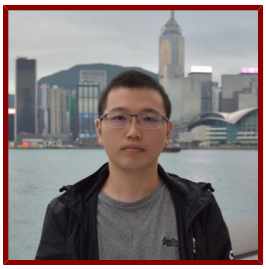
Stanford



# Xuandi Hou

Postdoctoral Scholar, Materials Science and Engineering

## Bio

### BIO

Xuandi Hou's research focuses on integrating nanotools and physical stimuli to gain insights into neural circuits and achieve precise remote manipulation of neural activity. His ultimate aspiration is to develop comprehensive toolkits that facilitate the exploration of the biophysical mechanisms underlying non-invasive transcranial ultrasound brain stimulation, offering applications in both neuroscience and neurology.

### PROFESSIONAL EDUCATION

- Doctor of Philosophy, Hong Kong Polytechnic University (2022)
- Postdoc fellow, Hong Kong Polytechnic University , Biomedical Engineering (2024)

## Publications

### PUBLICATIONS

- **Targeted Mechanogenetics to Modulate Specific Deep Neural Circuits** *ADVANCED SCIENCE*
  Hou, X., Jing, J., Shi, Z., Sun, L.
  2026: e78177
- **Tartrazine Clears Live Cells while Preserving Viability at High Refractive Indices and Osmolality.** *Bioconjugate chemistry*
  Hou, X., Cai, S., Cui, H., Liu, Z., Zhao, S., Zhang, L. Y., Baghdasaryan, A., Crunkleton, V., Brongersma, M. L., Hong, G.
  2026
- **Rapid rescue of despair behaviors by sonogenetic neuromodulation of the mPFC-DRN pathway** *MOLECULAR PSYCHIATRY*
  Lei, T., Xian, Q., Li, D., Su, M., Wu, Y., Hou, X., Jing, J., Jiang, Y., Huang, X., Wong, K., Zhu, J., Guo, J., Qiu, et al
  2026
- **Tartrazine clears live cells while preserving viability at high refractive indices and osmolality.** *bioRxiv : the preprint server for biology*
  Hou, X., Cai, S., Cui, H., Liu, Z., Zhao, S., Zhang, L. Y., Baghdasaryan, A., Crunkleton, V., Brongersma, M. L., Hong, G.
  2026
- **Sono-mechanical nanostructures-enabled sustained precise ultrasound brain stimulation** *NATURE COMMUNICATIONS*
  Hou, X., Jing, J., Shi, Z., Jiang, Y., Sun, L.
  2026; 17 (1)
- **Impact of endogenous sonosensation on in vivo sonogenetics.** *iScience*
  Xian, Q., Li, D., Zhao, X., Zhao, D., Jiang, Y., Jing, J., Hou, X., Huang, X., Wong, K. F., Murugappan, S., Qiu, Z., Sun, L.
  2025; 28 (12): 114030
- **Microbubble-enhanced ultrasound stimulation of β-cells improves insulin release and glycemic control in mice.** *Journal of nanobiotechnology*
  Wu, Y., Zhao, X., Jiang, Y., Chen, C., Liu, L., Hou, X., Xian, Q., Guo, J., Sun, L.

2025; 24 (1): 77

- **Precise modulation of cell activity using sono-responsive nano-transducers.** *Biomaterials*
  Hou, X., Liu, L., Sun, L.
  2025; 314: 122857
- **Nanobubble-actuated ultrasound neuromodulation for selectively shaping behavior in mice.** *Nature communications*
  Hou, X., Jing, J., Jiang, Y., Huang, X., Xian, Q., Lei, T., Zhu, J., Wong, K. F., Zhao, X., Su, M., Li, D., Liu, L., Qiu, et al
  2024; 15 (1): 2253
- **Tracking adoptive natural killer cells via ultrasound imaging assisted with nanobubbles** *ACTA BIOMATERIALIA*
  Jiang, Y., Hou, X., Zhao, X., Jing, J., Sun, L.
  2023; 169: 542-555
- **Modulation of deep neural circuits with sonogenetics** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Xian, Q., Qiu, Z., Murugappan, S., Kala, S., Wong, K., Li, D., Li, G., Jiang, Y., Wu, Y., Su, M., Hou, X., Zhu, J., Guo, et al
  2023; 120 (22): e2220575120
- **The mechanosensitive ion channel Piezo1 contributes to ultrasound neuromodulation.** *Proceedings of the National Academy of Sciences of the United States of America*
  Zhu, J., Xian, Q., Hou, X., Wong, K. F., Zhu, T., Chen, Z., He, D., Kala, S., Murugappan, S., Jing, J., Wu, Y., Zhao, X., Li, et al
  2023; 120 (18): e2300291120
- **Sonogenetics: Recent advances and future directions.** *Brain stimulation*
  Liu, T., Choi, M. H., Zhu, J., Zhu, T., Yang, J., Li, N., Chen, Z., Xian, Q., Hou, X., He, D., Guo, J., Fei, C., Sun, et al
  2022
- **Photonic Nanojet-Mediated Optogenetics** *ADVANCED SCIENCE*
  Guo, J., Wu, Y., Gong, Z., Chen, X., Cao, F., Kala, S., Qiu, Z., Zhao, X., Chen, J., He, D., Chen, T., Zeng, R., Zhu, et al
  2022; 9 (12): e2104140
- **Gas-filled protein nanostructures as cavitation nuclei for molecule-specific sonodynamic therapy.** *Acta biomaterialia*
  Song, L., Hou, X., Wong, K. F., Yang, Y., Qiu, Z., Wu, Y., Hou, S., Fei, C., Guo, J., Sun, L.
  2021; 136: 533-545
- **Protocol for the sonogenetic stimulation of mouse brain by non-invasive ultrasound** *STAR PROTOCOLS*
  Xian, Q., Qiu, Z., Kala, S., Guo, J., Zhu, J., Wong, K., Guo, S., Zhu, T., Hou, X., Sun, L.
  2021; 2 (2): 100393
- **Precise Ultrasound Neuromodulation in a Deep Brain Region Using Nano Gas Vesicles as Actuators.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
  Hou, X., Qiu, Z., Xian, Q., Kala, S., Jing, J., Wong, K. F., Zhu, J., Guo, J., Zhu, T., Yang, M., Sun, L.
  2021: e2101934
- **Targeted Neurostimulation in Mouse Brains with Non-invasive Ultrasound** *CELL REPORTS*
  Qiu, Z., Kala, S., Guo, J., Xian, Q., Zhu, J., Zhu, T., Hou, X., Wong, K., Yang, M., Wang, H., Sun, L.
  2020; 32 (7): 108033
- **Biogenic nanobubbles for effective oxygen delivery and enhanced photodynamic therapy of cancer.** *Acta biomaterialia*
  Song, L., Wang, G., Hou, X., Kala, S., Qiu, Z., Wong, K. F., Cao, F., Sun, L.
  2020
- **Surface-modified GVs as nanosized contrast agents for molecular ultrasound imaging of tumor** *BIOMATERIALS*
  Wang, G., Song, L., Hou, X., Kala, S., Wong, K., Tang, L., Dai, Y., Sun, L.
  2020; 236: 119803
- **Fluorescent magnetic PEI-PLGA nanoparticles loaded with paclitaxel for concurrent cell imaging, enhanced apoptosis and autophagy in human brain cancer** *COLLOIDS AND SURFACES B-BIOINTERFACES*
  Wang, X., Yang, L., Zhang, H., Tian, B., Li, R., Hou, X., Wei, F.
  2018; 172: 708-717

- **PINK1/Parkin-Mediated Mitophagy Promotes Resistance to Sonodynamic Therapy.** *Cellular physiology and biochemistry : international journal of experimental cellular physiology, biochemistry, and pharmacology*
  Song, L., Huang, Y., Hou, X., Yang, Y., Kala, S., Qiu, Z., Zhang, R., Sun, L.
  2018; 49 (5): 1825-1839

- **Ultrasonic Characteristics and Cellular Properties of Anabaena Gas Vesicles.** *Ultrasound in medicine & biology*
  Yang, Y., Qiu, Z., Hou, X., Sun, L.
  2017; 43 (12): 2862-2870

- **Polyethylenimine mediated magnetic nanoparticles for combined intracellular imaging, siRNA delivery and anti-tumor therapy** *RSC ADVANCES*
  Wang, X., Zhu, L., Hou, X., Wang, L., Yin, S.
  2015; 5 (123): 101569-101581