**Curriculum Vitae**

Jung Soo Suk, Ph.D.

Associate Professor, Neurosurgery

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University of Maryland School of Medicine

**Date** 10/14/2024

**Contact Information**

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Foreign Language Korean (Native)

**Education**

1994 - 2001 B.Eng., Chemical Engineering, Korea University, Seoul, Republic of Korea (South)

2002 - 2005 M.S.E., Biomedical Engineering, Johns Hopkins University, Baltimore, MD

2005 - 2011 Ph.D., Biomedical Engineering, Johns Hopkins University School of Medicine, Baltimore, MD

**Post Graduate Education and Training**

2001 – 2002 Research Assistant, BioMedical Research Center, Korea Advanced Institute of Science and Technology, Daijeon, Republic of Korea (South)

2011 – 2013 Postdoctoral Fellow, Johns Hopkins University School of Medicine

**Miliary Service**

1995 – 1997 Sergeant, The 26th Mechanized Infantry Division, Yangju, Republic of Korea

**Employment History**

**Academic Appointments:**

2013 – 2015 Research Associate, Department of Ophthalmology, Wilmer Eye Institute, Johns Hopkins University School of Medicine

2015 – 2023 Assistant Professor, Department of Ophthalmology, Wilmer Eye Institute, Johns Hopkins University School of Medicine

2018 – 2023 Assistant Professor, Department of Chemical & Biomolecular Engineering, Johns Hopkins University

2023 – present Associate Professor, Department of Neurosurgery, University of Maryland School of Medicine

2023 – present Associate Professor, Medicine institute for Neuroscience Discovery (UM-MIND), University of Maryland School of Medicine

2023 – present Adjunct Assistant Professor, Department of Neurosurgery, Johns Hopkins University School of Medicine

2023 – present Adjunct Assistant Professor, Department of Chemical & Biomolecular Engineering, Johns Hopkins University

**Professional Society Memberships**

2013 – present Member, Controlled Release Society

2016 – present Member, American Society of Gene & Cell Therapy

2016 – present Member, Association for Research in Vision and Ophthalmology (ARVO)

2017 – present Member, Korea American Scientists and Engineers Association (KSEA)

2018 – present Member, Biomedical Engineering Society

**Honors and Awards**

1998 – 2000 Korea University merit-based scholarship, Department of Chemical Engineering

2007 Society of Experimental Biology & Medicine Best Paper Award

2014 Johns Hopkins Center for Nanomedicine Award for Research Exellence

2015 W.W. Smith Charitable Trust Research Award

2018 Acta Biomaterialia Reviewer Award

**Administrative Service**

**Institutional Service**

2016 Session Chair, 27th Annual Wilmer Eye Institute Research Meeting, Johns Hopkins University School of Medicine

2017 Organizer, Center for Nanomedicine Seminar Series, Johns Hopkins University School of Medicine

2019 Reviewer, Pooled Professor Fund Grant Program, Johns Hopkins University School of Medicine

2023 Reviewer, Department of Neurosurgery Research Funding, University of Maryland School of Medicine

**Local and National Service**

2013 Session Chair, 40th Controlled Release Society Annual Meeting, “Emerging Technologies”

2013 – 2024 Reviewer, Journal of Controlled Release (25)

2014 Abstract Reviewer, Controlled Release Society Annual Meeting

2014 – 2024 Reviewer, Molecular Therapy: Methods & Clinical Development (2)

2014 – 2015 Reviewer, Journal of Aerosol Medicine and Pulmonary Drug Delivery (2)

2014 – 2016 Reviewer, Cellular Physiology and Biochemistry (2)

2015 Grant Reviewer, China Israel Research Program, Israel Science Foundation

2015 Reviewer, Colloidal and Surfaces B: Biointerface (1)

2015 – 2016 Guest Editor, Journal of Controlled Release, North America Special Issue Parts I/II

2015 – 2016 Reviewer, Proceedings of the National Academy of Sciences (2)

2015 – 2017 Reviewer, Journal of Drug Targeting

2015 – 2018 Reviewer, Molecular Therapy: Nucleic Acid (3)

2015 – 2021 Reviewer, Acta Biometerialia (11); Nanomedicine: Nanotechnology, Biology and Medicine (3)

2015 – 2023 Reviewer, Theranostics (8)

2016 Organizer, 14th Annual International Nanomedicine and Drug Delivery Symposium

2016 Organizer, The Korea Academy of Science and Technology Symposium for Young Scientist in Drug Delivery

2016 Grant Reviewer, Research Awards Programs, United States-Israel Binational Science Foundation (BSF)

2016 Session Chair, 43rd Controlled Release Society Annual Meeting, “Research Highlight Talk Group F”

2016 Reviewer, Nanomaterials (1)

2016 – 2019 Reviewer, Nanomedicine (3)

2016 – 2021 Reviewer, Advanced Healthcare Materials (7)

2016 – 2024 Reviewer, Nano Today (3); Advanced Materials (13); Biomaterials (5); WIRES Nanomedicine and Nanotechnology (2)

2017 Session Chair, 44th Controlled Release Society Annual Meeting, “New Directions for Polymers in Drug Delivery”

2017 Guest Editor, Journal of Controlled Release, Korean Academy of Science and Technology Symposium for Young Scientists in Drug Delivery Issue

2017 Abstract Reviewer, Controlled Release Society Annual Meeting

2017 – 2022 Grant Reviewer, Research Award Program, Focused Ultrasound Foundation

2017 Reviewer, Advanced Journal of Respiratory and Critical Care Medicine (1); Circulation (1); Medical Research Review (1); Nanoscale (1); Nature Communication (1); Neurotherapeutics (1); Pharmaceutics (1)

2017 – 2022 Reviewer, Advanced Drug Delivery Review (4)

2017 – 2023 Reviewer, Science Translational Medicine (2)

2017 – 2024 Reviewer, Molecular Therapy (2)

2018 Abstract Reviewer, Biomedical Engineering Society Annual Meeting

2018 Reviewer, Bioengineering (1); Light: Science & Applications (1)

2018 – 2020 Reviewer, Molecular Pharmaceutics (2)

2018 – 2021 Reviewer, Advanced Functional Materials (3); Angewandte Chemie International Edition (2); Bioengineering & Translational Medicine (2)

2018 – 2023 Reviewer, ACS Nano (3)

2018 – 2024 Reviewer, Science Advances (16)

2019 Reviewer, ACS Biomaterials Science & Engineering (1); Drug Discovery Today (1); mBio (1)

2019 – 2024 Reviewer, Small (7)

2019 – 2024 eMedia Editor, Drug Delivery and Translational Research

2020 Reviewer, Biomaterials Science (1); Cancers (1); Gene Therapy (1); International Journal of Nanomedicine (1); Langmuir (1); Nano Letter (1); Nature Nanotechnology (1); Journal of Molecular Medicine (1)

2020 – 2021 Abstract Reviewer, Controlled Release Society Annual Meeting

2020 – 2024 Reviewer, Advanced Science (4)

2020 – 2023 Reviewer, Drug Delivery and Translational Research (5)

2020 – 2024 Reviewer, Expert Opinion on Drug Delivery (4)

2021 – 2022 Reviewer, ACS Omega

2022 Grant Reviewer, Transformative Research Award (RFA-RM-21-017), NIH

2022 Consultant, Health Advances LLC

2022 Reviewer, European Journal of Pharmaceutical Sciences (1)

2023 Reviewer, Journal of Extracellular Vesicles (1)

2024 Ad hoc grant reviewer, Innovations in Nanosystems and Nanotechnology (INN) study section, NIH

2024 Ad hoc grant reviewer, Drug and Biologic Therapeutic Delivery (DBTD) study section, NIH

2024 – present Deputy Editor-in-Chief, Drug Delivery and Translational Research

**Teaching Service**

**Undergraduate Student Teaching**

2008 – 2020 Research Mentor/Advisor

41 undergraduates, monthly or quarterly meetings

2023 Guest Lecturer, Introduction to non-viral Nucleic Acid Delivery

Supramolecular Materials and Nanomedicine (EN.540.428, EN.540.628)

50 undergraduate or master’s students

**Master Student Training**

2012 – 2023 Research Mentor/Advisor

17 master’s students, biweekly or monthly regular meetings for scientific discussions and career advisory

**Ph.D. Student Training**

2011 – present Research Mentor/Advisor

8 Ph.D. students, daily and/or frequency scientific discussions and regular update meetings

**Postdoctoral Fellow Training**

2013 – present Research Mentor/Advisor

12 postdoctoral fellows, daily and/or frequency scientific discussions and regular update meetings

**Visiting Scientists**

2013 – 2020 Research Mentor/Advisor

10 Ph.D. students and 1 postdoctoral fellow, daily and/or frequent scientific discussions

**Grant Support**

**Active Grants:**

05/15/2019 – 04/30/2025NCE (PI: 20%)

Innovative delivery strategy to gene therapy of Parkinson’s disease

NIH R01NS111102

Annual Direct Costs: $387,304

Total Direct Costs: $1,936,511

05/01/2021 – 02/28/2026 (PI:25%)

Nanocage-based systemic delivery of TGFβ for immunomodulation of brain neoplasm

NIH R01NS119609

Annual Direct Costs: $308,916

Total Direct Costs: $1,546,556

08/01/2021 – 12/31/2023 (Co-Inv: 5%)

Mucus-penetrating nanoparticles for gene augmentation of CFTR

Cystic Fibrosis Foundation, DIXON20XX0

Annual Direct Costs: $119,925

Total Direct Costs: $225,850

Supervision and guidance on the engineering and *in vitro* and *in vivo* validation of cell-penetrating peptide-based gene delivery nanoparticles for inhaled gene therapy/editing

05/01/2022 – 04/30/2026 (PI: 25%)

Localized SDF-1 mRNA nanoparticle delivery for treating erectile dysfunction

NIH R01DK132425

Annual Direct Costs: $423,986

Total Direct Costs: $1,596,370

08/01/2022 – 07/30/2025 (Collaborator: 0%)

Brain-penetrating ATM gene therapy

Action for A-T (Ataxia-Telangiectasia) – Research Grant

Total Direct Cost: £150,000

Supervision and guidance on the formulation and *in vivo* evaluation of cell-penetrating peptide-based gene delivery nanoparticles for intracranial cerebellar gene delivery

09/01/2023 – 08/31/2025 (PI: 6%)

Novel bioreducible polymer-based delivery platform for intravitreal gene transfer to retina

NIH R21EY034677

Annual Direct Cost: $125,000

Total Direct Cost: $275,000

04/01/2024 – 03/31/2029 (Co-Inv: 15%)

High-throughput neurovascular-unit-on-a-chip with OASIS for modeling Parkinson’s disease

NIH R01133965

Provision of expertise on the human protein nanocage as a BBB-penetrating small-molecule drug delivery platform and guidance of the trainee working on the relevant experimental efforts

**Pending Grants:**

09/01/2024 – 08/31/2029 (PI: 25%)

The hybrid biological delivery platform for inhaled gene therapy

NIH R01HL176511

04/01/2025 – 03/31/2030 (MPI: 20%)

Novel ECM-modulating gene therapy of COPD via the inhaled route

NIH R01HL175436

04/01/2025 – 03/31/2030 (PI: 20%)

Novel chemo-immunotherapy of hematologic tumors

NIH R01CA299151

04/01/2025 – 03/31/2030 (MPI: 15%)

Targeting glioma cell-neural interactions in GBM

NIH R01NS139488

04/01/2025 – 03/31/2027 (MPI: 5%)

Bioengineering modular gene delivery system towards lung-targeted transgene expression

NIH R21HL179581

07/01/2025 – 06/30/2030 (MPI: 20%)

Maximizing chemo-immunotherapy for TNBC using engineered therapeutics

NIH R01CA302944

07/01/2025 – 06/30/2030 (MPI: 15%)

Novel GBA1 gene therapy for Parkinson’s disease

NIH R01

**Completed Grants:**

2014 – 2019 (Co-Inv)

Role of mucin in lung homeostasis and pathophysiology

NIH R01HL080396

Supervision and guidance on *ex vivo* and *ex situ* measurements of mucus microstructure and microrheological properties

2015 – 2017 (Co-PI)

Hypotonic delivery of mucus penetrating nanoparticles for CF gene therapy

Cystic Fibrosis Foundation, HANES15G0

Total Direct Costs: $180,000

2015 – 2020 (MPI)

Biodegradable mucus penetrating DNA nanoparticles for gene therapy of CF

NIH R01HL127413

Total Direct Costs: $1,052,000

2015 – 2020 (PI)

New inhalation therapy for COPD

NIH R01ND136617

Total Direct Costs: $1,000,000

2015 – 2020 (MPI)

Mucus microstructure and osmotic pressure: biomarker for CB in COPD

NIH R01HL125169

Total Direct Costs: $1,107,766

2015 – 2020 (Co-Inv)

MRI-guided miRNA nanoparticle delivery to glioblastoma with focus ultrasound

NIH R01EB020147

Supervision and guidance on the formulation and quality control of miRNA-loaded brain-penetrating nanoparticles

2015 – 2020 (Co-Inv)

Immunotherapeutic nanoparticle delivery to melanoma with MR-guided focused ultrasound

NIH R01CA197111

Supervision and guidance on the formulation and quality control of STAT3-interfering brain-penetrating nanoparticles

2016 – 2023 (MPI)

Targeted delivery of brain penetrating DNA nanoparticles to brain tumors

NIH R01CA204968

Total Direct Costs: $2,047,387

2016 – 2017 (Co-PI)

Minimally-invasive therapy for Parkinson’s disease achieved by the focus ultrasound-targeted delivery of gene-bearing nanoparticles

Focused Ultrasound Foundation

Total Direct Costs: $200,000

2016 – 2017 (PI)

Widespread but cancer-selective gene therapy for brain tumors

W.W. Smith Charitable Trust

Total Direct Costs: $100,000

2017 – 2020 (Co-PI)

MIP-based assessment of MCC and mucus microstructure

Cystic Fibrosis Foundation, HANES16XX0

Total Direct Costs: $300,000

2017 – 2020 (Co-Inv)

Master regulatory microRNA in glioblastoma

NIH U01CA220841

Supervision and guidance on the formulation and quality control of miRNA-loaded biodegradable brain-penetrating nanoparticles

2018 – 2019 (Co-PI)

Focus ultrasound mediated drug delivery across the urothelium

Focused Ultrasound Foundation

Total Direct Costs: $100,000

2018 – 2021 (PI)

Inhaled nanomedicine-based gene editing for curing CF

Cystic Fibrosis Foundation, SUK18I0

Total Direct Cost: $100,000

2022 – 2023 (PI)

Development of a novel immune stimulating antibody (ISAC) conjugate against CD47

TEDCO: MII – Technology Assessment, 0722-005

Total Direct Costs: $115,000

2023 – 2024 (Collaborator: 2%)

Development of an inhalable nanosuspension formulation for treating fibrotic lung diseases

TEDCO: MII – Technology Assessment

Total Direct Costs: $115,000

Supervision and guidance on the formulation, physicochemical characterization, and *in vivo* evaluation of nintedanib nanosuspension

**Patents, Inventions and Copyrights**

**US Patents Awarded**

2016 US9327037B2: Suk JS, Hanes J. Mucus penetrating gene carriers. Issued May 3, 2016.

2017 US9675711B2: Suk JS, Hanes J. Mucus penetrating gene carriers. Issued June 13, 2017.

2018 US9937270B2: Hanes J, Suk JS, Mastorakos P, Woodworth G, Zhang C. Engineering synthetic brain penetrating gene vectors. Issued April 10, 2018.

2019 US10335500B2: Hanes J, Suk JS, Mastorakos P. Highly stable biodegradable gene vector platforms for overcoming biological barriers. Issued July 2, 2019.

2020 US10632080B2: Zhang C, Mastorakos P, Suk JS, Hanes J. Compositions and methods to improve nanoparticle distribution within the brain interstitium. Issued April 28, 2020.

2020 US10695442B2: Hanes J, Suk JS, Mastorakos P, Woodworth G, Zhang C. Engineering synthetic brain penetrating gene vectors. Issued June 3, 2020.

2020 US10729786B2: Suk JS, Hanes J. Mucus penetrating gene carrier. Issued August 4, 2020.

2021 US1100727B2: Hanes J, Suk JS, Mastorakos P. Highly stable biodegradable gene vector platforms for overcoming biological barriers. Issued May 18, 2021.

2021 US11090391B2: Huang X, Suk JS, Hanes J. Protein nanocages with enhanced mucus penetration for targeted tissue and intracellular delivery. Issued August 17, 2021

**International Patents Awarded**

2018 AU2015259362B2: Hanes J, Suk JS, Mastorakos P, Woodworth G, Zhang C. Engineering synthetic brain penetrating gene vectors. Issued February 15, 2018.

2019 JP2019533645A: Huang X, Suk JS, Hanes J. Protein nanocages with enhanced mucus penetration for targeted tissue and intracellular delivery. Issued November 21, 2019.

2020 CA2948844C: Hanes J, Suk JS, Mastorakos P, Woodworth G, Zhang C. Engineering synthetic brain penetrating gene vectors. Issued June 30, 2020.

2020 JP6763780B2: Hanes J, Suk JS, Mastorakos P, Woodworth G, Zhang C. Manipulation of synthetic brain penetrating gene vectors. Issued September 30, 2020.

2021 JP6824535B2: Zhang C, Mastorakos P, Suk JS, Hanes J. Compositions and methods to improve nanoparticle distribution within the brain interstitium. Issued February 3, 2021.

**US Patents Pending**

2020 US20220175687A1: Suk JS, Negron K, Hanes J. Nanoparticles for drug delivery to brain.

2021 US20220370488A1: Suk JS, Kim YC, Hanes J. Mucus penetrating particle compositions and methods of use thereof enhancing immune response.

2023 WO2023154454A1: Donini O, Lehrer A, Chen D, Suk JS, DiCostanzo J. Telmisartan nanosuspension for therapy of respiratory infections and methods of making and using same.

2024 WO2024030514A1: Suk JS, Kwak G. Extracellular vesicle-associated adeno-associated virus vectors for inhaled gene therapy.

2024 WO2024059878A2: Suk JS, Kwak G, Zhang K. Bioreducible polymer and use thereof.

2024 WO2024006538A1: Suk JS, Chung S, Xie Y. Use of a conjugate of anti-CD47 antibody and toll-like receptor agonist.

2024 US20240285545A1: Suk, JS, Andrade da Silva LH, Rocco P, Morales M. Nanosuspension formulation for treatment of pulmonary fibrosis.

**International Patents Pending**

2019 EP3512563A1: Huang X, Suk JS, Hanes J. Protein nanocages with enhanced mucus penetration for targeted tissue and intracellular delivery.

2020 JP2019533645A5: Huang X, Suk JS, Hanes J. Protein nanocages with enhanced mucus penetration for targeted tissue and intracellular delivery.

2020 JP2020172534A: Hanes J, Suk JS, Mastorakos P, Woodworth G, Zhang C. Engineering synthetic brain penetrating gene vectors.

**Institutional Disclosures**

Chen D, Suk JS. Angiotensin receptor blocker nanosuspension for inhaled treatment of asthma and potentially other chronic obstructive lung diseases (JHU disclosure C16881)

Chung S, Suk JS. Nanocage based on a fusion protein of human heavy-chain ferritin and TGFβ receptor 2 ectodomain and its use for immunomodulatory therapy of malignant brain tumors (JHU disclosure C17147)

**Publications**

**Peer-reviewed Journal Articles**

1. **Suk JS**, Suh J, Choy KL, Lai SK, Fu J, Hanes J. Gene delivery to differentiated neurotypic cells with RGD and HIV Tat peptide functionalized polymeric nanoparticles. *Biomaterials*. 2006;27(29):5143-5150.
2. **Suk JS**, Suh J, Lai SK, Hanes J. Quantifying the intracellular transport of viral and nonviral gene vectors in primary neurons. *Exp Biol Med (Maywood)*. 2007;232(3):461-469.
3. Suh J, Choy KL, Lai SK, **Suk JS**, Tang BC, Prabhu S, Hanes J. PEGylation of nanoparticles improves their cytoplasmic transport. *Int J Nanomedicine*. 2007;2(4):735-741.
4. Wang YY, Lai SK, **Suk JS**, Pace A, Cone R, Hanes J. Addressing the PEG mucoadhesivity paradox to engineer nanoparticles that “slip” through the human mucus barrier. *Angew Chem Int Ed Engl*. 2008;47(50):9726-9729.
5. **Suk JS**\*\*, Lai SK\*\*, Wang YY, Boyle MP, Hanes J. The penetration of fresh undiluted sputum expectorated by cystic fibrosis patients by non-adhesive polymer nanoparticles. *Biomaterials*. 2009;30(13):2591-2597. \*\*Co-first author.
6. Tang BC, Dawson M, Lai SK, Wang YY, **Suk JS**, Yang M, Zeitlin P, Boyle MP, Fu J, Hanes J. Biodegradable polymer nanoparticles that rapidly penetrate the human mucus barrier. *Proc Natl Acad Sci U S A*. 2009;106(46):19268-19273.
7. **Suk JS**, Lai SK, Boylan NJ, Dawson MR, Boyle MP, Hanes J. Rapid transport of muco-inert nanoparticles in cystic fibrosis sputum treated with N-acetyl cysteine. *Nanomedicine (Lond)*. 2011;6(2): 365-375.
8. Hida K, Lai SK, **Suk JS**, Won S, Boyle MP, Hanes J. Common gene therapy viral vectors do not efficiently penetrate sputum from cystic fibrosis patients. *PLoS ONE*. 2011;6(5): e19919*.*
9. Lai SK, **Suk JS**, Pace A, Wang YY, Yang M, Mert O, Chen J, Kim J, Hanes J. Drug carrier nanoparticles that penetrate human chronic rhinosinusitis mucus. *Biomaterials*. 2011;32(26): 6285-6290*.*
10. Jachak A, Lai SK, Hida K, **Suk JS**, Markovic N, Biswal S, Breysse P, Hanes J. Transport of metal oxide nanoparticles and single-walled carbon nanotubes in Human Mucus. *Nanotoxicology*. 2011;6(6):614-622.
11. **Suk JS**, Boylan NJ, Trehan K, Tang BC, Schneider CS, Lin JG, Boyle MP, Zeitlin PL, Lai SK, Cooper MJ, Hanes J. N-acetylcysteine enhances sputum penetration and airway gene transfer by highly compacted DNA nanoparticles. *Mol Ther*. 2011;19(11):1981-1989*.*
12. Boylan NJ, **Suk JS**, Lai SK, Jelinek R, Boyle MP, Cooper MJ, Hanes J. Highly compacted DNA nanoparticles with low MW PEG coatings: *in vitro*, *ex vivo* and *in vivo* evaluation. *J Control Release*. 2012;157(1):72-79*.*
13. Ensign LM, Schneider CS, **Suk JS**, Cone R, Hanes J. Mucus penetrating particles: characterizing and overcoming the mucus barrier for improved drug and gene delivery, *Advanced Materials*. 2012;24(28):3887-3894.
14. Kim AJ, Boylan NJ, **Suk JS**, Lai SK, Hanes J. Non-degradative intracellular trafficking of highly compacted polymeric DNA nanoparticles. *J Control Release*. 2012;158(1):102-107*.*
15. Boylan NB, Kim AJ, **Suk JS**, Adstamongkonkul P, Lai SK, Zeitlin PL, Hanes J. Enhancement of airway gene transfer by DNA nanoparticles using a pH-responsive block copolymers of polyethylene glycol and poly-L-lysine, Biomaterials. 2012;33(7):2361-2371.
16. Burke CW, **Suk JS**, Kim A, Hsiang YH, Klibanow AL, Hanes J, Price RJ. Markedly enhanced skeletal muscle transfection achieved by the ultrasound-targeted delivery of non-viral gene nanocarriers with small microbubbles. *J Control Release*. 2012;162(2):414-421.
17. Xu Q, Boylan NJ, **Suk JS**, Nance EA, Wang YY, Yang JC, Schuster BS, McDonnell PJ, Cone RA, Duh EJ, Hanes J. Nanoparticle diffusion in, and microrhelogy of, the bovine vitreous *ex vivo. J Control Release.* 2013;167(1):76-84.
18. Schuster BS, **Suk JS**, Woodworth GF, Hanes J. Nanoparticle diffusion in respiratory mucus from humans without lung disease. *Biomaterials*. 2013;34(13):3439-3446.
19. Kim AJ, Boylan NB, **Suk JS**, Hwangbo M, Yu T, Schuster BS, Cebotaru L, Lesniak WG, Oh JS, Adstamongkonkul P, Choi A, Kannan RM, Hanes J. Use of single-site functionalized PEG-dendrons to prepare gene vectors that penetrate human mucus barriers. *Angew Chem Int Ed Engl*. 2013;52(14):3985-3988.
20. **Suk JS**\*\*, Kim AJ\*\*, Trehan K, Schneider CS, Cebotaru L, Woodword OM, Boylan NJ, Boylan MP, Lai SK, Guggino WB, Hanes J. Lung gene therapy with highly compacted DNA nanoparticles that overcome the mucus barrier. *J Control Release*. 2014;178:8-17. \*\*Co-first author.
21. da Silva AL, Martini SV, Abreu SC, Samary Cdos S, Diaz BL, Fernezlian S, de Sa VK, Capelozzi VL, Boylan NJ, **Suk JS**, Rocco PR, Hanes J, Morales MM. DNA nanoparticle-mediated thymulin gene therapy prevents airway remodeling in experimental allergic asthma. *J Control Release*. 2014;180:125-133.
22. Shuster BS, Kim AJ, Kays JC, Kanazawa MM, Guggino WB, Boyle MP, Rowe, SM, Muzyczka N, **Suk JS**, Hanes J. Overcoming the cystic fibrosis sputum barrier to leading adeno-associated virus gene therapy vectors. *Mol Ther*. 2014;22(8):1484-1493.
23. Kim AJ, Woodworth GF, Boylan NJ, **Suk JS**, Hanes J. Highly compacted pH-responsive DNA nanoparticles mediate transgene silencing in experimental glioma. *J Mater Chem B Mater Biol Med*. 2014;2(46):8165-8173.
24. Mastorakos P, Zhang C, Berry S, Oh Y, Lee S, Eberhart CG, Woodworth GF, **Suk JS\***, Hanes J\*. Highly PEGylated DNA nanoparticles provide uniform and widespread gene transfer in the brain. *Adv Healthc Mater*. 2015;4(7):1023-1033. \*Co-corresponding author.
25. Mastorakos P, da Silva AL, Chisholm J, Song E, Choi WK, Boyle MP, Morales MM, Hanes J\*, **Suk JS\***. Highly compacted biodegradable DNA nanoparticles capable of overcoming the mucus barrier for inhaled lung gene therapy. *Proc Natl Acad Sci U S A.* 2015;112(28):8720-8725. \*Co-corresponding author.
26. Shuster BS, Ensign LE, Allan DB, **Suk JS**, Hanes J. Particle tracking in drug and gene delivery research: state-of-the-art applications and methods. *Adv Drug Deliv Rev*. 2015;91:70-91.
27. **Suk JS**, Xu Q, Kim N, Hanes J, Ensign LM. PEGylation as a strategy for improving nanoparticle-based drug and gene delivery. *Adv Drug Deliv Rev*. 2015;99(Pt A):28-51.
28. **Suk JS**. Could recent advances in DNA nanoparticles lead to effective inhaled gene therapies? *Nanomedicine*. 2015;11(3):193-6.
29. Mastorakos P, Song E, Zhang C, Berry S, Park HW, Kim YE, Park JS, Lee S, **Suk JS\***, Hanes J\*. Biodegradable DNA nanoparticles that provide widespread gene delivery in the brain. *Small*. 2016;12(5):678-685. \*Co-corresponding author.
30. Mead BP, Mastorakos P, **Suk JS**, Klibanov AL, Hanes J, Price RJ. Targeted gene transfer to the brain via the delivery of brain-penetrating DNA nanoparticles with focused ultrasound. *J Control Release*. 2016;223:109-117.
31. Berry S, Mastorakos P, Zhang C, Song E, Patel H, **Suk JS\***, Hanes J\*. Enhancing intracranial delivery of clinically relevant non-viral gene vectors.*RCS Adv*. 2016;6:41665-41674. \*Co-corresponding author.
32. Yu T, Choi W, Anonuevo A, Pulicare S, Zhong W, Chen M, Fridley C, McMahon MT, Lai SK, Ensign LM, **Suk JS**, Hanes J. Mucus-penetrating nanosuspensions for enhanced delivery of poorly soluble drugs to mucosal surface. *Adv Healthc Mater*. 2016;5(21):2745-2750.
33. Duncan GA, Jung J, Thaxton A, West N, Boyle MP, Hanes J, **Suk JS**. Microstructural alterations of sputum in cystic fibrosis lung disease. *JCI Insights*. 2016;1(18):e99198.
34. Nascimento TL, Hillaireau H, Vergnaud J, Rivano M, Delomenie, C, Courillleau D, Arpicco S, **Suk JS**, Hanes J, Fattal E. Hyaluronic acid-conjugated lipoplexes for targeted delivery of siRNA in a murine metastatic lung cancer model. *Int J Pharm*. 2016;514(1):103-111.
35. Kim N, Duncan G, Hanes J, **Suk JS**. Barriers to inhaled gene therapy of obstructive lung diseases: a review. *J Control Release*. 2016;240:465-488.
36. Duncan GA, Jung J, Hanes J, **Suk JS**. Airway mucus as a barrier to inhaled gene therapy. *Mol Ther*. 2016;24(12):2043-2053.
37. Zhang C, Nance EA, Mastorakos P, Chisholm J, Berry S, Eberhart CG, Tyler B, Brem H, **Suk JS**, Hanes J. Convection enhanced delivery of cisplatin-loaded brain penetrating nanoparticles cures malignant glioma. *J Control Release.* 2017;263:112-119.
38. Timbie KF, Afzal U, Date A, Zhang C, Miller GW, **Suk JS**, Hanes J, Price RJ. MR Image-guided delivery of cisplatin-loaded brain-penetrating nanoparticles to invasive glioma with focused ultrasound. *J Control Release.* 2017;263:120-131.
39. Schneider CS, Xu Q, Boylan NJ, Chisholm, J, Tang B, Shuster B, Henning A, Ensign L, Lee E, Yu T, **Suk JS\***, Hanes J\*. Nanoparticles that do not adhere to mucus provide uniform and long-lasting drug delivery to airways following inhalation. *Sci Adv*. 2017;3(4):e1601556. \*Co-corresponding author.
40. Mead BP, Kim N, Miller GW, Hodges D, Mastorakos P, Klibanov AL, Mandell JW, Hirsh J, **Suk JS\***, Hanes J\*, Price RJ\*. Novel focused ultrasound gene therapy approach noninvasively restores dopaminergic neuron function in a rat Parkinson’s disease model. *Nano Lett.* 2017;17(6):3533-3542.\*Co-corresponding author.
41. Mastorakos P, Zhang C, Song E, Kim YE, Park HW, Berry S, Choi WK, Hanes J\*, **Suk JS\***. Biodegradable brain-penetrating DNA nanocomplexes and their use to treat malignant brain tumors. *J Control Release.* 2017;262:37-46. \*Co-corresponding author.
42. Zhang C, Mastorakos P, Sobral M, Berry S, Song E, Nance E, Eberhart CG, Hanes J, **Suk JS**. Strategies to enhance nanotherapeutic distribution in the brain. *J Control Release*. 2017;267:232-239.
43. Huang X, Chisholm J, Zhuang J, Xiao Y, Duncan G, Chen X, **Suk JS\***, Hanes J\*. Protein nanocages that penetrate airway mucus and tumor tissue. *Proc Natl Acad Sci U S A.* 2017;114(32):E6595-6602. \*Co-corresponding author.
44. Patil HP, Freches D, Karmani L, Duncan GA, Ucakar B, **Suk JS**, Hanes J, Gallez B, Vanbever R. Fate of PEGylated antibody fragment following delivery to the lungs: influence of delivery site, PEG size and lung inflammation. *J Control Release*. 2017;272:62-71.
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73. Rao D, Kwak G, Wang H, Eberhart, CG, Hanes J, **Suk JS**. Bioreducible gene delivery platform that promotes intracellular payload release and widespread brain dispersion. *ACS Biomater Sci Eng.* 2023; 9(8):4567-4572.
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75. Kwak G, Lee D, **Suk JS**. Advanced approaches to overcome biological barriers in respiratory and systemic routes of administration for enhanced nucleic acid delivery to the lung. *Expert Opin Drug Deliv.* 2023; 20(11):1531-1552.
76. Kwak G, Grewal A, Mess G, Li H, Poulopoulos A, Woodworth GF, Eberhart CG, Ko H, Manbachi A, Caplan J, Price RJ, Tyler B, D, **Suk JS**. Brain nucleic acid delivery and genome editing via focus ultrasound-mediated blood-brain barrier opening and long-circulating nanoparticles. *ACS Nano*. 2024; 18(35):24139-24153.

**Submitted or In-revision Peer-reviewed Journal Articles**

N/A

**Non-peer Reviewed Journal Articles**

1. Hanes J, Ensign L, Kannan R, **Suk JS**. Special Issue: Drug delivery research in North America – Part I. *J Control Release*. 2015;219:1.
2. Hanes J, Ensign L, Kannan R, **Suk JS**. Special Issue: North America special issue Part II. *J Control Release*. 2016;240:1.
3. **Suk JS**, Suh J, Cui H, Kim AK, Lee S, Yeo Y. Special Issue: The 28th KAST International Symposium on Young Scientist in Drug Delivery – Redirecting the Research Field. *J Control Release*. 2017;267:1.

**Book Chapters**

1. Negron K, Khalasawi N, **Suk JS**. Strategies to enhance the distribution of therapeutic nanoparticles in the brain by convection enhanced delivery. Nanotherapy for Brain Tumor Drug Delivery. In: Agrahari V., Kim A., Agrahari V. (eds) Nanotherapy for Brain Tumor Drug Delivery. Neuromethods, 2021;163:179-204. Humana, New York, NY. https://doi.org/10.1007/978-1-0716-1052-7\_7

**Major Invited Speeches**

**Local**

1. **Suk JS**. Mucus-penetrating DNA nanoparticles for cystic fibrosis gene therapy, Johns Hopkins Cystic Fibrosis Seminar. Baltimore, MD, 2013.
2. **Suk JS.** Biodegradable mucus-penetrating DNA nanoparticles for lung gene therapy. Johns Hopkins Cystic Fibrosis Seminar, Baltimore, MD, 2014.
3. **Suk JS**. Mucus penetrating nanoparticles for small cell lung cancer, NIH Center for Cancer Nanotechnology Excellence Annual Site Visit, Baltimore, MD. 2014.
4. **Suk JS**. Strategies to enhance nanoparticle-based drug delivery to the brain. Adult Brain Tumor Consortium Meeting, Baltimore, MD. 2017.
5. **Suk JS**. Synthetic nucleic acid delivery system for gene therapy. Johns Hopkins University Department of Chemical and Biomolecular Engineering Seminar Series. Baltimore MD, 2018.
6. **Suk JS**. Synthetic DNA-loaded nanoparticles for inhaled gene therapy, Cystic Fibrosis Foundation Research Development Program Seminar Series. 2018.
7. **Suk JS**. Therapeutic delivery strategies for treating brain diseases. University of Maryland School of Medicine Drug Delivery in Neuroscience Seminar. Baltimore, MD. 2023.
8. **Suk JS**. Nanomedicine for treating brain disorders. University of Maryland School of Medicine Neurosurgery Grand Round. Baltimore, MD. 2024.

**National**

1. **Suk JS**. Nanotechnology-based therapeutic delivery to the brain. Focused Ultrasound for Glioblastoma Workshop, Charlottesville, VA. 2015.
2. **Suk JS**. Breaching the mucus barrier for airway gene transfer. American Thoracic Society Annual Meeting, San Francisco, CA. 2016.
3. **Suk JS**. Mucus-penetrating DNA nanoparticles for inhaled gene therapy. Gordon Research Conference – Cilia, Mucus and Mucociliary Clearance., Galveston, TX. 2017.
4. **Suk JS**. GRAS material-based nanoparticles for widespread therapeutic delivery to the brain. AAPS-NERDG, Farmington, CT. 2018.
5. **Suk JS**. Human protein nanocage capable of overcoming multiple biological barriers to cancer therapeutics, 13th Frontier Scientist Workshop – Future Trends in Biomaterials, Salt Lake City, UT. 2018.
6. **Suk JS**. Human ferritin nanocage for cancer therapeutic delivery. IEEE NanoMed 2018 Conference, Honolulu, HI. 2018.
7. **Suk JS**. Synthetic nucleic acid delivery system for inhaled gene therapy. Biomedical Engineering Society Annual Meeting, Pennsylvania, PA. 2019.
8. **Suk JS**. Gene therapy as an end to asthma. American Academy of Allergy, Asthma & Immunology Annual Meeting. Phoenix, AZ. 2022.
9. **Suk JS**. Human nanocage-based TGFβ trap for enhancing immunotherapy of malignant brain tumors. US-Korea Conference on Science, Technology, and Entrepreneurship (UKC) 2022. Arlington, VA. 2022.
10. **Suk JS**. Human protein nanocage-based immunomodulatory therapy of malignant brain tumors. International Conference on PharmScience Research & Development. Las Vegas, NV. 2023.
11. **Suk JS**. How to promote and enhance interactions between clinicians and scientists to improve effectiveness and design of nanotherapeutics? Bethesda, MD. 2023.
12. **Suk JS**. A two-pronged strategy for systemic nucleic acid delivery to the brain. US-Korea Conference on Science, Technology, and Entrepreneurship (UKC) 2024. San Francisco, CA. 2024.

**International**

1. **Suk JS**. Mucus penetrating nanoparticle. International Conference and Workshop on Biological Barrier, Saarbrucken, Germany. 2014.
2. **Suk JS**. Brain penetrating nanoparticles for neurological diseases. Ben Gurion University Department of Chemistry Seminar Series, Beer-Sheva, Israel. 2014.
3. **Suk JS**. Merging simple approaches for effective therapeutic delivery. The Korean Academy of Science and Technology Symposium for Young Scientists in Drug Delivery – Redirecting the Research Field, Seoul, Republic of Korea. 2016.
4. **Suk JS**. Strategies to enhance therapeutic gene transfer to the brain. 8th International Congress- Nanotechnology in Medicine & Biology, Krems, Austria. 2017.
5. **Suk JS**. Nanoparticle applied to health: what does it mean? Brazilian National Academy of Medicine Symposium on Advanced Therapies – Stem Cells, Gene Therapy and Nanotechnology Applied to Healthy. Virtual. 2020.
6. **Suk JS**. Nanoparticle in health: an example applied to lung diseases. Brazilian National Academy of Medicine Symposium on Advanced Therapies – Stem Cells, Gene Therapy and Nanotechnology Applied to Healthy. Virtual. 2020.
7. **Suk JS**. Human protein nanocage as a delivery and therapeutic platform for cancer therapy. Seoul National University of Cancer Research Institute Seminar Series. Seoul, Republic of Korea. 2021.
8. **Suk JS**. Focused ultrasound- and polymeric nanoparticle-mediated nucleic acid delivery to the brain. 4th SIGN Conference. Hyderabad, India 2024.