张红定　副教授　博士　硕士生导师

姓　　名：张红定

专　　业：分析化学

邮　　箱：zhanghongding0606@163.com

办 公 室：化学楼 525

简　　介：张红定，女，1991 年 6 月生，博士，副教授，硕士生导师，南湖青年学者。2019 年 6 月毕业于复旦大学分析化学专业，获理学博士学位，师从刘宝红教授（杰青），2019 年 7 月起任职于信阳师范学院化学化工学院，主要从事单分子成像技术、功能纳米材料与生物传感技术的研究，构建了一系列超灵敏的生物传感新方法用于重要生物分子的检测。近年来，在 Chemical Science、Analytical Chemistry、Biosensors and Bioelectronics、Analyst 等国际知名期刊发表 SCI 学术论文 40 余篇。

个人经历

教育经历：

2009.9-2013.7　学士　南阳师范学院　化学与制药工程学院　化学

2013.9-2016.7　硕士　信阳师范学院　化学化工学院　分析化学　导师：王海波教授

2016.9-2019.6　博士　复旦大学　化学系　分析化学　导师：刘宝红教授

工作简历：

2019.7-2023.12　信阳师范大学化学化工学院　讲师

2024.1-至今　信阳师范大学化学化工学院　副教授

研究领域与兴趣

1. 功能纳米材料与生物传感
2. 单分子荧光成像技术
3. 核酸、蛋白质分析

主讲课程

本科生：《仪器分析》、《环境监测》、《分析化学实验》、《仪器分析实验》等

研究生：《化学修饰电极与生物传感器》

主持科研项目

纵向项目：

1. 河南省自然科学基金：单分子微流控技术用于肝癌 DNA 甲基化水平分析研究，222300420273，5.0 万，2022.1-2023.12，主持

2. 河南省教育厅项目：基于微纳限域效应的单分子荧光检测新方法研究，21A150050，3.0 万，2021.1-2022.12，主持

3. 国家自然科学基金：仿生微环境调控的单细胞关键蛋白质分析新方法，21775028，65 万，2018.1-2021.12，参与

4. 国家自然科学基金：荧光金纳米簇的制备、表征及其在超灵敏生物传感方法中的应用，U1704153，54 万，2018.1-2020.12，参与

横向项目：

1. 化学生物传感与计量学国家重点实验室开放课题：基于单分子荧光技术的生物传感新方法研究，2021016，3 万，2022.4-2024.4，主持

代表性研究成果

期刊论文：

1. **Hongding Zhang***, Changlu Ke, Yuxiao Mu, Menghan Li, Hai-Bo Wang. A redox-regulated inner filter effect between Ti_3C_2 quantum dots and MnO_2 nanosheets for sensitive alkaline phosphatase determination. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, **2026**, 359, 127945.

2. **Hongding Zhang***, Changlu Ke, Zhenhua Xing, Mengqi Zhao, Xin Xiang, Hai-Bo Wang. Fluorogenic response of thiamine triggered by Cu^{2+} for sensitive and economical determination of alkaline phospatase. *Analytical and Bioanalytical Chemistry*, **2025**, 417, 5211-5220.

3. **Hongding Zhang***, Sifei Wu, Hui-Jin Xiao, Hai-Bo Wang, Linxia Fang, Jun-Tao Cao*. Chemical-chemical redox cycling for improving the sensitivity of the fluorescent assay: A proof-of-concept towards DNA methylation detection. *Talanta*, **2024**, 268, 125363.

4. **Hongding Zhang***, Yinhui Su, Jiamiao Zhao, Huixi Song, Xiaohong Zhou. A ratiometric fluorescence assay for the detection of DNA methylation based on an alkaline phosphatase triggered in situ fluorogenic reaction. *Analyst*, **2024**, 149, 507-514.

5. **Hongding Zhang***, Sifei Wu, Zhenhua Xing, Jiaxin Wang, Hai-Bo Wang, Linxia Fang. Sensitive fluorescent determination of silver ion and glutathione in human serum using polydopamine nanodots as the probe. *Analytical Letters*, **2024**, 57(4), 595-606.

6. **Hongding Zhang***, Sifei Wu, Zhixiao Song, Linxia Fang, Hai-Bo Wang. Tannic acid-accelerated fenton chemical reaction amplification for fluorescent biosensing: The proof-of-concept towards ultrasensitive detection of DNA methylation. *Talanta*, **2023**, 265, 124811.

7. **Hongding Zhang**, Bei-Bei Tao, Ning-Ning Wu, Lin-Ge Chen, Hai-Bo Wang. Inter filter effect between fluorescent copper nanoparticles and Cr(VI) and its application for probing the activity of alkaline phosphatase. *Microchemical Journal*, **2023**, 193, 109066.

8. **Hongding Zhang***, Sifei Wu, Yihan Li, Beibei Tao, Ningning Wu, Hai-Bo Wang, Linxia

Fang. Etching triangular silver nanoparticles to initiate the fluorescent response of Ru@SiO2 for sensitive detection of glutathione. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **2023**, 671, 131686.

9. **Hongding Zhang***, Sifei Wu, Zhenhua Xing, Hai-Bo Wang. ALP-assisted chemical redox cycling signal amplification for ultrasensitive fluorescence detection of DNA methylation. *Analyst*, 2023, 148, 5753-5761.

10. Sifei Wu, Linxia Fang*, Yihan Li, Hai-Bo Wang, **Hongding Zhang***. A fluorescence turn on-off-on method for sensitive detection of Sn^{2+} and glycine using waste eggshell membrane derived carbon nanodots as probe. *Journal of Fluorescence*, **2023**, 33, 1505-1513.

11. **Hongding Zhang***, Sifei Wu, Mengwei Sun, Jiaoyu Wang, Man Gao, Hai-Bo Wang, Linxia Fang*. In-situ formation of MnO_2 nanoparticles on Ru@SiO_2 nanospheres as a fluorescent probe for sensitive and rapid detection of glutathione. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, **2022**, 283, 121724.

12. **Hongding Zhang***, Sifei Wu, Zhenhua Xing, Man Gao, Mengwei Sun, Jiaoyu Wang, Hai-Bo Wang. Green synthesis of carbon nanodots for direct and rapid determination of theophylline through fluorescence turn on-off strategy. *Applied Physics A*, **2022**, 128, 356.

13. **Hongding Zhang***, Sifei Wu, Zhenhua Xing, Hai-Bo Wang. Turning waste into treasure: chicken eggshell membrane derived fluorescent carbon nanodots for the rapid and sensitive detection of Hg^{2+} and glutathione. *Analyst*, **2021**, 146, 7250-7256.

14. **Hongding Zhang***, Sifei Wu, Zhenhua Xing, Hai-Bo Wang*, Yan-Ming Liu. A highly sensitive electrochemical sensor for theophylline based on dopamine-melanin nanosphere (DMN)–gold nanoparticles (AuNPs)-modifed electrode. *Applied Physics A*, **2021**, 127, 844.

15. **Hongding Zhang**, Xuedong Huang, Jianwei Liu*, Baohong Liu*. Simultaneous and ultrasensitive detection of multiple microRNAs by single-molecule fluorescence imaging. *Chemical Science*, **2020**, 11, 3812-3819.

16. **Hongding Zhang***, Zhenhua Xing, Miaomiao Pan, Hai-Bo Wang*, Yan-Ming Liu. Highly sensitive and selective electrochemical determination of 4-aminophenol based on flower-like Ag-Au nanocomposites modified glassy carbon electrode. *Journal of The Electrochemical Society*, **2020**,167, 126504.

17. **Hongding Zhang**, Kun Zhang, Yuanyuan Yao, Yujie Liu, Ji Ji, Xuedong Huang, Jianwei Liu*, Baohong Liu*. Single molecule fluorescence imaging for ultrasensitive DNA methyltransferase activity measuring and inhibitor screening. *Analytical Chemistry*, **2019**, 91, 9500-9507.

18. **Hongding Zhang**, Yujie Liu, Kun Zhang, Ji Ji, Jianwei Liu*, Baohong Liu*. Single molecule fluorescent colocalization of split aptamers for ultrasensitive detection of biomolecules. *Analytical Chemistry*, **2018**, 90, 9315-9321.

专利著作：

1. 国家发明专利（ZL 2013 1 0601223.9）：王海波，**张红定**，黄克靖，刘彦明. 一种多巴胺黑

色素纳米微球电化学传感器及其制备方法和应用.

2. 国家发明专利（ZL 2013 1 0600457.1）：王海波，**张红定**，黄克靖，刘彦明. 一种多巴胺黑色素纳米微球-石墨烯电化学传感器及其制备方法和应用.

奖励及荣誉

入选南湖学者奖励计划 B 类人才，多次获河南省教育厅优秀科技论文二等奖。近年来已在 Chemical Science，Analytical Chemistry，Biosensors and Bioelectronics，Analyst 等国际知名期刊发表 SCI 学术论文 40 余篇。主持河南省自然科学基金 1 项，河南省高等学校重点科研项目 1 项，化学生物传感与计量学国家重点实验室开放基金 1 项，参与国家自然科学基金 6 项，授权国家发明专利 2 项。担任 Scientific Reports 期刊青年编委，Sensors and Actuators B: Chemical、Talanta、Microchemical Journal、Analyst 等国际学术期刊审稿人。

个人主页

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