-glycolate Mannich reaction. *Chem. Commun.* **2009**, *32*, 6195–6197.
 17. Adkins, C. T.; Muchalski, H.; Harth, E. Nanoparticles with Individual Site-Isolated Semiconducting Polymers from Intramolecular Chain Collapse Processes. *Macromolecules* **2009**, *42*, 5786–5792.
 18. Giurg, M.; Kowal, E. A.; Muchalski, H.; Syper, L.; Młochowski, J. Catalytic oxidative domino degradation of alkyl phenols towards 2- and 3-substituted muconolactones. *Synth. Commun.* **2008**, *39*, 251–266.
 19. Daniels, R. N.; Kim, K.; Lebois, E. P.; Muchalski, H.; Hughes, M.; Lindsley, C. W. Micro-wave-assisted protocols for the expedited synthesis of pyrazolo[1,5-a] and [3,4-d]pyrimidines. *Tetrahedron Lett.* **2008**, *49*, 305–310.
 20. Niswender, C. M.; Lebois, E. P.; Luo, Q.; Kim, K.; Muchalski, H.; Yin, H.; Conn, P. J.; Lindsley, C. W. Positive allosteric modulators of the metabotropic glutamate receptor subtype 4 (mGluR4): Part I. Discovery of pyrazolo[3,4-d]pyrimidines as novel

- mGluR4 positive allosteric modulators. *Bioorg. Med. Chem. Lett.* **2008**, *18*, 5626.
21. Croce, T. A.; Hamilton, S. K.; Chen, M. L.; **Muchalski, H.**; Harth, E. M. Alternative *o*-Quinodimethane Cross-Linking Precursors for Intramolecular Chain Collapse Nano-particles. *Macromolecules* **2007**, *40*, 6028–6031.

ORAL
PRESENTATIONS

Conference Talks (†undergraduate co-author)

- Muchalski, H.**; Lamberson, C. R.; Levonyak, A. J.; Xu, L.; Porter, N. A. *Does quantum mechanical tunneling make free radical peroxidation favorable?*, Abstracts of Papers, 248th ACS National Meeting, San Francisco, CA, August 10-14, 2014.
- Muchalski, H.**; Xu, L; Porter, N. A. *Kinetic isotope effect of deuterium-reinforced 7-dehydrocholesterol in tocopherol-mediated free radical chain oxidation*, Abstracts of Papers, 247th ACS National Meeting, Dallas, TX, March 16-20, 2014.

Invited Talks

California State University, Fresno, CA (10/2022; sabbatical report); San Jose State University, San Jose, CA (2/2019); University of Tulsa, Tulsa, OK (1/2015); Kent State University, Kent, OH (1/2015); California State University, Fresno, CA (1/2015); Murray State University, Murray, KY (11/2014); University of Tampa, Tampa, FL (12/2015); University of Lodz, Lodz, Poland (5/2012); Wroclaw University of Technology, Wroclaw, Poland (5/2012).

POSTERS

†undergraduate student; ‡graduate student

1. Stevens, M.D.‡; Muchalski, H.; *Synthesis of Benzothiophenes in Water Catalyzed by Gold(I)–NHC Complexes*, 35th CSU Annual Biotechnology Symposium, Santa Clara, CA, January 13–14, 2023.
2. Pisor, J.W.‡; Mamo, K.†; Garcia, I.C.†; Muchalski, H.; *Synthesis of Benzofurans via Au(I)-Catalyzed Cyclization of 2-Alkynyl Phenol Derivatives*, 35th CSU Annual Biotechnology Symposium, Santa Clara, CA, January 13–14, 2023.
3. Pisor, J.W.‡; Garcia, I.C.†; Mamo, K.†; Muchalski, H.; *Synthesis Of 2-Substituted Benzofurans From 2-Alkynyl Aryl Ethers Catalyzed By Gold(I)–N-Heterocyclic Carbene Complexes*, Annual Biomedical Research Conference for Minority Students (ABRCMS), Long Beach, CA, November 9-12, 2022.
4. Pisor, J.W.‡; Garcia, I.C.†; Mamo, K.†; Muchalski, H.; *Synthesis Of 2-Substituted Benzofurans From 2-Alkynyl Aryl Ethers Catalyzed By Gold(I)–N-Heterocyclic Carbene Complexes*, Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS), Puerto Rico, October 27-29, 2022.
5. Lichtenstein, D. A.†; Dillon, C. C.‡; Le, Q.‡; Muchalski, H.; *Gold(I)–NHC-catalyzed synthesis of benzofurans via migratory cyclization of 2-alkynylaryl benzyl ethers*, College of Science and Mathematics Virtual Research Showcase, May 8–15, 2020.
6. Lichtenstein, D. A.†; Dillon, C. C.‡; Le, Q.‡; Muchalski, H.; *Gold(I)–NHC-catalyzed synthesis of benzofurans via migratory cyclization of 2-alkynylaryl benzyl ethers*, Abstracts of Papers, 259th ACS National Meeting & Exposition, Philadelphia, PA, March 22-26, 2020, CHED-1230
7. Lichtenstein, D. A.†; Dillon, C. C.‡; Le, Q.‡; Muchalski, H.; *Gold(I)–NHC-catalyzed synthesis of benzofurans via migratory cyclization of 2-alkynylaryl benzyl ethers*, 32nd CSU Annual Biotechnology Symposium, Santa Clara, CA, January 16–18, 2020.

8. Phasakda, A.[†]; Muchalski, H. *Studies of directed gold(I)-catalyzed hydrocarboxylation of unsymmetrical alkynes* 40th Annual Central California Research Symposium, Fresno, CA, May 1, 2019.
9. Lichtenstein, D.A.[†]; Le, Q.[‡] [†]; Muchalski, H. *Development of gold(I)-catalyzed synthesis of benzofurans via gold(I)-catalyzed cyclization of 2-alkynyl ethers* 40th Annual Central California Research Symposium, Fresno, CA, May 1, 2019.
10. Pisor, J.W.[†]; Avalos, D. [†]; Sanchez, M.[†]; Muchalski, H. *Development in the syntheses of isoquinolinones via gold(I)-catalyzed cyclization of 2-alkynyl Weinreb amides* 40th Annual Central California Research Symposium, Fresno, CA, May 1, 2019.
11. Waite, J.A.[†]; Bustos, K. [†]; Ewing, A.L.[†]; Muchalski, H. *Substrate scope studies of the gold(I)-catalyzed synthesis of 2,3-disubstituted benzofurans* 40th Annual Central California Research Symposium, Fresno, CA, May 1, 2019.
Award: Outstanding Poster Presentation in Chemistry (San Joaquin Valley Local Section of ACS)
12. Dillon, C.C.[†]; Keophimphone, B.[†]; Sanchez, M.[†]; Kaur, P.[†]; Muchalski, H. *Synthesis of 2-substituted benzo[b]thiophenes via gold(I)-IPr hydroxide-catalyzed cyclization of 2-alkynyl thioanisoles*, Abstracts of Papers, 257th ACS National Meeting & Exposition, Orlando, FL, Mar. 31-Apr. 4, 2019 (2019), ORGN-0099
13. Keophimphone, B.[†]; Sanchez, M.[†]; Muchalski, H. *Scope of the Gold(I)-IPr-OH-Catalyzed Synthesis of Benzo[b]thiophenes*, 31nd CSU Annual Biotechnology Symposium, Orange County, CA, January 3–5, 2019.
14. Sanchez, M.[†]; Phasakda, A.[†]; Muchalski, H. *Synthesis of Benzo[b]thiophenes Catalyzed by Gold(I)-IPr-Cl Complex* 39th Annual Central California Research Symposium, Fresno, CA, April 25, 2018.
15. Kaur, P.[†]; Dillon, C.C.[†]; Muchalski, H. *Optimization of Gold-Catalyzed Cyclization of 2-Alkynylthioanisole to 2-Phenylbenzo[b]thiophene* 39th Annual Central California Research Symposium, Fresno, CA, April 25, 2018.
Award: Outstanding Poster Presentation in Chemistry (College of Science and Mathematics)
16. Hedgpeth, H.[†]; Sanchez, M.[†]; Gomez, J.[†]; Muchalski, H.; Person, E. *Effective Treatment of Laboratory Mercury Waste Using Polymer Made From Sulfur and Canola Oil* 39th Annual Central California Research Symposium, Fresno, CA, April 25, 2018.
17. Le, Q.; Watters, R. R.[†]; Muchalski, H. *Synthesis of Solution Stable Sulfenic Acids*, 38th Annual Central California Research Symposium, Fresno, CA, April 18–19, 2017.
Award: Outstanding Oral or Poster Presentation in Chemistry (San Joaquin Section of the ACS)
18. Olvera, A.C.[†]; Ramos Flores, J.[†]; Muchalski, H. *Towards Understanding of Peroxidation of Mammalian Sterols: Microwave-Assisted Synthesis of 7-Dehydrocholesterol Isomers*, Abstracts of Papers, 253rd ACS National Meeting, San Francisco, CA, April 2–6, 2017 (2017), ORGN-521
19. Olvera, A.C.[†]; Ramos Flores, J.[†]; Muchalski, H. *Microwave-Assisted Synthesis of 7-Dehydrocholesterol Isomers for Structure–Oxidizability Relationship Studies*, SAC-NAS 2016
20. Muchalski, H. *Kinetic Isotope Effect of Deuterium-Reinforced 7-Dehydrocholesterol in*

- Toco-pherol-Mediated Free Radical Chain Oxidation*, Vanderbilt Institute of Chemical Biology Symposium, 2013
21. Muchalski, H. *Stereospecific Reactions of α -Amino- β -Diazonium Intermediates: Mechanistic Studies, New Reaction Discovery and Application to a Bidirectional Synthesis of (+)-Zwittermicin A*, Gordon Research Conferences: Organic Reactions & Processes, 2011

Please see [my personal homepage](#) for a complete list of conference presentations

GRANTS

Awarded Grants

Efficient Synthesis of Benzofuran Heterocycles Catalyzed by Gold(I)-NHC Complexes
 CSUPERB[‡] Faculty–Graduate Student Research Collaboration
 (awarded to Jeremy Pisor \$10,000) 2022

New Methodologies for Free Radical Oxidation Kinetics and Synthesis of Silyl Enol Ethers
 CSUPERB[‡] COVID-19 Research Recovery Grant (awarded \$1,067) 2021

Metal-Catalyzed Synthesis of Enol Esters for Controlled Release of Pheromonones
 CSUPERB[‡] New Investigator (awarded \$15,000) 2018–2020

Synthesis and Evaluation of the Scope of Cyclization of 2-Alkynylthioanisoles to Benzo-[B]Thiophenes Catalyzed by Gold(I)-N-Heterocyclic Carbene Complexes
 CSUPERB[‡] Presidents' Commission Scholar Program
 (awarded to Bagieng Keophimphone, \$8,000) 2018

[‡]California State University Program for Education and Research in Biotechnology

Applied, not awarded, or under review.

Metal-Catalyzed Preparation Fluorine-Tagged Peroxyesters of 4-Aryl-3-Butenoic Acids
 ACS Division of Organic Chemistry Summer Undergraduate Research Fellowship
 (under review; requested budget: \$6,000, Summer 2023) 2023

Metal-Catalyzed Preparation of tert-Butyl Peroxyesters of 4-Aryl-3-Butenoic Acids
 Organic Syntheses PUI Grant
 (under review; requested budget: \$8,000, Summer 2023) 2022

Development of Heteronuclear Quantitative NMR Assay for Direct Peroxyl Radical Clock Kinetics
 ACS Petroleum Research Fund
 (under review; requested budget: \$70,000, 3 years) 2022

RUI: Development of Peroxyl Radical Clock Methodology Using Quantitative Heteronuclear NMR
 National Science Foundation CHE/CSDM-B
 (under review; requested budget: \$441,626, 3 years) 2022

Synthesis NHC-Gold Complexes for Synthesis of Heterocycles in Water
 CSUPERB[‡] Graduate Student Research Restart Program (not awarded \$6,500) 2021

<i>Gold-Catalyzed Synthesis of Heterocycles</i> Dreyfus Teacher Scholar Award (not awarded)	2020
<i>RUI: Organogold Chemistry Involving Siloxides and Silanols</i> National Science Foundation (not awarded)	2017
<i>Development of Gold-Catalyzed Synthesis of Z-Vinyl Acetates</i> CSUPERB [‡] New Investigator (not awarded)	2017
<i>RUI: Synthesis and Characterization of Stable Sulfenic Acids</i> National Science Foundation (not awarded)	2016
<i>New Strategies for the Synthesis of Deuterium-Reinforced Fatty Acids</i> CSUPERB [‡] New Investigator (not awarded)	2016
<i>Synthesis of Sulfenic Acid-Based Antioxidants</i> Undergraduate New Investigator Grant, ACS PRF (not awarded)	2016

**TEACHING
EXPERIENCE**

Graduate Courses

Advanced Research Techniques (CHEM 260)
Sp22
Strategies and Tactics in Organic Synthesis (CHEM 240T)
Fa19, Fa22
Seminar in Chemistry (CHEM 280)
Fa18
Topics in Advanced Organic Chemistry (CHEM 240T)
Fa15

Undergraduate Courses (H = Honors Course; † = Virtual)

Organic Chemistry 1 (CHEM 128A)
Fa15, Fa16, Fa17, Fa18, Su19, Fa19, Fa20, Fa21, Sp23 (x2)
Organic Chemistry 2 (CHEM 128B)
Sp16, Sp17, Sp19, Fa20[†], Su21[†], Su22
Organic Chemistry Laboratory 1 (CHEM 129A)
Sp16, Fa19 (x2), Fa20[†] (x2), Fa21
Organic Chemistry Laboratory 2 (CHEM 129B)
Fa16, Fa17, Sp18 (x2), Su20[†], Sp21[†], Fa22, Sp23
Research Techniques (CHEM 160H)
Sp20
Seminar in Chemistry (CHEM 180H)
Fa18

ADVISING

Graduate students

Thesis Chair (7): Quang Le, Christopher C. Dillon, Karina N. Bustos (NSF B2D 2020), Jeremy W. Pisor, Michael D. Stevens, Kiersten Friesen, Jason Datsko.
Thesis Committee Member (10): Dennis Ashong, Inderpal Sekhon, Sitong Wu, Ziran Jiang, Pravien Rajaram, Keeton Montgomery, Mericarmen Gonzalez, Anthony Hinde, Xiang Li

Undergraduate students

Honors Thesis Advisor (7): Ani Abajian, Isabella Garcia, Montaser Ahmad, Elizabeth Herren, Simrit Dhindsa, Alexander Ewing, Bagieng Keophimphone, Parveen Kaur
RISE Program Advisor (3): Isabella Garcia, Kirubel Mamo, Angel Rojas. *Independent Study Advisor (33)*
ACS Project SEED High School Students (3): Jonathan Jimenez (2017), Aliyah Lerma (2018), Jasmine Ortigoza (2022).

**PROFESSIONAL
DEVELOPMENT**

ACS Green & Sustainable Chemistry Module Development	2021–PRESENT
HyFlex Course Institute (facilitator)	Summer 2021
Mastery Grading Conference (Virtual)	June 11–12, 2021
HyFlex Course Institute (participant)	Spring 2021
Advanced Quality Learning and Teaching (QLT)	Summer 2020
Introduction to Teaching Online Using (QLT)	Spring 2020
Mastery Grading Conference (Virtual)	June 5–6, 2020
Transforming STEM Teaching Faculty Learning Program	
UC/CSU program supported by the NSF (DUE #1626624)	2018
New Faculty Workshop	
ACS–Cottrell Scholars Collaborative, Washington, DC,	August 3–5, 2017
Active Learning in Organic Chemistry	
NSF cCWCS Mini-workshop, Atlanta, GA,	June 12–15, 2017
Early Career Investigator Workshop	
NSF Division of Chemistry, Arlington, VA,	March 20–21, 2017
Certificate in College Teaching	
Center for Teaching, Vanderbilt University	2014

**LEADERSHIP
AND SERVICE**

San Joaquin Valley Local Section, American Chemical Society	2016–PRESENT
Councilor (2018–present); Treasurer (2016–2018); National Chemistry Week Outreach Coordinator (2018–present); Chemists Celebrate Earth Week Outreach Coordinator (2018–present)	

CSU Fresno

University Campus Planning Committee Academic Senate	2018–2021
Graduate Curriculum Subcommittee (Chair)	2022–PRESENT
Graduate Curriculum Subcommittee (member)	2019–2022
Advisor to the ACS Student Chapter	2017–2021
College Curriculum Subcommittee	2017–2019

AFFILIATIONS

American Chemical Society	
<i>Member</i>	2012–PRESENT
Department of Chemistry, Vanderbilt University, Nashville, TN	
<i>Visiting Scholar</i>	2015–2021