Anqi ZHANG

California Institute of Technology

Email: anqizhang@caltech.edu
Web: https://zlab.caltech.edu/
ORCID: 0000-0001-6121-8095

PROFESSIONAL EXPERIENCE

Assistant Professor of Medical Engineering Mar 2025-Present
Division of Engineering and Applied Science, **California Institute of Technology**

EDUCATION AND TRAINING

Postdoc in Bioengineering	**Stanford University**, Stanford, CA	Feb 2025
Ph.D. in Chemistry	**Harvard University**, Cambridge, MA	May 2020
M.A. in Chemistry	**Harvard University**, Cambridge, MA	May 2017
B.S. in Materials Science	**Fudan University**, Shanghai, China	Jul 2014

RESEARCH EXPERIENCE (with first-author publications)

Postdoctoral Scholar Aug 2020 – Present
Departments of Bioengineering and Chemical Engineering, **Stanford University**
Advisors: Professor Karl Deisseroth and Professor Zhenan Bao

- Developed genetically targeted chemical assembly of functional materials within selected cell types of the nervous system (***Science Advances***, 2023a; ***Nature Synthesis***, 2024)
- Demonstrated genetically encoded photosensitizers for light-controlled polymerization and explored genetically enabled conjugation of pre-synthesized materials on living neuronal membranes (***Nature Reviews Bioengineering***, 2024)
- Developed flexible endovascular neural interfaces delivered into selected vascular branches in rodent brains without open-skull surgery and achieved multi-/single-unit neural recording (***Science***, 2023; ***AHA Postdoctoral Fellowship***; ***NIH K99/R00 Award***)

Doctoral Student Researcher Dec 2014 – May 2020
Department of Chemistry and Chemical Biology, **Harvard University**
Advisor: Professor Charles M. Lieber

- Functionalized ultra-flexible mesh electronics with antibodies and aptamers capable of targeting specific cell surface receptors, and demonstrated *in vivo* cell type- and neuron subtype-specific electrophysiology recording (***Science Advances***, 2023b)
- Developed ultra-small nanowire transistor arrays by combining deterministic shape-controlled nanowire transfer with spatially defined semiconductor-to-metal transformation and achieved recording of up to 100 mV intracellular action potentials from primary neurons (***Nature Nanotechnology***, 2019; ***Nano Today***, 2020, 2021; ***Chemical Reviews***, 2016)
- Developed a biomimetic approach for surface functionalization of silicon nanowires to facilitate spontaneous internalization of nanowires into primary neurons (***Nano Letters***, 2016)

Undergraduate Researcher Nov 2010 – Jul 2014
Department of Materials Chemistry, **Fudan University**
Advisor: Professor Meng Chen

- Developed a template-free, kinetically-controlled solution growth of silica nanotubes and other unconventional silica anisotropic nanostructures (***Nanotechnology***, 2014)
- Developed methods to synthesize polymer-coated semiconductor nanoparticles (***Journal of Nanoparticle Research***, 2014; ***Crystal Research and Technology***, 2013)
- Developed simulation based on Discrete Dipole Approximation theory to predict spectra of nanoparticles (***European Physical Journal D***, 2013)

PUBLICATIONS

First-author / Corresponding-author papers:

(1) **Anqi Zhang**, Spencer Zhao, Jonathan Tyson, Karl Deisseroth, Zhenan Bao, Applications of synthetic polymers directed toward living cells. ***Nature Synthesis***. 2024, 3, 943-957.

(2) **Anqi Zhang**, Yuanwen Jiang, Kang Yong Loh, Zhenan Bao, Karl Deisseroth, Genetically targeted chemical assembly. ***Nature Reviews Bioengineering***. 2024, 2, 82-94.

(3) **Anqi Zhang**†, Emiri T. Mandeville, Lijun Xu, Creed M. Stary, Eng H. Lo, Charles M. Lieber†, Ultraflexible endovascular probes for brain recording through micron-scale vasculature. ***Science***. 2023, 381, 306-312. (†corresponding authors) Covered by Science, Stanford, Physics World, etc.

(4) **Anqi Zhang***, Theodore J. Zwang*, Charles M. Lieber, Biochemically-functionalized probes for cell-type–specific targeting and recording in the brain. ***Science Advances***. 2023, 9, eadk1050. (*equal contribution)

(5) **Anqi Zhang**, Kang Yong Loh, Chandan S. Kadur, Lukas Michalek, Jiayi Dou, Charu Ramakrishnan, Zhenan Bao, Karl Deisseroth, Genetically targeted chemical assembly of polymers specifically localized extracellularly to surface membranes of living neurons. ***Science Advances***. 2023, 9, eadi1870. Covered by Stanford.

(6) **Anqi Zhang**†, Jae-Hyun Lee, Charles M. Lieber, Nanowire-enabled bioelectronics. ***Nano Today***. 2021, 38, 101135. (†corresponding author)

(7) **Anqi Zhang**, Yunlong Zhao, Siheng Sean You, Charles M. Lieber, Nanowire probes could drive high-resolution brain-machine interfaces. ***Nano Today***. 2020, 31, 100821.

(8) Yunlong Zhao*, Siheng Sean You*, **Anqi Zhang***, Jae-Hyun Lee, Jinlin Huang, Charles M. Lieber, Scalable ultrasmall three-dimensional nanowire transistor probes for intracellular recording. ***Nature Nanotechnology***. 2019, 14, 783-790. (*equal contribution)

(9) **Anqi Zhang**, Charles M. Lieber, Nano-bioelectronics, ***Chemical Reviews***. 2016, 116, 215-257.

(10) Jae-Hyun Lee*, **Anqi Zhang***, Siheng Sean You*, Charles M. Lieber, Spontaneous internalization of cell penetrating peptide-modified nanowires into primary neurons, ***Nano Letters***. 2016, 16, 1509-1513. (*equal contribution)

(11) **Anqi Zhang**, Gengfeng Zheng, Exploration of interactive teaching in all-English course of General Chemistry, ***Research in Teaching*** (Chinese). 2015, 38, 49-52.

(12) **Anqi Zhang**, Hui-Jun Li, Dong-Jin Qian, Meng Chen, Kinetically-controlled template-free synthesis of hollow silica micro-/nanostructures with unusual morphologies, ***Nanotechnology***. 2014, 25, 135608.

(13) **Anqi Zhang**, Qing-Zhe Tan, Hui-Jun Li, Li Sui, Dong-Jin Qian, Meng Chen, pH-dependent shape changes of water-soluble CdS nanoparticles, ***Journal of Nanoparticle Research***. 2014, 16, 2197.

(14) **Anqi Zhang**, Meng Chen, Discoveries and thoughts about new carbon nanostructures, ***University Chemistry*** (Chinese). 2014, 29, 48-53.

(15) **Anqi Zhang**, Gengfeng Zheng, Cultivation of students' scientific research interest and innovative thinking – Practice and experience in the research course of *Introduction to Nanomaterials and Functional Devices*, ***Journal of Chemical Education*** (Chinese). 2014, 14, 15-17.

(16) **Anqi Zhang**, Ling-Jian Cai, Li Sui, Dong-Jin Qian, Meng Chen, Reducing properties of polymers in the synthesis of noble metal nanoparticles, ***Polymer Reviews***. 2013, 53, 240-276.

(17) **Anqi Zhang**, Dong-Jin Qian, Meng Chen, Simulated optical properties of noble metallic nanopolyhedrons with different shapes and structures, ***European Physical Journal D***. 2013, 67, 231.

(18) **Anqi Zhang**, Lu Zhang, Li Sui, Dong-Jin Qian, Meng Chen, Morphology-controllable synthesis of ZnO nano-/micro- structures by a solvothermal process in ethanol solution, ***Crystal Research and Technology***. 2013, 48, 947-955.

First-author book:

(19) **Anqi Zhang**, Gengfeng Zheng, Charles M. Lieber, ***Nanowires: Building Blocks for Nanoscience and Nanotechnology***, Springer International Publishing, 2016.

First-author book chapter:

(20) **Anqi Zhang**, Gengfeng Zheng, "Semiconductor nanowires for biosensors", Chap. 17, ***Semiconductor Nanowires: Materials, Synthesis, Characterization and Applications***, J. Arbiol and Q. Xiong (Eds.), Woodhead Publishing Group, UK, 2015.

Co-author papers:

(21) Muhammad Khatib, Eric T Zhao, Shiyuan Wei, Alex Abramson, Estelle B Bishop, Chih-Hsin Chen, Anne-Laure Thomas, Chengyi Xu, Jaeho Park, Yeongjun Lee, Ryan Hamnett, Weilai Yu, Samuel E Root, Lei Yuan, Dorine Chakhtoura, Kyun Kyu Kim, Donglai Zhong, Yuya Nishio, Chuanzhen Zhao, Can Wu, Yuanwen Jiang, **Anqi Zhang**, Jinxing Li, Weichen Wang, Fereshteh Salimi-Jazi, Talha A. Rafeeqi, Nofar M Hemed, Jeffrey B-H Tok, Xiaoke Chen, Julia A Kaltschmidt, James Dunn, and Zhenan Bao, Spiral NeuroString: high-density soft bioelectronic fibers for multimodal sensing and stimulation. ***bioRxiv***. 2023, doi: 10.1101/2023.10.02.560482.

(22) Eric T. Zhao, Jacob Hull, Nofar Mintz Hemed, Hasan Uluşan, Julian Bartram, **Anqi Zhang**, Pingyu Wang, Albert Pham, Silvia Ronchi, John R. Huguenard, Andreas Hierlemann, Nicholas A. Melosh, A CMOS-based highly scalable flexible neural electrode interface. ***Science Advances***. 2023, 9, eadf952.

(23) Theodore J. Zwang, Rachel E. Bennett, Maria Lysandrou, Benjamin Woost, **Anqi Zhang**, Charles M. Lieber, Douglas S. Richardson, Bradley T. Hyman, Tissue libraries enable rapid determination of conditions that preserve antibody labeling in cleared mouse and human tissue. ***eLife***. 2023, 12, e84112.

(24) Ning Gao, Teng Gao, Xiao Yang, Xiaochuan Dai, Wei Zhou, **Anqi Zhang**, and Charles M. Lieber, Specific detection of biomolecules in physiological solutions using graphene transistor biosensors, ***Proceedings of the National Academy of Sciences***. 2016, 113, 14633-14638.

(25) Rui Dai, **Anqi Zhang**, Zhichang Pan, Abdullah M. Al-Enizi, Ahmed A. Elzatahry, Linfeng Hu, Gengfeng Zheng, Epitaxial growth of lattice-mismatched core–shell TiO_2@MoS_2 for enhanced lithium-ion storage, ***Small***. 2016, 12, 2792-2799.

(26) Yang Hu, **Anqi Zhang**, Hui-Jun Li, Dong-Jin Qian and Meng Chen, Synthesis, study, and discrete dipole approximation simulation of Ag-Au bimetallic nanostructures, ***Nanoscale Research Letters***. 2016, 11, 209.

(27) Hui-Jun Li, **Anqi Zhang**, Li Sui, Dong-Jin Qian, Meng Chen, Hyaluronan/Tween 80-assisted synthesis of silver nanoparticles for biological application, ***Journal of Nanoparticle Research***. 2015, 17, 111.

(28) Hui-Jun Li, **Anqi Zhang**, Yang Hu, Li Sui, Dong-Jin Qian, Meng Chen, Large-scale synthesis and self-organization of silver nanoparticles with Tween 80 as a reductant and stabilizer, ***Nanoscale Research Letters***. 2012, 7, 612.

SELECTED HONORS AND AWARDS

National Institutes of Health (NIH) National Institute of Neurological Disorders and Stroke (NINDS) K99/R00 Award 2024 – 2029

American Heart Association (AHA) Postdoctoral Fellowship 2023 – 2024

EAS (Engineering and Applied Science) Trailblazers Symposium, *California Institute of Technology* Nov 2023

Rising Stars in Chemical Engineering, *Massachusetts Institute of Technology* Oct 2023

Rising Stars in Soft and Biological Materials, *The University of Chicago, The University of California San Diego* Oct 2023

Rising Stars in Engineering in Health, *Cornell University, Johns Hopkins University, Columbia University* Sep 2023

Chinese Government Award for Outstanding Self-Financed Students Abroad, *China Scholarship Council* 2019

Department Travel Prize for Outstanding Research Achievement, *Department of Chemistry and Chemical Biology, Harvard University* 2019

Best Poster Award, *Center for Nanoscale Systems, Harvard University* 2017
Certificate of Distinction in Teaching Award (Physical Sciences 10: Quantum and Statistical Foundations of Chemistry), *Harvard University* Fall 2015
Certificate of Distinction in Teaching Award (Chemistry 27: Organic Chemistry of Life), *Harvard University* Spring 2015
Star of the Graduates (top 10 out of 3,800 students), *Fudan University* 2014
National University Innovation Program (top 1%), *Ministry of Education of China* 2012 – 2014
Shanghai Innovation Activity Plan for Undergraduates (top 1%), *Shanghai Municipal Education Commission* 2012 – 2014
Chun-Tsung and Wang-Dao Research Grants, *Hui-Chun Chin and Tsung-Dao Lee Chinese Undergraduate Research Endowment* 2010 – 2014
National Scholarship, *Ministry of Education of China* 2012 – 2013
Outstanding Academic Individuals of Bachelor's Degree, *Fudan University* 2012 – 2013
Top-10 Outstanding Oral Presentation Award, *Annual Conference of National Undergraduate Innovation and Entrepreneurship, China* 2013
Best Oral Presentation Award, *Shanghai Undergraduate Innovation Forum* 2013
Top Outstanding Student (top 0.1%), *Fudan University* 2012 – 2013

PRESENTATIONS

Beijing Brain Conference, Chinese Institute for Brain Research, Beijing, China	*Talk*	Aug 2024
Stanford MatSci Colloquium, Stanford University, Stanford, CA	*Talk*	May 2024
Materials Research Society (MRS) Spring Meeting, Seattle, WA	*Talk*	Apr 2024
Gordon Research Conference (GRC) – Neuroelectronic, Galveston, TX	*Poster*	Mar 2024
American Institute of Chemical Engineers (AIChE) Annual Meeting, Orlando, FL	*Poster*	Nov 2023
Stanford Wearable Electronics (eWear) Initiative, Stanford University, Stanford, CA	*Talk*	Nov 2023
Biomedical Engineering Society (BMES) Annual Meeting, Seattle, WA	*Talk*	Oct 2023
Biomedical Engineering Society (BMES) Annual Meeting, Seattle, WA	*Poster*	Oct 2023
Stanford Anesthesiology Research Seminar, Stanford University, Stanford, CA	*Talk*	Sep 2023
Gordon Research Conference (GRC) – Bioelectronics, Andover, NH	*Talk*	Jun 2023
Gordon Research Conference (GRC) – Bioelectronics, Andover, NH	*Poster*	Jun 2023
Cambridge Bioelectronics Symposium, University of Cambridge, Cambridge, UK	*Talk*	Jun 2023
Stanford Polymer Collective, Stanford University, Stanford, CA	*Talk*	Mar 2023
Annual Future Manufacturing Awardees Meeting, National Science Foundation	*Talk*	Apr 2022
Center for Nanoscale Systems Open House, Harvard University	*Poster*	Nov 2017
American Chemical Society (ACS) Fall Meeting, Washington, DC	*Poster*	Aug 2017
Materials Research Society (MRS) Fall Meeting, Boston, MA	*Talk*	Dec 2014
Annual Conference of National Undergraduate Innovation and Entrepreneurship	*Talk*	Nov 2013
Shanghai Undergraduate Innovation Forum, Shanghai, China	*Talk*	Nov 2013
Universitas 21 Undergraduate Research Conference, Amsterdam, Netherlands	*Talk*	Jul 2013

TEACHING AND MENTORING EXPERIENCE

Instructor, Montague Elementary School, Science is Elementary (SiE) 2022 – 2023
- Volunteered as a science instructor for kindergarteners
- Highlighted as a Volunteer Spotlight in SiE's monthly newsletter

Organizer and Instructor, GTCA Biomanufacturing Workshop, Stanford University 2021 – 2023

Trained over 260 local high school and community college students to do chemistry and neuroscience experiments

Mentor, Mentor/Mentee Program, Harvard University — July 2015
Mentored new graduate students in lab

Teaching Fellow, *Quantum and Statistical Foundations of Chemistry*, Harvard University — Fall 2015
Received the Certificate of Distinction in Teaching Award

Teaching Fellow, *Organic Chemistry of Life*, Harvard University — Spring 2015
Received the Certificate of Distinction in Teaching Award

Teaching Fellow, *Nanomaterials and Functional Devices*, Fudan University — 2013 – 2014
Published a paper on teaching (*Journal of Chemical Education* 2014)

Teaching Fellow, *General Chemistry*, Fudan University — 2013 – 2014
Published a paper on teaching (*Research in Teaching* 2015)

TOEFL Lecturer, New Oriental Education & Technology Group, Shanghai, China — 2012 – 2014
Taught over 1,000 students, from middle school students to adults in their 40s

SERVICE

Panelist, Grand Challenges in BME, Biomedical Engineering Society (BMES) Annual Meeting, Baltimore, MD — Oct 2024

Panelist, Stanford Polymer Collective (SPC) Faculty Search Panel, Stanford, CA — Jun 2024

Discussion Leader, Gordon Research Conference (GRC) – Neuroelectronic, Galveston, TX — Mar 2024

Review Editor, *Frontiers in Electronics* — Aug 2023

Committee Member, Cambridge Bioelectronics Symposium, University of Cambridge — Jun 2023

Science Writer, Science in the News (SITN), Harvard University — 2018 – 2019
Selected articles on brain stimulation, artificial nerves, drug delivery, wound healing, cancer treatment, eye diseases, and osteoarthritis

Independent Reviewer, *Science Advances*, *Nano Letters*, *Journal of the American Chemical Society*, *ACS Applied Electronic Materials, Device, Advanced NanoBiomed Research*, *Journal of Integrative Neuroscience, Journal of Colloid and Interface Science, Materials Research Society (MRS) Meetings* — 2014 – present