# Mark Bathe, Ph.D.

Curriculum Vitae

## Education

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| 2004 | Ph.D., Mechanical Engineering, MIT |
| 2001 | M.Sc., Mechanical Engineering, MIT |
| 1998 | B.Sc., Mechanical Engineering, MIT |

## Postdoctoral Training

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| 2006–2008 | Alexander von Humboldt Postdoctoral Fellow, University of Munich |

## Professional Experience

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| 2026 | Member, Microsystems Exploratory Council, DARPA |
| 2022–present | SAB Member, Cache DNA, Inc. |
| 2022–present | SAB Member, Kano Therapeutics, Inc. |
| 2022–2023 | Director, MIT New Engineering Education Transformation |
| 2022 | Co-Founder, Cache DNA, Inc. |
| 2022 | Co-Founder, Kano Therapeutics, Inc. |
| 2021–present | Member, Harvard Medical School Initiative for RNA Medicine |
| 2020–present | Professor, Department of Biological Engineering, MIT |
| 2016–2020 | Associate Professor with Tenure, Department of Biological Engineering, MIT |
| 2013–2016 | Associate Professor, Department of Biological Engineering, MIT |
| 2012–present | Associate Member, Broad Institute of MIT & Harvard |
| 2009–2013 | Assistant Professor, Department of Biological Engineering, MIT |
| 2006–2008 | Alexander von Humboldt Postdoctoral Fellow, University of Munich |

## Affiliations

Associate Member, Broad Institute of MIT & Harvard
Member, Harvard Medical School Initiative for RNA Medicine

## Research Interests

Active Immunotherapeutics
Central Nervous System Disorders
Excitonic Materials
Molecular Computing
Nanofabrication
Nanotechnology
Neurotherapeutics
Optoelectronic Materials
Particulate Vaccines
Photonic Materials
Quantum Information Science & Technology
Therapeutic Nucleic Acid Delivery

## Academic Service

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|---|---|
| 2025 | Chair, Gordon Research Conference on RNA Nanotechnology |

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| 2023 | Vice Chair, Gordon Research Conference on RNA Nanotechnology |
| 2020 | NIH Gene Delivery Study Section, Ad Hoc Review Panelist |
| 2019 | NIH Nanotechnology Study Section, Review Panelist |
| 2019 | NIH BRAIN Initiative Review Panel, Review Panelist |
| 2019 | NIH Fellowship Review Panel in Cell Biology, Developmental Biology, and Bioengineering, Ad Hoc Review Panelist |
| 2021–2023 | Director, MIT New Engineering Education Transformation |
| 2020–2021 | Co-Director, MIT New Engineering Education Transformation |
| 2019–2021 | Editorial Board Member, Scientific Reports |
| 2017–2019 | Chair, MIT Committee on Student Life |
| 2017–2019 | MIT New Engineering Education Transformation Core Committee |
| 2017–2018 | Chair, MIT Department of Biological Engineering Graduate Academic Program |
| 2017 | NIH, Cellular and Molecular Technologies Study Section, Review Panelist |
| 2017 | NIH, Synthetic and Biological Chemistry A Study Section, Review Panelist |
| 2016–present | MIT Department of Biological Engineering Graduate Admissions Committee |
| 2016–2020 | SRC Roadmap Committee on Synthetic Biology Steering Committee |
| 2015–2019 | MIT Institute Committee on Community Giving |
| 2015–2023 | MIT Department of Biological Engineering Teaching Awards Committee |
| 2015–2016 | MIT Institute for Medical Engineering & Science Faculty Search Committee |
| 2014–2018 | MIT Department of Biological Engineering Seminar Series Organizing Committee |
| 2014 | MIT Department of Biological Engineering Retreat Organizing Committee |
| 2013–2017 | MIT Department of Biological Engineering Undergraduate Program Committee |
| 2011–2012 | MISTI Global Seed Funds Evaluation Committee |
| 2011–2012 | MIT Department of Mechanical Engineering Graduate Admissions Committee |
| 2009–2017 | MIT Computational & Systems Biology Graduate Program Admissions Committee |
| 2009–2016 | MIT Computational & Systems Biology Graduate Program Committee |
| 2009–2013 | MIT Department of Biological Engineering Graduate Admissions Committee |
| 2008–2013 | MIT Department of Biological Engineering Graduate Program Committee |

## Publications

113. Kim, H-M., Omer, M., Knappe, G.A., McMullen, P., Le, D.A., Pasupathy, A., Anderson, D.G., **Bathe, M.** (2026). Programmable Lipid Functionalization of Nucleic Acid Nanoparticles Modulates Liver Cell-Type Targeting. *ACS Applied Materials & Interfaces* 18: 18721.

112. Shah, A., Lee, X.K., Li, K., Knappe, G.A., **Bathe, M.**, Barbastathis, G., Doyle, P.S. (2026). Interpretable Deep Learning for Single-Molecule Nanopore Fingerprinting Using Physics-Guided Preprocessing. *ACS Sensors* 40 (XXX), XXX.

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111. Berleant, J.D., Banal, J.L., Rao, D.K., **Bathe, M.** (2026). Enabling global-scale nucleic acid repositories through versatile, scalable biochemical selection from room-temperature archives. *Nature Communications* 17, 2807.

110. Romanov, A., Knappe, G.A., Ronsard, L., Cottrell, C.A., Zhang, Y.J., Suh, H., Duhamel, L., Omer, M., Chapman, A.P., Spivakovsky, K., Skog, P., Flynn, C.T., Lee, J.H., Kalyuzhniy, O., Liguori, A., Parsons, M.F., Lewis, V.R., Canales, J., Reizis, B., Tingle, R.D., Schiffner, T., Schief, W.R., Lingwood, D., **Bathe, M.**, Irvine, D.J. (2026). DNA origami vaccines program antigen-focused germinal centers. *Science* 391 (6785), eadx6291.

109. Scott, M.N., Banal, J.L., Chen, W.J., Brooks, C., Wang, X., Hart, S.M., Dodin, A., **Bathe, M.**, Willard, A.P., Schlau-Cohen, G.S. (2025). Transport of Delocalized Excitons through DNA-Based Molecular Photonic Wires. *ACS Nano* 19: 44.

108. Wei, X., Mo, Q., Chen, C., **Bathe, M.**, Hernandez, R. (2025). DNA Origami Nanostructures Observed in Transmission Electron Microscopy Images can be Characterized through Convolutional Neural Networks. *Journal of Chemical Information and Modeling* DOI: 10.1021/acs.jcim.5c00330

107. Knappe, G.A., Gorman, J., Bigley, A.N., Harvey, S.P., **Bathe, M.** (2025). Heterovalent Click Reactions on DNA Origami. *Bioconjugate Chemistry* 2025 36 (3), 476-485 DOI: https://doi.org/10.1021/acs.bioconjchem.4c00552

106. Luo, X., Ranno, L., Sverko, T., Lee, J.Y., Sbalbi, N., Jones, A., Chen, C., Bawendi, M.G., Hu, J., Macfarlane, R.J., **Bathe, M.** (2025). DNA origami directed integration of colloidal nanophotonic materials with silicon photonics *bioRxiv*, 2025.01.23.634416

105. Chen, C., Luo, X., **Bathe, M.** (2024). Versatile Dehydration-Assisted Functionalization of Quantum Dots and Rods. *Angew Chem Int Ed* 2024, 63, e202410247

104. Falkovich, R., Aryal, S., Wang, J., Sheng, M., **Bathe, M.** (2024). Synaptic composition, activity, mRNA translation and dynamics in combined single-synapse profiling using multimodal imaging. bioRxiv, 2024.10. 28.620504

103. Ofoegbu, P.C., Knappe, G.A., Romanov, A., Draper, B.E., **Bathe, M.**, Jarrold, M.F. (2024). Charge Detection Mass Spectrometry Enables Molecular Characterization of Nucleic Acid Nanoparticles ACS Nano 18 (34), 23301-23309.

102. Berleant, J.D., Banal, J.L., Rao, D.K., **Bathe, M.** (2024). Scalable search of massively pooled nucleic acid samples enabled by a molecular database query language. *medRxiv* DOI: https://doi.org/10.1101/2024.04.12.24305660

101. Allan, M.F., Aruda, J., Plung, J.S., Grote, S.L., Martin, Y.J., de Lajarte, A.A., **Bathe, M.**, Rouskin, S. (2024). Discovery and Quantification of Long-Range RNA Base Pairs in Coronavirus Genomes with SEARCH-MaP and SEISMIC-RNA. *bioRxiv* DOI: https://doi.org/10.1101/2024.04.29.591762

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100. Kim, H-M., **Bathe, M.** Force-free activation of Notch with DNA origami. (2024). *Trends in Genetics* DOI: https://doi.org/10.1016/j.tig.2024.03.001

99. Gorman, J., Hart, S.M., John, T., Castellanos, M.A., Harris, D., Parsons, M.F., Banal, J.L., Willard, A.P., Schlau-Cohen, G.S., **Bathe, M.** (2024). Sculpting photoproducts with DNA origami. *Chem* DOI: https://doi.org/10.1016/j.chempr.2024.03.007

98. Wamhoff, E-C., Ronsard, L., Feldman, J., Knappe, G.A., Hauser, B.M., Romanov, A., Case, J.B., Sanapala, S., Lam, E.C., St. Denis, K.J., Boucau, J., Barczak, A.K., Balazs, A.B., Diamond, M.S., Schmidt, A.G., Lingwood, D., **Bathe, M.** (2024). Enhancing antibody responses by multivalent antigen display on thymus-independent DNA origami scaffolds. *Nature Communications* 15: 795.

97. Chen, C., Luo, X., Kaplan, A.E.K., Bawendi, M.G., Macfarlane, R.J., **Bathe, M.** (2023). Ultrafast dense DNA functionalization of quantum dots and rods for scalable 2D array fabrication with nanoscale precision. *Science Advances*, 32: eadh8508.

96. Hart, S.M., Gorman, J., **Bathe, M.**, Schlau-Cohen, G.S. (2023). Engineering Exciton Dynamics with Synthetic DNA Scaffolds. *Accounts of Chemical Research*, 56: 2051.

95. Falkovich, R., Danielson, E.W., Perez de Arce, K., Wamhoff, E-C., Strother, J., Lapteva, A.P., Sheng, M., Cottrell, J.R., **Bathe, M.** (2023). A synaptic molecular dependency network in knockdown of autism- and schizophrenia-associated genes revealed by multiplexed imaging. *Cell Reports*, 42: 112430.

94. Wamhoff, E-C., Knappe, G.A., Burds, A.A., Du, R.R., Neun, B., Difilipppantonio, S., Sanders, C., Edmondson, E., Matta, J.L., Dobrovolskaia, M., **Bathe, M.** (2023). Evaluation of non-modified wireframe DNA origami for acute toxicity and biodistribution in mice. *ACS Applied Bio Materials*, 6: 1960.

93. Sheridan, K., Berleant, J., **Bathe, M.**, Condon, A., Williams, V.V. (2023). Factorization and pseudofactorization of weighted graphs. *Discrete Applied Mathematics*, 337: 81.

92. Berleant, J., Sheridan, K., Condon, A., Williams, V.V., **Bathe, M.** (2023). Isometric Hamming embeddings of weighted graphs. *Discrete Applied Mathematics*, 332: 119.

91. Parsons, M.F., Allan, M.F., Li, S., Shepherd, T.R., Ratanalert, S., Zhang, S., Pullen, K.M., Chiu, W., Rouskin, S., **Bathe, M.** (2023). 3D RNA-scaffolded wireframe origami. *Nature Communications*, 14: 382.

90. Knappe, G.A., Wamhoff, E-C., **Bathe, M.** (2023). Functionalizing DNA origami to investigate and interact with biological systems. *Nature Reviews Materials*, 8: 123.

89. Du, R.R., Cedrone, E., Romanov, A., Falkovich, R., Dobrovolskaia, M.A., **Bathe, M.** (2022). Innate immune stimulation using 3D wireframe DNA origami. *ACS Nano*, 16: 20340.

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88. Chen, C., Wei, X., Parsons, M.F., Guo, J., Banal, J.L., Zhao, Y., Scott, M.N., Schlau-Cohen, G.S., Hernandez, R., **Bathe, M.** (2022). Nanoscale 3D spatial addressing and valence control of quantum dots using wireframe DNA origami. *Nature Communications*, 13: 4935.

87. Wamhoff, E-C., Romanov, A., Huang, H., Read, B.J., Ginsburg, E., Knappe, G.A., Kim, H-M., Farrell, N.P., Irvine, D.J., **Bathe, M.** (2022). Controlling nuclease degradation of wireframe DNA origami with minor groove binders. *ACS Nano*, 16: 8954.

86. Wang, X., Li, S., Jun, H., John, T., Zhang, K., Fowler, H., Doye, J.P.K., Chiu, W., **Bathe, M.** (2022). Planar wireframe 2D origami. *Science Advances*, 8: eabn0039.

85. Lan, T.C.T., Allan, M.F., Malsick, L.E., Woo, J.Z., Zhu, C., Zhang, F., Khandwala, S., Nyeo, S.S.Y., Sun, Y., Guo, J.U., **Bathe, M.**, Näär, A., Griffiths, A., Rouskin, S. (2022). Secondary structural ensembles of the SARS-CoV-2 RNA genome in infected cells. *Nature Communications*, 13: 1128.

84. Wei, X., Chen, C., Zhao, Y., Harazinska, E., **Bathe, M.**, Hernandez, R. (2022). Molecular structure of single-stranded DNA on the ZnS surface of quantum dots. *ACS Nano*, 16: 6666.

83. Wang, X., Jun, H., **Bathe, M.** (2022). Programming 2D supramolecular assemblies with wireframe DNA origami. *Journal of the American Chemical Society*, 144: 4403.

82. Hart, S.M., Wang, X., Guo, J., **Bathe, M.**, Schlau-Cohen, G.S. (2022). Tuning optical absorption and emission using strongly coupled dimers in programmable DNA scaffolds. *The Journal of Physical Chemistry Letters*, 13: 1863.

81. Afonin, K.A., Dobrovolskaia, M.A., Ke, W., Grodzinski, P., **Bathe, M.** (2022). Critical review of nucleic acid nanotechnology to identify gaps and inform a strategy for accelerated clinical translation. *Advanced Drug Delivery Reviews* 181: 114081.

80. Adendorff, M.R., Tang, G.Q., Millar, D.P., **Bathe, M.**, Bricker, W.P. (2022). Computational investigation of the impact of core sequence on immobile DNA four-way junction structure and dynamics. *Nucleic Acids Research* 50: 717.

79. Lavi, R., **Bathe, M.**, Hosoi, A., Mitra, A., Crawley, E. (2021). The NEET ways of thinking: Implementing them at MIT and assessing their efficacy. *Advances in Engineering Education*.

78. **Bathe, M.** (2021). Nanoscale 2D and 3D patterning using programmed DNA assemblies. *Novel Patterning Technologies 2021* 11610: 1161012.

77. Banal, J.L., and **Bathe, M.** (2021). Scalable nucleic acid storage and retrieval using barcoded microcapsules. *ACS Applied Materials & Interfaces* 13: 49729.

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76. Jun, H., Wang, X., Parsons, M.F., Bricker, W.P., John, T., Li, S., Jackson, S., Chiu, W., **Bathe, M.** (2021). Rapid prototyping of arbitrary 2D and 3D wireframe DNA origami. *Nucleic Acids Research* 49: 10265.

75. Knappe, G.A., Wamhoff, E-C., Read, B.J., Irvine, D.J., **Bathe, M.** (2021). *In situ* covalent functionalization of DNA origami virus-like particles. *ACS Nano* 15: 14316.

74. Tomov, M.L., O'Neil, A., Abbasi, H.S., Cimini, B.A., Carpenter, A.E., Rubin, L.L., **Bathe, M.** (2021). Resolving cell state in iPSC-derived human neural samples with multiplexed fluorescence imaging. *Communications Biology* 4: 786.

73. Banal, J.L., Shepherd, T.Y., Berleant, J., Huang, H., Reyes, M., Ackerman, C.M., Blainey, P.C., **Bathe, M.** (2021). Random access DNA memory using Boolean search in an archival file storage system. *Nature Materials* 20: 1272.

72. **Bathe, M.**, Hernandez, R., Komiyama, T., Machiraju, R. and Neogi, S. (2021). Autonomous Computing Materials. *ACS Nano* 15: 3586.

71. Hart, S.M., Chen, W.J., Banal, J.L., Bricker, W.P., Dodin, A., Markova, L., Vyborna, Y., Willard, A.P., Häner, R., **Bathe, M.**, Schlau-Cohen, G.S. (2021). Engineering couplings for exciton transport using synthetic DNA scaffolds. *Chem* 7: 752.

70. Danielson, E., Perez de Arce, K., Cimini, B., Wamhoff, E-C., Singh, S., Cottrell, J.R., Carpenter, A.E., **Bathe, M.** (2020). Molecular diversity of glutamatergic and GABAergic synapses from multiplexed fluorescence imaging. *eNeuro* 8: ENEURO.0286-20.2020.

69. Afonin, K.A., Dobrovolskaia, M.A., Church, G., **Bathe, M.** (2020). Opportunities, barriers, and a strategy for overcoming translational challenges to therapeutic nucleic acid nanotechnology. *ACS Nano* 14: 9221.

68. Dobrovolskaia, M.A., **Bathe, M.** (2020). Opportunities and challenges for the clinical translation of structured DNA assemblies as gene therapeutic delivery and vaccine vectors. *WIREs Nanomedicine and Nanobiotechnology* 13: e1657.

67. Pisharady, K.P., Eberly, L.E., Cheong, I., Manousakis, G., Guliani, G., Clark, H.B., **Bathe, M.**, Walk, D., Lenglet, C. (2020). Tract-specific analysis improves sensitivity of spinal cord diffusion MRI to cross-sectional and longitudinal changes in amyotrophic lateral sclerosis. *Communications Biology* 3: 370.

66. Veneziano, R., Moyer, T.J., Stone, M.B., Mukherjee, S., Shepherd, T.R., Das, J., Schief, W.R., Irvine, D.J., **Bathe, M.** (2020). Role of nanoscale antigen organization on B-cell activation probed using DNA origami. *Nature Nanotechnology* 15: 716.

65. Hart, S.M., Banal, J.L., **Bathe, M.**, and Schlau-Cohen, G.S. (2020). Identification of non-radiative decay pathways in CY3. *The Journal of Physical Chemistry Letters* 11: 5000.

64. Jun, H., Wang, X., Bricker, W.P., & **Bathe, M.** (2019). Automated sequence design of 2D wireframe DNA origami with honeycomb edges. *Nature Communications* 10: 5419.

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63. Guo, S-M., Veneziano, R., Gordonov, S., Li, L., Danielson, E., Perez de Arce, K., Park, D., Kulesa, A.B., Wamhoff, E-C., Blainey, P.C., Boyden, E.S., Cottrell, J.R., **Bathe, M.** (2019). Multiplexed and high-throughput neuronal fluorescence imaging with diffusible probes. *Nature Communications* 10: 4377.

62. Wamhoff, E-C., Banal, J.L., Bricker, T.R., Parsons, M.F., Veneziano, R., Stone, M.B., Jun, H., Wang, X., **Bathe, M.** (2019). Programming structured DNA assemblies to probe biophysical processes. *Annual Review of Biophysics* 48: 395.

61. Shepherd, T.R., Du, R.R., Huang, H., Wamhoff, E-C., **Bathe, M.** (2019). Bioproduction of pure, kilobase-scale single-stranded DNA. *Scientific Reports* 9: 6121.

60. Kulikov, V., Guo, S-M., Stone, M.B., Goodman, A., Carpenter, A., **Bathe, M.**, Lempitsky, V. (2019). DoGNet: A deep architecture for synapse detection in multiplexed fluorescence images. *PLoS Computational Biology* 15: e1007012.

59. Jun, H., Zhang, F., Shepherd, T., Ratalanert, S., Qi, X., Yan, H., **Bathe, M.** (2019). Autonomously designed free-form 2D DNA origami. *Science Advances* 5: eaav0655.

58. Jun, H., Shepherd, T.R., Zhang, K., Bricker, W.P., Li, S., Chiu, W., **Bathe, M.** (2019). Automated sequence design of 3D polyhedral wireframe DNA origami with honeycomb edges. *ACS Nano* 13: 2083.

57. **Bathe, M.**, Chrisey, L.A., Herr, D.J., Lin, Q., Rasic, D., Woolley, A.T., Zadegan, R., Zhirnov, V.V. (2019). Roadmap on biological pathways for electronic nanofabrication and materials. *Nano Futures* 3: 012001.

56. Holec, P.V., Berleant, J., **Bathe, M.**, Birnbaum, M.E. (2018). A Bayesian framework for high-throughput T cell receptor pairing. *Bioinformatics* 149: 024905.

55. Bricker, W.P., Banal, J.L., Stone, M.B., **Bathe, M.** (2018). Molecular model of J-aggregated pseudoisocyanine fibers. *The Journal of Chemical Physics* 149: 024905.

54. **Bathe, M.**, Guo, S-M., Li, L., Veneziano, R., Gordonov, S., Cottrell, J.C. (2018). Multiplexed imaging of neuronal synapses using nucleic acid probe exchange. *Protocol Exchange* doi:10.1038/protex.2018.066.

53. Veneziano, R., Shepherd, T., Ratanalert, S., Bellou, L., Tao, C., **Bathe, M.** (2018). In vitro synthesis of gene-length single-stranded DNA. *Scientific Reports* 8: 6548.

52. **Bathe, M.** and Rothemund, P. (2017). DNA nanotechnology: A foundation for programmable nanoscale materials. *MRS Bulletin* 42: 882.

51. Boulais, E., Sawaya, N., Veneziano, R., Andreoni, A., Banal, J.L., Kondo, T., Mandal, S., Lin, S., Schlau-Cohen, G.S., Woodbury, N., Yan, H., Aspuru-Guzik, A., **Bathe, M.** (2018). Programmed coherent coupling in a synthetic DNA-based excitonic circuit. *Nature Materials* 17: 159.

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50. Banal, J.L., Kondo, T., Veneziano, R., **Bathe, M.**, Schlau-Cohen, G.S. (2017). Photophysics of J-aggregate-mediated energy transfer on DNA. *The Journal of Physical Chemistry Letters* 8: 5827.

49. Cunningham, P., Bricker, W., Diaz, S., Medintz, I., **Bathe, M.**, and Melinger, J.S. (2017). Optical determination of the electronic coupling and intercalation geometry of Thiazole Orange homodimer in DNA. *The Journal of Chemical Physics* 147: 055101.

48. Pan, K., Bricker, W., Ratanalert, S., **Bathe, M.** (2017). Structure and conformational dynamics of scaffolded DNA origami nanoparticles. *Nucleic Acids Research* 45: 6284.

47. Su, K.C., Barry, Z., Schweizer, N., Maiato, H., **Bathe, M.**, Cheeseman, I. (2016). A regulatory switch alters chromosome motions at the metaphase to anaphase transition. *Cell Reports* 17: 728.

46. Veneziano, R., Ratanalert, S., Zhang, K., Zhang, F., Yan, H., Chiu, W., **Bathe, M.** (2016). Designer nanoscale DNA assemblies programmed from the top down. *Science* 352: 1534.

45. Wang, P., Gaitanaros, S., Lee, S., **Bathe, M.**, Shih, W.M., Ke, Y. (2016). Programming self-assembly of DNA origami honeycomb lattices and plasmonic metamaterials. *Journal of the American Chemical Society* 138: 7733.

44. Katz, Z.B., English, B.P., Lionnet, T., Yoon, Y.J., Monnier, N., Ovryn, B., **Bathe, M.**, Singer, R.H. (2016). Mapping translation 'hot-spots' in live cells by tracking single molecules of mRNA and ribosomes. *eLife* 5: e10415.

43. Dhakal, S., Adendorff, M., Liu, M., Yan, H., **Bathe, M.**, Walter, N. (2016). Rational design of DNA-actuated enzyme nanoreactors guided by single molecule analysis. *Nanoscale* 8: 3125.

42. Hogstrom, L., Guo, S.M., Murugadoss, K., **Bathe, M.** (2016). Advancing multiscale structural mapping of the brain through fluorescence imaging and analysis across length-scales. *Journal of The Royal Society Interface* 6: 20150081.

41. Gordonov, S., Hwang, M.K., Wells, A., Gertler, F.B., Lauffenburger, D., **Bathe, M.** (2016). Time-series modeling of live-cell shape dynamics for image-based phenotypic profiling. *Integrative Biology* 8: 73.

40. Sedeh, R., Pan, K., Adendorff, M., Hallatschek, O., Bathe, K.J., **Bathe, M.** (2016). Computing nonequilibrium conformational dynamics of structured nucleic acid assemblies. *Journal of Chemical Theory & Computation* 12: 261.

39. Monnier, N., Barry, Z., Park, H.Y., Su, K.C., Katz, Z., English, B., Dey, A., Pan, K., Cheeseman, I., Singer, R., **Bathe, M.** (2015). Inferring transient particle transport dynamics in live cells. *Nature Methods* 12: 838.

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38. Sun, G., Guo, S.M., Teh, C., Korzh, V., **Bathe, M.**, Wohland, T. (2015). Bayesian model selection applied to the analysis of FCS data of fluorescent proteins in vitro and in vivo. *Analytical Chemistry* 87: 4326.

37. Zhou, Z., Munteanu, E.L., He, J., Ursell, T., **Bathe, M.**, Huang, K.C., Chang, F. (2015). The contractile ring coordinates curvature dependent septum assembly during fission yeast cytokinesis. *Molecular Biology of the Cell* 26: 78.

36. Pan, K., Kim, D.N., Zhang, F., Adendorff, M., Yan, H., **Bathe, M.** (2014). Lattice-free prediction of three-dimensional structure of programmed DNA assemblies. *Nature Communications* 5: 5578.

35. Klingner, C., Cherian, A.V., Diesinger, P.M., Aufschnaiter, R., Maghelli, N., Keil, T., Beck, G., Tolic-Norrelykke, I., **Bathe, M.**, and Wedlich-Soldner, R. (2014). An isotropic acto-myosin network promotes organization of the apical cell cortex in epithelial cells. *The Journal of Cell Biology* 207: 107.
34. Sun, W., Boulais, E., Hakobyan, Y., Wang, W., Guan, A., **Bathe, M.**, Yin, P. (2014). Casting inorganic structures with DNA molds. *Science* 346: 717.

33. Mori, M., Somogyi, K., Kondo, H., Monnier, N., Falk, H., Machado, P., **Bathe, M.**, Nedelec, F., and Lenart, P. (2014). An Arp2/3 nucleated F-actin shell fragments nuclear membranes at nuclear envelope breakdown. *Current Biology* 24: 1421.

32. Oh, H.S., Bryant, K.F., Nieland, T., Mazumder, A., Bagul, M., **Bathe, M.**, Root, D.E. and Knipe, D.M. (2014). Targeted RNAi screen reveals novel epigenetic factors that regulate herpesviral gene expression in U2OS osteosarcoma cells. *mBio* 5: e01086.

31. Guo, S.M., Bag, N., Mishra, A., Wohland, T., **Bathe, M.** (2014). Bayesian total internal reflection fluorescence correlation spectroscopy reveals hIAPP-induced plasma membrane domain organization in live cells. *Biophysical Journal* 106: 190.

30. Pan, K., Boulais, E., Yang, L., **Bathe, M.** (2014). Structure-based model for light-harvesting properties of nucleic acid nanostructures. *Nucleic Acids Research* 42: 2159.

29. Subramanian, V., Mazumder, A., Surface, L.E., Butty, V., Fields, P.A., Alwan, A., Torrey, L., Thai, K.K., Levine, S., **Bathe, M.**, Boyer, L. (2013). H2A.Z acidic patch couples chromatin dynamics to regulation of developmental gene expression programs during lineage commitment. *PLoS Genetics* 9: e1003725.

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26. Mazumder, A., Tummler, K., **Bathe, M.**, Samson, L.D. (2013). Single-cell analysis of RNR transcriptional and translational response to DNA damage. *Molecular & Cellular Biology* 33: 635.

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21. He, J., Guo, S.M., **Bathe, M.** (2012). Bayesian approach to the analysis of fluorescence correlation spectroscopy data I: Theory. *Analytical Chemistry* 84: 3871.

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17. Kim, D.N., Altschuler, J., Strong, C., McGill, G., **Bathe, M.** (2011). Conformational dynamics data bank: a database for conformational dynamics of proteins and supramolecular protein assemblies. *Nucleic Acids Research* 39: D451.

16. Kim, D.N., Nguyen, C.T., **Bathe, M.** (2011). Conformational dynamics of supramolecular protein assemblies. *Journal of Structural Biology* 173: 261.

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2. **Bathe, M.**, Shirai, A., Doerschuk, C.M., and Kamm, R.D. (2002). Neutrophil transit times through pulmonary capillaries: The effects of capillary geometry and fMLP-stimulation. *Biophysical Journal* 83: 1917.

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## Patents

21. Banal, J., **Bathe, M.**, Gorman, J., Knappe, G.A., Luo, X. Method and System for Massively Parallel Integration of Diverse Nanomaterials Using Orthogonally-Encoded DNA Templates. US Provisional Patent No. 63/815834 Jun. 1, 2025.

20. **Bathe, M.**, Dam, K.U., Knappe, G.A., Sirianni, R., Nucleic Acid Nanoparticle Delivery System for Targeted Delivery of Therapeutics and Vaccines to the Central Nervous System. US Provisional Patent No. 63/808429 May 19, 2025.

19. **Bathe, M.**, Veneziano, R., Wamhoff, E.-C., Moyer, T., Read, B.J., Romanov, A., Knappe, G.A., Irvine, D.J. Compositions of nucleic acid nanostructures for vaccines and methods of use thereof. US Patent App. No. 19/257,179. Jul. 1, 2025.

18. **Bathe, M.**, Falkovich, R., Multimodal and Network Phenotyping based on Single-Organelle In Situ Multiplexed Imaging. US Provisional Patent No. 63/706172 Oct., 11, 2024.

17. **Bathe, M.**, Ratanalert, S., Veneziano, R., Banal, J., Shepherd, T. Sequence-controlled polymer random access memory storage. US Patent App. 18/589,141. Feb. 27, 2024.

16. **Bathe, M.**, Chen, C., Luo, X., Macfarlane, R.J., Ultrafast Single-Step High-Density Conjugation of Quantum Dots and Rods with 2D Lattice Templated Array Alignment using DNA Origami. US Patent No. PCT/US2024/016144 Feb., 16, 2024.

15. Banal, J., Berleant, J.D., Shepherd, T., **Bathe, M.** Automated methods for scalable, parallelized enzymatic biopolymer synthesis and modification using microfluidic devices. US Patent App. 18/506,027. Nov. 9, 2023.

14. **Bathe, M.**, Du, R., Irvine, D.J., Moyer, T., Read, B., Veneziano, R., Wamhoff, E-C., Nucleic acid nanostructure platform for programming immune stimulation. US Patent App. No. 17/819,204. Aug. 11, 2022.

13. **Bathe M.**, Shepherd, T., Parsons, M.F., RNA scaffolded wireframe origami and methods thereof. US Patent App. No. 18/191,723. Mar. 28, 2023.

12. Banal, J.L., Berleant, J., Leiserson, C.E., Schardl, T., B., **Bathe, M.** Sequence-controlled polymer storage. US Patent No. PCT/US2022/032831. Jun. 9, 2022.

11. **Bathe, M.**, Veneziano, R., Wamhoff, E.-C., Moyer, T., Read, B., Irvine, D. Nucleic acid nanostructure platform for antigen presentation and vaccine formulations formed therefrom. US Patent No. US 11,419,932 B2. Aug. 23, 2022.

10. Hart, S.M., Wang, X., **Bathe, M.**, Schlau-Cohen, G.S., Guo, J. DNA-dye assembly based single-molecule fluorescence lifetime imaging probes. US Patent No. PCT/US2022/078972. Nov. 1, 2021.

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9. Zhang, F., Shepherd, T.R., Veneziano, R., **Bathe, M.**, Slaymaker, I., Zetsche, B. Nucleic acid assemblies for use in targeted delivery. U.S. Patent No. WO/2020/051507, published Dec. 3, 2020.

8. Shepherd, T., Du, R., **Bathe, M.** Microbial production of pure single stranded nucleic acids. U.S. Patent No. US10940171B2, filed Nov. 19, 2017, and published March 9, 2021.

7. Banal, J.L., Berleant, J.D., Shepherd, T., **Bathe, M.** Automated methods for scalable, parallelized enzymatic biopolymer synthesis and modification using microfluidic devices. U.S. Patent No. US 11,851,651 B2, filed Jun. 19, 2018, issued Dec. 26, 2023.

6. **Bathe, M.**, Du, R., Shepherd, T.R., Bacterial Production of Custom Sequence and Length ssDNA. U.S. Patent PCT/US2018/060727, Nov. 13, 2018.

5. Veneziano, R., Ratanalert, S., Shepherd, T., Jun, H., **Bathe, M.** Stable nanoscale nucleic acid assemblies and methods thereof. US Patent No. 11,410,746 B2, filed Apr. 27, 2017, issued Aug. 9, 2022.

4. **Bathe, M.**, Ratanalert, S., Veneziano, R., Banal, J.L., Shepherd, T. Sequence-controlled polymer random access memory storage. US Patent No. 11,961,008 B2, filed Apr. 27, 2017, issued Oct. 18, 2022.

3. **Bathe, M.**, Pan, K., Kim, D.-H. Techniques for controlling spatial structure of nucleic acid structures based on lattice-free, three-dimensional junction coordinates. U.S. Patent No. US 10,289,799 B2, filed Oct. 3, 2015, issued May 14, 2019.

2. **Bathe, M.**, Kim, D.-N., Dietz, H. 2012. Method and apparatus for controlling properties of nucleic acid nanostructures. U.S. Patent US20120166152A1, filed Dec. 22, 2010, and published Jun. 28, 2012.

1. **Bathe, M.**, He, J., Guo, S.-M., Monnier, N. 2012. Bayesian inference of particle motion and dynamics from single particle tracking and fluorescence correlation spectroscopy. U.S. Patent US20120155725A1, filed Dec. 16, 2011, and published Jun. 21, 2012.

## Invited Talks and Seminars

126. 1st International Symposium on Nanotechnology for Healthcare, Fiocruz, Rio de Janeiro, Brazil, 2026.

125. 2026 Global Startup Workshop, Daegu, Korea, 2026.

124. 35th Annual Meeting of the Society of Virology, Heidelberg, Germany, 2026.

123. Foundations of Nanoscience, Munich, Germany, 2026.

122. MIT Industrial Liaison Program, Seoul, Korea, 2026.

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121. MIT Industrial Liaison Program, Tokyo, Japan, 2026.

120. MIT Club of Japan, Tokyo, Japan, 2026.

119. Molecular Frontiers, NYC, NY, 2025.

118. New Trends in DNA Data Storage, Prague, CZ, 2025.

117. Tay Sachs & Related Disorders, Dallas, TX, 2025.

116. Keynote Seminar, FNANO, Snowbird Utah, 2024.

115. MIT Madrid Symposium, Ramon Areces Foundation, Madrid, Spain, 2023.

114. Wellcome Centre for Cell Biology, Edinburgh, Scotland, Virtual Seminar, 2023.

113. MIT ILP Seminar to USGA, Cambridge, MA 2023.

112. NIH Pioneer Interview, Virtual, 2023.

111. MIT ILP Seminar to Lonza, Inc., Cambridge, MA 2023.

110. Karolinska Institute, Stockholm, Sweden, 2023.

109. Army Research Office Basic Research Forum, Virtual Seminar, 2023.

108. Department of Chemistry, Rutgers University, Camden, NJ, 2022.

107. PEGS Gene Therapy R&D Analytics, Boston, MA, 2022.

106. OneChemistry, Johns Hopkins University, Virtual Seminar, 2022.

105. National Academy of Sciences, Using Biology for Communication and Information Transmission, Virtual Seminar, 2022.

104. Multivalency in Biology, Copenhagen, Denmark, Virtual Seminar, 2022.

103. ISBioTech Nucleic Acids, Development, Analysis, and Production of mRNA & DNA, Virtual Seminar, 2022.

102. MIT ILP Seminar to Evonik, Inc., Cambridge, MA 2022.

101. DNA Technology Days: Massive Data Workshop, Reston, VA, 2022.

100. Novo Nordisk, Virtual Seminar, 2021.

99. Harvard Medical School Initiative for RNA Medicine, 2021.

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98. Northrup Grumman Corporation, Virtual Seminar, 2021.

97. Teach Me in 10 Seminar on Vaccine Technologies, Virtual Seminar, 2021.

96. MIT ILP R&D Conference, Virtual Seminar, 2021.

95. EMBO Conference on Designing Functional Biomolecular Assemblies: Beyond Biology, Virtual Seminar, 2021.

94. IBM Unconventional Computing Paradigms Workshop, Virtual Seminar, 2021.

93. IUPAC CCCE 2021 – 104 Canadian Chemistry Conference, Virtual Seminar, 2021.

92. LBL Molecular Foundry, Virtual Seminar, 2021.

91. SPIE Novel Patterning Technologies, Virtual Seminar, 2021.

90. MIT Biomaking Solutions, Virtual Seminar, 2020.

89. MIT Koch Institute, Virtual Seminar, 2020.

88. MIT Marble Center, Virtual Seminar, 2020.

87. NSF Bioeconomy Distinguished Lecture, Virtual Seminar, 2020.

86. CROI Boston, Virtual Seminar, 2020.

85. 4$^{th}$ Annual Genome Conference, Virtual Seminar, 2020.

84. Intracellular Dynamics of Molecules: Analysis and Models, Bordeaux, France, 2019.

83. MIT Computational Center for Engineering Symposium, Cambridge, MA, 2019.

82. MIT Research and Development Conference, Accelerating Big Impact Innovations, 2018.

81. Cryo-EM Center at MIT.nano Opening Symposium, Cambridge, MA, 2018.

80. 3rd Annual MIT-Skoltech Conference, Moscow, Russia, 2018.

79. 256th ACS National Meeting, Boston, MA, 2018.

78. Department of Pharmaceutical Sciences, Northeastern University, Boston, MA, 2017.

77. Micron School of Materials Science and Engineering, Boise State University, Boise, ID, 2017.

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76. Department of Chemical & Biomolecular Engineering, Vanderbilt University, Nashville, TN, 2017.

75. KoreaBIO, Seoul, South Korea, 2017.

74. Applied Math and Computational Science, University of Pennsylvania, Philadelphia, PA, 2017.

73. 72nd New England Complex Fluids Workshop, Brandeis University, Newton, MA, 2017.

72. First Conference on Biomotors, Virus Assembly, and Nanobiotechnology Applications, Ohio State University, Columbus, OH, 2017.

71. Department of Chemistry & Biochemistry, Georgia Institute of Technology, Atlanta, Georgia, 2017.

70. DNATEC, Dresden, Germany, 2017.

69. HYBER Symposium, Helsinki, Finland, 2017.

68. The Future of Integrative Structural Biology Workshop, Clemson University, Clemson, SC, 2017.

67. Frontiers in Imaging Science Workshop, Janelia Research Campus, Ashburn, VA, 2017.

66. Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, 2017.

65. Non-invasive Delivery of Macromolecules Conference, San Diego, CA, 2017.

64. Gordon Conference on RNA Nanotechnology, Ventura Beach, CA, 2017.

63. Frederick National Laboratory for Cancer Research, Frederick, MD, 2016.

62. SRC/IBM/ONR Workshop on Biological Pathways for Electronic Nanofabrication and Materials, San Jose, CA, 2016.

61. High Content Analysis and 3D Screening Conference, Boston, MA, 2016.

60. Allen Institute for Cell Science in Seattle, WA, 2016.

59. Department of Biology, Boston College, Chestnut Hill, MA, 2016.

58. American Chemical Society Annual Meeting, Philadelphia, PA, 2016.

57. Conference on Excited State Processes, Santa Fe, New Mexico, 2016.

56. U.S. Naval Research Laboratory, Washington, D.C., 2016.

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55. Ten Years of DNA Origami Symposium, Caltech, Pasadena, CA, 2016.

54. Modeling and Inference Workshop: From Single Molecules to Cells, Ohio State University, Columbus, OH, 2016.

53. Biozentrum at the University of Basel, Basel, Switzerland, 2015.

52. Department of Chemistry, University of Chicago, Chicago, IL, 2015.

51. Department of Chemistry, University of Michigan, Ann Arbor, MI, 2015.

50. Autodesk Research, Inc., San Francisco, CA, 2015.

49. Department of Biological Engineering, MIT, Cambridge, MA, 2015.

48. DNA21, Harvard University, Cambridge, MA, 2015.

47. Washington University, St. Louis, MO, 2015.

46. Department of Biomedical Engineering, University of Minnesota, Minneapolis, MN, 2015.

45. 14th European Conference on Computational Biology in Strasbourg, France, 2014.

44. Department of Cell & Molecular Biology, Uppsala University, Uppsala, Sweden, 2014.

43. Microscopy Graduate Workshop at Stowers Institute for Medical Research in Kansas City, MO, 2014.

42. 110$^{th}$ International Titisee Conference, Titisee, Germany, 2014.

41. Department of Physics, McGill University, Montreal, Canada, 2014.

40. SIAM Conference on the Life Sciences, Charlotte, NC, 2014.

39. World Congress of Biomechanics, Boston, MA, 2014.

38. World Congress of Biomechanics, Boston, MA, 2014.

37. Curie Institute, Paris, France, 2014.

36. DNATEC14, Dresden, Germany, 2014.

35. Foundations of NanoScience Conference, Snowbird, UT, 2014.

34. GPU Technology Conference, San Jose, CA, 2014.

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33. National Academy of Sciences Kavli Frontiers of Science & Engineering Symposium, Rio de Janeiro, Brazil, 2014.

32. Department of Biochemistry & Molecular Biology at Wayne State University School of Medicine, Detroit, MI, 2014.

31. Quantitative Bioimaging Conference at the University of New Mexico, Albuquerque, NM, 2014.

30. Physical Mathematics Seminar Series, MIT, Cambridge, MA, 2013.

29. Department of Physics, University of Maryland, College Park, MD, 2013.

28. Interdisciplinary Symposium on Advanced Nano/Biosystems: Design, Fabrication, and Characterization, University of Illinois at Urbana-Champaign, Champaign, IL, 2013.

27. Department of Chemistry and Biochemistry, Arizona State University, Phoenix, AZ, 2013.

26. National Centre for Biological Sciences TIFR, Bangalore, India, 2013.

25. Janelia Farm Research Campus, Ashburn, VA, 2013.

24. Department of Physics, Technical University of Munich, Munich, Germany, 2013.

23. International Workshop on Macromolecular Structure and Dynamics, Uppsala University, Uppsala, Sweden, 2013.
22. SciLifeLab, The Svedberg Seminar Series, Uppsala University, Uppsala, Sweden, 2013.

21. Department of Biochemistry and Molecular Biology, University of Chicago, Chicago, IL, 2013.

20. 57$^{th}$ Annual Biophysical Society Meeting, Philadelphia, PA, 2013.

19. Boston University, Integrative Systems Biology Seminar Series, Boston, MA, 2012.

18. Materials Research Society, Boston, MA, 2012.

17. NNIN/C Conference, Synergy Between Experiment and Computation in Energy – Looking to 2030, Harvard University, Cambridge, MA, 2012.

16. Ohio State University, Columbus, OH, 2012.

15. Soft Matter Approaches to Biological Physics, KITP UCSB, Santa Barbara, CA, 2011.

14. Foundations of Nanoscience, Snowbird, UT, 2011.

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13. Biophysical Society, Baltimore, MD, 2011.

12. Biophysical Society, Baltimore, MD, 2011.

11. EMBO Workshop on Modeling, Microscopy, and Biophysical Methods, EMBL Heidelberg, Heidelberg, Germany, 2010.

10. Department of Biochemistry-Biophysics, Brandeis University, Waltham, MA, 2010.

9. The Cellular Cytoskeleton, Pingree Park, CO, 2010.

8. Harvard Squishy Physics, Harvard University, Cambridge, MA, 2010.

7. MIT Graduate Student Council Alumni Speaker Series, Cambridge, MA, 2009.

6. MIT BMES Undergraduate Students Association, Cambridge, MA, 2009.

5. Annual Meeting of the United States Association for Computational Mechanics, Columbus, OH, 2009.

4. Annual Meeting of the Biophysical Society, Boston, MA, 2009.

3. WAM Seminar Series, Harvard University, Cambridge, MA, 2009.

2. Institute for Biomolecular Science, Gakushuin University, Tokyo, Japan, 2009.

1. 2009 MIT in Japan Conference, Tokyo, Japan, 2009.

## Archival Journal Referee

*Accounts of Chemical Research*
*ACS Nano*
*Analytical Chemistry*
*Angewandte Chemie*
*Biophysical Journal*
*Biopolymers*
*Cell*
*Chemical Reviews*
*E-life*
*European Physical Journal*
*Integrative Biology*
*Journal of the American Chemical Society*
*Journal of Biological Chemistry*
*Journal of Cell Biology*
*Journal of Cell Science*
*Journal of Chemical Information and Modeling*
*Journal of Chemical Physics*
*Journal of Computational Chemistry*

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*Journal of Computational and Theoretical Nanoscience*
*Journal of Visualized Experiments*
*Nano Letters*
*Nanoscale*
*Nature*
*Nature Biotechnology*
*Nature Communications*
*Nature Materials*
*Nature Methods*
*Nature Nanotechnology*
*Nucleic Acids Research*
*Physical Biology*
*Physical Review E*
*PLoS Computational Biology*
*PLoS ONE*
*PNAS*
*Science*

## Teaching

| Term | Course Number | Course Title | Role | Course Type |
|---|---|---|---|---|
| Fall 2026 | 20.380 | Biological Engineering Design | Lecturer | Lecturer |
| Fall 2026 | 20.389J | The Bioeconomy and Society | Lecturer | Lecturer |
| Fall 2025 | STS.059[J] | The Bioeconomy and Society | Lecturer | Lecturer |
| Spring 2025 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |
| Fall 2023 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Spring 2023 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |
| Fall 2022 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Spring 2022 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |

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| Fall 2021 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Spring 2021 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |
| Fall 2020 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Spring 2020 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |
| Spring 2019 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |
| Fall 2017 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Fall 2017 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |
| Spring 2017 | 20.315/20.415 | Physical Biology | Lecturer | Lecture |
| Fall 2016 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Spring 2016 | 20.310 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |
| Fall 2015 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Fall 2015 | 20.416 | Topics in Biophysics & Physical Biology | Lecturer | Lecture |
| Spring 2015 | 20.415 | Physical Biology | Lecturer | Lecture |
| Fall 2014 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Fall 2014 | 20.416 | Topics in Biophysics & Physical Biology | Lecturer | Lecture |

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| Spring 2014 | 20.415 | Physical Biology | Lecturer | Lecture |
| Fall 2013 | 20.416 | Topics in Biophysics & Physical Biology | Lecturer | Lecture |
| Spring 2013 | 20.416 | Topics in Biophysics & Physical Biology | Lecturer | Lecture |
| Spring 2013 | 20.415 | Physical Biology | Lecturer | Lecture |
| Fall 2013 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Fall 2012 | CSB.100 | Topics in Computational & Systems Biology | Lecturer | Lecture |
| Fall 2012 | 20.416 | Current Research in Biophysics | Lecturer | Lecture |
| Fall 2012 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Spring 2012 | 20.415 | Physical Biology | Lecturer | Lecture |
| Fall 2011 | 20.110 | Thermodynamics of Biomolecular Systems | Lecturer | Lecture |
| Fall 2011 | 20.416 | Current Research in Biophysics | Lecturer | Lecture |
| Fall 2010 | 20.430 | Fields, Forces, & Flows in Biological Systems | Lecturer | Lecture |
| Spring 2010 | 20.415 | Physical Biology | Lecturer | Lecture |
| Fall 2009 | 20.110 | Thermodynamics of Biomolecular Systems | Lecturer | Lecture |
| Spring 2009 | 20.410 | Molecular, Cell, and Tissue Biomechanics | Lecturer | Lecture |

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## Current Graduate Students

| Name | Prior University | Training Period | Project Area | Current Position |
|---|---|---|---|---|
| Duy An Le | UCSD | 2025–present | CNS Therapeutics | Graduate Student, MIT |

## Past Graduate Students

| Name | Prior University | Training Period | Project Area | Current Position |
|---|---|---|---|---|
| Philip Bransford | University of Minnesota | 2009–2011 | Dynamics and evolution of cadherins and actin-bundling proteins | Senior Scientist, Vertex Pharmaceuticals, Inc. |
| Syuan-Ming Guo | National Taiwan University | 2009–2016 | Bayesian inference and super-resolution imaging of membrane dynamics | Senior Machine Learning Scientist, Insitro |
| Nilah Monnier Ioannidis | Harvard University (B.A.); University of Cambridge (M.Phil.) | 2009–2012 | Bayesian inference approaches for particle trajectory analysis in cell biology | Assistant Professor, University of California Berkeley |
| Reza Sedeh | Tehran University | 2009–2012 | Contributions to the analysis of proteins | AI Privacy & Governance, Meta |
| Matthew Adendorff | Rhodes University | 2011–2015 | DNA nanotechnology | Data Science Lead & CTO, Open Cities Lab |
| Zachary Barry | Georgia Institute of Technology | 2012–2017 | Bayesian analysis of peptidoglycan synthesis | Senior Machine Learning Scientist, Spring Discovery |
| Simon Gordonov | Rutgers University (B.Sc.); Cambridge University (M.Phil.) | 2012–present | Analysis & modeling of cell migration | Scientist, Vertex Pharmaceuticals, Inc. |

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|---|---|---|---|---|
| Sakul Ratanalert | Cornell University | 2013–2018 | Structural DNA nanotechnology sequence design | Lecturer, Johns Hopkins University |
| Joseph Berleant | California Institute of Technology | 2017–2023 | DNA nanotechnology for computing and data search | Postdoctoral Research Associate, MIT |
| Rebecca Du | California Institute of Technology | 2017–2022 | DNA nanotechnology for innate immune stimulation | Cell Culture Scientist, Culture Biosciences |
| Molly Parsons | Iowa State University | 2017–2022 | RNA nanotechnology | Research Fellow, Boston Children's Hospital |
| Matthew Allan | Penn State University | 2018–2023 | RNA nanotechnology | Postdoctoral Research Associate, HMS |
| Andy (Hyun-Min) Kim | Caltech | 2019–2025 | DNA nanotechnology for therapeutic delivery | Postdoctoral Research Associate, MIT |
| Grant Knappe | University of Maryland | 2019–2024 | DNA nanotechnology for active immunotherapeutics | Postdoctoral Research Associate, MIT |
| Beny (Reuven) Falkovich | Technion University | 2020–2025 | Neuronal phenotyping | Postdoctoral Research Associate, MIT |
| Anna Romanov | Georgia Tech | 2020–2025 | DNA nanotechnology for vaccines | Postdoctoral Research Associate, MIT |
| Kristin Sheridan | MIT | 2020–2021 | DNA nanotechnology for computing and memory | Doctoral Student, UT Austin |
| Julia Wu | MIT | 2020–2021 | Neuronal data analysis | Software Engineer, Google |

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## Current Postdoctoral Research Associates

| Name | Doctoral University | Training Period | Project Area | Current Position |
|---|---|---|---|---|
| Beny (Reuven) Falkovich | Technion University | 2025–present | Neuronal phenotyping | Postdoctoral Research Associate |
| Anna Romanov | Georgia Tech | 2026–present | Particulate vaccines for HIV | Postdoctoral Research Associate |
| Xin Luo | McGill University | 2022–present | Nanofabrication for quantum devices | Senior Postdoctoral Research Associate |
| Marjan Omer | Aarhus University | 2023–present | DNA nanotechnology for vaccines and therapeutics | Postdoctoral Research Fellow |
| Grant Knappe | University of Maryland | 2024–present | Active immunotherapy platform technology | Postdoctoral Research Associate |
| Selma Piranej | Emory University | 2024–present | Lithographic DNA patterning for diagnostics and computing | Postdoctoral Research Fellow |
| Sarah Al Abdullatif | Emory University | 2025–present | CNS biodistribution and delivery of DNA therapeutics | Postdoctoral Research Fellow |
| Tyler Brown | McGill University | 2026–present | Chemical approaches to quantum information science & technology | Postdoctoral Research Associate |
| Peter Satterthwaite | Massachusetts Institute of Technology | 2026–present | Nanofabrication for quantum sensing and computing | Postdoctoral Research Associate |
| Matteo Tollemeto | The Technical University of Denmark | 2026–present | Mucosal immunization strategies with DNA nanotechnology | Postdoctoral Research Fellow |

## Former Postdoctoral Research Associates

| Name | Doctoral University | Training Period | Project Area | Current Position |
|---|---|---|---|---|

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| | | | | |
|---|---|---|---|---|
| Jun He | Brown University | 2009–2011 | Bayesian approach to imaging-based spectroscopy | Data Science Manager, Adobe, Inc. |
| Aprotim Mazumder | NCBS – TIFR Bangalore, India | 2009–2014 | Single-cell DNA Damage Response | Assistant Professor, TCIS, TIFR |
| Philipp Diesinger | Institute of Theoretical Physics, University of Heidelberg | 2010–2011 | Quantitative analysis of cytoskeletal dynamics | Boston Consulting Group |
| Do-Nyun Kim | MIT | 2011–2014 | Predicting 3D structure of DNA origami | Professor, Seoul National University |
| Keyao Pan | Rice University | 2011–2016 | DNA nanostructure solution shape prediction | Research Data Scientist, Meta, Inc. |
| Lun Yang | Carnegie Mellon University | 2012–2013 | Modeling nanoscale excitonic networks | Quantitative Research Analyst, Exodus Point Capital Management |
| Etienne Boulais | École Polytechnique de Montréal | 2013–2015 | Excitonic properties of DNA-dye assemblies | Radar and Antenna Engineer, Canadian Space Agency |
| Yera Hakobyan | Cornell University | 2013–2014 | Structure-based mechanical modeling of DNA origami | Data Science Architect, 3M |
| Pramod Pisharady | National University of Singapore | 2013–2014 | Bayesian reconstruction of structural MRI data | Assistant Professor & CZI Imaging Scientist, University of Minnesota Medical School |
| Changsun Eun | University of California San Diego (Postdoc) - University of North Carolina at Chapel Hill (Ph.D.) | 2014–2014 | DNA scaffolded multi-enzyme cascades | Assistant Professor, Hankuk University of Foreign Studies |
| Stavros Gaitanaros | University of Texas at Austin | 2014–2015 | DNA nanostructure solution shape and mechanics | Assistant Professor, Johns Hopkins |

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| | | | | |
|---|---|---|---|---|
| | | | | University |
| Remi Veneziano | Institute Charles Gerhardt | 2014–2018 | Membrane-associated biomolecular structure and dynamics | Assistant Professor, George Mason University |
| William Bricker | Washington University | 2015–2019 | Computational modeling of DNA-based excitonic assemblies | Assistant Professor, University of New Mexico |
| Hyungmin Jun | Korea Advanced Institute of Science and Technology | 2015–2019 | Structural DNA nanotechnology | Professor, Jeonbuk National University |
| Tyson Shepherd | University of Iowa | 2015–2018 | RNA nanostructures | Research Scientist, Inscripta, Inc. |
| James Banal | University of Melbourne | 2016–2021 | Programmable excitonic systems on DNA nanostructures | Co-Founder, Cache DNA, Inc. |
| Syuan-Ming Guo | National Taiwan University | 2016–2018 | Bayesian inference and super-resolution imaging of membrane dynamics | Machine Learning Scientist, Insitro |
| Martin Tomov | Colleges of Nanoscale Science and Engineering, SUNY Polytechnic Institute / University at Albany-SUNY | 2016–2018 | Multiplexed fluorescence imaging of stem cell-derived neurons | Postdoctoral Fellow, Emory University |
| Jessica Wu | University of California, Irvine, Irvine, CA | 2016–2016 | Phenotypic profiling of synaptic proteins and mRNAs | Principal Scientist II, AbbVie, Inc. |
| Mathew Stone | University of Michigan | 2017–2018 | Quantitative fluorescence imaging of neurons and B-cells | Associate Predictive Modeler, Auto-Owners Insurance |
| Eike Wamhoff | Max Planck Institute of | 2017–2022 | DNA nanoparticle vaccines | Research Scientist, BioNTec, GMBH |

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| | | | | |
|---|---|---|---|---|
| | Colloids and Interfaces | | | |
| Eric Danielson | Medical College of Wisconsin | 2018–2020 | Phenotypic profiling of neuronal models of Schizophrenia | Senior Scientist II, NewCo |
| Xiao Wang | New York University | 2018–present | Structural DNA nanotechnology | Assistant Professor, Southeast University, China |
| Chi Chen | University of Paris Sud | 2020–2024 | DNA-based photonic materials | Professor, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences |
| Floris Engelhardt | TU Munich | 2020–2021 | Single-stranded DNA design and production | CEO and Co-Founder, KanoTx, Inc. |
| Jeffrey Gorman | University of Cambridge | 2020–2025 | Biomimetic light-harvesting materials | Assistant Professor, University of Durham, UK |
| Torsten John | Leipzig University | 2020–2023 | DNA-based excitonic materials | Assistant Professor, Constructor University, Germany |

**Doctoral Thesis Committee Reader**

2009 BoBae Lee (DMSE), Thesis Committee Member
2011 Ishan Barman (ME), Thesis Committee Member
2011 Fei Liang (BE), Thesis Committee Member
2013 Sungmin Son (ME), Thesis Committee Member
2013 Dimitrios Tzeranis (ME), Thesis Committee Member
2013 Dhiraj Devidas Bhatia (NCBS), Thesis Committee Member
2014 Christopher Negron (CSB), Thesis Committee Member
2015 Thomas Gurry (CSB), Thesis Committee Member
2015 Chia-Ching Chou (CEE), Thesis Committee Member
2015 Joyce Yang (HMS), Thesis Committee Member
2016 William Hesse (BE), Thesis Committee Chair
2016 Kelly Brock (CSB), Thesis Committee Member
2016 Rotem Gura (CSB), Thesis Committee Member
2016 Kento Masayuma (AA), Thesis Committee Member

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2017 Eric Ma (BE), Thesis Committee Chair
2018 Anthony Kulesa (BE), Thesis Committee Chair
2018 Stavros Chatzieleeftheriou (NTUA), Thesis Committee Member
2019 Alex Wesselhoeft (Biology), Thesis Committee Member
2019 Aaron Dy (BE), Thesis Committee Chair
2019 Paul Reginato (BE), Thesis Committee Chair
2020 Luke Funk (HST), Thesis Committee Chair
2021 Marjan Omer (Aarhus), Thesis Opponent
2022 Yang Wang (Karolinska), Thesis Opponent
2025 Farhan Khodaee (ME), Thesis Committee Chair
2026 Eyal Perry, Media Arts & Sciences, Thesis Committee Member
2026 Eyal Perry, Media Arts & Sciences, Thesis Committee Member
2026 Fan Xue, Electrical Engineering & Computer Science, Thesis Committee Member

## Funded Research Awards

**MIT CEHS NIH P30-ES002109** **9/1/2010–3/31/2012**
Role: Pilot Project PI $40,991
MIT CEHS Pilot Project Program/NIH P30 EHSCC
CEHS Pilot: Single-cell Analysis of Transcriptional and Translational Regulation of Genes Essential for DNA-Damage Response

**DOD-MURI W911NF-12-1-0420** **7/1/2012–8/19/2018**
Role: Co-I (PI Yan) $624,750
Arizona State University/Navy-ONR
Translating Biochemical Pathways to Non-Cellular Environments

**ONR DURIP N00014-13-1-0664** **6/15/2013–6/14/2014**
Role: PI (Equipment Grant) $313,969
Navy-ONR DURIP
DURIP: High Performance Computing for Nucleic Acids Nanotechnology

**NSF DMREF CMMI-1334109** **1/15/2014–12/31/2018**
Role: PI (Co-I Yan and Yin) (Total Award) $1,706,468
NSF DMREF (Bathe Portion) $817,106
Computational Design Principles for Functional DNA-based Materials
(Subcontracts: Arizona State University and Harvard University)

**NSF PoLS PHY-1305537** **4/1/2014–3/31/2018**
Role: PI $540,000
NSF PoLS
Inferring the Physics of Living Systems from Dynamic Light Microscopy Data

**HFSP RGP0029/2014** **5/1/2014–4/30/2018**
Role: Co-I (PI Krishnan) $337,500
Human Frontier Science Program
Dissecting the Mechanochemistry of Membrane Invagination with Designer DNA-Based Probes

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**ONR N00014-12-1-0621 & N00014-14-1-0609 & N00014-16-1-2181** **5/15/2014–8/14/2017**
Role: PI $1,418,207
Navy-ONR
Computer-Aided Engineering for Nucleic Acid-Based Nanotechnology

**NIH U01-MH106011** **9/26/2014–11/30/2017**
Role: Co-I (PI Boyden) (Total Award) $2,154,250
NIH BRAIN (Bathe Portion) $714,195
Ultra-Multiplexed Nanoscale In Situ Proteomics for Understanding Synapse Types

**Anonymous Foundation** **12/29/2014–12/31/2016**
Role: PI (Equipment Grant) $650,000
Anonymous Foundation
Purchase of a Light-sheet Fluorescence Microscope for Advanced Multi-scale Imaging at MIT

**DOE-Chicago DE-SC0001088** **8/1/2015–2/28/2017**
Role: Co-I (PI Baldo) (Bathe Portion) $329,893
DOE
RLE-Center for Excitonics

**NSF EAGER CCF-1547999** **8/1/2015–7/31/2019**
Role: PI $155,000
NSF EAGER
EAGER: Collaborative Research: Algorithmic Design Principles for Programmed DNA Nanocages

**ONR DURIP N00014-15-1-2830** **9/29/2015–9/28/2016**
Role: PI (Equipment Grant) $179,676
Navy-ONR DURIP
DURIP: High Performance Computing for Nucleic Acid Nanotechnology

**NSF CCF-1564025** **4/1/2016–3/31/2021**
Role: PI $638,493
NSF CCF
AF: Medium: Collaborative Research: Top-down Algorithmic Design of Structured Nucleic Acid Assemblies

**ONR DURIP N00014-16-1-2506** **7/15/2016–8/31/2017**
Role: PI (Equipment Grant) $162,843
Navy-ONR DURIP
DURIP: High-throughput Assembly and Characterization Tools for Structural DNA Nanotechnology

**ONR N00014-16-1-2953** **9/1/2016–8/31/2019**
Role: PI (Co-I Chiu) (Total Award) $786,856
Navy-ONR (Bathe Portion) $561,856
DNA Origami Scaffolds for Single-particle Cryo-Electron Microscopy of Viral RNA
(Subcontract: Baylor College of Medicine)

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**Skoltech 1911/R** **12/1/2016–11/30/2019**
Role: Co-I (PI Lempitsky) (Bathe Portion) $492,945
Skolkovo Institute of Science and Technology
Deep Learning Toolbox for Cell Image Analysis

**NIH R01-MH112694** **4/1/2017–2/28/2022**
Role: PI (Co-I Cottrell) (Total Award) $2,018,175
NIH R01 (Bathe Portion) $1,547,000
Simultaneous Multiplexed in Situ Fluorescence Imaging of Neuronal Proteins and Messenger RNAs
(Subcontract: The Broad Institute)

**DOE DE-SC0016353** **6/15/2017–6/14/2019**
Role: Co-I (PI Yan) (Bathe Portion) $213,388
Arizona State University/DOE
DNA Nanostructure Directed Designer Excitonic Networks

**ONR N00014-17-1-2609** **8/1/2017–7/31/2021**
Role: PI $661,663
Navy-ONR
Hierarchical Nanoscale Materials Programmed using Structured DNA Nanoparticles

**NSF PHY-1707999** **8/15/2017–7/31/2024**
Role: PI $720,000
NSF PoLS
Inferring the Physics of mRNA Trafficking in Neuronal Systems

**MIT Deshpande MOU** **9/1/2017–2/15/2019**
Role: PI $50,000
MIT Deshpande Center
Structured DNA Nanoparticles as a Therapeutic Delivery Platform

**NSF CBET-1729397** **1/1/2018–12/31/2021**
Role: PI (Co-I Yan and Yin) (Total Award) $1,600,000
NSF DMREF (Bathe Portion) $770,500
DMREF: Computational Design of Next-generation Nanoscale DNA-based Materials
(Subcontracts: Arizona State University and Harvard Medical School)

**ONR DURIP N00014-18-1-2290** **6/1/2018–5/31/2019**
Role: PI (Equipment Grant) $364,186
Navy-ONR DURIP
DURIP: DNA Synthesizer for the Development of New Modalities for DNA Nanostructures

**NIH R21-EB026008** **8/15/2018–12/20/2022**
Role: PI (Co-I on Supplement Lingwood and Schmidt) (Total Award) $796,348
NIH R21and Supplement (Bathe Portion) $588,303
Structured DNA Nanoparticles Therapeutic mRNA and CRISPR/Cas9 Delivery

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NIH R21-EB026008 Revision Supplement - DNA Nanoparticle Vaccine for COVID-19
(Subcontract on Supplement: Ragon Institute)

**i-Corps W911NF1810436** **9/10/2018–9/9/2021**
Role: PI $70,000
Army-ARO
Assessment of Nanoparticle Assemblies for Efficient Gene Therapy Vehicles

**NSF CHE-1839155** **9/15/2018–8/31/2023**
Role: PI (Total Award) $1,000,000
NSF RAISE (Bathe Portion) $321,772
RAISE-TAQS: Room-Temperature Quantum Sensing and Computation using DNA-based Excitonic Circuits

**UC Santa Barbara Funding under W911NF-19-2-0026** **12/1/2018–11/30/2019**
Role: Seed PI (PI Lauffenburger) $90,000
UC Santa Barbara/DOD
Programmable DNA-based Meta-materials

**ONR DURIP N00014-19-1-2344** **6/1/2019–5/31/2021**
Role: PI (Equipment Grant) $453,000
Navy-ONR DURIP
DURIP: Combinatorial DNA nanoparticle libraries for structural biology and materials research

**DOE DE-SC0019998** **8/1/2019–7/31/2022**
Role: Co-I (PI Schlau-Cohen) (Bathe Portion) $390,000
DOE
Controlling Exciton Dynamics with DNA Origami for Quantum Information Science

**NSF HDR OAC-1940231** **10/1/2019–9/30/2021**
Role: PI $334,231
NSF HDR
Collaborative Research: Autonomous Computing Materials

**UC Santa Barbara Funding under W911NF-19-2-0026** **12/1/2019–11/30/2023**
Role: Co-PI (PI McFarlane) (Total Award) $677,844
DOD UARC (Bathe Portion) $338,922
Controlling Electromagnetic Properties of DNA-based Metamaterials

**MIT ISN Seed Funding under W911NF-13-D-0001** **12/1/2019–12/31/2022**
Role: Co-PI (PI Irvine) (Bathe Portion) $139,904
MIT ISN/DOD
Pilot Project: Enzyme-Encapsulated Nucleic Acid Vaccines

**ONR N00014-20-1-2084** **1/15/2020–1/14/2023**
Role: PI (Co-I Chiu) (Total Award) $798,730
Navy-ONR (Bathe Portion) $639,830

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Synthetic Nucleic Acid Nanoparticles for RNA Structural & Synthetic Biology
(Subcontract: Stanford University)

**ONR DURIP N00014-20-1-2202** **4/1/2020–8/1/2023**
Role: PI (Equipment Grant) $552,061
Navy-ONR DURIP
DURIP: Expansion of Combinatorial DNA Nanoparticle Libraries for Materials Research & Structural Biology

**SPARK Therapeutics, Inc.** **3/11/2020–9/26/2021**
Role: PI $10,570
SPARK Therapeutics, Inc.
Evaluation of phagemid-produced single-strand DNA

**Fast Grant Award** **4/15/2020–4/30/2021**
Role: PI (Co-I Lingwood and Schmidt) (Total Award) $150,000
Mercatus Center at George Mason University (Bathe Portion) $70,000
COVID-19 Fast Grant
(Subcontract: Ragon Institute)

**NSF CCF-1956054** **5/1/2020–4/30/2024**
Role: PI $900,000
NSF CCF
AF Medium: DNA-based Data Storage and Computing Materials

**ONR N00014-21-1-4013** **11/2/2020–11/1/2023**
Role: PI $711,687
Navy-ONR
Hierarchical Nanoscale Materials Programmed using Structured DNA Nanoparticles

**NIH R01-AI162307** **8/2/2021–7/31/2025**
Role: Co-PI (PI Irvine) (Total Award) $1,551,000
NIH R01 (Bathe Portion) $705,484
Investigation of Synthetic DNA-based Viral Particles for Spatially Controlled Antigen Presentation

**ACX Grant** **1/6/2022–1/6/2025**
Role: PI $25,000
Centre for Effective Altruism
Project for novel platform for screening and development of psychiatric drugs, including therapeutic adaptations of psychedelics

**GanNa Bio, Inc.** **3/24/2022–1/31/2023**
Role: PI $10,430
GanNa Bio, Inc.
Collaboration with the Bathe Lab at MIT and GanNa Bio, Inc.

**ONR DURIP N00014-22-1-2317** **4/1/2022–12/31/2023**

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Role: PI (Equipment Grant) $417,550
Navy-ONR DURIP
DURIP: Accelerating the Discovery of DNA Based Materials using High-Performance Computing and Structural Biology

**Novo Nordisk Agreement** **6/29/2022–6/29/2023**
Role: PI $50,000
Novo Nordisk
Next-generation gene therapeutic delivery platform using DNA origami

**NIH R21-MH130624** **7/1/2022–6/30/2024**
Role: PI $418,370
NIH R21
Investigation of the Synaptic Molecular Network using Multiplexed Imaging

**DOE DE-SC0019998** **8/1/2022–7/31/2024**
Role: Co-I (PI Schlau-Cohen) Bathe Portion $487,500
DOE
Synthesizing functionality in excitonic systems using DNA origami

**NSF CMMI-2240309** **5/1/2023–4/30/2025**
Role: PI Total Award $300,000
NSF EAGER Bathe Portion $204,600
EAGER: Quantum Manufacturing: Bottom-up Molecular Qubit Arrays using DNA Origami

**MIT ISN-5 Project W911NF2320121** **7/1/2023–6/30/2028**
Role: PI $470,000
MIT ISN
ISN 5.1: Enzyme-Encapsulation and Performance of Nucleic Acid Nanoparticles

**ONR DURIP N00014-24-1-2254** **3/1/2024–2/28/2025**
Role: PI (Equipment Grant) $202,412
Navy-ONR DURIP
DURIP: Combinatorial nucleic acid nanoparticle libraries for materials research and molecular catalysis

**MIT Project W911NF2320121** **4/1/2024–3/31/2025**
Role: Co-I (PI Steven Harvey) $17,500
MIT ILIR
Enhancement of Nerve Agent Catalysis with DNA Origami

**NSF FET-2403100** **7/1/2024–06/30/2028**
Role: PI $1,150,730
Next-generation DNA-based Computing and Memory Materials

**NIH R01-MH112694** **11/30/2024–12/31/2029**
Role: PI $2,024,750
Simultaneous profiling of neuronal synapse activities, proteins, and messenger RNAs at the

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single-cell level (Subcontract: The Broad Institute)

**Navy-ONR N000142512217** **3/1/2025–2/28/2028**
Role: PI $924,523
DNA-templated Materials for Quantum Information Science and Technology

**The Simons Foundation SFI-AN-AR-Pilot-00009691** **3/1/2025–2/28/2027**
Role: PI $150,000
Multimodal synaptic profiling of patient-derived neuronal samples for the discovery of ASD therapeutics

**NSF MCB-2428308** **5/1/2025–4/30/2027**
Role: PI $500,000
FMSG BIO: Next-generation Sub-10nm Manufacturing Framework for Photonic Quantum Technologies using DNA

**Eli Lilly and Company** **06/11/2025–06/11/2026**
Role: PI $100,000
Collaboration and MTA with Bathe Lab

**NSF DMR-2522798** **10/1/2025–09/30/2029**
Role: Co-I (PI Adam Willard) $308,000
DMREF: Data-driven high-throughput design of DNA nanomaterials for next-generation optoelectronic and quantum technologies

**NIH R21-AG099044** **2/1/2026–1/31/2028**
Role: PI $466.340
Pilot of a new non-viral vector for therapeutic nucleic acid delivery to the CNS (Subcontract: UMASS Medical Center)

**MIT Deshpande** **2/1/2026–1/31/2027**
Role: PI $124,740
A preventative active immunotherapy for Alzheimer's Disease Momentum Grant Heals

**NIH R01-AI162307** **2/9/2026–1/31/2031**
Role: PI $4,096,910
Investigation of Synthetic DNA-based Viral Particles for Spatially Controlled Antigen Presentation (Subcontract: Ragon MGH and Scripps Institute)