Steven Mark Banik, Ph.D.

Assistant Professor of Chemistry and ChEM-H Institute Scholar

E-mail: sbanik@stanford.edu

DISCIPLINARY FIELDS

Chemistry & chemical biology, synthetic biology, cell biology, organic chemistry, protein engineering

EDUCATION

Harvard University | Cambridge, MA
Ph.D., Chemistry & Chemical Biology (March 2017)

University of Wisconsin-Madison | Madison, WI
B. S. with Honors in Chemistry (May 2011)

ACADEMIC TRAINING

Stanford University, NIH and Burroughs Wellcome Fund CASI Postdoctoral Fellow — Stanford, CA
Professor Carolyn R. Bertozzi — 2017–2020

Harvard University, NSF Research Fellow — Cambridge, MA
Professor Eric N. Jacobsen — 2011–2016

University of Wisconsin-Madison — Madison, WI
Professor Mahesh K. Mahanthappa — 2008–2011

Stanford University, NSF-REU Fellow — Stanford, CA
Professor Robert M. Waymouth — 2010

Columbia University, NSF-REU Fellow — New York, NY
Professor Nicholas J. Turro — 2009

PROFESSIONAL APPOINTMENTS

Stanford University | Assistant Professor of Chemistry (Jan. 2021-Present)
Stanford University | ChEM-H Institute Scholar (Jan. 2021-Present)
Stanford University | Wu-Tsai Human Performance Alliance (Nov. 2021-Present)
Stanford University | Bio-X Member (Jan. 2022-Present)

AWARDS & HONORS

Terman Faculty Fellowship | Stanford University, 2021-2023
Career Award, Burroughs Wellcome Fund | 2021-2026
National Institute of Health NRSA Postdoctoral Fellowship | 2017–2020
IUPAC-Solvay International Award for Young Chemists Honorable Mention| 2018
ACS-Division of Organic Chemistry Travel Award | 2015
Christiansen Travel Award | 2013
Lindau Nobel Laureate Conference | 2013
Bok Center Certificate of Distinction in Teaching | 2012–2013
Wayland E. Noland Fellowship | 2012
National Science Foundation Predoctoral Fellowship | 2011–2014
National Science Foundation-REU | Stanford University, 2010
Barry M. Goldwater Scholarship | 2010
Ackerman Award for Excellence in Chemistry | 2010

Dean's List | 2007-2011
Phi Beta Kappa | 2010
Ralph Abrams Scholarship | 2010
National Science Foundation-REU | Columbia University, 2009
Hilldale Undergraduate/Faculty Research Fellowship | 2009
American Chemical Society Organic Chemistry Award | 2009
Richard Fischer Chemistry Scholarship | 2009
Theodore Herfurth Scholarship | 2009
Edward Panek Memorial Scholarship | 2008

PUBLICATIONS

21. Li, V.L.; He, Y.; Contrepois, K. Liu, H.; Kim, J.T.; Wiggenhorn, A.L.; Tanzo, J.T.; Tung, A.; Lyu, X.; Zushin, P.-J. H.; Jansen, R.S.; Michael, B.; Loh, K. Y.; Yang, A.C.; Carl, C.S.; Voldstedlund, C.T.; Wei, W.; Terrell, S.M.; Moeller, B.C.; Arthur, R.M.; Wallis, G.A.; van de Wetering, K.; Stahl, A.; Kiens, B.; Richter, E.A.; Banik, S.M.; Snyder, M.P.; Xu, Y.; Long, J.Z. "An exercise-inducible signaling metabolite that suppresses obesity." *Nature* **2022**, accepted.

20. Ng, C.S.C.; Banik, S.M. "Recent Advances in Induced Proximity Modalities." *Curr. Opin. Chem. Biol.* **2022**, *67*, 102107.

19. Ng, C.S.C.; Banik, S.M. "Taming Transcription Factors with TRAFTACs." *Cell Chem. Biol.* **2021**, *28*, 588–590.

18. Ahn, G.; Banik, S.M.; Miller, C.L.; Riley, N.; Cochran, J.R.; Bertozzi, C.R. "Lysosome Targeting Chimeras (LYTACs) that Engage a Liver-Specific Asialoglycoprotein Receptor for Targeted Degradation." *Nat. Chem. Biol.* **2021**, *17*, 937–946.

17. Ahn, G.; Banik, S.M.; Bertozzi, C.R. "Degradation from the outside-in: targeting extracellular and membrane proteins for degradation through the endo-lysosomal pathway." *Cell Chem. Biol.* **2021**. *28*, 1072–1080.

16. Cambier, C.J.; Banik, S.M.; Buonomo, J.A.; Bertozzi, C.R. "Spreading of a mycobacterial cell-surface lipid into host epithelial membranes promotes infectivity." *eLife* **2020**, 9:e60648.

15. Delaveris, C.S.*; Webster, E.R.*; Banik, S.M.; Boxer, S.G.; Bertozzi, C.R. "Membrane-tethered mucin-like polypeptides sterically inhibit binding and slow fusion kinetics of influenza A virus." *Proc. Natl. Acad. Sci USA.* **2020**, *117*, 12643–12650.

14. Banik, S.M.; Pedram, K.; Wisnovsky, S.; Ahn, G.; Riley, N.; Bertozzi, C.R. "Lysosome-targeting chimaeras for degradation of extracellular proteins." *Nature* **2020**, *584*, 291–297.

13. Kim, J.T.; Jedrychowski, M.P.; Wei, W.; Fernandez, D.; Fischer, C.R.; Banik S.M.; Spiegelman, B.M.; Long, J.Z. "A plasma protein network regulates PM20D1 and N-acyl amino acid bioactivity." *Cell Chem. Biol.* **2020**, *27*, 1130-1139.

12. Haj, M.K.; Banik, S.M.; Jacobsen, E.N. "Catalytic, Enantioselective 1,2-Difluorination of Cinnamamides." *Org. Lett.* **2019**, *21*, 4919–5372.

11. Mennie, K.M.; Banik, S.M.; Reichert, E. C.; Jacobsen, E.N. "Catalytic Diastereo- and Enantioselective Fluoroamination of Alkenes." *J. Am. Chem. Soc.* **2018**, *140*, 4797–4802.

10. Banik, S.M.*; Levina, A.*; Hyde, A.M.; Jacobsen, E.N. "Lewis acid enhancement by hydrogen-bond donors for asymmetric catalysis." *Science* **2017**, *358*, 761–764.
*These authors contributed equally

9. Banik, S.M.*; Mennie, K.M.*; Jacobsen, E.N. "Catalytic 1,3 Difunctionalization via Oxidative C–C Bond Activation." *J. Am. Chem. Soc.* **2017**, *139*, 9152–9155.
*These authors contributed equally

8. Woerly, E.M.; Banik, S.M.; Jacobsen, E.N. "Enantioselective, Catalytic Fluorolactonization Reactions with a Nucleophilic Fluoride Source." *J. Am. Chem. Soc.* **2016**, *138*, 13858–13861.

7. Banik, S.M.; Medley, J.W.; Jacobsen, E.N. "Catalytic, asymmetric difluorination of alkenes to generate difluoromethylated stereocenters." *Science* **2016**, *353*, 51–54.

6. Banik, S.M.*; Medley, J.W.*; Jacobsen, E.N. "Catalytic, Diastereoselective 1,2-Difluorination of Alkenes." *J. Am. Chem. Soc.* **2016**, *138*, 5000–5003.
*These authors contributed equally

5. Chung, K.*; Banik, S.M.*; De Crisci, A.G.; Pearson, D.M.; Blake, T.R.; Olsson, J.V.; Ingram, A.J.; Zare, R.N.; Waymouth, R.M. "Chemoselective Pd-Catalyzed Oxidation of Polyols: Synthetic Scope and Mechanistic Studies," *J. Am. Chem. Soc.* **2013**, *135*, 7593–7602.
*These authors contributed equally

4. Banik, S.M.; Monnot, B.L.; Weber, R.L.; Mahanthappa, M.K. "ROMP-CT/NMP Synthesis of Multiblock Copolymers Containing Linear Poly(ethylene) Segments." *Macromolecules*, **2011**, *44*, 7141–7148.

3. Weber, R. L.; Ye, Y.; Banik, S. M.; Elabd, Y. A.; Hickner, M. A.; Mahanthappa, M. K. "Thermal and Ion Transport Properties of Hydrophilic and Hydrophobic Polymerized Styrenic Imidazolium Ionic Liquids." *J. Polym. Sci., Part B: Polym. Phys.* **2011**, *49*, 1287–1296.

2. Weber, R.L.; Ye, Y.; Schmitt, A. L.; Banik, S. M.; Elabd, Y. A.; Mahanthappa, M. K. "Effect of Nanoscale Morphology on the Conductivity of Polymerized Ionic Liquid Block Copolymers." *Macromolecules*, **2011**, *44*, 5727–5735.

1. Sundaresan, A.K.; Jockusch, S.; Li, Y.; Lancaster, J.R.; Banik, S.; Zimmerman, P.; Blackwell, J.M.; Bristol, R.; Turro, N.J. "Adiabatic Ring Opening in Tethered Naphthalene and Anthracene Cycloadducts." *Photochem. Photobiol. Sci.,* **2010**, *9*, 1082-1084.

PATENTS

Banik, S.M.; Pedram, K.; Bertozzi, C. Lysosome targeting chimeras (LYTACs). U.S. Provisional Application No. 62/782,193. Filed: December 19, 2018.
Licensed to Lycia Therapeutics

PRESENTATIONS

"Rewiring the Extracellular Interactome for Targeted Protein Degradation"
Dana-Farber Targeted Protein Degradation Webinar Series *Nov. 2021*

Reprogramming Glycan Receptors for Targeted Protein Degradation"
K12 Glyco Seminar Series *Feb. 2021*

New Tricks for Proximity: Targeted Protein Degradation from the Extracellular Space
Stanford Biology Department Seminar *Oct. 2020*

"Hijacking the lysosome for targeted degradation of extracellular and membrane proteins"
Next Generation in Biomedicine Symposium, Broad Institute, Cambridge, MA *Sept. 2019*
"Catalytic, Stereoselective Difluorination of Alkenes"
Catalysis in Chemistry Symposium, Cambridge, MA *Apr. 2016*

"Catalytic, Stereoselective Difluorination of Alkenes"
9th CaRLa Winter School Heidelberg, Germany *Feb. 2016*

"Cooperativity of Silyl Triflates and Squaramide Organocatalysts in Asymmetric (4+3) Cycloadditions: Enhanced Lewis Acidity and Enantioselectivity through Anion-Binding"
44th National Organic Symposium, College Park, MD *Jul. 2015*

"Synthesis of Acyclic Olefin Chain Transfer Agents for Tandem ROMP-NMP Block Copolymer Synthesis"
241st ACS National Meeting, Anaheim, CA *Mar. 2011*

"Tandem Ring-Opening Metathesis Polymerization and Nitroxide-Mediated Polymerization—a New Route to Block Copolymers"
Posters in the Rotunda 2010, Madison, WI *May 2010*

Professional Activities

Graduate Admissions Committee
Department of Chemistry, Stanford University
01/2021–Present

Seminar Committee
Department of Chemistry, Stanford University
08/2021–Present

ChEM-H Chemical Biology Interface Training Program Reviewer
Stanford University
01/2021–Present

Journal Reviewer: *Proceedings of the National Academy of Sciences, Journal of the American Chemical Society, ACS Chemical Biology, Cell Chemical Biology, Organic Letters*

Innovative Medicines Accelerator Small Molecule Therapeutics Pillar Letter of Intent Reviewer
Stanford University
01/2021–Present

Teaching Experience

Stanford University
Chem 91: Exploring Chemical Research at Stanford

Harvard University — Aug. 2014–Dec. 2014
Chemistry 17: Principles of Organic Chemistry — *Head Teaching Fellow*

Harvard University — Aug. 2012–Dec. 2012
Chemistry 17: Principles of Organic Chemistry — *Teaching Fellow*

Harvard University — Jan. 2012–May 2012
Chemistry 27: Organic Chemistry of Life — *Teaching Fellow*