

ERANTHIE WEERAPANA

Department of Chemistry
Boston College
Merkert Chemistry Center, Room 214A
2609 Beacon Street
Chestnut Hill, MA 02467-3860
E-mail: eranthie@bc.edu
Tel: 617-552-2931
<https://sites.bc.edu/eranthie-weerapana/>

Education

2006 Ph.D. in Chemistry
 Massachusetts Institute of Technology, Cambridge, MA

2000 B.S. in Chemistry, *Cum Laude* with Honors
 Yale University, New Haven, CT

Employment

2021- Professor, Department of Chemistry, Boston College
2016-2021 Associate Professor, Department of Chemistry, Boston College
2010-2016 Assistant Professor, Department of Chemistry, Boston College

Research Experience

2006-2010 Postdoctoral Research Assistant (Pfizer postdoctoral fellowship)
 The Scripps Research Institute, La Jolla, CA
 Advisor: Professor Benjamin F. Cravatt

2000-2006 Graduate Research Assistant
 Massachusetts Institute of Technology, Cambridge, MA
 Advisor: Professor Barbara Imperiali
 Thesis: Investigating asparagine-linked protein glycosylation in eukaryotic and
 prokaryotic systems

1997-2000 Undergraduate Research Assistant
 Yale University, New Haven, CT
 Advisors: Professors David. J. Austin and Andrew D. Hamilton

Awards

2022 Allen Distinguished Investigator, Paul G. Allen Frontiers Group
2022 Boston College Graduate School; Teaching and Mentoring Award
2020 Ono Pharma Breakthrough Science Initiative Award
2020 NIH Maximizing Investigators' Research Award (MIRA; R35)
2012 Damon Runyon-Rachleff Innovation Award
2011 Smith Family Award for Excellence in Biomedical Sciences
2008-2010 Pfizer Postdoctoral Fellow (The Scripps Research Institute)

Teaching Experience

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| • Fall 2010/2011/2012 | Chemistry 560: Principles of Chemical Biology |
| • Spring 2012/2013/2014 | Chemistry 562: Biochemistry II |
| • Fall 2013/2019/2020 Spring 2022/2023 | Chemistry 5567: Chemical Biology: Structure and Function |
| • Fall 2015/2016/2017/2021/2022 | Chemistry 4461: Biochemistry I |
| • Spring 2017/2018/2024 | Chemistry 2242: Honors Organic Chemistry II |
| • Spring 2020 | Chemistry 5582: Advanced Topics in Biochemistry |
| • Spring 2021, 2022 | Chemistry 6612: Scientific Communications II |

Publications (* denotes corresponding author; undergraduate co-authors are underlined)

Boston College

1. Osterberg MK, Bak DW, Andreini C, Kim M, Critchlow JM, Trinidad JC, Cornish PV, Akizuki T, Chazin WJ, Skaar EP, **Weerapana E***, Giedroc DP*. Exploring Metalloproteome Remodeling in Calprotectin-Stressed *Acinetobacter baumannii* Using Chemoproteomics. *ACS Chem Biol.* 2025 Nov 21;20(11):2808-2826.
2. Mann SA, Barasa L, Thompson PR*, **Weerapana E***. Development of a Chemoproteomic Platform to Identify Sites of (Homo)citrullination within Complex Proteomes. *ACS Chem Biol.* 2025 Nov 21;20(11):2741-2754.
3. Sherman JW, Rask GC, Xiong B, Tokarsky EJ, Dreher RD, Weinglass A, Hayes C, Duncan A, **Weerapana E**, Theisen ER*. *N*-(1-Phenylethylidene)benzohydrazide Cytotoxicity Is Lysine-Specific Demethylase 1 Independent and Linked to Iron-Sulfur Cluster Disruption in Ewing Sarcoma. *ACS Pharmacol Transl Sci.* 2025 Oct 23;8(11):4038-4054.
4. Loynd C, Singha Roy SJ, Canarelli SE, Bak DW, Sundaresh B, Babbitz Z, van Opijnen T, **Weerapana E***, Chatterjee A*. Cell-selective multiplexed bioorthogonal noncanonical amino acid tagging for nascent proteomics. *Nat Chem Biol.* 2025 Oct 2. doi: 10.1038/s41589-025-02039-3.
5. Brake J, Hanna DA, Kumar R, Peng Q, Landry AP, Singhal R, **Weerapana E**, Shah YM, Banerjee R*. Hydrogen sulfide increases intracellular oxygen and regulates the HIF response. *bioRxiv [Preprint].* 2025 Jul 24:2025.07.24.666576. doi: 10.1101/2025.07.24.666576. PMID: 40777462; PMCID: PMC12330667.
6. Peng Q, **Weerapana E***. Profiling Ligand-Induced Changes in Nuclear Localization Using Proximity Labeling-Coupled Chemoproteomics. *Methods Mol Biol.* 2025;2921:73-91.
7. Jackson PA, Kisty E, Pradhan V, Swank C, Bohrer L, Nolan TL, **Weerapana E***, Lapinsky DJ*. Appendage- and Scaffold-Diverse Electrophilic and Photoreactive Probes for Integrated Phenotypic Screening-Target Identification Campaigns via a Minimalist Bifunctional Isocyanide. *ACS Omega.* **2024** Oct 2;9(41):42557-42570.
8. Bak DW*, **Weerapana E***. Proteomic strategies to interrogate the Fe-S proteome. *Biochim Biophys Acta Mol Cell Res.* **2024** Oct;1871(7):119791.

9. Zhang M, Chapman M, Sarode BR, Xiong B, Liang H, Chen JK*, **Weerapana E***, Morken JP*. Catalytic asymmetric synthesis of meta benzene isosteres. *Nature*. **2024** Sep;633(8028):90-95.
10. Fisher CE, Bak DW, Miller KE, Washington-Hughes CL, Dickfoss AM, **Weerapana E**, Py B, Outten FW. Escherichia coli monothiol glutaredoxin GrxD replenishes Fe-S clusters to the essential ErpA A-type carrier under low iron stress. *J Biol Chem*. **2024** Aug;300(8):107506.
11. Hill CJ, Datta S, McCurtin NP, Kimball HZ, Kingsley MC, Bayer AL, Martin AC, Peng Q, **Weerapana E**, Scheck RA*. A Modular Turn-On Strategy to Profile E2-Specific Ubiquitination Events in Living Cells. *Angew Chem Int Ed Engl*. **2024** Mar 22;63(13):e202319579.
12. Loynd C, Singha Roy SJ, Ovalle VJ, Canarelli SE, Mondal A, Jewel D, Ficarella ED, **Weerapana E**, Chatterjee A*. Electrochemical labelling of hydroxyindoles with chemoselectivity for site-specific protein bioconjugation. *Nat Chem*. **2024** Mar;16(3):389-397.
13. Peng Q, **Weerapana E*** Profiling nuclear cysteine ligandability and effects on nuclear localization using proximity labeling-coupled chemoproteomics. *Cell Chem Biol*. **2024** Mar 21;31(3):550-564.e9.
14. Falco JA, Wynia-Smith SL, McCoy J, Smith BC, Weerapana E. Identification of Protein Targets of S-Nitroso-Coenzyme A-Mediated S-Nitrosation Using Chemoproteomics. *ACS Chem Biol*. **2024** Jan 19;19(1):193-207.
15. Chan AN, Chen X, Falco JA, Bak DW, **Weerapana E***, Li B*. Chemoproteomics Reveals Disruption of Metal Homeostasis and Metalloproteins by the Antibiotic Holomycin. *ACS Chem Biol.*, **2023**, 18, 1909-1914.
16. Liu C, Liu X, Zhou M, Xia C, Lyu Y, Peng Q, Soni C, Zhou Z, Su Q, Wu Y, **Weerapana E**, Gao J, Chatterjee A, Lin C, Niu J*. Fluorosulfate as a Latent Sulfate in Peptides and Proteins. *J Am Chem Soc.*, **2023**, 145, 20189-20195.
17. Kisty EA, Saart EC, **Weerapana E***. Identifying Redox-Sensitive Cysteine Residues in Mitochondria. *Antioxidants*, **2023**, 12, 992.
18. Singha Roy SJ, Loynd C, Jewel D, Canarelli SE, Ficarella ED, Pham QA, **Weerapana E**, Chatterjee A*. Photoredox-Catalyzed Labeling of Hydroxyindoles with Chemoselectivity (PhotoCLIC) for Site-Specific Protein Bioconjugation. *Angew Chem Int Ed Engl*. **2023**, 62, e202300961.
19. Kisty EA, Falco JA, **Weerapana E***. Redox proteomics combined with proximity labeling enables monitoring of localized cysteine oxidation in cells. *Cell Chem Biol.*, **2023**, 30, 321-336.e6.
20. Bak DW, **Weerapana E***. Monitoring iron-sulfur cluster occupancy across the E. coli proteome using chemoproteomics. *Nat Chem Biol*. **2023**, 19, 356-366.
21. Bennis HJ, Storch M, Falco JA, Fisher FR, Tamaki F, Alves E, Wincott CJ, Milne R, Wiedemar N, Craven G, Baragaña B, Wyllie S, Baum J, Baldwin GS, **Weerapana E**, Tate EW, Child MA*. CRISPR-based oligo recombineering prioritizes apicomplexan cysteines for drug discovery. *Nat Microbiol*. **2022**, 7, 1891-1905.

22. Maurais A, **Weerapana E***. A peptide-crosslinking approach identifies HSPA8 and PFKL as selective interactors of an actin-derived peptide containing reduced and oxidized methionine. *RSC Chem. Biol.*, **2022**, 3, 1282-1289.
23. Perez M, Nance KD, Bak DW, Thalalla Gamage S, Najera SS, Conte AN, Linehan WM, **Weerapana E**, Meier JL*. Conditional Covalent Lethality Driven by Oncometabolite Accumulation. *ACS Chem Biol.* **2022**, 17, 2789-2800.
24. Nasuhidehnavi A, Zhao Y, Punetha A, Hemphill A, Li H, Bechtel TJ, Rager T, Xiong B, Petrou VI, Gubbels MJ, **Weerapana E**, Yap GS*. A Role for Basigin in Toxoplasma gondii Infection. *Infect Immun.* **2022**, 90, e0020522.
25. Engelberg K, Bechtel T, Michaud C, **Weerapana E**, Gubbels MJ*. Proteomic characterization of the Toxoplasma gondii cytokinesis machinery portrays an expanded hierarchy of its assembly and function. *Nat Commun.* **2022**, 13, 4644.
26. Canarelli SE, Swalm BM, Larson ET,* Morrison MJ,* **Weerapana E***. Monitoring GAPDH activity and inhibition with cysteine-reactive chemical probes. *RSC Chem Biol.* **2022**, 3, 972-982.
27. Kovalyova Y, Bak DW, Gordon EM, Fung C, Shuman JHB, Cover TL, Amieva MR, **Weerapana E**, Hatzios SK*. An infection-induced oxidation site regulates legumain processing and tumor growth. *Nat Chem Biol.* **2022**, 18, 698-705.
28. Bak DW*, **Weerapana E***. Chemoproteomic interrogation of selenocysteine by low-pH isoTOP-ABPP. *Methods Enzymol.* **2022**, 662, 187-225.
29. Peeler JC*, **Weerapana E***. Expression of selenoproteins via genetic code expansion in mammalian cells. *Methods Enzymol.* **2022**, 662, 143-158.
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31. Griffante G, Gugliesi F, Pasquero S, Dell'Oste V, Biolatti M, Salinger AJ, Mondal S, Thompson PR, **Weerapana E**, Lebbink RJ, Soppe JA, Stamminger T, Girault V, Pichlmair A, Oroszlán G, Coen DM, De Andrea M, Landolfo S. Human cytomegalovirus-induced host protein citrullination is crucial for viral replication. *Nat Commun.* **2021**, 2, 3910.
32. Tagoe DNA, Drozda AA, Falco JA, Bechtel TJ, **Weerapana E**, Gubbels MJ. Ferlins and TgDOC2 in Toxoplasma Microneme, Rhoptry and Dense Granule Secretion. *Life*, **2021**, 11, 217.
33. Isor A, Chartier BV, Abo M, Currens ER, **Weerapana E**, McCulla RD.* Identifying cysteine residues susceptible to oxidation by photoactivatable atomic oxygen precursors using a proteome-wide analysis. *RSC Chem. Biol.*, **2021**, 2, 577-591.
34. Perez M, Bak DW, Bergholtz SE, Crooks DR, Arimilli BS, Yang Y, **Weerapana E**, Linehan WM, Meier JL*. Heterogeneous adaptation of cysteine reactivity to a covalent oncometabolite. *J Biol Chem.*, **2020**, 295,13410-13418.

35. Dey M, **Weerapana E**. Chemical Tools in Biological Discovery (Editorial). *Cell Chem Biol.*, **2020**, 27, 889-890.
36. Generation of Recombinant Mammalian Selenoproteins through Genetic Code Expansion with Photocaged Selenocysteine. Peeler JC, Falco JA, Kelemen RE, Abo M, Edinger LC, Chen J, Chatterjee A*, **Weerapana E***. *ACS Chemical Biology*, **2020**, 19, 1535-1540.
37. Gibberellin JRA-003: A Selective Inhibitor of Nuclear Translocation of IKK α . Annand JR, Henderson AR, Cole KS, Maurais AJ, Becerra J, Liu Y, **Weerapana E**, Koehler AN, Mapp AK, Schindler CS*. *ACS Med. Chem. Lett.*, **2020**, 11, 1913-1918.
38. Keller LJ, Lentz CS, Chen YE, Metivier RJ, **Weerapana E**, Fischbach M, Bogoy M*. Characterization of serine hydrolases across clinical isolates of commensal skin bacteria *Staphylococcus epidermidis* using activity-based protein profiling. *ACS Infect. Dis.*, **2020**, 6, 930-938.
39. Italia JS, Peeler JC, Hillenbrand CM, Latour C, **Weerapana E**, Chatterjee A*. Genetically encoded protein sulfation in mammalian cells. *Nat. Chem. Biol.* **2020**, 16, 379-382.
40. Salinger AJ, Dubuke ML, Carmona-Rivera C, Maurais AJ, Shaffer SA, **Weerapana E**, Thompson PR*, Kaplan MJ*. Technical comment on "Synovial fibroblast-neutrophil interactions promote pathogenic adaptive immunity in rheumatoid arthritis". *Sci. Immunol.*, **2020**, 5, 5672.
41. Yoo E, Schulze CJ, Stokes BH, Onguka O, Yeo T, Mok S, Gnädig NF, Zhou Y, Kurita K, Foe IT, Terrell SM, Boucher MJ, Cieplak P, Kumpornsin K, Lee MCS, Linington RG, Long JZ, Uhlemann AC, **Weerapana E**, Fidock DA, Bogoy M*. The Antimalarial Natural Product Salinipostin A Identifies Essential α/β Serine Hydrolases Involved in Lipid Metabolism in *P. falciparum* Parasites. *Cell Chem Biol.*, **2020**, 27, 143-157.
42. Bechtel TJ, Li C, Kisty EA, Maurais AJ, **Weerapana E***. Profiling cysteine reactivity and oxidation in the endoplasmic reticulum. *ACS Chem Biol.*, **2020**, 15, 543-553.
43. Sun B, Chang HH, Salinger A, Tomita B, Bawadekar M, Holmes CL, Shelef MA, **Weerapana E**, Thompson PR, Ho IC* Reciprocal regulation of Th2 and Th17 cells by PAD2-mediated citrullination. *JCI Insight*. **2019**, 4, 129687.
44. Peeler JC, **Weerapana E***. Chemical Biology Approaches to Interrogate the Selenoproteome. *Acc Chem. Res.* **2019**, 52, 2832-2840.
45. Engelberg K, Chen CT, Bechtel T, Sánchez Guzmán V, Drozda AA, Chavan S, **Weerapana E**, Gubbels MJ*. The apical annuli of *Toxoplasma gondii* are composed of coiled-coil and signalling proteins embedded in the inner membrane complex sutures. *Cell Microbiol.* **2019**, e13112.
46. Hoffman KS, Vargas-Rodriguez O, Bak DW, Mukai T, Woodward LK, **Weerapana E**, Söll D, Reynolds NM*. A cysteinyl-tRNA synthetase variant confers resistance against selenite toxicity and decreases selenocysteine misincorporation. *J. Biol. Chem.*, **2019**, 294, 12855-12865.
47. Mondal S, Gong X, Zhang X, Salinger AJ, Zheng L, Sen S, **Weerapana E**, Zhang X, Thompson PR*. Halogen Bonding Increases the Potency and Isozyme Selectivity of Protein Arginine Deiminase 1 Inhibitors. *Angew. Chem. Int. Ed. Engl.* **2019**, 58, 12476-12480.

48. Sorvillo N, Mizurini DM, Coxon C, Martinod K, Tilvawala R, Cherpokova D, Salinger AJ, Seward RJ, Staudinger C, **Weerapana E**, Shapiro NI, Costello CE, Thompson PR, Wagner DD*. Plasma Peptidylarginine Deiminase IV Promotes VWF-Platelet String Formation and Accelerates Thrombosis After Vessel Injury. *Circ. Res.*, **2019**, 125, 507-519.
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50. Libiad M, Vitvitsky V, Bostelaar T, Bak DW, Lee HJ, Sakamoto N, Fearon ER, Lyssiotis CA, **Weerapana E**, Banerjee R*. Hydrogen sulfide perturbs mitochondrial bioenergetics and triggers metabolic reprogramming in colon cells. *J Biol Chem.*, **2019**, 294, 12077-12090.
51. Morimoto K, Cole KS, Kourelis J, Witt CH, Brown D, Krahn D, Stegmann M, Kaschani F, Kaiser M, Burton J, Mohammed S, Yamaguchi-Shinozaki K, **Weerapana E**, van der Hoorn RAL*. Triazine probes targeting ascorbate peroxidases in plants. *Plant Physiol.*, **2019**, 180, 1848-1859.
52. Llabani E, Hicklin RW, Lee HY, Motika SE, Crawford LA, **Weerapana E**, Hergenrother PJ*. Diverse compounds from pleuromutilin lead to a thioredoxin inhibitor and inducer of ferroptosis. *Nat Chem.*, **2019**, 11, 521-532.
53. Bak DW, **Weerapana E***. Interrogation of Functional Mitochondrial Cysteine Residues by Quantitative Mass Spectrometry. *Methods Mol Biol.*, **2019**, 1967, 211-227.
54. Maurais AJ, **Weerapana E***. Reactive-cysteine profiling for drug discovery. *Curr. Opin. Chem. Biol.* **2019**, 50, 29-36.
55. Italia JS, Addy PS, Erickson SB, Peeler JC, **Weerapana E**, Chatterjee A*. Mutually orthogonal nonsense-suppression systems and conjugation chemistries for precise protein labeling at up to three distinct sites. *J. Am. Chem. Soc.* **2019**, 141, 6204-6212.
56. Sen S, Mondal S, Zheng L, Salinger AJ, Fast W, **Weerapana E**, Thompson PR*. Development of a Suicide Inhibition-Based Protein Labeling Strategy for Nicotinamide N-Methyltransferase. *ACS Chem Biol.*, **2019**, 14, 613-618.
57. Kulkarni RA[#], Bak DW[#], Bergholtz SE, Briney CA, Shrimp JH, Alpsoy A, Thorpe AL, Bavari AE, Crooks DR, Levy M, Florens L, Washburn MP, Frizzell N, Dykhuizen EC, **Weerapana E**, Linehan WM, and Meier JL*. A chemoproteomic portrait of the oncometabolite fumarate. *Nat. Chem. Biol.*, **2019**, 15, 391-400.
#These authors contributed equally to this work.
58. Long MJC, Lawson AP, Baggio R, Qian Y, Rozhansky L, Fasci D, El Oualid F, **Weerapana E**, Hedstrom L*. Diarylcarbonates are a new class of deubiquitinating enzyme inhibitor. *Bioorg Med Chem Lett.* **2019**, 29, 204-211.
59. Abo M, **Weerapana E***. Chemical probes for redox signaling and oxidative Stress. *Antioxid Redox Signal.* **2019**, 30, 1369-1386.
60. Bak DW*, Bechtel TJ, Falco JA, **Weerapana E***. Cysteine reactivity across the subcellular universe. *Curr Opin Chem Biol.* **2018**, 48, 96-105.

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64. Bak DW*, Gao J, Wang C, **Weerapana E***. A Quantitative Chemoproteomic Platform to Monitor Selenocysteine Reactivity within a Complex Proteome. *Cell Chem. Biol.*, **2018**, 25, 1157-1167.
65. Lentz CS, Sheldon JR, Crawford LA, Cooper R, Garland M, Amieva MR, **Weerapana E**, Skaar EP, Bogoy M*. Identification of a *S. aureus* virulence factor by activity-based protein profiling (ABPP). *Nat. Chem. Biol.*, **2018**, 14, 609-617.
66. Tilvawala R#, Nguyen SH#, Maurais AJ#, Nemmara VV, Nagar M, Salinger AJ, Nagpal, S, **Weerapana E**, Thompson PR*. The Rheumatoid Arthritis-Associated Citrullinome. *Cell Chem Biol.*, **2018**, 25, 691-704.
#These authors contributed equally to this work.
67. Cole KS, Grandjean JMD, Chen K, Witt CH, O'Day J, Shoulders MD, Wiseman RL, **Weerapana E***. Characterization of an A-Site Selective Protein Disulfide Isomerase A1 Inhibitor. *Biochemistry*. **2018**, 57, 2035-2043.
68. Nemmara VV, Subramanian V, Muth A, Mondal S, Salinger AJ, Maurais AJ, Tilvawala R, **Weerapana E**, Thompson PR*. The Development of Benzimidazole-Based Clickable Probes for the Efficient Labeling of Cellular Protein Arginine Deiminases (PADs). *ACS Chem Biol.* **2018**, 13, 712-722.
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70. Gorelenkova Miller O, Cole KS, Emerson CC, Allimuthu D, Golczak M, Stewart PL, **Weerapana E**, Adams DJ, Mieyal JJ*. Novel chloroacetamido compound CWR-J02 is an anti-inflammatory glutaredoxin-1 inhibitor. *PLoS One*. **2017**, 12, e0187991.
71. Sun BB, Dwivedi N, Bechtel TJ, Paulsen JL, Muth A, Bawadekar M, Li G, Thompson PR, Shelef MA, Schiffer CA, **Weerapana E**, Ho I-C*. Citrullination of NF- κ B p65 promotes its nuclear localization and TLR-induced expression of IL-1 β and TNF α . *Sci Immunol*. **2017**, 2, pii: eaal3062.
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90. Clancy KW, **Weerapana E**, Thompson PR*. Detection and identification of protein citrullination in complex biological systems. *Curr. Opin. Chem. Biol.*, **2016**, 30, 1-6. (Special issue on "Omics")
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100. Martell J, **Weerapana E***. Applications of copper-catalyzed click chemistry in activity-based protein profiling. *Molecules*. **2014**, 19, 1378-1393. (Special issue on "Bioorthogonal Chemistry")
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135. **Weerapana E**, Glover KJ, Imperiali B*. Investigating bacterial N-linked glycosylation: synthesis and glycosyl acceptor activity of the undecaprenyl pyrophosphate-linked bacillosamine. *J. Am. Chem. Soc.*, **2005**, 127, 13766-13767.
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Funding

Active Research Funding

- NIH 1R35GM134964-01 01/2020 – 12/2026 (NCE)
NIH
Role: PI
Developing chemical-proteomic tools to investigate cysteine oxidation
Goals: The goal of this project is to develop and apply chemoproteomic tools to investigate cysteine oxidation in various cellular systems.
- 80093-CH-MUR 08/2022-08/2027
Department of the Army – MURI Award
Role: Multi-PI with Ribbeck and Pate (MIT), Margolis (NYU), Lee and Kaplan (Tufts)
Mucin-mimetic Interventions to Modulate the Gut-Brain Axis
Goals: The major goals of this project are to understand the effects of mucins on the gut microbiome.
- Allen Distinguished Investigator Award 10/2022-10/2026 (NCE)
Paul G. Allen Frontiers Group
Role: Multi-PI with Chatterjee (Boston College)
Controlled labeling of the nascent proteome to track protein lifespan in mammalian cells
Goals: The major goals of this project is to develop chemoproteomic methods to track protein synthesis and degradation in mammalian cells.
- NSF CHE- 2128185 09/2021 - 08/2026 (NCE)
National Science Foundation
Role: Co-PI with Chatterjee and van Opijnen (Boston College))
Bioorthogonal Chemistries Targeting 5-hydroxytryptophan for Biological Discovery and Biologics Development
Goals: To utilize the non-canonical amino acid 5-HTP for nascent proteome labeling.
- NIH R01AI152387 02/2020 - 01/2026
NIH
Role: Collaborator (PI: Gubbels (Boston College))
The Toxoplasma basal complex in cell division
Goals: Apply mass spectrometry to identify proteins within the basal complex of Toxoplasma
- NIH R01AI182086 02/2020 - 01/2026
NIH
Role: Collaborator (PI: Hatzios (Yale))
Chemoproteomic discovery and functional characterization of infection-induced oxidation sites.
Goals: Apply chemoproteomics to determine the role of oxidation in H. pylori infection
- NSF CHE-2344561 03/2024-02/2028
NSF
Role: Collaborator (PI: Outten (University of South Carolina))
Unraveling the novel functions of E. coli GrxD and its BolA and IbaG partners in Fe-S cluster and cell envelope biogenesis
Goals: Apply chemoproteomics to determine the function of GrxD in Fe-S biogenesis

Completed Research Funding

10/23 – 09/2024

Gray Foundation; Role: Collaborator (PI: Hatzios (Yale))

The gut microbiome as an environmental factor shaping the BRCA atlas

08/2020 – 07/2024

Ono Pharma Breakthrough Science Initiative Award; Role: Multi-PI (w/ Jianmin Gao)

Interrogating the cell-surface proteome with covalent phage libraries

01/2020 – 12/2020

NIH 3R35GM134964-01S1; Role: PI

Equipment Supplement for purchase of a QExactiv Plus Mass Spectrometer for proteomics

08/2015-05/2020 (NCE to 2022)

NIH 1R01GM118431-01A1; Role: PI

Investigating cysteine-mediated protein activities in C. elegans

05/2016-04/2021

NIH 1R01GM117004-01; Role: PI

Title: Investigating cysteine PTMs in living cells

07/2019 - 03/2021 (NCE to 2022)

NIH R21AG061640; Role: Collaborator (PI: Hatzios (Yale))

Inhibition of mTOR by a small molecule activator of TSC2

05/2017 – 04/2020 (NCE to 2022)

NIH R21AI128136-01; Role: Collaborator (PI: Gubbels (BC))

Mapping the protein landscape of the Toxoplasma basal complex

06/2016 – 05/2021 (NCE to 2022)

NIH 1R01AI122923-01A1; Role: Collaborator (PI: Gubbels (BC))

The Ca²⁺-sensing machinery operating on exocytosis in Toxoplasma

02/2019-02/2020

Rheos Medicines, Inc, Role: PI

Title: Evaluating cysteine-reactive inhibitor selectivity

02/2016-01/2019

NIH, 1R03AI122042-01, Role: Multi-PI w/ Gubbels, BC

Title: Proteomic mapping of differential secretion in Toxoplasma gondii

08/2017-05/2018

NIH 1R01HL131740-01A1 Role: Collaborator (PI: Ahn, Wayne State University)

Title: Chemical Methods for Dissecting Protein Glutathionylation in Sarcomere

08/2014-01/2017

NIH, 1R01GM110394, Role: Collaborator (PI: Paul Thompson; UMass Medical School)

Title: Identification of citrullinated biomarkers of inflammatory disease and cancer

12/2011-08/2015

The Medical Foundation, Role: PI

Smith Family Awards Program for Excellence in Biomedical Research

Title: Activity-based proteomic approaches to investigate aging in C. elegans

01/2012-06/2015

Damon Runyon Innovation Award, Role: PI

Damon Runyon Cancer Research Foundation

Title: Targeting reactive cysteine residues for cancer therapy

05/2012-01/2015

Pfizer Collaborative Grant, Role: PI

Pfizer, Inc.

Title: Activity-based proteomic approaches to investigate metabolic diseases

Invited Lectures

1. Welch Symposium, Houston, TX (October 2025)
2. Abbvie, Worcester, MA (virtual September 2025)
3. ASBMB, Chicago, IL (April 2025)
4. ABPP 2025, London, UK (April 2025)
5. New York University, Novartis Symposium, New York, NY (March 2025)
6. Rowland Institute, Harvard, Cambridge, MA (February 2025)
7. Watanabe Symposium, Indiana University, Bloomington, IN (September 2024)
8. University of Pittsburgh, Pittsburgh, PA (May 2024)
9. Janelia Conference on "Chemical Tools for Complex Biological Systems III", Ashburn, VA (April 2024)
10. Covalent Drug Discovery Summit, Boston, MA (December 2023)
11. Dana Farber Cancer Institute, 5th Annual Chemical Biology Symposium, Boston, MA (December 2023)
12. Haverford College, Haverford, PA (September 2023)
13. Ono Pharma Symposium, San Francisco, CA (June 2023)
14. GRC on Bioorganic Chemistry, Andover, NH (June 2023)
15. Hanna Symposium, Case Western Reserve University School of Medicine, Cleveland, OH (May 2023)
16. University of Texas Southwestern Medical Center, Dallas, TX (October 2022; virtual)
17. University of Kansas, Lawrence, KS (September 2022)
18. University of Rhode Island, North Kingston, RI (September 2022)
19. University of Alabama, Tuscaloosa, AL (September 2022; virtual)
20. National Cancer Institute, Molecular Discovery Seminar Series, Frederick, MD (May 2022; virtual)
21. Oregon Health and Sciences University Conference on "Chemical Biology and Physiology 2021/22", Portland, OR (April 2022)
22. University of Nebraska, Lincoln, NE (March 2022; virtual)
23. University of Delaware, Newark, DE (March 2022; virtual)
24. Online seminar series on "Iron-Sulfur Protein Biogenesis 2021/22" (January 2022; virtual)
25. Pacifichem 2021; Session on "Frontiers in Macromolecule Epigenetic Modifications" (December 2021; virtual)
26. Pacifichem 2021; Session on "Sulfur Rush" (December 2021; virtual)
27. University of Buffalo, Buffalo, NY (November 2021; virtual)
28. Kojin Therapeutics, Cambridge, MA (September 2021; virtual)
29. Eli Lilly Symposium, ACS National Meeting (August 2021; virtual)
30. Annual Symposium of the Protein Society (July 2021; virtual)
31. Saint Louis University, St. Louis, MO (April 2021; virtual)
32. University of California, Santa Barbara, CA (April 2021; virtual)
33. Cornell University, Ithaca, NY (March 2021; virtual)

34. University of California, Berkeley, CA (Structural and Quantitative Biology Seminar Series), (March 2021; virtual)
35. College of Wooster, Wooster, OH (February 2021; virtual)
36. Indiana University, Bloomington, IN (February 2021; virtual)
37. St. Jude Children's Research Hospital; Memphis, TN (January 2021; virtual)
38. Michigan State University; East Lansing, MI (December 2020; virtual)
39. Translational Chemical Biology; Nature Conferences, Boston, MA (October 2020; virtual)
40. Rutgers Medical School, Newark, NJ (September 2020; virtual)
41. Memorial Sloan Kettering Cancer Institute, New York, NY (August 2020; virtual)
42. University of Arizona, Tucson, AZ (February 2020)
43. Harvard University, Cambridge, MA (Novartis Speaker; February 2020)
44. Dana Farber Cancer Institute/Harvard Medical School, Boston, MA (February 2020)
45. Genentech, San Francisco, CA (December 2019)
46. University of Pennsylvania, Philadelphia, PA (Invited speaker at the Chemical Biology Interface retreat; November 2019)
47. Texas A&M University, College Station, TX (September 2019); Scott Medal Symposium honoring Scott Medal winner Ben Cravatt
48. University of Texas Southwestern Medical Center, Dallas, TX (September 2019)
49. 17th Annual Discovery on Target, Boston, MA (September 2019)
50. Advancing Mass Spectrometry for Biophysics and Structural Biology Conference, Amherst, MA (July 2019)
51. The 26th Annual Peptide Symposium, Monterey, CA (June 2019)
52. GRC on Bioorganic Chemistry, Andover, NH (June 2019)
53. Stanford University, Distinguished Women in Science Chemistry Seminar, Palo Alto, CA, (May 2019)
54. NIH, Frontiers at the Chemistry & Biology Interface Symposium (FCBIS), Bethesda, MD (May 2019)
55. Janelia Conference on "Chemical Tools for Complex Biological Systems II", Ashburn, VA (April 2019)
56. Boston University, Beckman Scholars Invitation, Boston, MA (April 2019)
57. Tufts University, Medford, MA (April 2019)
58. UC Davis, 19th Annual R. Bryan Miller Symposium, Davis, CA (March 2019)
59. University of Connecticut, Storrs, CT (February 2019)
60. Brandeis University, Waltham, MA (February 2019)
61. Warp Drive Bio, Cambridge, MA (September 2018)
62. Boston University, Guest Lecture for "Special Topics in Organic Chemistry" Course, (September, 2018).
63. FASEB conference on Functional Disulfide Bonds in Health and Disease, Leesburg, VA (June 2018)
64. 2018 ASBMB Annual Meeting (Session on "Metabolomics and Lipidomics"), San Diego, CA (April 2018)
65. Holy Cross, Worcester, MA (April 2018)
66. Yale University, New Haven, CT (November 2017)
67. Southwestern Regional Meeting of the American Chemical Society, Lubbock, TX (October 2017); Symposium on Electrophilic Agents in Medicinal Chemistry
68. University of Wisconsin, Madison, WI (October 2017)
69. First Annual "Chemical Biology in the Hub" Symposium, Waltham, MA (September, 2017)
70. Cell Press LabLinks; Small Molecule Metabolites as Signaling Molecules, Cambridge, MA (September, 2017)
71. Twelfth International Symposium on Mass Spectrometry in the Health and Life Sciences: Molecular and Cellular Proteomics, San Francisco, CA (August 2017)
72. Janssen Research and Development, Spring House, PA (June 2017)
73. Canadian Chemistry Conference, Toronto, ON (May 2017)
74. University of Minnesota, Minneapolis, MN (April 2017)
75. University of Massachusetts, Amherst, MA (April 2017)
76. University of Southern California, Los Angeles, CA (April 2017)
77. ACS National Meeting ("Chemical Biology: Enabling Drug Discovery" symposium), San Francisco, CA (April 2017)

78. University of Houston, Houston, TX (March 2017)
79. Northeastern University, Boston, MA (January 2017)
80. Colby College, Waterville, ME (November 2016)
81. New York Academy of Sciences; Emerging Paradigms in Drug Discovery and Chemical Biology, New York, NY (October 2016)
82. University of Massachusetts, Dartmouth, MA (October 2016)
83. Purdue University, Lafayette, IN (September 2016)
84. GRC on Thiol-Based Redox Regulation & Signaling, Stowe, VT (August 2016)
85. Eli Lilly and Company, Indianapolis, IN (June 2016)
86. Memorial Sloan-Kettering Cancer Center, New York, NY (June 2016)
87. University of Illinois, Urbana-Champaign, IL (April 2016)
88. University of Connecticut, Storrs, CT (April 2016)
89. ACS National Meeting ("Click Chemistry in Carbohydrate, Materials Science and Biomedicine" symposium in Honor of Prof. Sharpless' 75th birthday), San Diego, CA (March 2016)
90. ACS National Meeting (Co-organizer of session on "Chemical Methods to Investigate Protein Posttranslational Modifications"), San Diego, CA (March 2016)
91. The Scripps Research Institute, La Jolla, CA (August 2015)
92. ACS National Meeting (Eli Lilly Award in Biological Chemistry Symposium in honor of Minkui Luo) Boston, MA (August 2015)
93. CHI Conference on "Chemical proteomics for Target Validation", Boston, MA (June 2015)
94. GRC on High Throughput Chemistry and Chemical Biology, New London, NH (June 2015)
95. Pfizer Gene Family Forum, Rye Brook, NY (June 2015)
96. Celgene, Bedford, MA (May 2015)
97. Scientific Meeting of the COST Action CM1004 (Synthetic Probes for Chemical Proteomics and Elucidation of Biosynthetic Pathways), Oxford University, Oxford, UK (April 2015)
98. Bridgewater State University, Bridgewater, MA (April 2015)
99. MIT, Cambridge, MA (April 2015)
100. 2015 ASBMB Annual Meeting (Session on "Mechanistic Impacts of Post-translational Modifications"), Boston, MA (March 2015)
101. Boston University Medical School, Boston, MA (March 2015)
102. Princeton University, Princeton, NJ (March 2015)
103. ACS National Meeting (ACS Chemical Biology Lectureship Symposium in honor of Kevan Shokat) Denver, CO (March 2015)
104. University of Washington, Seattle, WA (March 2015)
105. Oregon Health and Science University, Portland, OR (February 2015)
106. University of Michigan, Ann Arbor, MI (February 2015)
107. Northwestern University, Evanston, IL (January 2015)
108. University of Nebraska, Lincoln, NE (January 2015)
109. NIH/NCI, Frederick, MD (January 2015)
110. Johns Hopkins University, Baltimore, MD (January 2015)
111. Colorado State University, Fort Collins, CO (November 2014)
112. Merrimack College, North Andover, MA (October 2014)
113. GRC on Enzymes, Coenzymes and Metabolic Pathways, Waterville Valley, NH (July 2014)
114. University of Wisconsin-Madison, 37th Steenbock Symposium, Madison, WI (June 2014)
115. CHI Conference on "Chemical Biology for Target Validation", Boston, MA (May 2014)
116. Abbvie, North Chicago, IL (April 2014)
117. Clark University, Worcester, MA (25th Harry Allen Symposium) (April 2014)
118. Perkin-Elmer, Boston, MA (March 2014)
119. Wayne State University, Detroit, MI (March 2014)
120. Tufts University, Medford, MA (February 2014)
121. University of California, Berkeley, CA (February 2014)
122. AstraZeneca, Waltham, MA (December 2013)

123. Wesleyan University, Middletown, CT (November 2013)
124. The Scripps Research Institute, Jupiter, FL (September 2013)
125. GlaxoSmithKline, Waltham, MA (August 2013)
126. Novartis, Cambridge, MA (July 2013)
127. GRC on Bioorganic Chemistry, Andover, NH (June 2013)
128. Pacific Coast Protease Workshop, Palm Springs, CA (January 2013)
129. Bowdoin College, Brunswick, ME (October 2012)
130. GRC on Thiol-based Redox Regulation and Signaling, Lewiston, ME (Discussion Leader) (August 2012)
131. Worcester Polytechnic Institute, Worcester, MA (February 2012)
132. Pfizer, Cambridge, MA (November 2011)
133. ACS National Meeting (Young Investigator Symposium), Anaheim, CA (March 2011)

Service

Departmental/Institutional Service

- 2025- Vice Chair, Department of Chemistry, Boston College
- 2023-2024 Faculty Search Committee, Schiller Institute, Boston College
- 2023-2025 Tenure and Promotions Committee, MCAS, Boston College
- 2021-present University Research Council, Boston College
- 2021-2024 Faculty Review Panel, Boston College
- 2021-present Graduate Program Director, Boston College Chemistry Department
- 2020-2021 Boston College Chemistry Undergraduate Studies Committee
- 2020-2024 Chair of the Boston College Biosafety Committee
- 2020 Search Committee for the Boston College Chair of Engineering
- 2020-2024 Boston College Chemistry Department Diversity Committee
- 2019-present Boston College Chemistry Department Steering Committee
- 2019 Search Committee for the Executive Director for the Schiller Institute at Boston College
- 2015-2024 Boston College Biosafety Committee
- 2014-2021 Co-chair of the Boston College Biochemistry Major
- 2013-2020 Member of the Science Strategic Planning Committee for Boston College
- 2011-2013 Boston College Chemistry Graduate Student Admissions Committee
- 2011-2013 Boston College Chemistry Graduate Studies Committee
- 2010-2020 Boston College Chemistry Faculty Search Committee
- 2010-present Boston College Chemical Biology Seminar Committee

External Service

Grant Reviewing

- Beckman Young Investigator Grant Review Panel (2023)
- NIH - Synthetic and Biological Chemistry A (SBCA) Study Section (Standing Member; 2018-2022)
- NSF - Subcommittee for the Directorate for Mathematical and Physical Sciences (MPS); "MPS and the Living World" (2021)
- NIH – Special Emphasis Panel (November 2020; Chair of the Panel in March 2023)
- NSF – Ad Hoc Reviewer for Chemistry of Life Processes (CLP) 2019
- NIH – Synthetic and Biological Chemistry A (SBCA) Study Section (Ad Hoc Member; October 2017)
- NIGMS – Ad Hoc member of Advisory Council (August 2016)

- NIH – Macromolecular Structure and Function A (MSFA) Study Section (Ad Hoc Member; February 2014)
- Research Corporation for Science Advancement (Reviewer for the Cottrell College Science Award 2013)
- Boston College Institute on Aging – Grant Reviewer 2014

Journal Editorships

- Editor; Cell Chemical Biology (July 2018-2021)

Editorial Advisory Board

- Cancer Metabolomics (2012-2014)
- Cell Chemical Biology (2015-present)
- Molecular Biosystems (2015-2018)
- Chemical Science (2023-present)
- Accounts of Chemical Research (2024-present)

F1000

- Contributing member of 'FACULTY OF 1000'; Macromolecular Chemistry Section (2012-2018)

Guest Editorship

- Israel Journal of Chemistry; Guest editor for special issue honoring Wolf Prize winner Ben Cravatt on Activity-based Protein Profiling (w/ Stephan Hacker)
- Methods in Enzymology; Guest editor for special issue on "Selenoprotein structure and Function."
- Current Opinion in Chemical Biology; Guest editor for special issue on "Omics" (w/ Daniel Nomura, UC Berkeley and Alan Saghatelian, Salk Institute)
- Molecular Biosystems; Guest editor for special issue on "Protein labeling" (w/ Lyn Jones, Pfizer)
- Current Topics in Microbiology and Immunology; Guest Editor for special issue on "Activity-based Protein Profiling" (w/ Ben Cravatt, TSRI and Ken Hsu, University of Virginia)

Seminar Organization

- Organizing Committee for New York Academy of Sciences (NYAS) conference on "Covalent Modification: Chemical Biology and Therapeutic Applications" (2021)
- Academic co-chair; Boston Symposium on Organic and Bioorganic Chemistry (2022)

Consulting

- Seaside Therapeutics, Inc., Cambridge, MA (2010-2011)
- Celgene, Cambridge, MA (2015-2018)
- QSimulate, Cambridge, MA (2021-2022)
- Odyssey Therapeutics, MA (2022-present)
- Matchpoint Therapeutics, MA (2023-present)

Career and Mentoring Panels

- Empowering Women in Organic Chemistry (EWOC) Career Panel, 2022
- MIT Women in Chemistry and Chemical Engineering, 2019; Panel on Academic Careers
- NIGMS New Faculty Workshop, 2017
- MIT Department of Chemistry, 2014; Career Panel on Academia
- Northeastern Section Younger Chemists Committee (NSYCC), 2014; Panel on Academia and Teaching Careers
- Boston College Board of Regents; 2021; Panel on Faculty Research

Outreach

- Host Lab for the Boston College REU Program (2018)
- 2012-2017: *Co-founder of "Paper to Plastic": An interdisciplinary summer research program for high school students*. This program was founded by Eranthie Weerapana and Jeffery Byers at Boston College and provides high school students (particularly those underrepresented in STEM) the opportunity to undertake a research project converting the cellulose in used office paper to polylactic acid. This program has been effective since Summer 2012 and has enrolled >30 high school students in total. The design and implementation of this research project was published in the *Journal of Chemical Education* in 2014.
- 2013: *"Family Days"* event at the American Association for the Advancement of Science (AAAS) Annual Meeting (January 2013): The Weerapana Lab hosted a booth at this event that provided young science enthusiasts the opportunity to visualize microorganisms, such as the nematode *C. elegans*, under the microscope.

Current Group Members

Graduate Students

- Madison Rubino, 2022-
- Avinash Sanapala, 2022-
- Pamodya Pamunuwa, 2023-
- Fang Gao, 2024-
- Alison McCostis, 2024-
- Marguerite Flynn, 2025-
- Jillian Platt, 2025-

Postdoctoral Scholars

- Dr. Sailajah Gukathasan, 2022-

Research Assistant Professors

- Dr. Daniel Bak, Postdoctoral researcher (2013-2020); Research Associate (2020-2024); Research Assistant Professor (2024-present)

Undergraduate Students

- Tatum Evans, '25
- Colton Simon, '26
- Mia Barba, '27

Former Group Members and Current Positions

Graduate Students

- Dr. Nicholas J. Pace, Ph.D. 2015, Associate at Choate, Hall and Stewart, LLP
- Dr. Julianne Martell, Ph.D. 2016, Manager STEMCELL Technologies
- Dr. Yani Zhou, Ph.D. 2016, Research Associate, China
- Dr. D. Alexander Shannon, Ph.D. 2016, Senior Scientist II, Abbvie, Inc.
- Dr. Shalise M. Couvertier, Ph.D. 2017, Research Scientist I, Vertex Pharmaceuticals
- Dr. Lisa A. Stanke, Ph.D. 2018, Scientist, Rare Disease, Moderna
- Dr. Kyle Cole, Ph.D. 2018, Research Scientist I, C4 Therapeutics
- Dr. Tyler Bechtel, Ph.D. 2019, Postdoc, Merck
- Dr. Aaron Maurais, Ph.D. 2021, Postdoc, McCoss Lab, University of Washington

- Dr. Eleni Kisty, Ph.D. 2022, Scientist, LifeMine Therapeutics
- Dr. Julia Falco, Ph.D. 2023, Strategic Alliances Program Director, Mass General Hospital
- Dr. Benjamin Chartier, Ph.D. 2024.
- Qianni Peng, Ph.D. 2025, Postdoctoral researcher, Harvard Medical School
- Sarah Canarelli, Ph.D. 2025, Postdoctoral researcher, Harvard
- Sarah Mann, Ph.D. 2025
- Angela Xiong (FARA graduate fellowship), Ph.D. 2025
- Alison McCostis, MS 2025
- Katie Love, MS 2016, Unit Assistant, Trinity Health of New England
- Rebecca Metivier, MS 2019, Research Assistant II at Dana Farber Cancer Institute

Postdoctoral Scholars

- Dr. Emma Ste.Marie, 2020-2021, NIH F32 Postdoctoral Fellow (declined), Currently Assistant Professor, Norwich University
- Dr. Jennifer Peeler, NIH F32 Postdoctoral Fellow 2017-2020, Currently Assistant Professor, Colgate University
- Dr. Masahiro Abo, Postdoctoral Fellow of the Japanese Association for the Promotion of Science, (JSPS) (2013-2018), Currently Program Specific Assistant Professor at Kyoto University.
- Dr. Ranjan Banerjee, Postdoc 2011-2013, Associate Director CMC at Constellation Pharmaceuticals
- Yu Qian, Postdoc 2012-2014, Scientist, Proteomics, at Kezar Life Sciences
- Katarzyna Błażewska, Visiting Fulbright Scholar 2013-2014, Assistant Professor (Adjunct) at Lodz University of Technology, Poland

Undergraduate Students

- Elizabeth Webster, Visiting undergraduate student from University of San Diego '14, Graduate student at Stanford University
- Douglas Brown, '13, Researcher at Broad Institute, Cambridge, MA (Laboratory of Deborah Hung); Medical student at Harvard Medical School
- Christopher McLaughlin, '13, Medical student at Virginia Tech Carilion School of Medicine and Research Institute
- Daniel Pimentel, '13, Graduate student at Stanford
- TrangKimberley Nguyen, '13, Researcher at NIH, Bethesda, MD; Graduate student at Emory University
- Emily Witsberger, '14, Medical student at West Virginia University School of Medicine
- Alexander Warshauer, '14, Medical student at Perelman School of Medicine at the University of Pennsylvania
- Johanna O'Day, '15, Graduate Student at Stanford University
- Omar Khan, '15, Medical student at Oregon Health and Sciences University
- Paige Carleen, '17, Rutgers Robert Wood Johnson Medical School
- Inchul You, '17, Graduate student at Harvard/Dana Farber Cancer Institute
- Collin Witt, '18, Graduate student at NYU
- Mattia Pizzagalli, '18, Goldwater and Fulbright Scholarships, Fulbright Scholar at CeMM, Vienna, Austria, MD/PhD student at Brown University
- Melissa Rey, REU student from Wesleyan College, Graduate student at the University of Minnesota
- Alice Li, '19, Graduate student in Chemistry at Princeton
- Laura Edinger, '20
- James McCoy '21
- Emma Saart '21, MD/PhD student at Zucker School of Medicine
- Olivia Lavidor '21, Graduate student in Chemical Biology at Harvard
- Akanksha Jhunjunwala '23, Graduate student at the University of Southern California

- Marissa Fontaine '22, Graduate student in Chemistry at Cornell
- Daniel Kabanovsky '24, Associate Computational Biologist, Broad Institute
- Cristina Cusmai '24, Medical Student, Icahn School of Medicine, Mount Sinai
- Michael Fields '25