

Curriculum Vitae
Margaret E. Johnson

Associate Professor
Department of Biophysics
Johns Hopkins University

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EDUCATION AND PROFESSIONAL EXPERIENCE:

- 2022-Present Associate Professor, Johns Hopkins University
- 2013-Present Assistant Professor, Johns Hopkins University
Primary Appointment: Department of Biophysics, KSAS
Joint Appointment: Department of Biology, KSAS
Joint Appointment: Department of Chem. Biomolecular Engineering, WSE (since 2020)
- 2009-2013 Postdoctoral Fellow
US National Institutes of Health, Bethesda, MD.
Advisor: Dr. Gerhard Hummer
- 2004-2009 Ph.D in Bioengineering
University of California, Berkeley
Thesis: Understanding the interplay of structure and dynamics in liquids using coarse-grained models and experiment
Advisor: Prof Teresa Head-Gordon
- 2000-2004 B.S. in Applied Math, *Magna Cum Laude*
Columbia University, NY, NY

HONORS AND AWARDS:

- 2020 *Future of Biophysics* Invited Speaker. Burroughs Wellcome Fund Symposium at the annual Biophysical Society Meeting, recognizing four young scientists performing cutting-edge research in biophysics.
- 2019 NIH MIRA Award to the Johnson Lab.
- 2018 NSF CAREER Award.
- 2017 Scialog Fellow. About 50 promising early career researchers were selected as fellows for the initiative *Molecules Come to Life*. Research Corporation for Scientific Advancement.
- 2011 NIH K99/R00 Pathway to Independence Award.
- 2011 Grand prize poster award, Berkeley Statistical Mechanics Meeting.
- 2010 NIH Fellow Award for Research Excellence (FARE)
- 2006 Outstanding poster award, American Chemical Society Conference.

PUBLICATIONS:

INDEPENDENT CAREER (*=corresponding, †=lab undergraduate, °=co-first author)

1. Feng, X.A., Maryam, Y., Fu, Y., Ness, K.M., Liu, C., Ahmed, I., Bowman, G.D., **Johnson, M.E.**, Ha, T.J., Wu, C. GAGA Zinc finger transcription factor searches chromatin by 1D-3D facilitated diffusion. *In revision* (2024).
2. Fu, Y., Johnson, D., Beaven, A., Sodt, A., Zeno, W., & **Johnson, M.E.***, Predicting how lipid composition controls protein curvature sensing with a continuum bilayer membrane model. bioRxiv: doi:10.1101/2024.01.15.575755 (2024).
3. Jhaveri, A.°, Loggia, S.†°, Qian, Y.†, & **Johnson, M.E.***, Discovering optimal kinetic pathways for self-assembly using automatic differentiation. *PNAS USA* **121**, e2403384121 (2024).
4. Jiang, A., Gormal, R.S., Wallis, T., Robinson, P.J., **Johnson, M.E.**, Joensuu, M., Meunier, F.A. Dynamin1 long- and short-tail isoforms exploit distinct recruitment and spatial patterns to form endocytic nanoclusters. *Nat. Comm.* **15**, 4060 (2024).
5. Qian, Y.†°, Evans, D.°, Mishra, B., Fu, Y., Liu, Z., Guo, S., & **Johnson, M.E.*** Temporal control by co-factors prevents kinetic trapping in retroviral Gag assembly. *Biophysical Journal* **122**, 1-18 bioRxiv: doi:10.1101/2023.02.08.527704 (2023).
6. Guo, S., Saha, I., Saffarian, S., & **Johnson, M.E.*** Structure of the HIV immature lattice allows for essential lattice remodeling within budded virions. *eLife* e84881 bioRxiv: doi:10.1101/2022.11.21.517392 (2023).
7. Xie, Q., Lee, S.O., Vissamsetti, N., Guo, S., **Johnson, M.E.**, Fried, S.D. Secretion-Catalyzed Assembly of Protein Biomaterials on a Bacterial Membrane Surface. *Angewandte Chemie*, e202305178 (2023).
8. Fu, Y. and **Johnson, M.E.*** Modeling membrane reshaping driven by dynamic protein assemblies. *Curr Opin Struct Biol.* **78**, 102505 (2023).
9. Guo, S., Sodt, A.J., & **Johnson, M.E.*** Large self-assembled clathrin lattices spontaneously disassemble without sufficient adaptor proteins. *PLoS Comp Biol.* **18**, e1009969 (2022).
10. Duan, D.†, Hanson, M.†, Holland, D.O. & **Johnson, M.E.*** Integrating copy numbers and networks to quantify stoichiometry in clathrin-mediated endocytosis *Sci Reports* **12**, 5413 (2022).
11. Fu, Y., Zeno, W., Stachowiak, J. & **Johnson, M.E.*** A continuum membrane model can predict curvature sensing by helix insertion. *Soft Matter* **17**, 10649-10663 (2021).
12. Mishra, B. & **Johnson, M.E.*** Speed limits of protein assembly with reversible membrane localization. *J Chem Phys.* **154**, 194101 (2021).
13. Jhaveri, A., Maisuria, D.†, Varga, M., Mohammadyani, D. & **Johnson, M.E.*** Thermodynamics and free energy landscape of BAR-domain dimerization from molecular simulations. *J Phys Chem B.* **125**, 3739-3751 (2021).
14. **Johnson, M.E.***, A. Chen†, J. Faeder, P. Henning, I. Moraru, M. Meier-Schellersheim, R. Murphy, T. Prustel, J. Theriot, A. Uhrmacher. Quantifying the roles of space and stochasticity in computer simulations of cell biology and cellular biochemistry. *Mol Biol of Cell.* V32, 186-210 (2021).

15. Varga, M.^o, Fu, Y.^o, Loggia, S.[†], Yogurtcu, O.N. & **Johnson, M.E.*** NERDSS: a nonequilibrium simulator for multibody self-assembly at the cellular scale. *Biophysical J.* **118**, 3026-3040 (2020).
16. Fu, Y., Yogurtcu, O.N., Kothari, R., Thorkelsdottir, G., Sodt, A.J. & **Johnson, M.E.*** An implicit lipid model for efficient reaction-diffusion simulations of protein binding to surfaces of arbitrary topology. *J Chem Phys.* **151**, 124115 (2019).
17. **Johnson, M.E.*** Modeling the self-assembly of protein complexes through a rigid-body rotational reaction-diffusion algorithm. *J Phys Chem B.* **122**, 11771 (2018).
18. Holland, D.O. & **Johnson, M.E.*** Stoichiometric balance of protein copy numbers is measurable and functionally significant in a protein-protein interaction network for yeast endocytosis. *PLoS Comp Biol.* **14**, e1006022 (2018).
19. Yogurtcu, O.N. & **Johnson, M.E.*** Cytoplasmic proteins can exploit membrane localization to trigger functional assembly. *PLoS Comp Biol.* **14**, e1006031 (2018).
20. Holland, D.O., Shapiro, B.H.[†], Xue, P.[†], & **Johnson, M.E.*** Protein-protein binding selectivity and network topology constrain global and local properties of interface binding networks. *Sci. Reports.* **7**, 5631. (2017).
21. Yogurtcu, O.N. & **Johnson, M.E.*** Theory of bi-molecular association dynamics in 2D for accurate model and experimental parameterization of binding rates. *J. Chem. Phys.* **143**, 084117 (2015).
22. **Johnson, M.E.*** & Hummer, G. Free propagator reweighting integrator for single-particle dynamics in reaction-diffusion models of heterogeneous protein-protein interaction systems. *Phys. Rev. X* **4**, 031037 (2014).

CAREER PRIOR TO JHU

1. **Johnson, M.E.** & Hummer, G. Evolutionary pressure on the topology of protein interface interaction networks. *J. Phys. Chem. B* **117**, 13098-13106 (2013)
2. **Johnson, M.E.*** & Hummer, G. Interface resolved network of protein-protein interactions. *PLoS Comput Biol.* **9**, e1003065 (2013)
3. **Johnson, M.E.** & Hummer, G. Characterization of a Dynamic string method for the construction of transition pathways in molecular systems. *J. Phys. Chem. B* **116**, 8573-8583 (2012)
4. **Johnson, M.E.** & Hummer, G. Nonspecific binding limits the number of proteins in a cell and shapes their interaction networks. *Proc. Nat. Acad. Sci. USA.* **108**, 603-608 (2011).
5. Ponder, J.W., Wu, C.J., Ren, P.Y., Pande, V.S., Chodera, J.D., Schnieders, M.J., Haque, I., Mobley, D.L., Lambrecht, D.S., DiStasio, R.A., Head-Gordon, M., Clark, G.N.I., **Johnson, M.E.**, Head-Gordon, T. Current status of the AMOEBA polarizable force field. *J. Phys. Chem. B.* **114**, 2549-2564 (2010)
6. **Johnson, M.E.***, Malardier-Jugroot, C. & Head-Gordon, T*. Effects of co-solvents on peptide hydration water structure and dynamics. *Phys. Chem. Chem. Phys.* **12**, 393-405 (2010)
7. Malardier-Jugroot, C., Bowron, D.T., Soper, A.K., **Johnson, M.E.**, & Head-Gordon, T. Structure and water dynamics of aqueous peptide solutions in the presence of co-solvents. *Phys. Chem. Chem. Phys.* **12**, 382-392 (2010)
8. **Johnson, M.E.** & Head-Gordon, T. Assessing thermodynamic-dynamic relationships for waterlike liquids. *J. Chem. Phys.* **130**, 214510 (2009)

9. **Johnson, M.E.**, Malardier-Jugroot, C., Murarka, R.K. & Head-Gordon, T. Hydration water dynamics near biological interfaces. *J. Phys. Chem. B.* **113**, 4080-4092 (2009)
10. Malardier-Jugroot, C., **Johnson, M.E.**, Murarka, R.K. & Head-Gordon, T. Aqueous peptides as experimental models for hydration water dynamics near protein surfaces. *Phys. Chem. Chem. Phys.* **10**, 4903-4908 (2008)
11. **Johnson, M.E.**, Head-Gordon, T. & Louis, A.A. Representability problems for coarse-grained water potentials. *J. Chem. Phys.* **126**, 144509 (2007).
12. Head-Gordon, T. & **Johnson, M.E.** Tetrahedral Structure or chains for liquid water. *Proc. Nat. Acad. Sci. USA* **103**, 7973-7977 (2006).

GRANTS:

CURRENT FUNDING

1. National Institutes of Health, NIGMS MIRA 1R35GM133644 PI: Johnson
Mechanisms of Protein Self-Assembly Coupled to Membrane Mechanics in the Cell
 Dates: 7/1/19—6/30/24
 Total Amount: \$1,250,000

2. National Institutes of Health, Common Fund 1U01DK127432 PI: Taekjip Ha
Chromatin Function During Transcription and DNA Repair at Single Molecule Resolution in Living Cells
 Dates: 9/1/20—8/31/25
 Total Amount: \$3,500,000 Co-PIs: Wu, Johnson

PENDING FUNDING

1. National Science Foundation, CHE 2406596 PI: Johnson
Learning optimal kinetics of multi-subunit self-assembly
 Dates: 6/1/24 – 5/30/27
 Total Amount: \$374,865
2. National Institutes of Health, NIAID PI: S. Saffarian Co-PIs: M. Johnson, M. Vershinin
Architecture and dynamics of immature HIV lattice
 Dates: 9/1/24—8/31/29
 Total Amount: \$1,500,000
3. National Institutes of Health, NIGMS MIRA 1R35GM133644 PI: Johnson
Mechanisms of Protein Self-Assembly Coupled to Membrane Mechanics in the Cell
 Dates: 12/1/24—11/30/29
 Total Amount: \$1,500,000
4. JHU Discovery Award. PIs: M. Johnson and R. Schulman
Designing, controlling, and accelerating DNA filament motors and active materials using automatic differentiation

Dates: 7/1/24-6/30/26
Total Amount: \$100,000

COMPLETED FUNDING

1. National Science Foundation, CAREER 1753174 PI: Johnson
CDS&E: Developing Reaction-Diffusion Models of Non-Equilibrium Virion Assembly and Budding
Dates: 7/1/18 – 6/30/23
Total Amount: \$465,932
2. National Institutes of Health, NIGMS K99/R00 R00GM098371 PI: Johnson
Pathway to Independence Award: Modeling the nucleation of clathrin coated vesicles at the membrane
Dates: 7/1/2013-6/30/2016
Total Amount: \$747,000
3. National Science Foundation, MRI 1920103 PI: Dennice Gayme
MRI: Acquisition of an Advanced Computing Instrument to Integrate Data-driven Research and Data intensive computing at Johns Hopkins
Dates: 10/1/19-9/30/22
Total Amount: \$4,000,000 Co-PIs: Schatz, Hernandez, Johnson

PRESENTATIONS:

INVITED TALKS (AS A PI):

1. ACS National Meeting, Symposium "In Honor of Gregory Voth's 65th Birthday: From Quantum Dynamics to Ultra Coarse-Graining, and Everything in Between"
Date: March 2024
Title: "*Discovering optimal kinetic pathways for self-assembly using automatic differentiation*"
2. NIH, Bethesda MD. NIAID Systems Biology Section
Date: Feb 2024
Title: "*Targeting protein self-assembly to the right time and place*"
3. University of Pennsylvania, Dept of Chemistry
Date: Jan 2024
Title: "*Protein self-assembly at the right time and place*"
4. Amer. Soc. Cell Biol. National Meeting, Boston
Date: Dec 2023
Title: "*Modeling protein-driven membrane remodeling*"

5. Center for Multiscale Translational Mechanobiology Symposium, Boston University
Date: Oct 2023
Title: “*Modeling membrane remodeling by protein self-assemblies*”
6. Pittsburgh Diffraction Society
Date: Oct 2023
Title: “*Discovering optimal kinetics of macromolecular self-assembly*”
7. Biophysical Society Conference: Membrane Fusion and Budding, Estes Park, CO
Date: Sept 2023
Title: “*Self-assembly and membrane bending costs for clathrin-coat formation*”
8. CECAM Workshop on Macromolecular Complexes, Lausanne, Switzerland
Date: Sept 2023
Title: “*Discovering optimal kinetics of macromolecular self-assembly*”
9. Univ of Maryland, Dept of Chemistry
Date: Mar 2023
Title: “*Optimizing the kinetics of protein self-assembly*”
10. Biophysical Society National Meeting, San Diego, CA
Date: Feb 2023
Title: “*Kinetics and mechanics of the self-assembling HIV Gag lattice*”
11. JHU Program in Molecular Biophysics Recruitment
Date: Jan, 2023
Title: “*Kinetics and mechanics of the self-assembling HIV Gag lattice*”
12. GRC Physical Virology, Lucca, Italy
Date: Jan 22-27, 2023
Title: “*Kinetic control within immature HIV Gag lattices*”
13. Amer. Soc. Cell Biology, Washington, D.C.
Date: Dec 7, 2022
Title: “*Building macromolecular assembly dynamics into cell-scale simulations*”
14. UC Berkeley, Chemistry Department Physical Chemistry Seminar Series
Date: Oct 2022
Title: “*Optimizing the kinetics of protein self-assembly*”
15. Integrative Modeling Seminar Series, Indian Institute of Sciences-Bangalore
Date: July 2022—Virtual
Title: “*Controlling protein self-assembly at the membrane*”
16. Johns Hopkins University, Applied Math and Statistics Post-doc led Seminar Series
Date: Feb 7, 2022
Title: “*Modeling spatio-temporal dynamics of self-assembly in cellular environments*”
17. American Society for Cell Biology, Annual Meeting (virtual)
Date: Dec 2021
Title: “*Self-assembled clathrin lattices spontaneously disassemble without sufficient adaptor proteins*”
18. City College of New York, Advanced Science Research Center.
Date: Nov 2021
Title: “*Self-assembly at the right time and place*”
19. NIH Intramural Research, NHLBI Biochemistry and Biophysics Series
Date: Oct 2021

- Title: *“Mechanisms for spatial and dynamic control of protein self-assembly and disassembly”*
20. GRC Stochastic Physics in Biology
Date: Oct 2021
Title: *“Optimizing against kinetic trapping in hetero and homo-subunit protein assemblies”*
 21. GRC Physical Virology, Castelldefels, Spain.
Date: May 2021—POSTPONED COVID19
Title: *“Coupling self-assembly, membrane localization, and membrane bending to model viral escape”*
 22. APS March Meeting, Physics of emergent protein-complex assemblies, Virtual
Date: March 2021
Title: *“Active and stochastic triggering of protein self-assembly in cells”*
 23. Los Alamos National Lab, Center for Nonlinear Studies, Los Alamos, NM.
Date: March 2021
Title: *“Self-assembly at the right time and place”*
 24. University of Delaware, Physics Department
Date: Oct 2020
Title: *“Self-assembly at the right time and place”*
 25. University of Akron, Chemistry Department
Date: June 2020
Title: *“Control of self-assembly in the cell”*
 26. NSF Genome Architecture and Dynamics Workshop, MIT.
Date: June 2020
Title: *“Modeling nonequilibrium self-assembly in the cell, in the nucleus, and on the membrane”*
 27. Telluride Science Research Center (TSRC), Workshop: Quinary Interactions: Structure, Dynamics, Function
Date: June 2020
Title: *“Exploiting 3D to 2D localization to control protein self-assembly”*
 28. CECAM Workshop: Numerical Techniques for Nonequilibrium Steady-States. Mainz, Germany
Date: May 2020—POSTPONED COVID19
Title: *“Reaction-diffusion algorithms for nonequilibrium self-assembly”*
 29. Yale University, Physics of Living Systems, POLS Workshop
Date: April 2020—POSTPONED COVID19
Title: *“Control of self-assembly in the cell”*
 30. Future of Biophysics Burroughs Wellcome Fund Symposium, Biophysical Society Annual Meeting
Date: Feb 2020
Title: *“Exploiting 3D to 2D localization to control protein self-assembly”*
 31. MIT, Biophysics Seminar Series
Date: Nov 2019
Title: *“Control of multi-protein self-assembly by membrane localization”*
 32. University of Chicago, James Franck Institute
Date: Oct 2019
Title: *“Control of multi-protein self-assembly by membrane localization”*

33. University of Utah, Physics Department
Date: Oct 2019
Title: “*Control of multi-protein self-assembly by membrane localization*”
34. University of Dundee, Scotland, Department of Cell Biology
Date: Sept 2019
Title: “*Tuning multi-protein self-assembly by membrane localization*”
35. Sanger Institute, UK
Date: Sept 2019
Title: “*Evaluating stoichiometric balance of protein copy numbers to predict dynamics in clathrin-mediated endocytosis*”
36. CompBioMed Conference, London, UK
Date: Sept 2019
Title: “*Dynamics of nonequilibrium self-assembly through reaction-diffusion simulations*”
37. Rice University, q-Bio Summer School
Date: July 2019
Title: “*Modeling protein self-assembly with reaction-diffusion dynamics*”
38. NSF Genome Architecture and Dynamics Workshop and International Summer School, Varna, Bulgaria
Date: July 2019
Title: “*Exploiting dimensionality reduction to accelerate and promote protein assembly*”
39. Arizona State University, Physics Department
Date: April 2019
Title: “*Control of nonequilibrium self-assembly in the cell*”
40. OneChemistry Symposium, Molecular Machinery of Life, Johns Hopkins
Date: April 2019
Title: “*Control of nonequilibrium self-assembly in the cell*”
41. Johns Hopkins University, Department of Biology Colloquium
Date: Oct 2018
Title: “*Mechanisms of protein self-assembly coupled to membrane mechanics in the cell*”
42. Johns Hopkins University, Institute for Biophysics Research
Date: Sept 2018
Title: “*Clathrin-mediated endocytosis: molecular to network level dynamics*”
43. Max Planck Institute for Biophysics, Frankfurt, Germany.
Date: April 2018
Title: “*Protein self-assembly in the Cell: Spatial and temporal control through membrane localization*”
44. EMBO Workshop: Integrating Systems Biology, Heidelberg
Date: April 2018
Title: “*Evolution and dynamics in protein networks through integrating interfaces and copy numbers*”
45. Johns Hopkins University, *Chalk-it-up* Biophysics Seminar Series.
Date: Feb 2018
Title: “*Dimensionality Reduction: How membranes can drive protein self-assembly*”
46. Berkeley Statistical Mechanics Meeting, UC Berkeley.
Date: Jan 2018

- Title: “*Protein self-assembly in the Cell: Spatial and temporal control through membrane localization*”
47. Surrogate Models and Coarsening Techniques, Institute of Pure and Applied Mathematics, UCLA
Date: Nov 2017—Declined, Maternity
 48. Brandeis University, Physics Department
Date: Sept 2017
Title: “*Protein self-assembly in the Cell: Spatial and temporal control through membrane localization*”
 49. University of Maryland, College Park, Chemistry Department
Date: May 2017
Title: “*Cytosolic Proteins can exploit membrane localization to trigger functional assembly*”
 50. Scialog Conference, Molecules Come to Life, Tuscon AZ
Date: April 2017
Title: “*Active designer matter: pluripotent materials*”
 51. Carnegie Institute for Science, Department of Embryology, Baltimore MD
Date: April 2017
Title: “*More than the sum of its parts: Understanding dynamic multi-protein assembly in the cell with computational modeling*”
 52. National Institutes of Standards and Technology (NIST), NCNR.
Date: Sept 2016
Title: “*Mechanisms of protein assembly at the membrane: Insights from theory and reaction-diffusion simulation*”
 53. University of Connecticut Health Center, Center for Cell Analysis and Modeling
Date: May 2016
Title: “*Mechanisms of protein assembly at the membrane: Insights from theory and reaction-diffusion simulation*”
 54. NIMBioS Workshop, Improving Tools for Spatially Realistic Cell Simulations, Knoxville TN
Date: Dec 2015
Title: “*Modeling protein interactions and assembly at the cell-scale*”
 55. CECAM Workshop on Molecular and Chemical Kinetics, Free University, Berlin, Germany
Date: Sept 2015—Declined, Maternity
 56. Telluride Science Research Center, Workshop on Macromolecular Crowding, Telluride, CO
Date: June 2015
Title: “*Optimizing protein interactions for the crowded cell*”
 57. University of Pittsburgh, Department of Computational and Systems Biology
Date: March 2015
Title: “*Modeling protein interactions and assembly at the cellular length and timescales*”
 58. George Mason University, Krasnow Institute for Advanced Studies
Date: Feb 2015
Title: “*Modeling protein interactions and assembly with single particle reaction diffusion and multi-scale methods*”
 59. Banff International Research Station Workshop on Single Particle Reaction Diffusion Methods, Banff, Canada
Date: Nov 2014

Title: *“Free-propagator reweighting integrator (FPR) for single particle reaction diffusion in solution and on the membrane”*

60. Johns Hopkins University, Institute for Biophysics Research

Date: Sept 2013

Title: *“Modeling protein interactions and assembly processes in the cell”*

CONTRIBUTED TALKS AND POSTERS (AS A PI):

1. APS March Meeting

Date: March 2024

Title: *“Discovering optimal kinetic pathways for self-assembly using automatic differentiation”*

2. CSHL Retroviruses Meeting

Date: May, 2023

Poster title: *“Extracting kinetics and thermodynamics of immature Gag lattice contacts by combining modeling with experiment”*

3. APS March Meeting, Las Vegas, NV

Date: March, 2023

Talk Title: *“Contrasting assembly pathways at the membrane”*

4. GRC Stochastic Physics in Biology

Date: January 19, 2023

Poster title: *“A novel mechanism for biological oscillations by controlling membrane composition.”*

5. GRC Lysosomes and Endocytosis

Date: June 17, 2022

Talk Title: *“Determinants of spontaneous assembly and disassembly of clathrin coats on membranes”*

6. ASCB Annual Meeting, *Virtual*

Date: Dec 2020

Poster Title: *“Modeling kinetics and control of clathrin recruitment and assembly on membranes”*

7. APS March Meeting, Denver, CO

Date: March 2020

Talk Title: *“Quantifying kinetics of multi-protein assembly, remodeling, and disassembly”*

8. Berkeley Statistical Mechanics Meeting, Berkeley, CA

Date: Jan 2014, 2015, 2017, 2019, 2020.

Poster title: *“Quantifying kinetics of multi-protein assembly, remodeling, and disassembly”*
(most recent)

9. National Institutes of Health, Structural Biology of HIV

Date: June 2019

Poster title: *“Study of Gag-Pol dimerization using reaction-diffusion simulation”*

10. APS March Meeting, Boston MA

Date: March 2019

Talk title: *“Modeling nonequilibrium self-assembly in the cell through reaction-diffusion simulation”*

11. Stochastic Physics in Biology Gordon Research Conference (GRC) Ventura CA

Date: Jan 2019

- Talk title: “*Modeling nonequilibrium self-assembly in the cell through reaction-diffusion simulation*”
12. Statistical Mechanics Conference (120th), Rutgers, NJ
Date: Dec 2018
Poster title: “*Proteins can exploit membrane localization to trigger functional self-assembly*”
 13. Lysosomes and Endocytosis GRC, NH
Date: June 2018
Poster title: “*Tuning the speed and stability of vesicle formation in clathrin-mediated endocytosis*”
 14. q-Bio Conference, New Brunswick, NJ
Date: July 2017
Talk title: “*Cytoplasmic proteins can exploit membrane localization to trigger functional assembly*”
 15. Biophysical Society Annual Meeting
Date: Feb 2014, 2015, 2016, 2017
Poster title: “*Cytoplasmic proteins exploit membrane localization to trigger functional assembly*” (most recent)
 16. Stochastic Physics in Biology GRC, Ventura CA
Date: Jan 2017
Poster title: “*Cytoplasmic proteins exploit membrane localization to trigger functional assembly*”
 17. Stochastic Physics in Biology GRC, Ventura CA
Date: Jan 2015
Poster title: “*Modeling reaction-diffusion processes in 2D and 3D with a novel single-particle integrator*”
 18. Biophysical Society Thematic Meeting, Modeling of Biomolecular Systems Interactions, Istanbul, Turkey
Date: June 2014
Poster title: “*Multi-scale modeling of protein assembly in clathrin-mediated endocytosis*”
 19. Lysosomes and Endocytosis GRC, NH
Date: June 2014
Poster title: “*Multi-scale modeling of protein assembly in clathrin-mediated endocytosis*”

SCIENTIFIC SERVICE AND OUTREACH

PEER REVIEW: *Cell, Nature Communications, PNAS, Phys Rev X, Cell Systems, Biophysical Journal, Soft Matter, J Chem Phys, Chem Phys Lett, Phys Rev E, Scientific Reports, PLoS Comp. Biol., eLife, Nature Methods, Nature Reviews Physics, Science, Science Advances.*

GRANT REVIEW:

1. Human Frontier Science Program (2023 mail in)
2. Ford Foundation, National Academy of Science (2023)
3. US National Science Foundation (2017 CHEM, 2024 PHYS.) (Ad hoc, 2018, 2019, 2023).
4. US National Institutes of Health, NIGMS study sections (2018, 2020, 2021)
5. Israeli Science Foundation (ad hoc, 2018, 2019)

6. European Research Council (ad hoc, 2019)
7. Pittsburgh Supercomputing Center Anton2 Allocations (2017, 2018, 2020, 2021)
8. Johns Hopkins Provosts Undergraduate Research Awards-PURA (2023).

EDITORIAL BOARD MEMBER: *Biophysical Journal* (2023-Present)

NATIONAL SOCIETY LEADERSHIP: Executive Committee member: Theory and Computation Subgroup of the Biophysical Society. Elected 2022 for 2022-2025.

MEETING CO-ORGANIZER and ADVISING

1. Organizing Committee for TSRC Workshop: Quinary Interactions: Structure, Dynamics, Function. Telluride, CO. (2020)
2. Scientific Committee for 21st International Conference on Systems Biology, (ICSB) Hartford, CT. (2020—postponed COVID19)
3. Scientific Advisory Board, NIH R24 for Virtual Cell and COPASI software development. (2021-2023)
4. Workshop Chair, Artificial Cells: Understanding and Engineering, Biophysical Society Meeting, Baltimore (2015)

UNIVERSITY SERVICE AND OUTREACH:

1. Diversity Champion, Dept of Biophysics
Dates: 2022-Present
2. Diversity Advocate and Liaison, Department of Biophysics
Dates: 2016-2019
3. Graduate Admissions Committee, Program in Molecular Biophysics
Dates: 2023
4. Graduate Admissions Committee, Cell, Molecular, Developmental, Biophysical Biology
Dates: 2023
5. Faculty Search Committee, Department of Biophysics
Dates: 2021-2022, 2023-2024
6. Graduate Admission Committee, Jenkins Biophysics Graduate Program
Dates: 2017-2022
7. Director of Undergraduate Studies, Dept of Biophysics
Dates: 2023-Present
8. Co-Director of Undergraduate Studies, Department of Biophysics
Dates: 2020-2023
9. Co-founder, Lecture Series in Computational Biophysics at Johns Hopkins University
Dates: 2016-2021
Description: Bi-weekly seminar series, hosting post-doctoral, graduate, and undergraduate researchers across all JHU campuses, with periodic outside speakers.
10. Faculty mentor, STEM Achievement for Baltimore Elementary Schools (SABES). Johns Hopkins NSF Funded program
Dates: 2014-Present.

Description: In addition to acting as an afterschool mentor for the SABES program at Baltimore City Public School Margaret Brent Elementary once per month, recruited 4 undergraduate, 3 graduate students, and 2 post-docs to participate. Developed a new computer programming module using MIT Scratch, synergistic with the NSF CAREER.

11. Library Advisory Committee
Dates: 2016-2017

TEACHING AND MENTORING

TEACHING

1. Modeling the Living Cell (AS 250.302) Developer and Instructor
Dates: Spring 2015-2021. Fall 2022, 2023 (~20 students per year)
2. Biophysics Graduate Program Intro Computing in Biology (AS.250.649). Co-organizer and co-instructor
Dates: Fall 2014, 2018-2023 (~15 students per year)
3. Physical Chemistry of Biological Macromolecules. (AS.250.689) Co-instructor
Dates: Fall 2020-2022, Spring 2024 (12 students)
4. Quantitative Biology and Biophysics. Co-instructor (AS.020.674)
Dates: Spring 2021. (25 students)

GRADUATE STUDENT COMMITTEE WORK

1. Graduate Board Oral Exam committee, Program in Molecular Biophysics and Jenkins Biophysics Program
Dates: 2014, 2016, 2018, 2020-2023
Students: 4-5 per year
2. Graduate Board Oral Exam committee, Cell Molecular Developmental Biophysics (CMDB) Biology Graduate Program
Dates: 2014 (1 student), 2015 (1), 2016 (1), 2017 (1), 2019 (1), 2020 (1), 2021 (2), 2022 (2), 2023 (1)
3. Graduate Board Oral Exam committee, other programs
Dates: 2020 (1-Chemistry), 2021 (1-Physics), (1-Chemistry), 2022 (1-Physics), 2023 (1-Physics)
4. Thesis Committee Member (Biophysics, Biology—CMDB, Chemical and Biological Engineering—Chem BE graduate programs).
 - a. Samuel Canner, Biophysics 2022-Present
 - b. Ameya Harmalkar, Chem BE 2023
 - c. Anson Dang, Biophysics, 2021
 - d. Daniel Evans, Biophysics 2020-Present
 - e. Mayukh Chakrabarti, Biophysics 2021-2022
 - f. Remy Yovanno, Biophysics 2020-2023
 - g. Indy Badvaram, Biophysics 2020-Present
 - h. Alma Playa-Rodriguez, Biophysics 2019-2023
 - i. Basilio Cieza-Huaman, Biophysics 2019-2022
 - j. Lior Schahaf, Biophysics 2018-2022
 - k. Min Hyung Cho, CMDB (Biology) 2016-2020
 - l. Chris Bohrer, Biophysics, 2015-2019

- m. Max Klein, Biophysics 2015-2019
- n. Alex Chin, CMDB 2014-2018
- o. Shourya Burman, Chem BE 2016-2018
- p. Nick Marze, Chem BE 2017
- q. Joshua Fern, Chem BE 2017
- r. John Zenk, Chem BE 2017
- s. Barrett Steinberg, Chem BE 2015

TRAINEES

GRADUATE STUDENTS

1. David O. Holland, Ph. D. in Biomedical Engineering.
Dates: 2013-2017
Current Position: Post-doc in Elnitski Lab at the NIH
2. Adip Jhaveri, Ph. D. Candidate in Biophysics
Dates: 2020-Present
Expected Graduation: 2024
3. Mankun Sang, Ph. D. Candidate in Biophysics
Dates: 2021-Present
Expected Graduation: 2025
4. Yue Moon Ying, Ph. D. Candidate in Chemical and Biomolecular Engineering
Dates: Fall 2021-Present
Expected Graduation: 2025-26
5. Jonathan Fischer, Ph. D. Candidate in Cell, Mol., Dev. Biol. and Biophysics
Dates: Fall 2021-Present
Expected Graduation: 2025-26

MASTERS STUDENTS

1. Zixiu (Hugh) Liu, M.S. in Chemical and Biomolecular Engineering
Dates: 2021-2022
Current Position: Industry
2. Adip Jhaveri, M.S. in Chemical and Biomolecular Engineering
Dates: 2019-2020
Current position: Graduate Student in our lab.
3. Yasmin Moghadamnia, M.S in Biophysics
Dates: 2018-2020
Current Position: Masters student at Univ. of Delaware
4. Benjamin Shapiro, Joint M.S./B.S. in Applied Mathematics
Dates: 2014-2016
Current Position: Brown University Medical School

UNDERGRADUATE STUDENTS

1. Atahan Akdeniz, Sophomore, Chem and Biomolecular Engineering

- Dates: Fall 2023-Present
2. Samia Balogun, Junior Biophysics
Dates: Fall 2023
 3. Hassan Sohail, Sophomore Biophysics
Dates: Summer 2023, Spring 2024
 4. Ezra Greenberg, Freshman Applied Math
Dates: Spring 2023-Present
 5. Gabe Au, Sophomore Biophysics
Dates: Fall 2022-Present
 6. Achyuth Parola, Sophomore Biophysics
Dates: Fall 2022-Present
 7. Yufeng Du, Sophomore Biophysics
Dates: Fall 2022-Present
 8. Kazi Saad, Sophomore Biophysics
Dates: 2022
 9. Livia Huang, Sophomore Biophysics
Dates: 2022
 10. Samantha Camp, Junior Biophysics
Dates: Fall 2021-2022
 11. Millie Lewis, Amgen Scholar, Houston Baptist University
Dates: Summer 2021
 12. Adam Nachurski, Senior Biophysics
Dates: 2021
Currently: PhD Biophysics program at JHU
 13. Jackie Chang, Junior Biophysics
Dates: 2020-2022
 14. Spencer Loggia, Senior Computer Science and Neuroscience
Dates: 2018-2021
Currently: PhD Neuroscience at Brown
 15. Yian Qian, Sophomore Applied Math and Biophysics
Dates: 2020-2023
Currently: PhD Applied Math at Brown
 16. Nomongo Dorjsuren, Senior Biophysics
Dates: 2019-2021
 17. Nandan Kulkarni, Junior Biology and Mathematics
Dates: 2019-2022
Currently: PhD Candidate, NYU Courant Institute
 18. Meretta Hanson, Amgen Scholar, Luther College
Dates: Summer 2019
Currently: Neuroscience Ph.D Candidate Ohio State University
 19. Jack Simone, Senior Biophysics
Dates: 2019-2020
 20. Wilson Hu, Junior Physics and Biophysics
Dates: 2019-2020
 21. Noah Lu, Freshman Biomedical Engineering
Dates: 2019-2020

22. Dhruw Maisuria, Applied Math and Biophysics
Dates: 2018-2020
Currently: Medical Student, MUSC
23. Christopher Leung, Biophysics
Dates: 2018-2020
Currently: Medical Student, Georgetown University
24. Daisy Duan, Applied Math and Biophysics
Dates: 2016-2019
Currently: Biophysics Ph.D Candidate, Yale University
25. Benjamin Shapiro, Applied Math
Dates: 2014-2016
Currently: Medical Student at Brown University
26. Athena Chen, Applied Math and Biophysics
Dates: 2015-2017
Currently: Ph.D at JHU School of Public Health
27. Pei Xue, Biophysics
Dates: 2014-2015

HIGH SCHOOL STUDENTS

1. Hasini Sade, Howard High School, Internship
Dates: Fall 2023-Spring 2024
2. Ian Herzog-Pohl, BASIS DC, Senior Honors project
Dates: Spring 2023
3. Nevonah Darden, Biophysics Research for Baltimore Teens (BRBT) Baltimore Polytechnic High School, Baltimore, MD
Dates: Summer 2019
4. Taqueeya Cason: (BRBT) Western High School, Baltimore, MD
Dates: Summer 2018
5. Mekhi Closson: (BRBT) Baltimore Polytechnic High School, Baltimore, MD
Dates: Summer 2017
Currently: Undergraduate at Howard University

POSTDOCTORAL RESEARCHERS

1. Samuel Foley, Ph.D. Physics, Carnegie Mellon University
Dates: 2023-
2. Yiben Fu, Ph.D. Physics, Chinese Academy of Sciences Beijing
Dates: 2018-2023
Currently: Assistant Professor at South China University of Technology
3. Sikao Guo, Ph.D. Physics, Chinese Academy of Sciences Beijing
Dates: 2020-Present
4. Bhavya Mishra, Ph.D. Physics, Indian Institute of Tech. Kanpur
Dates: 2019-2021
Currently: Postdoc at UC Merced
5. Matthew Varga, Ph.D. Chemistry, University of Arizona
Dates: 2017-2019
Currently: Ambry Genetics

6. Osman Yogurtcu, Ph.D. Mechanical Engineering, Johns Hopkins University
Dates: 2013-2017
Currently: Staff Scientist, Food and Drug Administration (FDA), Center for Biologics Evaluations and Research
7. Dariush Mohammadyani, Ph.D. Bioengineering, Univ. Pittsburgh
Dates: 2016-2018
Currently: Janssen, Pharmaceutical Company of Johnson & Johnson
8. Sewwandi Rathanayake, Ph.D. Molecular Biology Kent State University
Dates: 2016-2019
Currently: Post-doc at University of Nebraska
9. Raza Ul-Haq, Ph.D. Biochemistry, Uppsala University
Dates: 2015-2016

ROTATION STUDENTS

1. David Bass, CMDB (2023)
2. Gus Fridell, CMDB (2023)
3. Nick Wong, CMDB (2023)
4. Richard Yang, Biophysics (2023)
5. Yijun Liao, CMDB (2022)
6. Garrett Tisdale, Biophysics (2022)
7. Alexis Kelley, Biophysics (2022)
8. Rimpei Kuroiwa, XDBio (2022)
9. MingYuan Li, CMDB (2021)
10. Adam Nachurski, Biophysics (2021)
11. Jonathan Fischer, CMDB (2021)
12. Mankun Sang, Biophysics (2021)
13. Samuel Canner, Biophysics (2021)
14. David Wang, CMDB/NIH Graduate Partner Program (GPP)—Must choose a PI from the NIH (2021)
15. Lucas Shen, Biophysics (2020)
16. Ifunanya Nwogbaba, Biophysics (2019)
17. Liana Islam, Biophysics (2019)
18. Daniel Evans, Biophysics (2018)
19. Justin Gray, CMDB/NIH GPP (2018)
20. Brice Lapin, Masters Program BME (2018)
21. Yasmin Moghadamnia, Biophysics (2017)
22. Basilio Cieza-Huaman, Biophysics (2016)
23. Min Hyung Cho, CMDB (2016)
24. Allison Dennis, CMDB/NIH GPP (2015)
25. Elizabeth Potter, CMDB/NIH GPP (2015)
26. Cameron Avelis, Biophysics (2014)
27. Ryan McQuillen, Biophysics (2014)
28. David Holland, Biomedical Engineering (2013)

