

# Nanoscale Horizons

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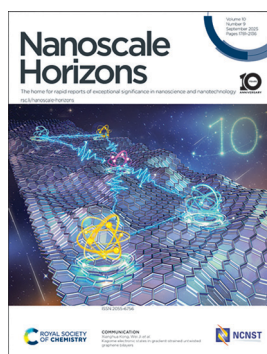
## IN THIS ISSUE

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

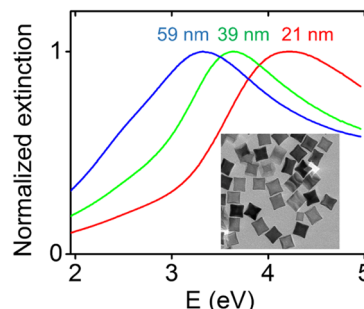


## COMMENTARYS

1793

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

Zhijia Geng and Jie Liu\*



# Environmental Science: Atmospheres

GOLD  
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and inspiring new ideas

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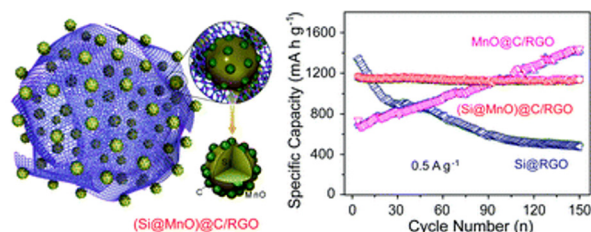


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Fundamental questions  
Elemental answers



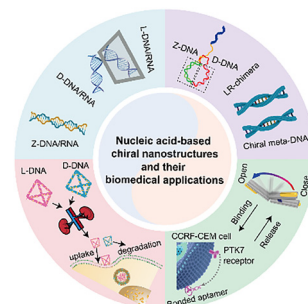
Hong Han Choo, Dan-Yang Wang and Qingyu Yan\*



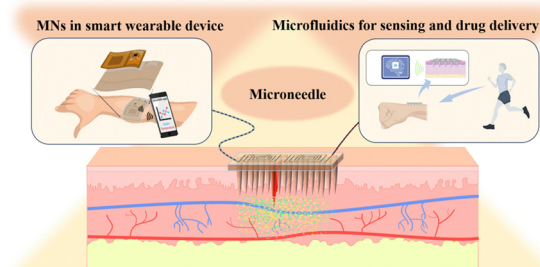
Reproduced from <https://doi.org/10.1039/C6NH00150E> with permission from the Royal Society of Chemistry

## 1802

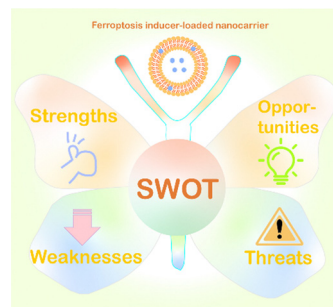
Shuhui Yu, Yiming Xie, Yunfei Jiao, Na Li\* and  
 Baoquan Ding\*



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

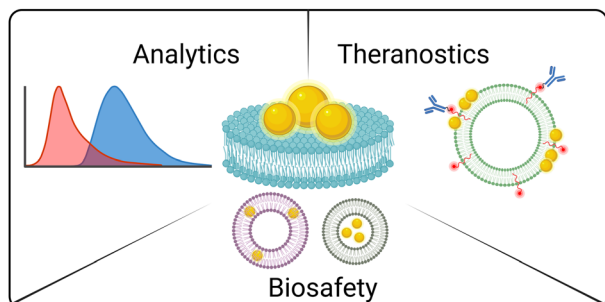


Qian Chen, Junli Zhu, Junhuang Jiang\* and  
Zhengwei Huang\*



## REVIEWS

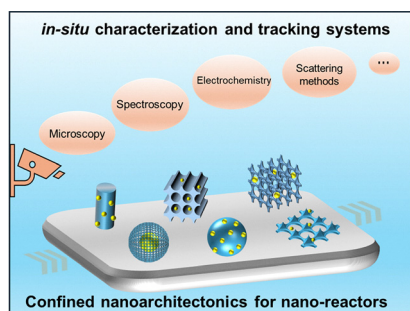
1863



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

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

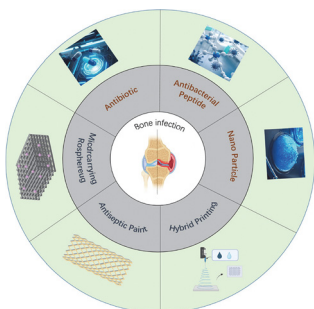
1882



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

Na Kong\* and Katsuhiko Ariga\*

1905

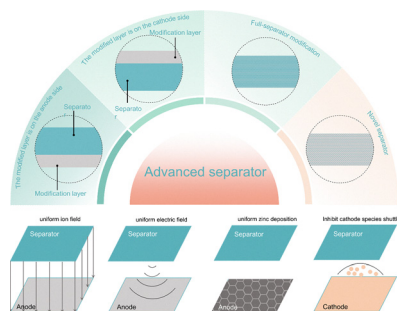


### The application and challenges of antimicrobial drug-loaded scaffold materials for the treatment of bone infections

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\*

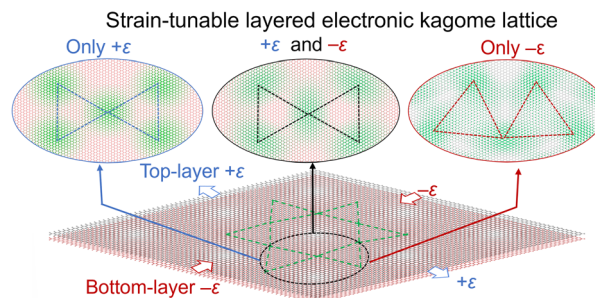


## COMMUNICATIONS

1956

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

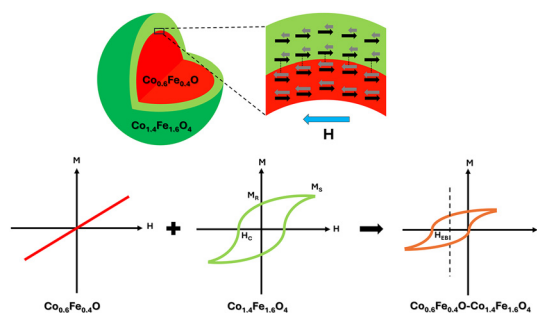
Zeyu Liu, Xianghua Kong,\* Zewen Wu, Linwei Zhou, Jingsi Qiao, Cong Wang, Shu Ping Lau and Wei Ji\*



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**

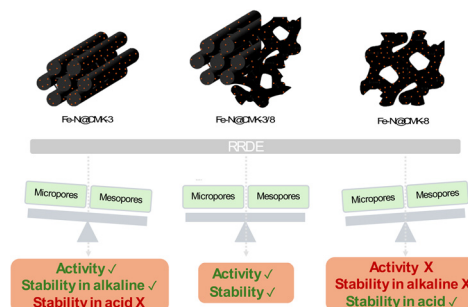
Samyog Adhikari, Roger D. Johnson, Pascal Manuel, Leonardo Lari, Le Duc Tung, Vlado K. Lazarov and Nguyen Thi Kim Thanh\*



1975

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

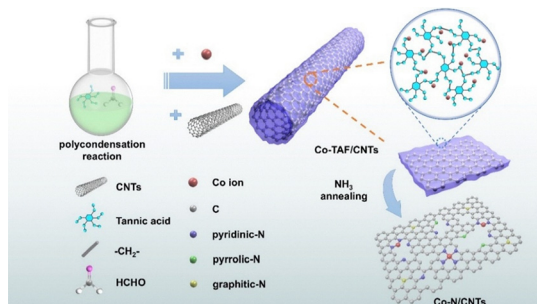
Giulia Gianola, Mirtha A. O. Lourenço,\* Luca Basile, Tiago Morais, Luis Mafra, Candido Pirri, Stefania Specchia and Juqin Zeng\*



1988

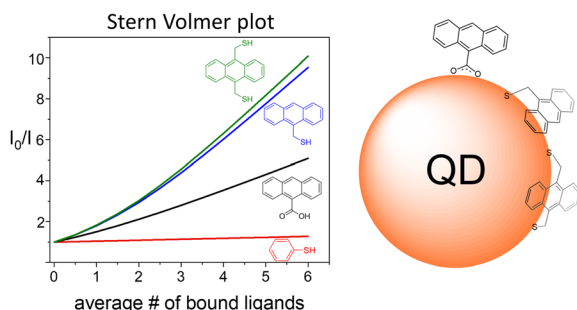
**Tannic acid-mediated surface engineering of CNTs for enhanced bifunctional oxygen electrocatalysis**

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



## COMMUNICATIONS

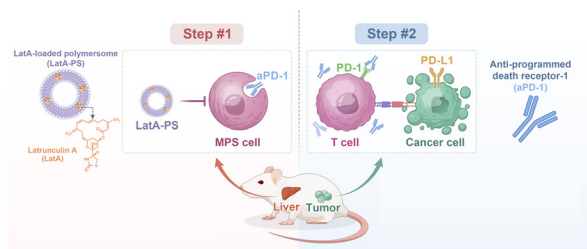
1997



### 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\*

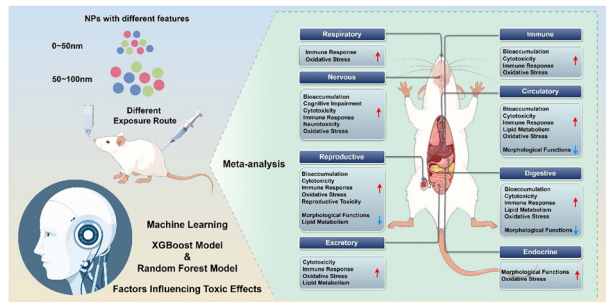
2003



### 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\*

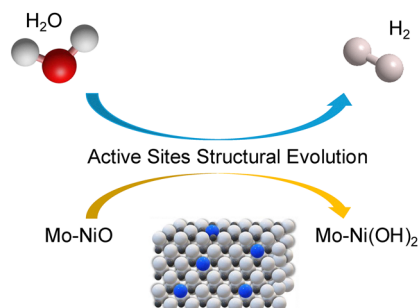
2017



### 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\*

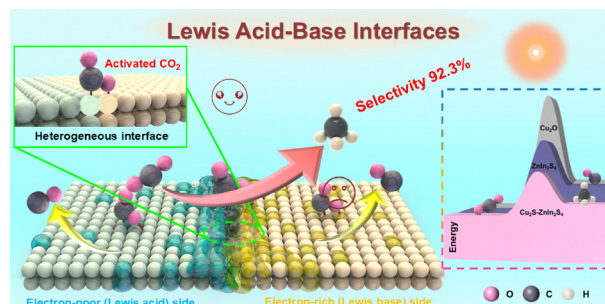


## COMMUNICATIONS

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

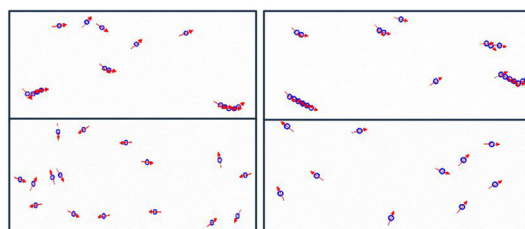
Yuanyuan Zhao, Kangjie Gao, Jiaxin Li, Huanhuan Liu,\* Fang Chen,\* Wentao Wang,\* Yijun Zhong and Yong Hu\*



2055

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

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

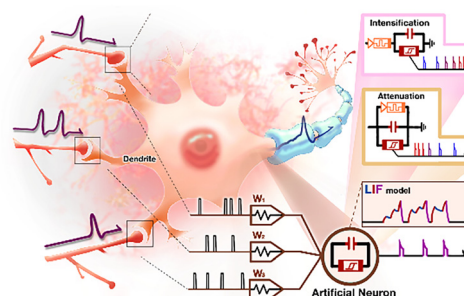


Snapshots of the particle configurations of surfactant-coated Co ferrite multicore (left), FeCo alloy (right) particles in the fluid by switching on (upper panels) an in-plane magnetic field at time  $t = 10^6$  MCS and after switching off the field at  $t = 1.1 \times 10^6$  MCS. Arrows show their corresponding spin orientation.

2068

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

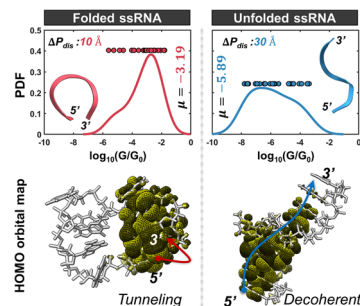
Shuai-Ming Chen, Li-Chung Shih, Jing-Ci Gao, Song-Xian You, Kuan-Ting Chen, Pei-Lin Lin, Kai-Shin Hsu, Chi-Chien Chen, Wei-Lun Chen and Jen-Sue Chen\*



2080

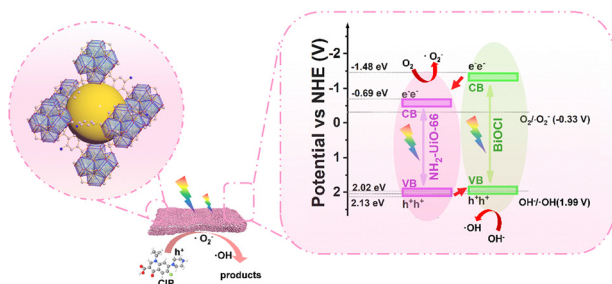
### Conformation driven conductance modulation in single-stranded RNA (ssRNA)

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



## COMMUNICATIONS

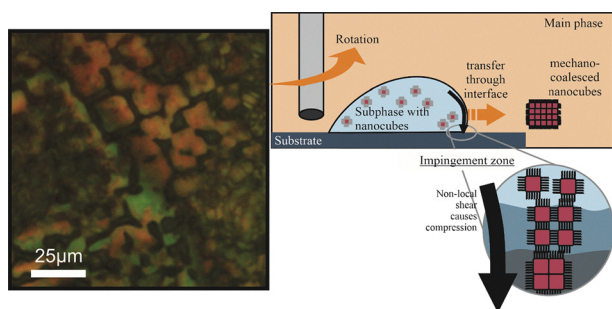
2094



### 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\*

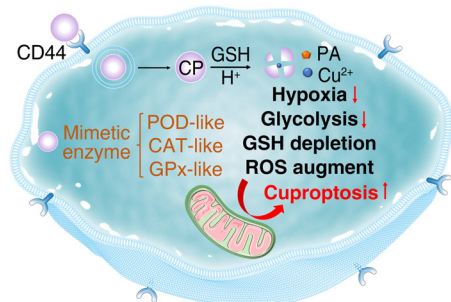
2104



### 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\*

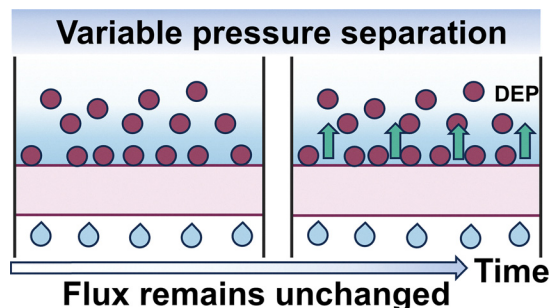
2111



### 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\*

