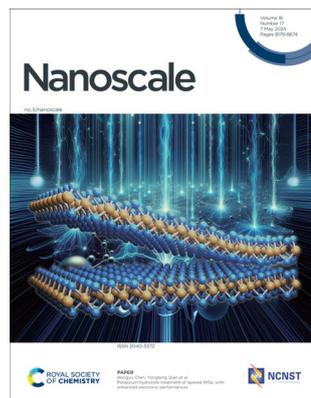


## IN THIS ISSUE

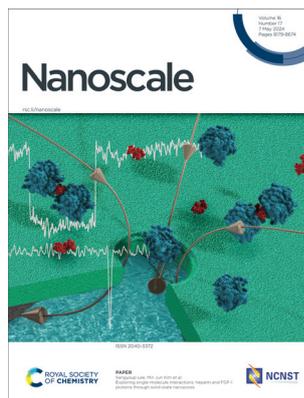
ISSN 2040-3372 CODEN NANOHL 16(17) 8179–8674 (2024)



### Cover

See Hongyu Chen,  
Yongteng Qian *et al.*,  
pp. 8345–8351.

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8345.



### Inside cover

See Sangyoun Lee,  
Min Jun Kim *et al.*,  
pp. 8352–8360.

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Madhav L. Ghimire,  
Sangyoun Lee and  
Min Jun Kim from  
*Nanoscale*, 2024, **16**, 8352.

## EDITORIAL

8193

### Introduction to fundamental processes in optical nanomaterials

Alison M. Funston,\* Eva Hemmer,\*  
Arindam Chowdhury\* and Jonathan G. C. Veinot\*

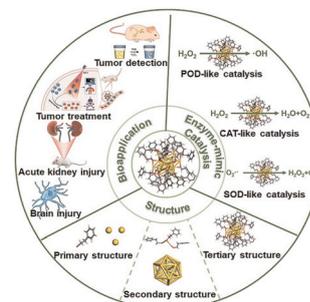


## REVIEWS

8196

### Enzyme-mimic catalytic activities and biomedical applications of noble metal nanoclusters

Xinxin Pan, Yidan Yao, Manxi Zhang, Xun Yuan,  
Qiaofeng Yao\* and Wenping Hu



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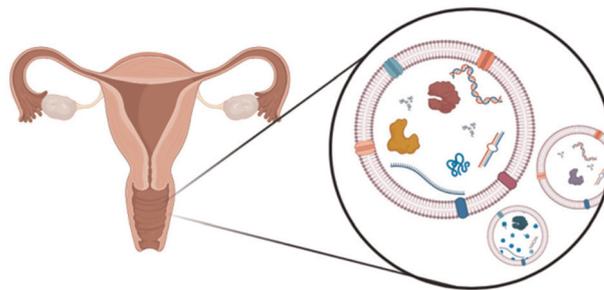
Fundamental questions  
Elemental answers

## REVIEWS

8216

### Microorganism-derived extracellular vesicles: emerging contributors to female reproductive health

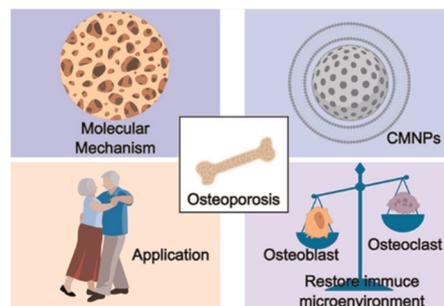
Kaitlyn A. Moore, Alyssa P. Petersen and Hannah C. Zierden\*



8236

### Cell membrane coated nanoparticles: cutting-edge drug delivery systems for osteoporosis therapy

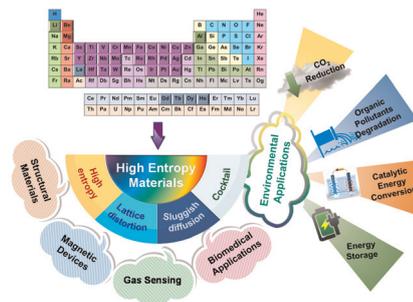
Jiewen Liao, Li Lu, Xiangyu Chu, Yuan Xiong, Wu Zhou, Faqi Cao, Peng Cheng, Mohammad-Ali Shahbazi,\* Guohui Liu\* and Bobin Mi\*



8256

### High-entropy-based nano-materials for sustainable environmental applications

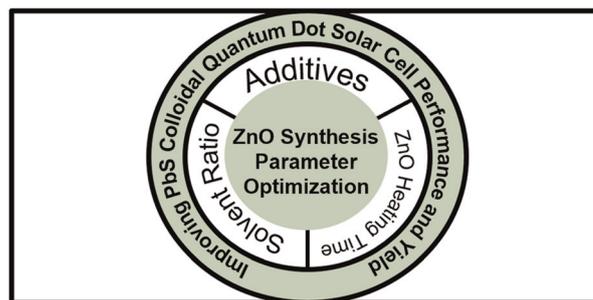
Shubhasikha Das, Shamik Chowdhury\* and Chandra Sekhar Tiwary\*



8273

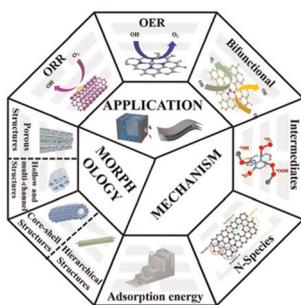
### Role of the ZnO electron transport layer in PbS colloidal quantum dot solar cell yield

Arlene Chiu, Chengchangfeng Lu, Dana E. Kachman, Eric Rong, Sreyas M. Chintapalli, Yida Lin, Daniel Khurgin and Susanna M. Thon\*



## REVIEWS

8286

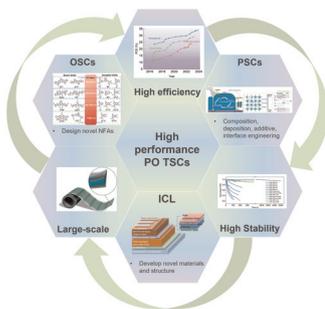


### Electrospinning-derived transition metal/carbon nanofiber composites as electrocatalysts for Zn-air batteries

Chengxiao Xu, Yuzheng Li, Daming Li, Yingjie Zhang, Bo Liu, M. D. Hasan Akhon and Peipei Huo\*

## MINIREVIEWS

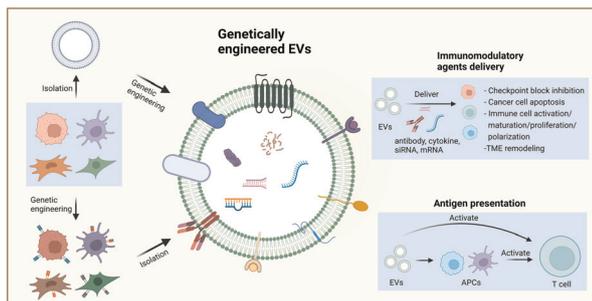
8307



### Opportunities and challenges in perovskite–organic thin-film tandem solar cells

Xin Meng, Zhengrong Jia, Xiuxiu Niu, Chunnian He\* and Yi Hou\*

8317

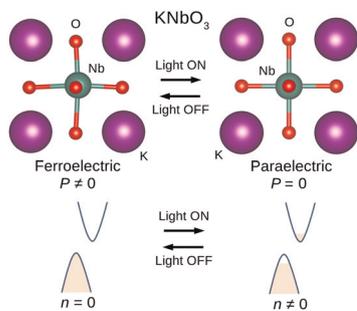


### Genetically engineered cell-derived nanovesicles for cancer immunotherapy

Shan He and Zongmin Zhao\*

## COMMUNICATION

8335



### Light-driven dynamical tuning of the thermal conductivity in ferroelectrics

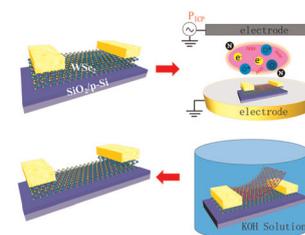
Claudio Cazorla, Sebastian Bichelmaier, Carlos Escorihuela-Sayalero, Jorge Íñiguez, Jesús Carrete and Riccardo Rurali\*



8345

### Potassium hydroxide treatment of layered $\text{WSe}_2$ with enhanced electronic performances

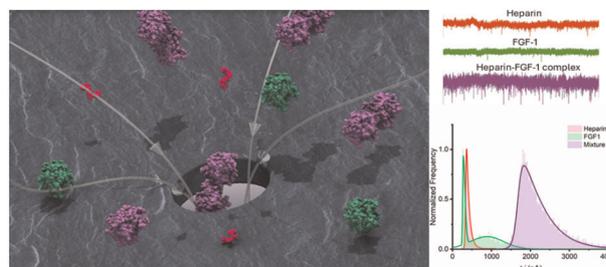
Dewu Yue, Cheng Tang, Jiajing Wu, Xiaohui Luo, Hongyu Chen\* and Yongteng Qian\*



8352

### Exploring single-molecule interactions: heparin and FGF-1 proteins through solid-state nanopores

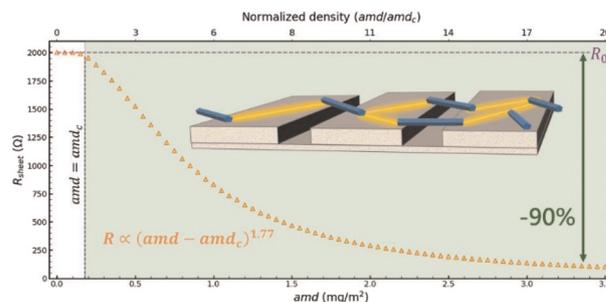
Navod Thyashan, Madhav L. Ghimire, Sangyoup Lee\* and Min Jun Kim\*



8361

### Bridge percolation: electrical connectivity of discontinued conducting slabs by metallic nanowires

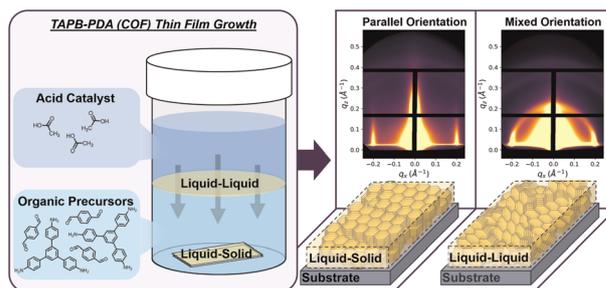
A. Baret,\* L. Bardet, D. Oser, D. P. Langley, F. Balty, D. Bellet and N. D. Nguyen\*



8369

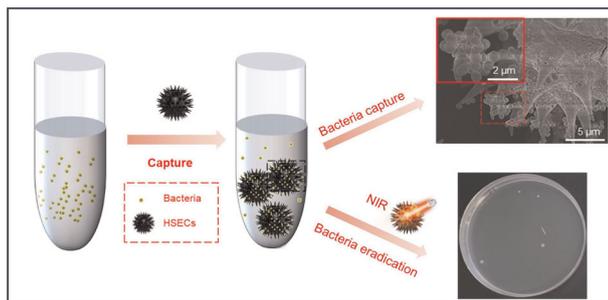
### Orientation and morphology control in acid-catalyzed covalent organic framework thin films

Dayanni D. Bhagwandin, Kirt A. Page, Ly D. Tran, Yao Yao, Alexander Reidell, Christopher Muratore, Qiyi Fang, Aleksey Ruditskiy, Cheri M. Hampton, W. Joshua Kennedy, Lawrence F. Drummy, Yu Zhong, Tobin J. Marks, Antonio Facchetti, Jun Lou, Hilmar Koerner, Luke A. Baldwin and Nicholas R. Glavin\*



## PAPERS

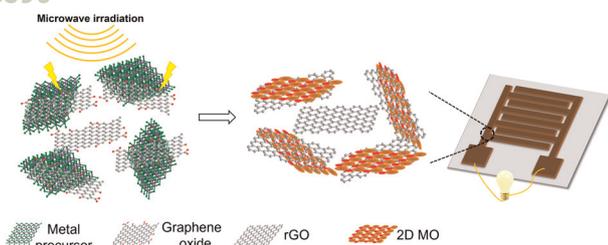
8378



### Sunflower pollen-derived microcapsules adsorb light and bacteria for enhanced antimicrobial photothermal therapy

Yao Yang, Bin Wang, Qian Liu, Zhenghua Wei, Ziyi Mou, Quan Li, Chunfa Chen, Zaichun You, Bang Lin Li, Guansong Wang,\* Zhi Xu\* and Hang Qian\*

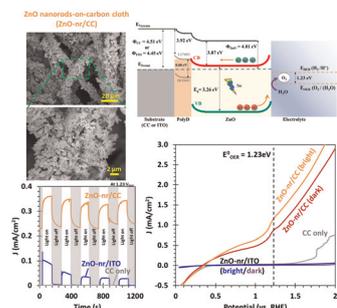
8390



### Scalable solid-state synthesis of 2D transition metal oxide/graphene hybrid materials and their utilization for microsupercapacitors

Muxuan Yang, Pratik Kasbe, Jinyu Bu and Weinan Xu\*

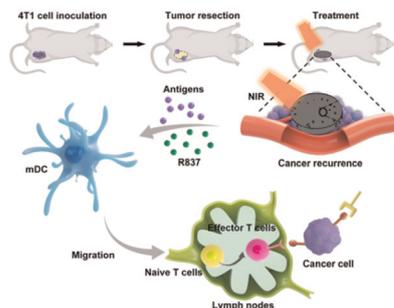
8401



### Enhanced photoelectrochemical water splitting using carbon cloth functionalized with ZnO nanostructures via polydopamine assisted electroless deposition

Ian P. Seetoh, Akhil K. Ramesh, Wei Xin Tan and Chang Quan Lai\*

8417



### A photo-responsive self-healing hydrogel loaded with immunoadjuvants and MoS<sub>2</sub> nanosheets for combating post-resection breast cancer recurrence

Siyu Wang, Zhuoping Qian, Huaxin Xiao, Guangwen Yang, Ziyi Zhu, Yubin Gu, Junjie Song, Xin Zhang, Xinxuan Huang, Lixing Weng, Yu Gao,\* Wenjing Yang\* and Lianhui Wang\*

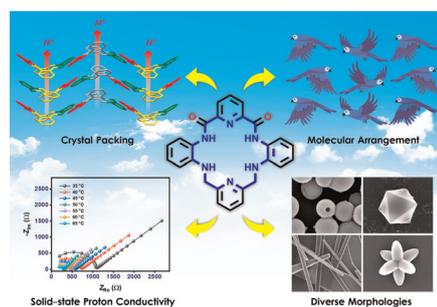


## PAPERS

8427

### Self-assembly of water-filled molecular saddles to generate diverse morphologies and high proton conductivity

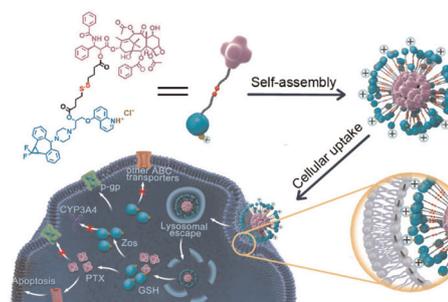
Nyaya Prakash Pradhan, Sweetey Gupta, Swapnendu Narayan Ghosh, Amit Paul,\* Santanu Talukder\* and Aasheesh Srivastava\*



8434

### A convenient protonated strategy for constructing nanodrugs from hydrophobic drug-inhibitor conjugates to reverse tumor multidrug resistance

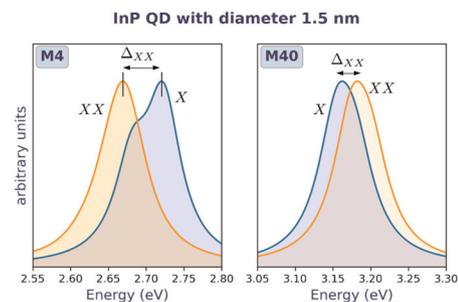
Penghui Wang, Yuling Wang, Xuelin Xia, Jingchun Wu, Jintang Lin, Wei Huang\* and Deyue Yan\*



8447

### Optical gain and entanglement through dielectric confinement and electric field in InP quantum dots

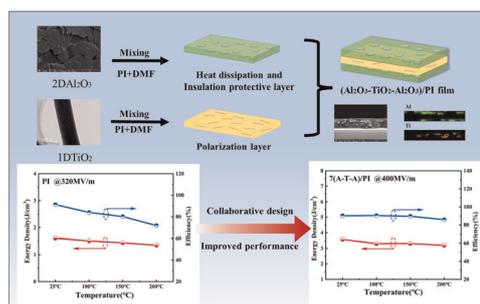
Christos S. Garoufalidis,\* David B. Hayrapetyan, Hayk A. Sarkisyan, Paytsar A. Mantashyan, Zaiping Zeng, Iosif Galanakis, Gabriel Bester, Torben Steenbock and Sotirios Baskoutas\*



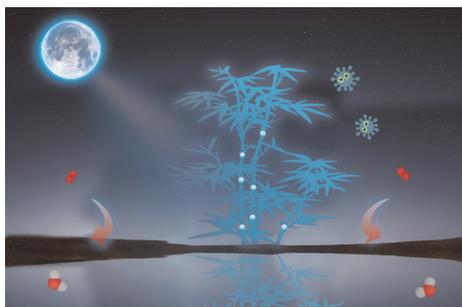
8455

### Research on the energy storage performance of laminated composites based on multidimensional co-design in a broad temperature range

Yipeng Tan, Jiayu Deng, Hang Gao, Ziwen Feng, Linfei Lu, Jiheng Wang, Zhongbin Pan, Lingmin Yao\* and Qinglin Deng\*



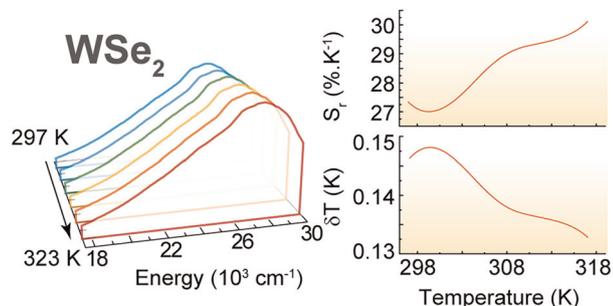
8462



### Bamboo-like nitrogen-doped carbon supported chlorine-doped Fe<sub>2</sub>P as an antibacterial oxygen reduction catalyst

Kai Cheng, Demin Jiang, Sainan Cai, Shikuo Li\* and Yuqiao Wang\*

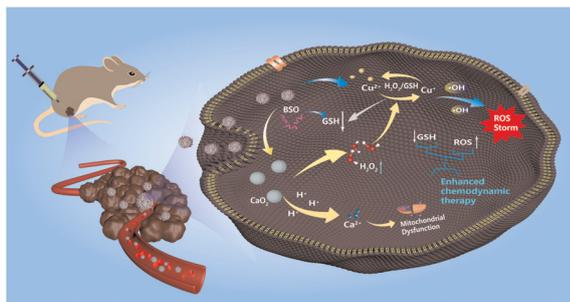
8470



### Morphology does not matter: WSe<sub>2</sub> luminescence nanothermometry unravelled

Paloma Martínez-Merino,\* Miguel A. Hernández-Rodríguez, José C. Piñero, Carlos D. S. Brites,\* Rodrigo Alcántara\* and Javier Navas\*

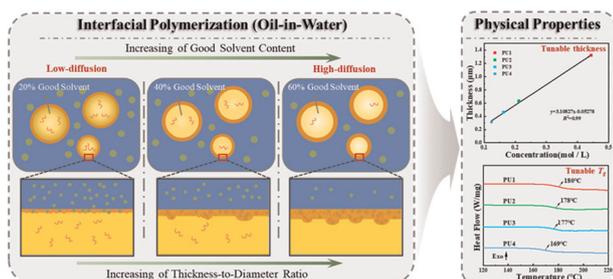
8479



### A ROS storm generating nanocomposite for enhanced chemodynamic therapy through H<sub>2</sub>O<sub>2</sub> self-supply, GSH depletion and calcium overload

Yong Li, Jing Wang, Tao Zhu, Ying Zhan, Xiaoli Tang, Jianying Xi, Xiaohui Zhu, Yong Zhang\* and Jinliang Liu\*

8495



### Synthesis of tunable thickness-to-diameter ratio microcapsules via a diffusion-controlled process for temperature-responsive release

Jinshun Zhao, Chun Li, Jiayang Sui, Tong Feng, Chonghui Li, Lifei Liu, Huimin Xue, Weizhen Zhao\* and Xuhuang Chen\*

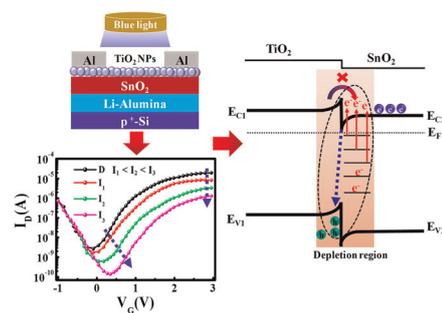


## PAPERS

8504

### Blue sensitive sub-band gap negative photoconductance in SnO<sub>2</sub>/TiO<sub>2</sub> NP bilayer oxide transistor

Utkarsh Pandey, Nila Pal, Arpan Ghosh, Swati Suman, Sajal Biring\* and Bhola N. Pal\*



8514

### Origami nanogap electrodes for reversible nanoparticle trapping

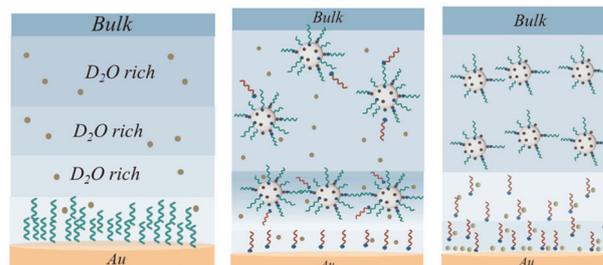
Itir Bakis Dogru-Yuksel,\* Allard P. Mosk and Sanli Faez



8521

### Elucidating the assembly of nanoparticle organic hybrid materials (NOHMs) near an electrode interface with varying potential using neutron reflectivity

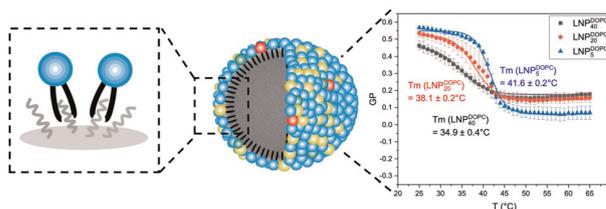
Md Ashraful Haque, Sara T. Hamilton, Tony G. Feric, Ah-Hyung Alissa Park and Mark D. Dadmun\*



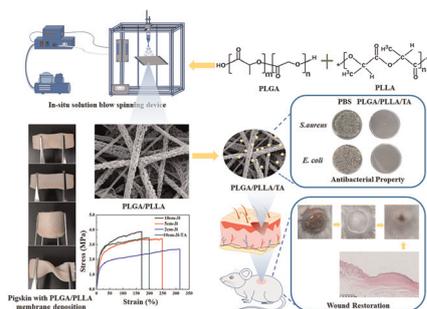
8533

### Membrane fluidity properties of lipid-coated polylactic acid nanoparticles

Yuanqing Gu and Björn M. Reinhard\*



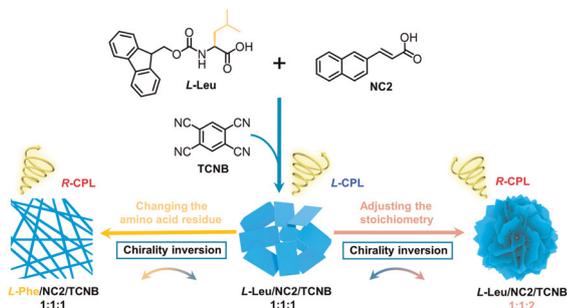
8546



### Automatic *in situ* short-distance deposition of PLGA/PLLA composite nanofibrous membranes for personalized wound dressings

Yuzhi Liu, Bihan Xia, Rui Zhao, Mei Qin, Xuan Weng, Zhi Zeng,\* Kai Deng\* and Hai Jiang\*

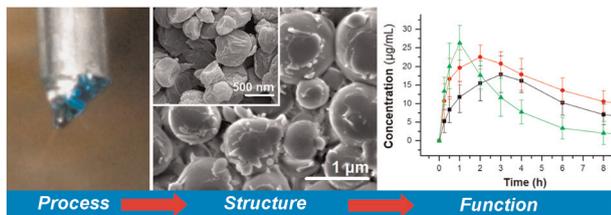
8563



### Achiral substituent- and stoichiometry-controlled inversion of supramolecular chirality and circularly polarized luminescence in ternary co-assemblies

Fang Wang,\* Liyun Lai, Min Liu, Quan Zhou\* and Shaoliang Lin\*

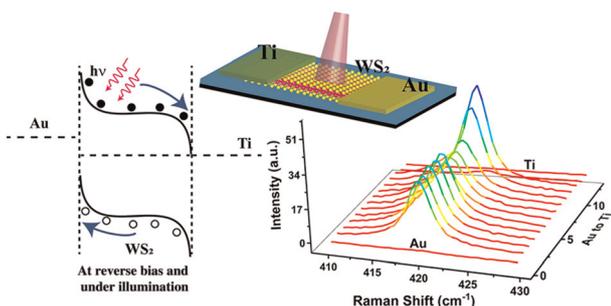
8573



### Electrospayed Eudragit RL100 nanoparticles with Janus polyvinylpyrrolidone patches for multiphase release of paracetamol

Jianfeng Zhou, Hao Pan,\* Wenjian Gong, Deng-Guang Yu\* and Yuhao Sun\*

8583



### Asymmetric contact-induced selective doping of CVD-grown bilayer WS<sub>2</sub> and its application in high-performance photodetection with an ultralow dark current

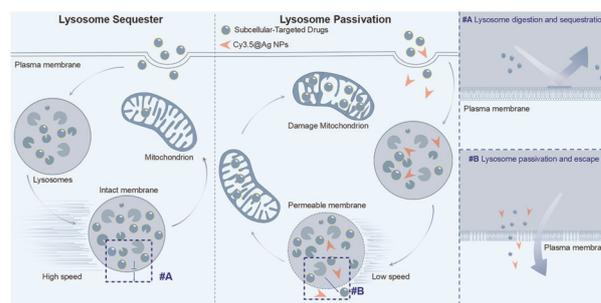
Abdul Kaium Mia, M. Meyyappan and P. K. Giri\*



8597

## Lysosome passivation triggered by silver nanoparticles enhances subcellular-targeted drug therapy

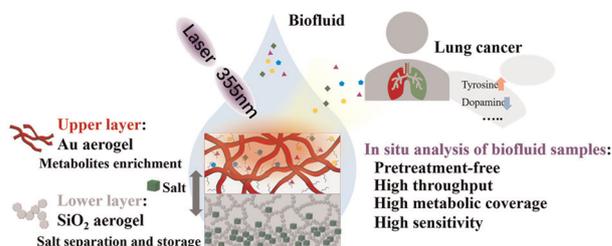
Xueqian Wang, Shulin Zhao, Guiqian Fang, Ran Wang, Xinxing Lyu, Xintian Shao, Peixue Ling, CaiCai Meng,\* Jia Chen\* and Yanling Mu\*



8607

## Hierarchical superstructure aerogels for *in situ* biofluid metabolomics

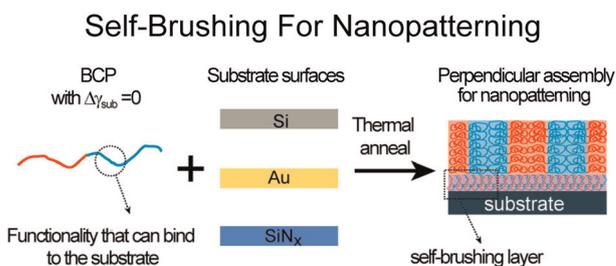
Siyu Chen, Keyuan Pu, Yue Wang, Yang Su, Jiamin Qiu, Xin Wang, Kunbin Guo, Jun Hu, Huiwen Wei, Hongbiao Wang, Xiaolong Wei, Yuping Chen, Wen Lin,\* Wenxiu Ni, Yan Lin, Jiayang Chen, Samuel Kin-Man Lai and Kwan-Ming Ng\*



8618

## Self-brushing for nanopatterning: achieving perpendicular domain orientation in block copolymer thin films

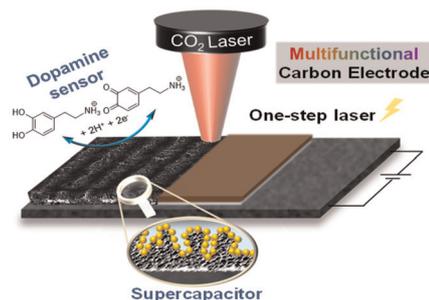
Hongbo Feng,\* Wen Chen, Gordon S. W. Craig, Stuart J. Rowan and Paul F. Nealey



8627

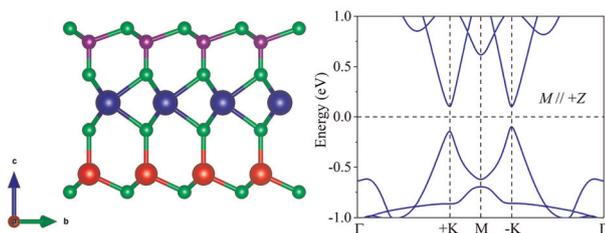
## Sustainable design of high-performance multifunctional carbon electrodes by one-step laser carbonization for supercapacitors and dopamine sensors

Sanghwa Moon, Evgeny Senokos, Vanessa Trouillet, Felix F. Loeffler\* and Volker Strauss\*



## PAPERS

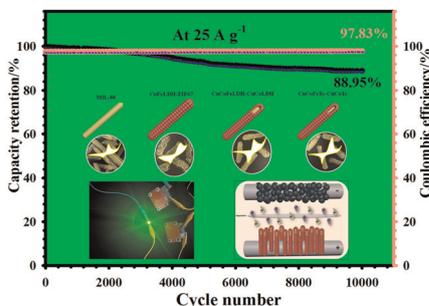
8639



### Tunable abundant valley Hall effect and chiral spin–valley locking in Janus monolayer VCGeN<sub>4</sub>

Kang Jia, Xiao-Jing Dong, Sheng-Shi Li, Wei-Xiao Ji and Chang-Wen Zhang\*

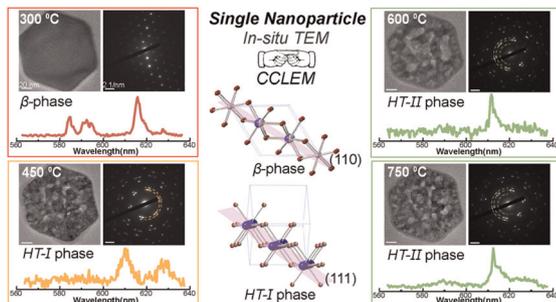
8650



### Exploring the potential of CuCoFeTe@CuCoTe yolk-shelled microrods in supercapacitor applications

Dorsa Dehghanpour Farashah, Maliheh Abdollahi, Akbar Mohammadi Zardkhoshoui\* and Saied Saeed Hosseiny Davarani\*

8661



### *In situ* observation of thermal-driven structural transitions of a β-NaYF<sub>4</sub> single nanoparticle aided with correlative cathodoluminescence electron microscopy

Mingxing Li, Xiaoge Wang, Xiaofan Cao, Zhiqun He, Chunjun Liang, Jing Ju\* and Fangtian You\*

## CORRECTION

8672

### Correction: Lattice engineering of noble metal-based nanomaterials *via* metal–nonmetal interactions for catalytic applications

Long Zheng, Lei Xu, Ping Gu and Ye Chen\*

