吕军鸿 教授

一、基本情况

吕军鸿，博士，二级教授/黄海学者，博士生导师,lvjunhong@ytu.edu.cn。

二、学习及工作经历

2001 年 3 月--2004 年 6 月 中国科学院研究生院，博士生
2004 年 6 月—2018 年 10 月 中国科学院上海应用物理所 助理研究员、副研、研究员
2007 年 3 月-2012 年 8 月 美国哈佛大学（医学院、米兰研究所）Research Fellow
2013 年 2 月-2015 年 1 月 英国牛津大学化学系 玛丽居里学者
2018 年 10 月-2023 年 10 月 中国科学院上海高等研究院 研究员 PI
2018 年 1 月-2025 年 2 月 山东滨州医学院 特聘教授
2025 年 2 月-今 烟台大学药学院 黄海学者特聘教授
2020 年 1 月-今 济南微生态生物医学省实验室 研究员 PI

三、目前研究领域

生物医学光子学：红外/太赫兹振动光谱与纳米成像
纳米生物学：气体/纳米气泡生物效应机理、抗菌纳米材料
干细胞生物学：基于单细胞组学的衰老机理与干预药物筛选
微生物组与代谢健康：基于药食同源和益生菌的食品开发

四、社会兼职

中国生物物理学会太赫兹分会副会长、中国老年保健医学研究会氢分子生物医学分会常务委员、中国颗粒学会微纳气泡专业委员会委员

五、目前承担科研项目情况

1. 细胞骨架集体振动在太赫兹波辐射诱导干细胞分化效应中的作用研究. 国家基金委联合基金,项目编号：U2230110，2023.01-2025.12，课题负责人

2. 纳米气泡生物效应的物理化学机制研究.上海市科委国际科技合作项目，,项目编号：22490714400. 2022.09-2025.08.课题负责人

六、发表论文

1. Zhihan Zhao, Shixing Chen, Zhixiao Liu, Jing Su, Junhong Lü, Lihong Hao, Yanzhi Dou, Lihua Wang, Shiping Song. T7 Endonuclease I-mediated single-base mismatch biosensing strategy for high-resolution quantitative analysis of 5-hydroxymethylcytosine in genomic DNA. JACS Au, 2025
2. Xiting Hu, Guangxu Zhang, Jiang Qian, Junhong Lü*, Yimin Zhu*, Yan Peng*.Terahertz s-SNOM Imaging of a Single Cell with Nanoscale Resolution. Nano Letters,2024, 24, 7757−7763.
3. Feng Geng#, Yuming Wu#, Pan Yang, Xueling Li, Xiaohong Pan, Yadi Wang*, Junhong Lü*. Engineered probiotic cocktail with two cascade metabolic Escherichia coli for the treatment of hydrolysineemia. Front. Microbiol. 2024, 15:1366017.
4. Changfeng Cao, Guangxu Zhang, Xueling Li, Yadi Wang, Junhong Lü*. Nanomechanical collective vibration of SARS-CoV-2 spike proteins. Journal of Molecular Recognition 2024,37(4):e3091.
5. Yue Wang, Yadi Wang, Xueling Li, Yu Gao, Xiaohong Pan, Junhong Lü*. Protopanaxadiol targeting membrane induces HepG2 cell apoptosis via raft-like formation and tubulation disruption. Cell Biochem Biophys 2024, 1203 - 1212
6. Huiping Liu, Jingfang Ma, Pan Yang, Feng Geng, Xueling Li, Junhong Lü*, Yadi Wang*. Comparative analysis of biofilm characterization of probiotic Escherichia coli. Front. Microbiol., 2024, 15: 1365562.
7. Yue Wang#, Yadi Wang#, Xueling Li, Junhong Lü*. Vibrational phenomics decoding of the stem cell stepwise aging process at single-cell resolution. ChemComm.2024, 60:3263-3266.
8. Jun Zhang, Yixin Chen, Yarui Zhao, Panpan Wang, Hongbin Ding, Cong Liu, Junhong Lü, Weidong Le *. Terahertz irradiation improves cognitive impairments and attenuates Alzheimer's neuropathology in APP SWE /PS1 DE9 mouse: A novel therapeutic intervention for Alzheimer's disease, Neuroscience Bulletin
9. Shi Jiao1‡*, Chuanchuan Li‡, Fenghua Guo‡, Jinjin Zhang, Hui Zhang, Zhifa Cao, Wenjia Wang, Wenbo Bu, Mobin Lin‡, Junhong Lü*, Zhaocai Zhou*. SUN1/2 Controls Macrophage Polarization via Modulating Nuclear Size and Stiffness.

Nature Communication., 2023, 14:6416.
10. Yadi Wang#, Jin Zheng#, Jie Cheng#, Runlong Zhou, Xueling Li*, Jun Hu, Junhong Lü*. Nanobubble can modulate microbial communities and sedimentary ecosystem in pond water treatment. Environmental Science: Water Research & Technology.2023
11. Jiang Qian#, Yadi Wang#, Xueling Li, Junhong Lü*. Hydrogel microenvironment contributes to chemical-induced differentiation of Mesenchymal stem cells: Single cell infrared microspectroscopy characterization. Analytical and Bioanalytical Chemistry,2023,415
12. Yadi Wang, Huiping Liu, Feng Geng, Pan Yang, Junhong Lü*, Xueling Li *. Label-free analysis of biofilm phenotypes by infrared micro- and correlation-spectroscopy. Analytical and Bioanalytical Chemistry, 2023,415:
13. Zheng, Jin; Qi, Juncheng; Song, Sanzhao; Yuan, Kaiwei; Zhang, Lijuan; Zhao, Hongwei; Lü, Junhong; Zhu, Beien; Zhang, Yi; Hu, Jun. An antioxidation strategy based on ultra-small nanobubbles without exogenous antioxidants. Scientific Reports.2023,13(1):8455.
14. Yadi Wang#, Yu Gao#, Xueling Li, Geng Tian*, Junhong Lü*. Single-cell infrared phenomics identifies cell heterogeneity of individual pancreatic Islets in mouse model. Analytical Chimica Acta.2023,1258:341185
15. Yujie Chen, Ruimin Xu, Shuang Zhou, Chengchen Zhao, Ziyue Hu, Yuwei Hua, Yanhong Xiong, Xiaoyu Liu, Junhong Lü, Yao Sun*, Chong Li*, Shaorong Gao* & Yong Zhang* Mechanical strain treatment improves nuclear transfer reprogramming efficiency by enhancing chromatin accessibility. Stem Cell Reports,2023,18:807-816.
16. Yuru Cao,Ben Liu, Wenzhen Li, Feng Geng, Xue Gao, Lijun Yue, Huiping Liu, Congying Liu, Zhenguo Su*, Junhung Lü*, Xiaohong Pan*. Protopanaxadiol manipulates gut microbiota to promote bone marrow hematopoiesis and enhance immunity in cyclophosphamide-induced immunosuppression mice. MedComm, 2023,4: e222.
17. Cheng Wang, Tingting Cheng; Qianqian Lu, Wenzhen Li, Ben Liu, Lijun Yue, Maoru Du, Wenxue Sheng, Zhaochen Lu, Jingnan Yang, Feng Geng, Xue Gao*, Junhong Lü*, Xiaohong Pan*. Oxygen therapy accelerates apoptosis induced by selenium compounds via regulating Nrf2/MAPK signaling pathway in hepatocellular carcinoma. Pharmacological Research, 2023, 187:106624.
18. Guangxu Zhang, Yadi Wang, Jiang Qian, Yue Wang, Xueling Li, Junhong Lü*. Terahertz refractive phenotype of living cells. Front. Bioeng. Biotechnol. 2023, 10: 1105249.
19. Jiang Qian#, Xue Gao#, Yadi wang, Xueling Li, Jun Hu, Junhong Lü*. Synchrotron infrared microspectroscopy for stem cell research. International Journal of Molecular Sciences. 2022, 23, 9878.
20. Chao Tang, Yadi Wang, Jie Cheng, Chao Chang*, Jun Hu, Junhong Lü*. Probing terahertz dynamics of multidomain protein in cell-like confinement. Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 2022,275:121173.

21. Feng Geng#, Guangxu Zhang#,Yadi Wang, Junhong Lü*. Membrane phosphatidylserine allosterically regulates the cytosolic phospholipase A2 activity via an electrostatic-switch mechanism. Soft Matter,2022,18(11),2203-2210.
22. Guangxu Zhang#, Chao Tang#, Lexin Pan, Junhong Lü*. Low-frequency collective motion of DNA-binding domain defines p53 function. Proteins, 2022,90(3):881-888.
23. Tingting Cheng, Cheng Wang, Qianqian Lu, Yuru Cao, Weiwei Yu, Wenzhen Li, Ben Liu, Xue Gao*, Junhong Lü*, Xiaohong Pan*. Metformin inhibits the tumor promoting effect of low-dose resveratrol, and enhances the anti-tumor activity of high-dose resveratrol by increasing its reducibility in triple negative breast cancer. Free Radical Biology and Medicine. 2022,180:108-120.
24. Jinfang Lu#, Jin Zheng#, Yadi Wang, Jie Cheng, Xueling Li, Jun Hu, Bin Li*, Junhong Lü*. Response of Escherichia coli to Hydrogen Nanobubbles: an In Vitro Evaluation Using Synchrotron Infrared Spectroscopy. Journal of Zhejiang University-SCIENCE B, 2021, 22(11):966-970.
25. Mingyu Wu, Yu Sun, Meiru Zhu, Laiyu Zhu, Junhong Lü, Feng Geng*. Molecular Dynamics-Based Allosteric Prediction Method to Design Key Residues in Threonine Dehydrogenase for Amino-Acid Production. ACS Omega 2021, 6, 16, 10975-10983.
26. Yadi Wang#, Wentao Dai#, ZhiXiao Liu#, Jixiang Liu, Jie Cheng, Yuanyuan Li, Xueling Li*, Jun Hu, Junhong Lü*. Single-cell infrared microspectroscopy quantifies dynamic heterogeneity of mesenchymal stem cells during adipogenic differentiation. Analytical Chemistry 2021, 93, 2, 671–676.
27. Chao Tang#, Jing Yang, Yadi Wang, Jie Cheng, Xueling Li, Chao Chang*, Jun Hu*, Junhong Lü*. Integrating terahertz metamaterial with water nanodroplets for ultrasensitive detection of soluble amyloid b aggregates in liquids. Sensors & Actuators: B. Chemical. 2021,329:129113.
28. Yadi Wang#, Yue Wang#, Jiang Qian, Xiaohong Pan, Xueling Li*, Feng Chen, Jun Hu, Junhong Lü*. Single-cell infrared phenomics: phenotypic screening with infrared microspectroscopy. Chemical Communication, 2020, 56(86) 13237-13240.
29. Yadi Wang#, Wentao Dai#, Yue Wang, Jixiang Liu, Zhixiao Liu, Yuanyuan Li, Xueling Li*, Jun Hu, Junhong Lü*. How many cells are enough for single-cell FTIR? Chemical Communication. 2020,56(26):3773–3776.
30. Cheng Jie, Chao Tang, Xueling Li, Jun Hu*, Junhong Lü*. Hydrogen molecules can modulate enzymatic activity and structural properties of pepsin protein in vitro. Colloids and Surfaces B: Biointerfaces, 2020,189:110856.
31. Jing Yang#,Chao Tang#, Yadi Wang, Chao Chang*, Jianbing Zhang, Jun Hu*, Junhong Lü*. The Terahertz Dynamics Interfaces to Ion-lipid Interaction Confined in Phospholipid Reverse Micelles. Chemical Communication. 2019,55(100):15141-15144.
32. Yue Wang#, Yadi Wang#, Lina Huang, Xiangyong Liu*, Jun Hu, Junhong Lü*. Evaluating the biochemical changes of LPS-stimulated endothelial cells by

synchrotron FTIR microspectroscopy at a single-cell level. Analytical and Bioanalytical Chemistry 2019:411(27) 7157-7164

33. Jinjin Zhang, Yizhou Yang, Shuo Yang, Jie Song, Ying Wang, Yue Shen, Shuo Wang, Haijun Yang, Junhong Lü, Bin Li, Haiping Fang, Jun Hu, Guosheng Shi & Yi Zhang. Nonconventional atomic structure of graphene sheets on solid substrates. Small 2019:15(42) :19026379.
34. Dingka Song, Junchen Meng, Jie Cheng, Zheng Fan, Pengyu Chen, Heifei Ruan hongyuan Tu, Ning Kang, Nan Li, Ying Xu, Xiaobo Wang, Few Shu, Libing Mu, Tengfei Li, Wenran Ren, Xin Lin, Jun Zhu , Xiaohong Fang, Matthias W. Amrein, Weihui Wu, Litang Yan Junhong Lü, Tie Xia and Yan Shi. Pseudomonas aeruginosa quorum-sensing metabolite induces host immune cell death through cell surface lipid domain dissolution. Nature Microbiology 2019, 4: 97-111.

九、授权专利情况

1. 含磷脂的微乳液及制备方法、在研究界面水性能中的应用.中国发明专利：ZL201610243873. 4
2. 一种基于纳米力学的蛋白分析方法.中国发明专利：ZL201811348868,
3. 一种小粒径纳米气泡水及其制备方法以及应用.中国发明专利：ZL202210088701.X.
4. 用于治疗高赖氨酸血症的组合物及应用. 中国发明专利:ZL202210752067.5
5. 代谢赖氨酸的工程菌及其构建方法与应用.中国发明专利：ZL202210754123.9