CURRICULUM VITAE

HONG CHEN, PH.D.

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A. RESEARCH PROGRAM

The mission of my laboratory is to develop innovative ultrasound techniques to improve the diagnosis and treatment of brain cancer and advance the understanding of brain functions.

B. ACADEMIC APPOINTMENTS

2023–present Associate Professor, Department of Neurosurgery, Washington University School of Medicine, St. Louis, MO

2021–present Associate Professor, Department of Biomedical Engineering, Washington University in St. Louis, St. Louis, MO

2021–2023 Associate Professor, Department of Radiation Oncology, Washington University School of Medicine, St. Louis, MO

2019–present Faculty Member, The Hope Center for Neurological Disorders, Washington University School of Medicine

2018–present Faculty Program Member, The Division of Biology & Biomedical Sciences, Washington University School of Medicine

2016–present CCSG Member, Oncological Imaging Program, Siteman Cancer Center, Washington University School of Medicine

2015–present Member, Institute of Clinical and Translational Sciences (ICTS), Washington University School of Medicine, St. Louis, MO

2015–2021 Assistant Professor, Department of Biomedical Engineering, Washington University in St. Louis, St. Louis, MO

2015–2021 Assistant Professor, Department of Radiation Oncology, Washington University School of Medicine, St. Louis, MO

C. EDUCATION AND POST-GRADUATE TRAINING

2012–2015 Postdoctoral Research Scientist, Department of Biomedical Engineering, Columbia University, New York, NY

2011–2012 Fellow, School of Medicine, University of Washington, Seattle, WA

2006–2011 Ph.D., Bioengineering, University of Washington, Seattle, WA

2003–2006 M.E., Biomedical Engineering, Xi'an Jiaotong University, Shaanxi, China

1999–2003 B.E., Biomedical Engineering, Xi'an Jiaotong University, Shaanxi, China

D. HONORS AND AWARDS

2023 Selected to the Washington University School of Medicine Siteman Emerging Leaders Council

2021	Washington University in St. Louis Leadership & Entrepreneurship Acceleration Program Winner
2020	Frederic Lizzi Early Career Award from the International Society of Therapeutic Ultrasound
2019	The 1st place professional poster prize at the American Association of Pharmaceutical Society Novel Approaches Target Brain Barriers for Effective Delivery of Therapeutics Workshop
2019	Chair's Award for Outstanding Teaching, Department of Biomedical Engineering, James McKelvey School of Engineering, Washington University in St. Louis
2019	Our publication titled "Focused Ultrasound-enabled Brain Tumor Liquid Biopsy" received 2, 169 article views in 2018 and was listed as one of the Top 100 Oncology papers for Scientific Reports in 2018.
2018	Received funding from the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative.
2014	Young Investigator Award, 4th International Symposium on Focused Ultrasound
2011	Finalist for Student Paper Competition, the International Society of Therapeutic Ultrasound
2011	Outstanding Teaching Assistant Award, Bioengineering Department, University of Washington
2008	Student Paper Award, IEEE International Ultrasonics Symposium
2005	R.W.B. Stephens Prize Winner, the World Congress in Ultrasonics/Ultrasonics International

E. AWARDS TO TRAINEES OF THE LAB

- 31 awards in total, only include awards from international organizations and conferences

1. Yaoheng Yang (Graduate student) was awarded the WashU BME Outstanding Dissertation Award 2023
2. Dingyue Zhang (Graduate Student) received the best poster award at the 15th International Conference on Ultrasound Engineering for Biomedical Applications (IC-UEBA), 2023
3. Dezhuang Ye (postdoc) won the Outstanding Poster Award at the 2023 American Society of Gene + Cell Therapy (ASGCT) Annual Meeting
4. Lu Xu (Graduate student) won the Student Travel Award at 2023 IEEE International Ultrasonics Symposium (IUS).
5. Yan Gong (Graduate student) won the Student Travel Award at 2023 IEEE International Ultrasonics Symposium (IUS)
6. Yaoheng Yang (Graduate student) received the Trainee Professional Development Award (TPDA) from the Society of Neuroscience (SfN), 2022
7. Dezhuang Ye (postdoc) won the Young Investigator Award in the 8th International Symposium on Focused Ultrasound 2022
8. Dezhuang Ye (postdoc) won the Bracco Women in Science Award in the 8th International Symposium on Focused Ultrasound 2022
9. Christopher Pacia (Graduate student) was awarded the WashU BME Outstanding Dissertation Award 2022
10. Dezhuang Ye (postdoc) won the NatureNeuro award at the Brain Immunology and Glia Symposium 2022
11. Zhongtao Hu (Postdoc) won the Best Presentation Award at the In Vivo Ultrasound Imaging

Gordon Research Conference, 2022

12. Christopher Pacia (Graduate student) won the Student Poster Award competition at the 181st Meeting of the Acoustical Society of America, 2021
13. Yaoheng Yang (Graduate student) was awarded the Nadine Barrie Smith Student Award at the 20th Annual International Symposium for Therapeutic Ultrasound 2021.
14. Yaoheng Yang (Graduate student) was awarded the Trainee Highlight Award at the 2021 BRAIN Initiative Investigators Meeting 2021.
15. Dezhuang Ye (Graduate student) won the poster award at Oncological Imaging Program at Washington University in St. Louis 2021.
16. Charlotte Weixel (Undergraduate student) received the WashU BioSURF award for summer 2021.
17. Yaoheng Yang (Graduate student) received the 2020 Trainee Professional Development Award from the Society for Neuroscience (SfN). 2020
18. Christopher Pacia (Graduate student) won the award for the top Emerging Investigator for 2020 from the Imaging Elevated: Utah Symposium for Emerging Investigators. October 9, Virtual meeting.
19. Christopher Pacia (Graduate student) won the Student Paper Award at the 2019 IEEE International Ultrasonics Symposium (IUS), October 6-9, 2019, Glasgow, Scotland.
20. Christopher Pacia (Graduate student) received a fellowship from the Cognitive, Computational, and Systems Neuroscience (CCSN) Pathway program. 2019
21. Dezhuang Ye (Graduate student) received the Association of Women Faculty Graduate Student Award, Washington University in St. Louis. 2019
22. Christopher Pacia (Graduate student) received the Officer Travel Grant from the SPIE for attending the SPIE Photonics West conference. 2019
23. Dezhuang Ye (Graduate student) won the First Place in the Student Poster Award competition at the 175th Meeting of the Acoustical Society of America, Minneapolis, Minnesota, 2018
24. Yaoheng Yang (Graduate student) won the Student Travel Award for attending the 18th International Symposium for Therapeutic Ultrasound, Nashville, Tennessee, 2018
25. Yaoheng Yang (Graduate student) won the Student Oral Award Finalist in the 18th International Symposium for Therapeutic Ultrasound, Nashville, Tennessee, 2018
26. Dezhuang Ye (Graduate student) won the Student Poster Award Finalist in the 18th International Symposium for Therapeutic Ultrasound, Nashville, Tennessee, 2018
27. Dezhuang Ye (Graduate student) won the Student Travel Award for attending the 18th International Symposium for Therapeutic Ultrasound, Nashville, Tennessee, 2018
28. Yaoheng Yang (Graduate student) won the Student Poster Award at the Oncologic Imaging Research Program Poster Session organized by the Siteman Cancer Center, Washington University in St. Louis. 2017
29. Zhaorui Wang (undergraduate student) was accepted by the Leah Menshouse Springer Summer Opportunities Program at the Siteman Cancer Center, Washington University in St. Louis. 2017
30. Dezhuang Ye (Graduate student) received the 22nd Annual Graduate Research Symposium in Engineering poster competition 2nd place, awarded by Washington University Graduate Student Senate, 2017
31. Satya Kothapolli (postdoc) received the New Investigator Award from the Society of Thermal Medicine, 2017.

F. PEER-REVIEWED JOURNAL ARTICLES

- Number of peer-reviewed publications: **68** in total
- h-index: **27**
- Google Scholar link: https://scholar.google.com/citations?user=DrUwvK0AAAAJ&hl=en

*: Corresponding author; underline: trainees of Hong Chen.

1. Yang YH, Yuan JY, Field RL, Ye DZ, Hu ZT, Xu K, Gong Y, Yue YM, Kravitz A, Bruchas MR, Cui JM, Brestoff JR, and **Chen H***, Induction of a torpor-like hypothermic and hypometabolic state in rodents by ultrasound, ***Nature Metabolism***, 2023;5, 789–803
2. Ye DZ, Chen S, Liu YJ, Weixel C, Hu ZT, and **Chen H***, Mechanically manipulating glymphatic transportation by ultrasound combined with microbubbles, ***Proceedings of the National Academy of Sciences***, 2023; 120 (21): e2212933120
3. Yuan JY, Xu L, Chien CY, Yang YH, Yue YM, Fadera S, Stark AH, Schwetye KE, Nazeri K, Desai R, Athiraman U, Chaudhuri AA, **Chen H*,** Leuthardt EC*, First-in-human prospective trial of sonobiopsy in high-grade glioma patients using neuronavigation-guided focused ultrasound, ***NPJ Precision Oncology***, 2023; 7(1): 92
4. Pacia CP, Yuan JY, Yue Y, Leuthardt EC, Benzinger TLS, Nazeri A, **Chen H***, Focused Ultrasound–mediated Liquid Biopsy in a Tauopathy Mouse Model, ***Radiology***, 2023; 307(2):e 220869
5. Fadera S, Chukwu C, Stark AH, Yue YM, Xu L, Chien CY, Yuan JY, **Chen H***, Focused ultrasound-mediated delivery of anti-programmed cell death-ligand 1 antibody to the brain of a porcine model, ***Pharmaceutics***, 2023, *15*(10), 2479
6. Xu L, Gong Y, Chien CY, Leuthardt E, **Chen H***, Transcranial focused ultrasound-induced blood–brain barrier opening in mice without shaving hairs, ***Scientific Reports***, 2023; 12: 13500
7. Hu ZT, Yang YH, Ye DZ, Chen S, Gong Y, Chukwu C, **Chen H***, Noninvasive and spatially targeted delivery of therapeutic agents to the mouse brain using a stereotactic-guided miniature focused ultrasound device, ***STAR Protocols***, 2023; 4(1): 102132
8. Xu L, Pacia CP, Gong Y, Hu ZT, Chien CY, Yang LQ, Gach MH, Hao Y, Comron H, Huang JY, Leuthardt, EC, **Chen H***, Characterization of the Targeting Accuracy of a Neuronavigation-guided Transcranial FUS system in vitro, in vivo, and in silico. ***IEEE Trans Biomed Eng***. 2023; 70(5):1528-1538.
9. Xu K, Yang Y, Hu ZT, Yue YM, Cui J, Culver JP, Bruchas MR, and **Chen H***, TRPV1-mediated sonogenetic neuromodulation of motor cortex in freely moving mice, ***J. of Neural Engineering***, 2023; 20:016055
10. Ye D, Yuan JY, Yang YH, Yue YM, Hu ZT, Fadera S, **Chen H***, Incisionless targeted adeno-associated viral vector delivery to the brain by focused ultrasound-mediated intranasal administration. ***eBioMedicine***. 2022 Oct;84:104277.
11. Pacia CP, Yuan JY, Yue Y, Xu L, Nazeri A, Desai R, Gach HM, Wang XW, Talcott MR, Chaudhuri AA, Dunn GP, Leuthardt EC, **Chen H***, Sonobiopsy for minimally invasive, spatiotemporally-controlled, and sensitive detection of glioblastoma-derived circulating tumor DNA. ***Theranostics***. 2022;12(1):362-378.
12. Hu ZT, Yang YH, Xu L, Jing Y, **Chen H***, Airy Beam-enabled Binary Acoustic Metasurfaces for Underwater Ultrasound Beam Manipulation. ***Phys Rev Appl***. 2022 Aug;18(2): 024070
13. Gong Y, Ye DZ, Chien CY, Yue YM, and **Chen H***, Comparison of Sonication Patterns and Microbubble Administration Strategies for Focused Ultrasound-Mediated Large-Volume Drug Delivery. ***IEEE Trans Biomed Eng***. 2022 Nov;69(11):3449-3459.

14. Hu ZT, Chen S, Yang YH, Gong Y, and **Chen H***, An Affordable and Easy-to-Use Focused Ultrasound Device for Noninvasive and High Precision Drug Delivery to the Mouse Brain. ***IEEE Trans Biomed Eng***. 2022 Sep;69(9):2723-2732.
15. Chen S, Nazeri A, Baek H, Ye D, Yang Y, Yuan J, Rubin JB, **Chen H***, A review of bioeffects induced by focused ultrasound combined with microbubbles on the neurovascular unit. ***J Cereb Blood Flow Metab.*** 2022 Jan;42(1):3-26.
16. Hu ZT, Yang YH, Xu L, Hao Y, **Chen H***, Binary acoustic metasurfaces for dynamic focusing of transcranial ultrasound. ***Front Neurosci***. 2022;16:984953.
17. Chien CY, Xu L, Pacia CP, Yue YM, **Chen H***, Blood-brain barrier opening in a large animal model using closed-loop microbubble cavitation-based feedback control of focused ultrasound sonication. **Sci Rep.** 2022 Sep 27;12(1):16147. PubMed PMID: 36167747; PubMed Central PMCID: PMC9515082.
18. Pan SL, Ye DZ, Yue YM, Yang LH, Pacia CP, DeFreitas D, Esakky P, Dahiya S, Limbrick DD, Rubin JB, Chen H, Strahle JM, Leptomeningeal Disease and Tumor in a Murine DIPG Model: Implications for Study of the Tumor-CSF-Ependymal Microenvironment, ***Neuro-oncology Advances***, 2022; 4(1): vdac059
19. Chien CY, Gong G, Yang YH, Yue YM, **Chen H***, Blood-Brain Barrier Opening by Individualized Closed-Loop Feedback Control of Focused Ultrasound, ***BME Frontiers***, 2022; 9867230
20. Yang Y, Pacia CP, Ye D, Yue Y, Chien CY, **Chen H***, Static Magnetic Fields Dampen Focused Ultrasound-mediated Blood-Brain Barrier Opening. ***Radiology***. 2021 Sep;300(3):681-689.
21. Yang Y, Pacia CP, Ye D, Zhu L, Baek H, Yue Y, Yuan J, Miller MJ, Cui J, Culver JP, Bruchas MR, and **Chen H***, Sonothermogenetics for noninvasive and cell-type specific deep brain neuromodulation. ***Brain Stimulation***. 2021 Jul-Aug;14(4):790-800.
22. Hou Z, Guertler CA, Okamoto RJ, **Chen H**, Garbow JR, Kamilov US, Bayly PV. Estimation of the mechanical properties of a transversely isotropic material from shear wave fields via artificial neural networks**.** ***Journal of the Mechanical Behavior of Biomedical Materials***. 2021 Dec 15:105046.
23. Hu ZT, Xu L, Chien CY, Yang YH, Gong G, Ye DZ, Pacia CP, and **Chen H***. 3-D Transcranial Microbubble Cavitation Localization by Four Sensors. ***IEEE Trans Ultrason Ferroelectr Freq Control.*** 2021 Nov;68(11):3336-3346.
24. Baek H, Yang Y, Pacia CP, Xu L, Yue YM, Bruchas MR, **Chen H***. Mechanical and mechanothermal effects of focused ultrasound elicited distinct electromyographic responses in mice. ***Phys Med Biol.*** 2021 Jun 24;66(13).
25. Ye D, **Chen H***, Focused ultrasound-mediated intranasal brain drug delivery technique (FUSIN). ***MethodsX***. 2021;8:101266.
26. Yuan JY, Ye D, Chen S, **Chen H*,** Therapeutic ultrasound-enhanced immune checkpoint inhibitor therapy, ***Frontiers in Physics***, 2021;9:636985
27. Zhu L, Huang Y, Lam D, Gach HM, Zoberi I, Hallahan DE, Grigsby PW, Chen H, Altman M, Targetability of cervical cancer by magnetic resonance-guided high-intensity focused ultrasound (MRgHIFU)-mediated hyperthermia (HT) for patients receiving radiation therapy. ***Int J Hyperthermia***. 2021;38(1):498-510.
28. Ye D, Yuan J, Yue Y, Robin J, **Chen H***, Focused Ultrasound-Enhanced Delivery of Intranasally Administered Anti-Programmed Cell Death-Ligand 1 Antibody to an Intracranial Murine Glioma Model. ***Pharmaceutics***. 2021 Feb 1;13(2).

29. Zhuang XH, Ye D, Yang L, Yue Y, Sultan D, Pacia C, Pang H, Detering L, Heo GS, Luehmann H, Choksi A, Sethi A, Tai YC, Limbrick D, Becher O, Rubin J, **Chen H***, Liu YJ*, Magnetic Resonance Imaging-Guided Focused Ultrasound-Based Delivery of Radiolabeled Copper Nanoclusters to Diffuse Intrinsic Pontine Glioma. ***ACS Appl Nano Mater.*** 2020 Nov 25;3(11):11129-11134.
30. Zhu L, Pacia CP, Dao L, Gach, M; Partanen A, Talcott MR, Greco SC, Zoberi I, Hallahan DE, **Chen H**, Altman MB. Characterization of magnetic resonance-guided high-intensity focused ultrasound (MRgHIFU)-induced large-volume hyperthermia in deep and superficial targets in a porcine model. ***Int J Hyperthermia***. 2020;37(1):1159-1173.
31. Ye D, Luan JY, Pang H, Yang Y, **Chen H***, Characterization of focused ultrasound-mediated brainstem delivery of intranasally administered agents. ***Journal of Control Release***. 2020 Dec 10;328:276-285.
32. Zhu L, Nazeri A, Pacia CP, Yue Y, **Chen H***, Focused ultrasound for safe and effective release of brain tumor biomarkers into the peripheral circulation. ***PLoS One***. 2020;15(6):e0234182.
33. Pacia CP, Zhu L, Yang Y, Yue Y, Nazeri A, Gach HM, Talcott MR, Leuthardt EC, **Chen H***, Feasibility and safety of focused ultrasound-enabled liquid biopsy in the brain of a porcine model. ***Sci Rep***. 2020 May 4;10(1):7449.
34. LeMoyne HG, Ye D, Carpenter J, Prior J, Marsala L, Mixdorf M, Rubin J, **Chen H**, Achilefu S, Intracranial glioma xenograft model rapidly reestablishes BBB integrity for longitudinal imaging of tumor progression using fluorescence molecular tomography, ***Journal of Biomedical Optics***. 2020; 25(2): 026004
35. Guertler CS, Okamoto RJ, Ireland J, Pacia C, Garbow J, **Chen H**, Bayly PV, Estimation of Anisotropic Material Properties of Soft Tissue by MRI of Ultrasound-Induced Shear Waves. J Biomech Eng. 2020 Mar 1;142(3).
36. Zhu L, Straube W, Zoberi I, Hallahan DE, Altman MB, **Chen H***, Ultrasound Hyperthermia Technology for Radiosensitization. Ultrasound Med Biol. 2019 May;45(5):1025-1043.
37. Zhu L, Partanen A, Talcott MR, Gach MH, Greco SC, Henke LE, Contreas JA, Zoberi I, Hallahan DE, **Chen H**, Feasibility and safety assessment of magnetic resonance-guided high-intensity focused ultrasound (MRgHIFU)-mediated mild hyperthermia in pelvic targets evaluated using an in vivo porcine model. ***Int J Hyperthermia***. 2019;36(1):1147-1159.
38. Xu S, Ye D, Wan L, Shentu Y, Yue Y, Wan M, **Chen H***. Correlation Between Brain Tissue Damage and Inertial Cavitation Dose Quantified Using Passive Cavitation Imaging. ***Ultrasound Med Biol***. 2019 Oct;45(10):2758-2766.
39. Yang Y, Zhang X, Ye D, Laforest R, Williamson J, Liu Y, **Chen H***. Cavitation dose painting for focused ultrasound-induced blood-brain barrier disruption. ***Sci Rep***. 2019 Feb 26;9(1):2840.
40. Ye D, Zhuang XH, Yue YM, Raliya R, Biswas P, Taylor S, Tai YC, Rubin JB, Liu YJ, **Chen H***. Focused ultrasound combined with microbubble-mediated intranasal delivery of gold nanoclusters to the brain. ***J Control Release***. 2018 Sep 28;286:145-153.
41. Ye D, Sultan D, Yue YM, Heo GS, Kothapalli S, Luehmann H, Tai YC, Rubin JB, Liu YJ*, **Chen H***. Focused ultrasound-enabled delivery of radiolabeled nanoclusters to the pons. ***J Control Release***. 2018 Aug 10;283:143-150.
42. Sultan D, Ye D, Heo GS, Zhang XH, Luehmann H, Yue YM, Detering L, Komarov S, Taylor S, Tai YC, Rubin JB, **Chen H***, Liu YJ*. Focused Ultrasound Enabled Trans-Blood Brain

Barrier Delivery of Gold Nanoclusters: Effect of Surface Charges and Quantification Using Positron Emission Tomography. ***Small.*** 2018 Jul;14(30):e1703115.
43. Kothapalli S, Partanen A, Zhu LF, Altman M, Gach HM, Hallahan D, **Chen H***. A convenient, reliable, and fast acoustic pressure field measurement method for magnetic resonance-guided high-intensity focused ultrasound systems with phased array transducers. ***J Ther Ultrasound.*** 2018;6:5.
44. Zhu L, Cheng G, Ye D, Nazeri A, Yue YM, Liu WJ, Wang XW, Dunn GP, Petti AA, Leuthardt EC, **Chen H***. Focused Ultrasound-enabled Brain Tumor Liquid Biopsy. ***Sci Rep***. 2018 Apr 26;8(1):6553.
45. Kothapalli S, Altman M, Zhu L, Cheng G, Partanen A, Gach HM, Zoberi I, Hallahan D, and **Chen H***. Evaluation and selection of anatomic sites for magnetic resonance imaging-guided mild hyperthermia therapy: a healthy volunteer study. ***Int J Hyperthermia***. 2018 Dec;34(8):1381-1389.
46. Kothapalli S, Partanen A, Zhu L, Altman M, Gach MH, Hallahan DE, **Chen H*.** Acoustic field characterization of a clinical magnetic resonance-guided high-intensity focused ultrasound system inside the magnet bore. ***Med Phys***. 2017 Sep;44(9):4890-4899.
47. Eranki A., Farr N., Partanen A., Sharma KV, **Chen H**, Rossi CT, Kothapalli S, et. al. Boiling histotripsy lesion characterization on a clinical magnetic resonance imaging-guided high intensity focused ultrasound system. ***Plos One***. 2017; 12(3): e0173867.
48. **Chen H**, Yang G, Getachew H, Acosta CJ, Sierra Sánchez CJ, Konofagou EE. Focused ultrasound-enhanced intranasal brain drug delivery of the brain-derived neurotrophic factor. ***Scientific Reports***. 2016; 6:28599.
49. Kamimura H, Wang ST, **Chen H**, Wang Qi, Aurup C, Acosta C, Carneiro A, and Konofagou E. Noninvasive focused ultrasound for cognitive- and motor-related brain modulation. ***Medical Physics***. 2016; 43(10): 5730-5735.
50. Payen T, Palermo C, Sastra S, **Chen H**, Yang H, Olive K, Konofagou E. Elasticity mapping of murine abdominal organs in vivo using harmonic motion imaging (HMI). ***Physics in Medicine and Biology***. 2016; 61(15): 5741.
51. Zhou YF, Wang Y-N, Farr N, Zia J, **Chen H**, Ko BM, Khokhlova T, Li T, Hwang JH. Enhancement of small molecule delivery by pulsed high-intensity focused ultrasound: A parameter exploration. ***Ultrasound in Medicine and Biology***. 2016;42(4):956-963.
52. **Chen H**, Han Y, Payen T, Palermo CF, Olive KP, Konofagou EE. Harmonic motion imaging for abdominal tumor detection and high-intensity focused ultrasound ablation monitoring: an in vivo feasibility study in a transgenic mouse model of pancreatic cancer. ***IEEE transactions on ultrasonics, ferroelectrics, and frequency control***. 2015; 62(9):1662-1673.
53. Li T, Wang Y-N, Khokhlova T, D'Andrea S, Starr F, **Chen H**, McCune JS, Risler LJ, Mashadi-Hossein A, Hwang JH. Pulsed high intensity focused ultrasound (pHIFU) enhances delivery of doxorubicin in the KPC mouse model of pancreatic cancer. ***Cancer Research***. 2015; canres-0296.
54. **Chen H**, Chen C, Wu SY, Tao Su, Acosta C, Konofagou EE. A new brain drug delivery strategy: Focused ultrasound-enhanced intranasal drug delivery. ***PLoS ONE***. 2014; 9(10): e108880.
55. **Chen H**, Konofagou EE. The size of blood-brain barrier opening induced by focused ultrasound is dictated by the acoustic pressure. ***Journal of cerebral blood flow and metabolism***. 2014; 34(7):1197–1204.
56. **Chen H**, Hwang JH. Ultrasound-targeted microbubble destruction for chemotherapeutic drug

delivery to solid tumors. Journal of Therapeutic Ultrasound. 2013;1(1):10

57. Li T, **Chen H**, Khokhlova TD, Wang YN, Kreider W, He XM, Hwang JH, Passive cavitation detection during pulsed HIFU exposures of ex vivo tissues and in vivo mouse pancreatic tumors. ***Ultrasound in Medicine and Biology***. 2014; 40(7): 1523-1534.
58. Hosseinkhah N, **Chen H**, Matula TJ, Burns P, Hynynen K. Mechanisms of microbubble-vessel interactions and induced stresses: a numerical model to describe the microbubble/fluid/vessel system. ***Journal of the Acoustical Society of America***. 2013; 134(3): 1875-1885.
59. Perez C, **Chen H**, Karzova M, Khokhlova V, Matula TJ. Acoustic field characterization of the Duolith: Measurements and modeling of a clinical shockwave therapy device. ***Journal of Acoustical Society of America***. 2013; 134(2): 1663-1674.
60. **Chen H**, Brayman AA, Matula TJ. Characteristic microvessel relaxation timescales associated with ultrasound-activated microbubbles. ***Applied Physics Letters***. 2012; 101(16): 163704.
61. **Chen H**, Brayman AA, Evan AP, Matula TJ. Preliminary observations on the spatial correlation between short-burst microbubble oscillations and vascular bioeffects. ***Ultrasound in Medicine and Biology***. 2012:38: 2151-2162.
62. **Chen H**, Kreider W, Brayman AA, Bailey MR, Matula TJ. Blood vessel deformations on microsecond time scales by ultrasonic cavitation. ***Physical Review Letters***. 2011; 106(3): 034301.
63. **Chen H**, Brayman AA, Kreider W, Bailey MR, Matula TJ. Observations of translation and jetting of ultrasound-activated microbubbles in mesenteric microvessels. ***Ultrasound in Medicine and Biology***. 2011; 37(12): 2139-4218.
64. **Chen H**, Brayman AA, Bailey MR, Matula TJ. Blood vessel rupture by cavitation. ***Urological Research***. 2010; 38(4): 321-326.
65. **Chen H**, Li XJ, Wan MX, Wang SP. High-speed observation of cavitation bubble clouds near a tissue boundary in high-intensity focused ultrasound fields. ***Ultrasonics***. 2009; 49(3): 289-292.
66. **Chen H**, Li XJ, Wan MX, Wang SP. High-speed observation of cavitation bubble cloud structures in the focal region of a 1.2 MHz high-intensity focused ultrasound transducer. ***Ultrasonics Sonochemistry***. 2007;14(3): 291-297.
67. **Chen H**, Li XJ, Wan MX. Spatial-temporal dynamics of cavitation bubble clouds in 1.2 MHz focused ultrasound field. ***Ultrasonics Sonochemistry***. 2006; 13(6): 480-486.
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H. BOOK CHAPTER

1. **Chen H**, Ye DZ, Focused Ultrasound-Mediated Intranasal Brain Drug Delivery Technique (FUSIN). In: Avraham Rasooly et al. (Eds): Biomedical Engineering Technologies: Springer Nature
2. Matula TJ, **Chen H.** Nano/Microparticles in Ultrasound Imaging & Therapy. In: Yang X, ed. Nanotechnology in Modern Medical Imaging and Interventions: Nova Science Publishers, Inc.

I. INVITED TALKS

1. "Breaking Barriers: Transforming the Diagnosis and Treatment of Brain Diseases Through Ultrasound", John Hopkins University Biomedical Engineering Department Seminars, 2023
2. "Emerging transcranial ultrasound neuromodulation technologies," Stanford University

NeuroTech Seminars, 2023

3. “Ultrasound neuromodulation induces a torpor-like state in rodents”, Carnegie Mellon University Neural Engineering Virtual Seminars, 2023
4. “Breaking Barriers: Transforming the Diagnosis and Treatment of Brain Diseases Through Ultrasound”, University of Texas Arlington, 2023
5. “Emerging transcranial ultrasound neuromodulation technologies,” Clinical Transcranial Magnetic Stimulation (TMS) Society Grand Rounds, 2023
6. “Ultrasound-enabled agent transport out and into the brain for diagnosis and treatment of brain diseases”, University of North Carolina Chapel Hill BME Coulter Seminar, 2023
7. “Ultrasound modulation of neurons by sonogenetics, 184th Meeting of the Acoustical Society of America, 2023
8. “Sonobiopsy for expanding the application of therapeutic ultrasound in the diagnosis of brain diseases”, 184th Meeting of the Acoustical Society of America, 2023
9. “Structured mentoring process”, 184th Meeting of the Acoustical Society of America, 2023
10. “Ultrasound-enabled gene transport in and out of the brain”, International Symposium on Biomolecular Ultrasound and Sonogenetics, California, 2022
11. “Noninvasive and cell-type-specific neuromodulation by integrating ultrasound with genetics”, The 21st Annual International Symposium for Therapeutic Ultrasound, Toronto, 2022
12. “Bubble-vessel interactions: From physics to applications in brain disease theranostics”, 182nd Meeting of the Acoustical Society of America, Denver, Colorado 2022
13. “Targeting the brain with focused ultrasound”. Vanderbilt University, January 28, 2022
14. “Targeting the brain with focused ultrasound”. George Mason University, November 11, 2022
15. “Targeting the brain with focused ultrasound”. Texas Tech University, November 08, 2022
16. “Targeting the brain with focused ultrasound”. Inserm Imaging & Brain, France, June 22, 2021
17. “Targeting the brain with focused ultrasound”. Pennsylvania State University, April. 4, 2021
18. “Targeting the brain with focused ultrasound”. Neurosurgery grand Rounds, Washington Univesity in St. Louis, Feb. 3, 2021
19. “Focused Ultrasound-Enabled two-way transfer across the blood-brain barrier”. 7th International Symposium on Focused Ultrasound, Nov. 9, 2020
20. “Focused Ultrasound-Enabled Liquid Biopsy for Noninvasive Diagnosis of Brain Cancer”, International Society of Therapeutic Ultrasound On-Air Webinar. June 25, 2020
21. "MRI-guided focused ultrasound for noninvasive diagnosis of brain tumors," 11th National Image Guided Therapy Workshop, April 2020.
22. "Two-way transfer across the blood-brain barrier," The Inauguration Symposium of the 15th Chancellor of Washington University in St. Louis, Oct. 2019.
23. "Advances in Image-Guided Focused Ultrasound Applications," The American Association of Physicists in Medicine, San Antonio, TX, July 2019.
24. "Image-Guided Focused Ultrasound-Mediated Brain Drug Delivery," Society for image-guided neurointerventions and children's brain tumor drug delivery consortium, Baltimore, MD, June 2019.
25. "Developing a magnetic resonance-focused ultrasound system for focused ultrasound-enabled brain tumor liquid biopsy (FUS-LBx) in a porcine model," 178th Meeting of the Acoustical Society of America, San Diego, CA, USA 2019
26. "Using Ultrasound for Detecting Brain Cancer without a Knife," McKelvey Engineering

Mentor Program Appreciation Dinner, Washington University in St. Louis, March 2019

27. "iFEND: Image-guided focused ultrasound-enabled nanoparticle delivery to the brain", Center for Multiple Melanoma Outreach Program, Mini-Symposium, Washington University in St. Louis, April 2018.
28. "Microbubble perivascular pump effect for enhancing the local delivery efficiency of intranasally-administered agents", 23rd European Symposium on Ultrasound Contrast Imaging, Rotterdam, the Netherlands, Feb. 2018
29. "Focused Ultrasound-mediated Intranasal (FUSIN) brain drug delivery", Neuro-oncology Focus Group Seminars, Washington University in St. Louis, Sept. 2017
30. "Image-guided ultrasound therapy", Imaging Science Seminar, Washington University in St. Louis, Oct. 2016
31. "Focused ultrasound", Christopher Davidson Forum, Washington University in St. Louis, Sept. 2016
32. "Focused ultrasound (FUS) for noninvasive and targeted brain drug delivery", Charles F. And Joanne Knight Alzheimer's Disease Research Center Seminar, Washington University in St. Louis, Aug. 2016
33. "Image-guided Focused Ultrasound for Cancer Treatment", Oncologic Imaging Poster Session and Special Lecture, Siteman Cancer Center, Washington University in St. Louis, Nov. 2016
34. "MRI-guided Focused Ultrasound for Blood-brain Barrier Opening", Neuro-oncology Focus Group Seminars, Washington University in St. Louis, Oct. 2015
35. "Ultrasound therapy and imaging: applications in brain drug delivery and pancreatic cancer treatment", Department of Biomedical Engineering, Vanderbilt University, March 2015
36. "Ultrasound therapy and imaging: applications in brain drug delivery and pancreatic cancer treatment", Department of Bioengineering, Northeastern University, April 2015

J. PATENT APPLICATIONS

1. Eric Claude Leuthardt, Gavin P. Dunn, **Chen H**, Allegra Petti, Methods and systems for noninvasive and localized brain liquid biopsy using focused ultrasound, US11667975, Status: Patent granted.
2. **Chen H,** Yaoheng Yang, Jeffrey Williamson, Methods of detecting, measuring, or imaging a concentration or location of a therapeutic agent, US11786215, Status: Patent granted.
3. **Chen H**, Nazeri A, Pacia C, Leuthardt EC, Methods and systems for noninvasive and localized brain liquid biopsy using focused ultrasound, US20220386872A1, Status: Pending
4. **Chen H**, Ye DZ, Yang YH, Focused ultrasound device, Patents application publication number: US20230277831A1, Status: pending.
5. **Chen H,** Zhongtao Hu, Airy beam-enabled binary acoustic metasurfaces for underwater ultrasound beam manipulation. US20240019562A1, Status: Pending
6. **Chen H,** Hu ZT, Yang YH, Chen S, Gong Y. Focused Ultrasound Device. US20230277831A1, Status: Pending
7. **Chen H,** Hu ZT, Three-dimensional transcranial microbubble cavitation localization, Invention disclosure filing date: 11/2020
8. **Chen H,** Arash Nazeri, Chris Pacia, Eric Leuthardt, Sonobiopsy for releasing brain-derived biomarkers for the diagnosis of neurodegenerative diseases. Invention disclosure filing date: 4/2022
9. **Chen H,** Zhongtao Hu, Binary Acoustic Metasurfaces for Dynamic Focusing of Transcranial Ultrasound. Invention disclosure filing date: 7/2022

10. **Chen H,** Dezhuang Ye**,** Noninvasive, efficient, and spatially targeted gene delivery to the brain by combining focused ultrasound with intranasal administration. Invention disclosure filing date: 7/2022
11. **Chen H,** Yaoheng Yang**,** Synthetic torpor induced by ultrasound. Invention disclosure filing date: 9/2022
12. **Chen H,** Lu Xu, Yao Gong, SonoLink - clinical transcranial focused ultrasound trajectory validation tool. Invention disclosure filing date: 9/2022
13. **Chen H,** Dezhuang Ye, Clearance of brain waste by ultrasound combined with microbubbles. Invention disclosure filing date: 10/2022
14. **Chen H,** Lu Xu, A method to perform transcranial focused ultrasound therapy without shaving hair. Invention disclosure filing date: 12/2022

K. SELECTION OF MEDIA COVERAGE OF RESEARCH WORK

- Ultrasound pulses to brain send mice into a hibernation-like state, ***New York Times***, May 23, 2023. Link
- Ultrasound brain pulses put mice in a hibernation-like state, ***Science***, May 25, 2023. Link
- Hibernation artificially triggered in potential space travel breakthrough, ***The Gaurdian***, May 25, 2023. Link
- Focussed ultrasound could have potential for inducing hibernation, ***Quirks & Quarks***. ***CBC***. Link
- Ultrasound can trigger a hibernation-like state in mice and rats, ***NewScientist***, May 25, 2023. Link
- Could This Tech Help Astronauts Journey to Distant Worlds? ***Daily Beast***, May 25, 2023. Link
- A sound approach for effective gene therapy delivery to brain, The Record, October 17, 2022. Link
- Ultrasound can briefly induce a hibernation-like state in animals, **NIH NIBIB**, August 17, 2023. Link
- Sonothermogenetic pulse controls mouse behavior, ***NIH NIBIB***, September 22, 2021. Link
- Sonothermogenetics Can Control Behavior by Stimulating a Specific Target Deep in the Brain, SciTechDaily, May 29, 2021. Link
- New tool activates deep brain neurons by combining ultrasound, genetics, EurekAlert, May 28, 2021. Link
- Non-Invasive Deep Brain Stimulation Using Ultrasound and Genetic Modification, Medgadget, May 28, 2021. Link
- Control of human behavior through sonothermogenetics, Explica, June 10, 2021. Link
- Ultrasound imaging can monitor the exact drug dose and delivery site in the brain, ***NIH NIBIB***, June 17, 2019. Link
- A new method for precision drug delivery: painting, *Phys.org*, February 27, 2019. Link
- A new method for precision drug delivery: Painting: Researchers are integrating ultrasound imaging with ultrasound therapy to pave the way for a new kind of drug delivery, *ScienceDaily*, February 27, 2019. Link
- A new method for precision drug delivery: painting, *Nanowerk*, February 27, 2019. Link
- A New Method for Precision Drug Delivery: Painting, *Newswise*, February 27, 2019. Link

- Cavitation dose painting technique: A new method for precise drug deliveryThe Medical News
- Adopting a "Painting by Numbers" Approach for Precise Drug Delivery, *Technology Networks*, February 27, 2019. Link
- Painting: a new method for precision drug delivery. *ecancer*, February 27, 2019. Link
- New Method for Accurate Drug Delivery, *Medindia*, February 28, 2019. Link
- Noninvasive Brain Tumor Biopsy on the Horizon, *Newswise*, April 2018. Link
- Science nears a brain-cancer biopsy with simple blood test, *CNET*, April 2018. Link
- Noninvasive Brain Tumor Biopsy on the Horizon, *Technology Networks*, April 2018. Link
- Noninvasive brain tumor biopsy on the horizon: New technique uses blood test, *Science Daily*, April 2018. Link
- Bubbles and a blood test could detect brain tumors, *Futurity*, April 2018. Link
- Noninvasive Brain Tumor Biopsy on the Horizon, *Health Medicine Network*, April 2018. Link
- Noninvasive brain tumor biopsy on the horizon, *EurekAlert*, April 2018. Link
- Noninvasive brain tumor biopsy on the horizon, *ecancernews*, *April* 2018. Link
- Noninvasive brain tumor biopsy on the horizon, *HealthCanal*, April 2018. Link
- Noninvasive Brain Tumor Biopsy Being Developed, *ReliaWire*, April 2018. Link
- Noninvasive Brain Tumor Biopsy Using Focused Ultrasound, *Medgadget*, April 2018. Link
- Liquid Biopsy for Brain Tumor Biomarker Developed, *Genengnews*, April 2018. Link
- Liquid Biopsy for Brain Tumor Biomarker Developed, *BioPorfolio*, April 2018. Link
- New noninvasive technique uses blood test to detect brain tumor biomarkers, *NewsMedical*, April 2018. Link
- Ultrasound can enable noninvasive biopsy for brain tumours, *Verdict Medical Devices*, April 2018. Link
- Advances in Cancer Detection, *University of Pennsylvania Department of Bioengineering Blog*. May 2018. Link
- WUSTL Develops Method That Could Result in Brain Cancer Detection With Blood Test, *Genomeweb*, May 2018. Link
- Noninvasive brain tumor biopsy on the horizon, *Medical Xpress*, April 2018. Link
- Liquid biopsy technique may detect brain tumor biomarkers, *Healio HemOnc Today*, July 2018. Link
- Nasal spray could deliver cancer drugs right to the brain, *Futurity*, September 2018. Link
- Focused delivery for brain cancers, *theSOURCE*, September 2018. Link
- Focused Delivery for Brain Cancers, *Newswise*, September 2018. Link
- Focused Delivery for Brain Cancers, *HealthCanal*, September 2018. Link
- Focused Delivery for Brain Cancers, *Medical Xpress*, September 2018. Link
- Focused delivery for brain cancer: Imaging, aerosols and pediatric neuro oncology come together to fight tumors, *Science Daily*, September 2018. Link
- Focused Delivery for Brain Cancers, *Technology Networks*, September 2018. Link
- Focused Delivery for Brain Cancers, *ecancernews*, September 2018. Link
- Focused Delivery for Brain Cancers, *TECHNOLOGY.ORG*, September 2018. Link
- Focused Delivery for Brain Cancers, *Health News Digest*, September 2018. Link

- Research shows new way to target drug delivery for brain tumors, *News Medical*, September 2018. Link
- Focused Delivery for Brain Cancers, *Science Daily*, September 2018. Link

L. TEACHING ACTIVITIES AT WASHU

2023 Fall Guest Lecturer, Cancer Ampersand Program, Enrollment: 20 undergraduate students

2023 Fall Guest Lecturer, Principles and Applications of Biological Imaging (**Biology 5146**), Enrollment: 10 graduate students

2023 Fall Instructor (develop the course), Ultrasound Imaging (**BME 495/595**), 3 Credits, Enrollment: 20 (5 undergraduates; 15 graduates)

2022 Spring Guest Lecturer, Quantitative Physiology II (QP II) (**BME 301B**). Enrollment: 40 undergraduate students

2022 Fall Instructor (develop the course), Ultrasound Imaging (**BME 495/595**), 3 Credits, Enrollment: 25 (5 undergraduates; 20 graduates)

2022 Fall Guest Lecturer, Principles and Applications of Biological Imaging (**Biology 5146**)

2022 Spring Guest Lecturer, Cancer Biology Advanced Topics (**L41.BiOL.5940.01**). Enrollment: 12 undergraduate students

2021 Fall Instructor (develop the course), Ultrasound Imaging (**BME 495/595**), 3 Credits, Enrollment: 18 (4 undergraduates; 14 graduates)

2021 Fall Guest Lecturer, Principles and Applications of Biological Imaging (**Biology 5146**)

2021 Spring Guest Lecturer, Quantitative Physiology II (QP II) (**BME 301B**).

2021 Spring Guest Lecturer, Cancer Biology Advanced Topics (**L41.BiOL.5940.01**). Enrollment: 12 undergraduate students

2021 Spring Guest Lecturer, Frontiers in Cancer Research and Treatment (**L41.BIOL.1441.01**). Enrollment: 18 undergraduate students

2020 Fall Instructor (co-develop and teach the course), Introduction to Biomedical Engineering (**BME 140**), Enrollment: 99 undergraduate students

2019 Fall Instructor (develop the course), Biomedical Ultrasound Journal Club (**BME 508**), Enrollment: 7 graduate students

2019 Fall Guest Lecturer, Principles and Applications of Biological Imaging (**Biology 5146**)

2019 Fall Lecturer, Women in STEM day, Enrollment: 36 high school girls.

2018 Fall Instructor (develop the course), Ultrasound Imaging (**BME 495/595**), 3 Credits, Enrollment: 17 (9 undergraduates; 8 graduates)

2018 Fall Guest Lecturer, Principles and Applications of Biological Imaging (**Biology 5146**)

2017 Fall Instructor (develop the course), Ultrasound Imaging (**BME 495/595**), 3 Credits, Enrollment: 13 (5 undergraduates; 8 graduates)

2016 Fall Instructor (develop the course), Ultrasound Imaging (**BME 495/595**), 3 Credits, Enrollment: 24 (14 undergraduates; 10 graduates)

2016-2018 Lecturer, Moving and Shaking class for the Gifted Resource Council to introduce middle schoolers to Engineering

2016-2019 Seminar in Imaging Science and Engineering (**ESE 596 /CSE 596/BME 506/Physics 596**)

2015-2019 Guest lecturer, Introduction to Biomedical Engineering (**BME 140**)

M. MENTORING ACTIVITIES

Ph.D. students supervised

1. Dezhuang Ye, Mechanical Engineering and Material Science, 2015–2021
   Thesis title: "Focused ultrasound-mediated drug delivery to the brain"
2. Lifei Zhu (co-mentored, primary mentor: Mike Altman), Biomedical Engineering, 2016–2021
   Thesis title: "MR-guided high intensity focused ultrasound for mild hyperthermia therapy"
3. Mack Yang, Biomedical Engineering, 2017–2022
   Thesis title: "Noninvasive, localized, and cell-type specific neuromodulation by ultrasound"
4. Christopher Pacia, Biomedical Engineering, 2017–2022
   Thesis title: "Focused ultrasound-enabled liquid biopsy for brain cancer diagnosis"
5. Lu Xu, Biomedical Engineering, 2019–2024 (expected)
   Thesis project: "Develop clinical focused ultrasound system for noninvasive diagnosis of brain cancer"
   Anticipated year for graduation: 2024
6. Chih-Yen Chien, Biomedical Engineering, 2019–2024 (expected)
   Thesis project: "Cavitation dose painting for precise and personalized brain drug delivery"
   Anticipated year for graduation: 2024
7. Yan Gong, Biomedical Engineering, 2019–2024 (expected)
   Thesis project: "Focused ultrasound-enabled intranasal brain drug delivery"
   Anticipated year for graduation: 2024

M.S. students supervised

1. Summer Elias, Biomedical Engineering, period 2/2016–5/2017
2. Yoga Shentu, Biomedical Engineering, period 8/2017–5/2018
3. Yajie Liu, Biomedical Engineering, period 8/2019–8/2021
4. Leqi Yang, Biomedical Engineering, period 10/2020 – 8/2022
5. Yi Zhang, Biomedical Engineering, period 9/2022 – 2023
6. Zhongli Tong, Biomedical Engineering, period 9/2022 – 2023

Undergraduate researchers supervised

1. Sein Pyo, Biomedical Engineering, 9/2015–12/2015
2. Michaela Wright, Biomedical Engineering Rice University, 12/2015–1/2017
3. Michel' le Wright, Biomedical Engineering, Rice University, 12/2015–1/2017
4. Galen Cheng, Biomedical Engineering, 2/2016–8/2018
5. Ray Wang, Biomedical Engineering, 1/2016–9/2018
6. Leighton Wan, Biomedical Engineering, 1/2016–9/2017
7. Tristan Ford, Biomedical Engineering University of Rochester, 6/2016–8/2016, Funded by Summer Engineering Fellowship Program
8. Varun Lahoti, Biomedical Engineering, 1/2016–5/2016
9. Jeffrey Blackman, Biomedical Engineering, 9/2015–12/2015
10. Kevin Xie, Biomedical Engineering, 9/2016–9/2017
11. Tommy Ahn, Biomedical Engineering, 1/2019–8/2019
12. Hannah Pang, Biomedical Engineering, 9/2017–2019
13. Crystal Shin, Biomedical Engineering, 9/2019– 9/2020
14. Trinh Woolridge, Biomedical Engineering, 6/2021– 9/2021
15. Charlotte Guertler, Biomedical Engineering, 6/2021– 5/2023
16. Lucas Chen, Biology, 9/2023 – present

Ph.D. rotation students supervised

1. Darshit Mehta, Biomedical Engineering, 2015 Fall semester rotation
2. Shiran Su, Biomedical Engineering, 2016 Fall semester rotation
3. Yifeng Zeng, Biomedical Engineering, 2017 Spring semester rotation
4. Jennifer Sun, Biomedical Engineering, 2017 Spring rotation
5. Kinan Alhallak, Biomedical Engineering, 2017 Spring rotation
6. Abby Magee, Biomedical Engineering, 2018 Fall semester rotation
7. Lu Xu, Biomedical Engineering, 2019 Fall semester rotation
8. Yan Gong, Biomedical Engineering, 2019 Fall semester rotation
9. Chih-Yen Chien, Biomedical Engineering, 2019 Fall semester rotation
10. Paul Boucher, Biomedical Engineering, 2019 Fall semester rotation
11. Kevin Xu, Biomedical Engineering, 2020 Fall semester rotation
12. Judith Sokei, Division of Biology and Biomedical Sciences, 2020 Fall semester rotation
13. Minghao Xue, Biomedical Engineering, 2021 Summer semester rotation
14. Keshav Kailash, Biomedical Engineering, 2021 Summer semester rotation
15. Siaka Fadera, Biomedical Engineering, 2021 Fall semester rotation
16. Chinwendu Chukwu, Biomedical Engineering, 2021 Fall semester rotation
17. Lila Dabill, Biomedical Engineering, 2022 Fall semester rotation
18. María E. Guerra García, Biomedical Engineering, 2022 Fall semester rotation
19. Andrew Stark, Biomedical Engineering, 2022 Fall semester rotation
20. Leqi Yang, Biomedical Engineering, 2022 Fall semester rotation
21. Dingyue Zhang, Biomedical Engineering, 2022 Fall semester rotation

Graduate thesis committees

1. Nikki Maughan: Biomedical Engineering, Ph.D. defense date 6/2016
2. Nathan Wong: Biomedical Engineering, Ph.D. defense date 11/2017
3. Micah Luderer: M.D./Ph.D. Ph.D. defense date 7/2017
4. Andrew Badachhape: Mechanical Engineering, Ph.D. defense date 12/2017
5. Atahar Mostafa, Biomedical Engineering, Ph.D. defense date 4/2019
6. Charlotte Guertler, Mechanical Engineering and Mateiral Science, Ph.D. defense date 6/2019
7. Joemini Poudel, Biomedical Engineering, Ph.D. defense date 11/2019
8. Yun He, Biomedical Engineering, Ph.D. defense date 12/2019
9. Yarob Alazzawi, Electrical and System Engineering, Ph.D. defense 3/2020
10. Yang Guang, Biomedical Engineering, Ph.D. thesis proposal date 3/2020
11. Chunyu Song, Biomedical Engineering, Ph.D. defense date 7/2020
12. Abby Magee, Biomedical Engineering, Ph.D. thesis proposal date 4/2020
13. Kinan Alhallak, Biomedical Engineering, Ph.D. thesis proposal date 6/2020
14. Yifeng Zeng, Biomedical Engineering, Ph.D. thesis proposal date 7/2020
15. Chris Pacia, Biomedical Engineering, Ph.D. thesis proposal date 7/2020
16. Yaoheng Yang, Biomedical Engineering, Ph.D. thesis proposal date 7/2020
17. Chunyu Song, Biomedical Engineering, Ph.D. thesis defense date 7/2020
18. Sreyankar Nandy, Biomedical Engineering, Ph.D. thesis defense date 8/2020
19. Xinyuan Chen, Biomedical Engineering, Ph.D. thesis proposal date 8/2020
20. Daniel Lane, Biomedical Engineering, Ph.D. defense date 10/2020
21. Dezhuang Ye, Mechanical Engineering, Ph.D. defense date 12/2020
22. Lifei Zhu, Biomedical Engineering, Ph.D. defense date 4/2021
23. Eghbal Amidi, Biomedical Engineering, Ph.D. defense date 7/2021
24. Xiangjun Peng, Biomedical Engineering, Ph.D. defense date 8/2021

25. Jennifer Sun, Biomedical Engineering, Ph.D. defense date 12/2021
26. Yuxuan Wang, Biomedical Engineering, Master. defense date 12/2022
27. Chia-Kuei Mo, Biomedical Engineering, Ph.D. thesis proposal date 11/2022
28. Yuhao Chen, Electrical & Systems Engineering, Ph.D. thesis defense date 11/2023
29. Sitai Kou, Biomedical Engineering, Ph.D. thesis proposal date 2/2023

Ph.D. student qualifying exam committees

1. Darshit Mehta, Biomedical Engineering, exam date 2016 Spring
2. Yifeng Zeng, Biomedical Engineering, exam date 2017 Spring
3. Xiandong Leng, Biomedical Engineering, exam date 2017 Spring
4. Eghbal Amidi, Biomedical Engineering, exam date 2017 Summer
5. Jennifer Sun, Biomedical Engineering, exam date 2017 Spring
6. Guang Yang, Biomedical Engineering, exam date 2018 Fall
7. Jingying Zhang, Biomedical Engineering, exam date 2019 Spring
8. Shuying Li, Biomedical Engineering, exam date 2019 Spring
9. Chia-Kuei Mo, Biomedical Engineering, exam date 2019 Fall
10. Sitai Kou, Biomedical Engineering, exam date 2020 Spring
11. Xiangjun Peng, Biomedical Engineering, exam date 2020 Spring
12. Pual boucher, Biomedical Engineering, exam date 2020 Spring
13. Amanda Jeske, Biomedical Engineering, exam date 2020 Spring
14. Minghao Xue, Biomedical Engineering, exam date 2021 Fall
15. Tiger Nie, Biomedical Engineering, exam date 2022 Summer
16. Maria E. Guerra Garcia, Biomedical Engineering, exam date 2023 Spring
17. Arthur Li, Biomedical Engineering, exam date 2023 Spring
18. Yin-Yuan Huang, Biomedical Engineering, exam date 2023 Spring

Postdoctoral researchers

1. Satya Kohapolli: Biomedical Engineering, 3/2016–9/2017
2. Hongaek Baek: Biomedical Engineering, 2/2019–2/2020
3. Si Chen: Biomedical Engineering, 12/2019 – 12/2021
4. Zhongtao Hu: Biomedical Engineering, 8/2019 – 4/2023
5. Dezhuang Ye: Biomedical Engineering, 4/2021 – present
6. Yaoheng Yang: Biomedical Engineering, 8/2022 – present
7. Tianqi Xu: Biomedical Engineering, 7/2023 – present

Permanent research staff

1. Leighton Wan: 9/2016–6/2017
2. Yajie Liu: 11/1/2021 – 9/2022
3. Nikolas Burks: 8/2022 – 6/2023
4. Yimei Yue: 4/1/2017 – present
5. Jinyun Yuan: 8/1/2019 – present

Faculty colleagues mentoring

1. Christine O'Brien: 2021-present. My role: faculty mentor.
2. Alexandra Rutz: 2022-present. My role: faculty mentor.
3. Arash Nazeri: 2023-present. My role: faculty mentor.

N. RESEARCH FUNDING SUPPORT

- Total federal funding received as PI is ~**$20M**
- Total foundation grants received as PI is **~$0.5M**
- Total internal funding received as PI is **~$0.8M**

Government Grants

1. **National Institute of Health**: NIH/NINDS R01 NS128461, **Chen (PI)**, Project title: Sonogenetics 2.0, Percent effort: 2.4 Cal. Month ($3,017,666; 07/15/2023 – 06/30/2028)
2. **National Institute of Health**: NIH/NIBIB 2R01 EB030102, **Chen (PI)**, Project title: Focused ultrasound-mediated intranasal brain drug delivery technique (FUSIN), Percent effort: 1.2 Cal. Month ($2,357,541; 07/01/2023 – 4/30/2027)
3. **National Institute of Health**: NIH/NIMH R01 MH116981, **Chen (PI)**, Project title: FOCUS: functional optical imaging feedback-controlled cellular-level ultrasound stimulation, Percent effort: 4.0 Cal. Month ($2,773,994; 09/01/2018 – 08/31/2022)
4. **National Institute of Health**: NIH/NIBIB R01EB027223, **Chen (PI)**, Project title: Image-guided focused ultrasound-mediated intranasal brain drug delivery technique (FUSIN), Percent effort: 4.8 Cal. Month ($1,642,738; 4/1/2019 – 1/31/2023)
5. **National Institute of Health**: NIH/NIA, NIH/NIBIB R01EB027223S1 Administrative Supplement, **Chen (PI)**, Project title: Image-guided focused ultrasound-mediated intranasal brain drug delivery technique (FUSIN) ($309,909; 4/1/2019 – 1/31/2020)
6. **National Institute of Health**: NIH/NIBIB, R01EB030102, **Chen (PI)**, Project title: Focused ultrasound-enabled brain tumor liquid biopsy (FUS-LBx), Percent effort: 1.8 Cal. Month ($2,496,945; 8/1/2020 – 7/31/2024)
7. **National Institute of Health**: NIH/NIBIB, R01EB030102-S1, **Chen (PI)**, Project title: Focused ultrasound-enabled brain tumor liquid biopsy (FUS-LBx) supplement, ($135,411; 8/19/2021 – 4/30/2022)
8. **National Institute of Health**: NIH/NIMH 1UG3MH126861, **Chen (PI)**, Project title: iSonogenetics for incisionless cell-type-specific neuromodulation of non-human primate brains, Percent effort: 2.4 Cal. Month ($2,119,491; 09/01/2021- 6/30/2024)
9. **National Institute of Health**: NIH/NCI R01CA276174, **Chen (co-PI)**, Project title: Sonobiopsy for Noninvasive Genetic Evaluation of Glioblastoma Patients, Percent effort: 1.2 Cal. Month ($3,218,430; 12/01/2022- 11/31/2027)
10. **Office of Naval Research**: ONR/GRANT1353891, **Chen (PI)**, Project title: Wearable passive sonar for cavitation detection in the brain, Percent effort: 1.2 Cal. Month ($750,000; 7/1/2022-6/30/2025)
11. **Office of Naval Research**: ONR/GRANT12716430, **Chen (PI)**, Project title: Passive sonar for cavitation detection in the brain, Percent effort: 0.6 Cal. Month ($470,500; 4/15/2019-04/08/2022)
12. **Office of Naval Research**: Defense University Research Instrumentation Program (DURIP), **Chen (PI)**, Project title: MR-compatible Focused Ultrasound for Measuring Mechanical Properties of Deep Brain Tissue at High Frequencies ($277,400; 7/15/2017-7/14/2018)

13. **National Science Foundation**: NSF/CMMI [#1727412], **Chen (co-PI)**, Bayly (P.I.), Project title: Characterization of soft fibrous materials by MRI of ultrasound-induced shear waves, Percent effort: 0.6 Cal. Month ($467,135; 08/31/2017-08/31/2020)
14. **National Science Foundation**: NSF/ECCS [#2219811], **Chen (co-PI)**, Kiani (P.I.), Project title: NCS-FO: Fully Wireless Flexible Electrical-Acoustic Implant for High-Resolution Neural Stimulation and Recording at Large Scale, Percent effort: 0.6 Cal. Month ($1,000,000; 08/01/2022-07/31/2025)

Foundation Grants

15. **Charlie Teo Foundation**: **Chen (P.I.)**, Project title: Focused ultrasound-mediated intranasal delivery for noninvasive drug delivery to the brainstem with minimized systemic exposure in a large animal model ($511,945; 7/1/2020 – 3/30/2023)
16. **Focused Ultrasound Foundation**: Chen (P.I.), Project title: Sonobiopsy for noninvasive diagnosis of diffuse intrinsic pontine glioma ($100,000; 12/2023 – 12/2024)

Intramural Grants

17. **SEAS Collaboration Initiation Grants**: **Chen (P.I.)**, Project title: Noninvasive, localized, and controlled delivery of gold nanoparticles for enhancing radiotherapy of brain tumors ($25,000; 6/1/2016-5/31/2017)
18. **Department of Radiation Oncology**: **Chen (P.I.)**, Project title: Focused ultrasound-facilitated delivery of tumor-targeting liposomes as a theranostic platform for the treatment of glioblastoma ($10,000; 7/1/2016-6/31/2017)
19. **Center for Myeloma Medical Nanotechnology**: **Chen (P.I.)**, Project title: Focused ultrasound-enabled delivery of theranostic liposomes for cancer treatment ($30,000; 7/1/2016-6/30/2017)
20. **Children's Discovery Institute:** MC-II-2017-637, **Chen (co-PI)**, Liu (P.I.), Project title: Image-guided drug delivery for improved treatment of diffuse intrinsic pontine glioma ($450,000; 2/1/2017-1/31/2020)
21. **Radiation Oncology Department**: Clinical-Biology Seed Grant, **Chen (P.I.)**, Project title: Focused ultrasound-enabled brain tumor liquid biopsy ($10,000; 1/1/2018-12/31/2018)
22. **American Cancer Society Institutional Research Grant**: IRG-58-010-61-1, **Chen (P.I.)**, Project title: Noninvasive, Localized, and Direct Brain Drug Delivery by Focused Ultrasound-mediated Intranasal Delivery (FUSIN) ($30,000; 1/1/2018-12/31/2018)
23. **Washington University Office of the Vice Chancellor for Research**: Seed Grant, **Chen (P.I.)**, Project title: Focused Ultrasound-enabled Brain Tumor Liquid Biopsy ($50,000; 6/15/2019-6/14/2020)
24. **Washington University Institute of Clinical and Translational Sciences (ICTS)**: **Chen (P.I.)**, Project title: Focused Ultrasound-enabled Brain Tumor Liquid Biopsy: Detecting Brain Cancer Without a Knife ($50,000; 4/1/2019-3/29/2020)
25. **Washington university in St. Louis National Security Academic Accelerator award** ($61,604; 1/1/2021-6/30/2021)
26. **LEAP competition through the Skandalaris Center for Interdisciplinary Innovation and Entrepreneurship of Washington University in St. Louis.** ($50,000; 1/13/2021-1/12/2022)
27. **Washington University Office of the Vice Chancellor for Research**: Seed Grant, **Chen (P.I.)**, Project title: Focused ultrasound for treating obesity: a pilot study in mice ($50,000; 6/15/2023-6/14/2024)

O. PROFESSIONAL DEVELOPMENT

2023 Faculty Mentoring Summit, a full-day event sponsored by the Office of the Provost of WashU to train faculty on mentoring appraoch and skills

2023 Attended Training for Mentors of Grad Students, Post Docs & Early Career Faculty provided by National Research Mentoring Network

2022 Siteman Cancer Center, Emerging Leaders Council training

2021 NIH Concept to Clinic: Commercializing Innovation (C3i) Program

2020 Women's Leadership Forum, Olin School of Business at Washington University

2018 Effective Research Execution Program, Office of Faculty Affaires and Olin Business School, Washington University in St. Louis

2017 Mentoring in STEM Teaching (MiST) Program for Junior Faculty, Washington University in St. Louis

P. PROFESSIONAL SERVICE

Grant Review Activities

2023 Ad-hoc reviewer, Swiss National Science Foundation

2023 Ad-hoc reviewer, Israeli Ministry of Innovation, Science and Technology

2023 Ad-hoc reviewer, Geneva University Hospitals Private Foundation, Switzerland

2022-present Member of the Imaging Guided Interventions and Surgery Study Section (IGIS), NIH

2022 Ad-hoc reviewer, Kika Foundation Children Cancerfree, Netherlands.

2021 Ad-hoc reviewer, NIH Bioengineering, Cellular and Circuit Neuroscience Study Section

2021 Ad-hoc reviewer, NIH Small Business Innovation Research (SBIR) Contract proposals

2021 Ad-hoc reviewer, NIH Emerging Imaging Technologies and Applications Study Section

2020 Ad-hoc reviewer, NIH Imaging Guided Interventions and Surgery Study Section

2020 Ad-hoc reviewer, NIH Member Conflict: Emerging Technologies in Neuroscience, ZRG1 ETTN-E (02) M

2020 Ad-hoc reviewer, NIH BRAIN Initiative: Noninvasive Neuromodulation - New Tools and Techniques (R01), ZMH1 ERB-S (08) R

2020 Ad-hoc reviewer, NIH National Eye Institute Special Emphasis Panel, ZEY1 VSN (08)

2019 Ad-hoc reviewer, NIH Vision Imaging, Bioengineering and Low Vision Technology Development (VIBT), ZRG1 ETTN-P (81)

2019 Ad-hoc reviewer, Institute of Clinical and Translational Sciences Research Development Program, Washington University in St. Louis, NIH Mock Study Section

2019 Ad-hoc reviewer, NIH Imaging member conflict review meeting, ZRG1 SBIB-Q 03

2019 Ad-hoc reviewer, NIH NINDS Special Emphasis Panel, ZNS1 SRB-L(16)

2019 Ad-hoc reviewer, Collaboration Initiation Grants (CIG), Washington University in St. Louis

2019 Ad-hoc reviewer, Institute of Clinical and Translational Sciences NIH Mock Study Section, Washington University in St. Louis

2019 Ad-hoc reviewer, Focused Ultrasound Foundation Research Award Program

2018 Ad-hoc reviewer, Natural Sciences and Engineering Research Council of Canada, Discovery Grant program
2018 Ad-hoc reviewer, NIH Biomedical Imaging Technology A (BMIT A) study section, National Institute of Health
2018-present Ad-hoc reviewer, FUS Foundation Research Award Program
2017-present Ad-hoc reviewer, Siteman Cancer Center, Washington University in St. Louis
2016-present Ad-hoc reviewer, Focused Ultrasound Foundation

Professional Society Memberships

2007–present Acoustic Society of America
2008–present IEEE Women in Engineering
2008–present IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society
2010–present International Society of Therapeutic Ultrasound
2015–present Society of Neuroscience
2018–present American Association of Physicists in Medicine
2018–present Biomedical Engineering Society
2019–present American Association of Pharmaceutical Scientists
2019–present Society for image-guided neurointerventions

Memberships on Editorial Boards

2018–2021 Scientific Reports
2019–2019 Ad-hoc Associate Editor for Medical Physics.

Manuscript ad-hoc Reviewer

Science, Science Translational Medicine, Cell Reports, Nature Biomedical Engineering, Nature Communication, Theranostics, Journal of Controlled Release, Scientific Reports, Plos One, Ultrasound in Medicine and Biology, ACS Applied Materials & Interfaces, Biotechnology and Bioengineering, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Journal of Acoustic Society of America, IEEE Transactions on Medical Imaging.

Service at International Conferences/Organizations

2022-2024 Chair of the Education Committee of the International Society for Therapeutic Ultrasound
2023 Selected as the Vice-Chair for In Vivo Ultrasound Imaging Gordon Research Conference
2022-present Academic Board Member of the International Society for Therapeutic Ultrasound
2022-present Technical Program Committee member of the IEEE International Ultrasonics Symposium
2022 Co-organizer of the inaugural International Symposium on Biomolecular Ultrasound and Sonogenetics
2021 Served at the organizing committee for IEEE International Ultrasonics Symposium 2021
2021 Organizer of the Women in Engineering event at the IEEE International Ultrasonics Symposium 2021
2021 Student paper competition organizer for the Focused Ultrasound Neuromodulator (FUN) conference, 2021

2021 Session chair at the 181st Meeting of the Acoustical Society of America, Seattle
2020-present Acoustical Society of America (ASA) Biomedical Ultrasound technical committee member
2019-present Acoustical Society of America (ASA) Women in Acoustics committee member
2019 Review of the abstracts for American Institute of Ultrasound in Medicine (AIUM) Annual Meeting, Mar 21 – 25, 2020
2019 Session chair at the American Association of Physicists in Medicine (AAPM) Annual Meeting, San Antonio, Texas, 2019
2019 Session chair at the 177th Meeting of the Acoustical Society of America, Louisville
2019 Session chair at the 178th Meeting of the Acoustical Society of America, San Diego
2019 Session chair at the American Association of Physicists in Medicine Annual Meeting, San Antonio, TX
2019 Session chair at the IEEE International Ultrasonics Symposium, Glasgow, Scotland
2018 Session chair at the IEEE International Ultrasonics Symposium, Kobe, Japan
2017–2019 Student paper competition judge at the Acoustical Society of America Annual Meetings.

Q. INTERNAL SERVICE

Departmental Level

2023–present Department of Biomedical Engineering Seminar Organization Committee, Washington University in St. Louis
2019–2022 Department of Biomedical Engineering Faculty Recruitment Committee, Washington University in St. Louis
2015–2019 Department of Biomedical Engineering Doctoral Affairs Committee, Washington University in St. Louis

School and University Level

2022–2023 Serve on McKelvey Strategic Planning - Research & Innovation Sub-Committee
2021 Serve on Provost Strategic Planning Research Enterprise Working Group
2019–present Brain Tumor Research Center scientific oversight committee, Washington University in St. Louis
2017–2021 McKelvey Assistant Professors Steering Committee, Washington University in St. Louis

Undergraduate Academic Advising

2022–2023 8 Biomedical Engineering undergraduate students
2021–2022 10 Biomedical Engineering undergraduate students
2020–2021 13 Biomedical Engineering undergraduate students
2019–2020 19 Biomedical Engineering undergraduate students
2018–2019 21 Biomedical Engineering undergraduate students
2017–2018 17 Biomedical Engineering undergraduate students
2016–2017 12 Biomedical Engineering undergraduate students
2015–2016 10 Biomedical Engineering undergraduate students

Serve as Panelist

2022 2022 Washington University in St. Louis Researcher Forum presenter. Title of presentation: Successfully Navigating the Transition Between Animal Models

2019 The William & Pudge Landau Lecture Panel Discussion sponsored by the Office of Neuroscience Research, the Department of Neurology, the McDonnell Center for Systems Neuroscience, and the Philosophy-Neuroscience-Psychology program.

2019 James McKelvey School of Engineering, Panel discussion on: Collaboration Initiation Grants

Diversity, equity, and inclusion efforts

2023 Serve as a panelist at the Student Mentorship session at the 23rd International Society of Therapeutic Ultrasound symposium.

2023 Led Women in Acoustics Roundtable discussion at the 184th Acoustic Society of America meeting.

2023 Performed demo of ultrasound technology to over 100 girls from St. Louis middle and high schools on the 2023 Women in STEM Day.

2022 Served as a panelist at the Women in FUS luncheon at the 8th International Symposium on Focused Ultrasound

2019 WashU Women's Symposium Panelist "How to brand yourself and your research outside of academic walls."

2016-2018 Performed demo of ultrasound technology to over 50 girls each year in the annual Moving and Shaking class to introduce engineering to St. Louis middle schoolers.