陕西师范大学 SHAANXI NORMAL UNIVERSITY

西安交通大学 XIAN JIAOTONG UNIVERSITY

2026年10月
October, 2026

简报
Newsletter

新概念传感器与分子材料研究院
Institute of New Concept Sensors and Molecular Materials



















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总策划：房喻教授
Producer & Editor-in-Chief: Prof. Fang Yu
责任编辑：薛东旭　冯 伟
Executive Editors: Xue Dongxu, Feng Wei
翻译：冯 伟
Translator: Feng Wei
校对：团队全体老师
Proofreading: Fang Group teachers

地址：陕西省西安市长安区西长安街 620 号
陕西师范大学长安校区
Chang'an Campus, Shaanxi Normal University, 620 West Chang'an Avenue,Chang'an District, Xi'an, Shaanxi, P. R. China
网站 (Website)：https://incsmm.snnu.edu.cn
电子邮箱 (Email)：incsmm@snnu.edu.cn

2025 级博士生开题汇报暨研究生学术论坛举行

Class of 2028 Doctoral Proposal Presentation and Graduate Student Academic Forum held





2026 年 10 月 7 日，陕西师范大学新概念传感器与分子材料研究院在报告厅举办了 2025 级博士生开题汇报暨研究生学术论坛。汇报会分别由丁立平教授、刘凯强教授、刘静教授、彭军霞教授、薛东旭教授、边红涛教授、马佳妮教授和刘太宏教授主持，研究院教师、研发工程师及研究生等近百人参加。

来自研究院和人工智能与计算机学院的 19 位博士研究生分别就自己的科研工作进展、取得成绩和未来毕业论文工作计划进行了汇报，其中有物理化学专业的李一丹、孙佩栋、周建成、韦何曦、李厚霖、谷雪、张晟珲、李书飞、邱泽彪、王靖婷、






Functional Materials Based on Acridi
Molecular Design to Applicati
Reporter: Jiancheng Zhou
Supervisor: Prof. Yu Fang
Date: Oct. 7, 2026


Design and Synthesis of New MOF/COF Materials for Sen
2025级博士研究生开题答辩
指导老师：薛东旭教授


Design, Excited-State Regulation, and
of Organic Luminescent Sma
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Supervisor: Prof. Yu Fang
Oct. 7, 2026


无溶剂有机液体薄膜的极性编码分
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Oct. 7, 2026


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Interfacial Charge and Energy Tra
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Reporter: Zebiao Qiu
Supervisor: Prof. Haonan Peng
Co-supervisor Prof. Kaifeng Wu
Date: Oct. 7, 2026


Bicontinuous Materials for Phase-Sel
Reporter : Jingting Wang
Supervisor : Zhongshan Liu


面向锂离子电池
动态二硫键聚电解质弹性体


Regulation of Aggregation Structures and Structu
Photophysics Relationships in Organic Luminescent S


Donor-Acceptor-Based Small-Molecule
Sensors for Discrimination of Illicit
Supervisor: Prof. Liping Ding


Microenvironment-Regulated
Responsive Eutecto
Reporter: Huanhuan D
Supervisor: Prof. Junxia
Date: Oct. 7, 2026


与智能识别方法研究
Multidimensional Optical Fingerprinting and Intelligent
New Psychoactive Substances
Reporter: Chun Yang
Supervisor: Prof. Yu Fang
Date: Oct. 7, 2026


Transport Mechanisms in Fluorin
代乙酸乙酯电解液中Li+溶剂化





赵晓竹、苏家欣、胡浩、董欢欢、杨春、姜寒，无机化学专业的冀梦娜，物理化学的冀梦雨，及人工智能与计算机学院博士研究生辛经琳。

开题汇报之后，研究生们回答了评委老师提出的问题，与老师讨论了相关问题，并对之后的研究和工作进行了探讨和展望。

最后，房喻院士发表总结讲话，鼓励导师和学生共同努力做出有意义的工作。

On October 7, 2026, the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University held a proposal Presentation and a graduate academic forum for Class 2028 doctoral students in the lecture hall. The event was moderated by Professors Ding Liping, Liu Kaiqiang, Liu Jing, Peng Junxia, Xue Dongxu, Bian Hongtao, Ma Jiani, and Liu Taihong in sections, and was attended by nearly 100 faculty, R&D engineers and graduate students from the institute.

Nineteen doctoral students from the institute and School of of Artificial Intelligence and Computer Science presented reports on the progress of their research work, achievements made, and future plans for their dissertation projects, including Li Yidan, Sun Peidong, Zhou Jiancheng, Wei Hexi, Li Houlin, Gu Xue, Zhang Shenghui, Li Shufei, Qiu Zebiao, Wang Jingting, Zhao Xiaozhu, Su Jiaxin, Hu Hao, Dong Huanhuan, Yang Chun, Jiang Han majoring in Physical Chemistry, Ji Mengna, majoring in Inorganic Chemistry, Ji Mengyu, majoring in Physical Chemistry, and Xin Jinglin from School of of Artificial Intelligence and Computer Science.

After the proposal report, the graduate students answered the questions raised by the judges, discussed the relevant issues and the prospect of the future research and work with the teachers.

Finally, Prof. Fang Yu delivered closing remarks, encouraging supervisors and students to work together to produce meaningful research.



研究院师生科学实验展演作品获第八届全国科学实验展演汇演二等奖

Faculty and students win second prize at 8th National Science Experiment Exhibition and Showcase

2026 年 10 月 12 日至 15 日，在中国科学院武汉植物园光谷园区举行的第八届全国科学实验展演汇演中，陕西师范大学新概念传感器与分子材料研究院老师和学生为主力的陕师大代表队凭借科学实验展演作品《让“危险”无处遁形》获全国二等奖。

展演舞台上，《让“危险”无处遁形》以“公交车发现可疑物品”为情境，将房喻院士团队在薄膜荧光传感器领域多年的攻关历程搬上舞台，生动演绎了传感器让 TNT、黑索金等爆炸物和毒品等“危险分子”现形的工作原理，并介绍了其在公共安全、反恐禁毒等场景的应用前景。

作品展现了薄膜荧光传感器在中国高端传感器领域从 0 到 1 的突破及团队多年攻坚克难的历程，由刘太宏、罗艳彦、张荷兰三位老师指导，参演学生包括侯铭、田依平、王偌轩、胡若羽等，学校科技处全程组织协调。

全国科学实验展演汇演旨在以“科学 + 艺术”形式展示全国科普创作最新成果，是我国科普领域最高级别赛事之一。本届汇演以“奋进‘十五五’ 科技谱新篇”为主题，由科技日报主办，汇集全国 168 支队伍、700 余名选手参赛，参赛规模创历届新高。

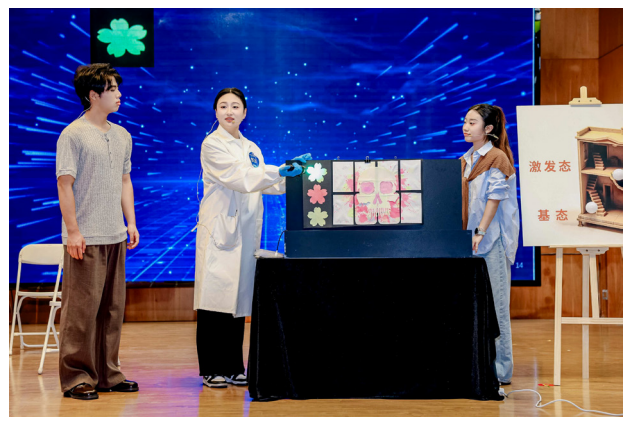
From October 12 to 15, 2026, at the 8th National Science Experiment Exhibition and Showcase held at the Optics Valley Campus of the Wuhan Botanical Garden of the Chinese Academy of Sciences, the Shaanxi Normal University delegation — composed primarily of faculty and students from the university’s Institute of New Concept Sensors and Molecular Materials — won the national second prize for their science experiment presentation titled “Leaving ‘Danger’ Nowhere to Hide”.

On the stage, their presentation used the scenario of “a suspicious object found on a bus” to bring years of research and development of Prof. Fang Yu’s group in the field of film fluorescent sensors to life. It vividly illustrated how these sensors work to detect “dangerous substances” such as TNT, RDX, and illicit drugs, and highlighted their potential applications in public safety, counterterrorism, and drug control.

The project showcases the breakthrough achieved in the development of film fluorescent sensors — from concept to reality — in China’s high-end sensor sector, as well as the team’s years-long journey of overcoming challenges. It was supervised by Prof. Liu Taihong, Ms. Luo Yanyan, and Ms. Zhang Helan, with participating students including Hou Ming, Tian Yiping, Wang Nuoxuan, and Hu Ruoyu. The university’s Office of Science and Technology provided full organizational and coordination support throughout the project.

The national science experiment competition aims to showcase the latest achievements in science popularization across the country through a “science plus art” format and is one of the highest-level competitions in China’s science popularization field. With the theme “Striving Forward in the 15th Five-Year Plan: Writing a New Chapter in Science and Technology”, this year’s event — organized by the Science and Technology Daily — brought together 168 teams and more than 700 participants from across the country, setting a new record for the number of participants in the competition’s history.





▷ 2026 年 10 月 16 至 18 日，房喻院士应邀出席了由中国科学院西安光学精密机械研究所、超快光科学与技术全国重点实验室主办的多模式兆伏（MeV）电子束科学设施战略研讨会。新概念传感器与分子材料研究院丁立平教授、刘太宏教授受邀参会，丁立平教授作题为“薄膜基荧光传感超快光物理过程及阿秒光源应用展望”的邀请报告。

▷ From October 16 to 18, 2026, Prof. Fang Yu attended the Strategic Symposium on the Multimode MeV Electron Beam Science Facility, hosted by the Xi’an Institute of Optics and Precision Mechanics of the Chinese Academy of Sciences and the State Key Laboratory of Ultrafast Optics Science and Technology. Professors Ding Liping and Liu Taihong from the Institute of New Concept Sensors and Molecular Materials attended the conference. Prof. Ding Liping presented an invited report titled “Ultrafast Optical Processes in Film-Based Fluorescence Sensing and Prospects for Attosecond Light Source Applications”.

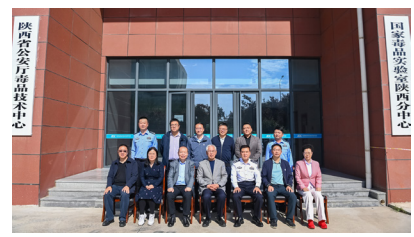
▷ 2026 年 10 月 11 日，房喻院士应邀出席了由西北工业大学化学与化工学院发起并主办的“第二届材料化学前沿论坛”，担任大会荣誉主席并主持大会报告。

▷ On October 11, 2026, Prof. Fang Yu attended the Second Forum on Frontiers in Materials Chemistry initiated and hosted by the School of Chemistry and Chemical Engineering at Northwestern Polytechnical University, where he served as one of the forum’s honorary chairs and presided over two plenary sessions.



▷ 2026 年 10 月 13 日上午，房喻院士作为国家毒品实验室陕西分中心学术委员会主任委员，出席并主持了陕西分中心第一届学术委员会第四次会议。丁立平教授作为陕西分中心学术委员会委员参加了会议。

▷ On October 13, 2026, Prof. Fang Yu, as chair of the Academic Committee of the National Anti-Drug Laboratory Shaanxi Regional Center, attended and presided over the fourth meeting of the first Academic Committee of the center. Prof. Ding Liping attended the meeting as a member of Shaanxi Regional Center’s Academic Committee.



▷ 2026 年 10 月 20 日，房喻院士在安康出席了第五届陕西省科协年会专项活动——院士专家与安康市领导干部座谈会并发言，对安康市产业升级与科技赋能提出具有前瞻性的意见建议。

▷ On October 20, 2026, Prof. Fang Yu attended and spoke at a symposium for academicians, experts, and leading officials of Ankang City — a special event held as part of the 5th Annual Conference of the Shaanxi Provincial Association for Science and Technology — in Ankang city, south Shaanxi province, offering forward-looking recommendations on industrial upgrading and technology-driven development in the city.



▷ 2026 年 10 月 22 日，刘凯强教授在重庆市参加了第六届中国复合材料科技大会，并作题为“极端环境中的高效界面黏附”的邀请报告。

▷ On October 22, 2026, Prof. Liu Kaiqiang attended the 6th China International Congress on Composite Materials in Chongqing, and presented an invited report titled “High-Efficiency Interface Adhesion in Extreme Environments”.



▷ 2026 年 10 月 24 日，房喻院士在陕西师范大学长安校区出席了第八届崇德学术论坛，并作题为“科学的价值与教育的作用”的主旨报告。

▷ On October 24, 2026, Prof. Fang Yu attended the 8th Chongde Academic Forum at Shaanxi Normal University’s Chang’an Campus and delivered a keynote speech titled “The Value of Science and the Role of Education”.



▷ 2026 年 10 月 22 至 25 日，房喻院士和丁立平教授参加了在天津召开的中国化学会第十三届有机固体电子过程暨华人有机光电功能材料学术研讨会。房喻院士主持了大会报告，丁立平教授作了题为“界面限域组装荧光纳米膜创制及 CBRN 传感性能研究”的邀请报告。





▷ From October 22 to 25, 2026, Prof. Fang Yu and Prof. Ding Liping attended Chinese Chemical Society’s 13th Symposium on Organic Solid-State Electronic Processes and the Academic Symposium on Chinese Organic Optoelectronic Functional Materials, held in Tianjin. Fang Yu chaired the plenary session, while Ding Liping presented an invited report titled “Development of Interface-Confined Assembled Fluorescent Nanomembranes and Study of Their CBRN Sensing Performance”.

▷ 2026 年 10 月 30 日，房喻院士在陕西师范大学长安校区出席了第三届丝路论坛，担任大会共同主席，并主持大会报告。刘凯强教授在新能源与氢能技术分会场作了题为“极端环境中的界面黏附”的邀请报告。丁立平教授担任“智能传感、‘双碳’战略与生态保护”分会场主持。





▷ On October 30, 2026, Prof. Fang Yu attended the Third Silk Road Forum at the Chang’an Campus of Shaanxi Normal University, where he served as co-chair of the conference and presided over the plenary session. Prof. Liu Kaiqiang from the Institute of New Concept Sensors and Molecular Materials presented an invited report titled “Interface Adhesion in Extreme Environments” at the “New Energy and Hydrogen Energy Technology” session. Prof. Ding Liping moderated the “Intelligent Sensing, Dual Carbon Strategy, and Ecological Conservation” session.

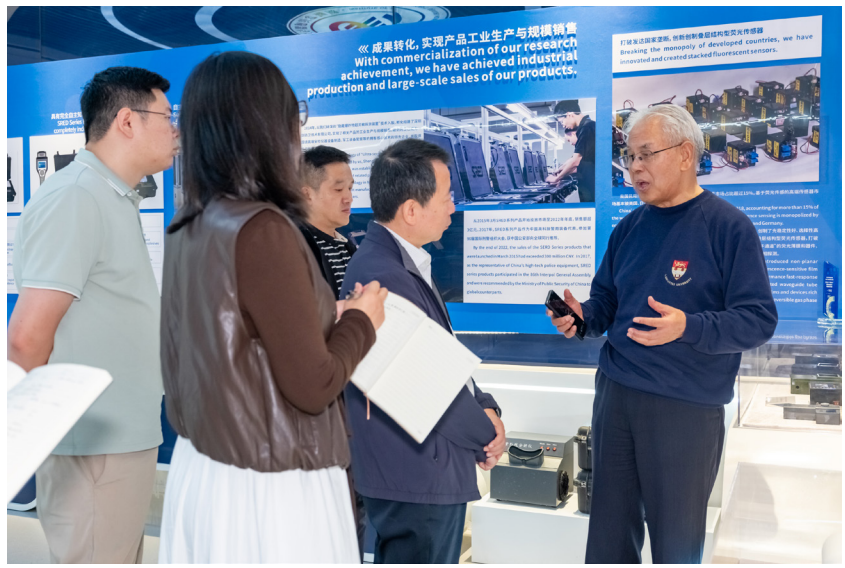
▷ 2026 年 10 月 31 日，房喻院士在西北工业大学长安校区出席了第四届太赫兹通信技术论坛暨电子信息学科发展研讨会，担任大会共主席，并在主论坛作题为“面向传感与未来技术的分子材料”的报告。

▷ On October 31, 2026, Prof. Fang Yu attended the Fourth Terahertz Communication Technology Forum and Seminar on the Development of Electronic Information Discipline at the Chang’an Campus of Northwestern Polytechnical University, where he served as co-chair of the conference and delivered a report titled “Molecular Materials for Sensing and Future Technologies” at the main forum.



彩虹显示器件股份有限公司一行来访

Caihong Display Devices visitors received



2026 年 10 月 8 日，彩虹显示器件股份有限公司徐剑总经理一行到访陕西师范大学新概念传感器与分子材料研究院，参观了研究院展厅，并与房喻院士座谈交流。

彩虹股份总经理助理侯宏荣、高级工程师曾召，秦创原（咸阳）创新促进中心有限公司副主任习斌、主任助理王维，研究院副院长杨小刚陪同参观并参加座谈交流。

On October 8, 2026, a delegation led by Xu Jian, general manager of Caihong Display Devices Co., Ltd., visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, toured the institute's exhibition room, and held a discussion with Prof. Fang Yu.

Caihong Display Devices GM assistant Hou Hongrong and senior engineer Zeng Zhao; Qinchuangyuan (Xianyang) Innovation Promotion Center deputy director Xi Bin and director's assistant Wang Wei; as well as INCSMM vice dean Yang Xiaogang, accompanied the tour and participated in the discussion.

先进技术成果西安转化中心一行来访

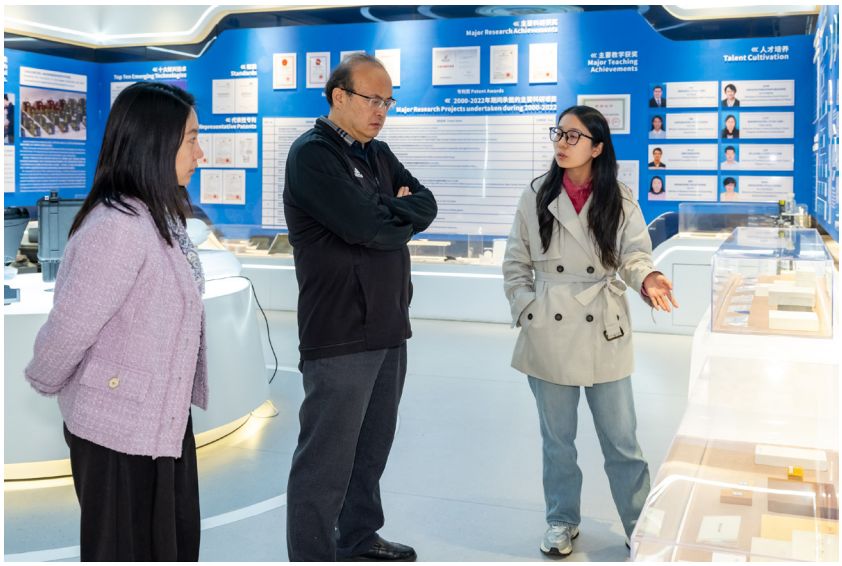
Xi'an Center for Commercialization of Advanced Technology Achievements visitors received

2026 年 10 月 28 日，先进技术成果西安转化中心党总支书记、负责人张建奇一行到访新概念传感器与分子材料研究院。

研究院副院长杨小刚、研发工程师何怡楠带领张建奇一行参观了研究院展厅，介绍了研究院科技成果转化布局及高性能介电材料的技术优势与应用前景，张维奇一行介绍了中心在成果交易、中试验证和政企对接方面的职能。双方还围绕项目孵化路径、中试资源共享及后续合作机制进行了探讨交流。

On October 28, 2026, Xi'an Center for the Commercialization of Advanced Technology Achievements director Zhang Jianqi visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University.

INCSMM vice dean Mr. Yang Xiaogang and R&D Engineer Ms



He Yinan led Zhang Jianqi on a tour of the institute's exhibition room, introducing the institute's strategy for the commercialization of S&T achievements, as well as the technical advantages and application prospects of high-performance dielectric materials. Zhang Jianqi outlined the center's functions in technology transfer, pilot-scale verification, and government-enterprise collaboration. The two sides also engaged in discussions regarding project incubation pathways, the sharing of pilot-scale resources, and mechanisms for future cooperation.

陕西鼎澈膜科技有限公司一行来访

Shaanxi UltraClean Membrane Technology visitors received

2026 年 10 月 29 日，陕西鼎澈膜科技有限公司总经理兼技术负责人朱加生一行到访陕西师范大学新概念传感器与分子材料研究院。

研究院副院长杨小刚、彭军霞教授、研发工程师王佩，及西安方格分子材料科技有限公司总经理韩鹏陪同接待，并带领来访团队参观研究院成果展厅，介绍了研究院科技成果转化整体布局、高性能膜材料核心技术优势与产业化应用前景。朱加生介绍了陕西鼎澈在反渗透膜、纳滤膜及特种功能膜领域的研发、生产制造与市场拓展情况。双方围绕高端膜材料开发、市场资源协同共享以及合作机制搭建等议题开展交流研讨。



On October 29, 2026, Zhu Jiasheng, general manager and chief technical officer of Shaanxi UltraClean Membrane Technology Co., Ltd., and his colleagues visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University.

INCSMM vice dean Mr. Yang Xiaogang, Prof. Peng Junxia, R&D Engineer Ms Wang Pei and Xi'an Fonge Molecular Materials Technology Co., Ltd. general manager Han Peng, hosted the visitors. They led them on a tour of the institute's exhibition room and introduced the institute's overall strategy for the commercialization of S&T achievements, as well as the core technological advantages and industrial application prospects of high-performance membrane materials. Zhu Jiasheng briefed about Shaanxi UltraClean's research and development, manufacturing, and market expansion efforts in the fields of reverse osmosis membranes, nanofiltration membranes, and specialty functional membranes. The two sides engaged in discussions and exchanges on topics including the development of high-end membrane materials, the collaborative sharing of market resources, and the establishment of cooperative mechanisms.

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RESEARCH ARTICLE

Visible Light-Induced [2 + 2]-Cycloaddition and Photo-Ene Reactions: Spin-Dependent Catalysis and Quantum Tunneling Effects

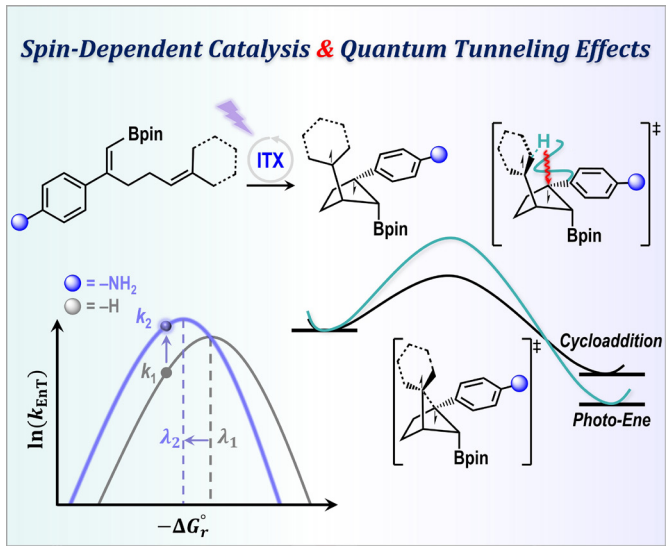
Xiao-Ya Dou[1] | Yi-Ran Jiang[1] | Le-Jie Liu[1] | Ling-Ya Peng[1] | Ganglong Cui[2,3] | Yu Fang[1]

[1]Key Laboratory of Applied Surface and Colloid Chemistry, Ministry of Education; Shaanxi Provincial Key Laboratory of New Concept Sensors and Molecular Materials, School of Chemistry and Chemical Engineering, Shaanxi Normal University, Xi'an, China | [2]Key Laboratory of Theoretical and Computational Photochemistry, Ministry of Education, College of Chemistry, Beijing Normal University, Beijing, China | [3]Hefei National Laboratory, Hefei, China

Correspondence: Ling-Ya Peng (lingya.peng@snnu.edu.cn) | Ganglong Cui (ganglong.cui@bnu.edu.cn)

可见光诱导的 [2 + 2] 环加成与光烯反应：自旋选择性催化与量子隧穿效应

Xiao-Ya Dou, Yi-Ran Jiang, Le-Jie Liu, Ling-Ya Peng*, Ganglong Cui*, and Yu Fang. Angew. Chem. Int. Ed. 2026, e6897356. https://onlinelibrary.wiley.com/doi/epdf/10.1002/anie.6897356



电子自旋在光化学研究中扮演着至关重要的角色，精准调控自旋有望提升催化性能。然而，自旋电子态与催化活性之间的构效关系仍不明确，尤其在能量转移（EnT）光催化的环加成与光烯反应中。为阐明这一重要关系，本文结合 Marcus 理论与从头算方法，深入解析了光敏化剂异丙基硫杂蒽酮（ITX）与底物 1，5– 二烯衍生物的 EnT 过程并阐明了其化学选择性。首先，ITX 在受到光激发后，会发生从 $^1\pi\,\pi^* \rightarrow {}^3n\,\pi^* \rightarrow {}^3\pi\,\pi^*$ 非绝热跃迁，最终布居至长寿命的 $^3\pi\,\pi^*$ 态。当底物存在时，ITX 自身的失活通道被抑制，优先与底物发生能量转移，

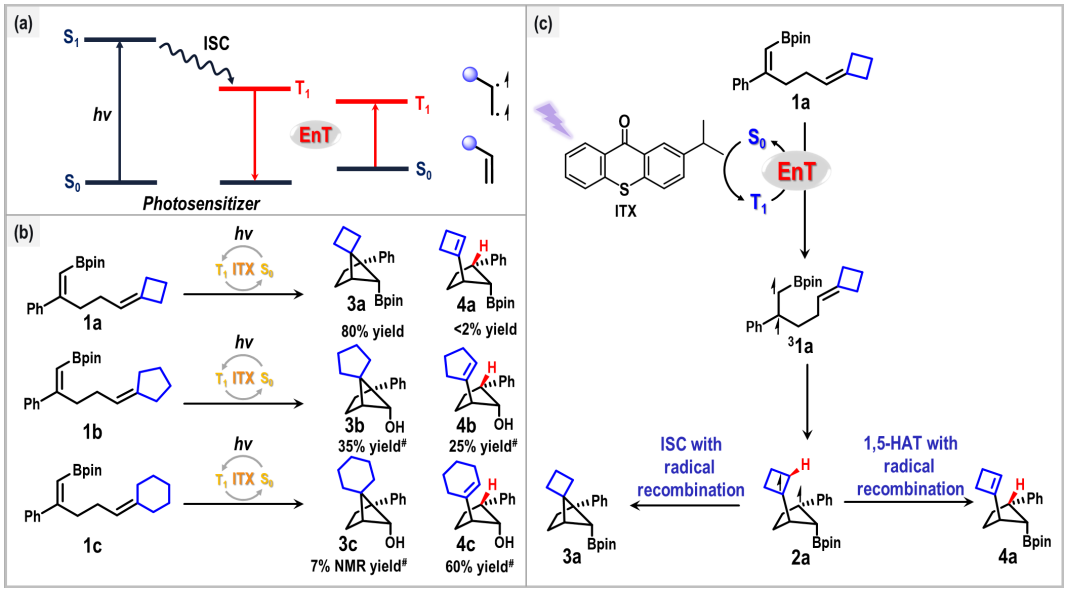


图 1. 研究背景
Figure 1. Research Background

实现底物分子的三重态布居。随后，三重态的 1,5– 二烯发生 5–exo–trig 自由基环化反应，经系间窜跃过程到达开壳层单重态，生成双环 [2.1.1] 己烷或环戊烷产物。值得注意的是，光环加成与光烯反应均表现出自旋选择性，反应优先发生在开壳层单重态。此外，量子隧穿效应在光烯反应中起决定性作用。基于 Marcus 理论，我们进一步对非绝热过程及反应机理进行了精准调控。在底物上引入了 $-NH_2$ 等给电子基以降低 EnT 过程的重组能，提升 EnT 速率，同时也增强了光环加成反应的化学选择性。

本研究系统阐明了光环加成与光烯反应的机理，基于 Marcus 理论建立了 EnT 过程及自旋选择性反应路径的理论调控策略，为后续新型高选择性光催化反应的实验设计与体系优化提供了重要的理论支撑与研究思路。

第一作者：陕西师范大学硕士研究生窦小雅
通讯作者：陕西师范大学彭灵雅博士、北京师范大学崔刚龙教授
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Electron spin refers to the intrinsic angular momentum property of electron, which underpins the electron transfer and molecular interactions in photochemistry. The precise manipulation of electron spin can enhance catalytic performance. However, the correlation between spin states and catalytic activity is still elusive, especially in the energy transfer (EnT)-catalyzed photocycloaddition and photo-ene reactions. Here, we rationalize the EnT process and clarify the chemoselectivity encompassing Marcus theory and ab initio methods. The initial photophysical process of photocatalyst isopropylthioxanthone (ITX) involves a nonadiabatic transition of $^1\pi\pi^* \rightarrow {}^3n\pi^* \rightarrow {}^3\pi\pi^*$ upon excitation, populating the long-lived $^3\pi\pi^*$ state. In the presence of 1,5-dienes, the intrinsic deactivation pathway of photocatalyst ITX does not suppress the intermolecular spin-allowed EnT process with substrates, and this process is accompanied by spin multiplicity transfer within the Marcus normal region. The triplet-state 1,5-diene preferentially undergoes 5-exo-trig radical cyclization, followed by intersystem crossing to the open-shell singlet state, where the reaction branches to yield bicyclo[2.1.1]hexanes or cyclopentanes. It should be noted that both the photocycloaddition and photo-ene reactions exhibit spin selectivity, whereas the chemoselectivity is governed in the open-shell singlet state. Furthermore, quantum mechanical tunneling effects play a decisive role in promoting the photo-ene reaction and reshaping the reaction pathways. Guided by Marcus theory, spin-dependent catalysis can be further regulated through amino-group substitution, which not only elevates the EnT efficiency but also enhances the photocycloaddition chemoselectivity.

Our work not only clarifies the observed selectivity and the spin-activity correlation, but also establishes a general strategy to theoretically modulate both the EnT process and the ensuing spin-dependent reaction pathway under the guidance of Marcus theory.

First Author: Dou Xiaoya, master's student, Shaanxi Normal University
Correspondence Authors: Dr. Peng Lingya, Shaanxi Normal University; Prof. Cui Ganglong, Beijing Normal University
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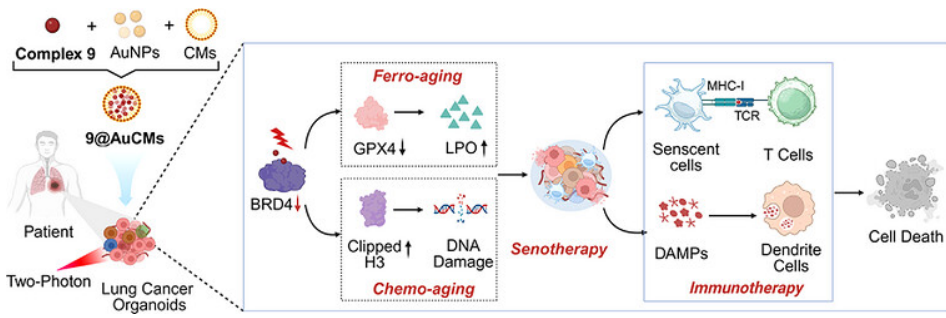
RESEARCH ARTICLE

Iterative Optimization of Photoactivatable BRD4 Degraders for Aging-Amplified Immunotherapy in Patient-Derived Lung Cancer Organoids

Jinrong Yang[1] | Fa Wang[1] | Shufei Li[2] | Kai Xiong[3] | Taihong Liu[2] | Yu Chen[1] | Hui Chao[4,5]

迭代优化的光激活 BRD4 降解剂用于人源肺癌类器官的衰老增强免疫治疗

Jinrong Yang, Fa Wang, Shufei Li, Kai Xiong, Taihong Liu*, Yu Chen*, Hui Chao*. Angew. Chem. Int. Ed. 2026, e2645239. https:// doi.org/10.1002/anie.2645239



癌症是全球重大的健康威胁之一，严重影响人类的身体健康、国民经济和社会发展。靶向蛋白质降解技术（TPD）已彻底改变了治疗开发中蛋白质功能的调控方式。然而，当前TPD分子的设计仍面临挑战，其往往缺乏体内应用所需的空间和时间精确性。在此，我们报道了一种光激活靶向降解（PATD）策略，并阐述和验证了化合物9的迭代优化过程。化合物9是首个双光子激发的BRD4光降解剂，包含光敏剂核心、辅助配体和连接子的分子工程。值得注意的是，BRD4降解可下调GPX4转录，促进脂质过氧化，从而诱导铁衰老（ferro-aging），同时通过组蛋白H3切割触发化学衰老（chemo-aging），导致DNA损伤和细胞周期阻滞。这种双重衰老机制加速肿瘤细胞衰老，从而实现协同衰老免疫治疗。与仅引发免疫原性细胞死亡（ICD）的传统光敏剂不同，化合物9将衰老驱动的免疫与ICD介导的抗肿瘤免疫整合起来。这种联合免疫刺激策略可引发强效的全身抗肿瘤反应，并在患者来源的类器官（PDOs）中实现增强的治疗效果，为耐药肿瘤的精准靶向蛋白质降解提供了新范式。

第一作者：中山大学博士研究生杨金荣
通讯作者：陕西师范大学刘太宏教授、中山大学陈禹教授、暨南大学和湖南科技大学巢晖教授

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Cancer remains a major global health threat. Targeted protein degradation (TPD) has revolutionized the modulation of protein function in therapeutic development. Nevertheless, the design of current TPD agents continues to face

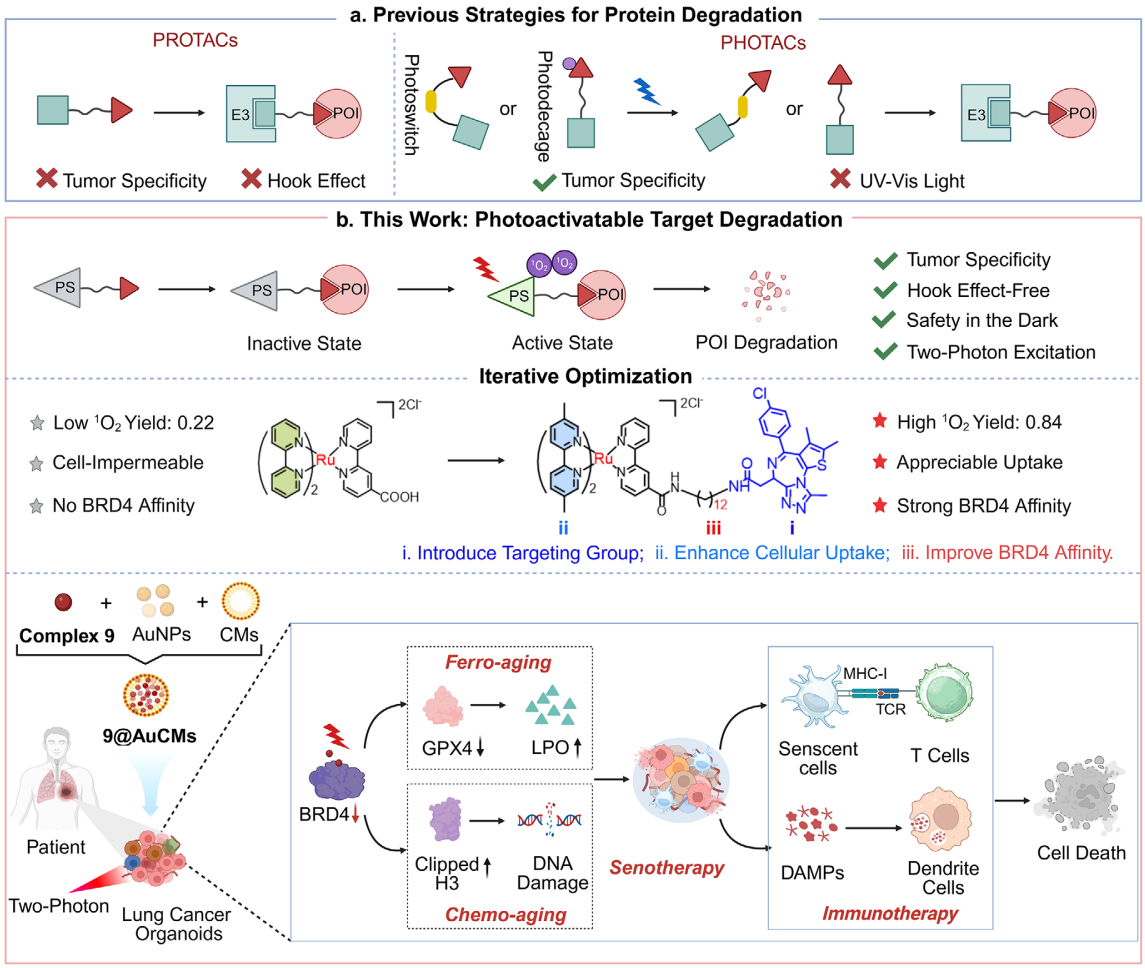


图 1. (a) 此前报道的蛋白降解靶向嵌合体 PROTACs 与光激活蛋白降解靶向嵌合体 PHOTACs。(b) 光激活 BRD4 降解剂的迭代优化，以及 9@AuCMs 用于光激活衰老增强免疫治疗的机制示意图。

Figure 1. (a) Previously reported PROTACs and PHOTACs. (b) Iterative optimization of the BRD4 photoactivatable degrader and schematic illustration of the mechanism of 9@AuCMs for photoactivatable aging-amplified immunotherapy.

challenges, including hook effects and, more critically, the frequent lack of spatial and temporal precision required for in vivo applications. Herein, we report a photoactivatable targeted degradation (PATD) strategy and describe the iterative optimization of compound 9, the first twophoton-excited BRD4 photodegrader, achieved through molecular engineering of the photosensitizer core, auxiliary ligands, and linkers. Notably, BRD4 degradation downregulates GPX4 transcription, promoting lipid peroxidation and thereby inducing ferroaging, while simultaneously triggering chemo-aging via histone H3 cleavage, which leads to DNA damage and cell cycle arrest. This dual-aging mechanism accelerates tumor cell senescence, enabling synergistic seno-immunotherapy. Beyond conventional photosensitizers that primarily elicit immunogenic cell death (ICD) alone, complex 9 integrates senescence-driven immunity with ICD-mediated antitumor immunity. This combined immunostimulatory strategy elicits robust systemic antitumor responses and achieves amplified therapeutic efficacy in patient-derived organoids (PDOs), presenting a new paradigm for precision targeted protein degradation in therapy-resistant tumors.

First Author: Yang Jinrong, doctoral candidate, Sun Yat-Sen University
Correspondence Authors: Prof. Liu Taihong, Shaanxi Normal University; Prof. Chen Yu, Sun Yat-Sen University; Prof. Chao Hui, Jinan University and Hunan University of Science and Technology
Full Text Link: https://doi.org/10.1002/anie.2645239

ADVANCED FUNCTIONAL MATERIALS

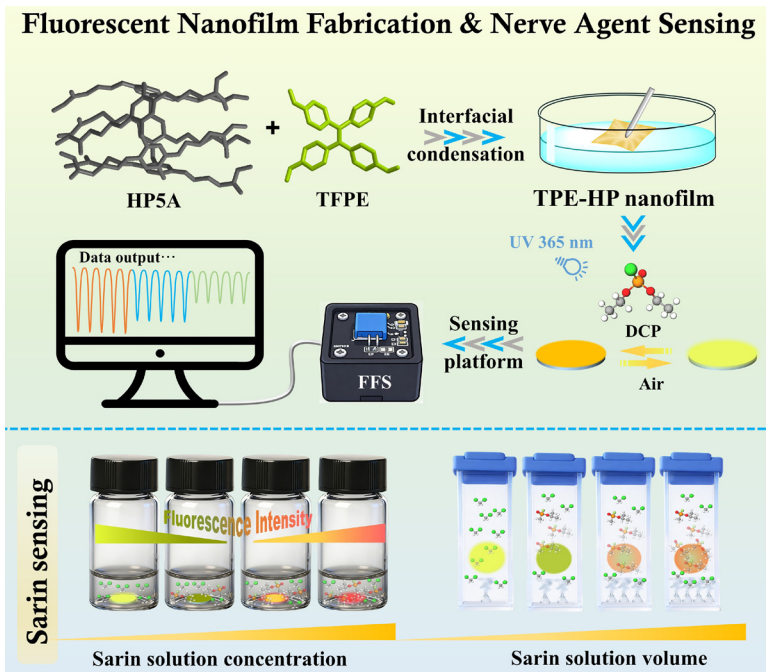
RESEARCH ARTICLE | Full Access

Robust Fluorescent Nanofilm Toward High-Performance Detection of Nerve Agent Simulant Diethyl Chlorophosphate and Sarin

Yong Chen, Min Qiao, Zhen Yan, Molin Qin, Haonan Peng, Ruijuan Wen, Jinglin Kong, Taihong Liu ✉, Liping Ding ✉, Yu Fang

强韧性荧光纳米薄膜用于神经毒剂模拟物氯磷酸二乙酯与沙林的高性能检测

Yong Chen, Min Qiao, Zhen Yan, Molin Qin, Haonan Peng, Ruijuan Wen, Jinglin Kong, Taihong Liu*, Liping Ding*, and Yu Fang. Adv. Funct. Mater. 2026, e78542. https://doi.org/10.1002/adfm.78542



将智能检测功能集成到力学韧性薄膜中，是发展高性能柔性传感器的关键，微型化便携式传感设备在其中发挥着不可或缺的作用。化学战剂中的有机磷神经毒剂对公共安全构成严重威胁，便携式现场检测装置的需求日益迫切。

本研究通过气液界面动态缩合策略，将酰肼功能化柱[5]芳烃（HP5A）与聚集诱导发光单元（TFPE）结合，制备了 TPE–HP 纳米薄膜。该薄膜表面平整、厚度可调（457–746 nm），具有自支撑、高抗穿刺与循环抗疲劳等力学性能。最大抗穿刺强度达 0.60 kN mm^{-1}，连续 50 次加载 – 卸载循环

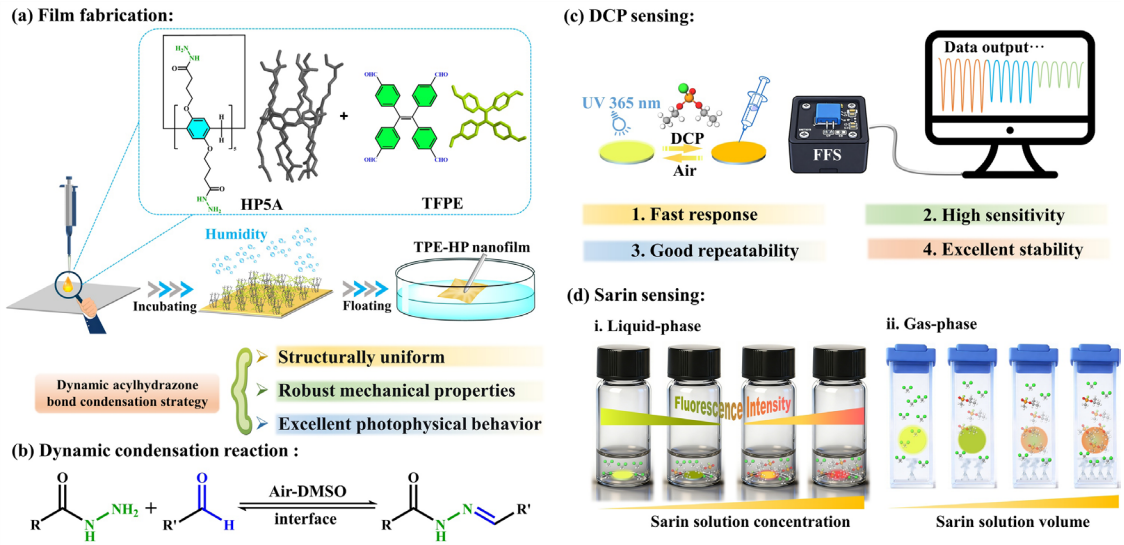


图 1. TPE−HP 纳米薄膜的制备及对氯磷酸二乙酯（DCP）和沙林的传感检测示意图

Figure 1. Schematic illustration of TPE-HP nanofilm fabrication and the sensing performance toward diethyl chlorophosphate (DCP) and sarin

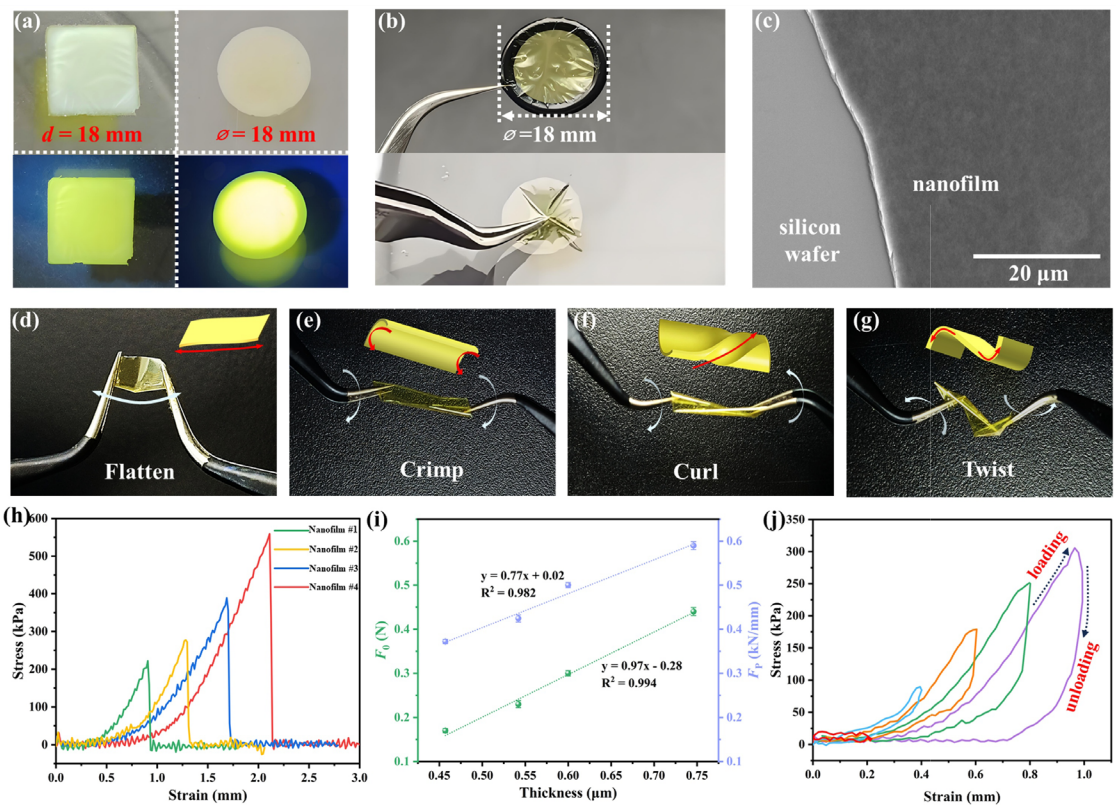


图 2. (a) 方形与圆形 TPE−HP 纳米薄膜在日光及 365 nm 紫外灯下的照片；(b) 纳米薄膜自支撑于橡胶环上及被尖锐物戳刺的照片；(c) 纳米薄膜的 SEM 图像；TPE−HP 纳米薄膜在 (d) 展平、(e) 卷曲、(f) 卷绕及 (g) 扭转状态下的光学照片；(h) 不同厚度纳米薄膜的应力 − 应变曲线。(h) 穿刺阻力与穿刺强度随纳米薄膜厚度的线性关系。(i) 循环加载 − 卸载的应力 − 应变扫描曲线及不同应变下的相应应力变化。

Figure 2. (a) Photographs of the TPE-HP nanofilms with the square and circular shapes under daylight and a 365 nm UV lamp. (b) Optical photos of the nanofilm self-standing on a rubber ring, and the nanofilm poked with a sharp object. (c) SEM image of the nanofilms on a silicon wafer. Optical photographs of the TPE-HP nanofilm in the flattening (d), crimping (e), curling (f), and twisting (g) states. (h) Stress-strain curves for nanofilms with varying thicknesses. (i) Linear relationships of both puncture resistance and puncture resistance strength as a function of nanofilm thickness. (j) Cyclic loading-unloading stress-strain scan curves and corresponding stress changes under different strains.

表现出抗疲劳性能。薄膜光致发光量子产率为 29.7%，在 365 nm 紫外光下发射黄绿色荧光。以该薄膜为传感单元，构建了叠层式便携传感平台，对神经毒剂模拟物氯磷酸二乙酯（DCP）实现快速、可逆、超灵敏检测，检测限低至 0.132 ppt，100 次循环响应保持稳定，双盲现场测试验证了可靠性。传感机制归因于 DCP 亲电磷原子进攻酰腙结构形成磷酸化中间体，随后发生质子化，伴随荧光红移与猝灭。该薄膜进一步用于真实神经毒剂沙林的检测，溶液相与气相的实用检测限分别为 1.0 mM 与 40.0 μg cm^{-3}，并通过 RGB 分析实现可视化监测。本研究不仅将高性能荧光检测功能结合到韧性纳米薄膜中，还实现了面向有机磷神经毒剂的现场可部署传感原型。

第一作者：陕西师范大学博士研究生陈永
通讯作者：陕西师范大学丁立平教授、刘太宏教授
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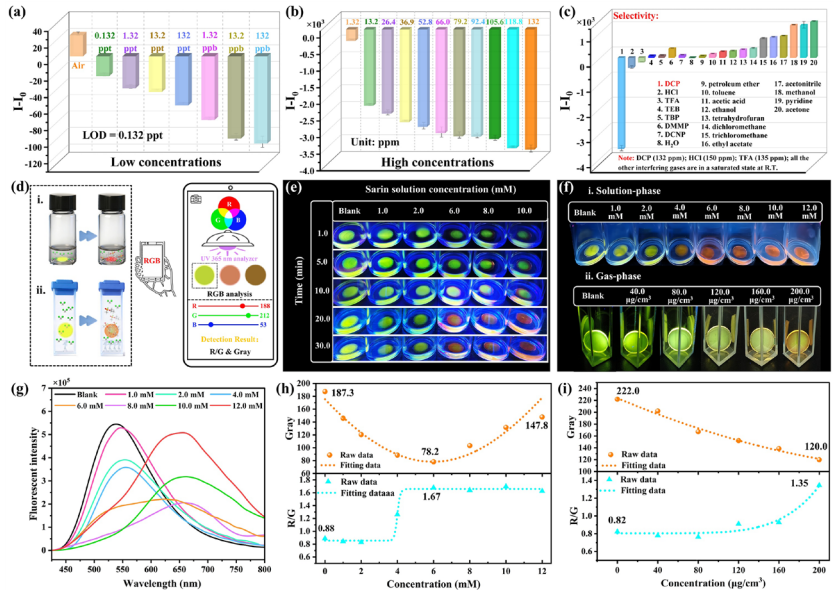


图 3. (a–b) TPE–HP 纳米薄膜对不同浓度 DCP 蒸气 (0–132 ppm) 的荧光响应；(b) 选择性评价，纳米薄膜对 DCP 蒸气 (c ~132 ppm) 与潜在干扰物的荧光响应对比；(d) 颜色与 RGB 变化的示意图分析；(e) TPE–HP 纳米薄膜在紫外光下暴露于溶液相沙林时的时间依赖性荧光变化；(f) 纳米薄膜对溶液相 (i) 与气相 (ii) 沙林的浓度依赖性荧光响应；(g) 纳米薄膜暴露于溶液相沙林时的相应荧光光谱变化；溶液相 (h) 与气相 (i) 沙林暴露下由可视化照片提取的灰度与 R/G 值（分别对应 f–i 与 f–ii）。
Figure 3. (a-b) Fluorescence responses of the TPE-HP nanofilm to varying DCP vapor concentrations (0-132 ppm). (c) Selectivity evaluation: fluorescence response of the nanofilm to DCP (c ~132 ppm) versus potential interferents. (d) Schematic analysis of the color and RGB changes. (e) Time-dependent fluorescence changes of the TPE-HP nanofilms under UV light upon exposure to Sarin in the solution phase. (f) Concentration-dependent fluorescence response of the nanofilm to Sarin in solution (i) and gas (ii) phase. Gray value and R/G ratio extracted from visualization photographs upon solution-phase (h) and gas-phase (i) Sarin exposure (corresponding to f-i and f-ii, respectively).

Integrating smart detection functionality into mechanically robust films is essential for developing high-performance flexible sensors, in which miniaturized and portable sensing devices play an indispensable role. Organophosphorus nerve agents among chemical warfare agents pose severe risks to public safety, and the demand for portable on-site detection devices is increasingly urgent.

In this work, a TPE-HP nanofilm was fabricated via a dynamic condensation strategy at the air-liquid interface, by integrating a hydrazide-functionalized pillar[5]arene (HP5A) with an aggregation-induced emission building block (TFPE). The nanofilm exhibits a smooth surface, a tunable thickness (457-746 nm), and favorable mechanical properties including self-standing, high puncture resistance, and cyclic fatigue resistance. The maximum puncture resistance strength reaches 0.60 kN mm-1, and anti-fatigue performance is maintained over 50 consecutive loading-unloading cycles. The nanofilm exhibits a photoluminescence quantum yield of 29.7% and emits yellow-green fluorescence under 365 nm UV illumination. Using the nanofilm as the sensing unit, a laminated and portable sensing platform was constructed, enabling rapid, reversible, and ultra-sensitive detection of the nerve agent simulant diethyl chlorophosphate (DCP), with a limit of detection of 0.132 ppt. The response remains stable over 100 cycles, and reliability was verified by double-blind field tests. The sensing mechanism is attributed to the attack of the electrophilic phosphorus atom in DCP on the acylhydrazone structure, forming a phosphorylated intermediate, followed by protonation, accompanied by fluorescence red-shift and quenching. The nanofilm was further applied to the detection of the real nerve agent sarin, achieving practical detection limits of 1.0 mM in the solution-phase and 40.0 μg cm-3 in the gas-phase, with visual monitoring realized via RGB analysis. This work not only combines high-performance fluorescence detection functionality into a robust nanofilm, but also achieves a field-deployable sensing prototype toward organophosphorus nerve agents.

First Author: Chen Yong, doctoral candidate, Shaanxi Normal University
Correspondence Authors: Prof. Ding Liping and Prof. Liu Taihong, Shaanxi Normal University
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THE JOURNAL OF PHYSICAL CHEMISTRY B
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Topological Engineering of Perylene Diimide-Based Metallacycles through Multicomponent Self-Assembly for Fluorescence Sensing of Picric Acid

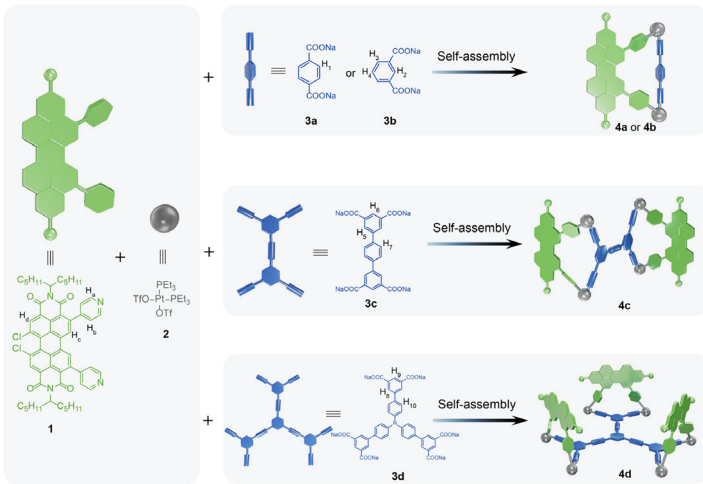
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Yingjie Li, Yali Hou, Shijin Jian, Haonan Peng,* Zhaohui Wang,* and Mingming Zhang*

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基于多组分自组装的苝二酰亚胺金属大环拓扑工程及其苦味酸荧光传感性能研究

Yingjie Li, Yali Hou, Shijin Jian, Haonan Peng*, Zhaohui Wang*, and Mingming Zhang*. J. Phys. Chem. B 2026, 130, 10609-10618. DOI: 10.1021/acs.jpcb.6c04747



配位驱动自组装是构筑结构明确、拓扑可控超分子配合物的有力策略。其中，离散金属环（metallacycles）因拓扑、空腔与骨架几何可经配体设计程序化调控，在主客体化学、分子识别与光电子学等领域前景广阔。将荧光发色团引入金属环骨架，可实现结构精确性与光物理功能的融合。苝二酰亚胺（PDI）发光优异、光稳定性高，基于PDI的金属环在荧光传感——尤其针对苦味酸（PA）等缺电子硝基芳烃类爆炸物的检测——潜力显著。相较于简单单环体系，含多重空腔或稠合拓扑的复杂金属环有望提供增强刚性、更高局部电荷密度与协同多价作用位点，从而提升识别与传感性能。然而，通过多组分自组装构筑拓扑复杂度逐级递增的同源荧光金属环仍鲜有探索。

本文以双吡啶功能化苝二酰亚胺（PDI）为荧光基元、*cis*-$Pt(PEt_3)_2(OTf)_2$为金属受体，仅改变辅助羧酸配体的几何与连接度，可控构筑了单环4a、4b，双环4c与三环4d的同源系列，并经NMR、ESI-MS与单晶X射线衍射确证：4a、4b呈梯形（上下底0.57/0.58与1.12/1.09 nm），4c

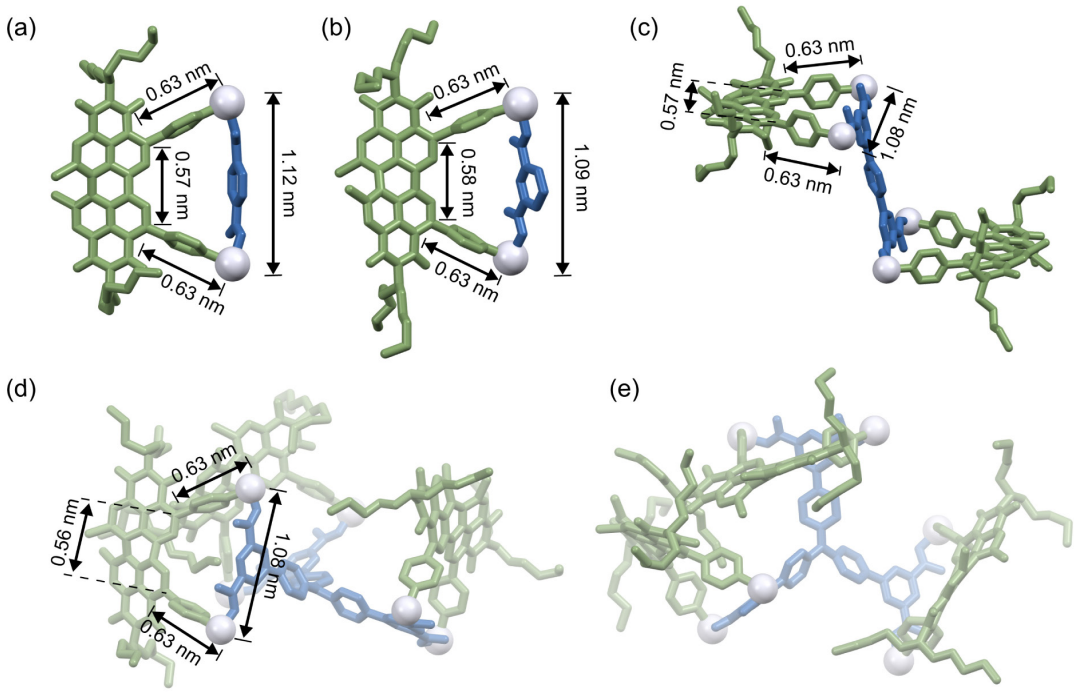


图 1. PDI 基金属环 4a–4d 的单晶结构

Figure 1. Single-crystal structures of PDI-based metallacycles 4a–4d

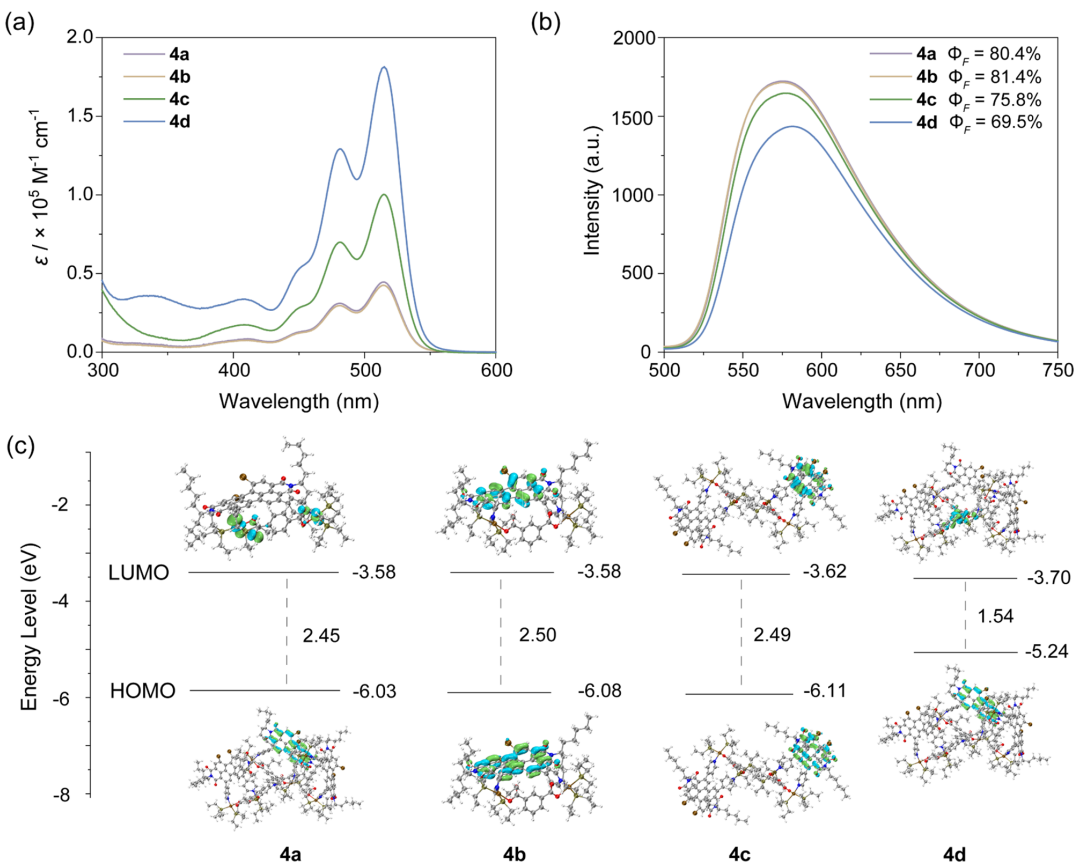


图 2. 金属环的吸收 / 发射光谱及前线分子轨道计算

Figure 2. Absorption and emission spectra and frontier molecular orbital calculations of the metallacycles

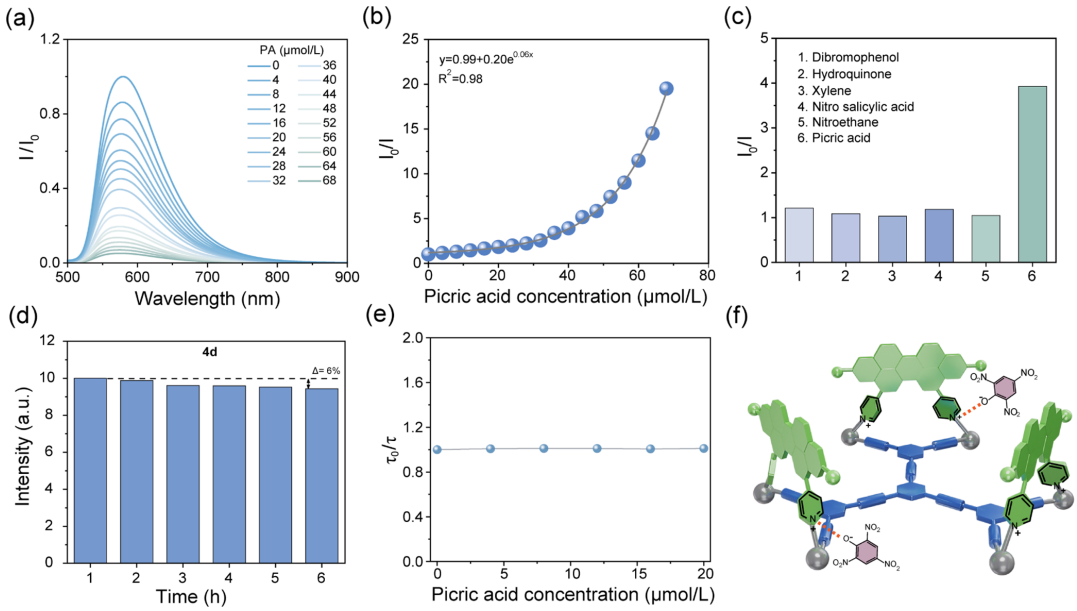


图 3. 金属环 4d 的苦味酸荧光传感响应与机理研究

Figure 3. Fluorescence sensing response of metallacycle 4d toward picric acid and investigation of the sensing mechanism

为蝴蝶结形，4d 因配体中三个间苯二甲酸酯单元非共面（与 PDI 平面二面角近 90° ）而呈三维结构，三个 PDI 面板围出扭曲、部分封闭的不规则空腔。四者均保持 PDI 中心吸收与发射（发射峰近 580 nm），量子产率分别为 80.4%、81.4%、75.8%、69.5%，其中 4d 呈现 HOMO 定域于三苯胺连接体、LUMO 定域于 PDI 的给－受体分离，并可经光致电子转移通道影响发光。用于苦味酸传感时，四者均表现出 turn-off 响应且性能呈拓扑依赖，检出限分别为 4.1、5.2、3.2、2.3 μmol/L，三环 4d 最优，兼具良好选择性与光稳定性，猝灭机理为静态淬灭。

本文发展了模块化多组分配位驱动自组装策略，仅改变辅助羧酸配体的几何与连接度，即可控构筑出拓扑复杂度逐级递增的 PDI 基 Pt(II) 金属环同源系列（单环、双环、三环），并保留了 PDI 的特征光物理性质。该拓扑工程可有效调控离散配位组装体的电子性质与传感性能，为功能超分子荧光材料的发展提供新机遇。

第一作者：陕西师范大学博士研究生李英杰
通讯作者：陕西师范大学彭浩南教授，西安交通大学张明明教授，清华大学王朝晖教授
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Coordination-driven self-assembly has emerged as a powerful strategy for the construction of discrete supramolecular coordination complexes with well-defined geometries and topologies. Perylene diimide (PDI) derivatives are especially attractive fluorescent building blocks; accordingly, PDI-based metallacycles have shown significant potential in fluorescence sensing, particularly for picric acid (PA). However, the systematic construction of homologous fluorescent metallacycles with progressively increasing topological complexity through multicomponent self-assembly remains largely underexplored.

Herein, by simply varying the geometry and connectivity of auxiliary carboxylate ligands, discrete monocyclic, bicyclic, and tricyclic PDI metallacycles were controllably assembled and confirmed by NMR, ESI-MS, and single-crystal X-ray diffraction. 4d adopts a three-dimensional tricyclic architecture with a distorted, partially enclosed cavity. All four remain highly emissive, and 4d displays a pronounced donor–acceptor electronic structure. PA induced progressive quenching with topology-dependent LODs of 4.1, 5.2, 3.2, and 2.3 μmol/L; 4d shows the highest sensitivity via a static association-assisted quenching mechanism.

In summary, topological engineering through multicomponent heteroleptic self-assembly provides an effective strategy for tuning the electronic properties and sensing performance of discrete coordination architectures.

First Author: Li Yingjie, doctoral candidate, Shaanxi Normal University
Correspondence Authors: Prof. Peng Haonan, Shaanxi Normal University; Prof. Zhang Mingming, Xi'an Jiaotong University; Prof. Wang Zhaohui, Tsinghua University
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ADVANCED OPTICAL MATERIALS

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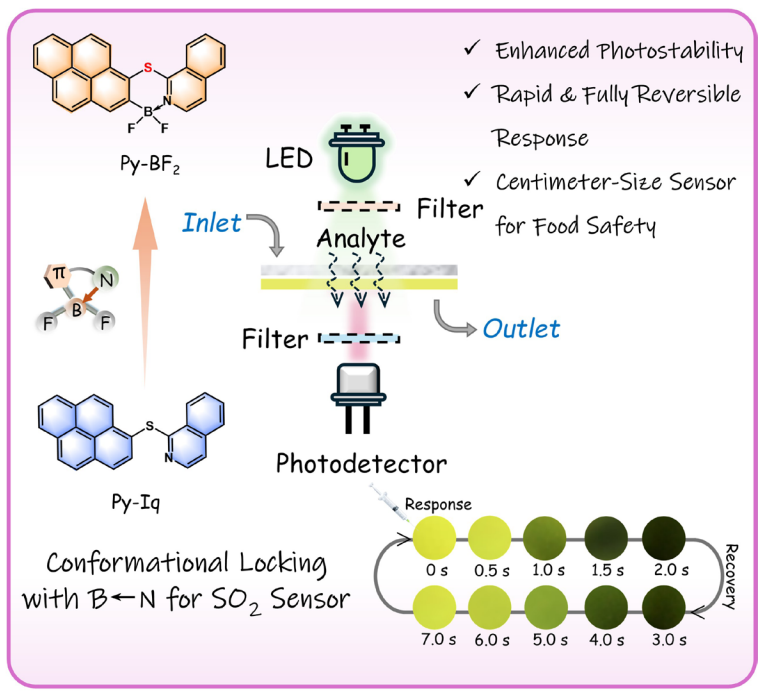
Conformational Locking With Built-in Recognition: A Generalizable Strategy for Reversible SO_2 Detection

Leyi Lü, Dingfang Hu, Zhouyu Chen, Jiancheng Zhou, Ruijuan Wen, Ling-Ya Peng ✉, Rongrong Huang ✉, Xiaogang Liu, Yu Fang ✉

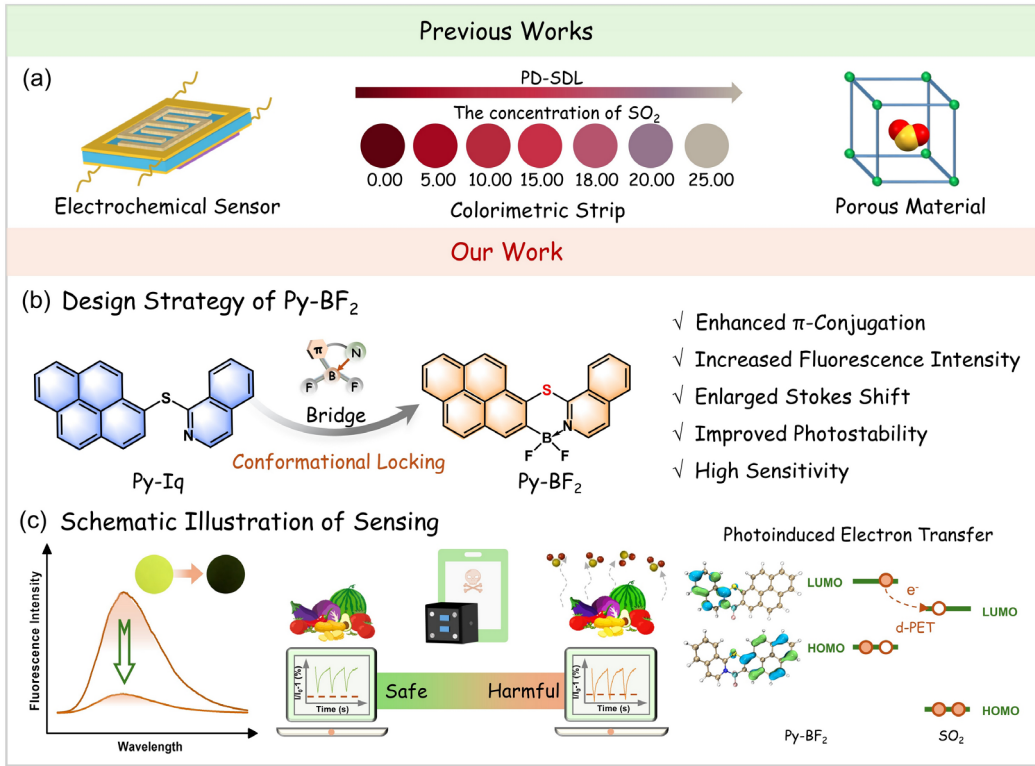
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构象锁定与内置识别：一种用于可逆 SO_2 检测的通用策略

Leyi Lü, Dingfang Hu, Zhouyu Chen, Jiancheng Zhou, Ruijuan Wen, Ling-Ya Peng*, Rongrong Huang*, Xiaogang Liu, Yu Fang*. Adv. Optical Mater. 2026, DOI: https://doi.org/10.1002/adom.71909



荧光传感器要同时实现超快响应与高可逆性仍面临着巨大挑战，因为这两项性能指标通常存在相互制约的关系。在本研究中，我们提出了一种将内置识别功能与构象锁定相结合的设计策略，并通过四配位硼桥联荧光团 Py–BF_2 实现了这一设计。在该分子结构中，B ← N 路易斯酸碱配位作用不仅能够刚性化分子骨架，还能扩展 π 共轭体系，从而构建有利于形成显著分子内电荷转移（ICT）态的电子结构，使其相较于未锁定的对照分子表现出显著增大的斯托克斯位移。这种一体化分子结构不仅提高了荧光效率，还充分利用 ICT 态实现了对 SO_2 的灵



敏检测。

基于该分子构建的薄膜传感器响应时间小于 2 s，检测限低至 1 ppm，并表现出优异的循环稳定性，在超过 100 次循环测试后仍未出现明显的性能衰减，从而有效突破了传统传感体系中响应速度与可逆性难以兼顾的限制。我们进一步通过葡萄和葡萄干中 SO_2 残留的快速筛查验证了该传感器的实际应用潜力，检测结果与国家标准方法（GB 5009.34–2022）进行了对照验证，可在数分钟内完成合规性判定。本研究为可逆气体传感提供了一种具有普适潜力的分子设计思路，即在同一分子骨架中整合信号转导与分析物识别功能。

第一作者：陕西师范大学硕士研究生吕乐怡
通讯作者：陕西师范大学彭灵雅博士、南洋理工大学博士后黄蓉蓉、陕西师范大学房喻教授
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The development of fluorescent sensors capable of simultaneous ultrafast response and high reversibility poses a significant challenge, as these two-performance metrics are typically constrained by a trade-off. Here, we present a conformational locking strategy with built-in recognition, realized through a tetracoordinate boron-bridged fluorophore (Py-BF_2). In this design, the B←N Lewis pair rigidifies the molecular framework while extending π-conjugation, yielding an electronic structure that promotes a pronounced intramolecular charge transfer (ICT) state with a substantially enlarged Stokes shift relative to the unlocked analogue. This integrated architecture not only enhances fluorescence efficiency but also exploits the ICT state for sensitive SO_2 detection.

The resulting film-based sensor achieves a response time of under 2 seconds, a detection limit of 1 ppm, and remarkable cycling stability exceeding 100 cycles without performance degradation, effectively overcoming the conventional speed-reversibility trade-off. Practical applicability is validated through rapid screening of SO_2 residues in grapes and raisins, with results corroborated against the Chinese national standard method (GB 5009.34–2022) and enabling compliance determinations within minutes. This work establishes a generalizable design paradigm that unifies signal transduction and analyte recognition within a single molecular scaffold for reversible gas sensing applications.

First Author: Lyu Leyi, master's student, Shaanxi Normal University
Correspondence Authors: Dr. Peng Lingya, Shaanxi Normal University; Dr. Huang Rongrong, Nanyang Technological University; Prof. Fang Yu, Shaanxi Normal University
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MINI REVIEW | Open Access

Regulating Multicolor Luminescence in Single-Component Systems: From Molecular Conformation to Photoactive Aggregates

Jing Li, Rong Miao ✉, Yu Fang ✉

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单组分多色发光体系——从分子构象到光活性聚集体调控策略

Jing Li, Rong Miao* and Yu Fang*. PhotoAggregate 2026, 1, e70001. https://onlinelibrary.wiley.com/doi/10.1002/pag3.70001



多色发光材料因其丰富可调的光学性质，在荧光传感、信息加密、光学防伪及显示等领域备受瞩目。然而，传统多色发光体系通常依赖多种发光组分，极易受到组成比例、相分离、光化学稳定性差异，以及不可控能量转移等因素的干扰，难以实现稳定信号输出。相比之下，单组分多色发光体系具有显著优势，该类体系仅通过

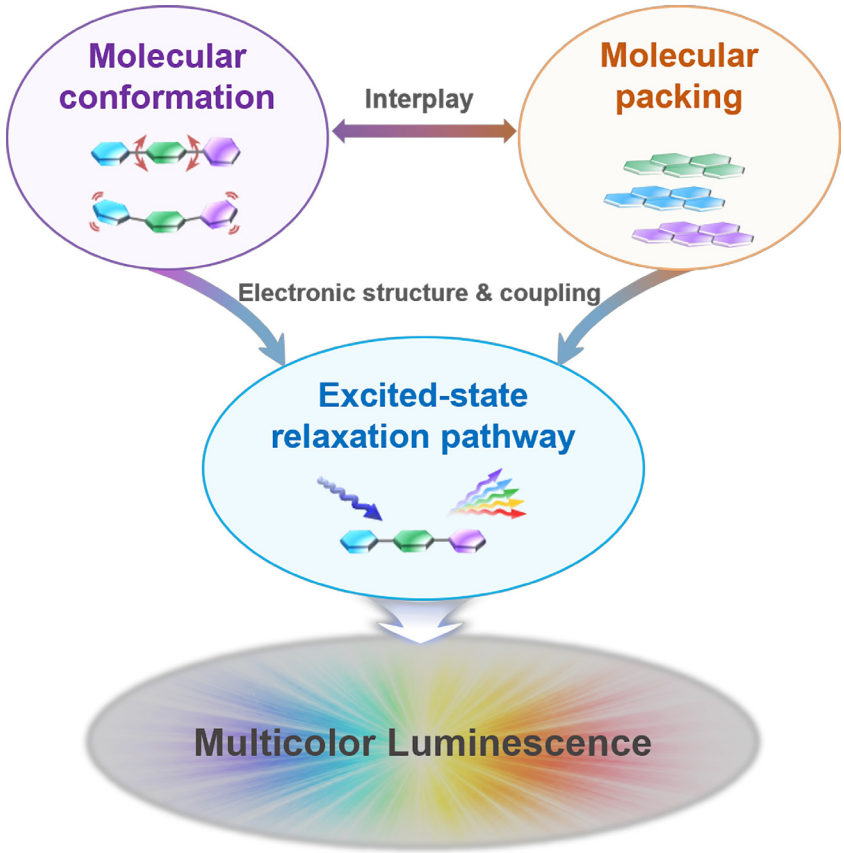


图 1. 调控单组分多色发光的主要因素包括：激发态弛豫途径、分子构象和分子堆积

Figure 1. Regulation of single-component multicolor luminescence by excited-state relaxation pathway, molecular conformation, and molecular packing.

调控单一化合物的激发态行为、分子构象及聚集状态，即可实现多种发光颜色的输出。从光物理机制看，不同激发态的弛豫过程以及分子旋转、弯曲等构象变化均可影响发光行为；而分子间相互作用及堆积方式，则进一步决定了聚集态的发光性质。尽管相关研究已取得显著进展，但激发态动力学、分子构象与聚集态结构之间的内在关联仍有待深入理解。因此，系统梳理单组分多色发光的形成机制与调控策略，对于深入理解分子结构、分子构象及分子堆积与发光性能之间的构效关系，指导新型发光材料的理性设计具有重要意义。基于此，该综述围绕单组分多色发光的形成机制、设计策略及功能应用，系统梳理了近年来该领域的代表性研究进展。重点探讨了激发态动力学、分子构象与聚集态结构之间的内在联系，以期为单组分多色发光材料的理性设计提供重要参考。

该综述应 PhotoAggregate 期刊邀请而作，发表于该刊创刊首期。

第一作者：陕西师范大学博士研究生李晶
通讯作者：陕西师范大学房喻院士、苗荣副教授
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Multicolor luminescent materials have attracted significant attention for their potential applications in fluorescence sensing, information encryption, optical anti-counterfeiting, and display technologies, owing to their diverse and tunable optical properties. However, conventional multicolor luminescent systems often rely on multiple emissive components and can be affected by variations in component ratios, phase separation, differences in photochemical stability, and uncontrolled energy transfer, all of which can reduce emission stability. By contrast, single-component systems can generate multiple emission colors by modulating the excited-state behavior, molecular conformation, and aggregation state of a single compound. Their emission can be influenced by relaxation pathways associated with different excited states, as well as by conformational changes such as molecular rotation and bending. In the aggregated state, intermolecular interactions and packing arrangements further influence luminescence properties. Although considerable progress has been made in this field, the relationships among excited-state dynamics, molecular conformation, and aggregate structure are not yet fully understood. This mini-review summarizes recent advances in single-component multicolor luminescence, covering its underlying mechanisms, design strategies, and functional applications. It highlights the interplay among excited-state dynamics, molecular conformation, and intermolecular packing, and discusses the remaining challenges and future prospects for the rational design of new luminescent materials.

Written at the invitation of *PhotoAggregate*, this review was published in the journal's inaugural issue.

First Author: Li Jing, doctoral candidate, Shaanxi Normal University
Correspondence Authors: Prof. Fang Yu, A/Prof. Miao Rong, Shaanxi Normal University
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我的大学 我的恩师（三）

何 刚

七、人在加拿大，心在师大

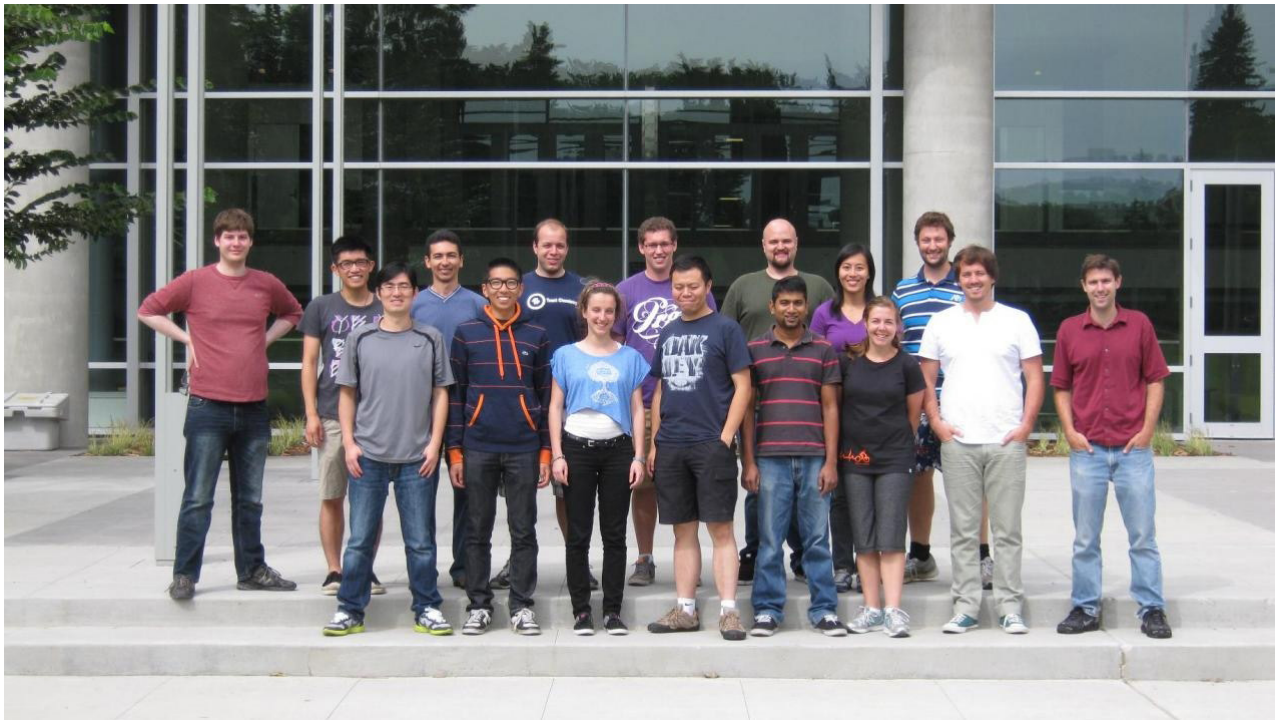
毕业之后，稍作调整，便赴北京办理签证手续。手续办妥后返回学校，又开始了实验室的再一次搬迁，从吴家坟迁往陕西师范大学长安校区。匆匆一两个月，终在开学之初完成了实验室的整体搬迁。每年九月二十八日，房老师都会与学生们聚餐。二〇一一年的聚会安排在大王村，彼时那里是陕西最为热闹的农家乐。那晚气氛格外欢愉，房老师与大家说了许多心里话，自然也给了我不少勉励。

翌日清晨，我拖着两只大行李箱启程前往加拿大。我在师大还留下了数个自本科起便积攒下来、虽不值钱却承载着无数情感的物件，约有三大箱。那时的我仍想着日后定会回到师大，便郑重其事地将这几箱物品托付给师弟们，心想一两年、两三年便能归来。本科同窗李召虎，以及实验室的几位师弟师妹前来送行。自此，我踏上了前往加拿大的旅途。这也是我平生第一次乘坐如此长时间的飞机。

我做博后的学校是加拿大阿尔伯塔大学，位于加拿大西部的埃德蒙顿，留学生们戏称为“爱屯”。碰巧的是，我们实验室的彭军霞师姐也在该校做博后。她将在我抵达的那个周末出站回国。于是，我顺理成章地“继承”了她留下的宝贵的财产，大到她的房间，小到她的锅碗瓢盆，让我初到异乡也能从从容容。我的博后合作导师是 Eric Rivard，一位年轻的教授。他与我简短交流不足十分钟后，便在那块黑板上写下了我要做的第一个化学反应。当然，做过实验的人都明白，这样的反应，往往难以一次成功。

在加拿大的日子颇为单调，却也十分充实。彼时重新开始，置身于全然陌生的环境，就用实验来充实自己。我记得他们开组会并不使用 PPT，完全以板书进行。这有其益处，便是迫使你对自己的研究内容了然于胸，画基团、描轨道之时，都令我受益匪浅。但其不足之处亦显而易见，讨论并不十分充分，因为许多实验细节并非用手绘所能呈现。我仍习惯国内以 PPT 汇报的方式。虽然起初大家都很不适应，但最终也逐渐接受了 PPT 汇报的形式。自此，Eric Rivard 课题组也开启了 PPT 汇报的先例。

我在实验室还是十分幸运的，有一位同样来自西安的同乡康乐同学，他亦是西安人，在普渡大学完成学士



学位后，来到加拿大 Eric Rivard 课题组攻读硕士学位。毕竟他在国外生活多年，接受过国外的本科教育，英文娴熟程度远胜于我。实验室的诸多仪器设备的使用方法，以及药品的采购事宜，我均在他的帮助下学习掌握。彼时 Eric Rivard 课题组主要研究方向是无机化学，并不使用柱层析分离技术。我的新课题是金属有机化学方面的，需要用到很多有机化学实验操作。而过柱子在房老师课题组乃是一项基本操作，我便将这一技术完美地带了过去，也教会了实验室的同学们。与之相应，我亦在他们的实验室学到了真正的无机化学，诸般严格的无水无氧操作、长单晶等一系列技能。

我时常忆起，在加拿大的许多交情，皆是以咖啡浇灌而成的。我本人并不喜饮咖啡，但得益于国内各种环境下的熏陶，我深知获得他人帮助至关重要。那么两三加元的咖啡，便成了沟通最好、亦最简洁的桥梁。无论是与实验室几位在读硕士、博士，还是与类似国内分析测试中心的几位友善的工作人员，常常以一杯咖啡为开端，便能在亟需数据时获得及时的帮助。这或许也是中国传统文化在加拿大的一点“渗透”吧。

在加拿大从事博士后研究期间，我依然争取每月都有一次机会向房老师汇报工作进展。我提前准备好 PPT，先让实验室的师弟们连好视频，待房老师上线后，便向他简要汇报。那时房老师对我说的最多的一句话便是：“加油，一定要好好干，干出一番样子来，将来报效祖国。”我便憋着这股劲，我在 Eric Rivard 课题组工作了两年半之久。

在此期间，二〇一二年十月，晏妮在美国联合培养两年之后，回到房老师课题组。二〇一三年六月她顺利通过了博士论文答辩，随后追随我亦来到加拿大。彼时在长安大学工作的高莉宁师姐早晏妮一个月，同样来到加拿大阿尔伯塔大学从事访问学者研究。我们三人在加拿大互帮互助，生活和工作也都很顺利。

此后，我又转至 Jillian Buriak 教授课题组继续从事博士后研究。二〇一四年八月二十四日，小马儿何妍希来到了我们身边。那段时光虽辛苦，如今回想起来却无比怀念。说实话，这些年始终觉得有愧于 Jillian Buriak 教授，在那段时日我将更多精力放在了家庭上，以至于至今未能与 Jillian Buriak 教授有合作论文发表，亦是人生中不小的遗憾。虽然此后 Jillian Buriak 教授来华访问时，我亦曾全力接待，心中始终感念她对我和家人的关照。

二〇一四年底，国家人才引进青年项目的申报工作启动。在殷亚东老师多次长时间的电话沟通与鼓励下，我下定决心加入西安交通大学前沿科学技术研究院（简称前沿院），依托该校申报国家级青年人才项目。说实话，彼时我信心并不充足。但无论在材料准备还是方向把握上，房老师都给予了我莫大的支持。提交完申报材料后，便是漫长的等待。因加拿大阿尔伯塔省冬季极为寒冷，晏妮也要回国找工作，二〇一四年十一月，我们不得不做出一个艰难的决定：晏妮独自带着刚满百天的小小的何妍希，历经二十余小时的长途飞行，回到汉中，回到我们的家乡。由于我的签证的问题，不能同行，她俩那段旅程委实艰难无比。

记得是二〇一四年十二月的某个夜晚，我忽然收到邮件，通知我参加国家特聘专家青年人才计划答辩，时间定在二〇一五年一月。彼时，我心中既紧张万分，又对国内答辩形式不甚明了，便匆忙开始了 PPT 的准备工作。颇为遗憾的是，历时近四年的博后期间我竟未曾回国一次，如今终踏上了回国的航班。甫一抵达，便前往西安交通大学与领导简短会面，随后立即奔赴陕师大。见到房老师，倍感亲切。房老师为我安排了一场极为正式的学术报告。如今回看，那份 PPT 在我讲完之后，房老师沉默了好几分钟，这是极少出现的场景。最后我看得出来，因我刚刚回国，他极不愿批评我。但他仍十分委婉地指出，那话语至今清晰如昨：“何刚，你的 PPT 报告水平退步了。”我想，业精于勤，荒于嬉。或许正是那几年在加拿大缺乏良好的锻炼平台，加之自身英语表达欠佳，不善于正式的学术陈述，这项能力便逐渐有所退步。

此后，在房老师的指导下，在师弟师妹们的全力协助下，我艰难地完成了 PPT 的修改。期间，交大的老师们也给予了许多指导。当最后一版试讲结束后，交大的一位老师给予了高度评价，也令我增添了不少信心。在北京顺利完成答辩，归来时得知自己成功入选了这一项目，心中激动万分，第一时间便将这份喜悦与房老师分享。随后返回加拿大阿尔伯塔大学办理后续手续交接，便顺利返程。晏妮也于同月顺利入职长安大学材料科学与工程学院。

西安，我终于回来了。

八、西交前沿新征程

这过去的十一年，仿佛是另一个独立而完整的故事。这段时光似乎流逝得更快了。我常与学生们说，一个人的学术生涯中，博士生导师或许是最重要、也是影响最深远的人。我虽在加拿大从事了四年博士后研究，但所秉持的基本学术思想与逻辑，早在博士阶段便已形成。自己的课题组建立之后，我常常思考：房老师当年是如何指导我做科研的？房老师担任校长期间极为辛劳，大量时间投入行政事务，在实验室的时间并不多，然而不知为何，总觉得房老师对待学生、对待学术那般亲切自然，这也奠定了我指导学生的方式。

当然，自己建立课题组亦遇到诸多不顺，挫折频仍。每每向房老师倾诉，他始终给予坚定支持，常说：“到

一个新的、更好的平台，必然会遇到挫折。关键在于你以怎样的心态去面对，以怎样的方式去做科研，以怎样的品味去对待自己的人生。”在这一信念的支撑下，我逐步建立起自己的课题组，也有一些学生相继取得了一些成绩。记得刚发表第一篇独立通讯作者的《Angew. Chem. Int. Ed.》论文时，我第一时间向房老师发去了消息。房老师极为迅速地回复了我，表示了祝贺。这亦是我此后继续从事科研所获得的最大鼓励。我也常常带领自己的学生参加房老师的一些学术活动。面对这些徒孙辈的年轻人，房老师依旧给予他们极大的鼓励。

不知不觉在交大已近十年。我十分珍视所获得的一项荣誉——西安交通大学优秀研究生导师。我想，自己取得的点滴学术成绩固然离不开老师的支持、指导与帮助，但获得“优秀研究生导师”这一称号，更是从房老师身上一点一滴汲取而来的。

如今自己也做了导师，面对学生的不理解、面对他们偶尔的懈怠与抱怨，我常常忆起当年的自己。忆起房老师不允我留校、执意要我出国的那一日，忆起他审阅我的论文时那恨铁不成钢的目光。时至今日，才明白房老师的一片苦心。他何尝不想将学生留在身边？他只是看得更为长远，知晓在何种阶段应当给予我们什么，哪怕当时我们并不理解，甚至心存埋怨。如今回望，房老师为我所做的每一个决定，都是对的。这份苦心，唯有自己为人师表之后，方能真正体会。

二〇二三年，时任前沿院党委书记刘莹老师、院长邵金友教授与我有过一次促膝长谈。他们提出，希望将房老师双聘至交大。我听罢，心中涌起一阵难以抑制的欣喜，随即又有些懊恼，如此佳事，我竟未曾想到。

此后，刘书记与邵院长多次拜访房老师。我由衷希望房老师能来交大担任兼职教授，继续引领我们前行。那段时日，房老师与蒋庄德院士在会议上亦有过多次交流，两位大家的惺惺相惜，更加坚定了房老师来交大双聘的决心。不久之后，刘书记、邵院长相继赴行政部门担任要职，但即便岗位变动，他们始终关心并促成此事。后来，这份沉甸甸的心意便落到了赵卫滨书记和我待之如兄长般的刘峰教授肩上。在王树国校长、卢建军书记以及后来接任的张立群校长等多方领导的关心与支持下，终于促成了房老师在交大双聘兼职这件大事。

我们着实欣喜不已。很快，西安交大新概念传感器与分子材料研究院正式成立。与此同时，与陕师大新概念传感器及分子材料研究院一道，联合申报并成功获批了陕西省新概念传感器及分子材料重点实验室。就这样，房老师在交大兼职的一段崭新历程，由此开启。

就在我行笔之际，研究院也正在有条不紊地建设之中。期待金秋落成之时，我们便可入驻新的研究院，继续在房老师的引领下，向前迈进，走向更远处。

九、感恩恩师

吾生有涯而学无涯。恩师始终如一盏明灯，指引着我不断前行。在学术上，他教诲我要开拓创新，做有意义、重要的工作；在人生中，他教导我面对挫折不可轻言放弃，永远坚定自己的信念，勇往直前。如今，我始终以房老师所传授、我曾用于 PPT 答辩的那句话自勉：勤勤恳恳做事，踏踏实实做人。这几个字质朴无华，但或许再也没有比这更恰当的字句，能指引我前行的方向了。

如今，虽常与房老师相聚，却也常常忆起初见房老师的情景，匆匆已逾二十载，连自己都有些恍惚了。与房老师相识，在其门下求学问道，或许便是改变我一生的契机。记得岁末与老家亲友相聚时，叔父问了我一句话，对我而言堪称灵魂拷问。他问：“为何你能从汉中一个普通家庭的孩子，成为西安交通大学的教授？”我想，几乎是不假思索的本能反应：因为我遇到了房老师，成为了房老师的学生。

感恩感念，千言万语。我不知用怎样的言辞方能表达对恩师的崇敬，不知用怎样的行动方能回报恩师的信任，亦不知怀着怎样的情感、带着怎样的心境继续前行。但我深知一点：与房老师同行，是此生最幸运的事。

云山苍苍，江水泱泱，先生之风，山高水长。

房老师七十华诞在即，学生无以为报，唯有将这份感恩化为前行的动力。恩师常说“把每一件平凡的事情做好就是不平凡；把每一件简单的事情做好就是不简单”，这句话早已深深刻入我的骨血之中。如今我也为人师表，有了自己的学生，我学着恩师当年的模样，告诫他们做学问先做人，告诫他们脚踏实地、不慕虚名。我想，这或许便是对恩师最好的报答，将他传授于我的，一点一滴传承下去。恩师是一棵参天大树，我们都是他枝头的叶子，无论飘向何方，根系始终深扎于那片沃土。

千言万语，凝成最朴素的言语：

祝恩师福寿绵长，松柏长青。愿您心中的那团火，永远照亮一代又一代学子前行的路。我们也必将这团火，化作心中的火种，传承下去，点亮更多年轻的生命。

学生何刚
2026 年 6 月 18 日初稿于
贵州遵义干部学院
6 月 30 日修改于
西安交通大学兴庆校区
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西安交通大学创新港

（连载三，全文完）

My University, My Mentor (III)

He Gang

VII. Body in Canada, Heart at SNNU

After graduation, I took a short break to adjust before heading to Beijing to process my visa. Once the paperwork was complete, I returned to school and began another relocation of the lab — this time from Wujiafen to the Chang'an Campus of the university. After a hectic one or two months, we finally completed the entire relocation of the lab just as the new semester began. Every year on September 28, Prof. Fang would host a dinner with his students. The 2011 gathering was held in Dawangcun, which at the time was the liveliest agritourism spot in Shaanxi. The atmosphere that evening was exceptionally joyful; Prof. Fang shared many heartfelt thoughts with everyone and, naturally, offered me plenty of encouragement.

Early the next morning, I set off for Canada, dragging two large suitcases behind me. I left behind at Shaanxi Normal University several boxes — about three in total — filled with items I'd collected since my undergraduate days; though they weren't valuable, they held countless memories. Back then, I still believed I would return to the university someday, so I solemnly entrusted these boxes to my younger classmates, thinking I'd be back in a year or two, or maybe two or three. My undergraduate classmate Li Zhaohu, along with several younger lab mates, came to see me off. And so, I set out on my journey to Canada. It was also the first time in my life that I had taken such a long flight.

I was doing my postdoc at the University of Alberta in Canada, located in Edmonton, in western Canada — a city international students jokingly call "Ai Tun" (literally the Edmonton Village). As it happened, my senior lab mate Peng Junxia was also doing her postdoc at the same university. She was set to finish her postdoc and return to China the very weekend I arrived. So, quite naturally, I "inherited" the valuable possessions she left behind — everything from her room to her pots, pans, and utensils — which allowed me to settle into my new life abroad with ease. My postdoc advisor is Eric Rivard, a young professor. After a brief conversation with me that lasted less than ten minutes, he wrote down the first chemical reaction I was to perform on the blackboard. Of course, anyone who has done lab work knows that such reactions are often difficult to get right on the first try.

My days in Canada were rather monotonous, yet very fulfilling. Back then, as I was starting over in a completely unfamiliar environment, I filled my time with experiments. I remember that they didn't use PowerPoint for group meetings; everything was done entirely by writing on the board. This had its benefits — it forced you to have a thorough understanding of your own research. Drawing functional groups and sketching orbitals taught me a great deal. However, the drawbacks were also obvious: discussions weren't always thorough, as many experimental details couldn't be conveyed through hand-drawn diagrams alone. I was still accustomed to the PowerPoint presentation style common in China. Although everyone struggled to adjust at first, we eventually came to accept PowerPoint presentations. From then on, Eric Rivard's lab set a precedent for using PowerPoint presentations.

I was quite fortunate in the lab to have a fellow student named Kang Le, who was also from Xi'an. After completing his bachelor's degree at Purdue University, he came to Canada to pursue a master's degree in Eric Rivard's research group. Having lived abroad for many years and received his undergraduate education overseas, his English proficiency far surpassed mine. With his help, I learned how to operate the lab's various instruments and equipment, as well as how to handle the procurement of chemicals. At that time, Eric Rivard's group focused primarily on inorganic chemistry and did not use



column chromatography for separation. My new research project focused on organometallic chemistry, which required numerous organic chemistry laboratory procedures. Since column chromatography was a fundamental technique in Prof. Fang's group, I seamlessly brought that skill with me and taught it to my lab mates. In return, I learned authentic inorganic chemistry in their lab, including a range of skills such as rigorous anhydrous and oxygen-free procedures and the growth of long single crystals.

I often recall how many of my friendships in Canada were nurtured over cups of coffee. I'm not a coffee drinker myself, but thanks to my experiences in various settings back home, I deeply understand how crucial it is to seek help from others. So a cup of coffee costing two or three Canadian dollars became the best — and simplest — bridge for communication. Whether it was with several master's and doctoral students in the lab or with friendly staff members at an analytical testing center similar to those back home, a cup of coffee often served as the starting point that allowed me to get timely help when I urgently needed data. Perhaps this is also a small example of how traditional Chinese culture has "seeped" into Canadian life.

While conducting postdoctoral research in Canada, I still made a point of reporting my progress to Prof. Fang at least once a month. I would prepare my PowerPoint presentation in advance, have my junior lab mates set up the video call, and once Prof. Fang joined the call, I would give him a brief update. The phrase Prof. Fang repeated most often to me back then was: "Keep it up. You must work hard, make a name for yourself, and serve your country in the future". Fueled by that encouragement, I worked in Eric Rivard's research group for two and a half years.

During this time, in October 2012, after two years of joint training in the United States, Yan Ni returned to Prof. Fang's research group. In June 2013, she successfully defended her doctoral dissertation and subsequently joined me in Canada. At that time, Gao Lining, who was working at Chang'an University, had arrived in Canada a month before Yan Ni and was also conducting research as a visiting scholar at the University of Alberta. The three of us supported one another in Canada, and both our personal lives and work went very smoothly.

After that, I moved to Prof. Jillian Buriak's lab to continue my postdoctoral research. On August 24, 2014, our little one, He Yanxi, joined our family. Although those days were tough, I look back on them with immense fondness now. To be honest, over the years I've always felt a sense of guilt toward Prof. Jillian Buriak. During that time, I devoted more of my energy to my family, which is why I have yet to publish a collaborative paper with her — a significant regret in my life. Although I did my utmost to host her when she visited China later on, I remain deeply grateful for the care she showed me and my family.

At the end of 2014, the application process for the National Talent Introduction Program for Young Scholars began. After numerous lengthy phone conversations and words of encouragement from Prof. Yin Yadong, I made up my mind to join the Frontier Institute of Science and Technology at Xi'an Jiaotong University (abbreviated as FIST) and apply for a National-Level Young Talent Program through the university. To be honest, I wasn't very confident at the time. However, Prof. Fang provided me with tremendous support, both in preparing the application materials and in refining my research direction. After submitting the application, a long wait began. Since winters in Alberta, Canada, are extremely cold and Yan Ni also needed to return to China to look for a job, in November 2014, we had to make a difficult decision: Yan Ni would travel alone with our tiny daughter, He Yanxi — who had just turned 100 days old — on a long-haul flight lasting more than 20 hours back to Hanzhong, our hometown. Due to issues with my visa, I was unable to accompany them, and their journey was truly incredibly difficult.

I remember it was one night in December 2014 when I suddenly received an email notifying me that I had been selected to participate in the defense for the National Specially Appointed Experts Young Talent Program, scheduled for January 2015. At the time, I was both extremely nervous and unfamiliar with the format of defense presentations in China, so I hurriedly began preparing my PowerPoint presentation. Regrettably, during my nearly four-year postdoctoral fellowship, I had not returned to China even once, but now I was finally boarding a flight back home. As soon as I arrived, I went to Xi'an Jiaotong University for a brief meeting with the officials, then immediately headed to Shaanxi Normal University. Seeing Prof. Fang, I felt a deep sense of warmth. Prof. Fang arranged a very formal academic presentation for me. Looking back now, after I finished my presentation, Prof. Fang remained silent for several minutes — a scene that rarely occurred. In the end, I could tell that, since I had just returned to China, he was extremely reluctant to criticize me. Yet he still pointed out very tactfully — and his words remain as clear to me today as they were then: "He Gang, the quality of your PowerPoint presentations has declined". I believe that excellence comes from diligence, while idleness leads to decline. Perhaps it was precisely because I lacked a good platform for professional development during those years in Canada, combined with my own poor English expression and lack of skill in formal academic presentations, that this ability gradually deteriorated.

After that, under Prof. Fang's guidance and with the full support of my junior classmates, I managed to complete the revisions to my PowerPoint presentation, though it was a challenging process. Throughout this time, the faculty at Jiaotong University also provided me with a great deal of guidance. After my final trial lecture, a professor

from Jiaotong University offered high praise, which gave me a significant boost of confidence. After successfully completing my defense in Beijing, I learned upon my return that I had been selected for the program. I was overjoyed and immediately shared the good news with Prof. Fang. I then returned to the University of Alberta in Canada to handle the necessary follow-up procedures and handover, before smoothly making my way back home. Yan Ni also successfully joined the School of Materials Science and Engineering at Chang'an University that same month.

Xi'an, I'm finally back.

VIII. A New Journey at XJTU FIST

These past eleven years feel like a separate, complete story of their own. Time seems to have flown by even faster during this period. I often tell my students that, in a person's academic career, the doctoral advisor is perhaps the most important and far-reaching influence. Although I spent four years conducting postdoctoral research in Canada, the fundamental academic ideas and logic I adhere to were already formed during my doctoral studies. After establishing my own research group, I often reflected: How did Prof. Fang guide me in my research back then? During his tenure as university president, Prof. Fang worked extremely hard, devoting a great deal of time to administrative affairs and spending relatively little time in the lab. Yet, for some reason, I always felt that Prof. Fang's approach to students and to academia was so warm and natural — and this has shaped the way I mentor my own students.

Of course, establishing my own research group came with its share of setbacks and frequent frustrations. Whenever I confided in Prof. Fang, he always offered unwavering support, often saying, "When you move to a new and better platform, you're bound to encounter setbacks. What matters is the mindset with which you face them, the approach you take to conducting research, and the values by which you live your life". Bolstered by this belief, I gradually built my own research group, and some of my students have since achieved notable results. I remember that when I first published my first paper as the sole corresponding author in Angew. Chem. Int. Ed., I immediately sent a message to Prof. Fang. He replied very quickly to offer his congratulations. This was also the greatest encouragement I received that spurred me to continue my research. I also often took my students to participate in some of Prof. Fang's academic events. Even when faced with these young researchers — who were effectively his "grandstudents" — Prof. Fang continued to offer them tremendous encouragement.

Before I knew it, I've been at Xi'an Jiaotong University for nearly a decade. I deeply cherish one honor I've received — the title of "Xi'an Jiaotong University Outstanding Graduate Advisor". I believe that while my modest academic achievements are undoubtedly due to the support, guidance, and help of my professors, the title of "Outstanding Graduate Advisor" is something I've earned bit by bit through learning from Prof. Fang.

Now that I've become a mentor myself, when faced with my students' lack of understanding, their occasional slackness, and their complaints, I often think back to who I was back then. I recall the day Prof. Fang refused to let me stay at the university and insisted that I study abroad; I recall the look of frustration in his eyes as he reviewed my papers, as if he were disappointed in a student with great potential. Only now do I understand Prof. Fang's well-intentioned concerns. How could he not have wanted to keep his students by his side? He simply had a longer-term perspective and knew exactly what we needed at each stage of our development — even if we didn't understand it at the time and even harbored some resentment. Looking back now, every decision Prof. Fang made for me was the right one. It is only after becoming a teacher myself that I can truly appreciate the depth of his dedication.

In 2023, Ms. Liu Ying, then Party Secretary of the Frontier Institute of Science and Technology, and Prof. Shao Jinyou, the institute's director, had a heart-to-heart conversation with me. They suggested that Prof. Fang be appointed to a dual appointment at Xi'an Jiaotong University. Upon hearing this, I felt an overwhelming surge of joy, followed immediately by a sense of regret — I couldn't believe I hadn't thought of such a wonderful opportunity myself.

After that, Liu Ying and Shao Jinyou paid numerous visits to Prof. Fang. I sincerely hoped that Prof. Fang would come to Xi'an Jiaotong University to serve as an adjunct professor and continue to guide us forward. During that time, Prof. Fang also exchanged views with Academician Jiang Zhuangde on multiple occasions at conferences; the mutual admiration between these two eminent scholars further strengthened Prof. Fang's resolve to accept a dual appointment at XJTU. Shortly thereafter, Liu Ying and Shao Jinyou successively took up key positions in other administrative departments, but even with these changes in their roles, they remained committed to this matter and continued to facilitate its progress. Later, the weight of this important responsibility fell on the shoulders of new Party Secretary Zhao Weibin and Prof. Liu Feng, whom I regard as an older brother. With the care and support of XJTU President Wang Shuguo, Party Secretary Lu Jianjun, and later President Zhang Liqun, among other officials, the significant achievement of securing Prof. Fang's dual appointment at Xi'an Jiaotong University was finally realized.

We were truly delighted. Soon after, the Institute of New Concept Sensors and Molecular Materials at Xi'an Jiaotong University was officially established. At the same time, together with the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, we jointly applied for and were successfully approved to establish

the Shaanxi Provincial Key Laboratory of New Concept Sensors and Molecular Materials. And so, a new chapter in Prof. Fang's part-time work at Xi'an Jiaotong University began.

As I write these words, the INCSMM at XJTU is also progressing steadily. I look forward to its completion this golden autumn, when we will be able to move into the new facility and, under Prof. Fang's guidance, continue to move forward and reach even greater heights.



IX. Gratitude to My Mentor

Life is finite, but learning is boundless. My mentor has always been a guiding light, leading me forward. Academically, he taught me to be innovative and to pursue meaningful, significant work; in life, he taught me never to give up easily in the face of setbacks, to always remain steadfast in my convictions, and to forge ahead courageously. To this day, I continue to take inspiration from the words Prof. Fang taught me — the very words I once used in my PowerPoint defense: "Work diligently and be a person of integrity". These words are simple and unadorned, yet perhaps there are no more fitting words to guide me on my path forward.

Nowadays, although I often meet with Prof. Fang, I still frequently recall the moment I first met him. More than twenty years have flown by in the blink of an eye, and even I feel a bit dazed by it all. Meeting Prof. Fang and studying under his guidance may well have been the turning point that changed my life. I remember during a year-end gathering with relatives and friends back home, my uncle asked me a question that felt like a soul-searching inquiry. He asked, "How did you, a child from an ordinary family in Hanzhong, become a professor at Xi'an Jiaotong University?" I think my answer came almost instinctively, without a moment's hesitation: "Because I met Prof. Fang and became his student."

I am filled with gratitude and appreciation — words cannot express it all. I do not know what words could possibly convey my deep respect for my mentor, nor what actions could repay the trust she has placed in me, nor what emotions or state of mind I should carry with me as I move forward. But I know one thing for certain: walking alongside Prof. Fang is the greatest blessing of my life.

The mountains are vast and majestic, the river flows broad and deep; my mentors noble character is as enduring as these towering peaks and flowing waters.

With Prof. Fang's 70th birthday approaching, we, his students, have no way to repay him; all we can do is turn this gratitude into the motivation to move forward. My mentor often said, "Doing every ordinary task well is extraordinary; doing every simple task well is not simple". These words have long been deeply ingrained in my mind. Now that I, too, have become a teacher with students of my own, I follow my mentor's example by advising them that character comes before scholarship, and urging them to stay grounded and avoid seeking empty fame. I believe this is perhaps the best way to repay my mentor — by passing on, bit by bit, what he taught me. My mentor is a towering tree, and we are all leaves on its branches; no matter where we may drift, our roots remain deeply embedded in that fertile soil.

A thousand words and a million thoughts are distilled into these simplest words:

May our beloved teacher enjoy a long and healthy life, and may he remain as evergreen as the pine and cypress. May the flame in your heart forever illuminate the path ahead for generation after generation of students. We, too, will transform this flame into a spark within our own hearts, passing it on to illuminate the lives of even more young people.

Student He Gang
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(Part 3 of 3; The End)