

## Bianca R. Sculimbrene

College of the Holy Cross  
Department of Chemistry  
1 College St  
Worcester, MA 01610

Phone: (508) 793-3425  
Fax: (508) 793-3530  
Email: [bsculimb@holycross.edu](mailto:bsculimb@holycross.edu)

**Current Position:** Assistant Professor, College of the Holy Cross

### Education:

1999-2004 Ph.D. Chemistry, Boston College  
1995-1999 B.S., Magna Cum Laude, Chemistry, Xavier University

### Research Experience:

2006-present Independent Research (College of the Holy Cross)  
*Utilizing Organic Synthesis for the Development of Chemical Tools*

2004-2006 Postdoctoral Research (Massachusetts Institute of Technology)  
*Lanthanide Binding Tags as Fluorescent Probes for Studying Protein-Protein Interactions* (Advisor: Barbara Imperiali)

1999-2004 Doctoral Research (Boston College)  
*Catalytic Asymmetric Phosphorylation: Total Syntheses of Inositol Phosphates* (Advisor: Scott J. Miller)

1997-1999 Undergraduate Research (Xavier University)  
*Silatrane-Nucleosides as Transition State Analogues: Synthesis and Characterization* (Advisor: Edward E. Fenlon)

### Teaching Experience:

#### Assistant Professor

2006 - present Organic Chemistry I (Lecture and Laboratory)  
Organic Chemistry II (Lecture and Laboratory)  
Undergraduate Research Tutorials

#### Teaching Assistant

2006 Teaching Assistant (at MIT): *Tools for Assessing Biological Function*  
2003 Teaching Assistant (at Boston College): *Mechanistic Organic Chemistry*  
2000-2001 Teaching Assistant (at Boston College): *Organic Chemistry*  
2000 Teaching Assistant (at Boston College): *General Chemistry*

## Grants:

- 2009 Batchelor (Ford) Faculty Fellowship  
"Synthesis of Peptide-Isosteres to Study Drug Interactions" \$3,800
- 2008 Jean Dreyfus Boissevain Undergraduate Scholarship (awarded to O.S. Fenton)  
"Development of a Catalytic Reaction for the Phosphorylation of Alcohols" \$5,500
- 2007 Batchelor (Ford) Faculty Fellowship  
"The Development of Chemical Tools in Organic Synthesis" \$3,500
- 2006 The Camille and Henry Dreyfus New Faculty Start-Up  
"Utilizing organic synthesis for development of chemical tools: new methods for phosphorylation, facile amino acid synthesis and vancomycin probes" \$30,000

## Awards and Honors:

- 2004-2006 NIH Postdoctoral Fellowship
- 2004 Outstanding Graduate Student Award (Boston College)
- 2002-2003 ACS Division of Organic Chemistry Graduate Fellowship
- 2002 Kenneth J. Hancock Memorial Student Award in Green Chemistry
- 2002 Donald J. White Teaching Excellence Award
- 1999-2000 GAANN Fellowship
- 1999 Fr. Frederick Miller Award in Chemistry (Xavier University)
- 1998 Council on Undergraduate Research Summer Fellowship

## Publications: (Undergraduate co-authors are \*)

### Research Articles

- (13) "A Wet lab Approach to Stereochemistry Using 31P NMR Spectroscopy" O.S. Fenton\*, **B.R. Sculimbrene** *J. Chem. Ed.* **2011**, 88, 662-664.
- (12) "Synthesis of a D-Ala-D-Ala Peptide Isostere via Olefin Cross-metathesis and Evaluation of Vancomycin Binding" R.K. Quinn\*, A.L. Cianci\*, J.A. Beaudoin\* and **B.R. Sculimbrene** *Bioorg. Med. Chem. Lett.* **2010**, 20, 4382-4385.
- (11) "Efficient Catalyst Turnover in the Phosphitylation of Alcohols with Phosphoramidites" P.B. Brady\*, E.M. Morris\*, O.S. Fenton\*, and **B.R. Sculimbrene** *Tetrahedron Lett.* **2009**, 50, 975-978.
- (10) "Lanthanide-Binding Tags with Unnatural Amino Acids: Sensitizing Tb<sup>+3</sup> and Eu<sup>+3</sup> Luminescence at Longer Wavelengths." A. M. Reynolds, **B.R. Sculimbrene**, B. Imperiali *Bioconjugate Chem.* **2008**, 19, 588-591.
- (9) "Lanthanide-Binding Tags as Luminescent Probes for Studying Proteins." **B. R. Sculimbrene**, B. Imperiali *J. Am. Chem. Soc.* **2006**, 128, 7346-7352.

- (8) "Streamlined Synthesis of Phosphatidylinositol (PI), PI3P, PI3,5P<sub>2</sub>, and Deoxygenated Analogues as Potential Biological Probes." Y.J. Xu, **B.R. Sculimbrene**, S.J. Miller *J. Org. Chem.* **2006**, *71*, 4919-4928.
- (7) "Rapid Combinatorial Screening of Peptide Libraries for the Selection of Lanthanide-Binding Tags (LBTs)." L. J. Martin, **B.R. Sculimbrene**, M. Nitz, B. Imperiali *QCS Comb. Sci.* **2005**, *24*, 1149-1157,
- (6) "Desymmetrization of Glycerol Derivatives with Peptide-based Acylation Catalysts." C.A. Lewis, **B.R. Sculimbrene**, Y.Xu, S.J. Miller *Org. Lett.*, **2005**, *7*, 3021-3023.
- (5) "Asymmetric Synthesis of Phosphatidylinositol-3-Phosphates with Saturated and Unsaturated Side Chains through Catalytic Asymmetric Phosphorylation." **B.R. Sculimbrene**, Y. Xu, S.J. Miller *J. Am. Chem. Soc.*, **2004**, *126*, 13182-13183.
- (4) "Nonenzymatic Peptide-Based Catalytic Asymmetric Phosphorylation of Inositol Derivatives." **B.R. Sculimbrene**, A.J. Morgan, and S.J. Miller *Chem. Commun.*, **2003**, *15*, 1781-1785.
- (3) "Enantiodivergence in Small-Molecule Catalysis of Asymmetric Phosphorylation: Concise Total Syntheses of the Enantiomeric D-*myo*-Inositol-1-phosphate and D-*myo*-Inositol-3-phosphate." **B.R. Sculimbrene**, A.J. Morgan, and S.J. Miller *J. Am. Chem. Soc.*, **2002**, *124*, 11653-11656.
- (2) "Discovery of a Catalytic Asymmetric Phosphorylation through Selection of a Minimal Kinase Mimic: A Concise Total Synthesis of D-*myo*-Inositol-1-Phosphate." **B.R. Sculimbrene** and S.J. Miller *J. Am. Chem. Soc.*, **2001**, *123*, 10125-10126.
- (1) "Silatranyl-Nucleosides: Transition State Analogues for Phosphoryl Transfer Reactions." **B.R. Sculimbrene**, R.E. Decanio, B.W. Peterson, E.E. Muntel, and E.E. Fenlon *Tetrahedron Lett.*, **2001**, *30*, 4979-4982.

#### Patents

- (1) "Peptide as Kinase Mimic Catalysts for Asymmetric Phosphorylation in Synthesis of Phosphorylated Inositols and Cyclo-alkanols" **B.R. Sculimbrene**, S.J. Miller, A.J. Morgan *PCT Int. Appl.* WO 2003004141 A3, 2003.

#### Doctoral Dissertation

- (1) **B.R. Sculimbrene**, "Catalytic Asymmetric Phosphorylation: Concise Total Syntheses of Inositol Phosphates" 2004

**Presentations:**

P.B. Brady, E.M. Morris, O.S. Fenton, **B.R. Sculimbrene**  
*Phosphorylation of Alcohols: New Methods and Reagents*  
ACS Meeting, March 2009

**B.R. Sculimbrene**, B. Imperiali  
*Development of Lanthanide Binding Tags (LBTs) as probes for protein-protein interactions*  
ACS Meeting, August 2005

**B.R. Sculimbrene**, A.J. Morgan, S.J. Miller  
*Asymmetric Catalytic Phosphorylation: Synthesis of Inositol Phosphates*  
National Organic Symposium, June 2003

**B.R. Sculimbrene**, S.J. Miller  
*Biomimetic Synthesis, Biomimetic Catalysis: Concise Synthesis of D-myo-Inositol-1-Phosphate*  
Green Chemistry and Engineering Conference, June 2001

**B.R. Sculimbrene**, E.E. Fenlon  
*Silatranyl-Nucleosides as Transition State Analogues*  
CUR Posters on the Hill, May 1999