

# Nanoscale Horizons

The home for rapid reports of exceptional significance in nanoscience and nanotechnology  
[rsc.li/nanoscale-horizons](https://rsc.li/nanoscale-horizons)

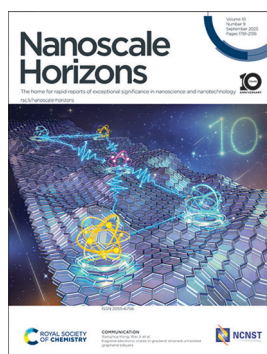
The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

## IN THIS ISSUE

ISSN 2055-6756 CODEN NHAOAW 10(9) 1781-2136 (2025)



**Cover**  
Cover image celebrates the 10th Anniversary of *Nanoscale Horizons*.



**Inside cover**  
See Xianghua Kong, Wei Ji *et al.*, pp. 1956–1964. Image reproduced by permission of Xianghua Kong from *Nanoscale Horiz.*, 2025, 10, 1956.

## EDITORIAL

1791

***Nanoscale Horizons* Emerging Investigator Series: Dr Jia-Ahn Pan, Pitzer and Scripps Colleges, United States**

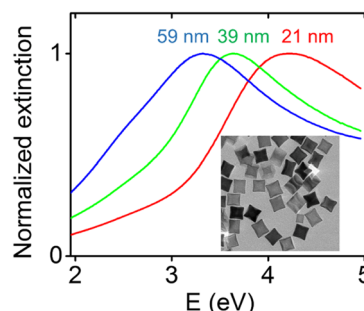


## COMMENTARIES

1793

**A reflection on 'Size-tunable rhodium nanostructures for wavelength-tunable ultraviolet plasmonics'**

Zhijia Geng and Jie Liu\*



# Environmental Science: Atmospheres

GOLD  
OPEN  
ACCESS

## Connecting communities and inspiring new ideas



Open Access Article. Published on 21 August 2025. Downloaded on 4/6/2026 8:24:59 AM.  
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

[rsc.li/submittoEA](https://rsc.li/submittoEA)

Fundamental questions  
Elemental answers

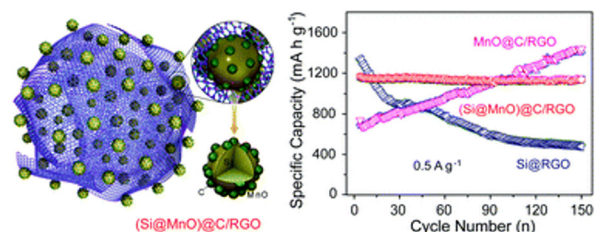


## COMMENTARYS

1797

### A reflection on 'A new strategy for developing superior electrode materials for advanced batteries: using a positive cycling trend to compensate the negative one to achieve ultralong cycling stability'

Hong Han Choo, Dan-Yang Wang and Qingyu Yan\*



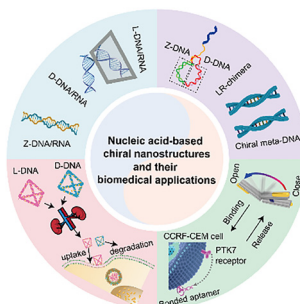
Reproduced from <https://doi.org/10.1039/C6NH00150E> with permission from the Royal Society of Chemistry

## REVIEWS

1802

### Nucleic acid-based chiral nanostructures and their biomedical applications

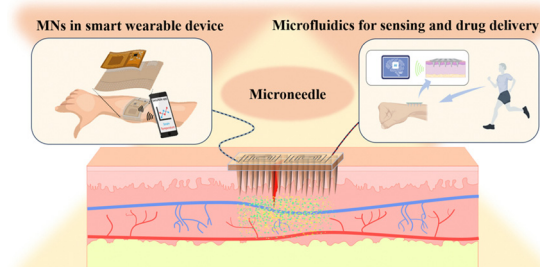
Shuhui Yu, Yiming Xie, Yunfei Jiao, Na Li\* and Baoquan Ding\*



1815

### Toward next-generation smart medical care wearables: where microfluidics meet microneedles

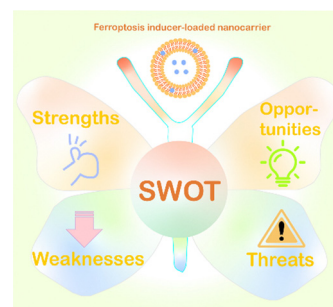
Xin Li, Shuoshuo Wan, Tamim Suza Pronay, Xuejiao Yang,\* Bingbing Gao\* and Chwee Teck Lim\*



1838

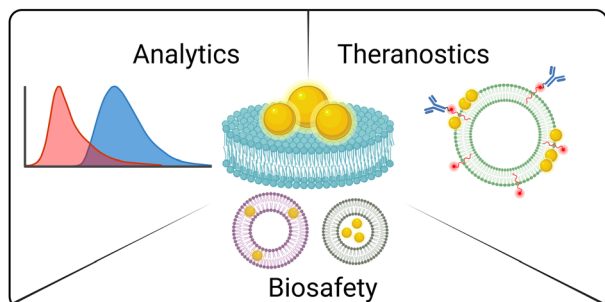
### Overview and SWOT analysis of nano-ferroptosis therapy for cancers

Qian Chen, Junli Zhu, Junhuang Jiang\* and Zhengwei Huang\*



## REVIEWS

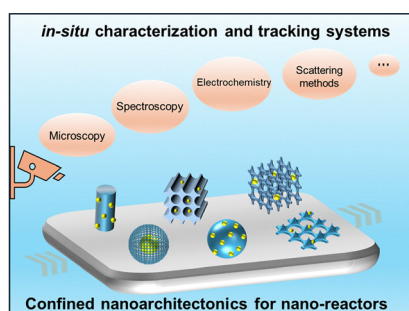
1863



### The gold nanoparticle–lipid membrane synergy for nanomedical applications

Lucrezia Caselli, Lucia Paolini, Wye-Khay Fong, Costanza Montis, Andrea Zandrini,\* Jacopo Cardellini,\* Paolo Bergese and Debora Berti

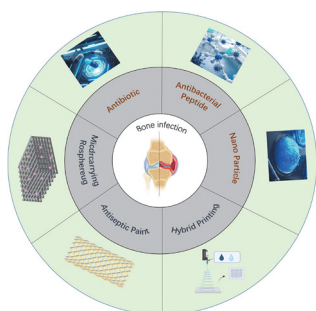
1882



### Confined nanoarchitectonics for nano-reactors: *in situ* characterization and tracking systems at the nanoscale

Na Kong\* and Katsuhiko Ariga\*

1905

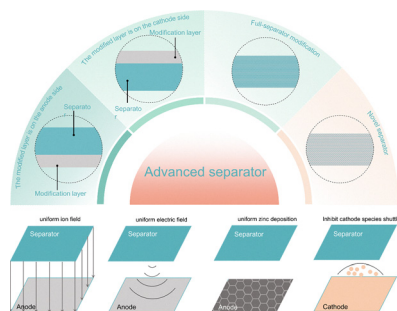


### The application and challenges of antimicrobial drug-loaded scaffold materials for the treatment of bone infections

Shenghua Wu, Fu Qin and Yongbiao Meng\*

## MINIREVIEW

1932



### Advancements in separator materials for aqueous zinc batteries

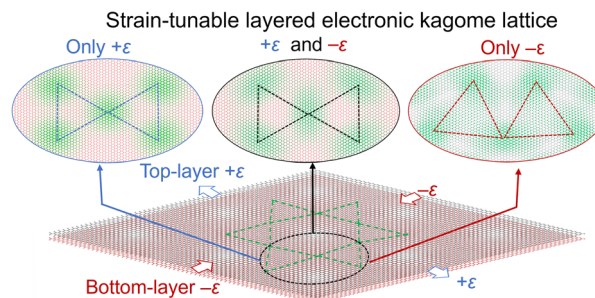
Qingshun Nian, Xinru Yang, Hu Hong, Peng Chen, Yuwei Zhao, Haiming Lv and Chunyi Zhi\*



1956

### Kagome electronic states in gradient-strained untwisted graphene bilayers

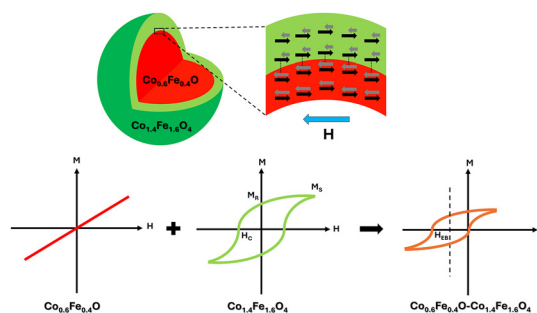
Zeyu Liu, Xianghua Kong,\* Zewen Wu, Linwei Zhou, Jingsi Qiao, Cong Wang, Shu Ping Lau and Wei Ji\*



1965

### Co<sub>0.6</sub>Fe<sub>0.4</sub>O–Co<sub>1.4</sub>Fe<sub>1.6</sub>O<sub>4</sub> core–shell nanoparticles with colossal exchange bias

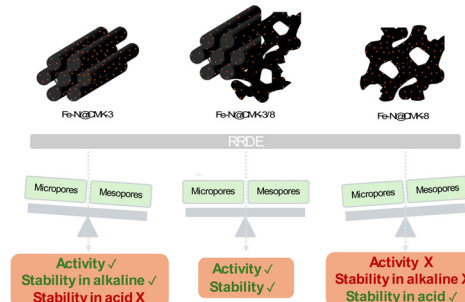
Samyog Adhikari, Roger D. Johnson, Pascal Manuel, Leonardo Lari, Le Duc Tung, Vlado K. Lazarov and Nguyen Thi Kim Thanh\*



1975

### Pore structure engineering via hard-template synthesis: unlocking the high oxygen reduction reaction activity and stability of Fe–N@C electrocatalysts

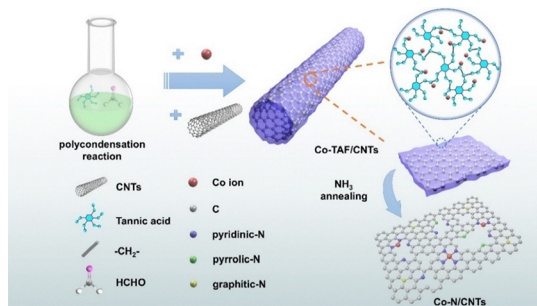
Giulia Gianola, Mirtha A. O. Lourenço,\* Luca Basile, Tiago Morais, Luis Mafra, Candido Pirri, Stefania Specchia and Juqin Zeng\*



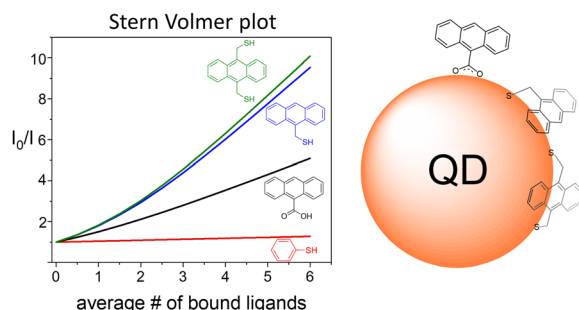
1988

### Tannic acid-mediated surface engineering of CNTs for enhanced bifunctional oxygen electrocatalysis

Xiangmin Tang, Luyao Zou, Xiaopeng Li, Zhipeng Xu, Huilin Fan,\* Chao Lin\* and Jung-Ho Lee\*



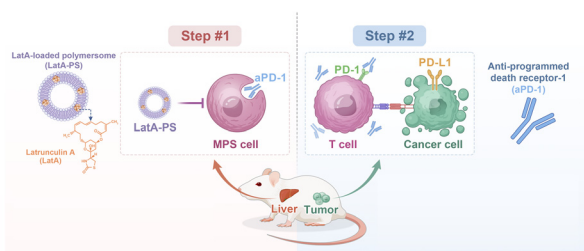
1997



### Unravelling quantum dot–molecule interactions for $\pi$ -conjugated ligands: insights into binding and anchoring group effects

Yinon Deree, Adar Levi, Xiang Li, Ori Gidron\* and Uri Banin\*

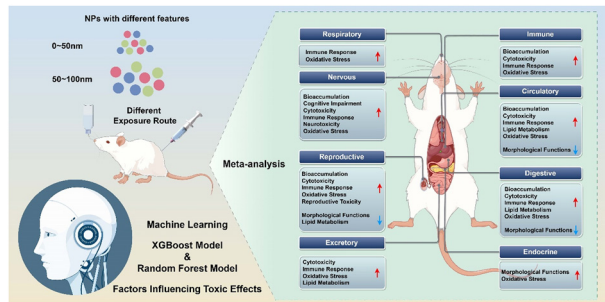
2003



### Pinocytosis inhibitory nanoparticles enhance aPD-1 antibody delivery and efficacy while avoiding toxicity in the treatment of solid tumors

Stephanie R. Zelenetz, Haeik Park, Wenan Qiang, Gan Lin, Sultan Almunif, Swagat H. Sharma, Debora B. Scariot, Junlin Lu, Robert W. Reichert, Bin Zhang and Evan A. Scott\*

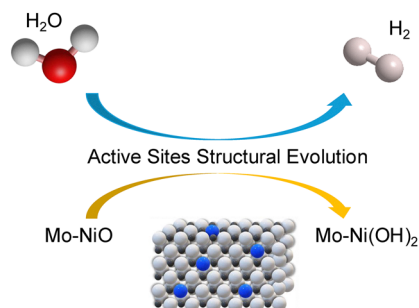
2017



### Toxicity of nanoplastics: machine learning combined with meta-analysis

Zhaoxiang Li, Yuanyi Zhang and Yueyue Chen\*

2037



### Single-atom molybdenum doping induces nickel oxide-to-hydroxide transformation for enhanced alkaline hydrogen evolution

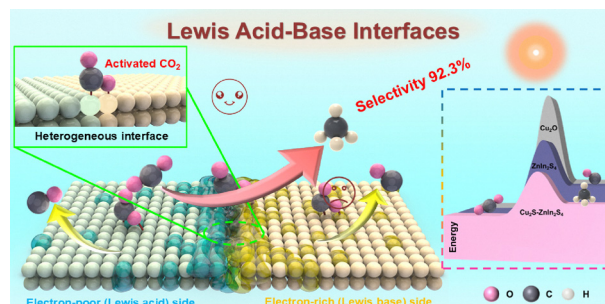
Yuanqi Liu, Qiang Gao, Lei Shi, Joseph Kearney, Xue Han, Zhenhua Xie, Maoyu Wang, Hua Zhou and Huiyuan Zhu\*



2045

### Engineering of Lewis acid–base interfaces in $\text{Cu}_2\text{S}/\text{ZnIn}_2\text{S}_4$ hollow hetero-nanocages for enhanced photocatalytic $\text{CO}_2$ reduction

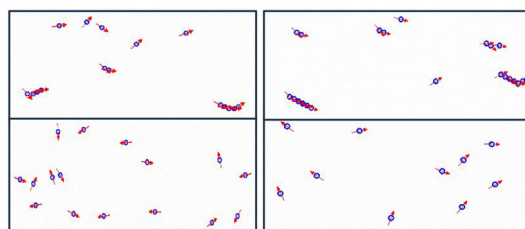
Yuanyuan Zhao, Kangjie Gao, Jiaxin Li, Huanhuan Liu,\* Fang Chen,\* Wentao Wang,\* Yijun Zhong and Yong Hu\*



2055

### Magnetically controlled cluster formation/dissociation in high-moment nanoparticle-based ferrofluids

Marianna Vasilakaki, Dino Fiorani, Davide Peddis and Kalliopi N. Trohidou\*

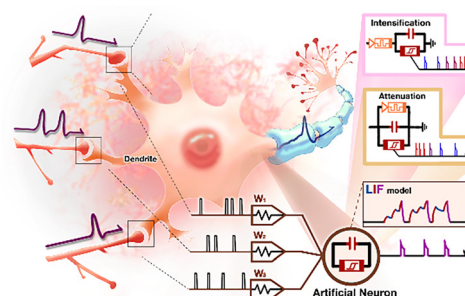


Snapshots of the particle configurations of surfactant-coated Co ferrite multicore (left), FeCo alloy (right) particles in the fluid by switching on (upper panels) an in-plane magnetic field at time  $t=10^8$  MCS and after switching off the field at  $t=1.1 \times 10^8$  MCS. Arrows show their corresponding spin orientation.

2068

### Spiking frequency adaptability and multi-weight synergy in artificial neuronal modules via bifunctional $\text{NbO}_x$ memristors

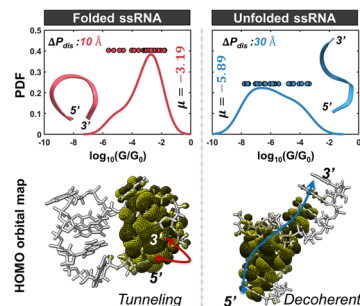
Shuai-Ming Chen, Li-Chung Shih, Jing-Ci Gao, Song-Xian You, Kuan-Ting Chen, Pei-Lin Lin, Kai-Shin Hsu, Chi-Chien Chen, Wei-Lun Chen and Jen-Sue Chen\*



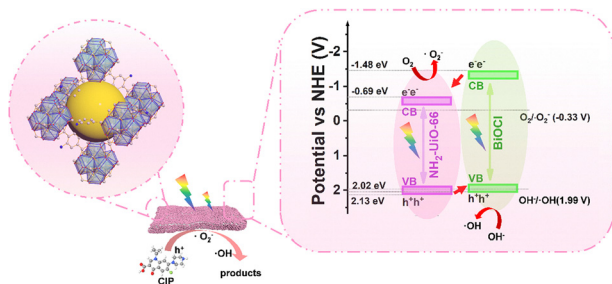
2080

### Conformation driven conductance modulation in single-stranded RNA (ssRNA)

Arpan De,\* Arindam K. Das and M. P. Anantram



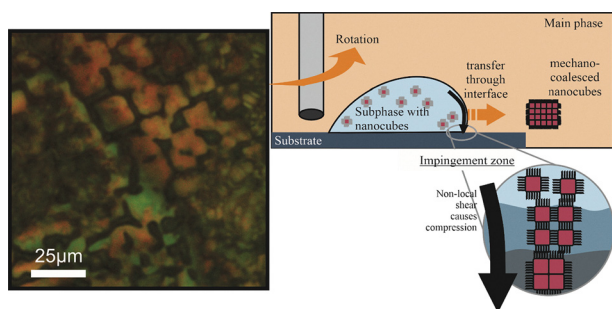
2094



### One-step construction of $\text{NH}_2\text{-UiO-66}$ based heterojunction photocatalysts for adsorption–photocatalytic synergistic removal of antibiotics

Yong Li,\* Xinyue Yang, Deyun Yue, Xiao Miao, Mengyao Wang and Haojie Song\*

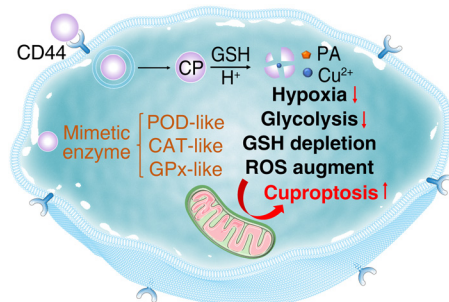
2104



### High-performance optoelectronics enabled by solution-based sintering of perovskite nanocrystals

Karthika Vijayan, Yu-Xiang Chen, Pradyumna Kumar Chand, Ting-Chun Huang, Ya-Ping Hsieh and Mario Hofmann\*

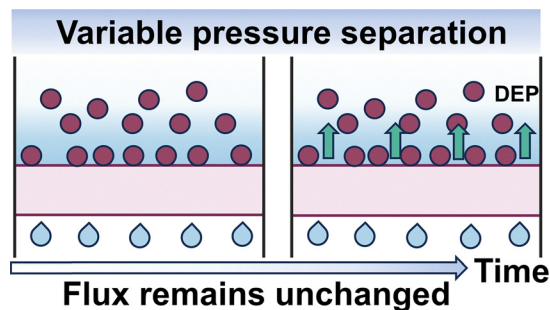
2111



### Cu–phytic acid nanozyme-induced cuproptosis therapy for the inhibition of tumor growth

Xiao-Wan Han, Xu Chen, Tian-Le Yang, Ying-Yi Luo, Rui-Xue Liang,\* San-Qi An\* and Xin-Li Liu\*

2123



### Piezoelectric PVDF membranes for emulsion separation with constant flux and high efficiency

Xin Zhong and Zhiguang Guo\*

