

Scotland Farley

Lewiston, ME

Phone: (404) 937-0017 | E-Mail: e.scotland.farley@gmail.com

EDUCATION

Reed College (Portland, OR) 2009-2013

B. A., Chemistry

Thesis: "Three Stereocenters, One Product: A Computational Study of A Stereoselective Amine-Catalyzed Diels-Alder Reaction"

Oregon Health & Science University (Portland, OR) 2016-2023

Ph. D., in Chemical Biology and Biochemistry

Thesis: "Disentangling the web: the synthesis of functional lipid probes to study metabolic rewiring in RNA virus infection"

RESEARCH EXPERIENCE

Oregon Health and Science University 2023-2024

Postdoctoral fellow with Dr. Fikadu Tafesse, Molecular Microbiology and Immunology department, and Dr. Carsten Schultz, Chemical Physiology and Biochemistry department

Lipid chemical biology of (+)-stranded RNA virus infection

- Wrote and published two manuscripts about the synthesis of novel functional lipid probes: trifunctional sphinganine and various fatty acid derivatives
- Synthesized functional probes based on ceramide

Oregon Health and Science University 2016-2023

Ph. D Candidate with Dr. Carsten Schultz, Chemical Physiology and Biochemistry department, and Dr. Fikadu Tafesse, Molecular Microbiology and Immunology Department

Lipid chemical biology of (+)-stranded RNA virus infection

- Synthesized diazirine-and-alkyne-functionalized probes based on palmitic acid, sphinganine, and sphingosine
- Characterized global changes in the host lipidome in response to SARS-CoV-2 infection using tandem mass spectrometry
- Used functional lipid probes to characterize how lipid-protein interactions change during SARS-CoV-2, ZIKV, and DENV-2 infection

Reed College

September 2012 - May 2013

Thesis student with Dr. Alan Shusterman, Chemistry department

Computational modeling of stereoselectivity

- Used Spartan modeling software to model the energies of enamine transition states in a stereoselective Diels-Alder reaction catalyzed by a proline-based organocatalyst

Reed College

May - September 2011

Research Assistant for Dr. Arthur Glasfeld, Chemistry department

Spectroscopic investigation of metal-binding bacterial proteins

- Purified the bacterial metalloregulatory protein mntR by affinity chromatography
- Characterized metal binding to mntR by UV/Vis spectroscopy and isothermal titration calorimetry
- Characterized DNA binding to mntR by fluorescence anisotropy

TEACHING EXPERIENCE

Bates College

Academic year 2024-2025

Visiting Assistant Professor, department of Chemistry and Biochemistry

- Introductory biochemistry lecture and lab (Chem 321), fall
- Introductory biochemistry lab (Chem 322) and Biochemistry of Virus Replication lecture (Chem 304), winter

University of Portland

Fall 2023

Adjunct Professor, department of Chemistry and Biochemistry

- Taught one section (15 students) of Biochemistry I lab (Chemistry 471C)
- This involved writing and delivering lab lectures for basic biochemistry techniques (quantitation of protein concentration by Bradford assay; isolation, purification, and enzymatic analysis of a plant peroxidase; analysis of proteins by western blot), safely facilitating laboratory experiments
- There was a focus on teaching scientific writing around one lab report, formatted like a standard research paper; this involved facilitating writing practice throughout the semester, and a peer review session
- Evaluated student performance, via lab notebooks and lab reports

Oregon Health and Science University

Fall 2023

Lecturer, Chemical Biology innovators (BMSC666)

- Wrote and delivered a lecture on the photochemistry of diazirine photoaffinity labels and their use in biological systems. Led classroom discussion around the design of experiments using diazirine-based photoaffinity labeling

Oregon Health and Science University

September - December 2018

Teaching Assistant, Bioregulation

- Designed and ran regular review sessions for first-year PhD students in the core Bioregulation course (covering aspects of the regulation of protein expression at the genetic, epigenetic, transcriptional, and translational level)

Peace Corps Mozambique

September 2013 - December 2015

High school math teacher (2014 and 2015)

- Taught 8th grade mathematics in the Mozambican public school system in the village of Panda, Inhambane, managing five classes of 45-65 students each. This involved designing lesson plans, evaluations, and exams, and managing grades and logistics by hand. All classes were conducted in Portuguese.

Science fair coordinator (2014 and 2015)

- Mozambique organizes a yearly science fair where students compete at the district, then provincial, then national level.
- In 2014, hosted an after-school science club to coach interested students in designing and thinking through their own science fair experiments. Also ran the district science fair in Panda, which involved planning and executing the event, finding local science teachers to serve as judges, and managing funds from Ministry of Science and Technology.
- In 2015, in addition to continuing the science club and running the Panda district science fair, also helped to run the provincial science fair for the Province of Inhambane, along with a local representative from the Ministry of Science and Technology. This involved both logistical support, and also designing and executing a workshop for chemistry teachers in attendance for practical science demonstrations to be used in their classrooms using local materials.

Secondary projects (2015)

- Grassroots Soccer (2015) — Grassroots Soccer is an curriculum developed by public health experts in South Africa which incorporates public health education into soccer-based games (focusing on HIV / AIDS, safe sex, and malaria prevention). The high school PE teacher in Panda and I went to the Grassroots Soccer training in Mozambique, after which the PE teacher incorporated the curriculum into his PE classes and I provided logistical support (mostly NGO-grant-related reporting paperwork).
- Math club (2015) — I designed an after-school math/logic club for interested 8th grade students using puzzles and games to sharpen math-adjacent skills that the classroom curriculum did not emphasize, such as spatial reasoning, logic, and word problems.

Reed College

August 2012 - May 2013

Tutor, Statistical Thermodynamics

- Was a resident tutor in the chemistry department as a resource for 1-on-1 assistance for students in the Statistical Thermodynamics course

PUBLICATIONS

Farley, S. E., Kyle, J. E., Jahn, H., Bramer, L. M., Piehowski, P. D., Shepmoes, A. A., Kaiser, B. L., Williams, S. M., Eder, J. G., Schultz, C., Tafesse, F. G. Integrated lipidomic and proteomic profiling reveals metabolic network disruption by SARS-CoV-2 variants. *J Lipid Res* **2025**, 66 (8): 100860. (PMID: 40659247)

Thomas, A., Müller, R., **Farley, S. E.**, Kojic, A., Stein, F., Haberkant, P., Schultz, C. Trifunctional lipid derivatives: PE's mitochondrial interactome. *Chem Commun* **2025**, 61, 2564-2567. (PMID: 39817617)

Farley, S. E., Hashimoto, R., Evangelista, J., Stein, F., Haberkant, P., Kikuchi, K., Tafesse, F. G., Schultz, C. Trifunctional fatty acid derivatives: the impact of diazirine placement. *Chem Commun* **2024**, 60 (52), 6651-6654. (PMID: 38856656)

Farley, S. E., Stein, F., Haberkant, P., Tafesse, F. G., Schultz, C. Trifunctional sphinganine: a new tool to dissect sphingolipid function. *ACS Chem Biol* **2024**, 19 (2), 336-347 (PMID: 38284972)

Guzman, G., Creek, C., **Farley, S. E.**, Tafesse, F. G. Genetic Tools for Studying the Roles of Sphingolipids in Viral Infections. *Methods Mol Biol* **2023**, 2610, 1-16. (PMID: 36534277)

Farley, S.E., Thomas, A., Laguerre, A., Schultz, C. Chapter 11: Chemical Biology of Lipids. In textbook: *Advanced Chemical Biology*. Eds. Hang, H. C., Pratt, M. R., Prescher, J. A. Wiley 2023.

Van Breemen, R. B., Muchiri, R. N., Bates, T. A., Weinstein, J. B., Leier, H. C., **Farley, S. E.**, Tafesse, F. G. Cannabinoids block cellular entry of SARS-CoV-2 and the emerging variants. *Journal of Natural Products* **2022**, 85 (1), 176-184. (PMID 35007072).

Schultz, C., **Farley, S. E.**, Tafesse, F. G. "Flash & Click": Multifunctionalized lipid derivatives as tools to study viral infections. *Journal of the American Chemical Society* **2022**, 144 (31):13987-13995. (PMID: 35900117)

Farley, S. E., Kyle, J. E., Leier, H. C., Bramer, L. M., Weinstein, J., Bates, T. A., Lee, J-Y., Metz, T. O., Schultz, C., Tafesse, F. G. A global lipid map reveals host dependency factors conserved across SARS-CoV-2 variants. *Nature Communications* **2022**, 13 (1): 3487 (PMID: 35715395)

Farley, S. E., Laguerre, A., Schultz, C. Caged lipids for subcellular manipulation. *Current Opinion in Chemical Biology* **2021**; 65: 42-48. (PMID: 34119744)

Bates, T. A., Weinstein, J. B., **Farley, S. E.**, Leier, H. C., Messer, W. B., Tafesse, F. G. Cross-reactivity of SARS-CoV structural protein antibodies against SARS-CoV-2. *Cell Reports* **2021**, 34 (7): 108737. (PMID: 33545052)

CONFERENCE PRESENTATIONS

Farley, S.E., Schultz, C. *Functional sphingolipids: a toolkit to investigate single lipid species*. Poster presentation at: Chemical Biology and Physiology Conference. 10-13 December, 2017. Portland, Oregon.

Farley, S.E. Leier, H., Tafesse, F. G., Schultz, C. *Investigation the role of sphingolipids in flaviviral pathogenesis using functional lipid probes*. Poster presentation at: Glycolipid and Sphingolipid Biology Gordon Research Conference. 11-16 February, 2018. Galveston, Texas.

Farley, S. E. *Synthesis and application of multifunctional sphingolipid derivatives*. Poster presentation at: FEBS Special Meeting in Sphingolipid Biology. 6-10 May 2019. Cascais, Portugal.

Farley, S. E. *Synthesis and application of multifunctional lipid derivatives*. Poster presentation at: Regional meeting for the American Chemical Society. 16-20 June, 2019. Portland State University, Portland, OR.

Farley, S. E. *Synthesis and application of multifunctional lipid derivatives*. Poster presentation at: Chemical Biology and Physiology Conference. 12-15 December, 2019. Oregon Health and Science University, Portland, OR.

Farley, S. E., Kyle, J. E., Leier, H. C., Bramer, L. M., Weinstein, J., Bates, T. A., Lee, J-Y., Metz, T. O., Schultz, C., Tafesse, F. G. *Exploring the roles of host lipids during SARS-CoV-2 infection*. Short talk at: Chemical Biology and Physiology Conference. April 28 - May 1, 2022. Oregon Health and Science University, Portland, OR.