Michael J. Mitchell, Ph.D.

Associate Professor of Bioengineering, University of Pennsylvania
Lipid Nanoparticle Delivery Systems Group Leader, Penn Institute for RNA Innovation
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PROFESSIONAL APPOINTMENTS

2023 – **University of Pennsylvania,** Philadelphia, PA
Associate Professor of Bioengineering
Lipid Nanoparticle Delivery Systems Group Leader, Penn Institute for RNA Innovation
Director, Lipid Nanoparticle Synthesis Core, Penn Institute for RNA Innovation
Member, Abramson Cancer Center
Member, Center for Cellular Immunotherapies
Member, Center for Precision Engineering for Health
Member, Center for Soft and Living Matter
Member, Center for Targeted Therapeutics and Translational Nanomedicine
Member, Institute for Translational Medicine and Therapeutics
Member, Institute for Regenerative Medicine
Member, Institute for Immunology
Member, Penn Cardiovascular Institute
Member, Penn Center for Musculoskeletal Disorders
Member, Penn Center for Innovation & Precision Dentistry

2018 – 2023 **University of Pennsylvania,** Philadelphia, PA
Skirkanich Assistant Professor of Innovation, Department of Bioengineering

2022 – **Liberate Bio,** Boston, MA
Co-Founder and Member, Scientific Advisory Board

2022 – **Capstan Therapeutics,** San Diego, CA
Co-Founder and Member, Scientific Advisory Board

2023 – **Stylus Medicine,** Cambridge, MA
Member, Scientific Advisory Board

2023 – **MusiQ Bio,** Houston, TX
Member, Scientific Advisory Board

2022 – **Seawolf Therapeutics,** San Diego, CA
Member, Scientific Advisory Board

2022 – **Tune Therapeutics,** Seattle, WA
Member, Scientific Advisory Board

2021 – 2023 **iECURE,** Philadelphia, PA
Member, Scientific Advisory Board

2021 – 2022 **Tessera Therapeutics,** Cambridge, MA
Member, Scientific Advisory Board

2014 – 2017 **Massachusetts Institute of Technology,** Cambridge, MA
NIH NCI F32 Ruth L. Kirschstein and Burroughs Wellcome Fund CASI Postdoctoral Fellow
Koch Institute for Integrative Cancer Research, Department of Chemical Engineering

Advisor: Dr. Robert S. Langer

EDUCATION

2014 **Doctor of Philosophy (Ph.D.),** Biomedical Engineering
2012 **Master of Science (M.S.),** Biomedical Engineering
Cornell University, Ithaca, New York
Thesis: Mechanotransduction and Therapeutic Targeting of Cells in the Circulation
Advisor: Dr. Michael R. King

2009 **Master of Engineering (M.E.),** Materials Science and Engineering
2009 **Bachelor of Engineering (B.E.),** Biomedical Engineering
Stevens Institute of Technology, Hoboken, New Jersey
Thesis: Microfluidic 3D Tissue Models of Wound Healing and Infection
Advisor: Dr. Woo Y. Lee

AWARDS AND HONORS

2024 Controlled Release Society Young Investigator Award
2024 Editorial Board, *Exploration*
2023 Cellular and Molecular Bioengineering Young Innovator Award
2023 IDEA Prize, University of Pennsylvania
2023 National Academy of Engineering Japan-America Frontiers of Engineering
2023 Editorial Board, *Exploration*
2022 NSF CAREER Award
2022 National Academy of Medicine Emerging Leaders Forum
2022 Society for Biomaterials Young Investigator Award
2021 Editorial Board, *GEN Biotechnology*
2021 Emerging Inventor of the Year, Penn Center for Innovation
2021 Inaugural Rising Star Award, *Journal of Nanobiotechnology*
2021 Editorial Board, *Biomaterials*
2021 Editorial Board, *Bioactive Materials*
2021 Strategic Development & Scientific Advisory Committee, Sanofi
2021 40 Under 40 Alumni Award, Stevens Institute of Technology
2021 Elected Chair, Gene Delivery and Gene Editing Focus Group, Controlled Release Society
2020 Emerging Investigator, *Biomaterials Science*
2019 Scientific Advisory Board, Lung Cancer Initiative, Johnson & Johnson
2019 T. Nagai Award, Controlled Release Society
2019 Young Investigator Award, Chinese Association for Biomaterials
2019 Rising Star Award in Cellular and Molecular Bioengineering, Biomedical Engineering Society
2019 Elected Chair, Drug Delivery Special Interest Group, Society for Biomaterials
2019 Selected Delegate, Academy of Achievement International Summit
2018 Director's New Innovator Award (DP2), National Institutes of Health
2018 Career Award at the Scientific Interface (CASI), Burroughs Wellcome Fund
2018 Skirkanich Assistant Professor of Innovation Endowed Chair
2017 Wunderkind Award, STAT News
2017 Merck Graduate Research Advances in Delivery Science Award, Controlled Release Society
2017 Cellular and Molecular Bioengineering Postdoctoral Award, Biomedical Engineering Society
2016 Scholar in Cancer Research, American Association for Cancer Research
2016 Université Laval Postdoctoral Trainee Award, World Biomaterials Congress
2016 Marlena Bradford Felter Research Travel Fellowship, MIT Koch Institute
2016 Young Investigator Council, *Tissue Engineering Parts A,B,C*
2016 Cellular and Molecular Bioengineering and Advanced Biomanufacturing Postdoctoral Fellow Award
2015 Ruth L. Kirschstein F32 National Research Service Award, National Institutes of Health

2015 MARC Travel Award, Federation of American Societies for Experimental Biology
2015 Postdoctoral Enrichment Program Fellowship, Burroughs Wellcome Fund
2015 Postdoctoral Research Travel Award, MIT Postdoctoral Association
2015 Award for Outstanding Ph.D. Research, Society for Biomaterials
2015 Ford Foundation Postdoctoral Fellowship Honorable Mention
2015 Cellular and Molecular Bioengineering PhD Student Award, Biomedical Engineering Society
2014 Max Planck Society Postdoctoral Fellowship
2014 Innovation and Career Development Award, Biomedical Engineering Society
2013 Separations Division Award, American Institute of Chemical Engineers
2013 Graduate Research and Design Award, Biomedical Engineering Society
2013 Biological and Biomedical Sciences Graduate Research Award, Cornell University
2013 École Nationale Supérieure des Mines de Saint Etienne Graduate Research Award
2013 NSF Fellowship, 12th International Summer School on Biocomplexity & Biodesign, Istanbul, Turkey
2013 Edward A. Bouchet Society Fellow, Yale University
2012 NextProf Future Faculty Workshop Participant, University of Michigan
2012 Coulter College Workshop Participant, Biomedical Engineering Society
2012 Caroline Coffey Fund Research Award, Cornell University
2012 International Society of Clinical Hemorheology Graduate Research Award
2012 National Science Foundation GK-12 Fellowship
2012 International Society of Biorheology Graduate Research Award
2010 National Science Foundation Graduate Research Fellowship Honorable Mention
2009 Center for Environmental Systems (CES) Hydroglobe Research & Entrepreneurship Award
2009 Undergraduate Technology Pitch Olympics Award, Stevens Institute of Technology
2009 Technogenesis Undergraduate Research Award, Stevens Institute of Technology
2009 International Society for Pharmaceutical Engineering Undergraduate Research Award
2008 Technogenesis Fellowship, Stevens Institute of Technology
2007 Elected Member, Tau Beta Pi National Engineering Honor Society
2007 Elected Member, Alpha Epsilon Delta National Premedical Honor Society
2004 Edwin A. Stevens Fellowship, Stevens Institute of Technology
2004 Presidential Fellowship, Stevens Institute of Technology

PEER REVIEWED PUBLICATIONS (*M.J. Mitchell as Corresponding Author; #Mitchell Lab Member)

Citations (Google Scholar): >13,700
h-index: 45
i10-index: 80

120. N. Gong#, M.G. Alameh, R. El-Mayta#, L. Xue#, D. Weissman, M.J. Mitchell*. Enhancing in situ cancer vaccines using delivery technologies. *In Press,* ***Nature Reviews Drug Discovery.*** DOI: 10.1038/s41573-024-00974-9 (2024).

119. X. Han#, M.G. Alameh, N. Gong#, L. Xue#, M. Ghattas, G. Bojja, J. Xu#, G. Zhao, C.C. Warzecha, M.S. Padilla#, R. El-Mayta#, Y. Xu, A.E. Vaughan, J.M. Wilson, D. Weissman, M.J. Mitchell*. Fast and Facile Synthesis of Amidine-Incorporated Degradable Lipids for Versatile mRNA Delivery. *In Press,* ***Nature Chemistry.*** DOI: 10.1038/s41557-024-01557-2 (2024).

118. H.C. Safford#, K.L. Swingle#, H.C. Geisler#, A.G. Hamilton#, A.S. Thatte#, A.A. Ghalsasi#, M.M. Billingsley#, M.G. Alameh, D. Weissman, M.J. Mitchell*. Orthogonal Design of Experiments for Engineering of Lipid Nanoparticles for Selective mRNA Delivery to the Placenta. *In Press,* ***Small.*** DOI: 10.1002/smll202303568 (2024).

117. A. Chan, R.M. Haley#, M.A. Najar, D. Gonzalez-Martinez, L.J. Bugaj, G.M. Burslem, M.J. Mitchell, A. Tsourkas. Lipid-Mediated Intracellular Delivery of Recombinant bioPROTACs for the Rapid Degradation of Undruggable Proteins. ***Nature Communications.*** 15:5808 (2024).

116. K. Mrksich[#], M.S. Padilla[#], R.A. Joseph[#], E.L. Han[#], D. Kim[#], R. Palanki[#], J. Xu[#], M.J. Mitchell*. Influence of ionizable lipid tail length on lipid nanoparticle delivery of mRNA of varying length. *In Press,* ***Journal of Biomedical Materials Research Part A*****.** 112:1494-1505 (2024).
**Cover Article.

115. A.J. Mukalel[#], A.G. Hamilton[#], M.M. Billingsley[#], J. Li[#], A.S. Thatte[#], X. Han[#], H.C. Safford[#], M.S. Padilla[#], T. Papp, H. Parhiz, D. Weissman, M.J. Mitchell*. Oxidized mRNA Lipid Nanoparticles for In Situ Chimeric Antigen Receptor Monocyte Engineering. *In Press,* ***Advanced Functional Materials*****.** DOI: 10.1002/adfm.202312038 (2024).

114. H.C. Geisler[#], H.C. Safford[#], M.J. Mitchell*. Rational Design of Nanomedicine for Placental Disorders: Birthing a New Era in Women's Reproductive Health. *In Press,* ***Small*****.** DOI: 10.1002/smll.202300852 (2024).

113. A.E. Metzloff[#], M.S. Padilla[#], N. Gong[#], M.M. Billingsley[#], X. Han[#], M. Merolle[#], D. Mai, C.G. Figueroa-Espada[#], A.S. Thatte[#], R.M. Haley[#], A.J. Mukalel[#], A.G. Hamilton[#], M.G. Alameh, D. Weissman, N.C. Sheppard, C.H. June, M.J. Mitchell*. Antigen presenting cell mimetic lipid nanoparticles for rapid mRNA CAR T cell cancer immunotherapy. ***Advanced Materials*****.** 36:2313226 (2024).
**Cover Article.

112. A.G. Hamilton[#], K.L. Swingle[#], A.S. Thatte[#], A.J. Mukalel[#], H.C. Safford[#], M.M. Billingsley[#], R. El-Mayta[#], X. Han[#], B.E. Nachod[#], R.A. Joseph[#], A.E. Metzloff[#], M.J. Mitchell*. High-throughput in vivo screening identifies differential influences on mRNA lipid nanoparticle immune cell delivery by administration route. ***ACS Nano*****.** 18:16151-16165 (2024).

111. T. Anchordoquy, N. Artzi, I.V. Balyasnikova, Y. Barenholz, N.M. La-Beck, J.S. Brenner, W.C.W. Chan, P. Decuzzi, A.A. Exner, A. Gabizon, B. Godin, S.K. Lai, T. Lammers, M.J. Mitchell, S.M. Moghimi, V. Muzykantov, D. Peer, J. Nguyen, R. Popovtzer, M. Ricco, N.J. Serkova, R. Singh, A. Schroeder, A.A. Schwendeman, J.P. Straehla, T. Teesalu, S. Tilden, D. Simberg. Mechanisms and Barriers in Nanomedicine: Progress in the Field and Future Directions. ***ACS Nano.*** 18:13983-13999 (2024).

110. H.C. Geisler[#], A.A. Ghalsasi[#], H.C. Safford[#], K.L. Swingle[#], A.S. Thatte[#], A.J. Mukalel[#], N. Gong[#], A.G. Hamilton[#], E.L. Han[#], B.E. Nachod[#], M.S. Padilla[#], M.J. Mitchell. EGFR-targeted ionizable lipid nanoparticles enhance in vivo mRNA delivery to the placenta. ***Journal of Controlled Release***. 371:455-469 (2024).

109. N. Gong[#], X. Han[#], L. Xue[#], M.M. Billingsley[#], X. Huang[#], R. El-Mayta[#], J. Qin[#], N.C. Sheppard, C.H. June, M.J. Mitchell*. Small-molecule-mediated control of the anti-tumour activity and off-tumour toxicity of a supramolecular bispecific T cell engager. ***Nature Biomedical Engineering.*** 8:513-528 (2024).
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108. G. Zhao, M.E. Gentile, L. Xue[#], C.V. Cosgriff, A.I. Weiner, S. Adams-Tzivelekidis, J. Wong, X. Li, S. Kass-Gergi, N.P. Holcomb, M.C. Basal, K.M. Stewart, J.D. Planer, E. Cantu, J.D. Christie, M.M. Crespo, M.J. Mitchell, N.J. Meyer, A.E. Vaughan. Vascular endothelial-derived SPARCL1 exacerbates viral pneumonia through pro-inflammatory macrophage activation. ***Nature Communications*****.** 15:4235 (2024).

107. E. Atsavapranee[#], R.M. Haley[#], M.M. Billingsley[#], A. Chan, B. Ruan, C.G. Figueroa-Espada[#], N. Gong[#], A.J. Mukalel[#], P.N. Bryan, M.J. Mitchell*. Ionizable lipid nanoparticles for RAS protease delivery to inhibit cancer cell proliferation. ***Journal of Controlled Release.*** 370:614-625 (2024).

106. M.M. Billingsley[#], N. Gong[#], A.J. Mukalel[#], A.S. Thatte[#], R. El-Mayta[#], S.K. Patel[#], A.E. Metzloff[#], K.L. Swingle[#], X. Han[#], L. Xue[#], A.G. Hamilton[#], H.C. Safford[#], M.G. Alameh, T. Papp, H. Parhiz, D.

Weissman, M.J. Mitchell*. In vivo mRNA CAR T cell engineering via targeted lipid nanoparticles with extrahepatic tropism. ***Small.*** 20:2304378 (2024).

105. W.N. Silva, P.A.C. Costa, S.R.A. Scalzo, H.A.S. Ferreira, P.H.D.M. Prazeres, C.L.V. Campos, M.T. Rodrigues Alves, N.J. Alves da Silva, A.L. de Castro Santos, L.C. Guimaraes, M.E.C. Ferris, A.S. Thatte#, A.G. Hamilton#, K.A. Bicalho, A.O. Lobo, H.D.C. Santiago, L. da Silva Barcelos, M.M. Figueredo, M.M. Teixeira, C. Vasconcelos Costa, M.J. Mitchell, F. Frezard, P.P.G. Guimaraes. Ionizable lipid nanoparticle-mediated mRNA delivery in the tumor microenvironment to reduce colon cancer progression. ***International Journal of Nanomedicine*****.** 19:2655-2673 (2024).

104. A.S. Thatte#, M.M. Billingsley#, J.R. Melamed, D. Weissman, M.J. Mitchell*. Emerging strategies for nanomedicine in autoimmunity. ***Advanced Drug Delivery Reviews*****.** 207:115194 (2024).

103. A.R. Hanna#, S.J. Shepherd#, D. Issadore, M.J. Mitchell*. Microfluidic generation of diverse lipid nanoparticle libraries. ***Nanomedicine.*** 19:455-457 (2024).

102. F. Yang, M.N. Akhtar, D. Zhang, R. El-Mayta#, J. Shin, J.F. Dorsey, L. Zhang, X. Xu, W. Guo, S.J. Bagley, S.Y. Fuchs, C. Koumenis, J. Lathia, M.J. Mitchell, Y. Gong, Y. Fan. An immunosuppressive vascular niche drives macrophage polarization and immunotherapy resistance in glioblastoma. ***Science Advances*****.** 10:eadj4678 (2024).

101. L. Xue#, A.G. Hamilton#, G. Zhao, Z. Xiao, R. El-Mayta#, X. Han#, N. Gong#, X. Xiong, J. Xu#, C.G. Figueroa-Espada#, S.J. Shepherd#, A.J. Mukalel#, M.G. Alameh, J. Cui, K. Wang, A.E. Vaughan, D. Weissman, M.J. Mitchell*. High-Throughput Barcoded Nanoparticles Identify Cationic, Degradable Lipid-Like Materials for mRNA Delivery to the Lungs in Female Preclinical Models. ***Nature Communications*****.** 15:1884 (2024).

100. X. Han#, J. Xu#, Y. Xu, M.G. Alameh, L. Xue#, N. Gong#, R. El-Mayta#, R. Palanki #, C.C. Warzecha, G. Zhao, A.E. Vaughan, J.M. Wilson, D. Weissman, M.J. Mitchell*. In situ combinatorial synthesis of degradable branched lipidoids for systemic delivery of mRNA therapeutics and gene editors. ***Nature Communications*****.** 15:1762 (2024).

99. E.L. Han#, M.S. Padilla#, R. Palanki#, D. Kim#, K. Mrksich#, J. Li#, S. Tang#, I.C. Yoon#, M.J. Mitchell*. Predictive high-throughput platform for dual screening mRNA lipid nanoparticle blood-brain barrier transfection and crossing. ***Nano Letters*****.** 24:1477-1486 (2024).
**Cover Article.

98. G. Zhao, L. Xue#, H.C. Geisler#, J. Xu#, X. Li, M.J. Mitchell*, A.E. Vaughan. Precision Treatment of Viral Pneumonia through Macrophage-Targeted Lipid Nanoparticle Delivery. ***PNAS.*** 121:e2314747121 (2024).

97. L. Xue#, A.S. Thatte#, D. Mai, R.M. Haley#, N. Gong#, X. Han#, K. Wang, N.C. Sheppard, C.H. June, M.J. Mitchell*. Responsive Biomaterials: Optimizing Control of Cancer Immunotherapy. ***Nature Reviews Materials.*** 9:100-118 (2024).

96. G. Zhao, L. Xue#, A.I. Weiner, N. Gong#, S. Adams-Tzivelekidis, J. Wong, M.E. Gentile, A.M. Nottingham, M.C. Basil, S.M. Lin, T.K. Niethamer, J.M. Diamond, C.A. Bermudez, E. Cantu, X. Han#, Y. Cao, M.G. Alameh, D. Weissman, E.E. Morrisey, M.J. Mitchell, A.E. Vaughan. TGF-βR2 signaling coordinates pulmonary vascular repair after viral injury in mice and human tissue. ***Science Translational Medicine.*** 16:eadg6229 (2024).

95. A.G. Hamilton#, M.J. Mitchell*. An oncolytic circular RNA therapy. ***Nature Cancer.*** 5:5-7 (2024).

94. L.C. Guimaraes, P.A.C. Costa, S.R.A. Scalzo Junior, H.A.S. Ferreira, A.C.S. Braga, L.C. de Oliveira, M.M. Figueiredo, S.J. Shepherd#, A.G. Hamilton#, C.M. Queiroz, W.N. da Silva, N.J. Alves, M.R. Alves,

A.K. Santos, K.K.S. de Faria, F.M. Marim, H. Fukumasu, A. Birbair, A. Teixeira-Carvalho, R.S. de Aguiar, M.J. Mitchell, M.M. Teixeira, V.V. Costa, F. Frézard, P.P.G. Guimaraes. Nanoparticle-based DNA vaccine induced protective effect against SARS-CoV-2 variants in female preclinical models. ***Nature Communications.*** 15:590 (2024).

93. P.A.C. Costa, W.N. Silva, P.H.D.M. Prazeres, H.A.S. Ferreira, M.T.R. Alves, N.J.A. da Silva, M.M. Figueiredo, B. da Silva Oliveira, S.R.A. Scalzo, F.R. da Silva Santos, A.S. de Miranda, A.G. Hamilton[#], R. Palanki[#], M.J. Mitchell, M.M. Teixeira, V.V. Costa, P.P.G Guimaraes. siRNA lipid nanoparticles for CXCL12 silencing modulates brain immune response during Zika infection. ***Biomedicine & Pharmacotherapy*****.** 170:115981 (2024).

92. S.K. Patel[#], M.M. Billingsley[#], A.J. Mukalel[#], A.S. Thatte[#], A.G. Hamilton[#], N. Gong[#], R. El-Mayta[#], H.C. Safford[#], M. Merolle, M.J. Mitchell*. Bile acid-containing lipid nanoparticles enhance extrahepatic mRNA delivery. ***Theranostics.*** 14:1-16 (2024).

91. A.G. Hamilton[#], K.L. Swingle[#], R.A. Joseph[#], D. Mai, N. Gong[#], M.M. Billingsley[#], M.G. Alameh, D. Weissman, N.C. Sheppard, C.H. June, M.J. Mitchell*. Ionizable lipid nanoparticles with integrated immune checkpoint inhibition for mRNA CAR T cell engineering. ***Advanced Healthcare Materials*****.** 12:2301515 (2023).

90. N. Gong[#], X. Han[#], L. Xue[#], R. El-Mayta[#], A.E. Metzloff[#], M.M. Billingsley[#], A.G. Hamilton[#], M.J. Mitchell*. In situ PEGylation of CAR T cells alleviates cytokine release syndrome and neurotoxicity. ***Nature Materials*****.** 22:1571-1580 (2023).
Highlighted in ***Nature Materials*. 22:1444-1445 (2023).

89. A.S. Thatte[#], A.G. Hamilton[#], B.E. Nachod[#], A.J. Mukalel[#], M.M. Billingsley[#], R. Palanki[#], K.L. Swingle[#], M.J. Mitchell*. mRNA Lipid Nanoparticles for Ex Vivo Engineering of Immunosuppressive T cells for Autoimmunity Therapies. ***Nano Letters.*** 23:10179-10188 (2023).
**Cover Article.

88. P.H.D.M. Prazeres, H.A.S. Ferreira, P.A.C. Costa, W.N. Silva, M.T.R. Alves, A.K. Santos, A. de Paula Sabino, H.L. Del Puerto, M.S. Padilla[#], A.S. Thatte[#], M.J. Mitchell, P.P.G Guimaraes. Delivery of Plasmid DNA By Ionizable Lipid Nanoparticles to Induce CAR Expression in T Cells. ***International Journal of Nanomedicine.*** 18:5891-5904 (2023).

87. W. Zhong, Y. Lu, X. Han[#], J. Yang, Z. Qin, W. Zhang, Z. Yu, B. Wu, S. Liu, W. Xu, C. Zheng, L.M. Schuchter, G.C. Karakousis, T.C. Mitchell, R.K. Amaravadi, A.J. Flowers, P.A. Gimotty, M. Xiao, G. Mills, M. Herlyn, H. Dong, M.J. Mitchell, J. Kim, X. Xu, W. Guo. Upregulation of exosome secretion from tumor-associated macrophages plays a key role in the suppression of anti-tumor immunity. ***Cell Reports.*** 42:113224 (2023).

86. C.G. Figueroa-Espada[#], P.P.G. Guimaraes[#], R.S. Riley[#], L. Xue[#], K. Wang, M.J. Mitchell*. siRNA Lipid-Polymer Nanoparticles Targeting E-Selectin and Cyclophilin A in Bone Marrow for Combination Multiple Myeloma Therapy. ***Cellular and Molecular Bioengineering.*** 16:383-392 (2023).

85. X. Han[#], M.G. Alameh, K. Butowska[#], J. Knox, K. Lundgreen, M. Gattas, N. Gong[#], L. Xue[#], Y. Xu, M. Lavertu, P. Bates, J. Xu[#], G. Nie, Y. Zhong, D. Weissman, M.J. Mitchell*. Adjuvant lipidoid-substituted lipid nanoparticles augment the immunogenicity of SARS-CoV-2 mRNA vaccines. ***Nature Nanotechnology*****.** 18:1105-1114 (2023).

84. S.J. Shepherd[#], X. Han[#], A.J. Mukalel[#], R. El-Mayta[#], A.S. Thatte[#], J. Wu, M.S. Padilla[#], M.G. Alameh, N. Srikumar, D. Lee, D. Weissman, D. Issadore, M.J. Mitchell*. Throughput-scalable manufacturing of SARS-CoV-2 mRNA lipid nanoparticle vaccines. ***PNAS.*** 120:e2303567120 (2023).

83. R. Palanki[#], S. Bose, A. Dave, B. White, C. Berkowitz, V. Luks, F. Yaqoob, E. Han[#], K.L. Swingle[#], P. Menon, E. Hodgson, A. Biswas, M.M. Billingsley[#], L. Li, F. Yiping, M. Carpenter, A. Trokhan, J. Yeo, N. Johana, T.Y. Wan, M.G. Alameh, F.C. Bennett, P.B. Storm, R. Jain, J.K.Y. Chan, D. Weissman, M.J. Mitchell*, W.H. Peranteau. Ionizable lipid nanoparticles for therapeutic base editing of congenital brain disease. ***ACS Nano.*** 17:13594–13610 (2023).

82. J. Nong, P.M. Glassman, J.W. Myerson, V. Zuluaga-Ramirez, A. Rodriguez-Garcia, A.J. Mukalel[#], S. Omo-Lamai, L.R. Walsh, M.E. Zamora, X. Gong, Z. Wang, K. Bhamidipati, R.Y. Kiseleva, C.H. Villa, C.F. Greineder, S.E. Kasner, D. Weissman, M.J. Mitchell, S. Muro, Y. Persidsky, J.S. Brenner, V.R. Muzykantov, O.A. Marcos-Contreras. Targeted nanocarriers co-opting pulmonary intravascular leukocytes for drug delivery to the injured brain. ***ACS Nano.*** 17:13121–13136 (2023).

81. N. Gong[#], A.G. Hamilton[#], M.J. Mitchell*. A hydrogel-entrapped live virus immunization. ***Nature Biomedical Engineering.*** 7:849-850 (2023).

80. N. Gong[#], M.J. Mitchell*. Rerouting nanoparticles to bone marrow via neutrophil hitchhiking. ***Nature Nanotechnology.*** 18:548-549 (2023).

79. P.P.G. Guimarães[#], C.G. Figueroa-Espada[#], R.S. Riley[#], N. Gong[#], L. Xue[#], T. Sewastianik, P.S. Dennis, C. Loebel, A. Chung, S.J. Shepherd[#], R.M. Haley[#], A.G. Hamilton[#], R. El-Mayta, K. Wang, R. Langer, D.G. Anderson, R.D. Carrasco, M.J. Mitchell*. In Vivo Bone Marrow Microenvironment siRNA Delivery Using Polymer-Lipid Nanoparticles for Multiple Myeloma Therapy. ***PNAS.*** 120:e2215711120 (2023).

78. K.L. Swingle[#], A.S. Ricciardi, W.H. Peranteau, M.J. Mitchell*. Delivery Technologies for Women's Health Applications. ***Nature Reviews Bioengineering.*** 1:408-425 (2023).
Highlighted in ***Nature Reviews Bioengineering*. 1:379 (2023).

77. R.M. Haley[#], A. Chan, M.M. Billingsley[#], N. Gong[#], M.S. Padilla[#], E.H. Kim[#], H. Wang, D. Yin, K.J. Wangensteen, A. Tsourkas, M.J. Mitchell*. Lipid Nanoparticle Delivery of Small Proteins for Potent In Vivo RAS Inhibition. ***ACS Applied Materials & Interfaces.*** 15:21877-21892 (2023).

76. A.G. Hamilton[#], K.L. Swingle[#], M.J. Mitchell*. Overcoming barriers to nucleic acid delivery using lipid nanoparticles. ***PLOS Biology.*** 21:e3002105 (2023).

75. N. Gong[#], A.G. Hamilton[#], M.J. Mitchell*. Exosome-disrupting peptides for cancer immunotherapy. ***Nature Materials.*** 22:530-531 (2023).

74. K. Butowska[#], X. Han[#], N. Gong[#], R. El-Mayta[#], R.M. Haley[#], L. Xue, W. Zhong, W. Guo, K. Wang, M.J. Mitchell*. Doxorubicin-conjugated siRNA lipid nanoparticles for combination cancer therapy. ***Acta Pharmaceutica Sinica B.*** 13:1429-1437 (2023).

73. A.L. de Castro Santos, N.J.A. da Silva, C.T.R. Viana, L.C.C.A dos Santos, G.H.C. da Silva, S.R.A. Scalzo, P.A.C. Costa, W.N. da Silva, M.T.Q. Magalhaes, I.C.G. de Jesus, A. Birbair, F. Frézard, S. Guatimosim, R.M. Haley[#], M.J. Mitchell, S.P. Andrade, P.P. Campos, P.P.G. Guimaraes. Oral formulation of Wnt inhibitor complex reduces inflammation and fibrosis in intraperitoneal implants in vivo. ***Drug Delivery and Translational Research.*** 13:1420-1435 (2023).

72. G. Bashiri, M.S. Padilla[#], K.L. Swingle[#], S.J. Shepherd[#], M.J. Mitchell, K. Wang. Nanoparticle Protein Corona: From Structure and Function to Therapeutic Targeting. ***Lab on a Chip.*** 23:1432-1466 (2023).

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34. M.J. Mitchell, L. Xue. Siloxane-Based Lipids, Lipid Nanoparticle Compositions Comprising the Same, and Methods of Use Thereof for Targeted Delivery. U.S. Provisional Patent Application No. 63/378,832, filed October 7, 2022.

33. M.J. Mitchell, A.G. Hamilton. Lipid Nanoparticle Compositions Comprising mRNA and siRNA Cargo and Methods of Use Thereof". U.S. Provisional Patent Application No. 63/378,828, filed October 7, 2022.

32. M.J. Mitchell, A.E. Metzloff, M.M. Billingsley. Compositions and Methods for T Cell Targeted Delivery of Therapeutic Agents and Activation of T Cells. U.S. Provisional Patent Application No. 63/378,819, filed October 7, 2022.

31. M.J. Mitchell, E. Atsavapranee, R.M. Haley. Lipid Nanoparticle (LNP) Compositions Comprising Large Protein Cargo, and Methods of Use Thereof. U.S. Provisional Patent Application No. 63/378,813, filed October 7, 2022.

30. M.J. Mitchell, S. Patel, M.M. Billingsley. Hydroxycholesterol Substituted LNP Compositions and Methods for T Cell Targeted Delivery of Therapeutic Agents. PCT/US22/77346, filed September 30, 2022.

29. M.J. Mitchell, M.M. Billingsley. Compositions and Methods for T Cell Targeted Delivery of Therapeutic Agents. PCT/US22/77156, filed September 28, 2022.

28. M.J. Mitchell, M. Padilla. Branched Lipid Compositions, Lipid Nanoparticles (LNPs) Comprising the Same, and Methods of Use Thereof. U.S. Provisional Patent Application No. 63/373,793, filed August 29, 2022.

27. M.J. Mitchell, J. Qin, L. Xue. Ionizable Lipopeptide Compounds, Lipid Nanoparticle (LNP) Compositions, and Methods of Use Thereof. U.S. Provisional Patent Application No. 63/373,786, filed August 29, 2022.

26. M.J. Mitchell, N. Gong. PEGylation of CAR T cell therapeutics. U.S. Provisional Patent Application No. 63/373,517, filed August 25, 2022.

25. M.J. Mitchell, K.L. Swingle, M.M. Billingsley, W. Peranteau. Amniotic Fluid Stabilized Compositions and Methods for In Utero Delivery of Therapeutic Agents. PCT/US2022/074457, filed August 3, 2022.

24. M.J. Mitchell, X. Han, K. Butowska. Drug-Conjugated Lipids, Nucleic Acid-Lipid Nanoparticles Comprising the Same, and Methods of Use Thereof. U.S. Provisional Patent Application No. 63/369,896, filed July 29, 2022.

23. M.J. Mitchell, A. Tsourkas, R.M. Haley, A. Chan. Lipid Nanoparticle (LNP) Compositions Comprising Protein Cargo, and Methods of Use Thereof. U.S. Provisional Patent Application No. 63/369,894, filed July 29, 2022.

22. M.J. Mitchell, L. Xue, D. Weissman, M.G. Alameh. Bisphosphonate Lipids and Compositions and Methods of Use Thereof for Targeted Delivery. U.S. Provisional Patent Application No. 63/341,753, filed May 13, 2022.

21. M.J. Mitchell, L. Xue. Siloxane-Based Lipids and Compositions and Methods of Use Thereof for Targeted Delivery. U.S. Provisional Patent Application No. 63/338,272, filed May 4, 2022.

20. M.J. Mitchell, L. Xue. Biodegradable Lipidoids and Compositions and Methods of Use. U.S. Provisional Patent Application No. 63/331,060, filed April 14, 2022.

19. M.J. Mitchell, L. Xue. Biodegradable Lipidoids and Compositions and Methods of Use Thereof for Liver Targeted Delivery. U.S. Provisional Patent Application No. 63/330,972, filed April 14, 2022.

18. M.J. Mitchell, N. Gong. Switchable Bispecific T Cell Nanoengager (switch-BiTE). U.S. Provisional Patent Application No. 63/299,663, filed January 14, 2022.

17. M.J. Mitchell, X. Han, H. Zhang. Anti-inflammatory Lipid Nanoparticles for Delivery of Therapeutic Agents. U.S. Provisional Patent Application No. 63/290,220, filed December 16, 2021.

16. M.J. Mitchell, S. Patel, M.M. Billingsley. Hydroxycholesterol Substituted LNP Compositions and Methods for T Cell Targeted Delivery of Therapeutic Agents. U.S. Provisional Patent Application No. 63/251,255, filed October 1, 2021.

15. M.J. Mitchell, X. Han. Anisamide-Containing Lipids and Compositions and Methods of Use Thereof for Targeted Delivery. U.S. Provisional Patent Application No. 63/286,760, filed December 7, 2021.

14. M.J. Mitchell, M.M. Billingsley. Compositions and Methods for T Cell Targeted Delivery of Therapeutic Agents. U.S. Provisional Patent Application No. 63/249,236, filed September 28, 2021.

13. M.J. Mitchell, K.L. Swingle, M.M. Billingsley, W. Peranteau. Amniotic Fluid Stabilized Compositions and Methods for In Utero Delivery of Therapeutic Agents. U.S. Provisional Patent Application No. 63/229,168, filed August 4, 2021.

12. E. Atochina-Vasserman, N. Huang, M. Liu, D. Maurya, M.J. Mitchell, N. Ona, V. Percec, D. Weissman, Q. Xiao, D. Zhang. One-component multifunctional sequence-defined ionizable amphiphilic janus dendrimer (IAJD) delivery systems of mRNA for vaccines and drugs. U.S. Provisional Patent Application No. 63/192,236, filed May 24, 2021.

11. M.J. Mitchell, D. Issadore, S.J. Shepherd, S. Yadavali. Microfluidic platform for large scale RNA lipid nanoparticle formulations. U.S. Provisional Patent Application No. 63/131,008, filed December 30, 2020.

10. M.J. Mitchell, W.H. Peranteau, M.M. Billingsley, R.S. Riley. Lipid Nanoparticle Platform for Drug Delivery. Submitted to the CHOP Technology Office (Case #DIS-00126-20).

9. M.J. Mitchell, M.M. Billingsley. Lipid and Lipid Nanoparticle Formulation for Drug Delivery. U.S. Provisional Patent Application No. 62/923,258, filed October 18, 2019.

8. M.J. Mitchell, M.M. Billingsley, C.H. June, N. Singh. Lipid Nanoparticle Compositions for CAR mRNA Delivery. U.S. Provisional Patent Application No. 62/916,942, filed October 18, 2019.

7. M.J. Mitchell, R. Spektor, R. Zhang. Compositions and Methods Comprising Ionizable Lipid Nanoparticles Encapsulating Barcoded mRNA. U.S. Provisional Patent Application No. 62/903,391, filed September 20, 2019.

6. M.J. Mitchell, T. Tammela, P.P.G. Guimaraes, K. Wang, K. Wu, K. Pitter, A. Ferrena, O. Grbovic-Huezo. Inhibition of Wnt Signaling in Pancreatic Cancer to Enhance Immunotherapy. Submitted to the Penn Technology Office (Penn Case #19-9011).

5. M.J. Mitchell, R.S. Riley, D. Brown, S. Gill. Deracinating cancer by in vivo delivery of CRISPR/Cas9 to delete oncogenic driver. Submitted to the Penn Technology Office (Penn Case #19-8858).

4. M.J. Mitchell, A. Chung, O.F. Khan, P.P.G. Guimaraes, D.G. Anderson, R. Langer. Polymer-Lipid Materials for Delivery of Nucleic Acids (US20180353435A1), Pending.

3. M.J. Mitchell, A. Chung, P.P.G. Guimaraes, R. Langer. Method to Increase Effect of Cytokine Therapeutics Using Mechanical Amplifier Materials. Submitted to the MIT Technology Office (MIT Case #19404).

2. M.R. King, M.J. Mitchell, K. Rana, E.C. Wayne, C.B. Schaffer, S. Chandrasekaran. Method to Functionalize Cells in Human Blood, Other Fluids and Tissues Using Nanoparticles. U.S. Patent No. 10,391,146. August 27, 2019.

1. N. Migliore, M.J. Mitchell, J. Sweetgall, A. Grimes, V. Hazelwood, A. Valdevit, R. Stutman. Portable UV Water Treatment System. U.S. Patent Application #12/871,092. May 5, 2011.

CURRENT RESEARCH SUPPORT

Burroughs Wellcome Fund Career Award at the Scientific Interface (CASI) 09/01/2018 - 06/30/2024
Title: Drug delivery vehicles for the study of biological barriers
Amount: $500,000 / 6 Years
Role: PI

NSF CAREER Award CBET-2145491 02/15/2022 - 01/31/2027
Title: CAREER: Nanoparticle mRNA and DNA Immunoengineering of Macrophages for Solid Tumor Targeting
Amount: $500,000 / 5 Years
Role: PI

American Cancer Society Research Scholar Grant 01/01/2023 - 12/31/2026
Title: Bone marrow vascular microenvironment combination RNAi-bortezomib nanotherapy for multiple myeloma
Amount: $792,000 / 4 Years
Role: PI

NIH NIDDK R01 DK123049 (PI: Peranteau (CHOP), Co-PI: Mitchell) 02/01/2020 - 01/31/2025
Title: In utero gene editing to cure a metabolic liver disease
Amount: $3,801,565 / 5 Years
Role: Co-PI

NIH NCI R37 CA244911 (PI: Tammela (MSKCC), Co-PI: Mitchell) 01/08/2020 - 12/31/2024
Title: Targeting stem-like cells and their niche in pancreatic cancer
Amount: $2,452,840 / 5 Years
Role: Co-PI

NIH NCI R01 CA241661 (PI: Tsourkas, Co-PI: Mitchell) 07/10/2019 - 06/30/2024
Title: Modular approach for the delivery of antibodies into the cytoplasm of cells
Amount: $1,830,935 / 5 Years
Role: Co-PI

NIH NHLBI R01 HL155198 (PI: Fan, MPI: Gong, Co-PI: Mitchell) 08/11/2021 - 07/31/2025
Title: Endothelial plasticity in cardiac repair after myocardial infarction
Amount: $2,377,368 / 4 Years
Role: Co-PI

Wellcome Leap RNA Readiness and Response (PI: Lee, Co-PI: Mitchell) 01/01/2022 - 12/31/2024

Title: On-Demand Modular Distributed Manufacturing of Broadly Applicable RNA Pharmaceuticals
Amount: $8,980,000 / 3 Years
Role: Co-PI

DoD PRMRP W81XWH-21-1-0509 **07/15/2021 - 07/14/2025**
Title: RGS12, a Novel Inflammatory Mediator for Rheumatoid Arthritis
Amount: $812,344 / 4 Years
Role: PI

DoD PRMRP W81XWH-22-1-0542 (PI: Yang, Co-PI: Mitchell) **07/01/2022 - 06/30/2025**
Title: Treatment of chondrosarcoma by YAP siRNA nanoparticles in a novel chondrosarcoma mouse model
Amount: $568,750 / 3 Years
Role: Co-PI

Korea Research Institute of Bioscience and Biotechnology **01/01/2022 - 12/31/2029**
Title: Novel intranasal delivery technology for mRNA vaccines
Amount: $3,020,904 / 8 years
Role: PI

Pfizer **08/01/2022 - 07/29/2024**
Title: Utilizing high throughput screening of RNA modalities for delivery to solid tumors
Amount: $1,498,602 / 2 Years (Total costs)
Role: PI

Eli Lilly and Company **12/01/2021 - 11/30/2025**
Title: Utilizing High Throughput Screening of RNA Delivery Modalities for Specific CNS Cell Type Uptake
Amount: $1,414,906 / 4 Years
Role: PI

Penn Cardiovascular Institute Dream Team Initiative (PIs: Mitchell, Momin) **01/01/2024 - 04/30/2025**
Title: Engineering antibody-tethered lipid nanoparticles to treat cardiovascular diseases
Amount: $150,000 / 2 Years
Role: PI

Penn IDEA Prize (PIs: Mitchell, Vining) **06/01/2023 - 05/31/2024**
Title: Trans-dentinal delivery of lipid nanoparticles for next-generation dental biomaterials
Amount: $80,000 / 1 Year
Role: PI

Penn VPR Research Recovery Award **01/01/2021 – No Expiry**
Title: Mitigate financial impact of ramping down bioengineering cell and animal experiments for COVID-19
Amount: $35,200 / 1 Year
Role: PI

NIH NCI F99/K00 CA284294 **06/01/2023 - 05/30/2029**
Title: Engineering Biomaterials to Modulate the Bone Marrow Microenvironment in Multiple Myeloma
Amount: $650,000 / 6 Years
Role: Mentor to Christian Figueroa-Espada, BE PhD Student

NIH NHLBI F30 HL162465 **06/01/2022 - 05/30/2026**
Title: Ionizable lipid nanoparticles for in utero gene editing of the lung
Amount: $207,008 / 4 Years
Role: Mentor to Rohan Palanki, BE MD PhD Student

NIH NIAID T32 AI007632 **02/01/2022 - 01/31/2024**

Title: Advanced Training at the Interface of Engineering and Oral-Craniofacial Sciences
Amount: $140,000 / 2 Years
Role: Mentor to Marshall S. Padilla PhD, BE Postdoctoral Fellow

NSF Graduate Research Fellowship **09/01/2020 - 08/30/2024**
Amount: $138,000 / 3 Years
Role: Mentor to Rebecca Haley, BE PhD Student

NSF Graduate Research Fellowship **09/01/2020 - 08/30/2024**
Amount: $138,000 / 3 Years
Role: Mentor to Kelsey Swingle, BE PhD Student

NSF Graduate Research Fellowship **09/01/2020 - 08/30/2024**
Amount: $138,000 / 3 Years
Role: Mentor to Alex Hamilton, BE PhD Student

NSF Graduate Research Fellowship **09/01/2021 - 08/30/2024**
Amount: $138,000 / 3 Years
Role: Mentor to Ann Metzloff, BE PhD Student

NSF Graduate Research Fellowship **09/01/2021 - 08/30/2024**
Amount: $138,000 / 3 Years
Role: Mentor to Hannah Safford, BE PhD Student

NSF Graduate Research Fellowship **09/01/2021 - 08/30/2024**
Amount: $138,000 / 3 Years
Role: Mentor to Hannah Geisler, BE PhD Student

NSF Graduate Research Fellowship **09/01/2022 - 08/30/2025**
Amount: $138,000 / 3 Years
Role: Mentor to Ajay Thatte, BE PhD Student

NSF Graduate Research Fellowship **09/01/2022 - 08/30/2025**
Amount: $159,000 / 3 Years
Role: Mentor to Emily Han, BE PhD Student

NSF Graduate Research Fellowship **09/01/2023 - 08/30/2026**
Amount: $159,000 / 3 Years
Role: Mentor to Andrew Hanna, BE PhD Student

NSF Graduate Research Fellowship **09/01/2023 - 08/30/2026**
Amount: $159,000 / 3 Years
Role: Mentor to Hannah Yamagata, BE PhD Student

NSF Graduate Research Fellowship **09/01/2023 - 08/30/2026**
Amount: $159,000 / 3 Years
Role: Mentor to Amanda Murray, BE PhD Student

GEM Research Fellowship **09/01/2022 - 08/30/2024**
Amount: $68,000 / 2 Years
Role: Mentor to Christian Figueroa-Espada, BE PhD Student

University of Pennsylvania Fontaine Fellowship **09/01/2019 - 08/30/2024**
Amount: Full Tuition Costs / 5 Years
Role: Mentor to Christian Figueroa-Espada, BE PhD Student

University of Pennsylvania Ashton Fellowship **09/01/2020 - 08/30/2025**
Amount: Full Tuition Costs / 5 Years
Role: Mentor to Kelsey Swingle, BE PhD Student

University of Pennsylvania Ashton Fellowship **09/01/2021 - 08/30/2026**
Amount: Full Tuition + Stipend Costs / 5 Years
Role: Mentor to Ann Metzloff, BE PhD Student

University of Pennsylvania Ashton Fellowship **09/01/2021 - 08/30/2026**
Amount: Full Tuition + Stipend Costs / 5 Years
Role: Mentor to Hannah Geisler, BE PhD Student

COMPLETED RESEARCH SUPPORT

NIH DP2 TR002776 Director's New Innovator Award **09/30/2018 - 06/30/2023**
Title: A data-driven (4D) drug delivery platform for probing and treating the chemoresistant bone marrow microenvironment
Amount: $2,415,000 / 5 Years
Role: PI

iECURE **07/01/2022 - 12/30/2023**
Title: Development of LNPs for liver gene editing
Amount: $1,290,843 / 2 Years
Role: PI

Spark Therapeutics **11/01/2020 - 10/31/2022**
Title: Evaluation of Synthetic Lipid-Mediated Delivery System for In Vivo DNA Gene Transfer
Amount: $817,883 / 3 Years
Role: PI

Skirkanich Assistant Professor of Innovation Endowed Chair **01/01/2018 - 06/30/2023**
Amount: $25,000 / 5 Years
Role: PI

TAPITMAT Grant (PIs: Mitchell, Fan) **02/01/2021 - 01/30/2023**
Title: Novel nano-vasculotherapy to improve glioblastoma immunotherapy
Amount: $150,000 / 2 Years
Role: PI

TAPITMAT Grant (PIs: Mitchell, Heller, Tsourkas) **02/01/2021 - 01/30/2023**
Title: Nanoparticle-based, Nr4a1 agonist delivery to combat cocaine addiction
Amount: $150,000 / 2 Years
Role: PI

Penn Gene Therapy Program **10/01/2018 - 09/30/2023**
Title: Nanotherapies for Delivery of Genome Editing Components
Amount: $432,407 / 5 Years
Role: PI

Penn CiPD Pilot Grant (PIs: Mitchell, Yang) **11/01/2020 - 10/30/2022**
Title: Control of RA pathogenesis by targeted RGS12 siRNA ionizable lipid nanoparticles
Amount: $50,000 / 1 Year
Role: PI

ITMAT CT^{3}N Pilot Grant (PIs: Mitchell, Parhiz, Brenner) **09/01/2020 - 08/30/2022**
Title: Nanocarrier-delivered mRNA to express therapeutic proteins to treat ARDS and COVID-19
Amount: $40,000 / 1 Year
Role: PI

Korea Research Institute of Bioscience and Biotechnology **01/01/2021 - 12/30/2021**
Title: Development of next generation mRNA vaccine delivery technology
Amount: $44,955 / 1 Year
Role: PI

TAPITMAT Grant (PIs: Mitchell, Peranteau) **02/01/2019 - 01/30/2021**
Title: A Nanoparticle Platform for In Utero Drug Delivery and Gene Editing to Cure Congenital Disorders
Amount: $150,000 / 2 Years
Role: PI

Janssen Pharmaceuticals **11/01/2018 - 12/30/2020**
Title: Nanotherapeutics for gastrointestinal (GI) delivery
Amount: $249,000 / 2 Years
Role: PI

Abramson Cancer Center-SEAS Grant (PIs: Mitchell, Tsourkas, Wherry) **11/01/2018 - 10/30/2020**
Title: Cytoplasmic Delivery of IgG and Inhibition of Nuclear Translocation of T-bet in T cells
Amount: $153,000 / 2 Years
Role: PI

AACR-Bayer Innovation and Discovery Grant **12/01/2018 - 11/30/2020**
Title: Accelerated discovery of microRNA leukemia therapeutics via molecular barcoding
Amount: $25,000 / 1 Year
Role: PI

Penn Health-Tech Pilot Grant (PIs: Mitchell, Tsourkas) **12/01/2018 - 11/30/2020**
Title: Universal Antibody Tags for Efficient Cytosolic Delivery
Amount: $50,000 / 1 Year
Role: PI

American Cancer Society Institutional Research Grant **07/01/2018 - 06/30/2019**
Title: Accelerated discovery of microRNA multiple myeloma therapeutics
via high-throughput in vivo screening of drug delivery systems
Amount: $30,000 / 1 Year
Role: PI

Burroughs Wellcome Fund PDEP Award **09/01/2015 - 08/30/2018**
Title: A nanoparticle platform for siRNA delivery to bone marrow endothelium to disrupt bone metastasis
Amount: $60,000 / 3 Years
Role: PI

NIH NCI F32 CA200351 **08/13/2015 - 08/12/2018**
Title: Polymeric nanoparticles for siRNA delivery to bone marrow endothelium
to disrupt tumor cell adhesion and bone metastasis formation in vivo
Amount: $163,728 / 3 Years
Role: PI

NIH NCI F31 CA260922 **09/01/2021 - 08/30/2024**
Title: Ionizable lipid nanoparticles for the delivery of mRNA for CAR T cell engineering
Amount: $138,108 / 3 Years

Role: Mentor to Margaret Billingsley, BE PhD Student

NIH NIAID T32 AI007632 **11/01/2020 - 10/30/2022**
Title: HIV Pathogenesis, vaccination, and cure
Amount: $100,000 / 2 Years
Role: Mentor to Margaret Billingsley, BE PhD Student

NIH NCI F32 CA243475 **07/01/2020 - 06/30/2021**
Title: Advancing mRNA vaccines for cancer therapy using molecularly barcoded nanotechnology
Amount: $64,926 / 1 Year
Role: Mentor to Rachel S. Riley PhD, BE Postdoctoral Fellow

NIH NHLBI T32 HL007954 **07/01/2018 - 06/30/2020**
Amount: $120,000 / 2 Years
Role: Mentor to Rachel S. Riley PhD, BE Postdoctoral Fellow

NSF Graduate Research Fellowship **09/01/2020 - 08/30/2023**
Amount: $138,000 / 3 Years
Role: Mentor to Sarah Shepherd, BE PhD Student

NSF Graduate Research Fellowship **09/01/2019 - 08/30/2022**
Amount: $138,000 / 3 Years
Role: Mentor to Alvin Mukalel, BE PhD Student

NSF Graduate Research Fellowship **09/01/2019 - 08/30/2022**
Amount: $138,000 / 3 Years
Role: Mentor to Christian Figueroa-Espada, BE PhD Student

University of Pennsylvania Fontaine Fellowship **09/01/2018 - 08/30/2023**
Amount: Full Tuition Costs / 5 Years
Role: Mentor to Sarah Shepherd, BE PhD Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2022 - 08/30/2022**
Amount: $5,500 / 1 Year
Role: Mentor to Ryann Joseph, BE Undergraduate Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2022 - 08/30/2022**
Amount: $5,500 / 1 Year
Role: Mentor to Kaitlyn Mrksich, BE Undergraduate Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2022 - 08/30/2022**
Amount: $5,500 / 1 Year
Role: Mentor to Aditi Ghalsasi, BE Undergraduate Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2022 - 08/30/2022**
Amount: $5,500 / 1 Year
Role: Mentor to Jacqueline Li, BE Undergraduate Student

Blair Undergraduate Research Fellowship **05/01/2021 - 08/30/2022**
Amount: $5,000 / 1 Year
Role: Mentor to Ella Atsavapranee, BE Undergraduate Student

Jumpstart for Juniors Grant **05/01/2022 - 09/30/2022**
Amount: $1,000 / 1 Year
Role: Mentor to Ella Atsavapranee, BE Undergraduate Student

Vagelos Undergraduate Research Grant **09/01/2021 - 08/30/2022**
Amount: $1,000 / 1 Year
Role: Mentor to Ella Atsavapranee, BE Undergraduate Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2021 - 08/30/2021**
Amount: $4,500 / 1 Year
Role: Mentor to Emily Kim, CBE Undergraduate Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2021 - 08/30/2021**
Amount: $4,500 / 1 Year
Role: Mentor to Matthew Jester, BE Undergraduate Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2021 - 08/30/2021**
Amount: $4,500 / 1 Year
Role: Mentor to Andres Hubsch, BE Undergraduate Student

Penn Undergraduate Research Mentoring Program (PURM) Fellowship **05/01/2020 - 08/30/2020**
Amount: $4,500 / 1 Year
Role: Mentor to Ella Atsavapranee, BE Undergraduate Student

Littlejohn Research Fellowship **05/28/2019 - 08/02/2020**
Amount: $5,000 / 1 Year
Role: Mentor to Ella Atsavapranee, BE Undergraduate Student

Tau Beta Pi Fellowship **09/01/2019 - 08/30/2020**
Amount: $10,000 / 1 Year
Role: Mentor to Margaret Billingsley, BE PhD Student

NSF LRSM REU **05/28/2019 - 08/02/2019**
Amount: $5,000 / 1 Year
Role: Mentor to Alex Hamilton, Undergraduate Student, University of Oklahoma

Blair Research Fellowship **05/28/2019 - 08/02/2019**
Amount: $1,000 / 1 Year
Role: Mentor to Julia Yan, Penn MSE Undergraduate

INVITED TALKS

176. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery to the Brain. ***Keystone Symposia,*** Drug Delivery to the Brain: Emerging Modalities, Keystone, Colorado. February 17-21, 2025.

175. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***French Society for Nanomedicine Annual Meeting,*** Toulouse, France. December 3-5, 2024.

174. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Beilstein-Institut,*** Beilstein Nanotechnology-Nanomedicine Symposium, Ruedesheim am Rhein, Germany. September 2-6, 2024.

173. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***City College of New York,*** Department of Biomedical Engineering, New York, New York. August 21, 2024.

172. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Gordon Research Conference – Drug Carriers in Medicine and Biology***, University of Southern Maine, Portland, Maine. August 4-9, 2024.

171. Navigating Transitions into Academia, Industry and Beyond. ***Gordon Research Seminar – Drug Carriers in Medicine and Biology***, University of Southern Maine, Portland, Maine. August 3-4, 2024.

170. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Nature Conference,*** Nanobiotechnology for Precision Medicine and Tissue Engineering, Tel Aviv University, Israel. June 3-6, 2024.

169. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Columbia University,*** Tissue Talks, Department of Biomedical Engineering, New York, New York. May 22, 2024.

168. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***TIDES USA: Oligonucleotide and Peptide Therapeutics,*** Boston, Massachusetts. May 14-17, 2024.

167. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***American Society of Gene and Cell Therapy,*** Baltimore, Maryland. May 11-14, 2024.

166. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***The Gulf Coast Consortia (GCC) Innovative Drug Discovery and Development (IDDD) Annual Conference,*** Houston, Texas. May 7-8, 2024.

165. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Drexel University,*** College of Medicine, Philadelphia, Pennsylvania, April 24, 2024.

164. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Terasaki Institute,*** Los Angeles, California. April 17, 2024.

163. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***FormuTech Summit 2024,*** Madrid, Spain. April 11-12, 2024.

162. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***NJIT,*** Department of Biomedical Engineering Seminar Series, Newark, New Jersey. April 5, 2024.

161. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Merck,*** External Seminar Series, West Point, Pennsylvania. March 27, 2024.

160. In situ PEGylation to reduce CAR T cell-associated toxicities. ***5th Immune Effector Cell Therapies in Multiple Myeloma Workshop,*** Boston, Massachusetts. March 23-24, 2024.

159. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***European Society for Molecular Engineering,*** 19th European Molecular Imaging Meeting, Porto, Portugal. March 12-15, 2024.

158. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Oligonucleotide and Precision Therapeutics Congress,*** Oligonucleotides & mRNA Therapeutics***,*** Boston, Massachusetts. March 13-14, 2023.

157. Delivery technologies for cancer immunotherapy. ***Nature Conference,*** Nanomaterials in Biomedical Applications, Waterville Valley Manipal, Karnataka, India. February 26-27, 2024.

156. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Forbeck Forum,*** Nanotechnology for Cancer Therapy, Pacific Grove, California. February 8-11, 2024.

155. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***University of Alabama at Birmingham,*** Birmingham, Alabama. January 26, 2023.

154. mRNA Lipid Nanoparticles for Ex Vivo Engineering of Immunosuppressive T Cells for Autoimmunity Therapies. ***Capstan Therapeutics,*** San Diego, California. December 11, 2023.

153. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***National Science Foundation,*** Nanoscale Science and Engineering Grantees Conference, Alexandria, Virginia. December 7-8, 2023.

152. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***International Conference of the Korean Society of Pharmaceutical Sciences and Technology,*** Seoul, Korea. November 30 – December 1, 2023.

151. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Agency for Science, Technology and Research (A*STAR),*** Singapore. November 15, 2023.

150. Lipid Nanoparticles for Overcoming Biological Barriers to *In Vivo* Genome Editing. ***In Vivo Gene Therapy & Genome Editing Summit,*** Miami, Florida. October 30-November 1, 2023.

149. Lipid Nanoparticles for *In Vivo* mRNA Delivery to the Placenta during Pregnancy. ***Controlled Release Society,*** Symposium on Women's Health. October 26-27, 2023.

148. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Nature Conference,*** Future Trends in Translational Medicine, Milan, Italy. October 26-27, 2023.

147. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***European Society of Gene and Cell Therapy Annual Meeting,*** Brussels, Belgium. October 24-27, 2023.

146. siRNA Lipid-Polymer Nanoparticles for Combination Multiple Myeloma Therapy. ***Biomedical Engineering Society Annual Meeting,*** Young Innovator Award in Cellular and Molecular Bioengineering, Seattle, Washington. October 11-14, 2023.

145. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***The Cooper Union,*** Kraut Lecture in Chemical Engineering, New York, New York. October 5, 2023.

144. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Harvard University,*** Topics in Bioengineering Seminar Series, Cambridge, Massachusetts. September 28, 2023.

143. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Smart People in Cellular Immunotherapy Symposium,*** San Diego, California. September 10-12, 2023.

142. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***ChinaNANO 2022,*** Beijing, China. August 28-30, 2023.

141. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***American Chemical Society Annual Meeting,*** San Francisco, California. August 13-17, 2023.

140. The Science of Outreach. ***Controlled Release Society Annual Meeting,*** Las Vegas, Nevada. July 24-27, 2023.

139. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Cystic Fibrosis Foundation,*** Addressing Challenges to Expand Genetic Therapies Conference, Big Sky, Montana. June 25-29, 2023.

138. Delivery technologies for cancer immunotherapy. ***Gordon Research Conference – Cancer Nanotechnology,*** Waterville Valley, New Hampshire. June 11-16, 2023.

137. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***International Advanced Drug Delivery Symposium,*** Hsinchu, Taiwan. May 25-26, 2023.

136. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***TIDES 2023,*** San Diego, California. May 7-10, 2023.

135. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***University of Colorado,*** Mechanisms and Barriers in Nanomedicine Workshop, Golden, Colorado. May 4-6, 2023.

134. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***St. John's University,*** Department of Pharmaceutical Sciences, Queens, New York. May 1, 2023.

133. mRNA Formulations for Fetal and Maternal Therapy. ***Leveraging mRNA Technology Workshop: From Infectious Disease to Other Illnesses,*** Washington, DC. April 28, 2023.

132. Delivery Technologies for Cancer Immunotherapy. ***American Association for Cancer Research Annual Meeting,*** Orlando, Florida. April 14-19, 2023.

131. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Ultragenyx Pharmaceutical,*** Novato, California. April 5, 2023.

130. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Duke University,*** Department of Biomedical Engineering, Durham, North Carolina. March 30, 2023.

129. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Oligonucleotide & Precision Therapeutics Congress,*** Boston, Massachusetts. March 13-15, 2023.

128. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***University of Pennsylvania,*** Institute for Regenerative Medicine Annual Retreat, Philadelphia, Pennsylvania. January 24, 2023.

127. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***PepTalk: The Protein Science Week 2023,*** San Diego, California. January 16-20, 2023.

126. Innovation @ Penn: The Future of mRNA Technology. ***J.P. Morgan Healthcare Conference,*** San Francisco, California. January 9, 2023.

125. Overcoming Biological Barriers to Nucleic Acid Delivery. ***IEEE EMBS Micro and Nanotechnology in Medicine Conference,*** Disney Aulani, Hawaii. December 5-9, 2022.

124. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***University of Pennsylvania,*** Center for Musculoskeletal Disorders Scientific Symposium, Philadelphia, Pennsylvania. November 16, 2022.

123. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***In Vivo Gene Therapy & Genome Editing Summit,*** Miami, Florida. October 31 – November 2, 2022.

122. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***AAPS Annual Meeting,*** Boston, Massachusetts. October 19, 2022.

121. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Fapon Biotech,*** Guangdong, China. October 17, 2022.

120. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Evonik Industries,*** Lafayette, Indiana. October 5, 2022.

119. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Korean Society for Biotechnology and Bioengineering,*** Jeju Shinhwa World, South Korea. September 28-30, 2022.

118. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Korea Research Institute of Bioscience and Biotechnology,*** Daejeon, South Korea. September 27, 2022.

117. Biomaterials for Cancer Immunotherapy and Genome Editing. ***University of Gdansk,*** Modeling & Design of Molecular Materials 2022 Conference. Gdansk, Poland. September 19-22, 2022.

116. Rational Design of Lipid Nanoparticles for mRNA Delivery. ***14th Annual Bioprocessing Summit,*** Boston, Massachusetts. August 15-18, 2022.

115. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Chinese Biophysics Congress,*** Kaifeng, China. July 22-24, 2022.

114. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Controlled Release Society Annual Meeting,*** Montreal, Canada. July 14, 2022.

113. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***FEBS 2022 Advanced Course,*** Biological Surfaces and Interfaces: Forces at Biological Interfaces. Sant Feliu de Guixols, Spain. June 19-24, 2022.

112. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***University of British Columbia,*** 17th Liposome Research Days, Vancouver, British Columbia. June 12-15, 2022.

111. Materials for Overcoming Biological Barriers to mRNA Delivery. ***Gordon Research Conference on Bioinspired Materials,*** Les Diablerets, Switzerland. June 5-10, 2022.

110. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***American Chemical Society Middle Atlantic Regional Meeting,*** The College of New Jersey, Ewing, New Jersey. June 1-4, 2022.

109. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***University of Pennsylvania,*** Center for Innovation and Precision Dentistry Symposium, Philadelphia, Pennsylvania. June 2, 2022.

108. On-Demand Modular Distributed Manufacturing of Broadly Applicable RNA Pharmaceuticals. ***Wellcome Trust,*** R3 Meeting, Cambridge, Massachusetts. May 16, 2022.

107. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***Society for Biomaterials Annual Meeting,*** Young Investigator Award Lecture. Baltimore, Maryland. April 29, 2022.

106. Anti-Inflammatory Lipid Nanoparticles for mRNA Delivery. ***Society for Biomaterials Annual Meeting,*** Baltimore, Maryland. April 28, 2022.

105. mRNA Lipid Nanoparticles for Dental and Craniofacial Applications. ***University of Pennsylvania,*** Center for Innovation and Precision Dentistry, Cross Talk Seminar Series, Philadelphia, Pennsylvania. April 7, 2022.

104. Lipid Nanoparticle Delivery Systems. ***amfAR – The Foundation for AIDS Research,*** Think Tank Meeting. March 25-27, 2022.

103. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***American Chemical Society Annual Meeting,*** San Diego, California. March 20-24, 2022.

102. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***NIH NHLBI Gene Therapy Workshop,*** Bethesda, Maryland. March 15-16, 2022.

101. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***AskBio - Asklepios Biopharmaceutical Inc,*** Seminar Series. March 9, 2022.

100. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Tune Therapeutics,*** Seminar Series. March 4, 2022.

99. Lipid Nanoparticles for Cancer Immunotherapy. ***eTheRNA Immunotherapies,*** Webinar Series. March 2, 2022.

98. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Omega Therapeutics***. February 9, 2022. *Virtual

97. mRNA in Cell and Gene Therapy. ***Maravai LifeSciences,*** Investor R&D Day. January 28, 2022. *Virtual

96. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Takeda Pharmaceuticals,*** Cambridge, Massachusetts. January 25, 2022.

95. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Pfizer,*** Boston, Massachusetts. January 19, 2022.

94. Delivery Technologies for Cancer Immunotherapy. ***Bristol Myers Squibb,*** Summit, New Jersey. January 19, 2022.

93. Lipid Nanoparticle-Mediated mRNA Delivery for CAR T Cell Engineering. ***Bayer AG,*** Scientific Talks Series, Berlin, Germany. January 19, 2022. *Virtual

92. Lipid Nanoparticles for T Cell Cancer Immunotherapy. ***University of Nebraska Medical Center,*** Omaha, Nebraska. December 17, 2021.

91. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Senda Biosciences,*** Cambridge, Massachusetts. December 6, 2021.

90. Lipid Nanoparticles for In Utero mRNA Delivery. ***nanoDDS 2021,*** Houston, Texas. December 3, 2021.

89. Lipid Nanoparticles for the Delivery of Proteins and mRNA. ***In Vivo Gene Therapy & Genome Editing Summit,*** Miami, Florida. November 15-16, 2021.

88. Lipid Nanoparticles for In Utero mRNA Delivery. ***9th International mRNA Health Conference,*** Berlin, Germany. November 9-10, 2021.

87. Lipid Nanoparticle-Mediated mRNA Delivery for CAR T Cell Engineering. ***13th International Congress of Pharmaceutical Sciences,*** Ribeirão Preto, Brazil. November 3, 2021. *Virtual

86. Novel Screening Approaches for LNP Discovery. ***Sanofi,*** Strategic Development & Scientific Advisory Committee Meeting. October 21, 2021.

85. Lipid Nanoparticle-Mediated mRNA Delivery for CAR T Cell Engineering. ***AAPS Annual Meeting,*** Philadelphia, Pennsylvania. October 17-20, 2021.

84. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Merck.*** October 18, 2021.

83. Overcoming Biological Barriers to Nucleic Acid Delivery. ***University of Texas at San Antonio,*** San Antonio, Texas. October 15, 2021.

82. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***University of British Columbia,*** Liposome Research Days 2021, Vancouver, British Columbia. June 13-16, 2021. *Canceled due to COVID-19

81. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Sanofi,*** Boston, Massachusetts. June 8, 2021. *Moved to Virtual

80. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Flagship Pioneering,*** Cambridge, Massachusetts. June 4, 2021. *Moved to Virtual

79. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Tessera Therapeutics,*** Cambridge, Massachusetts. March 2, 2021. *Moved to Virtual

78. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***MPM Capital,*** Cambridge, Massachusetts. March 2, 2021. *Moved to Virtual

77. Nanomaterials for Immunomodulation. ***Nature Nanotechnology,*** February 3, 2021. *Virtual

76. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Orna Therapeutics,*** Cambridge, Massachusetts. January 29, 2021. *Moved to Virtual

75. Lipid Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Myeloid Therapeutics,*** Cambridge, Massachusetts. December 21, 2020. *Moved to Virtual

74. Opportunities and Challenges for Integrating Delivery Technologies into CAR T Cell Cancer Immunotherapy. ***World Vaccine & Immunotherapy Congress 2020,*** San Francisco, California. November 30-December 3, 2020. *Moved to Virtual

73. Opportunities and Challenges for Integrating Delivery Technologies into Cancer Immunotherapy. ***Drexel University,*** Immune Modulation and Engineering Symposium, Philadelphia, Pennsylvania. November 11-13, 2020. *Moved to Virtual

72. Targeted Nanoparticle Nucleic Acid Delivery for Immune Cell Reprogramming. ***Third Rock Ventures,*** Gene Therapy Brain Trust, Cambridge, Massachusetts. October 30, 2020. *Moved to Virtual

71. Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Eli Lilly and Company,*** Cambridge, Massachusetts. August 31, 2020. *Moved to Virtual

70. Opportunities and Challenges for Integrating Delivery Technologies into Cancer Immunotherapy. ***American Chemical Society Annual Meeting,*** Nanotechnology, Single Molecule and Single Cell Imaging in Biology and Medicine Symposium. San Francisco, California. August 16-20, 2020. *Postponed due to COVID-19

69. Delivery Technologies for In Utero Nucleic Acid Therapy. ***American Chemical Society Annual Meeting,*** Bottom-Up Development of Formulations for Delivery of Nucleic Acids and Proteins Symposium. San Francisco, California. August 16-20, 2020. *Postponed due to COVID-19

68. Nanoparticles for Overcoming Biological Barriers to Nucleic Acid Delivery. ***Sarepta Therapeutics,*** Cambridge, Massachusetts. June 12, 2020. *Moved to Virtual

67. Overcoming Biological Barriers to Nucleic Acid Delivery. ***University of Porto,*** Faculty of Engineering, Symposium on Bioengineering. Porto, Portugal. April 3-5, 2020. *Postponed due to COVID-19

66. Delivery Technologies for Cancer Immunotherapy. ***American Chemical Society Annual Meeting,*** Nanotechnology, Single Molecule and Single Cell Imaging in Biology and Medicine Symposium. Philadelphia, Pennsylvania. March 22-26, 2020. *Postponed due to COVID-19

65. Overcoming Biological Barriers to Nucleic Acid Delivery. ***University of Michigan,*** Ann Arbor, Michigan. January 28, 2020.

64. Opportunities and Challenges for Integrating Delivery Technologies into Cancer Immunotherapy. ***World Vaccine & Immunotherapy Congress,*** San Francisco, California. December 4, 2019.

63. Overcoming Biological Barriers to Nucleic Acid Delivery. ***University of Utah,*** Department of Biomedical Engineering. Salt Lake City, Utah. November 22, 2019.

62. Biomaterials for Engineering the Bone Marrow Niche for Multiple Myeloma Therapy. ***Biomedical Engineering Society Annual Meeting,*** Philadelphia, Pennsylvania. October 16-19, 2019.

61. Overcoming Biological Barriers to Nucleic Acid Delivery. ***Spark Therapeutics,*** Philadelphia, Pennsylvania. September 25, 2019.

60. Overcoming Biological Barriers to Cancer Immunotherapy. ***Kidney Cancer Research Summit,*** Philadelphia, Pennsylvania. September 12, 2019.

59. Developing Advanced Drug Delivery Systems to Better Harness the Effects of Cancer Immunotherapy. ***Controlled & Modified Drug Release Summit,*** Philadelphia, Pennsylvania. August 28, 2019.

58. *In Vivo* Nucleic Acid Delivery Systems for Therapeutic Targeting of Multiple Myeloma-Microenvironment Interactions. ***American Chemical Society Annual Meeting,*** San Diego, California. August 25, 2019.

57. Biomaterials for Genetic Engineering of the Bone Marrow Niche for Multiple Myeloma Therapy. ***Controlled Release Society Annual Meeting – T. Nagai Award Lecture,*** Valencia, Spain. July 24, 2019.

56. Nanotechnology for Genome Editing and Cancer Immunotherapy. ***Technical University of Crete,*** Crete, Greece. June 18, 2019.

55. Biomaterials for Cancer Therapy and Immunoengineering. ***8th NSF Advanced Study Institute on Global Healthcare Challenges,*** Crete, Greece. June 15-18, 2019.

54. Nanotechnology for Overcoming Biological Barriers to Drug Delivery. ***18th NSF International Summer School on Bio-X,*** Crete, Greece. June 9-15, 2019.

53. Delivery Technologies for Gastrointestinal Therapeutics. ***Janssen Pharmaceuticals***. May 28, 2019.

52. Biomaterials for Cancer Therapy and Immunoengineering. ***World Economic Forum – Breakthrough Technologies in Cancer Research Session,*** Davos, Switzerland. January 21, 2019.

51. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Niche via Nanoparticle-Mediated RNAi. ***Cellular and Molecular Bioengineering Conference,*** San Diego, California. January 4, 2019.

50. Biomaterials for Cancer Therapy and Immunoengineering. ***Center for Targeted Therapeutics and Translational Nanomedicine Seminar,*** University of Pennsylvania. November 28, 2018.

49. Nanoparticle-Mediated siRNA Silencing in the Hematopoietic Stem Cell Niche. ***Gordon Research Conference – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. August 15, 2018.

48. Nanoparticle-Mediated siRNA Silencing in the Hematopoietic Stem Cell Niche. ***Controlled Release Society Annual Meeting – Gene Delivery Focus Group***. July 22, 2018.

47. Nanoparticle-Mediated siRNA Silencing in the Hematopoietic Stem Cell Niche. ***World Congress of Biomechanics***, Dublin, Ireland, July 9, 2018.

46. Overcoming Biological Barriers to Drug Delivery. ***Janssen Pharmaceuticals***. May 24, 2018.

45. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Niche via Nanoparticle-Mediated RNAi. ***Society for Biomaterials Annual Meeting,*** Atlanta, Georgia. April 11-14, 2018.

44. Biomaterials for Overcoming Biological Barriers to Drug Delivery. ***University of Pennsylvania,*** L'Oreal-Penn Workshop. February 2, 2018.

43. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Niche via Nanoparticle-Mediated RNAi. ***13th US-Japan Symposium on Drug Delivery Systems,*** Lahaina, Maui, Hawaii. December 14-18, 2017.

42. Mechanical Amplification of Tumor Death Using Polymeric Nanoparticles. ***National University of Singapore,*** 3rd International Symposium on Mechanobiology, Singapore. December 11, 2017.

41. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Microenvironment In Vivo via Nanoparticle-Mediated RNAi. ***University of Pennsylvania,*** Center for Targeted Therapeutics and Translational Medicine Symposium, Philadelphia, PA. December 5, 2017.

40. Engineering Blood and Marrow for Cancer Therapy. ***University of California - San Diego,*** Department of Bioengineering. April 10, 2017.

39. Engineering Blood and Marrow for Cancer Therapy. ***Columbia University,*** Department of Biomedical Engineering. April 6, 2017.

38. Engineering Blood and Marrow for Cancer Therapy. ***Northwestern University,*** Department of Pharmacology. April 4, 2017.

37. Engineering Blood and Marrow for Cancer Therapy. ***Northwestern University,*** Department of Biomedical Engineering. April 3, 2017.

36. Engineering Blood and Marrow for Cancer Therapy. ***Massachusetts Institute of Technology,*** Institute for Medical Engineering and Science. March 22, 2017.

35. Engineering Blood and Marrow for Cancer Therapy. ***Massachusetts Institute of Technology,*** Department of Mechanical Engineering. March 22, 2017.

34. Engineering Blood and Marrow for Cancer Therapy. ***University of Pennsylvania,*** Department of Bioengineering. March 16, 2017.

33. Engineering Blood and Marrow for Cancer Therapy. ***University of California-Los Angeles,*** Department of Bioengineering. March 16, 2017.

32. Engineering Blood and Marrow for Cancer Therapy. ***California Institute of Technology,*** Department of Medical Engineering. March 14, 2017.

31. Engineering Blood and Marrow for Cancer Therapy. ***University of Texas at Austin,*** Department of Biomedical Engineering. March 7, 2017.

30. Engineering Blood and Marrow for Cancer Therapy. ***University of Pittsburgh,*** Department of Chemical and Petroleum Engineering. March 2, 2017.

29. Engineering Blood and Marrow for Cancer Therapy. ***Washington University in St. Louis,*** Department of Biomedical Engineering. February 28, 2017.

28. Engineering Blood and Marrow for Cancer Therapy. ***Rice University,*** Department of Chemical and Biomolecular Engineering. February 21, 2017.

27. Engineering Blood and Marrow for Cancer Therapy. ***University of California-Berkeley,*** Department of Chemical and Biomolecular Engineering. February 16, 2017.

26. Engineering Blood and Marrow for Cancer Therapy. ***Georgia Institute of Technology,*** Department of Chemical and Biomolecular Engineering. February 13, 2017.

25. Engineering Blood and Marrow for Cancer Therapy. ***Rensselaer Polytechnic Institute,*** Department of Chemical and Biomolecular Engineering. February 10, 2017.

24. Engineering Blood and Marrow for Cancer Therapy. ***Northeastern University,*** Department of Chemical Engineering. January 26, 2017.

23. Engineering Blood and Marrow for Cancer Therapy. ***Duke University,*** Department of Biomedical Engineering. January 24, 2017.

22. Engineering Blood and Marrow for Cancer Therapy. ***Johns Hopkins University,*** Department of Chemical and Biomolecular Engineering. January 17, 2017.

21. Engineering Blood and Marrow for Cancer Therapy. ***University of North Carolina at Chapel Hill,*** Joint UNC/NC State Department of Biomedical Engineering. January 13, 2017.

20. Targeting the Bone Marrow Microenvironment. ***MIT-Novartis Symposium,*** Cambridge, Massachusetts. December 1, 2016.

19. Engineering Bone, Mechanics, and Marrow for Cancer Therapy. ***Massachusetts Institute of Technology,*** Koch Institute for Integrative Cancer Research. November 30, 2016.

18. Polymeric Mechanical Amplifiers of Tumor Apoptosis. ***Gordon Research Seminar on Biointerface Science,*** Les Diablerets, Switzerland. June 12, 2016

17. Delivery Materials for In Vivo RNA Delivery to Bone Marrow. ***MIT-Amgen Symposium,*** Cambridge, Massachusetts. April 15, 2016.

16. Biomaterials for Modulating Therapeutic Delivery and Mechanotransduction in the Vasculature. ***Burroughs Wellcome Fund,*** Raleigh, North Carolina. October 7, 2015.

15. Nanomaterials for Treating Bloodborne Cancer Metastasis. ***Rochester Institute of Technology,*** Rochester, New York. October 2, 2015.

14. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in Circulation. ***Cornell University – Meinig Symposium,*** Ithaca, New York. September 17, 2015.

13. Nanotechnology for Targeting Bloodborne Cancer Metastasis. ***10th International Congress of Pharmaceutical Sciences,*** São Paulo, Brazil. September 6-9, 2015.

12. Therapeutic Targeting of Circulating Tumor Cells. ***Universidade Federal de Goiás,*** Goiânia, Brazil. September 3, 2015.

11. Nanotechnology for Targeting Bloodborne Cancer Metastasis. ***6th Advanced Study Institute on Global Healthcare Challenges,*** Izmir, Turkey. June 16-22, 2015.

10. Cancer Nanotechnology. ***12th International Summer School on Biocomplexity and Biodesign: from Gene to System,*** Izmir, Turkey. June 16-22, 2015.

9. New Frontiers in Targeting Bloodborne Cancer Metastasis. ***12th International Summer School on Biocomplexity and Biodesign: from Gene to System,*** Izmir, Turkey. June 16-22, 2015.

8. Therapeutic Targeting of Circulating Tumor Cells in the Bloodstream. ***University of North Carolina,*** UNC-Chapel Hill/NC State Joint Department of Biomedical Engineering, March 19, 2015.

7. Therapeutic Targeting of Circulating Tumor Cells in the Bloodstream. ***5th Advanced Study Institute on Global Healthcare Challenges***, Antalya, Turkey. June 8-14, 2014.

6. Nanomaterials for Early Cancer Cell Detection and Therapeutic Targeting in the Bloodstream. ***Massachusetts Institute of Technology,*** Cambridge, Massachusetts. April 10, 2014.

5. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in Circulation. ***Cornell University Engineering - Annual Board of Directors Meeting***, Ithaca, New York. April 5, 2014.

4. Charged Nanomaterials Control Selectin-Mediated Adhesion and Isolation of Circulating Tumor Cells and Leukocytes Under Flow. ***12th International Summer School on Biocomplexity and Biodesign: from Gene to System***, Istanbul, Turkey. June 23-29, 2013.

3. Nanoscale Roughness and Surface Charge Control E-selectin Mediated Adhesion and Isolation of Malignant and Non-Malignant Cells. ***3rd École Nationale Supérieure des Mines de Saint Etienne (EMSE) Bioelectronics Symposium***, Porquerolles, France. June 10-14, 2013.

2. E-selectin Liposomal and Nanotube-Targeted Delivery of Therapeutics to Circulating Tumor Cells. ***14th International Congress of Biorheology and 7th International Conference on Clinical Hemorheology***, Istanbul, Turkey. July 4-7, 2012.

1. Shear-Induced Resistance to Neutrophil Activation via the Formyl Peptide Receptor. ***14th International Congress of Biorheology and 7th International Conference on Clinical Hemorheology***, Istanbul, Turkey. July 4-7, 2012.

CONFERENCE PRESENTATIONS AND ABSTRACTS (ORAL)

101. R. Palanki, W.H. Peranteau, M.J. Mitchell. Engineering Ionizable Lipid Nanoparticles for Gene Editing in the Liver. ***Keystone Symposium on Delivery of Nucleic Acid Therapeutics***, Seattle, Washington. January 22-26, 2023.

100. L. Xue, N. Gong, X. Han, J. Xu, M.J. Mitchell. Combinatorial Design of Siloxane-Incorporated Lipid Nanoparticles for Tissue-Specific mRNA Therapeutic Delivery. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

99. L. Xue, A.G. Hamilton, N. Gong, X. Han, C. Figueroa-Espada, J. Xu, M.J. Mitchell. High-Throughput Barcoded Nanoparticles Predict Cationic Degradable Lipid-Like Materials for Pulmonary mRNA Delivery. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

98. K.L. Swingle, M.J. Mitchell. Placenta-tropic VEGF mRNA lipid nanoparticles rescue blood pressure and fetal weight in a mouse model of pre-eclampsia during pregnancy. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

97. A.G. Hamilton, M.J. Mitchell. High-throughput in vivo screening reveals differential influences on mRNA lipid nanoparticle immune cell transfection by administration route. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

96. E. Han, M.J. Mitchell. HTS-BBB: A high-throughput transwell platform for screening mRNA lipid nanoparticle transfection of and transport across the blood-brain barrier. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

95. H.C. Geisler, A.A. Ghalsasi, M.J. Mitchell. EGFR-targeted Lipid Nanoparticles for Selective mRNA Delivery to the Placenta. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

94. X. Han, M.J. Mitchell. Amidine-Incorporated Degradable Lipids for Local, Systemic and Non-Liver mRNA Delivery. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

93. A.G. Hamilton, M.J. Mitchell. Generation of transient PD-L1-resistant CAR T cells using dual-encapsulating lipid nanoparticles. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

92. R. Palanki, H. Safford, W. Peranteau, M.J. Mitchell. Engineering Ionizable Lipid Nanoparticles for Gene Editing in the Liver. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

91. M.S. Padilla, M.J. Mitchell. Lipid Nanoparticles for Overcoming Biological Barriers to mRNA Delivery. ***American Chemical Society Annual Meeting,*** San Francisco, California. August 13-17, 2023.

90. K.L. Swingle, M.J. Mitchell. Ionizable lipid nanoparticles for in vivo mRNA delivery to the placenta during pregnancy. ***Gordon Research Seminar – Biomaterials and Tissue Engineering***, Holderness, New Hampshire. July 15-16, 2023.

89. S.J. Shepherd, M.S. Padilla, K. Gupta, D. Issadore, M.J. Mitchell. Redefining the characterization paradigm of RNA lipid nanoparticles. ***American Crystallographic Association Conference***, Baltimore, Maryland. July 7-11, 2023.

88. K.L. Swingle, M.J. Mitchell. Ionizable lipid nanoparticles for in vivo mRNA delivery to the placenta during pregnancy. ***American Society for Gene and Cell Therapy Annual Meeting***, Vertex Pharmaceuticals Symposium, Los Angeles, California. May 17, 2023.

87. R. Palanki, W.H. Peranteau, M.J. Mitchell. Ionizable lipid nanoparticles for therapeutic base editing of congenital brain disease. ***American Society for Gene and Cell Therapy Annual Meeting***, Los Angeles, California. May 17, 2023.

86. S.J. Shepherd, D. Issadore, M.J. Mitchell*. Throughput-Scalable Silicon and Glass Microfluidic Platform for Manufacturing of SARS-CoV-2 mRNA Lipid Nanoparticles Vaccines. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

85. K.L. Swingle, M.J. Mitchell*. Ionizable Lipid Nanoparticles for In Vivo mRNA Delivery to the Placenta During Pregnancy. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

84. R. Palanki, W.H. Peranteau, M.J. Mitchell*. Ionizable lipid nanoparticles for therapeutic base editing of congenital brain disease. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

83. M.S. Padilla, M.J. Mitchell*. Branched Lipid Architecture Enhances LNP-mediated mRNA Delivery to the Liver via Enhanced Endosomal Escape. ***Society for Biomaterials Annual Meeting***, Postdoctoral Recognition Competition, San Diego, California. April 19-22, 2023.

82. M.S. Padilla, M.J. Mitchell*. Branched Lipid Architecture Enhances LNP-mediated mRNA Delivery to the Liver via Enhanced Endosomal Escape. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

81. A.S. Thatte, M.J. Mitchell*. mRNA Lipid Nanoparticles for ex vivo Engineering of Primary Human T Cells for Autoimmunity Therapies. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

80. A.G. Hamilton, M.J. Mitchell*. Ionizable Lipid Nanoparticles with Integrated Immune Checkpoint Inhibition for mRNA CAR T Cell Engineering. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

79. X. Han, M.J. Mitchell*. Engineering Ligand-Tethered Lipidoids for Targeted RNA Delivery to Treat Liver Fibrosis. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

78. L. Xue, M.J. Mitchell*. Engineering Siloxane-Derived Lipid Nanoparticles for Tissue-Specific mRNA Therapeutics Delivery. ***Society for Biomaterials Annual Meeting***, Postdoctoral Recognition Competition, San Diego, California. April 19-22, 2023.

77. L. Xue, M.J. Mitchell*. Engineering Siloxane-Derived Lipid Nanoparticles for Tissue-Specific mRNA Therapeutics Delivery. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

76. H.C. Safford, M.J. Mitchell*. Orthogonal Design of Experiments for Engineering of Lipid Nanoparticles for Selective mRNA Delivery to the Placenta. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

75. R.M. Haley, M.J. Mitchell*. Ionizable Lipid Nanoparticle Platform for in Vivo Delivery of Small Protein Scaffolds for Potent RAS Inhibition. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

74. C.G. Figueroa-Espada, M.J. Mitchell*. Bone Marrow Vascular Microenvironment Combination RNAi Nanomaterials Therapy for Multiple Myeloma. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

73. I. Henrich, M.M. Billingsley, K. Jain, L. Quick, R. Young, M. Chou, M.J. Mitchell*. Intratumoral delivery of mRNA encoding USP6 activates multiple immuno-stimulatory pathways simultaneously and inhibits local and distal tumor growth in murine models. ***American Association for Cancer Research Annual Meeting***, Orlando, Florida. April 14-19, 2023.

72. M.S. Padilla, J.M. Wilson, M.J. Mitchell*. Branched lipid architecture improves lipid-nanoparticle-based mRNA delivery to the liver via enhanced endosomal escape. ***American Chemical Society Annual Meeting***, Indianapolis, Indiana. March 26-30, 2023.

71. M.S. Padilla, S. Yang, M.J. Mitchell*. Lipid nanoparticle optimization for mRNA-based head and neck cancer therapy. ***AADOCR/CADR Annual Meeting***, Indianapolis, Indiana. March 15-18, 2023.

70. S.J. Shepherd, M.J. Mitchell*, D. Issadore. Highly parallelized silicon and glass microfluidic platform for robust manufacturing of mRNA lipid nanoparticles for vaccine applications. ***microTAS Annual Meeting***, Hangzhou, China. October 23-27, 2022.

69. A.G. Hamilton, M.J. Mitchell*. Ionizable Lipid Nanoparticles with Integrated Immune Checkpoint Blockade for mRNA CAR T Cell Engineering. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

68. A.E. Metzloff, M.M. Billingsley, A.G. Hamilton, M.J. Mitchell*. APC-Mimetic Lipid Nanoparticles for Rapid mRNA-Based CAR T Cell Cancer Immunotherapy. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

67. R. Palanki, S. Bose, A. Dave, B. White, K.L. Swingle, M.M. Billingsley, W.H. Peranteau, M.J. Mitchell*. Translational ionizable lipid nanoparticle-base editing platform for treatment of congenital brain disease. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

66. K.L. Swingle, M.J. Mitchell*. Ionizable Lipid Nanoparticles for In Vivo mRNA Delivery to the Placenta during Pregnancy. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

65. N. Gong, X. Han, L. Xue, R. El-Mayta, A.E. Metzloff, M.M. Billingsley, A.G. Hamilton, M.J. Mitchell*. In Situ PEGylation of CAR T Cells Alleviates Cytokine Release Syndrome and Neurotoxicity. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

64. L. Xue, M.J. Mitchell*. Engineering Bisphosphonate Lipid-Like Materials for mRNA Delivery. ***Controlled & Modified Drug Release Summit***, Philadelphia, Pennsylvania. October 5-6, 2022.

63. C.C. Warzecha, R. El-Mayta, L. Xue, L. Wang, M.J. Mitchell*, J.M. Wilson. Generation of Efficient Lipid Nanoparticles for Liver-Directed Gene Therapy and Genome Editing. ***American Society of Cell and Gene Therapy Annual Meeting***, Washington, DC. May 16-19, 2022.

62. H. Zhang, X. Han, M.J. Mitchell*. Rational Design of Anti-Inflammatory Lipid Nanoparticles for mRNA Delivery. ***Society for Biomaterials Annual Meeting***, Baltimore, Maryland. April 27-30, 2022.

61. R. El-Mayta, M.J. Mitchell*. Helper Lipid Structure Influences Protein Adsorption and Delivery of Lipid Nanoparticles to Spleen and Liver. ***Society for Biomaterials Annual Meeting***, Baltimore, Maryland. April 27-30, 2022.

60. K.L. Swingle, M.M. Billingsley, W.H. Peranteau, M.J. Mitchell*. Amniotic Fluid Stabilized Lipid Nanoparticles for In Utero Intra-amniotic mRNA Delivery. ***Society for Biomaterials Annual Meeting***, Baltimore, Maryland. April 27-30, 2022.

59. S. Patel, M.M. Billingsley, X. Han, C. Frazee, K.L. Swingle, M.J. Mitchell*. Hydroxycholesterol Substitution in Ionizable Lipid Nanoparticles for mRNA Delivery to T Cells. ***Society for Biomaterials Annual Meeting***, Baltimore, Maryland. April 27-30, 2022.

58. B.M. White, S.K. Bose, R. Palanki, A. Dave, M.J. Mitchell*, W.H. Peranteau. Fetal Pulmonary Genome Modification via Direct Intratracheal Injection in the Mouse. ***Journal of the American College of Surgeons***. 233(5),S259-S260. October 23-27, 2021.

57. B.M. White, S.K. Bose, R. Palanki, A. Dave, M.J. Mitchell*, W.H. Peranteau. Surgical Lung Specimens Can Be Maintained Ex-Vivo and Serve As a High-Throughput and Cost-Effective Platform for Therapeutic Discovery. ***Journal of the American College of Surgeons***. 233(5),e195-e196. October 23-27, 2021.

56. S. Patel, M.M. Billingsley, X. Han, C. Frazee, K.L. Swingle, M.J. Mitchell*. Incorporation Of X-hydroxycholesterol Into Lipid Nanoparticles For mRNA Delivery to T Cells. ***Biomedical Engineering Society Annual Meeting***, Orlando, Florida. October 6-9, 2021.

55. M.M. Billingsley, R.S. Riley, M.V. Kashyap, W.H. Peranteau, M.J. Mitchell*. Engineering Lipid Nanoparticles for In Utero mRNA Delivery. ***Biomedical Engineering Society Annual Meeting***, Orlando, Florida. October 6-9, 2021.

54. S.J. Shepherd, C.C. Warzecha, R. El-Mayta, L. Wang, J.M. Wilson, D. Issadore, M.J. Mitchell*. Scalable Parallelized Microfluidic Device for Precise mRNA and siRNA Lipid Nanoparticle Formulations. ***Biomedical Engineering Society Annual Meeting***, Orlando, Florida. October 6-9, 2021.

53. M.M. Billingsley, S. Patel, A. Hamilton, N. Singh, P. Ravikumar, C.H. June, M.J. Mitchell*. Lipid Nanoparticle Mediated mRNA Delivery for CAR T cell Engineering. ***Society for Biomaterials Annual Meeting***, April 20-23, 2021.

52. M.M. Billingsley, R.S. Riley, M.V. Kashyap, B. White, P.W. Zoltick, A.Y. Cheng, R. Zhang, W.H. Peranteau, M.J. Mitchell*. Engineering Lipid Nanoparticles for In Utero mRNA Delivery. ***Society for Biomaterials Annual Meeting***, April 20-23, 2021.

51. S.J. Shepherd, D.A. Issadore, M.J. Mitchell*. Scalable Parallelized Microfluidic Device for Precise RNA Lipid Nanoparticle Formulations. ***Society for Biomaterials Annual Meeting***, April 20-23, 2021.

50. K. Singh, R.S. Riley, M.V. Kashyap, B. White, S.K. Bose, H. Li, R. Palanki, M.M. Billingsley, B.E. Coons, J.S. Riley, P. Zoltick, K. Musunuru, M.J. Mitchell, W.H. Peranteau. In utero lipid nanoparticle delivery of CRISPR technology to correct hereditary tyrosinemia type 1. ***Molecular Therapy,*** 29(4):10-10, ***American Society of Cell & Gene Therapy Virtual Annual Meeting***, May 11-14, 2021.

49. R.S. Riley, M.V. Kashyap, M.M. Billingsley, B. White, P.W. Zoltick, A.Y. Cheng, R. Zhang, W.H. Peranteau, M.J. Mitchell*. Ionizable Lipid Nanoparticles for In Utero mRNA Delivery. ***BMES Annual Meeting***, San Diego, California. October 14-17, 2020.

48. M.V. Kashyap, R.S. Riley, M.M. Billingsley, B.M. White, Z.P. Butt, M.J. Mitchell*, W.H. Peranteau. Ionizable Lipid Nanoparticle Platforms for In Utero Drug Delivery. ***Journal of the American College of Surgeons***. 231(4),S204. October 4-8, 2020.

47. J. Yeom, P.P.G. Guimaraes, M.J. Mitchell, A. Jaklenec, R. Langer. Chiral Supraparticles for Controllable Nanomedicine. ***AIChE Annual Meeting***, Orlando, Florida. November 10-15, 2019.

46. M.J. Mitchell, R. Langer. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Niche via Nanoparticle-Mediated RNAi. ***Biomedical Engineering Society Annual Meeting***, Phoenix, Arizona. October 11-14, 2017.

45. M.J. Mitchell, P. Guimaraes, M. Tan, R. Langer. In Vivo Nanoparticle-Mediated RNAi in Bone Marrow Enhances Hematopoietic Stem Cell Harvesting. ***Controlled Release Society Annual Meeting***, Boston, Massachusetts. July 16-19, 2017.

44. M.J. Mitchell, R. Langer. In Vivo Nanoparticle-Mediated RNAi in Bone Marrow Enhances Hematopoietic Stem Cell Mobilization and Harvesting. ***Society for Biomaterials Annual Meeting***, Minneapolis, Minnesota. April 11-14, 2017.

43. M.J. Mitchell, R. Langer. Mechanical Amplification of Immune Cytokine-Mediated Apoptosis Using Polymeric Particles. ***2017 Cellular and Molecular Bioengineering (CMBE) Conference***, Hawaii. January 3-7, 2017.

42. M.J. Mitchell, R. Langer. In Vivo Nanoparticle-Mediated RNAi in Bone Marrow Enhances Hematopoietic Stem Cell Mobilization and Harvesting. ***TERMIS Annual Meeting***, San Diego, California. December 11-14, 2016.

41. M.J. Mitchell, R. Langer. Mechanical Amplification of Immune Cytokine-Mediated Apoptosis Using Polymeric Particles. ***TERMIS Annual Meeting***, San Diego, California. December 11-14, 2016.

40. M.J. Mitchell, R. Langer. Delivery Materials to Induce RNAi in Bone Marrow to Control Hematopoietic Stem Cell Trafficking. ***American Institute of Chemical Engineers Annual Meeting***, San Francisco, California. November 12-17, 2016.

39. M.J. Mitchell, C.A. Castellanos, M.R. King. Exploiting Serum Interactions with Cationic Biomaterials Enables Label-Free Circulating Tumor Cell Isolation. ***American Institute of Chemical Engineers Annual Meeting***, San Francisco, California. November 12-17, 2016.

38. M.J. Mitchell, R. Langer. Mechanical Amplification of Tumor Death Using Polymeric Nanoparticles. ***American Institute of Chemical Engineers Annual Meeting***, San Francisco, California. November 12-17, 2016.

37. M.J. Mitchell, R. Langer. Mechanical Amplification of Tumor Death Using Polymeric Nanoparticles. ***Biomedical Engineering Society Annual Meeting,*** Minneapolis, Minnesota. October 5-8, 2016.

36. M.J. Mitchell, C.A. Castellanos, M.R. King. Serum Albumin Controls Charge-Mediated Adhesion and Isolation of Cancer Cells and Leukocytes Under Flow. ***Biomedical Engineering Society Annual Meeting,*** Minneapolis, Minnesota. October 5-8, 2016.

35. M.J. Mitchell, R. Langer. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Microenvironment In Vivo via Nanoparticle-Mediated RNAi. ***MechBio Symposium: Putting Together the Cell Mechanome,*** San Diego, California. August 4-5, 2016.

34. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Tumor Apoptosis. ***AACR Special Meeting on Engineering and Physical Sciences in Oncology,*** Boston, Massachusetts. June 25-28, 2016.

33. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Receptor-Mediated Apoptosis. ***10th World Biomaterials Congress,*** Montreal, QC Canada. May 17-22, 2016.

32. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Receptor-Mediated Apoptosis. ***American Association for Cancer Research Annual Meeting,*** New Orleans, Louisiana. April 16-20, 2016.

31. M.J. Mitchell, J. Lammerding, M.R. King. Lamin A/C Deficiency Reduces Circulating Tumor Cell Resistance to Fluid Shear Stress. ***2016 Cellular and Molecular Bioengineering (CMBE) and Advanced Biomanufacturing Joint Conference***, New Orleans, Louisiana. January 6-10, 2016.

30. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Tumor Cell Mechanotransduction and Cell Death. ***Materials Research Society (MRS) Annual Meeting,*** Boston, Massachusetts. November 29-December 4, 2015.

29. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Tumor Cell Mechanotransduction and Cell Death. ***American Institute of Chemical Engineers (AIChE) Annual Meeting,*** Salt Lake City, Utah. November 8-13, 2015.

28. E. Wayne, S. Chandrasekaran, M.J. Mitchell, C.B. Schaffer, M.R. King. TRAIL-Coated Leukocytes that Prevent the Bloodborne Metastasis of Prostate Cancer. ***Biomedical Engineering Society Annual Meeting,*** Tampa, Florida. October 7-10, 2015.

27. M.J. Mitchell, C. Denais, M. Chan, Z. Wang, J. Lammerding, M.R. King. Lamin A/C Deficiency Reduces Circulating Tumor Cell Resistance to Fluid Shear Stress. ***Biomedical Engineering Society Annual Meeting,*** Tampa, Florida. October 7-10, 2015.

26. J.C. Kohn, D. Zhou, F. Bordeleau, A. Zhou, B. Mason, M.J. Mitchell, M.R. King, C.A. Reinhart-King. Matrix Stiffening Inhibits Endothelial Cell Nitric Oxide Production and Decreases Barrier Integrity in Response to Fluid Shear Stress. ***Biomedical Engineering Society Annual Meeting,*** Tampa, Florida. October 7-10, 2015.

25. M.J. Mitchell, E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in Circulation. ***4th TERMIS World Congress***, Boston, Massachusetts. September 8-11, 2015.

24. M.J. Mitchell**,** C.A. Castellanos, M.R. King. Charged Nanomaterials for Differential Adhesion and Capture of Circulating Tumor Cells and Leukocytes Under Flow. ***BMES-Cellular and Molecular Bioengineering Conference***, St. Thomas, US Virgin Islands. January 6-10, 2015.

23. M.J. Mitchell, E.C. Wayne, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes Kill Cancer Cells in a Spontaneous Metastasis Mouse Model of Prostate Cancer. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 22-25, 2014.

22. C.A. Castellanos, J. Li, M.J. Mitchell, M.R. King. Antigen-Independent Targeting of Cancer Cells on Polylysine/Fatty Acid Complexes. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 22-25, 2014.

21. M.J. Mitchell, E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in Circulation. ***7th World Congress of Biomechanics***, Boston, Massachusetts. July 6-11, 2014.

20. S. Bajpai, M.J. Mitchell**,** M.R. King, C.A. Reinhart-King. Cyclic Chemotactic Gradients and Chemo-Selection in a Novel Microfluidic Device. ***7th World Congress on Biomechanics***, Boston, Massachusetts. July 6-11, 2014.

19. M.J. Mitchell**,** E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation. ***IEEE 40th Northeast Bioengineering Conference***, Boston, Massachusetts. April 25-27, 2014.

18. M.J. Mitchell**,** C.A. Castellanos, M.R. King. Charged Nanomaterials Differentially Control Selectin-Mediated Adhesion and Isolation of Circulating Tumor Cells and Leukocytes Under Flow. ***IEEE 40th Northeast Bioengineering Conference***, Boston, Massachusetts. April 25-27, 2014.

17. M.J. Mitchell**,** E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation. ***Society for Biomaterials Annual Meeting***, Denver, Colorado. April 16-19, 2014.

16. M.J. Mitchell**,** D. Syracuse, C.A. Castellanos, S. Archer, M.R. King. Fabrication of Jell-O Milli-Fluidic Chips for Hands-On Education of Hemodynamics and Blood Cell Adhesion. ***American Institute of Chemical Engineers Annual Meeting***, San Francisco, California. November 3-8, 2013.

15. M.J. Mitchell**,** M.R. King. Submillisecond Pulses of Fluid Shear Stress Suppress Chemoattractant-Induced Neutrophil Activation. ***American Institute of Chemical Engineers Annual Meeting***, San Francisco, California. November 3-8, 2013.

14. M.J. Mitchell, C.A. Castellanos, M.R. King. Nanoscale Roughness and Surface Charge Control Selectin-Mediated Adhesion of Malignant and Non-Malignant Cells Under Flow. ***American Institute of Chemical Engineers Annual Meeting***, San Francisco, California. November 3-8, 2013.

13. M.J. Mitchell, E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation. ***American Institute of Chemical Engineers Annual Meeting***, San Francisco, California. November 3-8, 2013.

12. M.J. Mitchell, C.A. Castellanos, M.R. King. Nanoscale Roughness and Surface Charge Control Selectin-Mediated Adhesion of Malignant and Non-Malignant Cells Under Flow. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. September 25-28, 2013.

11. M.J. Mitchell, E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. September 25-28, 2013.

10. M.J. Mitchell**,** C.A. Castellanos, M.R. King. Differentially Charged Nanomaterials Control Selectin-Mediated Adhesion and Isolation of Cancer Cells and Leukocytes Under Flow. ***12th Annual Biological and Biomedical Sciences Conference***, Cornell University, Ithaca, New York. August 23, 2013.

9. M.J. Mitchell, C.A. Castellanos, M.R. King. Nanostructured Biomaterial Surfaces for the Delivery of Chemotherapeutics to Circulating Tumor Cells. ***10th Annual Edward A. Bouchet Conference on Diversity and Graduate Education***, Yale University, New Haven, Connecticut. April 19-20, 2013.

8. M.J. Mitchell, M.R. King. Fluid Shear Stress Increases Leukocyte Sensitivity to Platelet Activating Factor. ***Biomedical Engineering Society Annual Meeting***, Atlanta, Georgia. October 24-27, 2012.

7. M.J. Mitchell, M.R. King. Fluid Shear Stress Sensitizes Circulating Cancer Cells to Receptor-Mediated Apoptosis via Trimeric Death Receptors. ***Biomedical Engineering Society Annual Meeting***, Atlanta, Georgia. October 24-27, 2012.

6. C.A. Castellanos, M.J. Mitchell, M.R. King. Halloysite Nanotube-Targeted Drug Delivery. ***Society of Hispanic Professional Engineers National Conference***, Fort Worth, Texas. November 14-18, 2012.

5. M.J. Mitchell, M.R. King. Neutrophil Shear-Induced Resistance to Activation via the Formyl Peptide Receptor. ***American Institute of Chemical Engineers Annual Meeting***, Pittsburgh, Pennsylvania. October 28-November 2, 2012.

4. M.J. Mitchell, C.S. Chen, V. Ponmudi, A.D. Hughes, M.R. King. E-selectin Liposomal and Nanotube-Targeted Delivery of Doxorubicin to Circulating Tumor Cells. ***Biomedical Engineering Society Annual Meeting***, Hartford, Connecticut. October 12-15, 2011.

3. M.J. Mitchell, M.R. King. Neutrophil Shear-Induced Resistance to Activation via the Formyl Peptide Receptor. ***Biomedical Engineering Society Annual Meeting***, Hartford, Connecticut. October 12-15, 2011.

2. M.J. Mitchell, M.R. King. Shear-Induced Resistance to Neutrophil Activation via the Formyl Peptide Receptor. ***IEEE 37th Annual Northeast Bioengineering Conference***, Troy, New York. April 1-3, 2011.

1. M.J. Mitchell, M.R. King. Neutrophil Shear-Induced Resistance to Activation via Chemoattractant G Protein-Coupled Receptors. ***Biomedical Engineering Society Annual Meeting***, Austin, Texas. October 6-9, 2010.

CONFERENCE PRESENTATIONS (POSTER)

75. A.K. Maparu, K. Iyer, Z. Siddiqui, K. Rajagopal, J. Kim, R.L. Mauck, M.J. Mitchell, L.J. Smith. Novel Porous Microcarrier for Extended Release of mRNA-lipid Nanoparticles for Musculoskeletal Tissue Repair. ***Orthopedic Research Society Annual Meeting***, Long Beach, California. February 2-6, 2024.

74. A.S. Thatte, M.J. Mitchell. mRNA Lipid Nanoparticles for Ex Vivo Engineering of Immunosuppressive T cells for Autoimmunity Therapies. ***Immune Modulation & Engineering Symposium***, Drexel University, Philadelphia, Pennsylvania. November 29 – December 1, 2023.

73. A.E. Metzloff, M.J. Mitchell. Antigen presenting cell mimetic lipid nanoparticles for rapid mRNA CAR T cell cancer immunotherapy. ***Immune Modulation & Engineering Symposium***, Drexel University, Philadelphia, Pennsylvania. November 29 – December 1, 2023.

72. S. Teerdhala, M.S. Padilla, M.J. Mitchell. mRNA Lipid Nanoparticles for Natural Killer Cell Engineering. ***Immune Modulation & Engineering Symposium***, Drexel University, Philadelphia, Pennsylvania. November 29 – December 1, 2023.

71. A. Mansoor, Z. Siddiqui, M.J. Mitchell. Transferrin-Conjugated Ionizable Lipid Nanoparticles for the Delivery of mRNA across the Blood-Brain Barrier. ***Annual Biomedical Research Conference For Minoritized Scientists***, Seattle, Washington. November 15-18, 2023.

70. L. Xue, G. Zhao, N. Gong, X. Han, S. Shepherd, C. Warzecha, R. El-Mayta, M.G. Alameh, L. Wang, D. Weissman, A. Vaughan, J.M. Wilson, M.J. Mitchell. Combinatorial Design of Siloxane-Incorporated Lipid Nanoparticles for Tissue-Specific mRNA Therapeutic Delivery. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

69. X. Han, M.G. Alameh, N. Gong, L. Xue, D. Weissman, M.J. Mitchell. Amidine-Incorporated Degradable Lipids for Local, Systemic and Non-Liver mRNA Delivery. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

68. E.M. O'Brien, T. Tylek, A. Mukalel, M.J. Mitchell, K. Spiller. Delivery of IL-4 mRNA via lipid nanoparticles for the intracellular control of macrophage phenotype. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

67. A. Ghalsasi, H.C. Geisler, M.J. Mitchell. Antibody Targeted Lipid Nanoparticles for Selective Organ Delivery. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

66. J.O. Acosta-Gonzalez, C.G. Figueroa-Espada, M.J. Mitchell. Ionizable Lipid Nanoparticles for mRNA Delivery to Human T Cells for Enforced Homing in Bone Marrow. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

65. K. Mrksich, M.S. Padilla, M.J. Mitchell. Optimizing ionizable lipid tails for liver and non-liver delivery of mRNA lipid nanoparticles. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

64. J. Li, M.S. Padilla, M.J. Mitchell. Paving the way for CAR macrophages: a novel lipid-based therapy for enhanced glioblastoma treatment. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

63. E.H. Kim, S. Yang, M.S. Padilla, M.J. Mitchell. Developing a platform for induced pluripotent stem cell reprogramming through lipid nanoparticle-based mRNA delivery. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

62. C.G. Figueroa-Espada, M.J. Mitchell. Bone Marrow Vascular Microenvironment Combination RNAi Nanotherapy for Multiple Myeloma. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. October 11-14, 2023.

61. K.L. Swingle, M.J. Mitchell. Ionizable lipid nanoparticles for in vivo mRNA delivery to the placenta during pregnancy. ***Gordon Research Conference – Biomaterials and Tissue Engineering***, Holderness, New Hampshire. July 16-21, 2023.

60. A.G. Hamilton, M.J. Mitchell. High-throughput in vivo screening of ionizable lipid-like materials for mRNA delivery to immune cells. ***Gordon Research Conference – Biomaterials and Tissue Engineering***, Holderness, New Hampshire. July 16-21, 2023.

59. R. Palanki, M.J. Mitchell. Ionizable lipid nanoparticles for therapeutic base editing of congenital brain disease. ***Gordon Research Conference – Biomaterials and Tissue Engineering***, Holderness, New Hampshire. July 16-21, 2023.

58. K.L. Swingle, M.J. Mitchell. Ionizable lipid nanoparticles for in vivo mRNA delivery to the placenta during pregnancy. ***Gordon Research Seminar – Biomaterials and Tissue Engineering***, Holderness, New Hampshire. July 15-16, 2023.

57. A.G. Hamilton, M.J. Mitchell. High-throughput in vivo screening of ionizable lipid-like materials for mRNA delivery to immune cells. ***Gordon Research Seminar – Biomaterials and Tissue Engineering***, Holderness, New Hampshire. July 15-16, 2023.

56. R. Palanki, M.J. Mitchell. Ionizable lipid nanoparticles for therapeutic base editing of congenital brain disease. ***Gordon Research Seminar – Biomaterials and Tissue Engineering***, Holderness, New Hampshire. July 15-16, 2023.

55. C.G. Figueroa-Espada, M.J. Mitchell. Bone Marrow Vascular Microenvironment Combination RNAi Nanomaterials Therapy for Multiple Myeloma. ***Gordon Research Conference – Cancer Nanotechnology***, Waterville Valley, New Hampshire. June 11-16, 2023.

54. C.G. Figueroa-Espada, M.J. Mitchell. Bone Marrow Vascular Microenvironment Combination RNAi Nanomaterials Therapy for Multiple Myeloma. ***Gordon Research Seminar – Cancer Nanotechnology***, Waterville Valley, New Hampshire. June 11-16, 2023.

53. H.C. Geisler, A.A. Ghalsasi, M.J. Mitchell*. EGFR-targeted Lipid Nanoparticles for Selective mRNA Delivery to the Placenta. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

52. A.J. Mukalel, M.J. Mitchell*. Oxidized Lipid Nanoparticles for in situ CAR Monocyte Engineering. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

51. N. Gong, M.J. Mitchell*. In Situ PEGylation of CAR T Cells Alleviates Cytokine Release Syndrome and Neurotoxicity. ***Society for Biomaterials Annual Meeting***, San Diego, California. April 19-22, 2023.

50. E.H. Kim, M.S. Padilla, M.J. Mitchell. Developing a platform for induced pluripotent stem cell reprogramming through lipid nanoparticle-based mRNA delivery. ***AIChE Midwest Regional Conference***, Chicago, Illinois. April 11-12, 2023.

49. R.A. Joseph, A.G. Hamilton, M.J. Mitchell*. Synthesis of Barcoded mRNA for High-Throughput Nucleic Acid Delivery Screening. ***Penn CURF Fall Research Expo***, Philadelphia, Pennsylvania. September 19, 2022.

48. E. Atsavapranee, R.M. Haley, M.J. Mitchell*. Lipid nanoparticle-mediated delivery of RAS protease to inhibit cancer cell growth. ***Penn CURF Fall Research Expo***, Philadelphia, Pennsylvania. September 19, 2022.

47. K. Mrksich, M.S. Padilla, M.J. Mitchell*. Elucidating Ionizable Lipid Structural Trends for mRNA Delivery In Vivo and Ex Vivo. ***Penn CURF Fall Research Expo***, Philadelphia, Pennsylvania. September 19, 2022.

46. J. Li, A. Mukalel, M.J. Mitchell*. Co-delivery of mRNA and siRNA to achieve SIRPα knockdown, enabling macrophage-mediated phagocytosis of cancer cells. ***Penn CURF Fall Research Expo***, Philadelphia, Pennsylvania. September 19, 2022.

45. L. Xue, N. Gong, M.J. Mitchell*. Rational Design of Bisphosphonate Lipid-like Materials for mRNA Delivery to the Bone Microenvironment. ***10th mRNA Health Conference***, Boston, Massachusetts. November 8-10, 2022.

44. S. Patel, M.M. Billingsley, R. El-Mayta, A. Mukalel, H.C. Safford, M.J. Mitchell*. Bile Acid-Containing Lipid Nanoparticles For mRNA Delivery to the Gastrointestinal Tract. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

43. E. Atsavapranee, R.M. Haley, M.M. Billingsley, B. Ruan, P. Bryan, M.J. Mitchell*. Lipid nanoparticle-mediated delivery of RAS protease to inhibit cancer cell growth. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

42. X. Han, N. Gong, L. Xue, M.M. Billingsley, S.J. Shepherd, M.J. Mitchell. Ligand-Installed Lipidoids for Targeted RNA Delivery to Treat Liver Fibrosis. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

41. L. Xue, G. Zhao, N. Gong, X. Han, S.J. Shepherd, C.C. Warzecha, R. El-Mayta, M.G. Alameh, L. Wang, D. Weissman, A.E. Vaughan, J.M. Wilson, M.J. Mitchell. Structure-Guided Siloxane Lipid Nanoparticles Mediate Tissue-Specific mRNA Delivery. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 12-15, 2022.

40. M. Huang, F. Yang, D. Zhang, M. Lin, L. Pei, M.J. Mitchell, D.J. Rader, Y. Fan, Y. Gong. Vessel Normalization By Targeting Endothelial Cell Plasticity To Improve Cardiac Repair After Myocardial Infarction. ***Circulation Research***. 131:AP2001. July 31-August 3, 2022.

39. M.M. Billingsley, S. Patel, A.G. Hamilton, A.J. Mukalel, N. Gong, D. Mai, N. Sheppard, C.H. June, M.J. Mitchell. Lipid Nanoparticle Mediated mRNA Delivery for CAR T cell Engineering. ***Gordon Research Conference – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 31-August 5, 2022.

38. S.J. Shepherd, D. Weissman, J.M. Wilson, D. Issadore, M.J. Mitchell. Parallelized microfluidic device enables large scale production of lipid nanoparticles for nucleic acid delivery. ***Gordon Research Conference – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 31-August 5, 2022.

37. R.M. Haley, A. Chan, M.M. Billingsley, N. Gong, E.H. Kim, H. Wang, D. Yin, K.J. Wangensteen, A. Tsourkas, M.J. Mitchell. Lipid nanoparticles for in vivo cytosolic delivery of small protein scaffolds and efficient inhibition of Ras. ***Gordon Research Conference – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 31-August 5, 2022.

36. K.L. Swingle, W.H. Peranteau, M.J. Mitchell. Amniotic Fluid Stabilized Lipid Nanoparticles for In Utero Intra-amniotic mRNA Delivery. ***Gordon Research Conference – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 31-August 5, 2022.

35. M.M. Billingsley, S. Patel, A.G. Hamilton, A.J. Mukalel, N. Gong, D. Mai, N. Sheppard, C.H. June, M.J. Mitchell. Lipid Nanoparticle Mediated mRNA Delivery for CAR T cell Engineering. ***Gordon Research Seminar – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 30-31, 2022.

34. S.J. Shepherd, D. Weissman, J.M. Wilson, D. Issadore, M.J. Mitchell. Parallelized microfluidic device enables large scale production of lipid nanoparticles for nucleic acid delivery ***Gordon Research Seminar – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 30-31, 2022.

33. R.M. Haley, A. Chan, M.M. Billingsley, N. Gong, E.H. Kim, H. Wang, D. Yin, K.J. Wangensteen, A. Tsourkas, M.J. Mitchell. Lipid nanoparticles for in vivo cytosolic delivery of small protein scaffolds and efficient inhibition of Ras. ***Gordon Research Seminar – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 30-31, 2022.

32. K.L. Swingle, W.H. Peranteau, M.J. Mitchell. Amniotic Fluid Stabilized Lipid Nanoparticles for In Utero Intra-amniotic mRNA Delivery. ***Gordon Research Seminar – Drug Carriers in Medicine and Biology***, Mount Snow, Vermont. July 30-31, 2022.

31. S.J. Shepherd, M.J. Mitchell, D. Issadore. Parallelized microfluidic device enables large scale production of lipid nanoparticles for nucleic acid delivery. ***Singh Center for Nanotechnology Annual Meeting***, Philadelphia, Pennsylvania. October 22, 2021.

30. K.L. Swingle, M.M. Billingsley, W.H. Peranteau, M.J. Mitchell*. Amniotic Fluid Stabilized Lipid Nanoparticles for In Utero Intra-amniotic mRNA Delivery. ***Biomedical Engineering Society Annual Meeting***, October 6-9, 2021.

29. S. Patel, M.M. Billingsley, X. Han, N. Gong, C. Frazee, K.L. Swingle, M.J. Mitchell*. Hydroxycholesterol Substitution in Ionizable Lipid Nanoparticles for mRNA Delivery to T Cells. ***Biomedical Engineering Society Annual Meeting***, October 6-9, 2021.

28. M.M. Billingsley, S. Patel, A. Hamilton, N. Singh, P. Ravikumar, C.H. June, M.J. Mitchell*. Lipid Nanoparticle Mediated mRNA Delivery for CAR T cell Engineering. ***Biomedical Engineering Society Annual Meeting***, October 6-9, 2021.

27. E.H. Kim, M.J. Mitchell*. DARPin Delivery Using Ionizable Lipid Nanoparticles. ***Penn CURF Fall Research Expo***, Philadelphia, Pennsylvania. September 14, 2021.

26. A. Hubsch, C. Figueroa-Espada M.J. Mitchell*. Ionizable Lipid Nanoparticle Mediated mRNA Delivery to Multiple Myeloma Cells. ***Penn CURF Fall Research Expo***, Philadelphia, Pennsylvania. September 14, 2021.

25. M.M. Billingsley, N. Singh, C. June, M.J. Mitchell. Ionizable Lipid Nanoparticle Mediated mRNA Delivery for Human CAR T Cell Engineering. ***Penn Bioengineering Graduate Symposium***, Philadelphia, Pennsylvania. January 12, 2021. *Virtual

24. M.M. Billingsley, N. Singh, C. June, M.J. Mitchell. Ionizable Lipid Nanoparticle Mediated mRNA Delivery for Human CAR T Cell Engineering. ***Center for Targeted Therapeutics and Translational Nanomedicine Annual Symposium***, Philadelphia, Pennsylvania. December 4, 2019.

23. R. El-Mayta, R. Zhang, L. Wang, J.M. Wilson, M.J. Mitchell. Ionizable Lipid Nanoparticles Encapsulating Barcoded mRNA for Accelerated In Vivo Delivery Screening. ***Center for Targeted Therapeutics and Translational Nanomedicine Annual Symposium***, Philadelphia, Pennsylvania. December 4, 2019.

22. S. Shepherd, S. Yadavali, M.J. Mitchell, D. Issadore. Clinical Scale Production for Nucleic Acid Delivery via Microfluidic Device. ***Center for Targeted Therapeutics and Translational Nanomedicine Annual Symposium***, Philadelphia, Pennsylvania. December 4, 2019.

21. S. Shepherd, S. Yadavali, M.J. Mitchell, D. Issadore. Parallelized microfluidic device enables large scale production of lipid nanoparticles for nucleic acid delivery. ***Singh Center for Nanotechnology Annual Meeting***, Philadelphia, Pennsylvania. October 28, 2019.

20. A. Hamilton, M.M. Billingsley, M.J. Mitchell. Engineering lipid nanoparticles for T cell delivery. ***Biomedical Engineering Society Annual Meeting***, Philadelphia, Pennsylvania. October 16-19, 2019.

19. M.M. Billingsley, A. Hamilton, M.J. Mitchell. Engineering lipid nanoparticles for T cell delivery. ***Drexel Symposium on Immune Modulation and Engineering***, Philadelphia, Pennsylvania. October 16, 2019.

18. M.J. Mitchell. Biomaterials for genetic engineering of the bone marrow niche for multiple myeloma therapy. ***Gordon Research Conference – Biomaterials and Tissue Engineering***, Barcelona, Spain. July 28-August 2, 2019.

17. R.S. Riley, P.P.G. Guimaraes, T. Tammela, M.J. Mitchell. Potent in vivo lung cancer Wnt signaling inhibition via cyclodextrin-LGK974 inclusion complexes. ***Gordon Research Conference – Cancer Nanotechnology***, Mount Snow, Vermont. July 23-28, 2019.
**Awards: Best Poster Award to Rachel Riley, Penn BE Postdoctoral Fellow

16. M.J. Mitchell. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Niche via Nanoparticle-Mediated RNAi. ***Controlled Release Society Annual Meeting***, New York, New York. July 21-25, 2018.

15. M.J. Mitchell, P. Guimaraes, M. Tan, R. Langer. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Niche via Nanoparticle-Mediated RNAi. ***Cellular and Molecular Bioengineering Conference***, Key Largo, Florida. January 2-6, 2018.

14. M.J. Mitchell, P. Guimaraes, M. Tan, R. Langer. In Vivo Nanoparticle-Mediated RNAi in Bone Marrow Enhances Hematopoietic Stem Cell Harvesting. ***Controlled Release Society Annual Meeting***, Boston, Massachusetts. July 16-19, 2017.

13. M.J. Mitchell, R. Langer. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Microenvironment In Vivo via Nanoparticle-Mediated RNAi. ***Gordon Research Conference on Cancer Nanotechnology,*** Mount Snow, Vermont. June 19, 2017.

12. M.J. Mitchell, R. Langer. Disrupting Physical Interactions Between Multiple Myeloma and the Bone Marrow Microenvironment In Vivo via Nanoparticle-Mediated RNAi. ***Gordon Research Seminar on Cancer Nanotechnology,*** Mount Snow, Vermont. June 18, 2017.

11. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Receptor-Mediated Apoptosis. ***Gordon Research Conference on Drug Carriers in Medicine and Biology,*** Waterville Valley, New Hampshire. August 7-12, 2016.

10. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Receptor-Mediated Apoptosis. ***Gordon Research Conference on Biointerface Science,*** Les Diablerets, Switzerland. June 12-17, 2016.

9. M.J. Mitchell, A. Chung, J. Webster, O.F. Khan, R. Langer. Polymeric Mechanical Amplifiers of Tumor Cell Receptor-Mediated Apoptosis. ***New England Science Symposium***, Boston, Massachusetts. April 3, 2016.

8. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Receptor-Mediated Apoptosis. ***13th US-Japan Symposium on Drug Delivery Systems,*** Lahaina, Maui, Hawaii. December 16-20, 2015.

7. M.J. Mitchell, E.C. Wayne, C.B. Schaffer, M.R. King. Cell Surface Engineering of Immune Cells to Kill Cancer Cells in the Circulation. ***Gordon Research Conference on Biomaterials and Tissue Engineering,*** Girona, Spain. July 19-24, 2015.

6. N. Comandante, M.J. Mitchell, R. Langer. Targeted siRNA Delivery To Bone Marrow Endothelial Cells Using Polymeric Nanoparticles For Bone Metastasis Inhibition. ***Biomedical Engineering Society (BMES) Annual Meeting,*** Tampa, Florida. October 7-10, 2015.

5. M.J. Mitchell, R. Langer. Polymeric Mechanical Amplifiers of Tumor Cell Mechanotransduction and Cell Death. ***Biomedical Engineering Society (BMES) Annual Meeting,*** Tampa, Florida. October 7-10, 2015.

4. M.J. Mitchell, C.A. Castellanos, M.R. King. Immobilized Surfactant-Nanotube Complexes Support Selectin-Mediated Capture of Viable Circulating Tumor Cells in the Absence of Capture Antibodies. ***Society for Biomaterials (SFB) Annual Meeting,*** Charlotte, North Carolina. April 14-18, 2015. *Society for Biomaterials Award Winner for Outstanding Ph.D. Research.

3. D. Zhou, F. Bordeleau, J. Kohn, A. Zhou, B.N. Mason, M.J. Mitchell, M.R. King, C.A. Reinhart-King. Crosstalk of Physiological Mechanical Cues in Endothelial Cell Signaling. ***Biomedical Engineering Society Annual Meeting***, San Antonio, Texas. October 22-25, 2014.

2. M.J. Mitchell, M.R. King. Submillisecond Pulses of Fluid Shear Stress Suppress Chemoattractant-Induced Neutrophil Activation. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. September 25-28, 2013.

1. T.M. Cao, M.J. Mitchell**,** J.L. Liesveld, M.R. King. Stem Cell Enrichment with Selectin Receptors: Mimicking the pH Environment of Trauma. ***Biomedical Engineering Society Annual Meeting***, Seattle, Washington. September 25-28, 2013.

OTHER PRESENTATIONS

23. M.J. Mitchell**,** A. Chung, R. Langer. Polymeric Mechanical Amplifiers of Receptor-Mediated Apoptosis. ***David H. Koch Institute for Integrative Cancer Research Annual Retreat,*** North Falmouth, Massachusetts. November 2, 2015.

22. M.J. Mitchell**,** E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation. ***Upstate New York Health Sciences Symposium & Technology Showcase on Cancer Biology and Neurobiology***, Ithaca, New York. May 6, 2014.

21. M.J. Mitchell**,** E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation. ***5th Annual Physical Sciences-Oncology Centers Network Investigator's Meeting***, Bethesda, Maryland. April 1-4, 2014.

20. M.J. Mitchell**,** C.A. Castellanos, M.R. King. Differentially Charged Nanomaterials Control Selectin-Mediated Adhesion and Isolation of Cancer Cells and Leukocytes Under Flow. ***National Cancer Institute (NCI) Physical Sciences-Oncology Center (PSOC) Site Visit***, Cornell University, Ithaca, New York. December 17, 2013.

19. M.J. Mitchell**,** E.C. Wayne, K. Rana, C.B. Schaffer, M.R. King. Unnatural Killer Cells: TRAIL-coated Leukocytes that Kill Cancer Cells in the Circulation. ***7th Annual Cornell Technology Venture Forum***, Ithaca, New York. October 24, 2013.

18. K.S. Lin, M.J. Mitchell, M.R. King. Fluid Shear Stress Increases Leukocyte Sensitivity to Platelet Activating Factor. ***11th Annual Cornell University BioExpo***, Ithaca, New York. March 14, 2013.

17. M.J. Mitchell. Nanostructured Biomaterial Surfaces for the Isolation of Patient CTCs and Delivery of Therapeutics to Circulating Cancer Cells. ***Guest Lecture, BME 5600: Biotransport & Drug Delivery***. March 13, 2013.

16. M.J. Mitchell. Non-linear Model Regression and Optimization. Guest Lecture, ***BME 5400: Biomedical Computation***. October 15, 2012.

15. M.J. Mitchell. Numerical Integration of Ordinary Differential Equations. ***Guest Lecture, BME 5400: Biomedical Computation***. October 5, 2012.

14. M.J. Mitchell. Fluid Shear Stress Sensitizes Circulating Tumor Cells to Receptor-Mediated Apoptosis. ***Annual Cornell Biomedical Engineering Society Summer Retreat***, Ithaca, New York. August 18, 2012.

13. M.J. Mitchell, M.R. King. E-selectin Liposomal and Nanotube-Targeted Delivery of Chemotherapeutics to Cancer Cells in the Circulation. ***Guest Lecture, BME 5600: Biotransport & Drug Delivery***. March 14, 2012.

12. M.J. Mitchell. Overview of probability and statistics. Guest Lecture, ***BME 5400: Biomedical Computation***. September 15, 2011.

11. M.J. Mitchell. Fundamentals of linear algebra. Guest Lecture, ***BME 5400: Biomedical Computation***. September 10, 2011.

10. M.J. Mitchell, M.R. King. Neutrophil Mechanotransduction via the Formyl Peptide Receptor. ***Annual Cornell Biomedical Engineering Society Summer Retreat***, Ithaca, New York. August 17, 2011.

9. M.J. Mitchell, M.R. King. Shear-Induced Resistance to Neutrophil Activation via G Protein-Coupled Receptors. ***Annual Cornell Biomedical Engineering Society Summer Retreat***, Ithaca, New York. August 19, 2010.

8. M.J. Mitchell, M.R. King. Shear-Induced Resistance to Neutrophil Activation via G Protein-Coupled Receptors. ***Cornell Engineering Research Conference***, Ithaca, New York. March 17, 2010.

7. A. Grimes, N. Migliore, M.J. Mitchell, J. Sweetgall. Effects of Portable, Manually Powered Ultraviolet Water Treatment. ***International Society of Pharmaceutical Engineering Annual Meeting***, San Diego, California. November 8-11, 2009.

6. A. Grimes, N. Migliore, M.J. Mitchell, J. Sweetgall. Effects of Portable, Manually Powered Ultraviolet Water Treatment. ***International Society of Pharmaceutical Engineering – New Jersey Chapter Meeting***, Newark, New Jersey. April 2009.

5. A. Grimes, N. Migliore, M.J. Mitchell, J. Sweetgall. Effects of Portable, Manually Powered Ultraviolet Water Treatment. ***IEEE 35th Annual Northeast Bioengineering Conference***, Boston, Massachusetts. April 3-5, 2009.

4. A. Grimes, N. Migliore, M.J. Mitchell, J. Sweetgall. Effects of Portable, Manually Powered Ultraviolet Water Treatment. ***Stevens Research and Entrepreneurship Day***, Hoboken, New Jersey. April 2009.

3. H. Qiu, R. Halder, J.D. Meyer, J.H. Lee, A. Ihnen, Y. Wang, Y. Gu, T. Boyd, M.J. Mitchell, W.Y. Lee. Microfluidics and Self-Assembly. ***Stevens Research and Entrepreneurship Day***, Hoboken, New Jersey. April 2009.

2. A. Grimes, N. Migliore, M.J. Mitchell, J. Sweetgall. Effects of Portable, Manually Powered Ultraviolet Water Treatment. ***Stevens Senior Design Day***, Hoboken, New Jersey. April 2009.

1. M.J. Mitchell, W.Y. Lee. Novel Methods to Measure Biofilm Adhesion Strength to Biomedical Implant Surfaces. ***Technogenesis Scholars Symposium***, Hoboken, New Jersey. August 2008.

RESEARCH GROUP - CURRENT

Current trainees mentored: 38 (12 Postdoctoral Fellows, 15 PhD Students, 1 Research Technician, 10 Undergraduate Students)

Total trainees mentored: 77 (19 Postdoctoral Fellows, 18 PhD Students, 6 MS Students, 4 Research Technicians, 30 Undergraduate Students)

Postdoctoral Fellows:

1. **Dr. Lulu Xue** (Ph.D., Leibniz Institute for New Materials, Germany), Bioengineering 2021 – Present
   Awards: SFB Postdoctoral Research Competition, Honorable Mention

2. **Dr. Marshall Padilla** (Ph.D., University of Wisconsin), Bioengineering 2021 – Present
   Awards: NIH NIDCR T90 Fellowship
   2023 Mind the Future Program, AADOCR
   2023 Bloc Travel Award, AADOCR
   2023 Hatton Award Finalist, AADOCR
   SFB Postdoctoral Research Competition, 3rd Place
   2024 Bloc Travel Award, AADOCR
   Penn Institute for RNA Innovation Travel Award

3. **Dr. Dongyoon Kim** (Ph.D., Seoul National University), Bioengineering 2022 – Present

4. **Dr. Junchao Xu** (Ph.D., Chinese Academy of Sciences), Bioengineering 2022 – Present

5. **Dr. Il-Chul Yoon** (Ph.D., Imperial College London), Bioengineering 2022 – Present

6. **Dr. Jeongeun Shin** (Ph.D., University of Minnesota, Twin Cities), Bioengineering 2022 – Present

7. **Dr. Zain Siddiqui** (Ph.D., New Jersey Institute of Technology), Bioengineering 2023 – Present
   Awards: NIH NIDCR T90 Fellowship

8. **Dr. Qiangqiang Shi** (Ph.D., University of Sci and Tech of China), Bioengineering 2023 – Present

9. **Dr. Adele Ricciardi** (M.D. Ph.D., Yale University), Bioengineering 2023 – Present

10. **Dr. Jinjin Wang** (Ph.D., Chinese Academy of Sciences), Bioengineering 2024 – Present

11. **Dr. Ye Zeng** (Ph.D., Leiden University), Bioengineering 2024 – Present

12. **Dr. Melgious Ang** (Ph.D., National University of Singapore), Bioengineering 2024 – Present
    Awards: A*STAR International Fellowship

PhD Students:

13. **Alvin Mukalel** (B.S., Vanderbilt University), Bioengineering 2018 – Present
    Awards: NSF Graduate Research Fellowship

14. **Christian Figueroa-Espada** (B.S., University of Puerto Rico), Bioengineering 2019 – Present
    Awards: NIH NCI F99/K00 Predoctoral to Postdoctoral Fellow Transition Award
    NSF Graduate Research Fellowship
    GEM Fellowship
    Fontaine Fellowship
    Hispanic Scholarship Fund Fellowship
    Selected Participant, NextProf Future Faculty Workshop
    Carl Storm Underrepresented Minority Fellowship, Gordon Research Conference
    GAPSA Travel Award, University of Pennsylvania
    PRISM Program, Stanford University

15. **Rebecca Haley** (B.S., Case Western Reserve University), Bioengineering 2020 – Present
    Awards: NSF Graduate Research Fellowship
    STAR Award, Society for Biomaterials
    GAPSA Travel Award, University of Pennsylvania

16. **Kelsey Swingle** (B.S. Case Western Reserve University), Bioengineering 2020 – Present
    Awards: NSF Graduate Research Fellowship
    Ashton Fellowship, University of Pennsylvania
    STAR Award, Society for Biomaterials
    GAPSA Travel Award, University of Pennsylvania
    Penn Institute for RNA Innovation Travel Award

17. **Alex Hamilton** (B.S. University of Oklahoma), Bioengineering 2020 – Present
    Awards: NSF Graduate Research Fellowship
    STAR Award, Society for Biomaterials
    Rapid Fire Talk Finalist, Gordon Research Conference

18. **Rohan Palanki** (B.S., Rice University), Bioengineering M.D. Ph.D. Student 2020 – Present
    Awards: Ruth L. Kirschstein NHLBI F30 Fellowship, National Institutes of Health
    STAR Award Honorable Mention, Society for Biomaterials
    Meritorious Abstract Travel Award, American Society for Gene and Cell Therapy
    Penn Institute for RNA Innovation Travel Award

19. **Ann Metzloff** (B.S. Cornell University), Bioengineering 2021 – Present
    Awards: NSF Graduate Research Fellowship
    Ashton Fellowship, University of Pennsylvania

20. **Hannah Safford** (B.S. Brown University), Bioengineering 2021 – Present
    Awards: NSF Graduate Research Fellowship
    GAPSA Travel Award, University of Pennsylvania
    STAR Award Honorable Mention, Society for Biomaterials

21. **Hannah Geisler** (B.S. University of Pittsburgh), Bioengineering 2021 – Present
    Awards: NSF Graduate Research Fellowship
    Ashton Fellowship, University of Pennsylvania

22. **Ajay Thatte** (B.S. University of Texas at Austin), Bioengineering 2022 – Present
    Awards: NSF Graduate Research Fellowship

23. **Emily Han** (B.S. Massachusetts Institute of Technology), Bioengineering 2022 – Present
    Awards: NSF Graduate Research Fellowship

24. **Andrew Hanna** (B.S. Vanderbilt University), Bioengineering 2023 – Present
    Awards: NSF Graduate Research Fellowship

25. **Hannah Yamagata** (B.S. Johns Hopkins University), Bioengineering 2023 – Present
    Awards: NSF Graduate Research Fellowship

26. **Amanda Murray** (B.S. Clemson University), Bioengineering 2023 – Present
    Awards: NSF Graduate Research Fellowship

27. **Sofia Dias** (B.S. University of Porto), Bioengineering 2024 – Present
    Awards: Fulbright Fellowship

Lab Administrator:

28. **Briyanna Hymms** (B.S., Drexel University), Bioengineering 2022 – Present

Undergraduate Students:

29. **Emily Kim**, Chemical and Biomolecular Engineering 2021 – Present
    Awards: James Clark Scholar
    PURM Fellowship
    2nd Place, AIChE Midwest Regional Conference Poster Competition

30. **Matthew Jester**, Bioengineering 2021 – Present
    Awards: PURM Fellowship

31. **Jacqueline Li**, Bioengineering 2021 – Present
    Awards: PURM Fellowship

32. **Kaitlin Mrksich**, Bioengineering 2021 – Present

Awards: Society for Biomaterials Award for Outstanding Undergraduate Research
PURM Fellowship

33. **Ryann Joseph**, Bioengineering 2022 – Present
Awards: PURM Fellowship

34. **Sridatta Teerdhala**, Biology 2022 – Present

35. **Aditi Ghalsasi**, Bioengineering 2022 – Present
Awards: PURM Fellowship

36. **Ben Nachod**, Bioengineering 2023 – Present
Awards: Rachleff Scholar, University of Pennsylvania
Vagelos Undergraduate Research Grant

37. **Cecilia Shuler**, Biophysics 2023 – Present

38. **Sophia Tang**, Bioengineering 2023 – Present

RESEARCH GROUP ALUMNI AND PRIOR ADVISEES

Alumni – Postdoctoral Fellows

Dr. Xuexiang Han (Ph.D., Tsinghua University), Bioengineering 2020 – 2024
Project: "Combinatorial synthesis of lipid-like materials for mRNA therapeutics and vaccines"
Current Position: Professor, Shanghai Institute of Biochemistry & Cell Biology, Chinese Academy of Sciences
Awards: Penn Institute for RNA Innovation Travel Award

Dr. Ningqiang Gong (Ph.D., Tsinghua University), Bioengineering 2019 – 2023
Project: "Delivery technologies for cancer immunotherapy"
Current Position: Professor, University of Science and Technology of China
Awards: BMES Burroughs Young Investigator Award

Dr. Jingya Qin (Ph.D., University of Delaware), Bioengineering 2021 – 2022
Project: "Ionizable lipid-peptide nanomaterials for targeted mRNA delivery"
Current Position: Research Scientist, Spark Therapeutics

Dr. Rachel Riley (Ph.D., University of Delaware), Bioengineering 2018 – 2020
Project: "Ionizable lipid nanoparticles for *in utero* mRNA delivery"
Current Position: Assistant Professor of Biomedical Engineering, Rowan University
Awards: Ruth L. Kirschstein NCI F32 Fellowship, National Institutes of Health
Ruth L. Kirschstein NHLBI T32 Fellowship, National Institutes of Health
Best Poster, 2019 Gordon Research Conference on Cancer Nanotechnology

Dr. Rui Zhang (Ph.D., University of Missouri) Bioengineering 2018 – 2019
Project: "Barcoded mRNA lipid nanoparticles for accelerated in vivo delivery screening"
Current Position: Director, Stylus Medicine

Dr. Pedro Guimarães (Ph.D., Universidade Federal de Minas Gerais) Bioengineering 2018 – 2019
Project: "Bone marrow-targeted RNAi therapeutics"
Current Position: Assistant Professor of Biophysics, Universidade Federal de Minas Gerais

Dr. Mingchee Tan (Ph.D., Cornell University) Bioengineering 2018 – 2019

Project: “Polymer-lipid nanoparticles for mRNA liver delivery”
Current Position: Principal Scientist, GenEdit

PhD Students

Dr. Sarah Shepherd (B.S., Washington State University), Bioengineering 2018 – 2023
Thesis: “Parallelized microfluidics for scalable mRNA and siRNA lipid nanoparticle formulation”
Current Position: TBD
Awards: NSF Graduate Research Fellowship
Fontaine Fellowship, University of Pennsylvania
Ford Foundation Fellowship Honorable Mention
STAR Award, Society for Biomaterials
GAPSA Travel Award, University of Pennsylvania
Etter Award, American Crystallographic Association

Dr. Margaret Billingsley (B.S., University of Delaware), Bioengineering 2018 – 2022
Thesis: “Ionizable lipid nanoparticles for CAR T cell engineering”
Current Position: Postdoctoral Fellow, Hammond Lab, MIT
Awards: Ruth L. Kirschstein NCI F32 Fellowship, National Institutes of Health
Ruth L. Kirschstein NIAID T32 Fellowship, National Institutes of Health
Tau Beta Pi Graduate Research Fellowship
NSF Graduate Research Fellowship Honorable Mention
STAR Award, Society for Biomaterials
Best Poster Award, Gordon Research Conference on Drug Carriers in Medicine and Biology
Elected Chair, Gordon Research Seminar on Drug Carriers in Medicine and Biology
Federation of Clinical Immunology Societies (FOCIS) Travel Award
Solomon R. Pollack Award for Excellence in Graduate Bioengineering Research

Dr. Kamila Butowska (Ph.D., University of Gdansk) Bioengineering 2020 – 2022
Thesis: “Doxorubicin tethered siRNA lipid nanoparticles for combination cancer therapy”
Current Position: Postdoctoral Fellow, Dowdy Lab, University of California, San Diego
Awards: NAWA Graduate Research Fellowship

Rotating PhD Students

Rohin Maganti (B.S., Duke University), Bioengineering M.D./Ph.D. Student 2022
Current Position: Rotation Student, University of Pennsylvania

Maria Merolle (B.S., University of Chicago), Immunology M.D./Ph.D. Student 2022
Current Position: Rotation Student, University of Pennsylvania

Michaela Helble (B.S., Dartmouth College), Cellular and Molecular Biology 2020
Current Position: PhD Student, Kulp Lab, University of Pennsylvania

Ai Mochida (B.S., Cornell University), Bioengineering 2020
Current Position: PhD Student, Hammer Lab, University of Pennsylvania

Matthew Aronson (B.S., Penn State University), Bioengineering 2020
Current Position: PhD Student, Gottardi Lab, CHOP

Puneeth Guruprasad (B.S., Georgia Institute of Technology), Bioengineering 2019
Current Position: PhD Student, Ruella Lab, University of Pennsylvania

David Mai (B.S., University of California-Berkeley), Bioengineering 2019
Current Position: PhD Student, June Lab, University of Pennsylvania

Master's Students

Jingcheng Xu (B.S., Fudan University), Biotechnology 2022 – 2023
Project: "RNA lipid nanoparticles for treating liver fibrosis"
Current Position: PhD Student, Brown University

Xisha Huang (B.S., Nanyang Technological University), Materials Engineering 2021 – 2022
Project: "Nanomaterials for reducing T cell exhaustion"
Current Position: Research Assistant, Brigham and Women's Hospital

Hanwen Zhang (B.S., Case Western Reserve University), Bioengineering 2020 – 2022
Project: "Rational design of anti-inflammatory lipid nanoparticles for mRNA delivery"
Current Position: Research Technician, University of Pennsylvania

Zijing (Helen) Zhang (B.S., New York University), Bioengineering 2020
Project: "Nanoparticles for Natural Killer Cell Engineering"
Current Position: Master's student, University of Pennsylvania

Carlos Castellanos (M.S., Cornell University) Biomedical Engineering 2012 – 2014
Project: "Nanostructured Surfaces to Target and Kill Cancer Cells while Repelling Leukocytes."
Current Position: Co-Founder, Bioforce Inc.

Zhexiao Wang (M.S., Cornell University) Biomedical Engineering 2012 – 2013
Project: "Role of Nuclear Envelope Composition in Tumor Cell Resistance to Fluid Shear Stress."
Current Position: PhD Student, China

Research Technicians

Rakan El-Mayta (B.S., UMBC), Chemical Engineering 2018 – 2023
Project: "High-throughput in vivo screening of lipid nanoparticles"
Current Position: PhD Student, Weissman Lab, University of Pennsylvania
Awards: NSF Graduate Research Fellowship

Amanda Chung (B.S., University of New England) Biology 2014 – 2017
Project: "Immune Cytokine-Mediated Apoptosis Using Polymeric Mechanical Amplifiers."
Current Position: PhD Student, UCSF
Awards: NSF Graduate Research Fellowship

Dr. Jamie Webster (Ph.D., Harvard University) Molecular Biology and Genetics 2015 – 2016
Project: "Polymeric Mechanical Amplifiers of Tumor Cell Therapeutic Efficacy."
Current Position: Postdoctoral Associate, MIT

Medical Students

Sue Yan (B.S., King's College London) Biomedical Engineering Summer 2012
Project: "Submillisecond Pulses of Fluid Shear Stress Suppress Neutrophil Activation."
Current Position: Medical Student, King's College London

Visiting Scientists

Stavroula Sofou (Associate Professor, Rutgers University) Biomedical Engineering 2015 – 2016
Project: "Patterned Membrane Tethering of Immune Cytokines to Enhance Tumor Death."
Current Position: Professor, Johns Hopkins University

Undergraduate Students

Savan Patel, Bioengineering 2019 – 2023
Project: "Cholesterol analogs to augment mRNA LNP delivery to T cells"
Current Position: PhD Student, Harvard-MIT HST PhD Program
Awards: NSF Graduate Research Fellowship
Tau Beta Pi Fellowship
Penn Bioengineering Senior Design Award
Rose Award for Outstanding Undergraduate Research, University of Pennsylvania
Hertz Foundation Fellowship Finalist
C. William Hall Scholarship, Society for Biomaterials
BMES-Medtronic Design Competition Finalist
Wharton Undergraduate Healthcare Club Pitch Competition 1st Place
Wharton Risk Management: Insurtech Prize
Penn Y-Prize Competition 2022 Winner

Ella Atsavapranee, Bioengineering 2020 – 2023
Project: "Lipid nanoparticles for RAS protease delivery to tumor cells"
Current Position: Fulbright Fellow, Swiss Federal Institute of Technology Lausanne (EPFL)
Awards: Fulbright Fellowship
Rose Award for Outstanding Undergraduate Research, University of Pennsylvania
Littlejohn Undergraduate Research Fellowship
PURM Fellowship
Penn CURF Research Grant Award
Vagelos Undergraduate Research Grant
Blair Undergraduate Research Fellowship
2022 Jumpstart for Juniors Grant

Joshua Acosta González, University of Puerto Rico Mayaguez, Chemical Engineering Summer 2023
Project: "mRNA lipid nanoparticles for improved CAR T cell homing to bone marrow."
Current Position: Undergraduate Student, University of Puerto Rico Mayaguez
Awards: Penn CEMB REU Fellowship

Nico Johnson, Ohio State University, Biomedical Engineering Summer 2023
Project: "Targeted lipid nanoparticles for mRNA delivery to the brain."
Current Position: Undergraduate Student, Ohio State University
Awards: Penn LRSM REU Fellowship

Aisha Mansoor, Rutgers University, Chemical Biology Summer 2023
Project: "Transferrin-functionalized lipid nanoparticles for targeted mRNA delivery."
Current Position: Undergraduate Student, Rutgers University
Awards: Penn LRSM REU Fellowship

Michael North, Bioengineering Summer 2023
Project: "mRNA lipid nanoparticles for multiple myeloma therapy"
Current Position: Undergraduate Student, University of Pennsylvania
Awards: Penn FERS SEAS Fellowship

Seth Thayumanavan, Chemical and Biomolecular Engineering 2021 – 2023
Project: "Microfluidic scaleup of mRNA and siRNA lipid nanoparticles"
Current Position: Undergraduate Student, University of Pennsylvania

Caitlin Frazee, Bioengineering 2021 – 2022
Project: "Cholesterol analogs for mRNA delivery to immune cells"
Current Position: PhD Student, University of Pennsylvania

Andres Hubsch, Bioengineering 2021 – 2022
Project: "siRNA lipid nanoparticles for multiple myeloma therapy"
Current Position: Undergraduate Student, University of Pennsylvania
Awards: PURM Fellowship

Yuzheng (George) Feng, University of Pennsylvania, Bioengineering 2019 – 2021
Project: "High-throughput screening of lipid nanoparticles"
Current Position: Analyst, TCG X

Julia Yan, University of Pennsylvania, Materials Science and Engineering 2018 – 2020
Project: "Lipid-like nanomaterials for multiple myeloma therapy."
Current Position: Co-Founder and CEO, Baleena
Awards: Blair Fellowship

Alex Hamilton, University of Oklahoma, Biomedical Engineering (LRSM NSF REU) Summer 2019
Project: "Lipid-like nanomaterials for T-cell delivery."
Current Position: PhD Student, Mitchell Lab, University of Pennsylvania
Awards: LRSM NSF-REU Fellowship, Goldwater Scholarship

Nicole Wojnowski (University of Pennsylvania) Bioengineering 2018 – 2019
Project: "Lipid-like nanomaterials for T-cell delivery."
Current Position: Undergraduate Researcher, Gottardi Lab, CHOP/Penn Medicine

Stephanie Gaglione (B.S., University of Toronto) Chemical Engineering 2015 – 2016
Project: "Lipid-like nanomaterials for bone marrow delivery."
Current Position: PhD Student, MIT

Natacha Lou Comandante (B.S., University of Washington) Chemical Engineering Summer 2015
Project: "Polymeric nanoparticles for siRNA delivery to bone marrow endothelial cells."
Current Position: PhD Student, University of Michigan

Maxine Chan (B.S., Cornell University) Biological Engineering 2013 – 2014
Project: "Circulating tumor cell resistance to fluid shear stress."
Current Position: Resident Physician, Duke University

Ryan Ashley (B.S., Cornell University) Biological Engineering 2012 – 2014
Project: "Red blood cell adhesion in capillaries via increased expression of Lu/BCAM"
Current Position: MD PhD Student, Northwell Health

Dennis Zhou (B.S., Cornell University) Biological Engineering 2011 – 2013
Project: "Effect of fluid shear stress and substsrate stiffness on endothelial cell phenotype."
Current Position: PhD, Georgia Tech; Medical Student, Vanderbilt University
Awards: NSF Graduate Research Fellowship

Ana Steen (B.S., Bucknell University) Chemical Engineering Summer 2011
Project: "Shear-induced sensitization to neutrophil activation via the platelet activating factor receptor."
Current Position: Graduate Student, Purdue University

Kimberly Lin (B.S., Cornell University) Biological Engineering 2010 – 2012
Project: "L-selectin shedding and Beta-2 integrin activation in differentiated HL60 cells."
Current Position: Medical Student, University of Pittsburgh

High School Teachers

David Syracuse (BOCES High School, Ithaca NY) 2012 – 2013
Project: "Effects of leukotriene B4 on neutrophil shear-induced activation."
Current Position: High School Teacher, BOCES High School

DEPARTMENTAL AND UNIVERSITY SERVICE

Committees

2024 Penn SEAS Center for Precision Engineering for Health, Faculty Search Committee
2024 Chair, Penn BE Faculty Search Committee
2024 Penn BE Seminar Committee
2023 Penn SEAS Center for Precision Engineering for Health, Faculty Search Committee
2023 Penn BE Faculty Search Committee
2023 Penn BE Seminar Committee
2022 Penn SEAS Center for Precision Engineering for Health, Faculty Search Committee
2022 Penn BE Faculty Search Committee
2022 Penn BE Seminar Committee
2021 Penn SEAS Center for Precision Engineering for Health, Faculty Search Committee
2021 Penn SEAS Long Range Plan Research Visioning Committee
2021 Penn BE Faculty Search Committee
2021 Penn BE Seminar Committee
2020 Penn BE Faculty Search Committee
2020 Penn BE Seminar Committee
2020 Penn BE Graduate Admissions Committee
2019 Penn BE Student Climate Committee
2019 Penn BE Graduate Admissions Committee
2018 Penn BE Social Media Committee
2018 Penn BE Graduate Admissions Committee

Postdoctoral Fellow Committees

Kathryn Wofford, PhD (Cullen Laboratory, Penn BE Postdoctoral Fellow, F32 Mentor) 2020 - Present

PhD Thesis Committees

Mosha Deng (Riley Laboratory, Penn BE PhD Candidate) 2024 – Present
Hannah Lawless (Zhang Laboratory, UAB BME PhD Candidate 2024 – Present
Thomas Malachowski (Cremins Laboratory, Penn BE PhD Candidate) 2023 – Present
Carolann Espy (Brenner Laboratory, Penn Pharmacology PhD Candidate) 2023 – Present
Serena Omo-Lamai (Brenner Laboratory, Penn BE PhD Candidate) 2023 – Present
Yu (Jen) Gu (Hammer Laboratory, Penn CBE PhD Candidate) 2021 – Present
Selen Uman (Burdick Laboratory, Penn BE MD/PhD Candidate) - Chair 2020 – 2022
Victoria Muir (Burdick Laboratory, Penn BE PhD Candidate) - Chair 2020 – 2022
Wisberty Gordian-Velez (Cullen Laboratory, Penn BE PhD Candidate) - Chair 2019 – 2022
Henry Hejia Wang (Tsourkas Laboratory, Penn BMB MD/PhD Candidate) 2019 – 2020

PhD Qualification Exam Committees

Hannah Yamagata (Penn BE) 2024
Amanda Murray (Penn BE) 2024
Andrew Hanna (Penn BE) 2024
Emily Han (Penn BE) 2023
Joanne Baek (Penn BE) 2023
Aria Huang (Penn BE) 2022
Ryan Friedman (Penn BE) 2022
Ann Metzloff (Penn BE) 2022
Hannah Safford (Penn BE) 2022
Hannah Geisler (Penn BE) 2022
Ajay Thatte (Penn BE) 2022

Alex Hamilton (Penn BE)	2021
Rohan Palanki (Penn BE)	2021
Kelsey Swingle (Penn BE)	2021
Jesse Weber (Penn CAMB)	2021
Serena Omo-Lamai (Penn BE)	2021
Karen Xu (Penn BE)	2021
Nikolas Di Caprio (Penn BE)	2021
Dylan Schaff (Penn BE)	2020
Rebecca Haley (Penn BE)	2020
Christian Figueroa-Espada (Penn BE)	2020
Isabel Navarro (Penn BE)	2020
Catherine Porter (Penn BE)	2019
John Viola (Penn BE)	2019
Alvin Mukalel (Penn BE)	2019
Sarah Shepherd (Penn BE)	2019
Margaret Billingsley (Penn BE)	2019

Panels

NSF Fellowship Application Panel	September 2023
NSF Fellowship Application Panel	September 2022
NSF Fellowship Application Panel	September 2021
NSF Fellowship Application Panel	September 2019
NSF Fellowship Application Panel	September 2018
The Joy of Being Faculty and How to Apply for a Faculty Position	April 2018

TEACHING

University of Pennsylvania (2018 – Present)

BE 220	Biomaterials (Instructor; TAs: K. Swingle, A. Hamilton, E. Han)	Spring 2024
BE 220	Biomaterials (Instructor; TAs: K. Swingle, A. Hamilton)	Spring 2023
CBE 564	Drug Delivery (Guest Lectures)	Spring 2023
BE 512	Biomaterials (Instructor; TAs: K. Swingle, A. Hamilton)	Fall 2022
BE 220	Biomaterials (Instructor; TAs: M.K. Evans, K. Swingle, M. Billingsley)	Spring 2022
BE 578	Principles of Controlled Release Systems (Guest Lectures)	Fall 2021
CAMB 610	Molecular Basis of Gene Therapy and Genome Editing (Guest Lectures)	Fall 2021
BE 220	Biomaterials (Instructor; TAs: H. Zlotnick, A. Peredo, M.K. Evans)	Spring 2021
REG 621	Cell and Gene Therapy (Guest Lectures)	Spring 2021
BE 512	Bioengineering III: Biomaterials (Instructor; TA: Victoria Muir*)	Fall 2020
BE 100	Introduction to Bioengineering (Guest Lectures)	Fall 2020
BE 220	Biomaterials (Instructor; Co-Instructor: LeAnn Dourte)	Spring 2020
CAMB 610	Molecular Basis of Gene Therapy and Genome Editing (Guest Lectures)	Fall 2019
BE 999	Thesis and Dissertation Research (PhD Thesis Advisor)	Fall 2019
BE 512	Bioengineering III: Biomaterials (Instructor; TA: Victoria Muir*)	Fall 2019
	*Awarded Penn Prize for Excellence in Teaching by Graduate Students	
XX XXX	18th NSF International Summer School on Bio-X (Faculty)	Summer 2019
BE 999	Thesis and Dissertation Research (PhD Thesis Advisor)	Spring 2019
CBE 564	Drug Delivery (Guest Lectures)	Spring 2019
BE 999	Thesis and Dissertation Research (PhD Thesis Advisor)	Fall 2018
BE 512	Bioengineering III: Biomaterials (Instructor; TA: Sonia Bansal)	Fall 2018
BE 100	Introduction to Bioengineering (Guest Lectures)	Fall 2018
PHRM 570	Principles of Cardiovascular Biology (Guest Lectures)	Spring 2018
CBE 564	Drug Delivery (Guest Lectures)	Spring 2018

MIT (2014 – 2017)

Controlled Release Technology (Guest Lectures)	Summer 2016

14th International Summer School on Biocomplexity and Biodesign (Faculty)		Summer 2014

Cornell University (2009 – 2014)

BME 5600	Biotransport and Drug Delivery (Guest Lectures)	Spring 2012, 2013
BME 5040	Biomedical Computation (Guest Lectures)	Fall 2011
BME 5040	Biomedical Computation (Graduate Teaching Assistant)	Fall 2010

Stevens Institute of Technology (2005 – 2009)

MA 227	Multivariable Calculus (Undergraduate Teaching Assistant)	Spring 2008, 2009
MA 221	Differential Equations (Undergraduate Teaching Assistant)	Fall 2006, 2007

OTHER TEACHING, MENTORSHIP, OUTREACH EXPERIENCE

2012-2014 **Teaching Fellow, Cornell Learning Initiative in Medicine and Bioengineering**
Department of Biomedical Engineering, Cornell University

- Collaborating with local high school teachers in Ithaca to develop techniques to enhance the content of the high school curriculum.
- Working with local Ithaca high school teachers on a summer research project focused on cellular adhesion and migration; part of a 3-credit course designed to increase knowledge in key topics relevant to biomedical engineering.
- Developing new inquiry based modules, providing science demonstrations, assisting with labs, and being a resident scientist in the classroom.
- Creating hands-on, interactive exercises and lecture materials that are based on biomedical engineering and will cover topics relevant to New York State education standards.

2011-2014 **TA Trainer Fellow, Cornell Engineering Teaching Assistant Development Program**
Advisor: Linda J. Tompkins

- Leading workshops and presentations focused on interactive teaching techniques, learning styles, and effective grading practices to 150 incoming engineering teaching assistants prior to fall and spring semesters.
- Conducting microteaching sessions for small groups of teaching assistants prior to semester.

2012 **The LeaderShape Institute Cluster Facilitator, Cornell University Chapter**
Advisor: Linda J. Tompkins

- Mentored >30 Cornell engineering students to develop effective leadership skills.
- Aided students in developing leadership visions for their future careers.
- Encouraged positive interpersonal and group skills amongst undergraduates.

2010 **Cornell Center for Materials Research "Ask a Scientist" Program**

- Answered biomedical engineering-related questions from students at West Middle School in Binghamton, NY, which were published in the *Ithaca Journal* in October 2010.

2009 - 2011 **Outreach and Fundraising Chair, Cornell Biomedical Engineering Society**
Cornell University, Ithaca, New York

- Organized and developed a 2-week curriculum focused on biophysics and biomaterials at Belle Sherman Elementary School.
- Organized annual holiday food & toy drives across the College of Engineering, in collaboration with the American Red Cross of Tompkins County.

2008 - 2009 **Outreach Chair, Stevens Biomedical Engineering Honor Society**
Stevens Institute of Technology, Hoboken, New Jersey

2008 - 2009 **President, Tau Beta Pi Engineering Honor Society**
Stevens Institute of Technology Chapter, Hoboken, New Jersey

2007 - 2008 **President, Biomedical Engineering Honor Society**
Stevens Institute of Technology Chapter, Hoboken, New Jersey

INDUSTRY EXPERIENCE

2006 - 2007 **Bioengineering Internship**, Becton, Dickinson and Company, Franklin Lakes, New Jersey
Advisor: Douglas Wright
- Assisted product development team with design of prototype blood collection tubes.
- Evaluation of new materials for prototype design of catheter-based surgical devices.
- Composed Failure Mode and Effects Analysis (FMEA) and validation protocols for lab instruments.
- Advised on product development implications arising from results after testing.
- Trained in Good Laboratory Practices (GLP) and Good Manufacturing Practices (GMP).

2006 **Systems Engineering Internship**, Automated Control Concepts, Inc., Neptune, New Jersey
Advisor: Kevin Hannigan
- Created specification and testing documents for FDA/non-FDA regulated systems.
- Trained in GAMP in order to properly execute hardware and software tests.
- Created SCADA systems by developing screens, databases, and ladder logic I/O code.

2005 - 2006 **Electrical Engineering Internship,** Cooper Industries, Long Branch, New Jersey
Advisor: Anthony Russo
- Assembled prototype PC boards for product testing.
- Performed light and sound intensity, and spectrum testing on speaker/strobe products.
- Designed, tested, and collected data on safety products and prototypes.
- Developed PC board layouts using PCB software.

PROFESSIONAL EXPERIENCE

Startup Companies

Co-Founder, Liberate Bio	2022 – Present

Scientific Advisory Boards

Stylus Medicine	2023 – Present
MusiQ Bio	2023 – Present
Liberate Bio	2022 – Present
Capstan Therapeutics	2022 – Present
Seawolf Therapeutics	2022 – Present
Tune Therapeutics	2022 – Present
iECURE	2021 – 2023
Tessera Therapeutics	2021 – 2022
Sanofi – Strategic Development & Scientific Advisory Committee	2021
Johnson & Johnson – Lung Cancer Initiative	2019

Editorial Boards

Exploration – Editorial Board	2023 – Present
Biomaterials – Editorial Board	2021 – Present
GEN Biotechnology – Editorial Board	2021 – Present
Bioactive Materials – Editorial Board	2021 – Present
Advanced Drug Delivery Reviews – Guest Editor, Autoimmune Diseases Issue	2023 – Present

Advanced Drug Delivery Reviews – Guest Editor, Fetal and Material Health Issue	2019 – 2022

Grant Review Panels

National Science Foundation	January 2024
National Science Foundation	January 2023
National Science Foundation	January 2022
Fundazione Telethon	July 2021
Foundation for Polish Science	July 2021
AIRC Foundation for Cancer Research	June 2021
National Institutes of Health (NIA U44 Special Emphasis Panel)	February 2021
National Defense Science and Engineering Graduate (NDSEG) Fellowship	February 2021
National Science Foundation	January 2021
European Research Council (ERC) Advanced Grants	January 2021
National Institutes of Health (BMBI Study Section – Ad Hoc)	October 2020
Czech Science Foundation	September 2020
Meharry-Vanderbilt TSU Cancer Partnership	August 2020
AIRC Foundation for Cancer Research	June 2020
National Institutes of Health (GDD Study Section – Ad Hoc)	February 2020
National Defense Science and Engineering Graduate (NDSEG) Fellowship	February 2020
National Science Foundation	January 2020
Cystic Fibrosis Foundation – Nucleic Acid Delivery Panel	November 2019
National Institutes of Health (NANO Study Section – Ad Hoc)	October 2019
Kom op tegen Kanker (Stand up to Cancer) – Flemish Cancer Society	March 2019
Cystic Fibrosis Foundation	February 2019
National Defense Science and Engineering Graduate (NDSEG) Fellowship	February 2019
Department of Defense	February 2019
National Institutes of Health (BMBI Study Section – Ad Hoc)	February 2019
National Science Foundation	January 2019
Breast Cancer Now	September 2018
King Abdullah International Medical Research Center	June 2018
National Science Foundation	January 2018

Professional Society Positions

2028 World Biomaterials Congress (WBC) Pitch Task Force	2022 – Present
Chair, Controlled Release Society GDGE Focus Group	2021 – Present
Chair, Society for Biomaterials Drug Delivery Special Interest Group	2019 – Present
Vice Chair, Controlled Release Society GDGE Focus Group	2019 – 2021
Controlled Release Society, Social Media Coordinator, GDGE Focus Group	2018 – 2020
Society for Biomaterials, Secretary and Treasurer, Drug Delivery SIG	2017 – 2019

Professional Society Conference and Symposium Session Chair

Controlled Release Society, Gene Delivery and Gene Editing	2023
Society for Biomaterials, Pediatric Drug Delivery and Device Design	2023
Society for Biomaterials, Drug Delivery Rapid Fire Talks	2023
Society for Biomaterials, Drug Delivery Special Interest Group	2023
Biomedical Engineering Society, Pregnancy/Reproductive Health Technologies	2022
Modeling & Design of Molecular Materials, Materials for Medical Treatment	2022
Controlled Release Society, Gene Delivery	2022
17th Liposome Research Days, LNP and Gene Therapies Session	2022
Discussion Leader – Gordon Research Conference on Drug Carriers	2022
Discussion Leader – Gordon Research Conference on Bioinspired Materials	2022
Society for Biomaterials, Drug Delivery 3	2022
Society for Biomaterials, Drug Delivery 2	2022
Society for Biomaterials, Drug Delivery Rapid Fire Talks	2022
Society for Biomaterials, Drug Delivery 1	2022

Session Chair – CT3N Symposium, University of Pennsylvania	2021
Immune Modulation and Engineering Symposium, Drexel University	2021
AAPS 2021, Machine Learning in Biomaterials Chemistry	2021
Society for Biomaterials, Drug Delivery 3	2021
Society for Biomaterials, Drug Delivery 2	2021
Society for Biomaterials, Drug Delivery 1	2021
Panel Member – 2020 Summit Meeting on In Vivo Gene Therapy and Editing	2020
Discussion Leader – Gordon Research Conference on Drug Carriers	2020
Cellular and Molecular Bioengineering Annual Meeting, Immunoengineering	2020
nanoDDS – 17th International Nanomedicine and Drug Delivery Symposium	2019
Biomedical Engineering Society, Emerging Cancer Technologies	2019
Biomedical Engineering Society, Hydrogels I	2019
Kidney Cancer Research Summit, Novel Methods of Drug Delivery	2019
Biomedical Engineering Society, Immunoengineering II	2018
Biomedical Engineering Society, Immunoengineering I	2018
Society for Biomaterials, Drug Delivery	2018
Biomedical Engineering Society, Gene Delivery and Genome Bioengineering	2017
Society for Biomaterials, Nucleic Acid Delivery	2017
American Institute of Chemical Engineers, Bionanotechnology II	2016
American Institute of Chemical Engineers, Bionanotechnology I	2016
Biomedical Engineering Society, Vascular Biomechanics	2012

Industry Consulting

MusiQ Bio	2023 – Present
Seawolf Therapeutics	2022 – Present
Tune Therapeutics	2022 – Present
West Pharmaceuticals	2022 – Present
Fapon Biotech	2022 – Present
Pfizer	2022
iECURE	2021 – Present
Williams & Connolly LLP	2021 – Present
Quinn Emanuel Urquhart & Sullivan, LLP	2021 – Present
Tessera Therapeutics	2021 – 2022
DeciBio Consulting	2021
Sanofi	2021
Select Equity Group	2021
Clarion Life Sciences Consulting	2021
Guidepoint	2019 – Present
Gerson Lehrman Group	2019 – Present
RA Capital Management	2019 – 2020
Arkin Holdings Ltd.	2019 – 2020
Johnson & Johnson	2019 – 2020
LEK Consulting	2018 – Present
HKF Technology	2018 – 2019
Sigilon Therapeutics	2017 – 2018

Journal Reviewer

Accounts of Chemical Research	Advanced Drug Delivery Reviews
ACS Applied Engineering Materials	Advanced Functional Materials
ACS Applied Materials & Interfaces	Advanced Healthcare Materials
ACS Biomaterials Science & Engineering	Advanced Materials
ACS Nano	Advanced Science
ACS Omega	Advanced Therapeutics
Acta Biomaterialia	Angewandte Chemie
Advanced Biosystems	Annals of Biomedical Engineering

BBA Reviews on Cancer
Biochimica et Biophysica Acta
Bioengineering & Translational Medicine
Biomacromolecules
Biomaterials
Biomaterials Science
Biomedical Microdevices
Biomolecules
Biotechnology and Bioengineering
Biotechnology Journal
Blood Advances
BMC Cancer
Cancer Discovery
Cancer Immunology, Immunotherapy
Cancer Research
Cell
Cellular and Molecular Bioengineering
Cellular Immunology
Chem
Chemical Reviews
Chemistry – A European Journal
Chemistry and Biodiversity
Chemistry and Physics of Lipids
ChemistrySelect
ChemPlusChem
Clinical and Translational Medicine
Computational Biology and Chemistry
Current Medicinal Chemistry
Current Nanomedicine
Current Opinion in Biomedical Engineering
Experimental Biology and Medicine
Expert Opinion on Biological Therapy
Immunological Research
International Journal of Molecular Sciences
International Journal of Nanomedicine
International Journal of Pharmaceutics
Israel Journal of Chemistry
Journal of Biomedical Materials Research Part A
Journal of Controlled Release
Journal of Research of NIST
Journal of the American Chemical Society
Journal of the American Society of Nephrology
Materials
Materials Today
Materials Today Communications
Med
Molecular Informatics
Molecular Pharmaceutics
Molecular Therapy
Molecular Therapy – Nucleic Acids
Nanomaterials
Nanomedicine: NBM
Nanoscale
Nano Letters
Nano Today
Nanotube Therapy
Nature Biomedical Engineering
Nature Cancer
Nature Communications
Nature Materials
Nature Medicine
Nature Nanotechnology
Nature Protocols
Nature Reviews Cancer
Nature Reviews Clinical Oncology
Nature Reviews Genetics
Nature Reviews Materials
OBM Genetics
Pharmaceutics
PLoS ONE
PNAS
Regenerative Biomaterials
RSC Advances
Science Advances
Science China Materials
Science Translational Medicine
Scientific Reports
Signal Transduction & Targeted Therapy
Small
Technology
Theranostics
Tissue Engineering Part C

Conference Abstract Reviewer

Cellular and Molecular Bioengineering (CMBE) BMES Conference	2024
Controlled Release Society Annual Meeting	2023
Cellular and Molecular Bioengineering (CMBE) BMES Conference	2023
Society for Biomaterials Annual Meeting	2023
Controlled Release Society Annual Meeting	2022
Society for Biomaterials Annual Meeting	2022
Biomedical Engineering Society – Cellular and Molecular Bioengineering Conference	2022
Controlled Release Society Annual Meeting	2021
Society for Biomaterials Annual Meeting	2021
Biomedical Engineering Society – Cellular and Molecular Bioengineering Conference	2021
Biomedical Engineering Society Annual Meeting	2020
Controlled Release Society Annual Meeting	2020

Biomedical Engineering Society – Cellular and Molecular Bioengineering Conference	2020
Biomedical Engineering Society Annual Meeting	2019
Controlled Release Society Annual Meeting	2019
Society for Biomaterials Annual Meeting	2019
Biomedical Engineering Society Annual Meeting	2018
Controlled Release Society Annual Meeting	2018
Society for Biomaterials Annual Meeting	2018
Biomedical Engineering Society Annual Meeting	2017
Society for Biomaterials Annual Meeting	2017
Biomedical Engineering Society Annual Meeting	2014
ASME International Conference on Nanochannels, Microchannels, and Minichannels	2012
ASME International Conference on Nanochannels, Microchannels, and Minichannels	2011
ASME International Conference on Nanochannels, Microchannels, and Minichannels	2010

PROFESSIONAL AFFILIATIONS

2019 -	Member, American Chemical Society (ACS)
2017 -	Member, Controlled Release Society (CRS)
2015 -	Member, American Association for Cancer Research (AACR)
2015 -	Member, Materials Research Society (MRS)
2015 -	Member, Tissue Engineering and Regenerative Medicine International Society (TERMIS)
2013 -	Member, Society for Biomaterials (SFB)
2013 -	Fellow, Edward A. Bouchet Society
2012 -	Member, American Institute of Chemical Engineers (AIChE)
2012 -	Member, International Society of Biorheology (ISB)
2012 -	Member, International Society of Clinical Hemorheology (ISCH)
2008 -	Member, International Society of Pharmaceutical Engineering (ISPE)
2007 -	Member, Biomedical Engineering Society (BMES)
2007 -	Member, Tau Beta Pi, Engineering Honor Society
2007 -	Member, Alpha Epsilon Delta, National Premedical Honor Society
2004 - 2009	Member, Stevens Cooperative Education Program