

## ROBERT J. MILLIKIN

Chemistry Graduate Program  
University of Wisconsin-Madison  
rjmillikin@gmail.com  
rmillikin@wisc.edu

### EDUCATION

**University of Wisconsin-Madison** **2016 – Present**  
Ph.D. Chemistry (Expected 2021)

**Sonoma State University** **2011 - 2015**  
B.S. Chemistry, major GPA: 3.80

### PROFESSIONAL EXPERIENCE

**Department of Chemistry, UW-Madison** **2016 – Present**

Research Associate

Research Advisor: Prof. Lloyd M. Smith

- Contributed to software to search tandem mass spectrometry data for peptides modified with post-translational modifications (“MetaMorpheus”)
- Wrote software to quantify peptides identified by in-house tandem mass spectrometry search engine

**Synterys, Inc.** **2015 - 2016**

Research Associate

- Synthesized small molecules via multi-step synthetic routes requested by customers
- Gained skills in synthetic techniques and automated flash-chromatography

**Sonoma State University** **2012 - 2015**

Student Research Assistant, Department of Chemistry (Research Advisor: Dr. Jon Fukuto)

- Synthesized, purified, and characterized 6 different HNO and NO donors as tools for study of fundamental HNO and NO chemistry
- Synthesized air-sensitive selenols (RSeH) as models for selenoproteins and investigated their hypothesized reaction with HNO by GC-MS
- Investigated persulfides (RSSH) as a possible endogenous mechanism to protect against thiol enzyme alkylation/oxidation, modeled by the phosphatase CD148
- Familiarity with  $^1\text{H}$  and  $^{13}\text{C}$  NMR (1D and 2D), GC-MS, HPLC-MS, FTIR, UV-Vis instruments and methodology

**Sonoma State University**

Supplemental Instructor

**2013 – 2014**

- Led organic chemistry discussion sections for 3 semesters

## **POSTERS & PRESENTATIONS**

Millikin, R.; Shortreed, M.; Solntsev, S.; Smith, L. *Enhanced FlashLFQ for Ultrafast Label-Free Peptide Quantification with Match-Between-Runs and Replicate Normalization*. Poster at the 66<sup>th</sup> American Society for Mass Spectrometry Annual Conference, **2018**.

Millikin, R.; Solntsev, S.; Shortreed, M.; Smith, L. *Ultrafast Label-Free Quantification of Peptides Detected by Mass Spectrometry*. Poster at the NHGRI Research Training and Career Development Annual Meeting, **2018**.

Dai, Y.; Millikin, R.; Cesnik, A.; Shortreed, M.; Scalf, M.; Frey, B.; Smith, L. *Elucidating E. coli Proteoform Families Using a Global PTM Discovery Database and Intact-mass Proteomics*. Poster at the 65<sup>th</sup> American Society for Mass Spectrometry Annual Conference, **2017**.

White, C.; Millikin, R.; Henriquez, S.; Saund, S.; Ono, K.; Lin, J.; Fukuto, J. *Persulfide Formation Protects Cysteine Thiols Against Damaging Modifications*. Poster at the 27th CSU Biotechnology Symposium, **2015**.

Millikin, R.; White, C.; Lin, J.; Fukuto, J. *Reactions of Selenols with HNO (Nitroxyl) as Model Chemistry for Selenium-Containing Proteins*. Poster at 26th Northern California Undergraduate Research Symposium, **2014**.

Millikin, R.; White, C.; Lin, J.; Fukuto, J. *Alkyl selenols: Synthesis, characterization and examination of the reaction with HNO*. Poster at the 26th CSU Biotechnology Symposium, **2014**.

## **PUBLICATIONS**

Lu, L.; Millikin, R.; Solntsev, S.; Rolfs, Z.; Scalf, M.; Shortreed, M.; Smith, L. Identification of MS-Cleavable and Noncleavable Chemically Cross-Linked Peptides with MetaMorpheus. *J. Proteome Res.*, **2018**, 17(7), 2370-2376. DOI: 10.1021/acs.jproteome.8b00141.

Millikin, R.; Solntsev, S.; Shortreed, M.; Smith, L. Ultrafast Peptide Label-Free Quantification with FlashLFQ. *J. Proteome Res.*, **2018**, 17(1), 386-391. DOI: 10.1021/acs.jproteome.7b00608.

Millikin, R.; Bianco, C.; White, C.; Saund, S.; Henriquez, S.; Sosa, V.; Akaike, T.; Kumagai, Y.; Soeda, S.; Toscano, J.; Lin, J.; Fukuto, J. The chemical biology of protein hydropersulfides: Studies of a possible protective function of biological hydropersulfide generation. *Free Radical Biol. Med.*, **2016**, 97, 136-147. DOI: 10.1016/j.freeradbiomed.2016.05.013.

Fukuto, J.; Millikin, R. Reactions of HNO with Non-Heme Proteins. In *The Chemistry and Biology of Nitroxyl (HNO)*. Elsevier, **2016**, 321-335. DOI: 10.1016/b978-0-12-800934-5.00017-7.

Saund, S.; Sosa, V.; Henriquez, S.; Nguyen, Q.; Bianco, C.; Soeda, S.; Millikin, R.; White, C.; Le, H.; Ono, K.; Tantillo, D.; Kumagai, Y.; Akaike, T.; Lin, J.; Fukuto, J. The chemical biology of

hydropersulfides (RSSH): Chemical stability, reactivity and redox roles. *Arch. Biochem. Biophys.*, **2015**, 588, 15-24. DOI: 10.1016/j.abb.2015.10.016.

### **FELLOWSHIPS**

Genomic Sciences Training Program, Predoctoral Trainee

**2017-Present**

### **EXTRACURRICULAR**

Sonoma State ACS Local Chapter Officer

**2014-2015**

- Authored funded grant for Sonoma State's National Chemistry Day event
- Created new website (ssuchemclub.com) to manage club news, outreach events, and student resources
- Started a chemistry journal club to encourage discussion of current chemical literature among undergraduates