

## Samuel H. Sternberg, Ph.D.

*Associate Professor*, Department of Biochemistry and Molecular Biophysics  
*Investigator*, Howard Hughes Medical Institute

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*Updated October 1, 2024*

### A. FIELD OF SPECIALIZATION

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Biochemistry, biophysics, molecular biology, genetics, genome engineering, CRISPR

### B. EDUCATION

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- 2009 – 2014 University of California, Berkeley, CA  
Ph.D. in Chemistry, awarded 2014  
Thesis title: Mechanism and engineering of CRISPR-associated endonucleases  
Advisor: Professor Jennifer A. Doudna
- 2003 – 2007 Columbia University, New York, NY  
B.A. in Biochemistry, awarded 2007  
Graduated *summa sum laude* with departmental honors  
Advisor: Professor Ruben L. Gonzalez, Jr.

### C. ACADEMIC AND NON-ACADEMIC POSITIONS HELD

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- 2024 – present Investigator  
Howard Hughes Medical Institute
- 2024 – present Associate Professor  
Department of Biochemistry and Molecular Biophysics, Columbia University
- 2018 – 2024 Assistant Professor  
Department of Biochemistry and Molecular Biophysics, Columbia University
- 2022 – present Scientific Advisory Board Member  
Prime Medicine, Inc., Cambridge, MA
- 2021 – present Scientific Advisory Board Member

	CrisprBits, Inc., Delhi, India
2017 – present	Co-Founder & Scientific Advisory Board Member Dahlia Biosciences, Inc., San Francisco, CA
2016 – 2017	Scientist & Group Leader, Technology Development Caribou Biosciences, Inc., Berkeley, CA
2015 – 2016	Book author, <i>A Crack in Creation</i> Houghton Mifflin Harcourt, New York, NY Co-author: Jennifer A. Doudna
2015	Postdoctoral researcher Department of Chemistry, University of California, Berkeley, CA Advisor: Professor Jennifer A. Doudna
2010 – 2014	Ph.D. researcher, thesis Department of Chemistry, University of California, Berkeley, CA Advisor: Professor Jennifer A. Doudna
2009 – 2010	Ph.D. researcher, rotations Department of Chemistry, University of California, Berkeley, CA Advisors: Professors Carlos Bustamante, Jennifer A. Doudna, & Andreas Martin
2007 – 2009	Research assistant Department of Chemistry, Columbia University, New York, NY Advisor: Professor Ruben L. Gonzalez, Jr.
2006 – 2007	Undergraduate researcher Department of Chemistry, Columbia University, New York, NY Advisor: Professor Ruben L. Gonzalez, Jr.

## **D. HONORS, PRIZES, AND FELLOWSHIPS**

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2024	Amgen Young Investigator Award
2023 – 2028	NSF CAREER Award
2022	The Harold and Golden Lamport Award for Excellence in Basic Science Research
2022	Alice Bohmfalk Charitable Trust Award
2021 – 2026	Irma T. Hirschl and Monique Weill-Caulier Research Award
2021 – 2022	Schaefer Research Scholars Program Award
2020 – 2025	NIH New Innovator Award (DP2)
2020 – 2025	Pew Biomedical Scholarship
2020 – 2022	Sloan Research Fellowship
2016	J.P. McCaskey High School Distinguished Alumni Award
2015	Harold M. Weintraub Graduate Student Award
2015	Scaringe Young Scientist Award, RNA Society
2013	Biophysical Society Education Travel Award
2011 – 2013	National Defense Science & Engineering Graduate Research Fellowship

2009 – 2014	NSF Graduate Research Fellowship
2007	Graduated <i>summa cum laude</i> and with Departmental Honors, Dept. of Chemistry, Columbia University
2007	Outstanding Undergraduate Research Award, Dept. of Chemistry, Columbia University
2007	Phi Beta Kappa, Columbia University
2007	NSF Leadership Travel Award
2006	National Science Foundation (NSF) Research Experience for Undergraduates Program, Columbia University (Best student presentation)
2006 – 2007	Irving Langmuir Scholars Program, Columbia University
2003 – 2007	Dean's List, Columbia University
2003 – 2006	Thomas M. Macioce Scholarship, Columbia University

## E. PUBLICATIONS

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Authorship convention: Senior author is always listed last.

\*Denotes equal contributions

#Denotes corresponding author

### PEER-REVIEWED PUBLICATIONS

1. Vaysset, H.\*, Meers, C.\*, Cury, J., Bernheim, A.#, **Sternberg, S.H.#** “Evolutionary origins of archaeal and eukaryotic RNA-guided RNA modification in bacterial IS110 transposons.” *Nature Microbiol* (2024), accepted.
2. Tang, S., Conte, V.\*, Zhang, D.J.\*, Žedaveinytė, R., Lampe, G.D., Wiegand, T., Tang, L.C., Wang, M., Walker, M.W.G., George, J.T., Berchowitz, L.E., Jovanovic, M., **Sternberg, S.H.#** “De novo gene synthesis by an antiviral reverse transcriptase.” *Science* (2024), DOI: 10.1126/science.adq0876.
3. Žedaveinytė, R., Meers, C., Le., H.C., Mortman, E.E., Tang, S., Lampe, G.D., Pesari, S.R., Gelsinger, D.R., Wiegand, T., **Sternberg, S.H.#** “Antagonism between transposon-encoded introns and guide RNAs.” *Science* **385** (2024): eadm8189.
4. Wiegand, T., Hoffmann, F.T., Walker, M.W.G., Tang, S., Richard, E., Le, H.C., Meers, C., **Sternberg, S.H.#** “TnpB homologs exapted from transposons are RNA-guided transcription factors.” *Nature* **631** (2024): 439–448.
5. Lampe, G.D.\*, King, R.T.\*, Halpin-Healy, T.S., Klompe, S.E., Hogan, M.I., Vo, P.L.H., Tang, S., Chavez, A., **Sternberg, S.H.#** “Targeted DNA integration in human cells without double-strand breaks using CRISPR-associated transposases.” *Nat Biotechnol* **42** (2024): 87–98.
6. George, J.T., Acree, C., Park, J.-U., Kong, M., Wiegand, T., Pignot, Y.L., Kellogg, E.H., Greene, E.C., **Sternberg, S.H.#** “Mechanism of target site selection by type V-K CRISPR-associated transposases.” *Science* **382** (2023): eadj8543.
7. Gelsinger, D.R., Vo, P.L.H., Klompe, S.E., Ronda, C., Klompe, S.E., Wang, H.H., **Sternberg, S.H.#** “Bacterial genome engineering using CRISPR RNA-guided transposases.” *Nat Protoc* (2023), DOI: 10.1038/s41596-023-00927-3.
8. Tang, S., **Sternberg, S.H.#** “Genome editing with retroelements.” *Science* **382** (2023): 370–371.

9. Meers, C., Le, H., Pesari, S.R., Hoffmann, F.T., Walker, M.W.G., Gezelle, J., Tang, S., **Sternberg, S.H.**<sup>#</sup> “Transposon-encoded nucleases use guide RNAs to promote their selfish spread.” *Nature* **622** (2023): 863–871.
10. Walker, M.W.G.\*<sup>#</sup>, Klompe, S.E.\*<sup>#</sup>, Zhang, D.J., **Sternberg, S.H.**<sup>#</sup> “Novel molecular requirements for CRISPR RNA-guided transposition.” *Nucleic Acids Res* **51** (2023): 4519–4535.
11. Hoffmann, F.T.\*<sup>#</sup>, Kim, M.\*<sup>#</sup>, Beh, L.Y.\*<sup>#</sup>, Wang, J., Vo, P.L.H., Gelsinger, D.R., Thomas Geoge, J., Acree, C., Mohabir, J.T., Fernández, I.S.<sup>#</sup>, **Sternberg, S.H.**<sup>#</sup> “Selective TnsC recruitment enhances the fidelity of RNA-guided transposition.” *Nature* **609** (2022): 384–393.
12. Klompe, S.E., Jaber, J., Beh, L.Y., Mohabir, J.T., Bernheim, A., **Sternberg, S.H.**<sup>#</sup> “Evolutionary and mechanistic diversity of Type I-F CRISPR-associated transposons.” *Mol Cell* **82** (2022): 616–628.
13. Vo, P.L.H., Acree, C., Smith, Melissa L., **Sternberg, S.H.**<sup>#</sup> “Unbiased profiling of CRISPR RNA-guided transposition products by long-read sequencing.” *Mob DNA* **12** (2021): 1–8.
14. Vo, P.L.H., Ronda, C., Klompe, S.E., Chen, E.E., Acree, C., Wang, H.H., **Sternberg, S.H.**<sup>#</sup> “CRISPR RNA-guided integrases for high-efficiency and multiplexed bacterial genome engineering.” *Nat Biotechnol* **39** (2021): 480–489.
15. Halpin-Healy, T.S., Klompe, S.E., **Sternberg, S.H.**<sup>#</sup>, Fernandez, I.S.<sup>#</sup> “Structural basis of DNA targeting by a transposon-encoded CRISPR-Cas system.” *Nature*, **577** (2020): 271–274.
16. Cameron, P.<sup>#</sup>, Coons, M. M., Klompe, S. E., Lied, A. M., Smith, S. C., Vidal, B., Donohoue, P. D., Rotstein, T., Kohrs, B. W., Nyer, D. B., Kennedy, R., Bahn, L. M., Williams, C., Toh, M. S., Irby, M. J., Edwards, L. S., Künne, T., van der Oost, J., Brouns, S. J. J., Slorach, E. M., Fuller, C. K., Gradia, S., Kanner, S. B., May, A. P., **Sternberg, S. H.**<sup>#</sup> “Harnessing Type I CRISPR–Cas systems for human genome engineering.” *Nat Biotechnol*, **37** (2019): 1471–1477.
17. Klompe, S.E., Vo, P.L.H.\*<sup>#</sup>, Halpin-Healy, T.S.\*<sup>#</sup>, **Sternberg, S.H.**<sup>#</sup> “Transposon-encoded CRISPR–Cas systems direct RNA-guided DNA integration.” *Nature*, **571** (2019): 219–225.
18. Klompe, S.E., **Sternberg, S.H.**<sup>#</sup> “Harnessing ‘a billion years of experimentation’: the ongoing exploration and exploitation of CRISPR–Cas immune systems.” *CRISPR J*, **2** (2018): 141–158.
19. Chen, J.S., Dagdas, Y.S., Kleinstiver, B.P., Welch, M.M., Sousa, A.A., Harrington, L.B., **Sternberg, S.H.**, Joung, J.K., Yildiz, A.<sup>#</sup>, Doudna, J.A.<sup>#</sup> “Enhanced proofreading governs CRISPR-Cas9 targeting accuracy.” *Nature* **550** (2017): 407–410.
20. Dagdas, Y.\*<sup>#</sup>, Chen, J.S.\*<sup>#</sup>, **Sternberg, S.H.**, Doudna, J.A.<sup>#</sup>, Yildiz, A.<sup>#</sup> “A conformational checkpoint between DNA binding and cleavage by CRISPR–Cas9.” *Science Advances* **3** (2017): eaao0027.
21. Jackson, R.N., van Erp, P.B., **Sternberg, S.H.**, Wiedenheft, B.<sup>#</sup> “Conformational regulation of CRISPR-associated nucleases.” *Curr Opin Microbiol* **21** (2017): 110–119.
22. Boyle, E.A.\*<sup>#</sup>, Andreasson, J.O.L.\*<sup>#</sup>, Chircus, L.M.\*<sup>#</sup>, **Sternberg, S.H.**, Wu, M.J., Guegler, C.K., Doudna, J.A.<sup>#</sup>, Greenleaf, W.J.<sup>#</sup> “High-throughput biochemical profiling reveals sequence determinants of dCas9 off-target binding and unbinding.” *PNAS* **114** (2017): 5461–5466.
23. Singh, D., **Sternberg, S.H.**, Fei, J., Doudna, J.A.<sup>#</sup>, Ha, T.<sup>#</sup> “Real-time observation of DNA recognition and rejection by the RNA-guided endonuclease Cas9.” *Nat Comm* **7** (2016): 1–8.
24. **Sternberg, S.H.**\*<sup>#</sup>, Richter, H.\*<sup>#</sup>, Charpentier, E.<sup>#</sup>, Qimron, U.<sup>#</sup> “Adaptation in CRISPR-Cas systems.” *Mol Cell* **61** (2016): 797–808.
25. **Sternberg, S.H.**, LaFrance, B., Kaplan, M., Doudna, J.A.<sup>#</sup> “Conformational control of DNA target cleavage by CRISPR-Cas9.” *Nature* **527** (2015): 110–113.

26. Redding, S., **Sternberg, S.H.**, Marshall, M., Gibb, B., Bhat, P., Guegler, C.K., Wiedenheft, B., Doudna, J.A.<sup>#</sup>, Greene, E.C.<sup>#</sup> “Surveillance and processing of foreign DNA by the *Escherichia coli* CRISPR-Cas system.” *Cell* **163** (2015): 854–865.
27. **Sternberg, S.H.**, Doudna, J.A.<sup>#</sup> “Expanding the biologist’s toolkit with CRISPR-Cas9.” *Mol Cell* **58** (2015): 568–574.
28. Baltimore, D., Berg, P., Botchan, M., Carroll, D., Charo, R.A., Church, G., Corn, J.E., Daley, G.Q., Doudna, J.A., Fenner, M., Greely, H.T., Martin, G.S., Penhoet, E., Puck, J., **Sternberg, S.H.**, Weissman, J.S., Yamamoto, K.R. “A prudent path forward for genomic engineering and germline gene modification.” *Science* **348** (2015): 36–38.
29. Wright, A.V.\* , **Sternberg, S.H.\***, Taylor, D.W., Staahl, B.T., Bardales, J.A., Kornfeld, J.E., Doudna, J.A.<sup>#</sup> “Rational design of a split-Cas9 enzyme complex.” *PNAS* **112** (2015): 2984–2989.
30. O’Connell, M.R., Oakes, B.L., **Sternberg, S.H.**, East-Seletsky, A., Kaplan, M., Doudna, J.A.<sup>#</sup> “Programmable RNA recognition and cleavage by CRISPR/Cas9.” *Nature* **516** (2014): 263–266.
31. Hochstrasser, M.L.\* , Taylor, D.W.\* , Bhat, P., Guegler, C.K., **Sternberg, S.H.**, Nogales, E.<sup>#</sup>, Doudna, J.A.<sup>#</sup> “CasA mediates Cas3-catalyzed target degradation during CRISPR RNA-guided interference.” *PNAS* **111** (2014): 6618–6623.
32. Jinek, M.\* , Jiang, F.\* , Taylor, D.W.\* , **Sternberg, S.H.\***, Kaya, E., Ma, E., Anders, C., Hauer, M., Zhou, K., Lin, S., Kaplan, M., Iavarone, A.T., Charpentier, E., Nogales, E.<sup>#</sup>, Doudna, J.A.<sup>#</sup> “Structures of Cas9 endonucleases reveal RNA-mediated conformational activation.” *Science* **343** (2014): 1247997-1–11.
33. **Sternberg, S.H.\***, Redding, S.\* , Jinek, M., Greene, E.C.<sup>#</sup>, Doudna, J.A.<sup>#</sup> “DNA interrogation by the CRISPR RNA-guided endonuclease Cas9.” *Nature* **507** (2014): 62–67.
34. Haurwitz, R.E., **Sternberg, S.H.**, Doudna, J.A.<sup>#</sup> “Csy4 relies on an unusual catalytic dyad to position and cleave CRISPR RNA.” *EMBO J* **31** (2012): 2824–2832.
35. **Sternberg, S.H.**, Haurwitz, R.E., Doudna, J.A.<sup>#</sup> “Mechanism of substrate selection by a highly specific CRISPR endonuclease.” *RNA* **18** (2012): 661–672.
36. Wiedenheft, B., **Sternberg, S.H.**, Doudna, J.A.<sup>#</sup> “RNA-guided genetic silencing systems in bacteria and archaea.” *Nature* **482** (2012): 331–338.
37. Chakravarthy, S., **Sternberg, S.H.**, Kellenberger, C.A., Doudna, J.A.<sup>#</sup> “Substrate-specific kinetics of Dicer-catalyzed RNA processing.” *J Mol Biol* **404** (2010): 392–402.
38. Fei, J., Wang, J., **Sternberg, S.H.**, MacDougall, D.D., Elvekrog, M.M., Pulkunat, D.K., Englander, M.T., Gonzalez, R.L.<sup>#</sup> “A highly purified, fluorescently labeled in vitro translation system for single-molecule studies of protein synthesis.” *Meth Enzymol* **472** (2010): 221–259.
39. **Sternberg, S.H.**, Fei, J., Prywes, N., McGrath, K.A., Gonzalez, R.L.<sup>#</sup> “Translation factors direct intrinsic ribosome dynamics during translation termination and ribosome recycling.” *Nat Struct Mol Biol* **16** (2009): 861–868.

## PREPRINTS

1. Lampe, G.D.\* , Liang, A.R.\* , Zhang, D.J., Fernández, I.S.<sup>#</sup>, **Sternberg, S.H.**<sup>#</sup> “Structure-guided engineering of type I-F CASTs for targeted gene insertion in human cells.” *bioRxiv* (2024), DOI: 10.1101/2024.09.19.613948.

## NON-PEER-REVIEWED PUBLICATIONS

1. Lampe, G.D., Sternberg, S.H.<sup>#</sup> “Novel recombinases for large DNA insertions.” *Nat Biotechnol* **41** (2023): 471–472.
2. Nemudryi, A., Nemudraia, A., Wiegand, T., Sternberg, S.H., Wiedenheft, B.<sup>#</sup> “A viral ‘codebreaker’ intercepts a host alarm.” *Cell Host Microbe* **30** (2022): 1647–1648.
3. Klompe, S.E., Sternberg, S.H. “CRISPR–Cas immune systems and genome engineering.” In *Rosenberg's Molecular and Genetic Basis of Neurological and Psychiatric Disease, 6<sup>th</sup> Edition*, edited by Roger N. Rosenberg and Juan M. Pascual, 157–177. Academic Press, 2020.
4. Doudna, J.A.\* , Sternberg, S.H.\* *A Crack in Creation: Gene editing and the unthinkable power to control evolution*. New York: Houghton Mifflin Harcourt, 2017.
5. Sternberg, S.H. “Risky Business: A research’s death spurs an overhaul of safety at the UCs.” *The Berkeley Science Review*, Spring 2013.
6. Sternberg, S.H. “Germ Warfare: Bacteria and viruses adapt for battle.” *The Berkeley Science Review*, Fall 2012.

## F. PATENTS

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### ISSUED PATENTS

1. Sternberg, S.H., Klompe, S.E. “RNA-guided DNA integration using Tn7-like transposons.” U.S. Patent No. 10,947,534. Granted March 16, 2021.
2. Sternberg, S.H., Doudna, J.A. “Cas9 variants and methods of use thereof.” U.S. Patent No. 10,793,842. Granted October 6, 2020.
3. Cameron, P.S., Klompe, S.E., Sternberg, S.H. “Engineered cascade components and cascade complexes. U.S. Patent No. 10,597,648. March 24, 2020.
4. Doudna, J.A., Sternberg, S.H., O’Connell, M.R., Oakes, B.L. “Methods and compositions for modifying a single stranded target nucleic acid.” U.S. Patent No. 10,494,620. Granted December 3, 2019.
5. Cameron, P.S., Klompe, S.E., Sternberg, S.H. “Engineered cascade components and cascade complexes. U.S. Patent No. 10,457,922. Granted October 29, 2019.
6. Sternberg, S.H., Doudna, J.A. “Cas9 variants and methods of use thereof.” U.S. Patent No. 10,392,607. Granted August 27, 2019.
7. Cameron, P.S., Klompe, S.E., Sternberg, S.H. “Engineered cascade components and cascade complexes.” U.S. Patent No. 10,329,547. Granted June 25, 2019.
8. Doudna, J.A., Sternberg, S.H., O’Connell, M.R., Oakes, B.L. “Methods and compositions for modifying a single stranded target nucleic acid.” U.S. Patent No. 9,994,831. Granted June 12, 2018.
9. Doudna, J.A., Sternberg, S.H., Jinek, M., Jiang, F., Kaya, E., Taylor, D.W. “Cas9 crystals and methods of use thereof.” U.S. Patent No. 9,963,689. Granted May 8, 2018.
10. Doudna, J.A., Jinek, M., Sternberg, S.H. “Endoribonucleases and methods of use thereof.” U.S. Patent No. 9,688,971. Granted June 27, 2017.
11. Gonzalez, R.L., Sternberg, S.H., Pulukkunat, D.K. “Fluorescence-based approach to monitor release factor-catalyzed termination of protein synthesis. U.S. Patent No. 9,470,680. Granted October 18, 2016.

**PATENT APPLICATIONS**

1. Sternberg, S.H., Lampe, G.D. “Systems, methods, and components for RNA-guided effector recruitment.” PCT Patent Application No. PCT/US22/034072. Filed June 17, 2022.
2. Sternberg, S.H., Lampe, G.D., King, R., Chavez, A., Klompe, S.E. “CRISPR-transposon systems for DNA modification.” PCT Patent Application No. PCT/US22/32541. Filed June 6, 2022.
3. Sternberg, S.H., Vo, P.H. “RNA-guided DNA integration and modification.” US Patent Application No. 17/907,510. Filed March 26, 2021.
4. Sia, S.K., Sternberg, S.H., Arumugam, S., Shepard, K. “Transposition-based diagnostics methods and devices.” US Patent Application No. 17,758,415. Filed January 7, 2021.
5. Sternberg, S.H., Vo, P.H. “RNA-guided DNA integration and modification.” US Patent Application No. 17/634,759. Filed August 14, 2020.
6. Sternberg, S.H., Klompe, S.E. “RNA-Guided DNA Integration Using Tn7-Like Transposons.” US Patent Application No. 16/913,299. Filed June 26, 2020.
7. Sternberg, S.H., Klompe, S.E., Vo, P.H. “RNA-Guided DNA Integration Using Tn7-Like Transposons.” PCT Patent Application No. PCT/US2020/021568. Filed March 6, 2020.
8. Sternberg, S.H, Doudna, J.A., LaFrance, B., Chen, J.S. Reporter cas9 variants and methods of use thereof. PCT Patent Application No. PCT/US2016/036754. Filed June 9, 2016.
9. Sternberg, S.H., Doudna, J.A., Wright, A.V. “Heterodimeric cas9 and methods of use thereof.” PCT Patent Application No. PCT/US2016/012470. Filed January 7, 2016.

**G. TEACHING EXPERIENCE**

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**COURSES TAUGHT AT COLUMBIA UNIVERSITY**

2022, 2024	CPLS UN3965 – Precision Medicine: Biological, Social, and Ethical Implications Co-instructor This course covers the scientific foundations and social dimensions of precision medicine, alongside fundamental humanistic questions and challenges raised by this discipline. It is designed as an introduction to precision medicine for undergraduates, particularly for the non-scientist student, but also explores issues relevant to students who are planning a career in science or medicine.
2021 – 2023	MRKT B8658 – Catching Growth Waves: To 2050 and Beyond Guest lecturer
2018 – 2024	CMBS G4150 – Molecular Genetics Guest lecturer
2018 – 2024	BCHM G6300 – Biochemistry, Cell and Molecular Biology I Guest lecturer
2018 – 2024	BIOL GU4080 – The Ancient and Modern RNA Worlds Guest lecturer
2018, 2020	CMBS OC6200 – Genomic Innovation Guest lecturer

## EXPERIENCE AS THESIS SPONSOR AND COMMITTEE MEMBER

### **Current postdoctoral scientists**

1. Dr. Egill Richard  
Ph.D. in Bacterial Genetics (2022)  
Institut Pasteur, Advisor: Professor Céline Loot
2. Dr. Tanner Wiegand  
Ph.D. in Microbiology and Cell Biology (2021)  
Montana State University, Advisor: Professor Blake Wiedenheft
3. Dr. Diego R. Gelsinger  
Ph.D. in Biology (2020)  
Johns Hopkins University, Advisor: Professor Jocelyne DiRuggiero
4. Dr. Chance Meers  
Ph.D. in Molecular Genetics (2019)  
George Institute of Technology, Advisor: Professor Francesca Storici

### **Current doctoral students**

1. Mr. Americo Casas Ciniglio  
Columbia University, Dept. of Genetics, 2024 – present  
B.S. from University of Miami (2023)
2. Ms. Rimantė Žedaveinytė  
Columbia University, Integrated Program in CMBS, 2022 – present  
B.S., M.S. from Vilnius University (2018, 2020)
3. Ms. Edan Mortman  
Columbia University, Dept. of Genetics, 2021 – present  
B.S. from Tel Aviv University (2021)
4. Mr. Stephen Tang  
Columbia University, MSTP / Integrated Program in CMBS, 2020 – present  
B.S. from Yale University (2018)
5. Mr. Matt W.G. Walker  
Columbia University, Dept. of Biological Sciences, 2020 – present  
B.A. from Harvard College (2016)
6. Mr. Florian T. Hoffmann  
Columbia University, Integrated Program in CMBS, 2020 – present  
B.S. from University College London (2020)
7. Mr. George D. Lampe  
Columbia University, Integrated Program in CMBS, 2020 – present  
B.A. from Middlebury College (2018)

### **Former postdoctoral scientists**

1. Dr. Jerrin T. George  
Postdoctoral scientist, 2021–2024  
Current position: Postdoctoral scientist, Montana State University, Bozeman, MT, USA
2. Dr. Minjoo Kim  
Postdoctoral scientist, 2020–2021  
Current position: Postdoctoral scientist, NYU School of Engineering, New York, NY, USA



3. Dr. Leslie Y. Beh  
Postdoctoral scientist, 2019–2020  
Current position: PI, Institute of Molecular and Cell Biology, A\*STAR, Singapore

### Former doctoral students

1. Dr. Rebeca T. King  
Ph.D. awarded in 2023  
Thesis title: Targeted DNA integration in human cells without double-strand breaks using CRISPR-associated transposases  
Current position: Medical school student, Columbia University Irving Medical Center
2. Dr. Sanne E. Klompe  
Ph.D. awarded in 2022  
Thesis title: Discovery of RNA-guided DNA integration by CRISPR-associated transposases  
*\*Awarded RNA Society Scaringe Award, Harold Weintraub Award, CUIMC Dean's Award*  
Current position: Postdoctoral fellow, Institut Pasteur, Paris, France
3. Dr. Phuc L.H. Vo  
Ph.D. awarded in 2021  
Thesis title: Bacterial genome engineering with CRISPR RNA-guided transposons  
Current position: Research scientist, Vertex Pharmaceuticals, Boston, MA, USA
4. Dr. Tyler S. Halpin-Healy  
Ph.D. awarded in 2021  
Thesis title: Structure and function of a transposon-encoded CRISPR-Cas system  
Current position: Senior scientist, Regeneron Pharmaceutic, Tarrytown, NY, USA

### Undergraduate students

I have mentored / am presently mentoring ~12 undergraduate students at Columbia University.

### Thesis committees

I have served / am serving on ~15 doctoral thesis committees at Columbia University.

## H. INVITED TALKS

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### KEYNOTE TALKS & NAMED LECTURES

- 2024 Keynote, Japanese Society for Genome Editing annual meeting, Osaka, Japan; June 18
- 2024 Keynote, Chemistry-Biology Interface (CBI) Retreat, University of Pennsylvania, Philadelphia, PA, USA; June 7
- 2024 Keynote, BCDBs Annual T32 Symposium, Emory University, Atlanta, GA, USA; May 3
- 2023 Keynote, Hansen Life Sciences Retreat, Utah State University, Logan, UT, USA; October 27
- 2023 Keynote, AMBGC, McGill University Research Institute, Montreal, Quebec, Canada; March 21
- 2022 Keynote, Lehigh Valley Symposium on CRISPR, Easton, PA, USA; September 17
- 2022 Keynote, Regeneron Pharmaceuticals, Inc. (virtual); March 14
- 2021 Claritas Lecture, Susquehanna University, Selinsgrove, PA, USA; October 5

- 2020 Explorer Lecture, Cleveland Museum of Natural History (virtual); November 6
- 2020 Nathan Kaufman Timely Topics Lecture, USCAP Annual Meeting, Los Angeles, CA, USA; March 2
- 2019 Distinguished Speaker Series Keynote Speaker, Bakersfield College, Bakersfield, CA, USA; October 24
- 2018 Keynote, Linda Hall Library, Kansas City, MO, USA; March 15

### INVITED SEMINARS & PRESENTATIONS

- 2024 Aaron Diamonds AIDS Research Center, Columbia University, New York, NY, USA; July 30
- 2024 GenScript Gene & Cell Engineering Summit (virtual); July 24
- 2024 Genome Editing Symposium, Institute of Medical Science, University of Tokyo, Japan; June 21
- 2024 Genetic Engineering and Biotechnology News Summit, The State of CRISPR and Gene Editing (virtual); June 5
- 2024 RNA Initiative Symposium, Columbia University, New York, NY, USA; May 13
- 2024 Department of Biochemistry and Molecular Biophysics, Columbia University, New York, NY; May 9
- 2024 ImmunoTalks, University of Bonn, Germany; April 26
- 2024 International Congress on Transposable Elements, Saint-Malo, France; April 23
- 2024 Genome Integrity Discussion Group, New York, NY, USA; April 10
- 2024 Department of Pharmacology, Weill Cornell Medicine, New York, NY, USA; April 2
- 2024 Department of Molecular Genetics, University of Toronto, Canada; March 11
- 2024 Keystone Symposium in Precision Genome Engineering, Banff, Canada; January 23
- 2024 RNA MaxiGroup, University of Wisconsin-Madison, Madison, WI, USA; January 16,
- 2023 EMBO Workshop, CRISPR-Cas: From Biology to Therapeutic Applications, Seville, Spain; November 7
- 2023 In Vivo Gene Therapy & Genome Editing Summit, Miami, FL, USA; October 30
- 2023 MCB Graduate Program Seminar Series, Brown University, Providence, RI, USA; October 25
- 2023 Stem Cell Clonality and Genome Stability Retreat, Brussels, Belgium; October 23
- 2023 Center for Synthetic Biology, University of California, Irvine, CA, USA; October 6
- 2023 Dept. of Chemistry and Biochemistry, University of California, San Diego, CA, USA; October 5
- 2023 Frontiers in Biology Seminar Series, Stanford University, Palo Alto, CA, USA; October 4
- 2023 Systems Biology Institute, Yale University, New Haven, CT, USA; September 13
- 2023 Nucleic Acids Gordon Research Conference, Newry, ME, USA; June 21
- 2023 Advances in Precision Medicine Seminar Series, Columbia University, New York, NY, USA; June 15
- 2023 Visiting seminar, Beam Therapeutics, Cambridge, MA, USA; June 12
- 2023 American Society of Gene + Cell Therapy Annual Meeting, Los Angeles, CA, USA; May 18
- 2023 Visiting seminar, Eli Lilly (virtual); May 10
- 2023 Guest speaker, Aude Bernheim Group Retreat (virtual); May 4
- 2023 Dept. of Genetics and Genome Sciences, UConn Health, Farmington, CT, USA; April 27
- 2023 Webinar hosted by InsideScientific, Sanguine Biosciences (virtual); April 13
- 2023 Seminars in Clinical Research, The Rockefeller University, New York, NY, USA; April 5
- 2023 Guest speaker, David Liu Group Retreat, Puerto Rico, USA; February 24

- 2023 Institute of Medical Science University of Tokyo Seminar, New York, NY, USA; February 17
- 2023 Swiss CRISPR Symposium, Zurich, Switzerland; February 9
- 2023 Dept. of Microbiology, University of California, San Francisco, CA, USA; January 24
- 2022 Program in Quantitative Genomics conference, Harvard University (virtual); November 4
- 2022 MBGSO Distinguished Speaker, Rutgers University, New Brunswick, NJ, USA; October 28
- 2022 Transposable Elements, Cold Spring Harbor Laboratory Meeting, NY, USA; October 15
- 2022 Dept. of Biochemistry and Molecular Biology, University of Chicago, IL, USA; September 28
- 2022 Cystic Fibrosis Foundation Research Conference Seattle, WA, USA; June 27
- 2022 Visiting seminar, Eli Lilly / Prevail Therapeutics (virtual); May 23
- 2022 Dept. of Microbiology, Biochemistry and Molecular Genetics, Rutgers New Jersey Medical School, Newark, NJ, USA; May 17
- 2022 Biotechnology Training Program, Northwestern University (virtual); May 11
- 2022 Keystone Symposium in Precision Genome Engineering, Keystone, CO, USA; April 29
- 2022 Dept. of Biochemistry and Biophysics, University of Rochester Medical Center, Rochester, NY, USA; April 6
- 2022 Dept. of Biochemistry and Molecular Biophysics, McGill University (virtual); March 21
- 2022 Visiting seminar, Caribou Biosciences, Inc. (virtual); March 16
- 2022 Dept. of Molecular and Cell Biology, University of California, Berkeley, CA, USA; February 7
- 2022 Dept. of Biochemistry and Molecular Biology, Johns Hopkins University (virtual); January 31
- 2022 Social DNAing seminar series, Columbia University (virtual); January 20
- 2021 Dept. of Chemistry and Biochemistry, CUNY ASRC, New York, NY, USA; December 8
- 2021 Genetics and Genomics Grand Rounds, Columbia University (virtual); December 2
- 2021 European Society of Gene and Cell Therapy annual meeting (virtual); October 22
- 2021 Dept. of Biological Chemistry, University of Michigan, Ann Arbor, MI, USA; October 12
- 2021 Dept. of Microbiology, Cornell University, Ithaca, NY, USA; October 7
- 2021 AIChE CRISPR Technologies Conference (virtual); October 3
- 2021 Next Generation Genomics annual meeting (virtual); September 27
- 2021 The Mobile Genome, EMBO meeting (virtual); September 1
- 2021 Genome Engineering, Cold Spring Harbor Laboratory Meeting (virtual); August 18
- 2021 Genscript Gene & Cell Engineering Virtual Summit (virtual); July 22
- 2021 CRISPR 2021 Meeting (virtual); June 7
- 2021 Dept. of Biochemistry and Molecular Genetics, University of Louisville (virtual); April 12
- 2021 Nucleic Acid Therapies, Cold Spring Harbor Laboratory Meeting (virtual); March 25
- 2021 Keystone Symposium: Precision Engineering of the Genome, Epigenome, and Transcriptome (virtual); March 8
- 2021 National Center for Genome Editing in Agriculture, Israel (virtual); February 23
- 2021 Crop Bioengineering Center, Iowa State University (virtual); February 10
- 2020 Biotechnology Program Symposium, University of Virginia (virtual); November 6
- 2020 Transposable Elements, Cold Spring Harbor Laboratory Meeting (virtual); October 9
- 2020 American Society of Gene & Cell Therapy, Annual Meeting (virtual); May 15
- 2020 Dept. of Medicine Grand Rounds, Icahn School of Medicine at Mount Sinai, New York, NY, USA; February 18
- 2020 Dept. of Medical Microbiology and Immunology, University of Wisconsin, Madison, WI, USA; February 14
- 2020 PepTalk Conference, San Diego, CA, USA; January 20
- 2019 RNA Therapeutics Institute, UMass Medical School, Worcester, MA, USA; November 19

- 2019 Helmholtz Institute for RNA-based Infection Research, Würzburg, Germany; December 10
- 2019 Dept. of Molecular Biology and Genetics, Johns Hopkins University, Baltimore, MD, USA; November 7
- 2019 Genome Engineering, Cold Spring Harbor Laboratory Meeting, NY, USA; October 11
- 2019 Genome Integrity Group, New York Academy of Sciences, New York, NY, USA; October 7
- 2019 World Affairs Council, Louisville, KY, USA; August 19
- 2019 CRISPR 2019 Meeting, Quebec City, Canada; June 11
- 2019 New York Genome Center, New York, NY, USA; May 29
- 2018 Future of North Carolina Forum, Raleigh, NC, USA; December 7
- 2018 Arizona State University Biodesign Institute, Tempe, AZ, USA; November 1
- 2018 16<sup>th</sup> Medical Biodefense Conference, Munich, Germany; October 29
- 2018 Jackson Laboratory Healthcare Forum, Farmington, CT, USA; October 24
- 2018 Simons Society of Fellows Conference, New York, NY, USA; October 11
- 2018 New Jersey City University, Jersey City, NJ, USA; September 25, 2018.
- 2018 Division of Life Science, Hong Kong University of Science and Technology, Hong Kong; September 10
- 2018 International Consortium on Applied Bioeconomy Research, Washington, DC, USA; June 15
- 2018 Panel discussion, World Science Festival. New York, NY, USA; May 31
- 2018 Pacific Coast Reproductive Society Meeting, Palm Springs, CA, USA; March 25
- 2018 XPOMET Convention, Leipzig, Germany; March 22
- 2017 Global Food Summit, Berlin, Germany; November 29
- 2017 Precision Health Forum, University of Illinois, Chicago, IL, USA; November 9
- 2017 Chicago Ideas Week, Chicago, IL, USA; October 17
- 2017 Symposium on Emerging Technologies (virtual); September 21
- 2017 StartART: Annual REI Nursing Congress, Las Vegas, NV, USA; August 5
- 2017 American Academy of Dermatology 2017 meeting, New York, NY, USA; July 28
- 2017 IVY Ideas Night, Los Angeles, CA, USA; June 22
- 2017 Midwest Reproductive Symposium international, Chicago, IL, USA; June 17
- 2017 Dept. of Microbiology and Immunology, Columbia University, New York, NY, USA; April 17
- 2016 Envision Conference, Princeton, NJ, USA; December 4
- 2016 EuropaBio 20<sup>th</sup> Year Anniversary Gala, Brussels, Belgium; November 16
- 2016 StartART: Annual REI Nursing Congress, Las Vegas, NV, USA; August 4
- 2016 “What Makes Us ... Us.” TED Radio Hour; July 15
- 2016 CRISPR–Cas9: Breakthroughs and challenges, Inserm workshop, Bordeaux, France; April 6
- 2016 Common Hour Lecture, Franklin & Marshall College, Lancaster, PA, USA; January 21
- 2015 CRISPR Summit, London, England; December 8
- 2015 Medical Research Council-Laboratory of Molecular Biology, Cambridge, England; December 7
- 2015 TEDMED, Palm Springs, CA, USA; November 18
- 2015 Patrick Cramer Group Annual Workshop, Kreuth, Germany; October 2
- 2015 Harold Weintraub Graduate Student Award Symposium, Fred Hutchinson Cancer Research Center, Seattle, WA, USA; May 1
- 2015 Dept. of Molecular Genetics, Weizmann Institute, Rehovot, Israel; February 10
- 2015 Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel; February 9
- 2014 Antiviral Defense Mechanisms Symposium, Wageningen, Netherlands; October 8

- 2014 Systems Biology of Gene Regulation and Genome Editing, Cold Spring Harbor Asia, Suzhou, China; September 11
- 2014 Genome Engineering: Theory into Practice, Bentley University, Boston, MA, USA; June 20
- 2014 German Cancer Research Center, University of Heidelberg, Heidelberg, Germany. May 23
- 2014 Max-Delbrück-Center for Molecular Medicine, Berlin, Germany; May 13
- 2014 Broad Institute, Massachusetts Institute of Technology, Cambridge, MA, USA; April 14
- 2014 Biosciences & Biotechnology Division Seminar, Lawrence Livermore National Laboratory, Livermore, CA, USA; January 16
- 2013 Dept. of Biology, Franklin & Marshall College, Lancaster, PA, USA; October 8
- 2013 Microbes Meeting, University of Illinois, Urbana-Champaign, IL, USA; April 4
- 2013 Dept. of Immunology and Infectious Disease, Montana State University, Bozeman, MT, USA; February 26