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OFER KIMCHI

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CURRENT

Assistant Professor of Mathematics, Courant Institute, New York University — January 2026 – present
Branco Weiss Fellow, postdoc-to-faculty transition fellowship — October 2024 – 2029

EDUCATION AND TRAINING

Lewis-Sigler Theory Scholar, Princeton University — *Princeton, NJ*
Fellow, Center for the Physics of Biological Function, CUNY — September 2021 – January 2026

Harvard University — *Cambridge, MA*
Ph.D., Biophysics. Advised by Michael Brenner — May 2021
National Defense Science and Engineering Graduate (NDSEG) Fellowship

Princeton University — *Princeton, NJ*
A.B., Physics; Graduated with Highest Honors. — May 2016
Research advisors: Ben Machta, David Huse, Ned Wingreen
Certificates: Quantitative & Computational Biology; Applied & Computational Mathematics

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 $1^{st}/2^{nd}$ 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), wrae093 (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. Cragnolini, 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 *Palo Alto, CA*
Summer Intern 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

Selected speaker, *RNA Nanotechnology Gordon Research Conference, Ventura, CA*	2025
Invited speaker, *San Diego State University, San Diego, CA*	2024
Poster, *AIChE Annual Meeting, San Diego, CA*	2024
Invited speaker, *Oxford University, Oxford, UK*	2024
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, *1ˢᵗ Annual Biodesign Research Conference, Virtual*   2020
Speaker & session chair, *APS March Meeting, Virtual*   2020
Speaker & poster, *Harvard QBio symposium, Cambridge, MA*   2020
Speaker, *APS March Meeting, Boston, MA*   2019
Poster, *Stochastic Physics in Biology Gordon Research Conference, Ventura, CA*   2019
Speaker, *APS March Meeting, Los Angeles, CA*   2018
Poster, *Cargèse summer school, Cargèse, France*   2018
Poster, *Vannevar Bush Faculty Fellowship 10ᵗʰ Anniversary Symposium, Washington, D.C.*   2018
Speaker, *APS March Meeting, New Orleans, LA*   2017
Poster, *Intracellular Phase Transitions Meeting, Princeton, NJ*   2017

TEACHING

Princeton University   Fall 2021, Summer 2022
- Scientific Reading and Presentations in Biology, *course instructor*
- Integrated Science, *preceptor*

Harvard University   Fall 2017 – Summer 2020
- Scientific Reading and Writing in Quantitative Biology, *course instructor*
- Science and Engineering for Managing Covid, *teaching assistant*
- Inverse Problems, *teaching assistant*
- Mathematical Modeling, *teaching assistant*

Princeton University   Summers 2014, 2015
- Freshman Scholars Institute QuantLab, *tutor*

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