

## CURRICULUM VITAE

### Neha P. Kamat

Assistant Professor of Biomedical Engineering  
Northwestern University, 2145 Sheridan Road, Evanston, IL 60208  
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### PROFESSIONAL APPOINTMENTS

**Associate Professor**, Department of Biomedical Engineering, Northwestern University (2023 – present)

**Assistant Professor**, Department of Biomedical Engineering, Northwestern University (2017 – 2023)

Affiliations at Northwestern:

Member, Center of Synthetic Biology (2018 – present)

Member, Chemistry of Life Processes Institute (2017 – present)

Member, Robert H. Lurie Comprehensive Cancer Center (2022 – present)

Preceptor, Interdisciplinary Biological Sciences Graduate Program (2017 – present)

Preceptor, Molecular Biophysics Training Program (2017– present)

### PROFESSIONAL EDUCATION

**Postdoctoral Fellow**, Molecular Biology, Advisor: Jack W. Szostak  
Harvard University and Massachusetts General Hospital, Boston, MA (2012 – 2016)

**Ph.D.**, Bioengineering, Advisor: Daniel A. Hammer  
University of Pennsylvania, Philadelphia, PA (2008 - 2012)

**B.S.**, Bioengineering (Magna Cum Laude), Advisor: Jennifer L. West  
Rice University, Houston, TX (2004- 2008)

### HONORS AND AWARDS

2022	ACS Synthetic Biology Young Innovator Award
2021	NSF CAREER Award
2021	2021 Young Innovators of Cellular and Molecular Bioengineering Award
2021	BMES Cellular and Molecular Bioengineering Rising Star Award
2019	Rice Outstanding Young Engineering Alum Award
2018	Cornew Innovation Award, Chemistry of Life Processes, Northwestern University
2018	Air Force Young Investigator Research Program Recipient
2018	Selection for the National Academy of Engineering Frontiers of Engineering Symposium
2014-2016	NASA Postdoctoral Research Fellowship, Harvard University
2013	Solomon R. Pollack Award; thesis award in Bioengineering, University of Pennsylvania
2011	Nano/Bio Interface Center Graduate Research Award; best graduate research on Nanotechnology applied to Biology at the University of Pennsylvania
2009-2012	NSF Graduate Research Fellowship, University of Pennsylvania
2008-2009	GAANN Fellowship, University of Pennsylvania
2008	Student Association Outstanding Senior Award, Rice University
2008/2009	Outstanding Bioengineering Junior/Senior Award, Rice University
2005-2007	Beckman Scholars Award, Arnold and Mabel Beckman Foundation
2004-2008	Rice University Trustee Distinguished Scholarship, Louis J. Walsh Engineering Scholarship
2004-2006	Rice University Century Scholars Program
2004	Intel Science Talent Search Semifinalist

## **PUBLICATIONS**

\* = corresponding author; underline = member of Kamat group; # = equal contribution; † = highlighted

### **Submitted:**

1. Peruzzi, J.A. #; Gunnels, T.F. #; Edestein, H.I.; Lu, P.; Baker, D.; Leonard, J.N.; Kamat, N.P.\* Enhancing extracellular vesicle cargo loading and functional delivery by engineering protein-lipid interactions. bioRxiv [Preprint] 2023. DOI: 10.1101/2023.04.29.538810 *in review*
2. Steinkühler, J. \* #; Peruzzi, J.A. #; Krüger, A.; Jacobs, M. L.; Jewett, M. C.; Kamat, N. P.\* Improving cell-free expression of membrane proteins by tuning ribosome co-translational membrane association and nascent chain aggregation. bioRxiv [Preprint] 2023. DOI: [10.1101/2023.02.10.527944](https://doi.org/10.1101/2023.02.10.527944) *in review*
3. Peruzzi, J. A.; Steinkühler, J.; Vu, T. Q.; Gunnels, T. F.; Lu, P.; Baker, D.; Kamat, N. P.\* Hydrophobic mismatch drives self-organization of designer proteins into synthetic membranes. bioRxiv [Preprint]. **2022**. DOI: 10.1101/2022.06.01.494374 *in revision*
4. Jacobs, M. L.; Steinkühler, J.; Lemley, A.; Larmore, M. J.; Ng, L. C.; Cologna, S. M.; DeCaen, P. G.\*; Kamat, N. P.\* Probing the force-from-lipid mechanism with synthetic polymers. bioRxiv [Preprint] **2022**. DOI: 10.1101/2022.05.20.492859
5. Steinkühler, J.\*; Abrahamson, C. H.; Agudo-Canalejo, J.; Golestanian, R.; Tullman-Ercek, D.\*; Kamat, N. P.\* Enzymatically-active bacterial microcompartments follow substrate gradients and are protected from aggregation in a cell-free system. bioRxiv [Preprint] **2022**. DOI: [10.1101/2022.05.16.492142](https://doi.org/10.1101/2022.05.16.492142) *in revision*

### **Published:**

6. Peruzzi, J.A. #; Vu, T.Q. #; Gunnels, T.F.; Kamat, N.P.\* Rapid Generation of Therapeutic Nanoparticles Using Cell-Free Expression Systems. *Small Methods* **2023**, *in press* DOI:10.1002/smt.202201718
7. Peruzzi, J. A.; Galvez, N. R.; Kamat, N. P.\* Engineering transmembrane signal transduction in synthetic membranes using two-component systems. *PNAS* **2023**, 120, e2218610120
8. Vu, T. Q. #; Sant'Anna, L. E. #; Kamat, N. P.\* Tuning targeted liposome avidity to cells via lipid phase separation. *Biomacromolecules* **2023**, 24, 1574-1584
9. Peruzzi, J. A.; Vu, T. Q.; Kamat, N. P.\* Engineered membrane receptors with customizable input and output functions. *Trends Biotechnol.* **2023**, 41, 276-277
10. Manszer, Z. A.; Ghosh, S.; Roy, A.; Jacobs, M. L.; Carten, J.; Kamat, N. P.; Daniel, S.\* Cell-free synthesis goes electric: dual optical and electronic biosensor via direct channel integration into a supported membrane electrode. *ACS Synthetic Biology* **2023**, 12, 502-510 † [Featured on the cover](#)
11. Hu, V. T.; Kamat, N. P.\* Cell-free protein synthesis systems for vaccine design and production. *Current Opinion in Biotechnology* **2023**, 79, 102888
12. Boyd, M. A.; Thavarajah, W.; Lucks, J. B.\*; Kamat, N. P.\* Robust and tunable performance of a cell-free biosensor encapsulated in lipid vesicles. *Science Advances* **2023**, 9, eadd6605
13. Steinkühler, J.; Jacobs, M. L.; Boyd, M. A.; Loverde, S. M.; Kamat, N. P.\* PEO-b-PBD diblock copolymers induce packing defects in lipid : hybrid membranes and improve insertion rates of natively folded peptides. *Biomacromolecules* **2022**, 23, 4756-4765
14. Ankeny, C. J. #\*; Dunton, C. #; Virk, R.; Scott, E.; Kamat, N. P. Development of a low-cost, easy-to-adopt diversity, equity, and inclusion program during crisis. *Biomedical Engineering Education* **2022**, 1-7
15. Gunnels, T. F.; Stranford, D. M.; Mitrut, R. E.; Kamat, N. P.\*; Leonard, J. N.\* Elucidating design principles for engineering cell-derived vesicles to inhibit SARS-CoV-2 infection. *Small* **2022**, 18, 2200125
16. Vu, T. Q.; Peruzzi, J. A. ; Sant'Anna, L. E.; Kamat, N. P.\* Lipid phase separation in vesicles enhances TRAIL-mediated cytotoxicity. *Nano Letters* **2022**, 22, 2627-2634
17. Jacobs, M. L.; Kamat, N. P.\* Cell-free membrane protein expression into hybrid lipid/polymer vesicles. *Cell-free gene expression. Methods in Molecular Biology* **2022**, 2433
18. Boyd, M. A.; Davis, A. M.; Chambers, N. R.; Tran, P.; Prindle, A.; Kamat, N. P.\* Vesicle-based sensors for extracellular potassium detection. *Cellular and Molecular Bioengineering* **2021**, 14, 459-469

19. Boyd, M. A.; Kamat, N. P.\* Designing artificial cells towards a new generation of biosensors. *Trends in Biotechnology* **2021**, *39*, 927-939 † Featured on the cover † Best of Trends in Biotechnology 2021
20. Jacobs, M. L.; Faizi, H. A.; Peruzzi, J. A.; Vlahovska, P. M.; Kamat, N. P.\* EPA and DHA differentially modulate membrane elasticity in the presence of cholesterol. *Biophysical Journal* **2021**, *120*, 2317-2329, published † Best of Biophysical Journal 2021
21. Warfel, K. Hershewe; J. M.; Ilyer, S; Peruzzi J. A.; Roth, E.; Kamat, N. P.; Jewett, M.\* Improving cell-free glycoprotein synthesis by characterizing and enriching native membrane vesicles. *Nature Communications* **2021**, *12*, 1-12 † Highlighted in Northwestern Engineering News
22. Manzer, Z. A.; Ghosh, S.; Jacobs, M. J.; Krishnan, S.; Zipfel, W.R.; Piñeros, M.; Kamat, N. P.\*; Daniel, S.\* Cell-Free Synthesis of a Transmembrane Mechanosensitive Channel Protein into a Hybrid-Supported Lipid Bilayer. *ACS Applied Bio Materials* **2021**, *4*, 3101-3112
23. Webber, M. J.; Kamat, N. P.; Messersmith, P. B.; Lecommandoux, S. Bioinspired Macromolecular Materials. *Biomacromolecules* **2021**, *22*, 1-3
24. Steinkühler, J.; Kamat, N. P.\* Energy Dissipation at Interfaces drives multicompartment remodeling. *Chem* **2020**, *6*, 1051-1052
25. Peruzzi, J. A.; Jacobs, M. L.; Wang, K. S.; Kamat, N. P.\* Barcoding Biological Reactions with DNA-Functionalized Vesicles. *Angewandte Chemie International Edition* **2019**, *131*, 18856-18863 † Highlighted in Northwestern Engineering News
26. Hilburger, C. E.; Jacobs, M. L.; Lewis, K. R.; Peruzzi, J. A.; Kamat, N. P.\* Controlling secretion in artificial cells with a membrane AND gate. *ACS Synthetic Biology* **2019**, *8*, 1224-1230
27. Jacobs, M. J.; Boyd, M. A.; Kamat, N. P.\*; Diblock copolymers enhance folding of a mechanosensitive membrane protein during cell-free expression. *Proceedings of the National Academy of Sciences of the United States of America* **2019**, *10*, 4031-4036 † Highlighted in Northwestern Engineering News
28. Boyd, M. A. and Kamat, N. P.\* Visualizing tension and growth in model membranes using optical dyes. *Biophys J.* **2018**, *115*, 1307-1315
29. O'Flaherty, D. K.#; Kamat, N.P.#\*; Mirza, F. M.; Li, L.; Prywes, N.; Szostak, J. W.\* Copying of mixed sequence RNA templates inside model protocells. *Journal of the American Chemical Society* **2018**, *140*, 5171-5178 # authors contributed equally; \* co-corresponding authors

#### **PUBLICATIONS** - prior to Northwestern

30. Jin, L.#; Kamat, N. P.#; Jena, S.; Szostak, J. W. Fatty Acid/Phospholipid Blended Membranes: A Potential Intermediate State in Protocellular Evolution. *Small* **2017**, 1704077. # authors contributed equally
31. Izgu, E. C.; Bjorkbom, A.; Kamat, N. P.; Lelyveld, V. S.; Zhang, W.; Jia, T. Z.; Szostak, J. W. NCarboxyanhydride-Mediated Fatty Acylation of Amino Acids and Peptides for Functionalization of Protocell Membranes. *Journal of the American Chemical Society* **2016**, *138*, 16669-16676.
32. Kamat, N. P.; Tobe, S.; Hill, I. T.; Szostak, J. W. Electrostatic Localization of RNA to Protocell Membranes by Cationic Hydrophobic Peptides. *Angewandte Chemie* **2015**. † Highlighted in The Science Times and designated as a "Hot Paper" by journal
33. Adamala, K.; Engelhart, A. E.; Kamat, N. P.; Jin, L.; Szostak, J. W. Construction of a Liposome Dialyzer for the Preparation of High-Value, Small-Volume Liposome Formulations. *Nature Protocols* **2015**, *10*, 927-38.
34. Percec, V.; Leowanawat, P.; Sun, H.-J.; Kulikov, O.; Nusbaum, C. D.; Tran, T. M.; Bertin, A.; Wilson, D. A.; Peterca, M.; Zhang, S.; Kamat, N. P.; Vargo, K.; Moock, D.; Johnston, E. D.; Hammer, D. A.; Pochan, D. J.; Chen, Y.; Chabre, Y. M.; Shiao, T. C.; Bergeron-Brelek, M.; Andre, S.; Roy, R.; Gabius, H.-J.; Heiney, P. A. Modular Synthesis of Amphiphilic Janus Glycodendrimers and Their Self-Assembly into Glycodendrimersomes and Other Complex Architectures with Bioactivity to Biomedically Relevant Lectins. *Journal of the American Chemical Society* **2013**, *135*, 9055-9077.
35. Kamat, N. P.; Henry, S. J.; Lee, D.; Hammer, D. A. Single-Vesicle Patterning of Uniform, Giant Polymersomes into Microarrays. *Small* **2013**, *9*, 2272-2276.

36. Lee, M. H.; Hribar, K. C.; Brugarolas, T.; **Kamat, N. P.**; Burdick, J. A.; Lee, D. Harnessing Interfacial Phenomena to Program the Release Properties of Hollow Microcapsules. *Advanced Functional Materials* **2012**, *22*, 131-138. † [Featured on the cover](#)
37. Katz, J. S.; Eisenbrown, K. A.; Johnston, E. D.; **Kamat, N. P.**; Rawson, J.; Therien, M. J.; Burdick, J. A.; Hammer, D. A. Soft Biodegradable Polymersomes from Caprolactone-Derived Polymers. *Soft Matter* **2012**, *8*, 10853-10862.
38. Hammer, D. A.; **Kamat, N. P.** Towards an Artificial Cell. *Febs Letters* **2012**, *586*, 3766-3766.
39. **Kamat, N. P.**; Liao, Z.; Moses, L. E.; Rawson, J.; Therien, M. J.; Dmochowski, I. J.; Hammer, D. A. Sensing Membrane Stress with near Ir-Emissive Porphyrins. *Proceedings of the National Academy of Sciences of the United States of America* **2011**, *108*, 13984-13989. † [Highlighted in Penn Today](#), [World of Chemicals](#), and [NSF News from the Field](#)
40. **Kamat, N. P.**; Lee, M. H.; Lee, D.; Hammer, D. A. Micropipette Aspiration of Double Emulsion-Templated Polymersomes. *Soft Matter* **2011**, *7*, 9863-9866.
41. **Kamat, N. P.**; Katz, J. S.; Hammer, D. A. Engineering Polymersome Protocells. *Journal of Physical Chemistry Letters* **2011**, *2*, 1612-1623. † [Featured on the cover](#)
42. Cheng, Z.; Elias, D. R.; **Kamat, N. P.**; Johnston, E. D.; Poloukhtine, A.; Popik, V.; Hammer, D. A.; Tsourkas, A. Improved Tumor Targeting of Polymer-Based Nanovesicles Using Polymer-Lipid Blends. *Bioconjugate Chemistry* **2011**, *22*, 2021-2029.
43. **Kamat, N. P.**; Robbins, G. P.; Rawson, J.; Therien, M. J.; Dmochowski, I. J.; Hammer, D. A. A Generalized System for Photoresponsive Membrane Rupture in Polymersomes. *Advanced Functional Materials* **2010**, *20*, 2588-2596.

## **PATENTS**

1. Daniel A Hammer, Ivan Julian Dmochowski, Gregory Patrick Robbins, Masaya S Jimbo, Michael J Therien, and Neha P Kamat. Polymer Vesicles for Selective Electromagnetic Energy-Induced Delivery. US Patent App. 12/548, 801.
2. Timothy Vu, Justin A. Peruzzi, Neha P. Kamat. Phase-segregated vesicles for spatially controlled protein conjugation and cell therapy. U.S. Provisional Patent
3. Justin A. Peruzzi, Jan Steinkuehler, Neha P. Kamat. Leveraging lipid-protein interactions to engineer spatial organization in cell-free systems. U. S. Provisional Patent.
4. Margrethe A. Boyd, Walter Thavarajah, Julius B. Lucks, Neha P. Kamat. Membrane encapsulated cell-free systems for expanded biosensing and biosynthesis capabilities. U. S. Provisional Patent

## **INVITED PRESENTATIONS** † = keynote

### **Accepted/ Upcoming:**

Telluride Science Research Center Workshop on Complexity in the Chemistry and Physics of Lipid Membranes, Telluride, CO, June 2023  
 Systems Chemistry Virtual Symposium, Summer 2023  
 Gordon Research Conference, 2023 Membrane Protein Folding, Castelldefels, Spain, June 2023  
 IUPAP International Conference on Biological Physics 2023 (ICB2023), Seoul, South Korea, August 2023  
 Johns Hopkins University, Chemical and Biomolecular Engineering, Fall 2024

### **Completed (47):**

Sanders Tri-Institutional Chemical Biology Seminar Series, co-organized by Weill Cornell Medical College, The Rockefeller University, and Memorial Sloan Kettering Cancer Center, Spring 2023  
 Cornell University, Chemical and Biomolecular Engineering, Spring 2023  
 Union College, Engineering Seminar Series, Spring 2023  
 International Chemical Biology Society 11<sup>th</sup> annual conference, Brisbane Australia, December 2022 † = [keynote](#)

Washington University, Molecular Engineering and Sciences Institute, Seminar Series, Seattle, WA, Fall 2022 (selected and invited by graduate students)  
Discussion Meeting on Artificial Cells, Royal Society in London, Virtual, Fall 2022  
Biophysical Society of Japan Annual Meeting, Hakodate, Japan, Virtual, Fall 2022  
Northwestern University and Westfaelische Wilhelms-Universitaet (WWU) Münster Symposium on Smart Materials: From Nanoscience to Biomedicine, Summer 2022 † = keynote  
ACS Fall 2022 Meeting, Colloids and Surface Chemistry, Chicago, IL Fall 2022  
Naval Research Laboratory HBCU/MI Internship Program, Summer 2022  
Gordon Research Conference, 2022 Bioanalytical Sensors, Newport, RI, June 2022  
Gordon Research Conference, 2022 Bioinspired Materials, Les Diablerets, Switzerland, June 2022  
Synthetic Biology: Engineering, Evolution & Design (SEED) Conference, Arlington, VA, Spring 2022  
Penn State, Department of Chemistry, Seminar Series, State College, PA, Winter 2022  
Biophysical Week, Biophysical Society, Virtual Series, Winter 2022  
Washington University, Department of Bioengineering, Seminar Series, Seattle, WA, Winter 2022  
Washington University, Department of Chemical Engineering, Fall 2021  
Biomedical Engineering Society Young Innovator Award Session, Fall 2021  
University of Guelph, Department of Chemistry, Seminar Series, Fall 2021  
Tethered Membrane Conference (TETHMEM), Bad Honnef, Germany, August 2021  
Amarin Advisory Board Meeting, Virtual, Fall 2021  
Build a Cell Seminar Series, Virtual, Summer 2021  
University of New Mexico and Max Planck Institute for Medical Research, International Conference on Engineering Synthetic Cells and Organelles, Spring 2021  
New York University, Department of Biomedical Engineering, Seminar Series, Spring 2021  
University of Virginia, Department of Biomedical Engineering, Seminar Series, Spring 2021  
Rice University, Bioengineering Department, Seminar Series, Winter 2021  
Cellular and Molecular Bioengineering Rising Star Award Talk, CMBE Annual Meeting, Winter 2021  
Society for Developmental Biology, 79<sup>th</sup> Annual Meeting, Chicago, IL, July 2020  
Kyoto University, Inst. for Integrated Cell-Material Sciences (iCeMS) Retreat, Kyoto, Japan, July 2019  
Washington University in St. Louis, T32 Mechanobiology Retreat, Spring 2019 † = keynote  
University of Illinois at Chicago, Department of Chemistry, Seminar Series, Spring 2019  
Northwestern University Department of Pharmacology Retreat, Spring 2019  
Northwestern University, Biotechnology Training Program, Seminar Series, Spring 2019  
2019 ACS Great Lakes Regional Meeting (GLRM), Spring 2019  
Northwestern University, Center of Synthetic Biology, Fall 2017  
University of Nebraska-Lincoln, Big 10 BME Speaker Exchange, Spring 2017  
Northwestern University, Department of Chemical Engineering, Faculty Lunch Series, Fall 2017  
Northwestern University Interdisciplinary Biosciences Retreat, Fall 2017  
Northwestern University, Department of Biomedical Engineering, Seminar Series, Spring 2016  
Columbia University, Department of Biomedical Engineering, Seminar Series, Spring 2016  
Stanford University, Department of Chemical Engineering, Seminar Series, Spring 2016  
Boston University, Department of Biomedical Engineering, Seminar Series, Spring 2016  
Columbia University, Department of Chemical Engineering, Seminar Series, Spring 2016  
Duke University, Department of Biomedical Engineering, Seminar Series, Fall 2015  
Northeastern University, College of Engineering, Seminar Series, 2014.  
Earth-Life Science Institute Origins of Life Chemistry Workshop, Tokyo, Japan, 2014.

## **INVITED WORKSHOPS**

NSF, Current Needs for Advancing Living Sentinel Cell Research, Fall 2023  
DoD, Control of Living Organisms Roadmap, Summer 2023  
EBRC, Engineering Biology & Materials Science Roadmap, Winter 2021  
DoD and EBRC, Synthetic Biology for Military Environments Roadmap, Winter 2019

NSF, Understanding the Rules of Life: Building a Synthetic Cell Ideas Lab, Winter 2019  
NSF, 2018 NSF EFRI Workshop: Convergence and Interdisciplinarity in Advancing Larger Scale Research, Summer 2018

### **CONTRIBUTED PRESENTATIONS AND POSTERS by KAMAT GROUP MEMBERS at NATIONAL CONFERENCES** - at Northwestern

Presentations by group members (Oral presentations (17); Poster presentations (18))

name = presenting author      \* = undergraduate

2018, 2019, 2021, 2022 Annual Biomedical Engineering Society Meeting

Oral: Boyd, \*Hilburger, Boyd, \*Davis, Hu, Peruzzi, Gunnels;

Posters: \*Hilburger, Vu

2019 Chicago Area Undergraduate Research Symposium (Oral: Hilburger)

2019, 2021 Biophysical Society Annual Meeting

Oral: Jacobs, Peruzzi

Posters: \*Hilburger, Peruzzi, Steinkühler

2019 Synthetic Biology: Engineering, Evolution and Design Meeting (Posters: Peruzzi, Boyd)

2017, 2020, 2021 AIChE National Meetings (Oral: Kamat (1), Peruzzi (3))

2019, 2021 Biomaterials Society Annual Meeting (Oral: Kamat, Vu)

2021 TETHMEM, Bonn, Germany (Posters: Steinkühler)

2022 Bioinspired Materials Gordon Research Seminar (Oral: Peruzzi)

2018, 2022 Bioinspired Materials Gordon Research Seminar (Poster: Kamat, Peruzzi)

2022 Midwest Protein Folding Symposium (Posters: Peruzzi, Jacobs, Hu, Villasenor)

2022 Gordon Research Conference Immunoengineering (Posters: Vu)

2022 International Nanomedicine and Drug Delivery Symposium (NanoDDS) (Posters: Vu)

2022 ACS Fall Meeting: (Oral: Vu; Poster: \*Sant'Anna)

2022 SynCell (Oral: Steinkühler)

2022 Biomembrane Days (Oral: Kamat, Poster: Steinkühler)

### **POSTDOCTORAL SCHOLARS SUPERVISED**

1. **Sara Carina Fedosejevs**, Ph.D. TU Dortmund University, Dortmund, Germany (January 2023 – present)
2. **Jan Steinkühler**, March 2020 – Feb 2022, currently Professor at University of Kiel, Germany

### **PHD DISSERTATIONS SUPERVISED**

1. **Delfin Buyco**, Ph.D. Molecular Biosciences (2022-present)
2. **Beth Dibiase**, Ph.D. Chemical and Biological Engineering (2022-present) (Co-Advised with Prof. Joshua Leonard)
3. **Mary Kelly**, Ph.D. Biomedical Engineering (2022- present)
4. **Citlayi Villaseñor**, Ph.D. Molecular Biosciences (2021-present)
5. **Vivian Hu**, Ph.D. Biomedical Engineering (2020-present)
6. **Taylor Gunnels**, Ph.D. Biomedical Engineering (2019-present) (Co-Advised with Prof. Joshua Leonard)
7. **Timothy Vu**, Ph.D. Biomedical Engineering (2018-present)
8. **Justin Peruzzi**, Ph.D. Chemical and Biological Engineering (2017-2023) PhD, Thesis Title: "Engineering the active interface: Harnessing membrane biophysical features for biosensing and therapeutics," Technology Development Scientist at AI Proteins
9. **Margrethe Boyd**, Ph.D. Biomedical Engineering (2017-2022) PhD, Thesis Title: "Engineering bilayer membranes for nano- and microscale sensing," Scientist I at PhenoVista Biosciences
10. **Miranda Jacobs**, Ph.D. Molecular Biosciences (2017-2022) PhD, Thesis Title: "Investigating How Membrane Mechanical Properties Affect the Expression, Folding, and Function of a Model Mechanosensitive Channel Protein," currently Protein Scientist at Teledyne FLIR

## UNDERGRADUATE RESEARCH MENTORING

\* = publication in Kamat Lab

1. Aiden Linderman (Spring 2023-present)
2. Isa Candal (Winter 2023-present)
3. Jessy Gonzalez (Summer 2022, REU, **Beckman Scholar**)
4. Yazeed Alroogi (2022- present)
5. Atiriya Iyer (2022- present)
6. \*Andre Gu (2021- present)
7. Ugochinyere Ndukwe (Summer 2021, REU)
8. \*Nina Galvez (2020- 2023)
9. \*Lucas Sant'Anna (2020-2023, **NSF Graduate Fellow**, currently Stanford PhD student)
10. \*Anna Davis (2019-2021, currently Georgia Tech PhD)
11. Summer Duffy (2019-2020)
12. Jacob Brandner (Summer 2019, REU)
13. \*Nora Chambers (2019-2021)
14. \*Kenneth Wang (2019-2021)
15. Kayla Purdy (Summer 2018, REU)
16. \*Claire Hilburger (2017-2019, **NSF Graduate Fellow**, currently Berkeley PhD student)
17. \*Kamryn Lewis (2017-2018)
18. David Alexander Fong (2017-2019)

## ACHIEVEMENTS BY GROUP MEMBERS

### **Grants/Fellowships:**

NDSEG Graduate Fellowships: 2019 (Boyd)

NSF Graduate Fellowships: 2018 (Peruzzi), 2019 (Boyd- *declined*), 2020 (Hilburger), 2021 (Gunnels), 2022 (DiBiase), 2023 (Sant'Anna)

American Heart Association Predoctoral Fellowship: 2019 (Jacobs)

Regenerative Engineering Training Program (RE-Training): 2022 (Kelly)

Molecular Biophysics Training Program NIH: 2017-18 (Jacobs), 2018 (Boyd), 2021 (Villaseñor)

Synthesizing Biology Across Scales (SynBAS) National Research Traineeship NSF: 2021-2023 (Hu), 2022-2023 (Buyco)

Biotechnology Training Program NIH: 2019 (Vu)

Northwestern Graduate School Conference Travel Grant: 2019 (Jacobs)

Northwestern Interdisciplinary Biological Sciences Program Travel Award: 2019 (Jacobs)

Northwestern Undergraduate Research Assistant Program Grant: 2017 (Hilburger)

Northwestern Undergraduate Research Grant: 2017 (Fong), 2018 (Hilburger), 2019 (Wang, Chambers), 2020 (Davis, Chambers, Sant'Anna)

Northwestern McCormick Grant: 2018 (Fong), 2019 (Duffy), 2023 (Candal)

Northwestern BME Research Grant: 2017 (Fong, Lewis), 2019 (Chambers), 2021 (Galvez), 2023 (Linderman)

Northwestern Jaharis Undergraduate Research Fellowship: 2021 (Sant'Anna), 2022 (Alroogi)

### **Awards/Recognition:**

ABioM 2023 Graduate Student Research Award: 2023 (Vu)

Biomedical Engineering Thesis Award Runner Up: 2022 (Boyd)

Schmidt Science Fellow Institutional Nominee: 2022 (Peruzzi)

STAR Award Society for Biomaterials Meeting: 2021 (Vu)

AIChE Area 8B Graduate Student Award Session, 1<sup>st</sup> Place: 2020 (Peruzzi)

Ryan Graduate Fellowship, Northwestern University: 2020 (Peruzzi)

Biomedical Engineering Research Award, Northwestern University: 2019 (Boyd)

Northwestern BME Undergraduate Award for Research: 2019 (Hilburger), 2021 (Davis)

Northwestern Lyle F. Mockros Outstanding Senior Award: 2021 (Chambers), 2022 (Galvez, Sant'Anna)

BMES Student Design and Research Award: 2019 (Hilburger)

Alumnae of Northwestern University STEM Scholarship: 2018 (Hilburger)

## **TEACHING ACTIVITIES**

BME 250 – Thermodynamics (Winter 2017 – present)

BME 446 - Synthetic Biology in Biomaterials (Spring 2018)

BME 403 – Quantitative Systems Physiology (Spring 2019 – 2022)

BME 495 – Biological Phenomena in Cell/Cell-Free Systems (Spring 2022 – present)

“Managing the publishing process” with Dr. Mike Jewett. Northwestern SynBAS NRT Workshop (2022)

## **SERVICE- CONFERENCE/ SYMPOSIUM/ COLLOQUIUM ORGANIZATION**

### **1. Materials Research Society**

- Symposium Organizer of a new session: Symposium SB11: Engineering Biomaterials with Synthetic Biology, Fall 2022, Boston, NY

### **2. Synthetic Biology: Engineering, Evolution & Design (SEED), 2019-present**

- Organizing Committee, 2019 and Chair of Session 2: The Materials Science/ Synthetic Biology Interface, June 2019, NY, NY
- Organizing Committee, 2021-2022, Arlington, VA

### **3. Biomedical Engineering Society Annual Meeting, 2017-present**

- Co-chair, “Applications of nanopores and Nanoparticles,” October 2017, Phoenix, AZ
- Co-chair, “Nanotechnologies for Nucleic Acid Detection and Exosome Analysis,” Oct 2018, Atlanta, GA
- Abstract reviewer, 2017- present

### **4. American Institute of Chemical Engineers, 2017-present**

- Co-chair, “Biomaterials,” Nov 2017, San Francisco, CA
- Co-chair, “Biomimetic Materials,” Nov 2019, Orlando, FL

### **5. Central US Synthetic Biology Workshop**

- Organizing Committee, Sept 2018, Evanston, IL
- Organizing Committee, Sept 2019, Evanston, IL

### **6. Cell-Free Systems Conference**

- Organizing Committee, Dec 2019, Boston, MA
- Organizing Committee, Nov 2023, Austin, TX

### **7. American Chemical Society Annual Symposium**

- Co-Chair, “Bio-Inspired Macromolecular Materials,” Spring 2020, Philadelphia, PA

### **8. New York Academy of Sciences, Synthetic Biology Conference**

- Organizing Committee, Fall 2020, NY, NY

## **SERVICE- PROPOSAL AND MANUSCRIPT REVIEW**

### **1. National Science Foundation**

- MCB Ad Hoc Reviewer, 2021
- NSF Convergence Accelerator, *Networked Blue Economy (Track E)*, 2022

### **2. National Institute of Health**

- Gene and Drug Delivery (GDD) Study Section Ad Hoc Reviewer, 2019

### **3. European Research Council**

- Advanced Grants Reviewer, 2017

### **4. Journal Reviews**

- Biomacromolecules, Langmuir, Soft Matter, Biochemistry, ACS Synthetic Biology, Biophysical Journal, ACS Nano, Science Advances, Chem, Nature Chemistry, Nature Nanotechnology, Small, Angewandte Chemie, Advanced Functional Materials, Current Biology, PNAS

## **SERVICE- PROFESSIONAL**

### **1. Engineering Biology Research Consortium (EBRC), Member, 2019- present**



2. **ACS Synthetic Biology Journal**, Editorial Advisory Board Member, 2020- present
3. **Experimental Biology and Medicine**, Editorial Advisory Board Member, 2022- present
4. **Build-A-Cell**, Member, 2018-present

## **SERVICE- UNIVERSITY**

Northwestern BME Diversity, Equity, and Inclusion (DEI) Committee Co-Chair, 2020 – present  
Northwestern Interdisciplinary Biological Sciences DEI Committee 2021- present  
Northwestern BME Undergraduate Academic Advisor, 2017 - present  
Northwestern BME Graduate Recruitment Committee, 2017- present  
Northwestern BME Undergraduate Club Faculty Advisor, 2017- 2019  
Northwestern Undergraduate Research Assistant Program (URAP) Committee (2018- present)  
Northwestern HHMI Gilliam Fellow Nomination Committee, 2017  
Lunch with Chemistry Life Processes Trainees, 2019  
Northwestern U SANCAS Midwest Regional Meeting Panel Member on Importance of Inclusivity in Higher Education, 2020  
Guest speaker at CARE T32 Trainee Meeting: “Membranes, mentorship, and motherhood: navigating an academic career in BME,” Nov 2022  
Panelist for McCormick Engineering NSF Career Panel Discussion, March 2022  
Guest speaker: BME Professional Development Lunch, Topic: “How to not let my PhD take forever,” April 2023

## **MEDIA COVERAGE AND HIGHLIGHTS**

### **Media Coverage**

Sarah Knapton (2022) [Scientists develop ‘decoy cells’ to trick Covid-19 away from healthy ones](#), The Telegraph  
Darlene Tverdohle (2015) [Study Reveals New Insights on Origin of Life](#), The Science Times

### **Research and Award Highlights**

Win Reynolds (2023) [Researchers Detect Fluoride in Water with New Simple Color Change Test](#), Northwestern Engineering News  
Amanda Morris (2022) [Decoy particles trick coronavirus as it evolves](#), Northwestern Engineering News  
Alex Gerage (2021) [Neha Kamat Receives Prestigious NSF CAREER Award](#), Northwestern Engineering News  
Amanda Morris (2021) [Membranes Unlock Potential to Vastly Increase Cell-Free Vaccine Production](#), Northwestern Engineering News  
Alex Gerage (2019) [Barcoding’ DNA Vesicles for Selective Biochemical Reactions](#), Northwestern Engineering News  
Glenn Jeffers (2019) [Cell Maker](#), Northwestern Research News  
Lisa Valee (2019) 2019 [CLP Cornew Awards Kick-Start Three Blue Sky Team Science Projects](#), CLP Frontpage  
Emily Ashford (2019) [New Technique Improves Folding of Membrane Proteins](#), Northwestern Engineering News  
Alexandra Jacobson (2018) [Northwestern Engineering Faculty Teams Receive NSF Big Ideas for the Future Grants](#), Northwestern Engineering News  
Evan Lerner (2011) [Penn Molecular Scientists Develop Color Changing Stress Sensor](#), Penn Today