

CURRENT

Assistant Professor of Mathematics, Courant Institute, New York University
Branco Weiss Fellow, postdoc-to-faculty transition fellowship

January 2026 – present
October 2024 – 2029

EDUCATION AND TRAINING

Lewis-Sigler Theory Scholar, Princeton University
Fellow, Center for the Physics of Biological Function, CUNY

Princeton, NJ
September 2021 – January 2026

Harvard University

Ph.D., Biophysics. Advised by Michael Brenner
National Defense Science and Engineering Graduate (NDSEG) Fellowship

Cambridge, MA
May 2021

Princeton University

A.B., Physics; Graduated with Highest Honors.
Research advisors: Ben Machta, David Huse, Ned Wingreen
Certificates: Quantitative & Computational Biology; Applied & Computational Mathematics

Princeton, NJ
May 2016

SELECTED FELLOWSHIPS, HONORS AND AWARDS

Branco Weiss Fellowship ~\$660K over 5 years to support postdoc-to-faculty transition 2024 – 2029
Awarded to 7/360 applicants worldwide across sciences, engineering, humanities
Lewis-Sigler Theory Scholar Princeton University; salary + \$25K/year in research funding 2021 – present
Quantitative Biology Ph.D. Fellowship Harvard University 2019 – 2021
Certificates of Distinction in Teaching Harvard University March 2018, September 2018
DBIO Graduate Student Travel Award to present at APS March Meeting January 2017
National Defense Science and Engineering Graduate Fellowship June 2016
Princeton Kusaka Memorial Prize in Physics for outstanding 4th year research and coursework June 2016
Princeton Applied and Computational Mathematics Prize for outstanding independent research June 2016
Princeton Quantitative and Computational Biology Award for outstanding independent research June 2016
Member, Phi Beta Kappa Society; Society of Sigma Xi June 2016
Princeton Allen G. Shenstone Prize in Physics for outstanding 3rd year research and coursework May 2015
2015 Education Committee Travel Award to present at Biophysical Society Meeting February 2015
Shapiro Prize for Academic Excellence awarded to top 3% of 1st/2nd year Princeton students December 2014
Presidential Scholar Semifinalist; National Merit Scholarship Finalist January 2012

PUBLICATIONS

T. K. Chiang, **O. Kimchi**, H. K. Dhaliwal, D. A. Villarreal, F. F. Vasquez, V. Manoharan, M. P. Brenner, R. Garmann. *Measuring intramolecular connectivity in long RNA molecules using two-dimensional DNA patch-probe arrays*. Nucleic Acids Research 53, 11 (2025).

L. A. Becker, S. A. Quinodoz, T. J. Comi, **O. Kimchi**, D. A. Knowles, C. P. Brayngwynne. *Genome-wide mapping of mesoscale neuronal RNA organization and condensation*. bioRxiv 649570 (2025).

O. Kimchi, Y. Meir, N. S. Wingreen. *Bacterial defense and phage counter-defense lead to coexistence in a modeled ecosystem*. Proceedings of the National Academy of Sciences, USA 121(44), e2414229121 (2024).

O. Kimchi, Y. Meir, N. S. Wingreen. *Lytic and temperate phage naturally coexist in a dynamic population model*. The ISME Journal 18(1), wræ093 (2024).

O. Kimchi^{*}, B. B. Larsen^{*}, O. R. S. Dunkley, A. J. W. te Velthuis, C. A. Myhrvold. *RNA structure modulates Cas13 activity and enables mismatch detection*. bioRxiv 560533 (2023).

O. Kimchi[†], E. M. King, M. P. Brenner. *Uncovering the mechanism for aggregation in repeat expanded RNA reveals a reentrant transition*. Nature Communications 14 (2023). Selected for Editor's Highlights.

A. I. Curatolo, **O. Kimchi**, C. P. Goodrich, R. K. Krueger, M. P. Brenner. *A computational toolbox for the assembly yield of complex, heterogeneous structures*. Nature Communications 14 (2023).

O. Kimchi[†], M. P. Brenner, L. J. Colwell. *RNA structure prediction including pseudoknots through direct enumeration of states: A user's guide to the LandscapeFold algorithm*. RNA structure prediction, Methods in Molecular Biology Springer (2022).

O. Kimchi[†], C. P. Goodrich, A. Courbet, A. I. Curatolo, N. B. Woodall, D. Baker, M. P. Brenner. *Self-assembly-based posttranslational protein oscillators*. Science Advances 6(51) (2020).

J. Kames, D.D. Holcomb, **O. Kimchi**, M. DiCuccio, N. Hamasaki-Katagiri, T. Wang, A. A. Komar, A. Alexaki, C. Kimchi-Sarfaty. *Sequence analysis of SARS-CoV-2 genome reveals features important for vaccine design*. Scientific Reports 10, 15643 (2020).

O. Kimchi[†], T. Cragolini, M. P. Brenner, L. J. Colwell[†]. *A polymer physics framework for the entropy of arbitrary pseudoknots*. Biophysical Journal 117(3):520-532 (2019).

O. Kimchi, S. L. Veatch, B. B. Machta. *Ion channels can be allosterically regulated by membrane domains near a de-mixing critical point*. Journal of General Physiology 150(12):1769-1777 (2018). Selected for cover.

M. Watts, J. Ha, **O. Kimchi**, A. Sherman. *Paracrine Regulation of Glucagon Secretion: The β - α - δ Model*. American Journal of Physiology—Endocrinology & Metabolism 310(8):E597-E611 (2016).

*Co-first authors [†]Corresponding author

PATENT APPLICATIONS

Method of determining secondary structure of a nucleic acid. U.S. Patent Application No. 17/482,765, March 31, 2022. R. F. Garmann, T. K. Chiang, V. N. Manoharan, **O. Kimchi**, M.P. Brenner.

Enhanced nucleic acid detection using Cas13 and designed secondary structure. U.S. Patent Application No. 63/542,704, October 5, 2023. C. Myhrvold, B. Larsen, **O. Kimchi**, O. Dunkley, A. te Velthuis.

NON-ACADEMIC RESEARCH EXPERIENCE

Google Research

Summer Intern

Palo Alto, CA

Summer 2019

- *What information is encoded by continuous glucose monitors?*
 - Analyzed large time-series datasets of patient continuous glucose monitoring data
 - Employed machine learning, neural networks (LSTMs, CNNs, FCNs)
- *Are correlations in language truly long-range?* Advisor: Bill Bialek
 - Conducted large-scale dataset analysis on English text documents
 - Used information theory approaches to compare correlations to those expected by chance

SELECTED PRESENTATIONS

Invited speaker, Flatiron Institute, New York City, NY	2024
Invited speaker, APS March Meeting, Minneapolis, MN	2024
Invited speaker, Aspen Center for Physics Workshop: the Physics of Biological Data Analysis, Aspen, CO	2024
Poster, CSHL Meeting: Genome Engineering—CRISPR Frontiers, Cold Spring Harbor, NY	2024
Poster, Winter Q-Bio conference, Ko Olina, HI	2024
Poster, Biophysical Society Annual Meeting, Philadelphia, PA	2024
Invited speaker, MIT Physics of Living Systems Short Talks, Cambridge, MA	2023
Poster, Soft Matter Physics Gordon Research Conference, New London, NH	2023
Selected lightning talk, Rutgers-Princeton Biomolecular Condensates Day, Princeton, NJ	2023
Speaker & session chair, APS March Meeting, Las Vegas, NV	2023
Invited speaker, Boston College Biology Seminar, Boston, MA	2021
Selected oral presentation, 1 st Annual Bidesign Research Conference, Virtual	2020
Speaker & session chair, APS March Meeting, Virtual	2020
Speaker & poster, Harvard QBio symposium, Cambridge, MA	2020

Speaker, <i>APS March Meeting, Boston, MA</i>	2019
Poster, <i>Stochastic Physics in Biology Gordon Research Conference, Ventura, CA</i>	2019
Speaker, <i>APS March Meeting, Los Angeles, CA</i>	2018
Poster, <i>Cargèse summer school, Cargèse, France</i>	2018
Poster, <i>Vannevar Bush Faculty Fellowship 10th Anniversary Symposium, Washington, D.C.</i>	2018
Speaker, <i>APS March Meeting, New Orleans, LA</i>	2017
Poster, <i>Intracellular Phase Transitions Meeting, Princeton, NJ</i>	2017

TEACHING

Princeton University	Fall 2021, Summer 2022
<ul style="list-style-type: none"> Scientific Reading and Presentations in Biology, <i>course instructor</i> Integrated Science, <i>preceptor</i> 	
Harvard University	Fall 2017 – Summer 2020
<ul style="list-style-type: none"> Scientific Reading and Writing in Quantitative Biology, <i>course instructor</i> Science and Engineering for Managing Covid, <i>teaching assistant</i> Inverse Problems, <i>teaching assistant</i> Mathematical Modeling, <i>teaching assistant</i> 	
Princeton University	Summers 2014, 2015
<ul style="list-style-type: none"> Freshman Scholars Institute QuantLab, <i>tutor</i> 	

COMMUNITY ACTIVITIES

Peer reviewer

- Physical Review Letters; PNAS; Nature Communications; PLOS Computational Biology*

Conference organizer

January 2024

- Co-organized workshop “Bacteria vs. Phage: The Main Event” at Princeton Center for Theoretical Science.
- Recruited speakers, emphasizing diversity across different axes; led discussions throughout workshop

Seminar leader

Fall 2019 – Spring 2021

- Ran Kavli seminar: weekly seminar series with diverse speakers fostering intra-Harvard collaborations
- Shepherded seminar into virtual space in March 2020, maintaining high attendance and engagement

REFERENCES

Ned S. Wingreen, Princeton University. wingreen@princeton.edu

Cameron A. Myhrvold, Princeton University. cmyhrvol@princeton.edu

Michael P. Brenner, Harvard University. brenner@seas.harvard.edu