

# Samuel M. Thompson

*Dept. of Bioengineering  
Stanford University  
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## EDUCATION

*University of California, San Francisco — graduated June 2020*  
Ph.D. Biophysics

*Massachusetts Institute of Technology — graduated June 2013*  
B.Sc. Chemistry, Japanese minor — Cumulative GPA: 4.56/5.0

*Texas Academy of Mathematics and Science — graduated June 2008*  
Honors diploma, President's List, 100+ hours of community service

## RESEARCH POSITIONS

*Laboratories of Professors Polly Fordyce and David Baker — September 2020 - present*

Departments of Bioengineering and Genetics, Stanford University, Stanford, California  
Institute for Protein Design, University of Washington, Seattle, Washington

[Biophysics] Design and high-throughput screening of non-aqueous proteins as biocatalysis and novel nanomaterials using computational protein design and droplet-based microfluidics.

*Laboratory of Professor Tanja Kortemme — September 2013 - September 2020*

Department of Bioengineering and Therapeutic Sciences, University of California, San Francisco, California  
[Computational Protein Design] Modeling enzymes as multi-state ensembles for protein design. High-throughput screening to map mutational landscape of E.coli DHFR in different proteostasis regimes.

*Laboratory of Professor Wen Shan Yew — June 2013 - August 201*

Department of Biochemistry, Yong Loo Lin School of Medicine, National University of Singapore, Singapore  
[Synthetic Biology] Determination of structural motifs that decide carbocation rearrangement pathways for natural product cyclization in monoterpene cyclases.

*Laboratory of Professor Catherine Drennan — May 2011 - September 2011, September 2012 - June 2013*

Department of Chemistry, MIT, Cambridge, Massachusetts  
[Structural Biology] Crystallographic and 3D electron microscopy analysis of the human variant of ribonucleotide reductase. Electron microscopy analysis of conformational changes regulating the catalytic cycle in the carbon dioxide fixing enzyme carbon monoxide dehydrogenase/acetyl-CoA synthase.

*Laboratory of Professor Junichi Takagi — September 2011 - August 2012*

Institute for Protein Research, Osaka University, Osaka, Japan  
[Structural Biology] Purification, refolding from soluble aggregates, and crystallographic analysis of a promiscuous extracellular carboxypeptidase with potential chemical biology applications. Development of image processing algorithms for 3D electron microscopy.

*Laboratory of Professor Alice Ting — September 2008 - May 2011*

Department of Chemistry, MIT, Cambridge, Massachusetts  
[Chemical Biology] Development of fluorescent protein labeling methods for the PRIME methodology via re-engineering of E.coli lipoate protein ligase.

*Laboratory of Professor Andrew Ellington — June 2008 - August 2008*

Institute for Cellular and Molecular Biology, University of Texas, Austin, Texas  
[Synthetic Biology] Design of Winfree-type DNA- /RNA-based transcriptional logic gates for *in vitro* repressilator circuitry.

*Laboratory of Professor Zhibing Hu — October 2006 - June 2008*

Department of Physics, University of North Texas, Denton, Texas  
[Materials Science] Characterization of thermosensitive biomedical polymers poly(ethylene glycol) and poly(N-isopropylacrylamide) microgels and cross-linked thin-films for application in drug delivery.

## **PUBLICATIONS**

FACS-Sortable Triple Emulsion Picoreactors for Screening Reactions in Biphasic Environments. Samuel Thompson\*, Yanrong Zhang, Zijian Yang, Lisa A Nichols, Polly M Fordyce\*. *Advanced Material Interfaces*. **2024** Feb 2; 12, 2400403. \*As co-corresponding author

The genetic landscape of a metabolic interaction. Thuy Nguyen, Christine Ingle, Samuel Thompson, Kimberly A Reynolds. *Nature Communications*. **2024**. Apr 18;15(1):3351.

Antibacterial potency of Type VI amidase effector toxins is dependent on substrate topology and cellular context. Atanas Radkov, Anne L. Sapiro, Sebastian Flores, Corey Henderson, Hayden Saunders, Rachel Kim, Steven Massa, Samuel Thompson, Chase Mateusiak, Jacob Biboy, Ziyi Zhao, Lea M. Starita, William M Hatleberg, Waldemar Vollmer, Alistair B. Russell, Jean-Pierre Simorre, Spencer Anthony-Cahill, Peter Brzovic, Beth Hayes, & Seemay Chou. *eLife*. **2022** Jun 28;11:e79796.

Fundamentals to function: Quantitative and scalable approaches for measuring protein stability. Bea Atsavapranee, Catherine D. Stark, Fanny Sunden, Samuel Thompson\*, & Polly Fordyce\*. *Cell systems* **2021** 12(6), 547–560. \*As co-corresponding author

Structurally distributed surface sites tune allosteric regulation. James W McCormick, Marielle Ax Russo, Samuel Thompson, Audrey Blevins, & Kimberly A. Reynolds. *eLife*. **2021** Jun 16;10:e68346.

Negative-Stain Electron Microscopy Reveals Dramatic Structural Rearrangements in Ni-Fe-S-Dependent Carbon Monoxide Dehydrogenase/Acetyl-CoA Synthase. Steven E. Cohen, Edward J. Brignole, Elizabeth C. Wittenborn, Mehmet Can, Samuel Thompson, Stephen W. Ragsdale, & Catherine L. Drennan. *Structure* **2020** S0969-2126(20)30324-5.

Altered expression of a quality control protease in E. coli reshapes the in vivo mutational landscape of a model enzyme. Samuel Thompson\*, Yang Zhang, Christine Ingle, Kimberly A. Reynolds, & Tanja Kortemme\*. *eLife* **2020** 9 e53476. \*As co-corresponding author

Flex ddG: Rosetta Ensemble-Based Estimation of Changes in Protein-Protein Binding Affinity upon Mutation Kyle A. Barlow, Shane Ó Conchúir, Samuel Thompson, Pooja Suresh, James E. Lucas, Markus Heinonen, Tanja Kortemme. *Journal of Physical Chemistry B* **2018** 122 (21) 5389-5399.

Conformational Freedom of the LRP6 Ectodomain Is Regulated by N-glycosylation and the Binding of the Wnt Antagonist Dkk1. Kyoko Matoba, Emiko Mihara, Keiko Tamura-Kawakami, Naoyuki Miyazaki, Shintaro Maeda, Hidenori Hirai, Samuel Thompson, Kenji Iwasaki, Junichi Takagi. *Cell Reports* **2017** 18 (1) 32-40.

Determination of Ubiquitin Fitness Landscapes Under Different Chemical Stresses in a Classroom Setting. David Mavor, Kyle A. Barlow, Samuel Thompson, et al. *Elife* **2016** 5, 15802.

Allosteric inhibition of human ribonucleotide reductase by dATP entails the stabilization of a hexamer. Nozomi Ando, Haoran Li, Edward J. Brignole, Samuel Thompson, Martin I. McLaughlin, Julia E. Page, Francisco J. Asturias, JoAnne Stubbe, Catherine L. Drennan. *Biochemistry* **2015** 55 (2), 373-81.

Structure-guided engineering of a Pacific Blue coumarin ligase for specific protein imaging in living cells. Justin D. Cohen, Samuel Thompson, and Alice Y. Ting. *Biochemistry* **2011** 50 (38), 8221-5.

A fluorophore ligase for site-specific labeling inside living cells. Chayasith Uttamanpinant, Katharine A. White, Hemantha Baruah, Samuel Thompson, Marta Fernández-Suárez, Sujiet Puthenveetil, and Alice Y. Ting. *Proceedings of the National Academy of Sciences* **2010** 107 (24), 10914-9.

Yeast display evolution of a kinetically efficient 13-amino acid substrate for lipoic acid ligase. Sujiet Puthenveetil, Daniel S. Liu, Katharine A. White, Samuel Thompson, and Alice Y. Ting. *Journal of the American Chemical Society* **2009** 131 (45), 16430-8.

Photonic hydrogels with poly(ethylene glycol) derivative colloidal spheres as building blocks. Tong Cai, Guonan Wang, Samuel Thompson, Manuel Marquez, and Zhibing Hu. *Macromolecules* **2008** 41 (24), 9508-12.

## **HONORS AND AWARDS**

**Best GRS Talk, Protein Folding and Dynamics Gordon Research Conferences** —

January 2024

**Homeworld Collective Garden Grant** —

October 2023

<https://podcasts.apple.com/us/podcast/proteins-in-organic-solvents-engineering-enzymes-for/id1752032581?i=1000691996851>

Arnold O. Beckman Postdoctoral Fellowship —	July 2022
2022 HHMI Hanna Grey Fellow Finalist —	June 2022
Schmidt Science Fellows Semifinalist —	July 2021
Stanford School of Medicine Dean's Postdoctoral Fellowship —	November 2020
UCSF Dr. Herbert Landahl Mathematical Biophysics Student Excellence Award — <a href="https://www.instagram.com/p/Bm43GfKHKRL/?hl=en">https://www.instagram.com/p/Bm43GfKHKRL/?hl=en</a>	November 2018
Protein Engineering Canada Best Presentation Award —	June 2018
UCSF Mel Jones Memorial Research Award —	June 2017
UCSF Quantitative Biosciences Consortium TA Award —	November 2015
NSF Graduate Research Fellowship —	April 2014
UCSF Chuan Lyu Chancellor Fellowship —	June 2013
MIT Department of Chemistry Research Award —	May 2013
Osaka University Frontier Lab Best Presentation —	August 2012
MIT Foreign Languages and Literature Distinguished Student —	April 2011
HHMI-MIT Summer Undergraduate Fellowship —	June 2009
Eugene and Margaret McDermott Scholarship Fund —	2008-2011, 2013
Barry M. Goldwater Scholar —	March 2008
Intel Talent Search Semifinalist —	January 2008
Siemens Competition Regional Finalist —	November 2007

## **SERVICE AND DIVERSITY EFFORTS**

Stanford Vice Provost of Graduate Education Selection Committee —	2024-2025
Stanford Vice Provost of Graduate Education Strategic Vision Team/Advisory Team —	Winter 2022-
Designing for an Anti-Racist Stanford (Stanford Design School project course) —	Fall 2021
Stanford Justice, Equity, Diversity & Inclusion (JEDI) Inclusive Mentorship Workshop —	June 2021
UCSF Perspective Matters Coordinating Committee — Discussion results included in the 2017 UCSF Mentorship Climate Survey	2016-2017
Moderator, Annual OUT in Science LGBTQ+ Scientist Panel Discussion —	2014-2017
UCSF SACNAS Prospective Graduate Student Recruitment Brunch —	2014, 2015
UCSF Graduate Division DEI Orientation Organizing Committee —	Summer 2014
Organizer, Petition to UCSF Graduate Division for tracking LGBTQ+ recruitment —	Summer 2014
Co-founder, UCSF Graduate Queer Alliance —	2013-2017
Singapore University of Technology and Design 5th Row Leadership Program Mentor —	Summer 2013
Behind the Scenes at MIT Freshman Chemistry Diversity Video Series — <a href="http://techtv.mit.edu/videos/24167-samuel-thompson-s-personal-story">http://techtv.mit.edu/videos/24167-samuel-thompson-s-personal-story</a>	Summer 2011

## **PROFESSIONAL TRAINING AND ACTIVITIES**

Stanford Grant Writing Academy Instructor: Hanna Gray Fellowship Bootcamp —	Fall 2022-
Mentoring the Individual: A Needs-Based Approach to Inclusive Mentorship —	May 2022
Stanford-NIH Responsible Conduct of Research Course —	November 2021
Stanford Grant Writing Academy: Writing Compelling Fellowships —	Spring 2021
Nature Career Column — Veuthey TL, Thompson S. Why you need an agenda for meetings with your principal investigator. Tess L. Veuthey & Samuel Thompson. <i>Nature</i> 2018 561(7722):277.	September 2017
UCSF Grant Writing Workshop: Writing Clear and Compelling Specific Aims —	March 2017
UCSF Grant Writing Workshop: Navigating the NIH Grant Application Process —	March 2017
UCSF NSF GRFP Proposal Workshop TA —	Fall 2015, 2017
UCSF Graduate Division Associate Dean Search Committee —	Summer 2016
UCSF Graduate Division TA: Molecular Thermodynamics —	Winter 2014
Singapore University of Technology and Design Chemistry TA and Recitation Leader —	Summer 2013
Behind the Scenes at MIT Freshman Chemistry Teaching Video Series —	Summer 2011

## **INTERNATIONAL CONFERENCES**

<b>Protein Engineering Canada, Toronto, ON (Talk) —</b>	June 2024
<b>Gordon Research Conference, Protein Folding and Dynamics, Galveston, TX (Talk) —</b>	January 2024
<b>Gordon Research Conference, High-Throughput Chemistry and Chemical Biology, New London, NH (Poster and Talk) —</b>	July 2023
<b>Gordon Research Conference, Protein Engineering, Smithfield, RI (Poster) —</b>	July 2023
<b>Gordon Research Conference, Protein Folding and Dynamics, Ventura, CA (Poster) —</b>	October 2022
<b>Gordon Research Conference, Protein Folding and Dynamics, Galveston, TX (Poster) —</b>	January 2020
<b>RosettaCon, Leavenworth, WA (Talk) —</b>	August 2019
<b>Protein Engineering Canada, Vancouver, BC (Talk) —</b>	June 2018
<b>RosettaCon, Leavenworth, WA (Poster) —</b>	August 2014
<b>RosettaCon, Leavenworth, WA (Talk, Team Talk, and Poster) —</b>	August 2015
<b>ASBMB, Boston, MA (Poster) —</b>	April 2013
<b>Protein Science Society of Japan, Nagoya, Japan (Poster) —</b>	June 2012