Krishna
Shrinivas

Assistant Professor of Chemical and Biological Engineering, Northwestern University

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Education

PhD & MS in Practice, Chemical Engineering, Massachusetts Institute of Technology

September 2014 - August 2020

B.Tech (Honors), Chemical Engineering, IIT-Madras

Sept 2010 - Jul 2014, Minor in Theoretical Chemistry

Experience

Assistant Professor of Chemical and Biological Engineering, Northwestern University
Member, Center for Synthetic Biology

Feb 2024 - now, Evanston IL USA

NSF-Simons Quantitative Bio Fellow, Harvard University

Sept 2020 - Jan 2024, Cambridge MA USA

Whitman Center Associate & Physiology Trainee, Marine Biological Laboratories
Visiting researcher, Gladfelter Lab

July 2023, 2022 & June-July 2021, Woods Hole, USA

March 2022, UNC-Chapel Hill

Consulting Scientist,

Merck, April 2016 - May 2016, Ballydine, Ireland

Cenovus Energy, Jan 2016 - Feb 2016, Calgary, Canada

Key Awards and Fellowships

NSF-Simons Fellowship, Harvard University, *Sept. 2020 - Jan 2024*
~$350K over 3+ years for supporting independent postdoctoral research

Research Grant, Marine Biological Laboratories, *March 2022*
~$2k funding to facilitate collaborative research at Gladfelter Lab

Edward W. Merrill Outstanding Teaching Assistant Award, MIT *May 2018*
Student nominated award for best TA across Chemical Engineering

Institute silver medal & Reliance Heat Transfer Prize, IIT-Madras *2013-2014*
University-wide prize for academic and research excellence

Publications

Refer to Google Scholar for exhaustive list (14 *published*, 1 *preprint*, 6000+ citations)
Papers in reverse chronological order | [=]equal contributions, [c]corresponding author

Key papers

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1. Halima H. Schede[=], Pradeep Natarajan[=], Arup K. Chakraborty, and **Krishna Shrinivas[c]** "A model for organization and regulation of nuclear condensates by gene activity." *Nature Communications* 14, no. 1 (2023): 4152. | Link to paper

2. **Krishna Shrinivas[c]**, Michael P Brenner "Phase separation in fluids with many interacting components." *Proceedings of the National Academy of Sciences* 118, no. 45 (2021): e2108551118.| Link to paper

3. Jonathan E. Henninger[=], Ozgur Oksuz[=], **Krishna Shrinivas[=]**, Ido Sagi, Gary LeRoy, Ming M. Zheng, J. Owen Andrews Alicia V. Zamudio, Charalampos Lazaris, Nancy M. Hannett, Tong Ihn Lee, Phillip A. Sharp, Ibrahim I. Cissé, Arup K. Chakraborty[c], and Richard A. Young[c]. "RNA-mediated feedback control of transcriptional condensates." *Cell* 184, no. 1 (2021): 207-225. | Link to paper

4. **Krishna Shrinivas[=]**, Benjamin R Sabari[=], Eliot L Coffey, Isaac A Klein, Ann Boija, Alicia V Zamudio, Jurian Schuijers, Nancy M Hannett, Phillip A Sharp, Richard A Young, Arup K Chakraborty. "Enhancer features that drive formation of transcriptional condensates." *Molecular Cell* 75, no. 3 (2019): 549-561 | Link to paper

5. Ang Gao[=], **Krishna Shrinivas[=]**, Paul Lepeudry, Hiroshi I Suzuki, Phillip A Sharp, Arup K Chakraborty " *Proceedings of the National Academy of Sciences* 115, no. 47 (2018): E11053-E11060. | Link to paper

6. Benjamin R Sabari, Alessandra Dall'Agnese, Ann Boija, Isaac A Klein, Eliot L Coffey, **Krishna Shrinivas**, Brian J Abraham, Nancy M Hannett, Alicia V Zamudio, John C Manteiga, Charles H Li, Yang E Guo, Daniel S Day, Jurian Schuijers, Eliza Vasile, Sohail Malik, Denes Hnisz, Tong Ihn Lee, Ibrahim I Cisse, Robert G Roeder, Phillip A Sharp, Arup K Chakraborty, Richard A Young "Coactivator condensation at super-enhancers links phase separation and gene control." *Science* 361, no. 6400 (2018)| Link to paper

7. Denes Hnisz[=], **Krishna Shrinivas**[=], Richard A Young, Arup K Chakraborty, Phillip A Sharp, A phase separation model for transcriptional control. *Cell*, 169 (2017), pp.13-23.| Link to paper

Additional papers

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1. Pradeep Natarajan, **Krishna Shrinivas**, and Arup K. Chakraborty. "A model for cis-regulation of transcriptional condensates and gene expression by proximal lncRNAs." *Biophysical Journal* (2023) S0006-3495. | Link to paper
2. Lu, Wen, Ynes A. Helou, **Krishna Shrinivas**, Jen Liou, Byron B. Au-Yeung, and Arthur Weiss. "The phosphatidylinositol-transfer protein Nir3 promotes PI (4, 5) P2 replenishment in response to TCR signaling during T cell development and survival." *Nature Immunology* 24, no. 1 (2023): 136-147. | Link to paper
3. **Krishna Shrinivas**[c], Michael P Brenner "Multiphase coexistence capacity in complex fluids." bioRxiv (2022): 2022-10. | Link to Preprint
4. Isaac A. Klein, Ann Boija, Lena K. Afeyan, Susana Wilson Hawken, Mengyang Fan, Alessandra Dall'Agnese, Ozgur Oksuz, Jonathan E Henninger, **Krishna Shrinivas**, Benjamin R Sabari, Ido Sagi, Victoria E Clark, Jesse M Platt, Mrityunjoy Kar, Patrick M McCall, Alicia V Zamudio, John C Manteiga, Eliot L Coffey, Charles H Li, Nancy M Hannett, Yang Eric Guo, Tim-Michael Decker, Tong Ihn Lee, Tinghu Zhang, Jing-Ke Weng, Dylan J Taatjes, Arup Chakraborty, Phillip A Sharp, Young Tae Chang, Anthony A Hyman, Nathanael S Gray, Richard A Young "Partitioning of cancer therapeutics in nuclear condensates." *Science* 368, no. 6497 (2020): 1386-1392. | Link to paper
5. Yang Eric Guo, John C Manteiga, Jonathan E Henninger, Benjamin R Sabari, Alessandra Dall'Agnese, Nancy M Hannett, Jan-Hendrik Spille, Lena K Afeyan, Alicia V Zamudio, **Krishna Shrinivas**, Brian J Abraham, Ann Boija, Tim-Michael Decker, Jenna K Rimel, Charli B Fant, Tong Ihn Lee, Ibrahim I Cisse, Phillip A Sharp, Dylan J Taatjes, Richard A Young "Pol II phosphorylation regulates a switch between transcriptional and splicing condensates." *Nature* 572, no. 7770 (2019): 543-548 | Link to paper
6. Ann Boija, Isaac A Klein, Benjamin R Sabari, Alessandra Dall'Agnese, Eliot L Coffey, Alicia V Zamudio, Charles H Li, **Krishna Shrinivas**, John C Manteiga, Nancy M Hannett, Brian J Abraham, Lena K Afeyan, Yang E Guo, Jenna K Rimel, Charli B Fant, Jurian Schuijers, Tong Ihn Lee, Dylan J Taatjes, Richard A Young "Transcription factors activate genes through the phase-separation capacity of their activation domains." *Cell* 175, no. 7 (2018): 1842-1855. | Link to paper
7. **Krishna Shrinivas,** Rahul P Kulkarni, Saif Shaikh, Ravindra V Ghorpade, Renu Vyas, Sanjeev S Tambe, S Ponrathnam, Bhaskar D Kulkarni Prediction of Reactivity Ratios in Free Radical Copolymerization from Monomer Resonance–Polarity (Q–e) Parameters: Genetic Programming-Based Models." International Journal of Chemical Reactor Engineering 14, no. 1 (2016): 361-372. | Link to paper

8. Susmita Roy, **Krishna Shrinivas**, Biman Bagchi "A stochastic chemical dynamic approach to correlate autoimmunity and optimal vitamin-D range." PLoS One 9, no. 6 (2014): e100635. | Link to paper

Talks

Invited and plenary presentations | contributed talks are specified separately

2023

1. Greater Boston Area Statistical Mechanics meeting, *MIT USA*
2. ChBE Dept. Retreat, *Northwestern University*
3. MathBio Annual Meeting, *Simons Foundation NY, USA*

Faculty search seminars:

4. *UCSD* NanoEngineering , USA
5. *UCLA* Chemical and Biological Engineering, USA
6. *Caltech* Chemistry and Chemical Engineering, USA
7. *Carnegie Mellon* University Physics, USA
8. *Stanford University* Chemical Engineering, USA
9. *University of Wisconsin-Madison* Chemical Engineering, USA
10. *Northwestern University* Chemical and Biological Engineering,USA

2022

11. AIChE Conference, *Phoenix, USA* (multiple talks, *contributed*)
12. Rising Stars in Soft and Biological Matter, *UChicago* (virtual)
13. Soft Living Adaptive and Active Matter Talk, *UC Merced* (virtual)
14. Physics of Living Systems Short Talks, *MIT, USA*
15. Genome organization and Nuclear function, *CSHL, USA*

2021

16. Molecular & Cell Biology Seminar, *Harvard, USA*
17. Active Matter Colloquium, *Harvard CMSA, USA*
18. Cell fate symposia, *UC Irvine, USA* (virtual)
19. Dewpoint Therapeutics, *Cambridge MA, USA* (virtual)

2020

20. Kavli Seminar, *Harvard, USA* (virtual)
21. NSF-Simons Colloquia, *Harvard QBio Initiative USA* (virtual)

2019

22. MPI-PKS and MPI-CBG ELBE colloquia, *Dresden, Germany*
23. Center for Systems Biology Seminar, *Dresden, Germany*
24. Lewis-Sigler Institute Symposia, *Princeton, NJ USA*
25. Keystone Symposia on Biomolecular Condensates, *Snowbird USA*
26. IMES Research Seminar Series, *MIT USA*

2017

27. Physics seminar series, *Brandeis USA*
28. MIT Biophysics Retreat, *MIT USA*
29. Phase separation and RNA processing, *San Diego USA*

Patents

Methods and assays for modulating gene transcription by modulating condensates, US Patent App. 17/040,967 Pending

Mentorship

Northwestern
Ethan V. Halingstad, *ChBE Graduate student*, Northwestern University
Mary K. Skillicorn, *ChBE Graduate student,* Northwestern University

Outside Northwestern
Wilton T. Snead (K-99 committee), *Postdoc*, Duke University
Aidan Zentner, *Graduate student in Physics,* Harvard University
Ryan Krueger, *Graduate student*, Harvard University

Past Mentees (at MIT or Harvard)
Ella King, *PhD candidate,* Harvard University
Ramya Desphande, *PhD candidate*, Harvard University
Pradeep Natarajan, *PhD candidate*, MIT
Halima H. Schede, *MS Thesis*, MIT
Cecilia Salah, *MS Thesis*, MIT
Paul Lepeudry, *MS Thesis*, MIT

Teaching and communication

Kavli seminar, 2021-2022

Organized a purely trainee-focused chalk-talk style lecture series on applied and soft matter physics

ChemE Communication Lab, MIT

April 2017 - Dec 2019 | Link to work

Organized workshops, mentored 10+ UROPS, and developed open-access resources

Kaufman Teaching Certificate Program, MIT

June 2019

Teaching Assistant for UG Transport, MIT

May 2018

Student-nominated prize for best TA in department

Service

Peer Review (20+ reviews)

Cell, Science, Physical Review Letters, Proceedings of the National Academy of Sciences, Nature Communications, iScience, Scientific Reports, Journal of Physical Chemistry Letters, EMBO Reports, Soft Matter, Frontiers in Cell & Developmental Biology, Biochemistry and Biophysical Reports, Viruses, Cells, and Biomolecules, Physical Review Letters, EMBO Journal,

Editor

Guest editor for PNAS

Reviewing editor for Frontiers in Physics & Molecular Biosciences

eLife Ambassador 2019-2020

Worked on improving open and accessible science outcomes

Phase separation Journal Club, MIT & Harvard (2017-2019)

Organized monthly meetings on phase separation in biology

References

References available upon request