Zhimin Huang, Ph.D., Assistant Professor

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Professional Appointment

01/2025 – Present Assistant Professor, University of Pittsburgh, PA

01/2025 – Present Department of Neurological Surgery — Primary Appointment
11/2025 – Present Department of Bioengineering — Secondary Appointment
01/2026 – Present Affiliate Faculty — Joint Carnegie Mellon-University of Pittsburgh Ph.D. Program in Computational Biology
09/2026 – Present University of Pittsburgh Graduate Faculty
09/2026 – Present Associate Member, UPMC Hillman Cancer Center Cancer Therapeutics Program

Principal Investigator of the Laboratory for NeuroControl and Monitoring, focused on developing noninvasive biotechnologies and molecular tools to control and monitor endogenous processes in intact brain cells and tissues, with the goals of deepening our understanding of fundamental neuroscience and enabling precise, noninvasive therapies for brain disorders.

Education and Training

2020-2024 Rice University, TX
Postdoctoral research associate, Department of Bioengineering
Engineering site-specific brain therapeutics
Advisor: Jerzy Szablowski

2018-2020 University of Washington, WA
Senior fellow, Department of Biochemistry
Engineering red light-switchable protein dimerization systems
Advisor: Liangcai Gu

2015-2017 Shanghai Jiao Tong University, Shanghai, China
Postdoctoral fellow, School of Medicine
Identification of a cellularly active SIRT6 allosteric activator
Advisor: Jian Zhang

2009-2015 Shanghai Jiao Tong University, Shanghai, China
Ph.D. in Biochemistry and Molecular Biology, School of Medicine
Analysis of allosteric regulation in proteins and design of allosteric modulators for SIRT6
Advisors: Guoqiang Chen, Jian Zhang

2005-2009 Tianjin Medical University, Tianjin, China
B.Eng. in Biomedical Engineering

Grant Support

1. Programmable Ultrasound-Leveraged Site-Specific Exosomes
Sponsor: National Institute of Biomedical Imaging and Bioengineering, Trailblazer R21
Role: Principal Investigator
Project Period: August 2026 – July 2029
Status: Active

2. Noninvasive Ultrasound Control of Lysosomal Function: A Transdisciplinary Engineering–Biology

Approach to Rare Disease and Brain Aging
Sponsor: Pitt Center for Industry Studies (CIS) Transdisciplinary Award
Role: Co-Principal Investigator, with Dr. Kirill Kiselyov and Dr. Nikhil Bajaj
Project Period: Sep 2026 – Aug 2027
Status: Active

3. *In Vivo* Protein Engineering for Prolonged Site-Specific Brain Therapeutics
Sponsor: PhRMA Foundation Faculty Starter Grant in Drug Delivery
Role: Principal Investigator
Project Period: 2025 – 2026
Status: Completed

Honors and Awards

2026 NIH/NIBIB Trailblazer Award
2026 Co-Editor, forthcoming Elsevier eBook on Synthetic Binding Proteins
2026 Ad Hoc Reviewer, Congressionally Directed Medical Research Programs (CDMRP)
2026 Invited Grant Reviewer, Action Medical Research (a UK medical research charity)
2026 Member, American Society of Gene + Cell Therapy
2025 PhRMA Foundation Faculty Starter Grant in Drug Delivery
2025 Ad Hoc Reviewer, NIH BRAIN Initiative U24 Program
2023 Trainee Highlight Award Honorable Mention of 9th Annual BRAIN Initiative Meeting
2022 Poster Award of International Symposium on Biomolecular Ultrasound and Sonogenetics
2015 Excellent Graduates of Shanghai Colleges and Universities granted by Shanghai Municipal Education Commission
2012 Scholarship Award for Excellent Doctoral Student granted by Ministry of Education of China
2012 National Scholarship for Graduate Student granted by Ministry of Education of China
2012 Qiu Shi Graduate Student Scholarship granted by Qiu Shi Science and Technologies Foundation
2012 Excellent Oral Presentation Award, Second Session of Graduate Academic Forum in Shanghai Jiao-Tong University School of Medicine
2011 First-class Scholarship for Excellent Graduate Students in Shanghai Jiao Tong University, School of Medicine

Publications and Manuscripts Under Review

11 first-author (# equal contribution) and 1 corresponding-author (*) publications.

1. Michael Edwards, Zheye Zhang, Lilly Schultz, Junlin Li, Xianglong Dai, Ziyu Ding, Yutong Xing, **Zhimin Huang***. BrainFUS Atlas: A Comprehensive Database of Focused Ultrasound Applications in the Brain. *Submitted, 2026.* (*Corresponding author)
2. Bozhi Ye[#], Xin Zhong[#], **Zhimin Huang**[#], Shanshan Dai[#], Ziyi Huang, Luo Li, Binbin Xia, Ruiyin Shao, Xiaoxi Fan, Zhouqing Huang, Changfa Guo, Hongbo Yang, Wenwen Tang, Lili Dong, Juying Qian, Junbo Ge, Jiatian Cao. Cardiomyocyte-derived KMO reprograms cardiac tryptophan metabolism to attenuate myocardial remodeling. Under review at *Nature Communications* (2026).
3. Wu K, Ge X, Duan X, Li J, Wang K, Chen Q, **Huang Z**, Zhang W, Wu Y, Li Q. Wip1 phosphatase activator QGC-8-52 specifically sensitizes p53-negative cancer cells to chemotherapy while protecting normal cells. ***Drug Resist Updat.*** 2025:79:101196.
4. **Zhimin Huang**, Zigang Wu, Andrei Mitrofan, Rongshu Jin, Honghao Li, Joon P. Seo, Shirin Nouraein, Chris Pennington, Clark Horak, Manwal Harb, Jerzy O. Szablowski. Site-Specific Brain Therapeutics. Revised and resubmitted; currently under review. bioRxiv, doi: 10.1101/2023.10.12.562069.

5. Seo JP, Trippett JS, **Huang Z**, Lee S, Nouraein S, Wang RZ, Szablowski JO. Acoustically targeted measurement of transgene expression in the brain. ***Science Advances.*** 2024 Aug 9;10(32):eadj7686.
6. Lee S, Nouraein S, Kwon J. J, **Huang Z**, Wojick JA, Xia B, Corder G, Szablowski O. J. Engineered serum markers for non-invasive monitoring of gene expression in the brain. ***Nature Biotechnology.*** 2024 Nov;42(11):1717-1725.
7. Hao Q[#], **Huang Z**[#], Li Q[#], Liu D, Wang P, Wang K, Li J, Cao W, Deng W, Wu K, Su R, Liu Z[#], Vadgama J, Wu Y. A novel metabolic reprogramming strategy for the treatment of diabetes-associated breast cancer. ***Advanced Science.*** 2022, 9(6):e2102303.
8. Zhang Q[#], Chen Y[#], Ni D[#], **Huang Z**[#], Wei J, Feng L, Su J, Wei Y, Ning S, Yang X, Zhao M, Qiu Y, Song K, Yu Z, Xu J, Li X, Lin H, Lu S, Zhang J. Targeting a cryptic allosteric site of SIRT6 with small-molecule inhibitors that inhibit the migration of pancreatic cancer cells. ***Acta Pharm Sin B.*** 2022, 12(2):876-889.
9. **Huang Z**[#], Li Z[#], Zhang X[#], Dong R, Kang S, Sun L, Fu X, Vaisar D, Watanabe K, Gu L. Creating Red Light-Switchable Protein Dimerization Systems as Genetically Encoded Actuators with High Specificity. ***ACS Synth Biol.*** 2020, 9(12):3322-3333.
10. Wu K, Yu X, **Huang Z**, Zhu D, Yi X, Wu YL, Hao Q, Kemp KT, Elshimali Y, Iyer R, Nguyen KT, Zheng S, Chen G, Chen QH, Wang G, Vadgama JV, Wu Y. Targeting of PP2Cδ by a small molecule C23 inhibits high glucose-induced breast cancer progression in vivo. ***Antioxid Redox Signal.*** 2019, 30(17):1983- 1998.
11. **Huang Z**[#], Zhao J[#], Deng W[#], Chen Y[#], Shang J[#], Song K, Zhang L, Wang C, Lu S, Yang X, He B, Min J, Hu H, Tan M, Xu J, Zhang Q, Zhong J, Sun X, Mao Z, Lin H, Xiao M, Chin E, Jiang H, Xu Y, Chen G, Zhang J. Identification of a cellularly active SIRT6 allosteric activator. ***Nature Chem Biol.*** 2018, 14(12):1118-1126.
12. Wei W[#], Ma C[#], Cao Y[#], Yang L[#], **Huang Z**[#], Qin D, Chen Y, Liu C, Wang T, Lei H, Yu Y, Huang M, Tong Y, Xu H, Gao F, Zhang J, Wu Y. Identification of H7 as a novel peroxiredoxin I inhibitor to induce differentiation of leukemia cells. ***Oncotarget.*** 2016, 7(4):3873-3883.
13. Huang M, Chen Z, Zhang L, **Huang Z**, Chen Y, Xu J, Zhang J, Shu X. Screening and biological evaluation of a novelSTAT3signaling pathway inhibitor against cancer. ***Bioorg Med Chem Lett.*** 2016, 26(21):5172-5176.
14. Shen Q, Wang G, Li S, Liu X, Lu S, Chen Z, Song K, Yan J, Geng L, **Huang Z**, Huang W, Cheng G, Zhang J. ASD v3.0: unraveling allosteric regulation with structural mechanisms and biological networks. ***Nucleic Acids Res.*** 2016, 44(D1):D527-535.
15. Song F, Xia L, Ji P, Tang Y, **Huang Z**, Zhu L, Zhang J, Wang J, Zhao G, Ge H, Zhang Y, Wang Y. Human dCTP Pyrophosphatase 1 promotes breast cancer cell growth and stemness through modulation on 5-methyl-dCTP metabolism and global hypomethylation. ***Oncogenesis.*** 2015, 4:e159.
16. Huang W, Wang G, Shen Q, Liu X, Lu S, Geng L, **Huang Z**, Zhang J. ASBench: benchmarking sets for allosteric discovery. ***Bioinformatics.*** 2015, 31(15):2598-2600.
17. **Huang Z**[#], Mou L[#], Shen Q[#], Lu S[#], Li C[#], Liu X, Wang G, Li S, Geng L, Liu Y, Wu J, Chen G, Zhang J. ASD v2.0: updated content and novel features focusing on allosteric regulation. ***Nucleic Acids Res.*** 2014, 42(1):D510-516.
18. Huang W, Lu S, **Huang Z**, Liu X, Mou L, Luo Y, Zhao Y, Liu Y, Chen Z, Hou T, Zhang J. Allosite: a method for predicting allosteric sites. ***Bioinformatics.*** 2013, 29(18):2357-2359.
19. Shi T, Han Y, Li W, Zhao Y, Liu Y, **Huang Z**, Lu S, Zhang J. Exploring the desumoylation process of SENP1: a study combined MD simulations with QM/MM calculations on SENP1-SUMO1-RanGAP1. ***J Chem Inf Model.*** 2013, 53(9):2360-2368.
20. Li X, Chen Y, Lu S, **Huang Z**, Liu X, Wang Q, Shi T, Zhang J. Toward an understanding of the sequence and structural basis of allosteric proteins. ***J Mol Graph Model.*** 2013, 40:30-39.
21. Huang M, Lu S, Shi T, Zhao Y, Chen Y, Li X, Liu X, **Huang Z**, Zhang J. Conformational transition pathway in the activation process of allosteric glucokinase. ***PLoS One.*** 2013, 8(2):e55857.
22. Lu S, **Huang Z**, Huang W, Liu X, Chen Y, Shi T, Zhang J. How calcium inhibits the magnesium-dependent kinase gsk3β: a molecular simulation study. ***Proteins.*** 2013, 81(5):740-753.

23. **Huang Z**[#], Jiang H[#], Liu X[#], Chen Y, Wong J, Wang Q, Huang W, Shi T, Zhang J. HEMD: an integrated tool of human epigenetic enzymes and chemical modulators for therapeutics. ***PLoS One.*** 2012, 7(6):e39917.
24. Chen Y[#], Wen D[#], **Huang Z**[#], Huang M, Luo Y, Liu B, Lu H, Wu Y, Peng Y, Zhang J. 2-(4-chlorophenyl)-2-oxoethyl 4-benzamidobenzoate derivatives, a novel class of SENP1 Inhibitors: Virtual screening, synthesis and biological evaluation. ***Bioorg Med Chem Lett.*** 2012, 22(22):6867-6870.
25. Lu S, Huang W, Li X, **Huang Z**, Liu X, Chen Y, Shi T, Zhang J. Insights into the role of magnesium triad in myo-inositol monophosphatase: metal mechanism, substrate binding, and lithium therapy. ***J Chem Inf Model.*** 2012, 52(9):2398-2409.
26. Wang Q, Zheng M, **Huang Z**, Liu X, Zhou H, Chen Y, Shi T, Zhang J. Toward understanding the molecular basis for chemical allosteric modulator design. ***J Mol Graph Model.*** 2012, 38:324-333.
27. Tang J, **Huang Z**, Chen Y, Zhang Z, Liu G, Zhang J. A novel inhibitor of human La protein with anti-HBV activity discovered by structure-based virtual screening and in vitro evaluation. ***PLoS One.*** 2012, 7(4):e36363.
28. Duan X, Block E, Li Z, Connelly T, Zhang J, **Huang Z**, Su X, Pan Y, Wu L, Chi Q, Thomas S, Zhang S, Ma M, Matsunami H, Chen GQ, Zhuang H. Crucial role of copper in detection of metal-coordinating odorants. ***Proc Natl Acad Sci U S A.*** 2012, 109(9):3492-3497.
29. Liu X, Liu B, **Huang Z**, Shi T, Chen Y, Zhang J. SPPS: a sequence-based method for predicting probability of protein-protein interaction partners. ***PLoS One.*** 2012, 7(1):e30938.
30. **Huang Z**[#], Zhu L[#], Cao Y[#], Wu G, Liu X, Chen Y, Wang Q, Shi T, Zhao Y, Wang Y, Li W, Li Y, Chen H, Chen G, Zhang J. ASD: a comprehensive database of allosteric proteins and modulators. ***Nucleic Acids Res.*** 2011, 39(Database issue):D663-669.
31. Liu X, Su X, Wang F, **Huang Z**, Wang Q, Li Z, Zhang R, Wu L, Pan Y, Chen Y, Zhuang H, Chen G, Shi T, Zhang J. ODORactor: a web server for deciphering olfactory coding. ***Bioinformatics.*** 2011, 27(16):2302-2303.
32. Zhao Y, Lu X, Yang CY, **Huang Z**, Fu W, Hou T, Zhang J. Computational Modeling Toward Understanding Agonist Binding on Dopamine 3. ***J Chem Inf Model.*** 2010, 50(9):1633-1643.

Patents

1. Szablowski JO, **Huang Z**. Site Specific Brain Therapeutics. US Patent, US20250195629A1. Publication date: Jun. 19, 2025.
2. Gu L, **Huang Z**, Zhang X. Red light-controlled protein dimerization systems. US Patent, US20230167167A1. Publication date: Jun. 1, 2023. (**Licensed out**)
3. Zhang J, Chen Y, Zhang Q, Zhao M, Wei J, **Huang Z**, Feng L. Compounds with inhibitory activity against SIRT6 deacetylation, SIRT6 inhibitors, and the uses thereof. Chinese patent, CN115043824A. Publication date: Sep. 13, 2022.
4. Wu Y, Vadgama J, **Huang Z**, Wu K. Novel MCT4 inhibitors and uses thereof. US Patent, US10919878B2. Publication date: Feb. 16, 2021. (**Licensed out**)
5. Zhang J, **Huang Z,** Chen Y. Small molecule activators of SIRT6 and the uses thereof. Chinese patent, CN109384694A. Publication date: Feb. 26, 2019. (**Licensed out**)
6. Zhang J, Chen Y, Huang M, **Huang Z**. Small molecule inhibitors of STAT3 and the uses thereof. Chinese patent, CN103880707A. Publication date: Jun. 25, 2014.
7. Zhang J, Cheng J, Huang M, Chen Y, **Huang Z**, Lu S, Shi T. Small molecule inhibitors of Senp2 and the uses thereof. Chinese patent, CN103877078A. Publication date: Jun. 25, 2014.

Selected Invited Presentations

1. Invited talk for the 'Nano Neuro' session at the Society for Brain Mapping and Therapeutics (SBMT) 2027 Annual Meeting. March 2027; Los Angeles, CA, USA.

2. Invited talk to faculty and residents, Department of Neurological Surgery, University of Pittsburgh. Dec 3, 2025.
3. Invited online flash talk, 2025 NIH Transporter Elucidation Network Meeting. April 16, 2025.
4. Invited talk for the 'Advances in Ultrasound Neuromodulation' session at the Society for Brain Mapping and Therapeutics (SBMT) 2025 Annual Meeting. March 2, 2025; Los Angeles, CA, USA.
5. Invited online talk for the Rice University Pancakes for Parkinson's Spring Conference. March 2024.
6. Invited talk for Synbio Supergroup Seminar Series at Rice University. Jan 2024, Houston, TX, USA.
7. Invited online talk, Basic Medical Sciences Seminar Series, University of Arizona College of Medicine. Dec 2023.
8. Invited talk for Seminars for Postdocs Advancing Inclusion (SPAI) 2023 series at Baylor College of Medicine. Dec 2023, Houston, TX, USA.
9. Invited talk for the Second Graduate Academic Forum, Shanghai Jiao Tong University School of Medicine. October 2012; Shanghai, China.
10. Invited talk for the International Student Research Forum. August 2012; Omaha, NE, USA.
11. Invited talk for the 11th Chinese Computational Chemistry Conference. August 2011; Lanzhou, China.
12. Invited talk for the "Xin Yu" Cup Graduate Research Appreciation Day, Shanghai Jiao Tong University School of Medicine. January 2011; Shanghai, China.

Professional Service

Peer review for journals: *Advanced Drug Delivery Reviews, Journal of Nanobiotechnology*, *Bioengineering & Translational Medicine*, *Bioinformaitcs*, *Computers in Biology and Medicine*, *Journal of Chemical Information and Modeling*, *RSC Medicinal Chemistry, IEEE Transactions on Neural Systems and Rehabilitation Engineering*

Grant review: NIH BRAIN Initiative (U24), Congressionally Directed Medical Research Programs (CDMRP), Action Medical Research Project Grant (a UK medical research charity)

Conference review: Abstract Reviewer for Biomedical Engineering Society (BMES) Annual Meeting

Other scholarly activities: Invited Co-Editor and Contributing Author for the forthcoming Elsevier eBook, *Synthetic Binding Proteins: Biophysical Principles, Engineering Strategies, and Programmable Molecular Systems*.

Research Mentoring

University of Pittsburgh: Mentored 1 postdoctoral fellow, 3 graduate students, 8 undergraduate students, 6 academic visitors, and 3 K–12 students; served as a faculty mentor for 2 cohorts of Pitt's First Experiences in Research (FE-R) Program.
Rice University: Mentored 2 graduate students and 3 undergraduate students
University of Washington: Mentored 5 undergraduate students
Shanghai Jiao Tong University: Mentored 3 graduate students and 1 undergraduate student

Teaching

Teaching assistant for Basic Theory and Practice of Oncology (2009-2010) and Medical Functional Experiment (2010-2011) at Shanghai Jiao Tong University.

Outreach

- Completed the UPMC Peer Coach Training Program and earned a certificate, Spring 2025.
- Delivered an invited public science talk on the potential of noninvasive therapies at Rice University's Virtual Parkinson's Awareness Conference, March 2, 2024.
- Initiated and contributed to a special session on Diversity, Equity, and Inclusion (DEI) in Neuroscience and Engineering Education at the InterfaceRice 2023 Conference.

- Collaborated with a team to deliver an interactive Brain Anatomy lecture using a creative “fruit salad” approach to engage teenage patients at MD Anderson Cancer Center, 2023.