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RESEARCH INTERESTS

Framework nucleic acid (DNA framework) nanobiosensors: DNA-encoded nano-interfaces for plasmonic/SERS sensing; DNA-confined assembly of highly luminescent metal nanoclusters; mechanosensitive DNA nanomachines for imaging cell-membrane tension in living cells and tissues.

POSITIONS

2024 – present **Postdoctoral Researcher**, School of Chemistry and Chemical Engineering, Shanghai Jiao Tong University
Co-advisors: Prof. Xiurong Yang and Prof. Chunhai Fan

EDUCATION

2019 – 2024 **Ph.D. in Chemistry**, School of Chemistry and Chemical Engineering, Shanghai Jiao Tong University
Advisor: Prof. Chunhai Fan

2015 – 2019 **B.S. in Chemistry**, College of Chemistry and Molecular Sciences, Wuhan University

SELECTED PUBLICATIONS

1. **Haoran Zheng**[*], Yan Zhou[*], Bingjie Yan[*], Gaoang Zhou, Xinyi Cheng, Sicheng Lin, Mulin Duan, Jiang Li, Lihua Wang, Chunhai Fan, Jing Chen[†], Jianlei Shen[†]. DNA Framework-Guided Self-Limiting Aggregation for Highly Luminescent Metal Cluster Nanoaggregates. *J. Am. Chem. Soc.* 2024, **146**(25), 17094–17102. doi:10.1021/jacs.4c02401 **[First author]**
2. **Haoran Zheng**[*], Haidong Li[*], Mingqiang Li[*], Tingting Zhai, Xiaodong Xie, Cong Li, Xinxin Jing, Chengpin Liang, Qian Li, Xiaolei Zuo, Jiang Li, Jiangli Fan[†], Jianlei Shen[†], Xiaojun Peng, Chunhai Fan. A Membrane Tension-Responsive Mechanosensitive DNA Nanomachine. *Angew. Chem. Int. Ed.* 2023, **62**(35), e202305896. doi:10.1002/anie.202305896 **[First author]**
3. Tingting Zhai[*], **Haoran Zheng**[*], Weina Fang[*], Zhaoshuai Gao, Shiping Song, Xiaolei Zuo, Qian Li, Lihua Wang, Jiang Li, Jiye Shi, Xiaoguo Liu, Yang Tian, Jianlei Shen[†], Chunhai Fan. DNA-Encoded Gold-Gold Wettability for Programmable Plasmonic Engineering. *Angew. Chem. Int. Ed.* 2022, **61**(46), e202210377. doi:10.1002/anie.202210377 **[Co-first author]**
4. Yu Li[*], **Haoran Zheng**[*], Hui Lu[*], Mulin Duan, Cong Li, Mingqiang Li, Jiang Li, Lihua Wang, Qian Li, Jing Chen[†], Jianlei Shen[†]. Noncanonical Condensation of Nucleic Acid Chains by Hydrophobic Gold Nanocrystals. *JACS Au* 2023, **3**(8), 2206–2215. doi:10.1021/jacsau.3c00252 **[Co-first author]**
5. Jianhong Liao[*], **Haoran Zheng**[*], Zengming Fei, Bo Lu, Hua Zheng[†], Dan Li, Xiong Xiong, Ying Yi. Tumor-targeting and pH-responsive nanoparticles from hyaluronic acid for the enhanced delivery of doxorubicin. *Int. J. Biol. Macromol.* 2018, **113**, 737–747. doi:10.1016/j.ijbiomac.2018.03.004 **[Co-first author]**
6. **Haoran Zheng**, Jianlei Shen. Construction of Molecular Assemblies with AIEgens for Biosensing in Living Cells. *Encyclopedia of Aggregation-Induced Emission* 2025, 1–10. doi:10.1007/978-981-97-1574-9_119-1 **[First author]**
7. Chengpin Liang, Qiuling Huang, **Haoran Zheng**, Mulin Duan, Xinyi Cheng, Jielin Chen, Qian Li, Zhiyun Zhang[†], Chunhai Fan, He Tian, Jianlei Shen[†]. Probing Cell Membrane Tension Using DNA Framework-Encoded Vibration-Induced Emission Molecular Assemblies. *J. Am. Chem. Soc.* 2024, **146**(50), 34341–34351. doi:10.1021/jacs.4c08271

8. Mulin Duan*, Yan Zhou*, **Haoran Zheng**, Bingjie Yan, Gaoang Zhou, Siyuan Zhang, Shihua Luo, Jing Chen, Chang Yan, Chunhai Fan†, Jianlei Shen†. Harnessing Exciton Flux With a Single-Stranded DNA-Programmed Nanodevice. *Angew. Chem. Int. Ed.* 2026, **65**(11), e25693. doi:10.1002/anie.202525693
9. Tingting Zhai*, Lingyu Feng*, Xinyi Cheng*, Sicheng Lin, Xiaodong Xie, **Haoran Zheng**, Cong Li, Zhibei Qu, Chengpin Liang, Bin Chen, Lifeng Xu, Xiaoguo Liu, Fei Wang, Lihua Wang, Jiang Li, Chunhai Fan†, Jianlei Shen†. Programming Hydrophobic Nanocavity of DNA Frameworks for Ultrastable Fluorescent Imaging. *Angew. Chem. Int. Ed.* 2026, **65**(47), e9068292. doi:10.1002/anie.9068292
10. Yan Zhou*, Tonglu Lu*, Siyuan Zhang, Yang Yang, Hui Lu, Gaoang Zhou, Jianxin Yang, Jinghuang Chen, **Haoran Zheng**, Mulin Duan, Mingqiang Li†, Xiaoliang Chen, Jianlei Shen†. A Supra-amphiphilic DNA Complex for Delivering Mechanosensitive Gold Nanoclusters into Lipid Membranes. *Nano Lett.* 2026 (ASAP, published online Nov 2026). doi:10.1021/acs.nanolett.6c04559

* equal contribution; † corresponding author. 16 publications in total (incl. one book chapter); full list at hrzheng.com.

GRANTS

2026 – 2028	**Mechanosensitive DNA nanomachines for precise detection of cell membrane tension** (PI) National Natural Science Foundation of China (NSFC), Young Scientists Fund (Category C), No. 22504083
2024 – 2026	**DNA framework-based nanomachines dual-responsive to membrane tension and membrane potential** (PI) China Postdoctoral Science Foundation, Postdoctoral Fellowship Program (Grade B), No. GZB20240432
2024 – 2026	**DNA framework-encoded multifunctional DNA nanosensors for simultaneous detection of membrane tension and membrane potential** (PI) China Postdoctoral Science Foundation, 76th General Program, No. 2024M761945
2024 – 2026	**Construction of DNA framework-based multidimensional nanosensors** (PI) Shanghai "Super Postdoc" Incentive Program, No. 2024395
2020 – 2025	**Construction and application of living functional biomaterials** (Participant) National Key R&D Program of China, Ministry of Science and Technology, No. 2020YFA0908100
2020 – 2024	**Applications of catalytic assembly in biomedicine and materials** (Participant) National Natural Science Foundation of China (NSFC), Major Program, No. 21991134
2020 – 2022	**CRISPR-targeted dual-mode imaging of chromatin** (Participant) National Natural Science Foundation of China (NSFC), Major Research Plan, No. 91953106

SELECTED HONORS

2024	Outstanding Graduate of Shanghai
2023	National Scholarship for Doctoral Students
2023	Best Poster Award, 33rd Congress of the Chinese Chemical Society
2022	First Prize, SJTU Doctoral Forum on Translational Medicine

PATENTS

Mechanosensitive nanomachine and its preparation method and application. Chinese invention patent ZL 2023 1 0768042.9 (granted; 5th inventor).

Preparation and application of highly luminescent metal cluster nanoaggregates. Chinese invention patent application 202410511492.4 (under substantive examination; 3rd inventor).