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a. Personal Statement

My research and educational activities are focused on understanding how living cells utilize the phase transition of multivalent biomolecules to organize their intracellular space into membrane-less compartments and control specific signaling functions, such as stress regulation and gene activation. To achieve this goal, current research in my lab is focused on investigating the formation, structure, dynamics, and regulation of phase transition of ribonucleoproteins (RNPs) that play multifaceted roles in RNA metabolism and posttranslational regulation of gene expression in eukaryotes. Our work involves the application of high-resolution fluorescence microscopy, single-molecule Förster Resonance Energy Transfer (FRET) spectroscopy, dual-trap optical tweezer technology, bioinformatics, biochemical, cellular, and molecular biology tools, and polymer physics-based model building.

In parallel, I have developed an intensive mentoring program at UB that inspires improved participation of minority and historically underrepresented students in cross-disciplinary research. Under my mentorship, Ms. Hannah Seppala, a female undergraduate student, won the prestigious Barry Goldwater Scholarship in 2019 and NSF Graduate Research Fellowship in 2020. One of my current students from the PI's group, Mr. Paul Dewan Jr, a URM junior in Physics and Biology, won the prestigious Barry Goldwater Scholarship in 2022 and NSF Graduate Research Fellowship in 2020. I am currently training 2 undergraduate students (one underrepresented minority student), 5 graduate students, and 5 postdoctoral trainees in my group.

b. Education and Training

RKMVC College, University of Calcutta, Kolkata, India	Chemistry	BS/2005
West Bengal University of Technology, Kolkata, India	Chemical Physics	MS/2007
University at Albany, SUNY, Albany, NY	Biophysics	Ph.D./2011
The Scripps Research Institute, La Jolla, CA	Research Associate, Single-molecule Biophysics	Postdoc/2012-2017
The Scripps Research Institute, La Jolla, CA	American Heart Association Postdoctoral Fellow	Postdoc/2014-2015

c. Professional Appointments

2021-present **Adjunct Assistant Professor of Biology**, Department of Biological Sciences, University at Buffalo, Buffalo, NY

2021-present	Adjunct Assistant Professor , Department of Chemical and Biological Engineering, University at Buffalo, Buffalo, NY
2017-present	Assistant Professor of Physics , Department of Physics, University at Buffalo, Buffalo, NY
2012-2017	Research Associate in Biophysics , The Scripps Research Institute, La Jolla, CA
2008-2011	Research/Teaching Assistant , University at Albany, SUNY, Albany, NY

d. Products

Preprints

1. Wadsworth, G. M., Zahurancik, W. J., Zeng, X., Pullara, P., Lai, L. B., Sidharthan, V., Pappu, R. V., Gopalan, V., **Banerjee, P. R.***, 2022. RNAs undergo phase transitions with lower critical solution temperatures. *bioRxiv*. DOI: <https://doi.org/10.1101/2022.10.17.512593>.
2. Alshareedah, I., Singh, A., Quinn, A., **Banerjee, P. R.***, 2022. Determinants of Viscoelasticity and Flow Activation Energy in Biomolecular Condensates. *bioRxiv* 2022.12.30.522262; DOI: <https://doi.org/10.1101/2022.12.30.522262>.
3. Alshareedah, I., Borchers, W. M., Cohen, S., R., Farag, M., Bremer, A., Singh, A., Pappu, R. V., Mittag, T., **Banerjee, P. R.***, 2022. Sequence-encoded grammars determine material properties and physical aging of protein condensates. *bioRxiv* 2023.04.06.535902; DOI: <https://doi.org/10.1101/2023.04.06.535902>.
4. Davis, B. D., Ranganath, A. K., Moosa, M. M., **Banerjee, P. R.***, 2023. Heterotypic interactions in the dilute phase can drive co-condensation of prion-like low-complexity domains of FET proteins and mammalian SWI/SNF complex. *bioRxiv* 2023.04.12.536623; DOI: <https://doi.org/10.1101/2023.04.12.536623>.

Peer-reviewed Publications [h-index = 21(Google Scholar)]

After 2017

(*Corresponding author; §Co-first authors)

1. Davis, B. D., Moosa, M. M., **Banerjee, P. R.***, 2022. Ectopic Biomolecular Phase Transitions: Fusion Proteins in Cancer Pathologies. *Trends in Cell Biology*. **In Press**. DOI: <https://doi.org/10.1016/j.tcb.2022.03.005>
2. Laghmach, R. §, Alshareedah, I. §, Pham, M., Raju, M., **Banerjee, P. R.***, Potoyan, D. A.* , 2022. RNA chain length and stoichiometry govern surface tension and stability of protein-RNA condensates. *iScience*. DOI: [10.1016/j.isci.2022.104105](https://doi.org/10.1016/j.isci.2022.104105)
3. Pullara, P., Alshareedah, I., **Banerjee, P. R.***, 2022. Temperature-dependent reentrant phase transition of RNA–polycation mixtures. *Soft Matter*. 18, 1342-1349. DOI: [10.1039/D1SM01557E](https://doi.org/10.1039/D1SM01557E).
 - This article is part of the themed collection: *Soft Matter Emerging Investigators Series 2021*.

4. Alshareedah, I., **Banerjee, P. R.***, 2022. Measurement of protein and nucleic acid diffusion coefficients within biomolecular condensates using in-droplet fluorescence correlation spectroscopy. *Methods in Molecular Biology*. **In Press**.
5. Alshareedah, I., Moosa, M. M., **Banerjee, P. R.***, 2021. Programmable Viscoelasticity in Protein-RNA Condensates with Disordered Sticker-Spacer Polypeptides. *Nature Communications*. 12(1):6620. DOI: [10.1038/s41467-021-26733-7](https://doi.org/10.1038/s41467-021-26733-7). PubMed PMID: 34785657; PubMed Central PMCID: PMC8595643.
6. Davis, B. D., Kaur, T., Moosa, M. M., **Banerjee, P. R.***, 2021. FUS Oncofusion Protein Condensates Recruit mSWI/SNF Chromatin Remodelers via Heterotypic Interactions Between Prion-like Domains. *Protein Science: Special Issue—Biophysics of Biomolecular Condensates*. 30(7):1454-1466. DOI: <https://doi.org/10.1002/pro.4127>.
7. Kaur, T., Raju, M., Alshareedah, I., Davis, B. D., Potoyan, A. D., **Banerjee, P. R.***, 2021 Sequence-encoded and Composition-dependent Protein-RNA Interactions Control Multiphasic Condensate Topologies. 2021. *Nature Communications*. DOI: <https://doi.org/10.1038/s41467-021-21089-4>
8. Alshareedah, I., Thurston, G. M. & **Banerjee, P. R.*** Quantifying Viscosity and Surface Tension of Multi-Component Protein-Nucleic Acid Condensates. 2021. *Biophysical Journal*. DOI: <https://doi.org/10.1016/j.bpj.2021.01.005>
 - New and Notable commentary by Yu and Lemke. *Biophysical Journal*, Volume 120, Issue 7. <https://doi.org/10.1016/j.bpj.2021.02.024>.
9. Alshareedah, I. Moosa, M. M., Raju, M., Potoyan, A. D., **Banerjee, P. R.***, 2020. Phase Transition of RNA-protein Complexes into Ordered Hollow Condensates. *Proc. Natl. Acad. Sci. (U.S.A)*. 117 (27) 15650-15658. DOI: <https://doi.org/10.1073/pnas.1922365117>.
 - Featured article in phys.org
 - Featured article in EurekAlert
 - Featured article in ScienceDaily
10. Alshareedah, I., Kaur, T., **Banerjee, P. R.***, 2020. Methods for characterizing the material properties of biomolecular condensates. *Methods in Enzymology*; DOI: <https://doi.org/10.1016/bs.mie.2020.06.009>
11. Subversion of Host Stress Granules by Coronaviruses: Potential Roles of π -rich Disordered Domains of Viral Nucleocapsids. Moosa, M. M., **Banerjee, P. R.*** 2020. *J Med Virol*. 10.1002/jmv.26195. DOI: <https://doi.org/10.1002/jmv.26195>
12. Kaur, T., Alshareedah, I., Wang, W., Ngo, J., Moosa, M. M., **Banerjee, P. R.*** 2019. Molecular Crowding Tunes Material States of Ribonucleoprotein Condensates. *Biomolecules*, 9(2), 71; Doi: <https://doi.org/10.3390/biom9020071>.
 - Featured as a Cover Article by *Biomolecules*
 - News Highlight in UB News and Views, March 11, 2019
 - News brief published on the NSFScience360 News Service
 - Featured article in phys.org
 - Featured article in EurekAlert
 - Featured article in BioPhotonics Magazine
13. Alshareedah, I., Kaur, T., Ngo, J., Seppala, H., Djomnang Kounatse, L.-A., Wang, W., Moosa, M. M., **Banerjee, P. R.***, 2019. Interplay Between Short-range Attraction and Long-range Repulsion Controls Reentrant Liquid Condensation of Ribonucleoprotein-RNA Complexes. *J. Am. Chem. Soc.* 141, 37, 14593-14602. Doi:

<https://doi.org/10.1021/jacs.9b03689>

- News Highlight in [UB News and Views](#), 13th Oct, 2019.
- Featured in JACS Young Investigators 2020 [virtual issue](#)
- Recommended in [Faculty Opinions](#)

14. Onuchic, P. L., Milin, A. N., Alshareedah, A., Deniz, A. A., **Banerjee, P. R.*** 2019. Divalent cations can control a switch-like behavior in heterotypic and homotypic RNA coacervates. *Scientific Reports*, Vol 9, Article number: 12161. Doi: <https://doi.org/10.1038/s41598-019-48457-x>.

- News Highlight in [UB News and Views](#), 22nd Aug, 2019

15. Nair, S. J., Yang, L., Meluzzi, D., Oh, S., Yang, F., Friedman, M., Wang, S., Suter, T., Alshareedah, I.[§], Gamliel, A., Ma, Q., Zhang, J., Hu, Y., Tan, Y., Ohgi, K., Jayani, R., **Banerjee, P. R.**, Aggarwal, A. K., Rosenfeld, M. G. 2019. Phase Separation of Ligand-Activated Enhancers Licenses Cooperative Chromosomal Enhancer Assembly. *Nature Structural & Molecular Biology*. 26, 193–203; Doi: <https://doi.org/10.1038/s41594-019-0190-5>.

- Commentary in [Nature Structural & Molecular Biology: News and Views](#). 26, 153–154 (2019).
- New highlight published in [Nature Review Genetics](#). 20, 255 (2019).

16. Mitrea, D. M., Cika, J. A., Stanley, C. B., Nourse, A., Onuchic, P. L., **Banerjee, P. R.**, Phillips, A. H., Park, C. G., Deniz, A. A., Kriwacki, R. W. 2018. “Self-interaction of NPM1 modulates multiple mechanisms of liquid-liquid phase separation”, *Nature Communications*. 9: 842. DOI: <https://doi.org/10.1038/s41467-018-03255-3>

- Featured article in *phys.org*
- Featured article in *EurekaAlert*

Patents

1. **Banerjee, P. R.**, Alshareedah, I., Moosa, M. M. January 2020. Lipid-free polyionic vesicles and methods of making and using same. *Provisional patent filed. US 62/958,039*.

Before 2017 (Graduate and Postdoctoral Research)

(*Corresponding Authors; [§]Co-first authors)

17. **Banerjee, P. R.***, Milin, A. N., Moosa M. M., Onuchic, P. L., Deniz, A. A.* 2017. Reentrant phase transition drives dynamic substructure formation in ribonucleoprotein droplets. *Angew Chem Int Ed Engl*. 56(38):11354-11359. DOI: 10.1002/anie.201703191. PMID: 28556382.

- Highlighted as a Very Important Paper (VIP) by the journal
- Featured in TSRI News & Views, June 2017
- Featured in The Scientist Magazine, June 2017

18. **Banerjee, P. R.***, Moosa M. M., Deniz, A. A.* 2016. Two-dimensional crowding uncovers a hidden conformation of α -synuclein. *Angew Chem Int Ed Engl*. 55(41):12789-92. PMID: PMC5166577.

- Highlighted as a “Hot Paper” by the journal.
- Featured in TSRI News & Views, Sept 2016.

19. **Banerjee, P. R.**, Mitrea, D. M., Kriwacki, R. W., Deniz, A. A., 2015. Asymmetric Modulation of Protein Order-Disorder Transitions by Phosphorylation and Partner Binding. *Angew Chem Int Ed Engl.* 55(5):1675-9. PMID: PMC4752826.
 - Faculty of 1000 Recommended Paper, Jan 2016
 - Featured in TSRI News & Views, Dec 2015.
20. Mitrea, D. M., Cika, J. A., Guy, C. S., Ban, D., **Banerjee, P. R.**, Stanley, C. B., Nourse, A., Deniz, A. A., Kriwacki, R. W. 2016. NPM1 integrates into the nucleolar fraction through multi-modal interactions with R-rich linear motifs and ribosomal RNA. *eLife*;10.7554/eLife.13571. PMID: PMC4786410.
21. **Banerjee, P. R.**, Deniz, A. A. 2014. Shedding light on protein folding landscapes by single-molecule fluorescence. *Chem. Soc. Rev.* 43, 1172-1188. PMID: PMC3958939.
22. Polinkovsky, M. E.[§], Gambin, Y.[§], **Banerjee, P. R.**[§], Erickstad, M. J., Groisman, A., Deniz, A. A. 2014. Ultrafast cooling reveals microsecond-scale biomolecular dynamics. 2014. *Nature Communications.* 5:5737 ([§] **Equal contributions first authors**).
 - News coverage by BioTechniques, Jan 2015
 - Featured in TSRI News & Views, Dec 2014
23. **Banerjee, P. R.**, Pande, A., Shekhtman, A., Pande, J. 2015. Molecular mechanism of the chaperone function of mini- α -crystallin, a 19-residue peptide of human α -crystallin. *Biochemistry*, 54 (2), 505–515.
 - News Coverage in Chemical & Engineering News: January 5, 2015, Vol 93 (1), p. 8. PMID: PMC4303307
24. **Banerjee, P. R.**, Pande, A., Patrosz, J., Thruston, G. M., Pande, J. 2011. Cataract-associated mutant E107A of human gamma D-crystallin shows increased attraction to alpha-crystallin and enhanced light scattering. *Proc. Natl. Acad. Sci. (U.S.A)* 108, 574-579.
 - Commentary in *Proc. Natl. Acad. Sci. (U.S.A)*: January 11, 2011, 108, p. 437-8
 - Highlighted in *Chemical & Engineering News*. January 17, 2011, Vol 89 (3), p. 36). PMID: PMC3021023
25. **Banerjee, P. R.**, Puttamadappa, S. S., Pande, A., Shekhtman, A., Pande, J. 2011. Increased hydrophobicity and decreased backbone flexibility explain the lower solubility of a cataract-linked mutant of gammaD-crystallin. *J. Mol. Biol.* 412, 647-659. PMID: PMC3184788.
26. Pande, A., Ghosh, K. S., **Banerjee, P. R.**, Pande, J. 2010. Increase in surface hydrophobicity of the cataract-associated P23T mutant of human gamma D-crystallin is responsible for its dramatically lower, retrograde solubility. *Biochemistry*, 49, 6122-6129. PMID: PMC2913551.
27. Pande, A., Zhang, J., **Banerjee, P. R.**, Puttamadappa, S. S., Shekhtman, A., Pande, J. 2009. NMR study of the cataract-linked P23T mutant of human gamma D-crystallin shows minor changes in hydrophobic patches that reflect its retrograde solubility. *Biochem. Biophys. Res. Commun.* 382, 196-199. PMID: PMC2707783.
28. Halder, P., **Banerjee, P. R.**, Zangrando, E., Paine, T. K. 2008. Effect of Ligand Spacer on Metallosupramolecular Architectures: From a Dinuclear Copper (II) Double Helicate to a Tetranuclear Copper (II) Complex. *European Journal of Inorganic Chemistry* (36), 5659-5665.

29. Halder, P., Chakraborty, B., **Banerjee, P. R.**, Zangrando, E., Paine, T. K. 2008. Role of α -hydroxycarboxylic acids in the construction of supramolecular assemblies of nickel (ii) complexes with nitrogen donor coligands. *CrystEngComm* 11 (12), 2650-2659.
30. Chakraborty, B., **Banerjee, P. R.**, Paine, T. K. 2012. Oxidative C–C Bond Cleavage of α -Keto Acids by Cobalt (II) Complexes of Nitrogen Donor Ligands. *European Journal of Inorganic Chemistry* (35), 5843-5853.

e. Oral Presentations (30 Invited talks and 8 contributed talks)

After 2017

1. **2022.** Invited seminar at the Department of Physics and Astronomy, Johns Hopkins University. Postponed to Spring 2023.
2. **2022.** Invited seminar at the Department of Chemistry, UMass Amherst. Postponed to Spring 2023.
3. **2022.** Invited Key Note Speaker at the Soft Matter Symposium, Rochester Institute of Technology
4. **2022.** Invited seminar at the NCI/NIH workshop: Understand the Role of Intrinsically Disordered Proteins
5. **2022.** Invited seminar at the Department of Biochemistry and Molecular Biology, Johns Hopkins Bloomberg School of Public Health
6. **2022.** Invited seminar at Biochemistry & Cellular and Molecular Biology Department, The University of Tennessee Knoxville
7. **2022.** Invited seminar at the BIOCENTER, Johannes Gutenberg University, Mainz, Germany.
8. **2022.** Invited talk at the EMBL Symposium: Cellular mechanisms driven by phase separation
9. **2022.** Invited seminar at the [IDP seminar series](#).
10. **2022.** Invited seminar at Department of Biochemistry, Medical College of Wisconsin, Milwaukee.
11. **2022.** Invited seminar at Department of Chemistry, University at Albany, SUNY.
12. **2021.** Invited speaker at the 2021 [Condensate Colloquium Series](#) (supported by the German Research Foundation).
13. **2021.** Invited speaker at the 51st IUPAC General Assembly.
14. **2021.** Invited Seminar at the Faze Medicines.
15. **2021.** Invited seminar at Department of Chemistry and Biochemistry, The Ohio State University.
16. **2021.** Invited Colloquium at the Department of Physics and Astronomy, SUNY Geneseo.
17. **2021.** Invited Seminar at the Department of Chemical and Biological Engineering, University at Buffalo.
18. **2021.** Invited Seminar at the Structural Biology Department, St. Jude Children's Research Hospital.

19. **2020.** Invited speaker at the Next Generation Biophysics Symposium 2020. Hosted by The Medical Research Council Laboratory of Molecular Biology and Imperial College London, Cambridge, UK.
20. **2020.** Invited speaker at the FOXG1 Science Symposium 2020. Hosted by the FOXG1 Research Foundation.
21. **2020.** Invited Seminar at the Department of Chemistry, University at Buffalo.
22. **2020.** Invited webinar at Lumicks, Amsterdam, Netherlands.
23. **2020.** Invited webinar at Dewpoint Therapeutics, Boston, MA. Publicly available [link](#).
24. **2020.** Invited talk at the Intrinsically Disordered Protein subgroup symposium, 64th Annual Meeting of Biophysical Society, San Diego, CA.
25. **2020.** Invited talk at the Biomolecular Condensate Summit, Boston, MA. (Meeting canceled due to COVID-19 outbreak)
26. **2020.** Invited seminar at the Department of Physics, Clemson University, Clemson, SC. (Visit canceled, a Webinar given through Zoom)
27. **2020.** Invited seminar at the Department of Chemistry and Biochemistry, Ohio State University (Visit canceled due to COVID 19 outbreak)
28. **2019.** Invited talk at the Workshop on Macromolecular Crowding in Telluride (TSRC), CO.
29. **2019.** Invited talk in the "Biomolecular Structure and Function in Liquid-Liquid Phase Separation" session, Fall 2019 National Meeting of the American Chemical Society, San Diego, CA.
30. **2019.** Invited seminar at the Roy J. Carver Department of Biochemistry, Biophysics and Molecular Biology, Iowa State University, Ames, IA.
31. **2019.** Contributed talk at the APS March meeting, Boston, MA.
32. **2018.** Young Investigator Talk at the 32nd Annual Symposium of the Protein Society, Boston, MA.
33. **2018.** Contributed talk at the Gordon Research Conference on Intrinsically Disordered Proteins, Les Diablerets, Switzerland.

Before 2017

34. **2017.** Contributed talk at the Phase Separation and RNA Processing as Drivers of Cancer and Neurodegenerative Disease Meeting, San Diego, CA.
35. **2017.** Contributed talk at the 61st annual meeting of Biophysical Society, New Orleans, LA.
36. **2015.** Contributed talk at the 59th annual meeting of Biophysical Society, Baltimore, MD.
37. **2013.** Contributed talk at the 57th annual meeting of Biophysical Society, Philadelphia, PA.
38. **2011.** Contributed talk at the 17th Conversation Meeting, Albany, NY, USA.

Oral Presentations by the Group Members

1. **2022.** Contributed talk by Gable Wadsworth (postdoc) at the 66th annual meeting of Biophysical Society, San Francisco, CA.

2. **2021.** Contributed talk by Richoo Davis (postdoc) at the virtual IDPseminars annual poster event.
3. **2021.** Contributed talk by Taranpreet Kaur (graduate student) at the APS March Meeting (virtual).
4. **2021.** Contributed talk by Ibraheem Alshareedah (graduate student) at the APS March Meeting (virtual).
5. **2021.** Contributed talk by Paul Pullara (undergraduate student) at the APS March Meeting (virtual).
6. **2021.** Contributed talk by Ibraheem Alshareedah (graduate student) at the 35th Annual Symposium of the Protein Society (virtual).
7. **2021.** Contributed talk by Ibraheem Alshareedah (graduate student) at the IDPSIG symposium (virtual).
8. **2020.** Contributed talk by Taranpreet Kaur (graduate student) at the IOP early career symposium.

f. Honors and Awards

- **2023.** NSF CAREER Award
- **2021.** Soft Matter Emerging Investigator
- **2020.** Outstanding Investigator Award (R35/MIRA) by NIH/NIGMS
- **2020.** Featured in JACS Young Investigator Issue
- **2015.** American Heart Association (AHA) postdoctoral fellowship (01/2015 – 12/2016)
- **2012.** Distinguished Doctoral Dissertation Award, College of Arts and Science, University at Albany, SUNY, Albany.

g. Professional Affiliations

- Editorial board member (Associate Editor) of Frontiers in Molecular Biosciences, 2022 – Present
- Member of American Chemical Society, 2019 – present
- Member of American Physical Society (APS), 2017 – Present
- Member of Protein Society, 2016 – Present
- Member of American Heart Association (AHA), 2013 – Present
- Member of Biophysical Society (BPS), 2010 – Present

h. Mentoring

- **Current graduate students:**
 - Paul Pullara (Physics program; Spring 2022 – Present)
 - Pinki Chahal (Physics program; Fall 2022 – Present)
 - Tharun Mahendran (Biology program; Spring 2021 – Present)

- Anushka Supakar (Biology program; Spring 2022 – Present)
- Aishwarya Kanchi Ranganath (Chemical and Biological Engineering program; Fall 2021 – Present)
- **Past graduate students:**
 - Ibraheem Alshareedah
 - Physics PhD; Graduated in May 2022; currently a postdoc at the University at Buffalo, SUNY
 - Taranpreet Kaur
 - Physics PhD; Graduated in Feb 2022; currently a postdoc at Duke University
 - Benjamin Cammett (Physics M.S.; Graduated in August 2020)
 - Tsering Dolma (Physics M.S.; Graduated in May 2018)
- **Current undergraduate students:**
 - Alex Quinn (Winter 2021 – present)
 - Paul Dewan (Spring 2021 – present)
 - Recipient of 2022 Barry Goldwater Scholarship
- **Past undergraduate students:**
 - Ritika Bhajiwala (Spring 2022-Summer 2022; currently a graduate student at the University of Toronto)
 - Sean Ge (Winter 2021-Spring 2022)
 - Mridu Moitra (2020-2021; currently a project engineer at Project Farma)
 - Hannah Seppala (2017-2020; currently a graduate student at the Physics Department, UMBC)
 - Recipient of 2019 Barry Goldwater Scholarship
 - Recipient of 2021 NSF Graduate Research Fellowship
 - Paul Pullara (Spring 2020-Winter 2022; currently a graduate student at the Physics Department, University at Buffalo, SUNY)
 - Jason Ngo (2018-2020; currently a research technician at Columbia University)
 - Liz-Audrey Djomnang Kounatse (2018-2020; currently a graduate student at Cornell University Graduate Program in Biomedical Engineering)
 - Andrew Sipper (Summer 2019)
 - Anishka Mendez (Summer 2018: recruited through the Louis Stokes Alliance for Minority Participation-LSAMP program, UB)
 - Dan Morphet (2017-2018)
- **Current postdoctoral fellows:**
 - Dr. Richoo Davis (September 2019 – present)
 - Dr. Gable Wadsworth (December 2020 – present)
 - Dr. Anurag Singh (May 2022 – present)
 - Dr. Ibraheem Alshareedah (June 2022 – present)
 - Dr. Ritika Gupta (Oct 2022– present)

- **Past postdoctoral fellows:**
 - Dr. Mahdi Moosa (2019 – 2022)
 - Dr. Wei Wang (2018 – 2019)
- **Ph.D. thesis advisory committees:**
 - Muye He (Physics Department, current)
 - Xing Liu (Physics Department, current)
 - Qian He (Biological Sciences Department, current)
 - Akansha Sharma (Physics Department, Graduated in Spring 2022)
 - Michael Zucker (Physics Department; Graduated in Fall 2021)

i. Mentoring Highlights

- Paul Dewan was the Recipient of the 2022 Goldwater Scholarship and 2023 NSF Graduate Research Fellowship
- Hannah Seppala was the Recipient of the 2019 Goldwater Scholarship and 2021 NSF Graduate Research Fellowship
- Liz-Audrey Djomnang Kounatse is Currently a Dean Scholar at the Cornell University Graduate Program in Biomedical Engineering
- Taranpreet Kaur received Biophysical Society Travel Award at the 65th Annual meeting, 2021 (Virtual)
- Ibraheem Alshareedah received Biophysical Society Travel Award at the 64th Annual meeting, 2020 (San Diego, CA)
- Ibraheem Alshareedah received Biophysical Society Student Research Achievement Award (SRAA) at the 64th Annual meeting, 2020 (San Diego, CA)
- Ibraheem Alshareedah (in 2022) and Taranpreet Kaur (in 2021) received Bahethi Fellowship from the UB Physics Department for showing outstanding promise in graduate research

j. Teaching

- PHY107LR General Physics I: Fall 2017, Spring 2018, Spring 2020, Spring 2021, Spring 2022
 - This is a calculus-based introductory course primarily for chemistry, engineering, and physics majors. The average enrollment in this course was 180 students.
- PHY583/PHY533 Introduction to Molecular Biophysics: Spring 2019, Spring 2023
 - I developed this one-semester course on Molecular Biophysics that consists of both lectures and laboratory sessions. It is designed to provide beginning graduate students and upper-level undergraduate students with basic education and training in Molecular Biophysics. Both theory and modern experimental tools to study the complex biophysics of living systems are covered. The average enrollment in this course was 14 students.
- PHY405 Thermal and Statistical Physics I: Fall 2019, Fall 2020, Fall 2021, Fall 2022
 - This course explores the main ideas and techniques of statistics and statistical description of particles. This is an upper-level undergraduate course that is

required for undergraduate students enrolled in the Physics BS program. The average enrollment in this course was 20 students.

- BIO504/404 Advanced Molecular Genetics (3 lectures): Spring 2021, Spring 2022
 - This is a senior/graduate course, taught by multiple instructors, that highlights the experimental basis for our understanding of the mechanisms of DNA replication and gene expression. In my section, I cover overviews of the formation, and regulation of the function of biomolecular condensates in bacteria, plants, and humans. The average enrollment in this course was 17 students.

k. Services (Community, Department & University level)

- **Reviewer activity for peer-reviewed journals:**

- Biophysical Journal
- Physical Chemistry Chemical Physics
- Scientific Reports
- Molecular BioSystems
- Analytical Chemistry
- Analytical Methods
- Chemical Communications
- RSC Advances
- The Journal of Physical Chemistry Letters,
- Biochemistry
- The Journal of Biological Chemistry
- The Journal of Molecular Biology
- Proceedings of the National Academy of Sciences (PNAS)
- The Journal of American Chemical Society
- Nature Communications
- Nucleic Acid Research
- Molecular Cell
- Nature Cell Biology
- Nature Chemical Biology
- Nature Chemistry
- eLife
- iScience

- **Reviewer activity for grant applications**

- National Institutes of Health (NIH) panel reviewer /scientific review group 2023/01 ZCA1 SRB-X (J1) S member (2022)
- National Science Foundation (NSF) MRI panel, Division of Biological Infrastructure: Served as a panel reviewer (2022)
- Swiss National Science Foundation (SNSF): Served as an external peer reviewer (2022)
- European Research Council (ERC): Served as an external peer reviewer (2022)

- National Institutes of Health (NIH) special emphasis panel ETTN-H (50) reviewer (2021-2022)
- French National Research Agency (ANR): Served as an external peer reviewer (2021; 2022)
- Deutsche Forschungsgemeinschaft (German Research Foundation): Served as an external peer reviewer (2021-2022)
- French National Research Agency (ANR): Served as an external peer reviewer (2021; 2022)
- Deutsche Forschungsgemeinschaft (German Research Foundation): Served as an external peer reviewer (2021-2022)
- National Science Foundation (NSF): Served as an external peer reviewer (2021)
- Reeves Endowment project, Dartmouth Hitchcock Medical Center and Dartmouth College: Served as an external peer reviewer (2021)

- **Organizing Committee Member for [45th International Conference on Infrared, Millimeter, and Terahertz Waves](#)**. All-virtual conference. Nov 08-13, 2020. (Initially scheduled to take place in Buffalo, NY, USA). Total registered attendees ~ 600.
- **Elected Program Co-chair of Biophysical Society (BPS) Intrinsically Disordered Protein (IDP) Subgroup** (2022 annual meeting).
- **Elected Council member of Biophysical Society (BPS) Intrinsically Disordered Protein (IDP) Subgroup** (2022-2024)
- **Co-editor** of a Nature Springer's Methods in Molecular Biology (MiMB) book series entitled "[Phase-Separated Biomolecular Condensates](#)" (2022)
- **Guest editor** of a special issue "[Phase Separation— At the Interface Between Cell Biology, Polymer Chemistry, and Soft Matter Physics](#)." in iScience (cell press) (2021-2022)
- **Guest editor** of a special issue "Liquid-Liquid Phase Separation in Biological Systems" in *Biomolecules* (2020)
- **Committee service at the Department & University level:**
 - Faculty search committee at Physics Department (2023)
 - Arts and Physics Building Exhibit Committee at Physics Department (2019-2020; Chair: 2020-Present)
 - Graduate Studies Committee at Physics Department (2018-present)
 - Graduate Recruitment Committee at Physics Department (2019-present; Chair: 2019-2020)
 - Sekula Scholarship Committee at Physics Department (2022-present)
 - Faculty search committee at Physics Department (2021-2022)
 - Chair's Advisory Committee at Physics Department (2019-2021)
 - Bahethi Fellowship Committee at Physics Department (2020-2021)
 - Physics Colloquium Committee (Chair: Fall 2019; Fall 2021)

- Faculty search committee at Biological Sciences Department (2019-20)
- Physics Safety Committee (Chair: Second Floor and Observatory Representative; 2018-2019)
- Physics Seminar Committee (2018-2019)

I. Research Support

• Award 1

Funding agency: National Institutes of Health/NIA (grant number **R21 AG064258**)

Project period: 08/01/19-03/31/22

Project Title: Mechanism of liquid phase homeostasis of prion-like RNA binding proteins

Status: Award Completed

Role: Principal Investigator/Project Director

• Award 2

Funding agency: National Institutes of Health/NIGMS (grant number **R35 GM138186**)

Project period: 08/15/20-06/30/25

Project Title: Quantifying Physiologic and Pathologic Viscoelastic Phases of Biomolecular Condensates by Correlative Force and Fluorescence Microscopy

Status: Current Award

Role: Principal Investigator/Project Director

• Award 3

Funding agency: Mae Stone Goode Trust

Project period: 12/01/20-03/31/23

Status: Award Completed

Project Title: Decoding and Targeting FOXG1 Condensation in Treatment of Neurodevelopmental Disorders

Role: Principal Investigator/Project Director

• Award 4

Funding agency: National Institutes of Health/NIA (grant number **R03 AG070510**)

Project period: 01/15/21-12/31/23

Project Title: Developing a screening platform to identify inhibitors of pathological self-assembly of Tau

Status: Current Award

Role: Principal Investigator/Project Director

• Award 5

Funding agency: National Institutes of Health/NCATs (grant number **R03 TR003387-01A1**)

Project period: 05/01/21-04/30/23

Status: Current Award

Project Title: Deciphering the role of low complexity domains in dual specificity kinase function

Role: Principal Investigator/Project Director

• Award 6

Funding agency: St Jude Children's Research Hospital

[Updated: April 2023](#)

[Priya R. Banerjee, Ph.D.](#)

Assistant Professor, Department of Physics
Adjunct member, Department of Biological Sciences
Adjunct member, Department of Chemical and Biological Engineering

Group webpage: Banerjeelab.org
Twitter: [@BanerjeeLab_UB](https://twitter.com/BanerjeeLab_UB)

Project period: 03/01/22-02/28/2027

Project Title: Research Collaborative on Liquid Organelles (Leader T. Mittag): The biology and biophysics of RNP granules

Status: Current Award

Role: Co-Principal Investigator

- **Award 7**

Funding agency: National Science Foundation

Project period: 01/15/23-12/31/2027

Project Title: CAREER: Dissecting Phase Behavior of Pioneer Transcription Factor Condensates and Their Role in Gene Regulation

Role: Principal Investigator