

# LANGDON J. MARTIN

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## Professional Experience

**2012–**            **Professor of Chemistry**  
Warren Wilson College, Swannanoa, NC

**2014–**            **Director of General Education**  
Warren Wilson College

## Education

**2008–2012**    **Postdoctoral Fellow** in Biochemistry  
University of Wisconsin–Madison, Madison, WI

**2003–2008**    **Ph.D.** in Organic Chemistry  
Massachusetts Institute of Technology, Cambridge, MA  
Thesis: *Development of Lanthanide-Binding Tags (LBTs) as Powerful and Versatile Peptides for Use in Studies of Proteins and Protein Interactions*

**1999–2003**    **B.A., Magna Cum Laude**, with Honors in Chemistry  
Kalamazoo College, Kalamazoo, MI  
Thesis: *Synthesis and Polymerization with a Cycloaliphatic Epoxide*

**2001–2002**    **Study Abroad** at Waseda University, Tokyo, Japan

## Teaching Experience

**2012–**            **Professor**, Warren Wilson College Dept. of Chemistry

- Organic Chemistry I and Organic Chemistry I Lab (CHM 225 & 227)
- Organic Chemistry II and Organic Chemistry II Lab (CHM 226 & 227)
- Peer-Led Team Learning and Scientific Teaching (CHM 318)
- General Chemistry I (CHM 116)
- Principles of Chemistry (CHM 103)
- First-Year Seminar (FYS 120) “Chemical Features (and Where to Find Them)”

**2012**            **Instructor**, UW–Madison Dept. of Biochemistry

- Biochem 651: Biochemical Methods

**2009–2010**    HHMI Wisconsin Program for Scientific Teaching, UW–Madison

- **Teaching Fellow.** *Developed, implemented, and disseminated a Teachable Unit (TU). The TU is freely available at [http://biology.wisc.edu/documents/goingviraltu\\_ljm.pdf](http://biology.wisc.edu/documents/goingviraltu_ljm.pdf)*
- **Instructor**, Dept. of Bacteriology: Case Studies in Microbiology (Microbiology 375)

- **Scientific Teaching Postdoc.** *Facilitator for the National Academies Summer Institute on Undergraduate Education in Biology*
- 2003, '04, '07 **Teaching Assistant**, M.I.T. Dept. of Chemistry
- Biological Chemistry, (5.07) Fall 2007
  - Organic Chemistry I, (5.12) Fall 2004: *Head Teaching Assistant*
  - Chemistry Laboratory Techniques, (5.301) January-term 2004
  - Organic Chemistry I, (5.12) Fall 2003

## **Research & Mentoring Experience**

- 2013– **Undergraduate Research Mentor** Natural Sciences Undergraduate Research Sequence (N.S.U.R.S.) Program at Warren Wilson College
- Christopher Feidler-Cree (degree expected 2018)
  - Emily “Rhys” Burns (degree expected 2018)
  - Mathilde Meyenberg (2016) “*Design of Antiviral Compounds Acting Against the Nucleoprotein of H1N1 and H5N1 Influenza Virus Using Naproxen-C0 as Lead Compound*”
  - Jamie DeMarco (2016) “*Analysis of 4-methylimidazole in Beer*”
  - Austen Casey (2016) “*Peptide Synthesis: A Renewable Method*”
  - Virginia Pszczolkowski (2016) “*Reducing methane and ammonia production in whole rumen fluid with spent craft brewers’ yeast*”
  - Rebecca J. Truitt (2015) “*Cultivating anaerobic equine gut flora at Warren Wilson College*”
  - Evan Muir (2015) “*In silico rational drug design: An investigation of potential drug leads derived from opioid alkaloids present in Mitragyna speciosa*”
  - Daniel Wentworth
  - Mary Roerty (2014) “*The efficiency of solid-phase extraction for detecting phthalates in aqueous standard samples*”
  - Hannah Edwards (2014) “*Comparison of antioxidant constituent content of home-gardened, organically grown, and conventionally grown spinach*”
  - Chin-pu “Jason” Chen (2014) “*Maximizing the yield of Fmoc-MeCys(StBu)-OH through reduction of an oxazolidinone intermediate*”
  - Chau Siu (2014) “*The antioxidant properties of banana flower vary with cooking method*”
  - Nick Stuer (2014) “*A comparison of berberine concentrations in Hydrastis canadensis (goldenseal) and Xanthorhiza simplicissima (yellowroot)*”
  - Davis Jones (2013) “*Extraction and analysis of oil and biodiesel produced from spent coffee grounds*”

- 2008–2012 **Postdoctoral Research** with Professor Ronald T. Raines  
University of Wisconsin–Madison, Madison, WI  
*Study of the Ubiquitin–Proteasome System through chemical biology, utilizing techniques including organic synthesis, cysteine-labeling reagents, intein chemistry, and aqueous traceless Staudinger ligation*
- Undergraduate Joel M. Prince (2009–2012). *Molecular biology techniques including cloning, mutagenesis, and protein manipulation; Organic syntheses*
  - Undergraduate Sappho Z. Gilbert (10-week summer R.E.U. internship, 2009). *Molecular biology techniques including cloning and mutagenesis*
  - Graduate student Kristen A. Anderson (2011–2012). *Trained to take over all aspects of my postdoctoral research projects*

- Lab manager Gregory J. Jakubczak (intermittently). *Organic synthesis*

- 2003–2008**     **Doctoral Research** with Professor Barbara Imperiali  
Massachusetts Institute of Technology, Cambridge, MA  
*Generation of LBT (Lanthanide-Binding Tag) peptides and peptide-libraries by solid-phase peptide synthesis; cloning, expression, and purification of LBT–protein fusion constructs; characterization of LBTs and LBT–protein constructs by luminescence spectroscopy including LRET*
- 2002**            **Undergraduate Research** (10-week summer R.E.U.) with Professor Dean C. Webster  
North Dakota State University, Fargo, ND  
*Small-molecule synthesis; polymerization; characterization of synthetic polymers*

### Awards and Honors

- 2016**            **Commendation in Teaching**, Warren Wilson College
- 2014**            **PCMNCG** (Pittsburg Conference Memorial National College Grant)  
*Used to purchase a Tecan Fluorescence Microplate Reader*
- 2012**            **Teaching Innovation Grant**, Warren Wilson College
- 2009–2011**     **National Institutes of Health N.R.S.A. Postdoctoral Fellowship**
- 2010**            **National Academies Education Mentor in the Life Sciences**  
*Recognizes commitment to undergraduate education through action as a Facilitator at the 2010 National Academies Summer Institute on Undergraduate Education in Biology*
- 2007**            **Wyeth Scholar**  
*Awarded to M.I.T. graduate students in recognition of accomplishments in research and for delivering excellent lectures at the Organic Chemistry Graduate Research Symposium*
- 2005**            **Department of Chemistry Award for Teaching**  
*Recognizes outstanding Teaching Assistants in the M.I.T. chemistry department; earned from work performed in Course 5.12 (Organic Chemistry I), Fall 2004*
- 2003**            **Phi Beta Kappa**, Kalamazoo College
- 2003**            **Kalamazoo College American Chemical Society Award**
- 1998**            **Eagle Scout**, Boy Scouts of America

### Outreach

- 2014 – 2015**     **Warren Wilson College Chemistry Road Show**, in collaboration with The Science House of NC State University.  
*One-hour shows for middle school students that include demonstrations and explanations of chemistry experiments*
- Valley Springs Middle School (Asheville, NC)
  - East McDowell Middle School (Marion, NC)

- Enka Middle School (Buncombe County, NC)

**2004 – 2007 M.I.T. Chemistry Outreach program**

*At high schools in New England (nine schools over four summers)*

**Professional Development**

- 2016**      Biennial Conference on Chemical Education, Greeley, CO
- 2016**      SLAC–WPA [Small Liberal Arts Colleges–Writing Program Administrators]: Memphis, TN
- 2015**      AAC&U Institute on Integrative Learning and the Departments, Newark, DE  
*Team leader*
- 2015**      POGIL [Process-oriented guided-inquiry learning] Workshop, Asheville, NC
- 2014**      Biennial Conference on Chemical Education, Grand Rapids, MI
- 2014**      The 2014 Institute on Quality Enhancement and Accreditation, New Orleans, LA
- 2013**      Active Learning in Organic Chemistry, Charlotte, NC
- 2012**      Facilitator, National Academies Yale-Specific Summer Institute on Undergraduate Education. New Haven, CT
- 2011, 2010**      UW–Madison Postdoctoral Conference on Professional Development, Madison, WI
- 2011**      CIRTL Forum, Madison, WI
- 2011**      P3 Workshop: Postdoc to PUI Professor, Holland, MI
- 2010**      Facilitator, National Academies Summer Institute on Undergraduate Education in Biology. Madison, WI

**Publications**

- (8)      V. L. Pszczolkowski, R. W. Bryant, B. E. Harlow, G. E. Aiken, L. J. Martin, M. D. Flythe, “Effect of spent craft brewers’ yeast on fermentation and methane production by rumen microorganisms.” *Advances in Microbiology*, **2016**, 6, 716–723
- (7)      L. J. Martin, B. Imperiali. “The Best and the Brightest: Exploiting Tryptophan-Sensitized Tb<sup>3+</sup> Luminescence to Engineer Lanthanide-Binding Tags.” **2015**, Chapter in *Peptide Libraries, Methods in Molecular Biology (Springer) 1248*, 201–220
- (6)      K. A. Andersen, L. J. Martin, J. M. Prince, R. T. Raines. “Intrinsic site-selectivity of ubiquitin dimer formation.” *Protein Science*, **2015**, 24, 182–189

- (5) K. D. Daughtry, L. J. Martin, A. Surraju, B. Imperiali, K. N. Allen. “Tailoring Encodable Lanthanide-Binding Tags as MRI Contrast Agents.” *ChemBioChem*, **2012**, *13*, 2567–2574
- (4) L. J. Martin, R. T. Raines. “Carpe Diubiquitin.” *Angew. Chem. Int. Ed.* **2010**, *49*, 9042–9044
- (Highlight of recent publications regarding the syntheses of diubiquitin)
- (3) N. R. Silvaggi, L. J. Martin, H. Schwalbe, B. Imperiali, K. N. Allen. “Double-Lanthanide-Binding Tags for Macromolecular Crystallographic Structural Determination.” *J. Am. Chem. Soc.* **2007**, *129*, 7114–7120
- Highlighted in *C&E News*, 16 May 2007, *85* (21), p.31
- (2) L. J. Martin, M. J. Hähnke, M. Nitz, J. Wöhnert, N. R. Silvaggi, K. N. Allen, H. Schwalbe, B. Imperiali. “Double-Lanthanide-Binding Tags: Design, Photophysical Properties, and NMR Applications.” *J. Am. Chem. Soc.* **2007**, *129*, 7106–7113
- Highlighted in *C&E News*, 16 May 2007, *85* (21), p.31
  - Featured in Faculty of 1000 Biology, F1000 Factor 6.4: <http://www.f1000biology.com/article/id/1087761/evaluation>
- (1) L. J. Martin, B. R. Sculimbrene, M. Nitz, B. Imperiali. “Rapid Combinatorial Screening of Peptide Libraries for the Selection of Lanthanide-Binding Tags (LBTs).” *QSAR Comb. Sci.* **2005**, *24*, 1149–1157

### **Invited Presentations**

- 2015** “Writing as a tool for Active Learning in Organic Chemistry,” *Active Learning in Organic Chemistry*: Washington D.C. (via Skype)
- 2010** “Scientific Teaching Workshop.” *UW–Madison Postdoctoral Conference on Professional Development*: Madison, WI
- 2010** “Imperatives of Ubiquitin-Mediated Protein Degradation.” *Biology Seminar Series*, Lawrence University: Appleton, WI;

### **Other Presentations**

- 2016** D.M. Emmert, L.J. Martin. “Collaboration between Organic Chemistry II and Biochemistry Laboratory Courses” Biennial Conference on Chemical Education: Greely, CO
- 2016** L.J. Martin. “Writing in Organic Chemistry” Biennial Conference on Chemical Education: Greely, CO
- 2016** L.J. Martin “Organic Chemistry is Enhanced by Writing” SLAC–WPA [Small Liberal Arts Colleges–Writing Program Administrators]: Memphis Tennessee
- 2015** R.W. Bryant, M.D. Flythe, B.E. Harlow, S.P. O’Connel, R.J. Truitt, L.J. Martin. “Hop Acid-Rich Spent Craft Brewer’s Yeast Modulates Gut Bacterial Growth” *Molecules in the*

Mountains: Cullowhee, NC

- 2015** R.J. Truitt, B.E. Harlow, M.D. Flythe, R.W. Bryant L.J. Martin. “*Anaerobic Growth of Equine GI Bacteria at Warren Wilson College*” Molecules in the Mountains: Cullowhee, NC
- 2014** L.J. Martin. “*Peer Supplemental Instruction for General Chemistry I*” Biennial Conference on Chemical Education: Grand Rapids, MI
- 2010** L.J. Martin, J.-H. Yu, S. Miller. “*Going Viral: Influenza-Influenced Changes in Student Behavior*” UW Teaching and Learning Symposium: Madison, WI
- 2008** L.J. Martin, N.R. Silvaggi, K.N. Allen, B. Imperiali. “*Lanthanide-Binding Tags: Protean Tools for Protein Studies*” Gordon Research Conference *Chemistry and Biology of Peptides*: Ventura, CA
- 2007** L.J. Martin, N.R. Silvaggi, K.N. Allen, B. Imperiali. “*Double-Lanthanide-Binding Tags: Powerful and Versatile Protein Probes*” 234<sup>th</sup> National ACS Meeting: Boston, MA