

Degrees / Appointments

- 2021 – McCamish Foundation Early Career Professor, Department of Biomedical Engineering, Georgia Institute of Technology and Emory School of Medicine
- 2021 – Associate Professor with Tenure, Department of Biomedical Engineering, Georgia Institute of Technology and Emory School of Medicine
- 2016 – Assistant Professor, Department of Biomedical Engineering, Georgia Institute of Technology and Emory School of Medicine
- 2015 – LSRF post-doctoral fellow, Genome Engineering, Broad Institute of Harvard and MIT
Advisor: Feng Zhang
- 2015 – NSF / NDSEG Ph.D. Student, Medical Engineering / Medical Physics, MIT-Harvard Med HST Program
Advisors: Robert Langer and Daniel Anderson
Committee Members: Robert Langer, Daniel Anderson, Philip Sharp, Sangeeta Bhatia
- 2009 – B.S. Biomedical Engineering, Wright State University

Summary

My vision is to create targeted gene therapies in non-liver tissues by applying technology development principles to nanomedicine. I achieve this by combining high throughput chemical engineering, nanotechnology, and omics-based technologies. For example, we combined high throughput chemistry and genomics to DNA barcode thousands of nanoparticles *in vivo*. I co-founded and was Board Chairman of Guide Therapeutics, a DNA barcoding biotech that was acquired by Beam Therapeutics. I led fundraising, and as a result, have strong ties to investors, biotechs, and pharmas. My lab subsequently developed multiomic screens (DNA barcoded LNPs + single-cell RNA sequencing + protein) to quantify drug delivery *in vivo* in single, transcriptionally defined cells. Finally, my lab studies the biology of delivery, identifying genes whose manipulation may increase nanoparticle specificity and / or safety.

I have taught two sections of a large core course on genetics and biotechnologies for several years, and have won department-, college-, and university-wide Georgia Tech teaching recognitions. In one section, I achieved perfect (5.0 / 5.0) teaching scores from all 55 students. I am also a mental health advocate, and chair the Georgia Tech BME Mental Health Subcommittee.

Recognitions

Georgia Tech Thank A Teacher Certificate
Georgia Bio “Acquisition of the Year” for Beam / GuideTx Deal
Organizer, PNAS Special Issue on Nanomedicine + mRNA Therapeutics
Georgia Tech Thank A Teacher Certificate
Clinical Omics Pioneers Under 40 List
Nature Biotechnology 25th Anniversary “Voices of Biotech”
AOCS Phospholipid Division Best Paper Award for Gan et al., 2020
BMES CMBE Editor’s Choice Award for Sago et al., 2019
GaTech BME Department Outstanding Teaching Recognition for Remote Instruction
Controlled Release Society Gene Delivery and Gene Editing Young Investigator Award
Georgia Tech Thank A Teacher Certificate
ASGCT Outstanding New Investigator Award
Georgia Tech Outstanding Achievement in Early Career Research Award - One GT Professor / Year
Student Recognition of Excellence in Teaching: Class of 1934 Award
Georgia Bio “Deals of the Year” Award for GuideTx fundraising
Invited: Futures Issue of Bioengineering and Translational Medicine (BioTM)
Parker H. Petit Institute for Bioengineering and Biosciences Entrepreneurship Award
BMES Rita Schaffer Young Investigator Award

Barcoding mentioned by World Economic Forum in Top 10 Emerging Technologies of 2019
Above and Beyond Award, Georgia Tech Biomedical Engineering Students
Invited: Young Investigator – Cellular and Molecular Bioengineering (CMBE) Journal
MIT Tech Review TR35 – 35 innovative people in world <35 years old
Drug delivery co-chair for Robert Langer birthday symposium
Invited: Emerging Investigator Issue – Journal of Materials Chemistry B
Women In Engineering Teaching Award - only 2 faculty members GaTech College of Engineering
Named 1 of 6 ‘Transcendent Teachers’ for Georgia Tech
Class of 1940 Course Teaching Effectiveness Award (12 courses awarded each year across GaTech)
Excellence in Teaching Award – Georgia Tech Biomedical Engineering
Georgia Tech Teaching Award
Young Investigator Keynote, SERLC Conference
Bayer Young Investigator Award
Parkinson’s Disease Foundation Stanley Fahn Jr. Faculty Award
Weintraub PhD Award in Biological Sciences – only 13 Ph.D. theses from entire US / UK selected
LSRF Postdoctoral Fellowship
Excellence in Science Award - North American Vascular Biology Inflammation Meeting
Excellence in Applied Cellular and Molecular Biology Award - *Nature Biotech* Symposium
Travel Grant Awardee, Gordon Research Conference on Vascular Biology
NDSEG Graduate Fellowship
NSF GRFP Graduate Fellowship
NIH Oxford-Cambridge Graduate Fellowship
Whitaker International Research Fellowship
MIT Presidential Graduate Fellowship
NSF REU Fellowship
Wright State Presidential Commendation for Excellence
Barry M. Goldwater Fellowship

Publications

&&Co-corresponding, *co-first. **DahlmanLab** members are bolded.

1. **Hatit MZC***, **Dobrowolski CN***, **Lokugamage MP**, **Loughrey D**, **Ni H**, **Zurla C**, **Da Silva Sanchez AJ**, **Radmand A**, **Huayamares SG**, **Paunovska K**, Peck HE, Kim JJ, **Sato M**, **Feldman JI**, **Rivera MA**, **Cristian A**, Kim Y, Santangelo PJ, **Dahlman JE**. Nanoparticle stereochemistry-dependent endocytic processing improves *in vivo* mRNA delivery. **Nature Chemistry**, 2022.
2. **Da Silva Sanchez A**, **Dobrowolski C**, **Cristian A**, **Echeverri ES**, **Zhao K**, **Hatit MCZ**, **Loughrey**, **Paunovska K&&**, **Dahlman JE**. Universal barcoding predicts *in vivo* ApoE-independent lipid nanoparticle delivery. **Nano Letters**, 2022.
3. **Huayamares SG&&**, Lokugamage MP, **Da Silva Sanchez AJ**, **Dahlman JE**. A systematic analysis of biotech startups that went public in the first half of 2021. <https://arxiv.org/abs/2205.00993>
4. **Ni H***, **Hatit MZC***, **Zhao K***, **Loughrey D**, **Lokugamage MP**, Peck HE, **Del Cid A**, Muralidharan A, Kim Y, Santangelo PJ, **Dahlman JE**. Piperazine-derived lipid nanoparticles deliver mRNA to immune cells *in vivo*. **Nature Communications**, 2022.
5. **Dobrowolski CN***, **Paunovska K***, **Echeverri ES**, **Ni H**, **Hatit MCZ**, **Loughrey D**, **Lokugamage MP**, **Kuzminich Y**, Peck HE, Santangelo PJ, **Dahlman JE**. Nanoparticle single-cell multiomics reveals that cell heterogeneity impacts lipid nanoparticle-mediated mRNA delivery. **Nature Nanotechnology**, 2022.

6. **Sago CD, Lokugamage MP, Lindsay KE, Loughrey D, Hincapie R, Krupczak BR, Kalathoor S, Sato M, Fitzgerald JP, Gan Z, Castro MG, Paunovska K, Sanhueza CA, Hatit MCZ, Finn MG, Santangelo PJ, Dahlman JE.** Augmented lipid-nanoparticle-mediated *in vivo* genome editing in the lungs and spleen by disrupting Cas9 activity in the liver. **Nature Biomedical Engineering**, 2022.
7. Miracle DB^{&&}, Dahlman A, Wilks G, Dahlman JE. Dataset of bond enthalpies (ϵ_{AA} , ϵ_{AB} , ϵ_{BB}) in 975 binary intermetallic compounds. **Data in Brief**, 2022.
8. **Paunovska K, Loughrey D, Dahlman JE.** Drug delivery systems for RNA therapeutics. **Nature Reviews Genetics**, 2022. **Invited.**
9. **Loughrey D, Dahlman JE.** Non-liver mRNA delivery. **Accounts of Chemical Research**, 2021. **Invited.**
10. **Hatit MZC*, Lokugamage MP*, Dobrowolski CN, Paunovska K, Zhao K, Ni H, Vanover D, Beyersdorf J, Peck HE, Loughrey D, Sato M, Cristian A, Santangelo PJ, Dahlman JE.** Species-dependent *in vivo* mRNA delivery and cellular response to nanoparticles. **Nature Nanotechnology**, 2022.
11. **Lokugamage MP*, Vanover D*, Beyersdorf J*, Hatit MZC*, Rotolo L, Peck HE, Ni H, Schrader E, Yoon JK, Kim Y, Santangelo PJ^{&&}, Dahlman JE^{&&}.** Optimization of lipid nanoparticles for the delivery of nebulized therapeutic mRNA to the lungs. **Nature Biomedical Engineering**, 2021.
12. Culley MK et al. Frataxin deficiency promotes endothelial senescence in pulmonary hypertension. **Journal of Clinical Investigation**, 2021.
13. **Dobrowolski C*, Paunovska K*, Hatit MZC, Lokugamage MP, Dahlman JE.** Therapeutic RNA delivery for COVID and other diseases. **Advanced Healthcare Materials**, 2021. **Invited.**
14. Somatic Cell Gene Editing Consortium. The NIH Somatic Cell Gene Editing Program. **Nature**, 2021.
15. Alter G*, Bingham K*, Corey L*, **Dahlman JE***, Jackson N*, Moore J*, Rappuoli R*. Whither COVID-19 Vaccines? **Nature Biotechnology**, 2020. **Invited.**
16. **Paunovska K, Da Silva Sanchez AJ, Cristian A, Dahlman JE.** Treating cystic fibrosis with mRNA and CRISPR. **Human Gene Therapy**, 2020. **Invited, Special Issue on Lung Gene Therapies.**
17. **Paunovska K*, Da Silva Sanchez AJ*, Foster MT, Loughrey D, Blanchard EL, Islam FZ, Gan Z, Mantalaris A, Santangelo PJ, Dahlman JE.** Increased PIP3 activity blocks nanoparticle mRNA delivery. **Science Advances**, 2020.

Highlighted by Oligotherapeutics Society.

18. **Gan Z*, Lokugamage MP*, Hatit MZC, Loughrey D, Paunovska K, Sato M, Cristian A, Dahlman JE.** Nanoparticles containing constrained phospholipids deliver mRNA to immune cells *in vivo* without targeting ligands. **Bioengineering and Translational Medicine**, 2020. **Invited for 'Futures' Issue.**

AOCS phospholipid paper of the year, 2020.

19. **Lokugamage MP, Gan Z, Zurla C, Levin J, Islam FZ, Kalathoor S, Sato M, Sago CD, Santangelo PJ, Dahlman JE.** Mild innate immune activation overrides efficient nanoparticle-mediated RNA delivery. **Advanced Materials**, 2019.

Highlighted by Oligotherapeutics Society.

20. Chen PY, Qin L, Li G, Wang Z, **Dahlman JE** et al. Endothelial TGF- β signaling drives vascular inflammation and atherosclerosis. **Nature Metabolism**, 2019.

Highlighted by Nature Metabolism, Genetic Engineering News, Science Daily, MedicalXPress, and others.

21. **Paunovska K, Loughrey D, Sago CD**, Langer R, **Dahlman JE**. Using large datasets to understand nanotechnology. **Advanced Materials**, 2019.

Highlighted by Journal of Controlled Release.

22. **Lokugamage MP*, Sago CD*, Gan Z, Krupczak BR, Dahlman JE**. Constrained nanoparticles deliver siRNA and sgRNA to T cells *in vivo* without targeting ligands. **Advanced Materials**, 2019.

Highlighted by Oligotherapeutics Society.

23. Brown JM, **Dahlman JE**, Neuman K, Prata C, Krampert M, Hadwiger P, Vornlocher HP. Ligand conjugated multimeric siRNAs enable multiplexed gene silencing. **Nucleic Acid Therapeutics**, 2019.

24. **Dahlman JE**. How DNA is used to store – and generate – information at extreme scales. **Invited, Scientific American**, 2019.

25. **Sago CD, Krupczak BR, Lokugamage MP, Gan Z, Dahlman JE**. Cell types within the liver microenvironment differentially interact with lipid nanoparticles. **Cell and Molecular Bioengineering**, 2019. **Invited, CMBE 2019 Young Investigators**.

2020 CMBE Editor's Choice Award

26. Yu Q et al. BOLA3 deficiency controls endothelial metabolism and glycine homeostasis in pulmonary hypertension. **Circulation**, 2019.

27. **Paunovska K, Da Silva Sanchez AJ, Sago CD, Gan Z, Lokugamage MP, Islam FZ, Krupczak BR, Dahlman JE**. Nanoparticles containing oxidized cholesterol deliver mRNA to the liver microenvironment at clinically relevant doses. **Advanced Materials**, 2019.

28. Kofler N, Collins JP, Kuzma J, Marris E, Esvelt K, Nelson MP, Newhouse A, Rothschild LJ, Vigliotti VS, Semenov M, Jacobsen R, **Dahlman JE**, Prince S, Caccone A, Brown T, Schmitz OJ. Editing Nature: Local roots of global governance. **Science**, 2018.

29. **Sago CD*, Lokugamage M*, Islam FZ, Krupczak BR, Sato M, Dahlman JE**. Nanoparticles that deliver RNA to bone marrow identified by *in vivo* directed evolution. **JACS**, 2018.

Featured on JACS cover.

Highlighted by Chemistry News.

30. **Sago CD, Lokugamage MP, Paunovska K**, Vanover DA, **Monaco CM, Castro MG**, Anderson S, **Rudoltz TR, Lando G**, Kirschman JL, Willet N, Jang Y, Santangelo PJ, Bryksin AV, **Dahlman JE**. A high throughput *in vivo* screen of functional mRNA delivery identifies nanoparticles for endothelial cell gene editing. **PNAS**, 2018.

Highlighted by GaTech, Scientific American, STAT News, Journal of Controlled Release, Phys.org, GenEng News, Futurity, and others.

31. **Sago CD***, **Lokugamage MP***, **Lando GN**, Djeddar N, **Shan NN**, Bryksin AV, **Dahlman JE**. Modifying a commonly expressed endocytic receptor retargets nanoparticles *in vivo*. **Nano Letters**, 2018.

Featured on Nano Letters cover.

32. **Sago CD**, **Kalathoor S**, **Islam FZ**, **Krupczak BR**, **Dahlman JE**. Barcoding chemical modifications into nucleic acids improves drug stability *in vivo*. **Journal of Materials Chemistry B**, 2018. **Invited, Emerging Investigator Issue**.

Featured on journal cover.

33. **Lokugamage M**, **Sago CD**, **Dahlman JE**. Testing thousands of nanoparticles *in vivo* using DNA barcodes. **Current Opinion in Biomedical Engineering**, 2018.

34. **Paunovska K**, **Gil CG**, **Lokugamage M**, **Sago CD**, **Sato M**, **Lando GN**, **Castro MG**, Bryksin AV, **Dahlman JE**. Analyzing 2,000 *in vivo* drug delivery data points reveals cholesterol structure impacts nanoparticle delivery. **ACS Nano**, 2018.

Highlighted by Journal of Controlled Release, ASME and others.

35. **Paunovska K***, **Sago CD***, **Monaco CM**, Hudson WH, Castro MG, **Rudoltz T**, **Kalathoor S**, Vanover DA, Santangelo PJ, Ahmed R, Bryksin AV, **Dahlman JE**. A direct comparison of *in vitro* nanoparticle delivery and *in vivo* nanoparticle delivery using hundreds of nanoparticles reveals a weak correlation. **Nano Letters**, 2018.

Highlighted by Nature Biotech, Georgia Tech, UPenn, Phys.org, Science Daily, ASME, and others.

36. **Dahlman JE**^{&&}, Kauffman KJ*, Xing Y, Shaw TE, Dlott C, Mir Faryal F, Langer R, Anderson DG, Wang E^{&&}. High throughput *in vivo* therapeutic discovery. **PNAS**, 2017.

Highlighted by MIT, Georgia Tech, University of Florida, Phys.org, and others

37. Tibbitt MW, **Dahlman JE**, Langer R. Emerging frontiers in drug delivery. **JACS**, 2016.

38. Sager HB*, Dutta P*, **Dahlman JE***, Borodovsky A, Fitzgerald K, Heidt T, Courties G, Wojtkiewicz GR, Iwamoto Y, Sebas Y, Khan OF, Xing Y, Shaw TE, Libby P, Swirski FK, Langer R, Weissleder R, Anderson, DG, Nahrendorf M. Five gene RNAi therapy targeted to endothelial cells reduces post-MI vascular inflammation. **Science Translational Medicine**, 2016

Featured on cover.

Image named top 10 science images of 2016 by NSF.

Highlighted by Science, Nature Reviews Cardiology, and Mass General Hospital.

39. Yun S, Budatha M, **Dahlman JE**, Coon BG, Langer R, Anderson DG, Baillie G, Schwartz MA. Integrin alpha5-PDE4D interaction regulates endothelial inflammatory signaling. **Nature Cell Biology**, 2016.

40. **Dahlman JE**^{&&}, Abudayyeh OA*, Gootenberg JS, Joung J, Zhang F, Konermann S. Orthogonal gene knockout and activation with a catalytically active Cas9 nuclease. **Nature Biotechnology**, 2015.

Featured on Nature Biotech cover.

Highlighted by Nature Methods.

41. **Dahlman, JE***, Barnes C* et al. *In vivo* endothelial siRNA delivery using polymeric nanoparticles with low molecular weight. **Nature Nanotechnology**, 2014.

Highlighted by MIT, MIT Tech Review, Nature Materials, Nature Medicine, and others.
Cover Feature.

42. Platt RJ, Chen S, Zhou Y, Yim M, Swiech L, Kempton HR, **Dahlman JE**, Parnas O, Eisenhaure TM, Jovanovico M, Jhunjhunwala S, Graham D., Xavier RJ, Langer R, Anderson DG, Hacohen N, Regev A, Feng G, Zhang F. A Cre-Dependent CRISPR-Cas9 knockin transgenic mouse for efficient *ex vivo* and *in vivo* genome editing. **Cell**, 2014.
43. Xue W*, **Dahlman JE***, Tammela T, Khan OF, Sood S, Dave A, Cai W, Chirino L, Yang GR, Bronson R, Crowley DG, Sahay G, Schroeder A, Langer R, Anderson DG, Jacks T. Small RNA combination therapy for lung cancer. **PNAS**, 2014.
44. Schroeder A, Heller DA, Winslow MM, **Dahlman JE***, Pratt GW, Langer R, Jacks T, Anderson DG. Treating metastatic cancer with nanotechnology. **Nature Reviews Cancer** 2012.
45. Sager HB, Hulsmans M, Lavin KJ, Moreira MB, Courties G, Sun Y, Iwamoto Y, Heidt T, Tricot B, Khan OF, **Dahlman JE**, Borodovsky A, Fitzgerald K, Anderson DG, Weissleder R, Libby P, Swirski FK, Nahrendorf M. Proliferation and recruitment contribute to myocardial macrophage expansion in chronic heart failure. **Circulation Research**, 2016.
46. Koga J, Figueiredo J, **Dahlman JE**, Niida T, Iwata H, Aster JC, Yagita H, Anderson DG, Ozaki CK, Aikawa M. Macrophage Notch ligand Delta-like 4 promotes the lesion development of vein grafts: implications for the treatment of vein graft failure. **Arteriosclerosis, Thrombosis, and Vascular Biology**, 2015.

Featured on cover.

Awarded cover of the year by ATVB.

47. Khan OF, Zaia E, Jhunjhunwala S, Xue W, Wenxin C, Dong YS, Barnes C, **Dahlman JE**, Dong Y, Pelet J, Webber M, Tsosie J, Jacks T, Langer R, Anderson DG. Dendrimer-inspired nanomaterials for the *in vivo* delivery of siRNA to lung vasculature. **Nano Letters**, 2015.
48. White K, Lu Y, Annis S, Hale AE, Chau N, **Dahlman JE**, Hemann C, Opotowsky AR, Vargas SO, Rosas I, Perrella MA, Osorio JC, Haley KJ, Graham BR, Kumar R, Saggari R, Wallace WD, Ross DJ, Khan OF, Bader A, Gochoico BR, Matar M, Polach K, Anderson DG, Langer R, Zweier JL, Bindoff LA, Systrom D, Waxman AB, Jin RC, Chan SY. Genetic and hypoxic alterations of the miR-210-ISCU1/2 axis promote iron-sulfate deficiency and pulmonary hypertension. **EMBO Molecular Medicine**, 2015.
49. Khan OF, Zaia E, Yin H, Bororad R, Pelet JM, Webber MJ, Zhuang I, **Dahlman JE**, Langer R, Anderson DG. Chemically modified dendrimers with alkyl chain-substituted amines for siRNA delivery to the liver endothelium *in vivo*. **Angewandte Chemie**, 2014.
50. Stewart MP, Lorenz A, **Dahlman JE**, and Sahay G. Challenges in carrier mediated intracellular delivery: Lessons from cell biology to trigger endosomal escape. **WIREs Nanomedicine and Nanobiotechnology**.
51. Herr KJ, Tsang YN, En JO, Qiushi L, Yap LL Yu W, Yin H, Bogorad R, **Dahlman JE**, Chan YG, Bay BH, Singaraja R, Anderson DG, Kotlianky V, Viasnoff V. Alpha-catenin elicits a cholestatic response and impairs liver regeneration. **Scientific Reports**, 2014.

52. **Dahlman JE**, Kauffman K, Langer R, Anderson DG. Nanotechnology for *in vivo* targeted siRNA Delivery. **Advances in Genetics**, 2014.
53. **Dahlman JE**. A lesson in communication. **Nature Nanotechnology** 2014.
54. **Dahlman JE**, Langer R, Goldberg M. Lipid-like delivery materials for efficient siRNA delivery. **Nanotechnology for the delivery of therapeutic nucleic acids** 2013.
55. Schroeder A, **Dahlman JE***, Sahay G, Love KT, Jiang S, Eltouhky AA, Levins CG, Wang Y, Anderson DG. Alkane-modified short polyethyleneimine for siRNA delivery. **Journal of Controlled Release** 2012.
56. Whitehead K, **Dahlman JE**, Langer R, Anderson DG. Silencing or stimulation? siRNA delivery and the immune system. **Annual Reviews of Chemical and Biomolecular Engineering**, 2011.
57. Miracle DB, Wilks G, Dahlman A, **Dahlman JE**. The strength of chemical bonds in solids and liquids. **Acta Materialia**, 2011.
58. **Dahlman J**, Senkov ON, Scott JM, Miracle DB. Corrosion Properties of Ca based bulk metallic glasses. **Materials Transactions**, 2007.

Professional Experience

Co-founder and Board Chairman. Guide Therapeutics. Started in late 2018, led fundraising efforts, helped developed BD / partnership strategy. Extensive network of biotech VCs and leadership of biotech / pharma companies. Guide was acquired by Beam Therapeutics in February 2021.

Teacher. BMED 2250; 32 student core course on engineering design. BMED 3600; 55 student core course on cell biology and genetics. While teaching a total of ~100 students between two sections of BMED3600 in the same semester, achieved perfect (5.0 / 5.0) and near-perfect (4.9 / 5.0) teaching scores for the two sections, respectively. Won eleven Georgia Tech teaching awards or accolades since 2016.

Reviewer. Tech Review TR35 List, Cell, Nature Biotechnology, Nature Materials, Nature Nanotechnology, Nature Biomedical Engineering, Nature Methods, Nature Protocols, Advanced Materials, Cell Chemical Biology, Cell Stem Cell, Nature Communications, JACS, ACS Nano, PNAS, Nano Letters, Advanced Drug Delivery Reviews, Accounts of Chemical Research, Cell Reports, Biomaterials, Trends in Biotechnology, Advanced Healthcare Materials, Current Opinion in Biomedical Engineering, The CRISPR Journal, PLOS One, Scientific Reports, Journal of Controlled Release, Analytical Chemistry, FEBS Reports, Biomacromolecules, Journal of Colloids and Surfaces B, Biomaterial Science, Bioengineering and Translational Medicine, Acta Biomaterialia.

Selected Invited Talks (from >130)

1. Harvard Program in Quantitative Genomics, Cambridge, MA, November, 2022.
2. Pfizer, Cambridge, MA, September, 2022.
3. Cold Spring Harbor Laboratory: CRISPR Frontiers Meeting, Cold Spring Harbor, NY, August, 2022.
4. American Association of Pharmaceutical Scientists Annual Meeting, Philadelphia, PA, October, 2021. **Keynote.**
5. Liposomal Research Days, Vancouver, British Columbia, June, 2022. **Keynote.**
6. Cold Spring Harbor Laboratory Nucleic Acid Therapies, Cold Spring Harbor, NY, March, 2021.
7. Vertex Pharmaceuticals, Boston, MA, December, 2020.
8. Genentech, San Francisco, CA, October, 2020.
9. Harvard School of Engineering and Applied Sciences, Boston, MA, September, 2020.
10. Controlled Release Society, Las Vegas, NV, July, 2020. **Gene Delivery / Gene Editing Young Investigator Award Lecture.**

11. ASGCT, Boston, MA, May, 2020. **Outstanding New Investigator Keynote.**
12. Rita Schaffer Young Investigator Lecture, BMES, Philadelphia, PA, October, 2019. **Keynote.**
13. CMBE Young Investigator Lecture, BMES, Philadelphia, PA, October, 2019. **Young Investigator Award.**
14. Broad Institute of MIT and Harvard, Boston, MA, May, 2019.
15. UC San Francisco, San Francisco, CA, May, 2019.
16. EPFL Bioengineering, Lausanne, Switzerland, April, 2019.
17. ETH Zurich D-BSSE, Basel, Switzerland, April, 2019.
18. FDA, Washington, D.C., March, 2019.
19. Gordon Research Conference on Vascular Biology, Venture, CA, January, 2019.
20. Stanford Bio-X Institute, Palo Alto, CA, May, 2018.
21. BioNTech Therapeutics, Mainz, Germany, December, 2017.