

John E. Hofferberth

Assistant Professor of Chemistry

Harvey F. Lodish Faculty Development Professor in the Natural Sciences

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EDUCATION

Ph.D., Organic Chemistry, The Ohio State University, Columbus, Ohio (December 2002);
Primary Preceptor (Organic): Professor Leo Paquette, Co-Preceptor (Biochemistry):
Professor Ming-Daw Tsai

B.S., Chemistry and Engineering Physics, Summa Cum Laude, Physics Honors, Miami
University, Oxford, Ohio (August 1996)

DOCTORAL DISSERTATION

Progress Toward the Total Synthesis of Taxol[®]

RESEARCH EXPERIENCE

2005-Present: **Assistant Professor of Chemistry**, Kenyon College, Gambier OH.
Directing research by undergraduate students focused on aspects of insect olfaction
including the synthesis of insect derived semiochemicals and the biophysical
characterization of an odorant binding protein from *Lucophaea maderae*.

2003-2005: **Visiting Assistant Professor of Chemistry**, Kalamazoo College, Kalamazoo
MI. Initiated a collaborative chemical ecology research project with Professor Ann
Fraser (Kalamazoo College, Department of Biology) studying the chemical
communication between obligately myrmecophilous butterflies and their ant partners.
Initiated a collaborative computational chemistry study with Professor Christopher
Hadad (The Ohio State University, Department of Chemistry) focused on the reactive
intermediates involved in the auto-oxidation of carbonyl compounds.

2002-2003: **Research Scientist**, Medicinal Chemistry, Pharmacia Corporation, Kalamazoo,
MI (position eliminated in Pfizer acquisition). Used target protein structure to design
potential antibiotics for pathogenic multidrug-resistant bacteria. Synthesized target
compounds by traditional and parallel synthetic techniques for biological evaluation.

1997-2002: **NIH Chemistry/Biology Interface Training Fellow**, The Ohio State
University, Columbus, OH. Designed and implemented a concise synthesis of highly
functionalized ABC-ring taxane derivatives, which are poised for elaboration into
paclitaxel (Taxol[®]) and biologically interesting derivatives. Applied molecular
modeling techniques to gain both predictive and interpretive understanding of the
thermodynamic stability, isomer preference, and geometric nature of organic

molecules. Gained experience in biochemical techniques during a six month laboratory rotation under Professor Ross Dalbey.

1995: **Pharmaceutical Discovery Summer Intern**, Hoechst Marion Roussel, Cincinnati, OH. Developed a route for the stereoselective synthesis of cis-5-proline derivatives for use as cores of novel Angiotensin-Converting Enzyme inhibitors. Used the resulting synthetic route to produce eight such cores.

TEACHING EXPERIENCE

2005-Present: **Assistant Professor of Chemistry**, Kenyon College, Gambier OH.

Courses Taught:

Chemistry 123 – Introductory Chemistry Lab I (F05)

Chemistry 124 – Biophysical and Medicinal Chemistry (S06, S07)

Chemistry 126 – Biophysical and Medicinal Chemistry Lab (S07)

Chemistry 231 – Organic Chemistry I (F06)

Chemistry 376 – Chemistry Research (S06)

Chemistry 402 – Seminar in Enzyme Mechanism (S06)

2003-2005: **Visiting Assistant Professor of Chemistry**, Kalamazoo College, Kalamazoo, MI. Teaching responsibilities: Introductory Chemistry I, Organic Chemistry I & II, Advanced Organic Chemistry, Physical Chemistry I & II, and associated laboratories.

AWARDS AND HONORS

Harvey F. Lodish Faculty Development Professor in the Natural Sciences (2007-2010)

Camille and Henry Dreyfus Faculty Start-up Awardee (2005)

The Frances Diebold Award for Outstanding Contribution to the Kalamazoo College Community (2004)

NIH Chemistry/Biology Interface Training Fellow (1997-2002)

Ohio State University Graduate Fellow (1997)

Outstanding Senior Physics Student, Miami University (1996)

Miami Scholar Leader Award and Scholarship (1995-1996)

Mercury Seven Award and Scholarship (1995)

ACADEMIC SERVICE

Faculty Advisor for the Kenyon Paintball Club (Kenyon College, 2007)

Leader of the QUAD Program (Kenyon College, S07)

Director of the Math and Science Skills Center (Kenyon College, 2006-2007)

Faculty LINKS Program Participant (Kenyon College, 2007—present)

Academic Advisor (Kenyon College, 2007 – present)

Institutional Biosafety Committee member (Kenyon College, 2006 – present)

Pre-Health Health Advisory Committee member (Kenyon College, 2006 – present)

Search Committee Member, Chemistry Tenure Track (Kenyon College, 2005)

Academic Advisor (Kalamazoo College, 2004-2005)
Senior Individualized Project Advisor (Kalamazoo College, 2003-2005)
Chair of the 2001 NIH Chemistry/Biology Interface Symposium organizing committee (The Ohio State University)

OTHER SERVICE ACTIVITIES

Alumni Panel Member for graduate student recruits in the Chemistry Department at The Ohio State University (March 10, 2007)
Featured speaker for the 'Last Lecture' series (Title: "Progress Report", Kenyon College, Residential Life, November 6, 2006)
Panelist for the 2006 Henne Graduate Research Competition (The Ohio State University, April 3, 2006)
Co-Advisor for the Kalamazoo College ACS Student Affiliate (Forensics Day, Museum Day, Student Picnic, 2003-2005)
Science Lectures and Demonstrations at Portage Northern High School (2003-2005)
Invited Lecturer for the Howard Hughes Medical Institute funded summer program 'The Art and Science of Medicine' for under-represented minority high school students in Michigan, Kalamazoo College (2003 - 2005)

CONFERENCES, SYMPOSIA, AND WORKSHOPS

'233rd American Chemical Society National Meeting', Chicago, Illinois, March 25-26, 2007. Attended with Amy Elizabeth Thurber ('07, poster) and Joel Stanly Beckett ('08, poster)
'Applications of Organometallic Reagents in Organic Synthesis', The Ohio State University, May 20, 2006. Attended with Kenyon Student Joel Beckett ('08)
'POGIL Workshop at Grand Valley State University', Grand Valley State University, April 24, 2004. Attended with Kristin Hofferberth
'Residential School on Medicinal Chemistry', Drew University, June 9-13, 2003, Attended

PROFESSIONAL AFFILIATIONS

American Chemical Society
Council on Undergraduate Research

REFEREED PUBLICATIONS

Kreilein, M. M.; Hofferberth, J. E.; Hart, A. C.; Paquette, L. A."Diosphenol-Based Approach to the A-Ring Functionalization of Advanced Taxol Precursors" *J. Org. Chem.*; **2006**; *71*(19); 7329-7336
Paquette, Leo A.; Hartung, Ryan E.; Hofferberth, John E.; Vilotijevic, Ivan; Yang, Jiong "Synthesis of Stereoisomeric Medium-Ring α,α' -Dihydroxy Cycloalkanones" *J. Org. Chem.* **2004**, *69*, 2454-2460

- Paquette, Leo A.; Hartung, Ryan E.; Hofferberth, John E.; Gallucci, Judith C. "Reactions of α , α' -Dihydroxy Ketones with Phosgene. Structural Requirements for Spiro Epoxy Carbonate Formation" *Org. Lett.* **2004**, *6*, 969-971
- Paquette, Leo A.; Hofferberth, John E. "Effect of 9,10-Cyclic Acetal Stereochemistry on Feasible Operation of the α -Ketol Rearrangement in Highly Functionalized Paclitaxel (Taxol) Precursors" *J. Org. Chem.* **2003**, *68*, 2266-2275
- Paquette, Leo A.; Lo, Ho Yin; Hofferberth, John E.; Gallucci, Judith C. "A Delicate Balance of Energetics. Subtleties Associated with α -Ketol-Based Bridge Migration to Afford 9-Keto-10 β -*p*-methoxybenzyloxytaxanes" *J. Org. Chem.* **2003**, *68*, 2276-2281
- Paquette, Leo A.; Basu, Kallol; Eppich, James C.; Hofferberth, John E. "Systematic Analysis of the Intramolecular Competition Associated with the Ring Closing Metathesis of Ene-Diene Systems of Differing Chain Length with a Pair of Ruthenium Catalysts" *Helv. Chim. Acta* **2002**, *85*, 3033-3051
- Hofferberth, John E.; Lo, Ho Yin; Paquette, Leo A. "Stereospecific Anionically Promoted Transannular Hydride Shifts in Medium-Ring Hydroxy Ketones. Probe of Their Reversibility and the Potential for Regiocontrol" *Org. Lett.* **2001**, *3*, 1777-1780
- Paquette, Leo A.; Fabris, Fabrizio; Tae, Jinsung; Gallucci, Judith C.; Hofferberth, John E. "Catalytic Ring-Closing Metathesis of Doubly Armed, Bridged Bicyclic Sulfones. Evaluation of Chain Length and Possible Intramolecular SO₂ Group Ligation to the Ruthenium Carbenoid" *J. Am. Chem. Soc.* **2000**, *122*, 3391-3398
- Paquette, Leo A.; Shih, Tzenge-Lien; Zeng, Qingbei; Hofferberth, John E. "Synthesis of Stereodefined Z-Vinyl Iodides from Carbohydrates as a Prelude to C/D Ring Assembly in Taxanes" *Tetrahedron Lett.* **1999**, *40*, 3519-3522
- Beight, Douglas W.; Flynn, Gary A.; Hofferberth, John E.; Koehl, Jack R.; Mehdi, Shujaath "Synthesis of Substituted Proline and Pipecolic Acid Derivatives and Their Use in Angiotensin-Converting Enzyme Inhibition" Book of Abstracts, 212th ACS National Meeting, Orlando, FL, August 25-29, **1996**, ORGN-200

BOOK CHAPTER

- Paquette, Leo A.; Hofferberth, John E. "The α -Hydroxy Ketone (α -Ketol) Rearrangement" Overman, Larry E. Ed.; *Organic Reactions*, Volume 62, John Wiley & Sons, **2003**; pp 477-567

INVITED ENCYCLOPEDIA CONTRIBUTIONS (*Kenyon Student Coauthor)

- Hofferberth, J. "Mercury(II) Acetate (Update)" *Encyclopedia of Reagents for Organic Synthesis*, John Wiley & Sons, Ltd, DOI: 10.1002/047084289X.rm028, Article Online Posting Date: April 15, 2004

Hofferberth, J. "Peracetic Acid (Update)" *Encyclopedia of Reagents for Organic Synthesis*, John Wiley & Sons, Ltd, DOI: 10.1002/047084289X.rp034.pub2, Article Online Posting Date: April 15, 2006

Hofferberth, J.; Beckett, J* "Diethyl(1,1,2,3,3,3-hexafluoropropyl)-amine (Update)" *Encyclopedia of Reagents for Organic Synthesis*, John Wiley & Sons, Ltd, DOI: 10.1002/047-84289X.rd196.pub2, Article Online Posting Date: March 15, 2007

GRANTS

Principle Investigator, Dreyfus Foundation, "Investigation of Antibacterial Agents with Potential Applications in Directed Molecular Evolution." Funded 7/05, \$30,000, Funding Rate 16%.

Co-Principle Investigator, National Science Foundation, "RUI Collaborative Research: Chemosensory basis of host selection by ant-associated butterflies," written in collaboration with Professor Ann Fraser (Kalamazoo College, Biology Department). Funded 5/05, \$62,000 for JEH, Funding Rate 15%.

Co-Principle Investigator, Ohio Supercomputer Center, "Computational Studies on the Mechanism of Carbonyl Autooxidation," written in collaboration with Professor Christopher Hadad (The Ohio State University, Chemistry Department). Funded 2/05.

Co-Principle Investigator, National Science Foundation, "Increasing STEM Majors at Kalamazoo College through Stronger Foundations in Chemistry and Mathematics," written in collaboration with Professor John Fink (Kalamazoo College, Mathematics Department). Not funded 8/04.