

Stephen E. Leonard

Associate Professor of Chemistry

Indiana Wesleyan University
Department of Chemistry

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Education

2002 – 2006 Indiana Wesleyan University, Marion, IN– B.S. in Chemistry
2006 – 2011 University of Michigan, Ann Arbor, Michigan – Ph.D. in Chemical Biology

Research Experience

2004 – 2006 **Indiana Wesleyan University Marion, IN**
Research Advisor: Professor John Lakanen

2007 – 2011 **University of Michigan Ann Arbor, MI**
Research Advisor: Professor Kate S. Carroll

- Design and synthesis of new antimalarial drugs

2011 – 2014 **University of Washington Seattle, WA**
Research Advisor: Professor Dustin J. Maly

- Developing small molecule probes to investigate protein sulfenylation in living cells.

2014 – Present **Indiana Wesleyan University Marion, IN**
Primary Investigator

- Design of selective bivalent inhibitors of protein tyrosine phosphatase Shp2

Teaching Experience

2005-2006 Organic Chemistry Laboratory Teaching Assistant, Indiana Wesleyan University
2007 Organic Chemistry Discussion Course Leader, Chem 210, University of Michigan
2008 Organic Chemistry Laboratory Instructor, Chem 211, University of Michigan
2009 Chemical Biology Teaching Assistant, ChemBio 502, University of Michigan
2014-2015 Visiting Assistant Professor of Chemistry, CHE110, CHE125L and CHE226,
Indiana Wesleyan University
2015-present Assistant and Associate Professor of Chemistry, CHE110, CHE125, CHE125L, CHE126L,
CHE235, CHE235L, CHE236, CHE236L, CHE330, and CHE350
Indiana Wesleyan University

University Service

2007 – 2011 Life Sciences Institute NMR Core Committee – supervision and maintenance of
University of Michigan 400 and 500 MHz NMR

2016 – 2018 Enrollment Management Committee – Indiana Wesleyan University

2017 – 2019 John Wesley Honors College Committee – Indiana Wesleyan University

2015 – Present Indiana Wesleyan Science Club Sponsor

2018-Present NSF Grant Panel Reviewer

2019- 2021 Engineering Taskforce

2017-2023 co-Director Hodson Research Institute

2015- Present co-PI/PI of three NSF S-STEM awards

2023-2024
2024-Present

University Instructional Technology Council
Student Success Committee

Grants and Awards

Rural Low Income Student Investigations Network Groups: Researching Belonging in STEM, Community, and Higher Education

Directorate for STEM Education (Alexandria) 2024-10-01 to 2029-09-30|Grant

GRANT_NUMBER: 2426451 Funding Amount: \$193,940

Role: PI

Connecting Science Identity to STEM Success at a Rural Primarily Undergraduate Institution Propelled by an Evidence-Based First Year Experience

Directorate for STEM Education (Alexandria) 2021-12-01 to 2027-11-30|Grant

GRANT_NUMBER: 2130078 Funding Amount: \$1,338,895

Role: PI

Scholarships for Boosting the Scientific Workforce in Rural Central Indiana

Directorate for STEM Education (Alexandria) 2015-09-01 to 2022-08-31|Grant

GRANT_NUMBER: 1458331 Funding Amount: \$623,337

Role: Co-PI

Investigation of the catalytic and non-catalytic roles of Src family kinases in oncogenic systems

National Cancer Institute (Bethesda) 2013-04-01 to 2014-08-01|Grant

GRANT_NUMBER: F32CA174346 Funding Amount: \$68,455

Role: Awardee

Co-director of NSF S-STEM AWARD

2015-2023

Ott Faculty Award in Math and Science

2018

American Chemical Society Division of Chemical Education Travel Grant

2019

Active Learning in Organic Chemistry Workshop

2022

Faculty Learning Community on The Science of Teaching and Learning

2022-2023

Faculty Learning Community on Green Chemistry

2024-2025

RISING Network Group leader

2025-Present

Peer-Reviewed Publications and Reviews

Research papers:

1. KG Reddie, YH Seo, WB Muse III, *SE Leonard*, KS Carroll 2009 A chemical approach for detecting sulfenic acid-modified proteins in living cells **Mol. BioSyst.** 4 (6), 521-531
2. *SE Leonard*, KG Reddie, KS Carroll 2009 Mining the thiol proteome for sulfenic acid modifications reveals new targets for oxidation in cells **ACS Chemical Biology** 4 (9), 783-799
3. M Depuydt, *SE Leonard*, D Vertommen, K Denoncin, P Morsomme, K Wahni, Joris Messens, Kate S Carroll, Jean-François Collet 2009 A periplasmic reducing system protects single cysteine residues from oxidation **Science** 326 (5956), 11092009
4. *SE Leonard*, FJ Garcia, DS Goodsell, KS Carroll 2011 Redox Based Probes for Protein Tyrosine Phosphatases **Angewandte Chemie International Edition** 50 (19), 4423-44272011
5. CE Paulsen, TH Truong, FJ Garcia, A Homann, V Gupta, *SE Leonard*, KS Carroll 2012 Peroxide-dependent sulfenylation of the EGFR catalytic site enhances kinase activity **Nature Chemical Biology** 8 (1), 57-64
6. TJ Barrett, DI Pattison, *SE Leonard*, KS Carroll, MJ Davies, CL Hawkins 2012 Inactivation of thiol-dependent enzymes by hypothiocyanous acid: role of sulfenyl thiocyanate and sulfenic acid intermediates **Free Radical Biology and Medicine** 52(6):1075-85
7. R Kishnamurthy, JL Brigham, *SE Leonard*, P Ranjitkar, ET Larson, EJ Dale, EA Merritt, DJ Maly 2013 Active site profiling reveals coupling between domains in SRC-family kinases. **Nature Chemical Biology** 9 (1), 43-50.
8. SB Hari, BGK Perera, *SE Leonard* DJ Maly 2013 Investigating inactive conformations of protein kinases **The FASEB Journal** 27, 042.1
9. RSR Vidadala, KK Ojo, SM Johnson, ZZ Zhang, *SE Leonard*, A Mitra, AC Reid, KR Keyloun, AMW Fox, M Kennedy T Silver-brace JCC Hume, S Kappe C Verlidine, E Fan, EA Merritt, WC Van Voorhis, DJ Maly 2014 Development of potent and selective Plasodium falciparum calcium-dependent protein

kinase 4 (pfCDPK4) inhibitors that block the transmission of malaria to mosquitoes. **European Journal of Medicinal Chemistry** 74 (3) 562-573.

10. *SE Leonard*, AC Register, R Krishnamurty, GJ Brighty, DJ Maly 2014 Divergent Modulation of Src-Family Kinase Regulatory Interactions with ATP-Competitive Inhibitors. **ACS Chemical Biology** 9 (8), 1894-1905.
11. AC Register, *SE Leonard*, DJ Maly 2014 SH2-Catalytic Domain Linker Heterogeneity Influences Allosteric Coupling Across the SFK Family. **Biochemistry** 53 (44), 6910-6923.
12. GJ Crowther *et al.* Biochemical Screening of Five Protein Kinases from Plasmodium falciparum against 14,000 Cell-Active Compounds. **PloS one** 11 (3),
13. Devers, C., Devers, E., Alayan, A., Deeter, C., Johnson, A., Echeverry, S., Tompkin, N., Tripp, S. & *Leonard, SE.* (2020). Supporting Student Success: Implementing Evidence-Based Approaches using Text Messaging. In T. Bastiaens & G. Marks (Eds.), Proceedings of Innovate Learning Summit 2020 (pp. 660-666). Association for the Advancement of Computing in Education (**AACE**).
14. Devers, C., Devers, E., Alayan, A., Echeverry, S., Uros-Yarid, A., Robertson, J., Baquet, Z., Heavner, S., Ruiz, R., Miller, P., Ho, N., Davis, K., Johnson, A., Deeter, C., Tripp, S. & *Leonard, SE.* (2021). The Impact of Text Message Quizzing on Course Performance in General Chemistry. In T. Bastiaens (Ed.), *Proceedings of Innovate Learning Summit 2021* (pp. 515-522). Online, United States: Association for the Advancement of Computing in Education (**AACE**).

Reviews

15. *SE Leonard*, KS Carroll 2011 Chemical 'omics' approaches for understanding protein cysteine oxidation in biology **Current Opinion in Chemical Biology** 15 (1), 88-102.

Selected Presentations

1. "Mining the Thiol Proteome for Sulfenic Acid Modifications Reveals New Targets for Oxidation in Cells." *SE Leonard*, KG Reddie, KS Carroll; Poster; Gordon Research Conference: Thiol-Based Redox Regulation & Signaling, Lucca, Italy May 2010.
2. Investigation of the catalytic and non-catalytic roles of Src family kinases in oncogenic cells. *SE Leonard*, AC Register DJ Maly. Poster; Gordon Research Conference: Bioorganic Chemistry, Andover, NH June 2012
3. Invited Speaker at Discussion Panel workshop "Career Opportunities at Primarily Undergraduate Institutions" NIH-supported Chemistry-Biology Interface (CBI) Career Development Conference 2016.
4. Invited Speaker at Discussion Panel at graduate chemistry workshop, Teaching at a Religious PUI. 2021.
5. CJ Devers, EE Devers, A Alayan, C Deeter, A Johnson, S Escheverry, N Tompkin, S Tripp, and *SE Leonard*, Supporting student success: implementing evidence-based approaches using text messaging. International Journal on E-Learning, 2020 (pp. xx-xx) Chesapeake, VA AACE.