Hubert Muchalski *Curriculum vitae*

Contact Information

Department of Chemistry
California State University, Fresno
2555 East San Ramon Avenue, SB 70
Fresno, CA 93740-8034

E-mail: hmuchalski@csufresno.edu
Phone: (559) 278-2711
Fax: (559) 278-4402

Research Interests

Stereoselective synthesis, total synthesis of natural products, peroxidation of lipids, synthesis of deuterium-reinforced compounds.

Academic Appointments

Assistant Professor **July 2015 to present**

Department of Chemistry, California State University, Fresno

- Synthesis of isotopically-reinforced lipids for investigation of oxidative stress.

Postdoctoral Scholar **2012–2015**

Department of Chemistry, Vanderbilt University

- Study of kinetic isotope effects in free radical oxidation of sterols and oxidizable hydrocarbons.
- Adviser: Professor Ned A. Porter

Education

Vanderbilt University, Nashville, TN

Ph.D., Chemistry, 2012
Dissertation: *Stereospecific Reactions of α-Amino-β-Diazonium Intermediates: Mechanistic Studies, New Reaction Discovery and their Application to a Two-Directional Total Synthesis of (+)-Zwittermicin A*
Adviser: Professor Jeffrey N. Johnston

Wroclaw University of Technology, Wroclaw, Poland

B.S./M.S., Chemistry, 2006

Research Experience

Vanderbilt University, Nashville, TN

Postdoctoral Researcher (Prof. Ned Porter) **July 2012 to present**

- Total synthesis of deuterium-reinforced 7-dehydrocholesterol and lathosterol.
- Determination of the kinetic isotope effect for autooxidation of sterols and lipids.
- Study of tunneling in autoxidation of hydrocarbons.

Research Assistant (Prof. Jeffrey Johnston) **March 2007 to June 2012**

- Study of the mechanism of the Brønsted acid-catalyzed aza-Darzens reaction.
- Development of the diastereoselective *syn*-glycolate Mannich reaction.
- Total synthesis of zwittermicin A.

Visiting Scholar (Prof. Eva Harth) **July 2005 to January 2006**

Wroclaw University of Technology, Wroclaw, Poland

Diploma Research (Dr. Miroslaw Giurg) **January 2003 to June 2006**

Institute of Organic Chemistry, Polish Academy of Sciences, Warsaw, Poland

Summer Spectroscopy Internship **July 2005**

Teaching Experience

Vanderbilt University, Nashville, TN

Teaching Assistant **2006–2010**

- Instructor for Chem219: Organic Chemistry Laboratory
  - prepared prelab lectures to teach students the theory behind each experiment
  - demonstrated basic lab techniques and safety procedures
  - prepared quizzes, graded weekly lab reports final exams
  - Supervisor: Dr. Adam List.

Graduate Teaching Fellow **Fall 2008**

- Lectured weekly General Chemistry Recitation sessions.
  - teaching appointment for selected graduate teaching assistants (5 sections ca. 30 students each)
  - prepared and graded weekly probelm set
  - Supervisor: Prof. Joel Tellinghuisen

Instructor for Chem 222 (Physical Organic Chemistry) **Spring 2014**

- Series of lectures on free radiacl chemistry

Mentorship

- First year organic chemistry graduate students
  - guided student through a large scale (50 g) four step synthetic sequence
  - trained students in standard and safe operating techniques and analytical instruments (NMR, IR, GC) compounds
- Honor thesis undergraduate student
  - guided student through a five step synthetic sequence
  - trained students in standard and safe operating techniques and analytical instruments (NMR, IR, GC) compounds

Professional Development

Postdoc to PUI Professor Workshop

Hope College, Holland, MI **April 2013**

- ACS-sponsored workshop for postdoctoral fellows pursuing a faculty position in the chemical sciences at a Primarily Undergraduate Institution (PUI)

Certificate in College Teaching

Vanderbilt University **Spring–Fall 2014**

- A two-semester series of seminars and practice sessions that help gain a clearer, deeper, more active approach to teaching and learning in higher education.

Service

Beckman Scholars Program Review Committee (2012)
Peer review for journal Chemical Science (RSC)
Peer review for journal Organic and Biomolecular Chemistry (RSC)
Peer-review for journal RSC Advances (RSC)

Fellowships and Awards

University Graduate Fellowship 2006–2012
Warren Research Fellow 2010
Best Poster Award, Vanderbilt Institute of Chemical Biology Retreat 2007
Poster Award, Vanderbilt Institute of Chemical Biology Retreat 2009

Professional Memberships

American Chemical Society

Peer-reviewed Journal Publications (Undergraduate Co-Authors Underlined)

[1] Hubert Muchalski; Alexander J. Levonyak; Libin Xu; Keith U. Ingold; Ned A. Porter Competition H(D) Kinetic Isotope Effects in the Autoxidation of Hydrocarbons. *J. Am. Chem. Soc.* **2015**, *137*, 94–97. DOI:10.1021/ja511434j

[2] Hubert Muchalski; Libin Xu; Ned A. Porter Tunneling in Tocopherol-Mediated Peroxidation of 7-Dehydrocholesterol. *Org. Biomol. Chem.* **2015**, *13*, 1249–1253.

[3] Connor R. Lamberson; Libin Xu; Hubert Muchalski; J. Rafael Montenegro-Burke; Vadim V. Shmanai; Andrei V. Bekish; John A. McLean; Catherine F. Clarke; Mikhail S. Shchepinov; Ned A. Porter 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.

[4] Giurg, M.; Muchalski, H.; Kowal E. A. Oxofunctionalized *trans*-2-Carboxycinnamic Acids by Catalytic Domino Oxidation of Naphthols and Hydronaphthoquinones. *Synth. Commun.* **2012**, *42*, 2526–2539.

[5] 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.

[6] 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.* **2011**, *6*, 1206–1210.

[7] Muchalski, H.; Troyer, T. L.; Doody, A. B.; Johnston, J. N. Preparation of isopropyl 2-diazoacetyl(phenyl)carb *Org. Synth.* **2011**, *Vol. 88*, 212–223.

[8] 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.

[9] Giurg, M.; Kowal, E. A.; Muchalski, H.; Syper, L.; MThlochowski, J. Catalytic oxidative domino degradation of alkyl phenols towards 2- and 3-substituted muconolactones. *Synth. Commun.* **2009**, *39*, 251–266.

[10] Adkins, C. T.; Muchalski, H.; Harth, E. Nanoparticles with Individual Site-Isolated Semiconducting Polymers from Intramolecular Chain Collapse Processes. *Macromolecules* **2009**, *42*, 5786–5792.

[11] 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]pyrimi-dines. *Tetrahedron Lett.* **2008**, *49*, 305–310.

[12] 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*, 5626–5630.

[13] 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.

Reviews and Book Chapters

[14] 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

[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.

Conference Papers

[16] 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, United States, August 10-14, 2014, AEI-60

[17] Muchalski, H; Xu, L; Porter, N. A. *Kinetic isotope effect of deuterium-reinforced 7-dehydro-cholesterol in tocopherol-mediated free radical chain oxidation*, Abstracts of Papers, 247th ACS National Meeting, Dallas, TX, United States, March 16-20, 2014, ORGN-333

[18] 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 (poster)

[19] 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 (poster)

[20] Muchalski, H. *Alkylate and Oxygenate Before You Protonate: Novel Reactivity of α-Diazo Imide*, Vanderbilt Institute of Chemical Biology Retreat, 2009 (poster)

[21] Adkins, Chinessa T.; Muchalski, Hubert; Cohen, Mitchell J.; Harth, Eva *Synthesis of semiconducting nanoparticles*, Abstracts of Papers, 236th ACS National Meeting, Philadelphia, PA, United States, August 17-21, 2008, POLY-006

[22] Croce, T.; Muchalski, H.; Adkins, C. T.; Huang, K.; Hamilton, S. K.; Harth, E. *Design and Synthesis of Nanoscopic Objects for Applications in Medicine and Materials Sciences*, Conference Proceedings for the Austral Asian Polymer Symposium, **2006**, *45*, 56

[23] Croce, Teresa A.; Muchalski, Hubert; Adkins, Chinessa T.; Huang, Kui; Hamilton, Sharon K.; van der Ende, Alice; Harth, Eva *Approaches in the development of 3-D nanoscopic, multimodal vectors*, Abstracts of Papers, 231st ACS National Meeting, Atlanta, GA, United States, March 26-30, 2006, PMSE-171

[24] Croce, Teresa A.; Muchalski, Hubert; Adkins, Chinessa T.; Huang, Kui; Hamilton, Sharon K.; van der Ende, Alice; Harth, Eva *Approaches in the development of 3-D nanoscopic, multimodal vectors*, Polymer Preprints **2006**, *94*, 270

[25] Muchalski, H.; Giurg. M.; MThlochowski, J. *Fluorinated diaryl diselenides as catalysts for hydroperoxide oxidation of hydroxyarenes*, 14th International Symposium on Fluorine Chemistry, 2004 (poster).