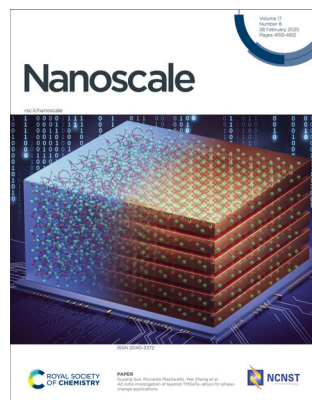


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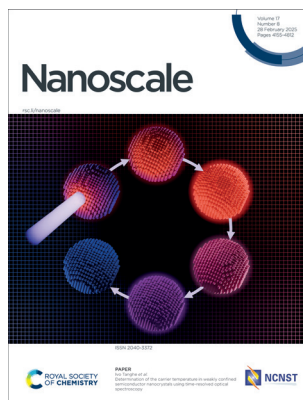
ISSN 2040-3372 CODEN NANOHL 17(8) 4155–4812 (2025)



### Cover

See Suyang Sun, Riccardo Mazzarello, Wei Zhang *et al.*, pp. 4372–4380.

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### Inside cover

See Ivo Tanghe *et al.*, pp. 4381–4388.

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## EDITORIAL

4172

### Nanocatalysis—facing a sustainable future

Zhiqun Lin,\* In Young Kim\* and Michelle L. Personick\*

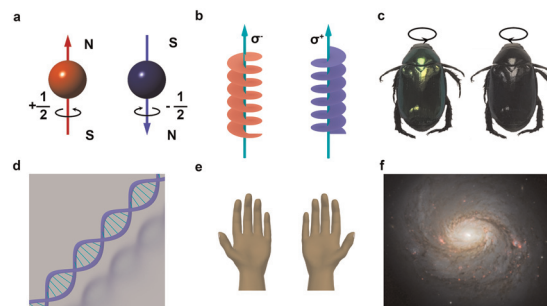


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### Ultrafast chirality-dependent dynamics from helicity-resolved transient absorption spectroscopy

Xiu Zhang, Lu Zhang, Junzhi Zhu, Tingxiao Qin, Haiyun Huang, Baixu Xiang, Haiyun Liu\* and Qihua Xiong\*



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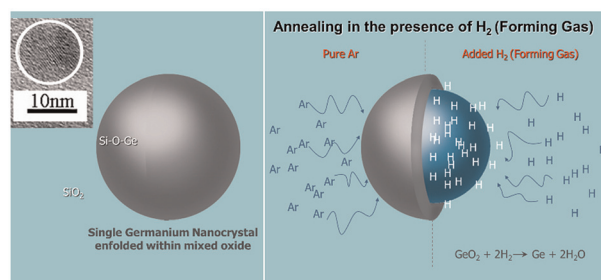
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## REVIEWS

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### Germanium nanocrystal non-volatile memory devices: fabrication, charge storage mechanism and characterization

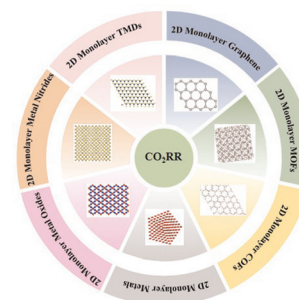
Wai Kin Chim



4212

### 2D monolayer electrocatalysts for CO<sub>2</sub> electroreduction

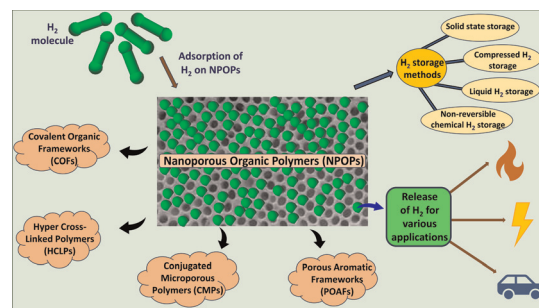
Xuemin An and Deren Yang\*



4226

### Recent advances in nanoporous organic polymers (NPOPs) for hydrogen storage applications

Shagufta Jabin, Sadiqa Abbas, Priti Gupta, Sapana Jadoun,\* Anupama Rajput and Prachika Rajput

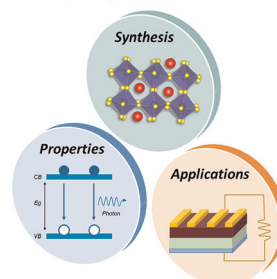


4250

### From synthesis to application: a review of BaZrS<sub>3</sub> chalcogenide perovskites

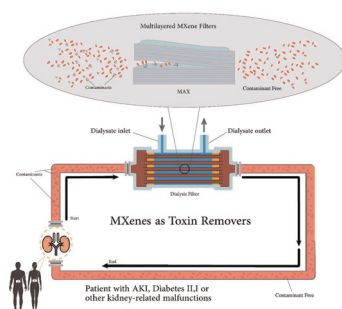
Shubhanshu Agarwal, Kiruba Catherine Vincent and Rakesh Agrawal\*

#### Promising BaZrS<sub>3</sub> Chalcogenide Perovskite



## REVIEWS

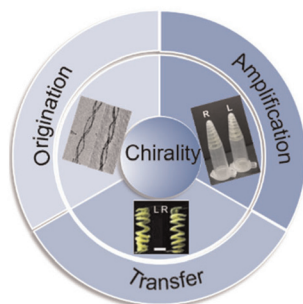
4301



### Innovative applications of MXenes in dialysis: enhancing filtration efficiency

Pouya Javaherchi, Atefeh Zarepour, Arezoo Khosravi, Parisa Heydari, Siavash Irvani\* and Ali Zarrabi\*

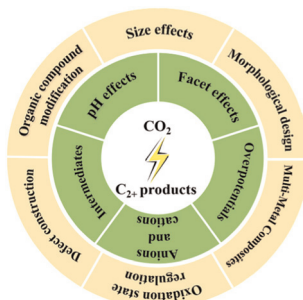
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### Chirality of sub-nanometer nanowires/nanobelts

Kaiyang Xing, Junfeng Hui and Simin Zhang\*

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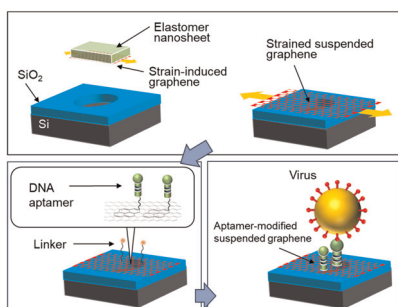


### Electrocatalytic reduction of CO<sub>2</sub> to produce the C<sub>2+</sub> products: from selectivity to rational catalyst design

Xu-Dong Shi, Rui-tang Guo,\* Heng-fei Cui, Cong Liu and Wei-guo Pan\*

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### Elastomer-assisted graphene transfer technique for enhanced resonance characteristics in chemisorption-based graphene resonant mass sensors

Motoki Kato, Ken Arano, Masato Saito, Toshinori Fujie, Yuki Imaizumi, Tatsuro Goda, Yong-Joon Choi, Toshihiko Noda, Kazuaki Sawada and Kazuhiro Takahashi\*

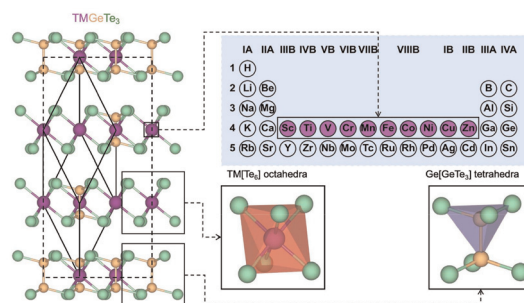


## PAPERS

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**Ab initio investigation of layered TMGeTe<sub>3</sub> alloys for phase-change applications**

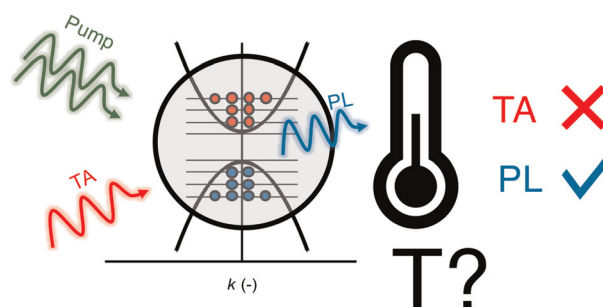
Yihui Jiang, Suyang Sun,\* Hanyi Zhang, Xiaozhe Wang, Yibo Lei, Riccardo Mazzarello\* and Wei Zhang\*



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**Determination of the carrier temperature in weakly confined semiconductor nanocrystals using time-resolved optical spectroscopy**

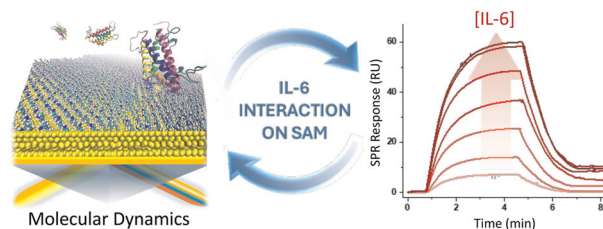
Ivo Tanghe,\* Chao-Yang Lin, Isabella Wagner, Margarita Samoli, Servet Ataberk Cayan, Zeger Hens, Justin Hodgkiss, Kai Chen and Pieter Geiregat



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**Protein–surface interactions in nano-scale biosensors for IL-6 detection using functional monolayers**

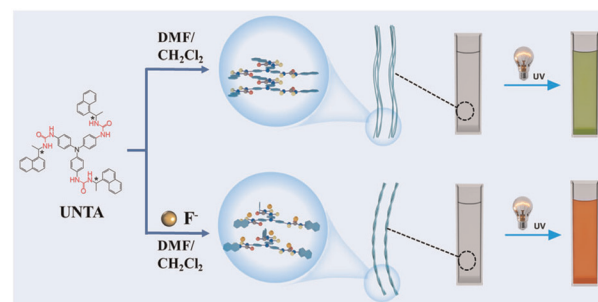
Serena Giberti, Sutapa Dutta, Stefano Corni, Marco Frasconi\* and Giorgia Brancolini\*



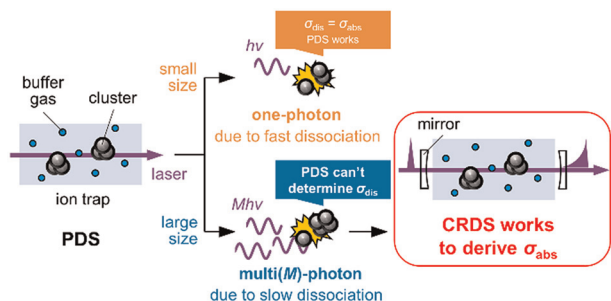
4400

**Fluoride binding-modulated supramolecular chirality of urea-containing triarylamine and its photo-manifestation**

Sijia Ma, Xin Wen, Yuqian Jiang, Jian Jiang,\* Wenchao Hao, Li Zhang\* and Minghua Liu\*



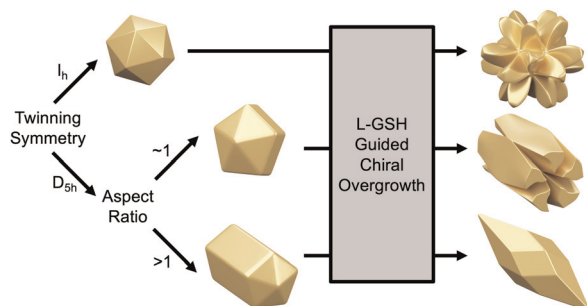
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### Photoabsorption of silver cluster cations in an ion trap: nonlinear action spectra via multi-photon dissociation vs. directly measured linear absorption spectra

Satoshi Kono, Shuhei Fujimoto, Tomonori Ito, Masashi Arakawa, Takuya Horio and Akira Terasaki\*

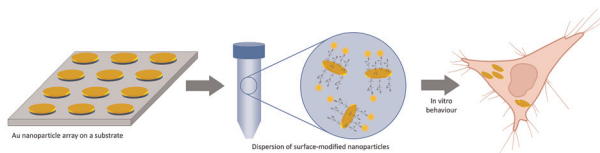
4415



### 532- and 52-symmetric Au helicoids synthesized through controlled seed twinning and aspect ratio

Jack S. Googasian, Maxwell P. Perkins, Jun Chen and Sara E. Skrabalak\*

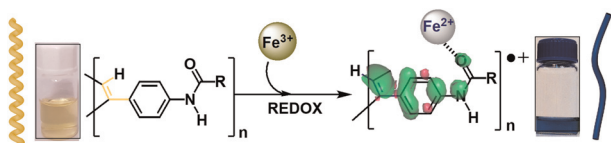
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### Fabrication of nanoparticles with precisely controllable plasmonic properties as tools for biomedical applications

Pauline Kolar-Hofer, Giulia Zampini, Christian Georg Derntl, Enrica Soprano, Ester Polo, Pablo del Pino, Nurgul Kereyeva, Moritz Eggeling, Leoni Breth, Michael J. Haslinger, Michael Mühlberger, Peter Ertl, Astrit Shoshi, Julian Hartbaum, Michael Jurisch, Beatriz Pelaz\* and Stefan Schrittwieser\*

4439



### Colorimetric detection of oxidizing metal ions using anilide-poly(phenylacetylene)s

Manuel Núñez-Martínez, Manuel Fernández-Míguez, Emilio Quiñoá and Félix Freire\*

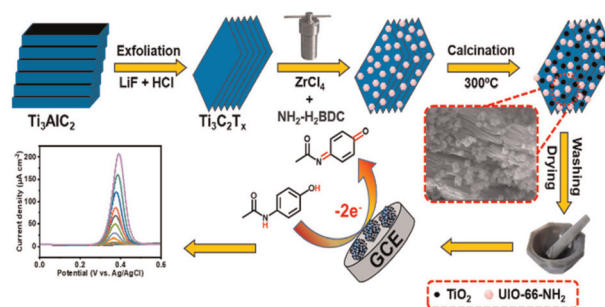


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**In situ synthesis of a UIO-66-NH<sub>2</sub>@Ti<sub>3</sub>C<sub>2</sub> composite for advanced electrochemical detection of acetaminophen**

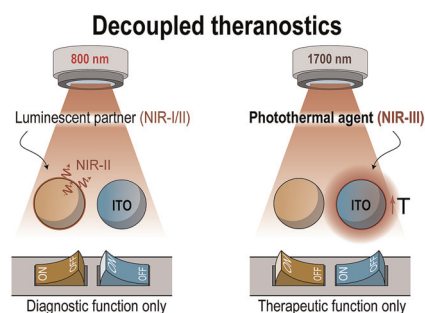
Muhammad Hussnain Afzal, Wajeeha Pervaiz, Zhuo Huang, Zhengyun Wang, Guangfang Li\* and Hongfang Liu\*



4455

**Plasmonic heating by indium tin oxide nanoparticles: spectrally enabling decoupled near-infrared theranostics**

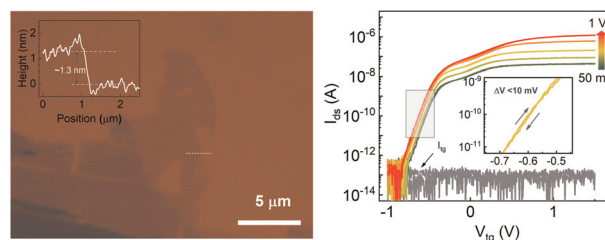
Nicol Caetano-Zeballos, Leyre Aldaz-Caballero, Jesús Giráldez-Martínez, Lucas V. Besteiro, Marta Quintanilla, Riccardo Marin\* and Antonio Benayas\*



4465

**High-performance van der Waals stacked transistors based on ultrathin GaPS<sub>4</sub> dielectrics**

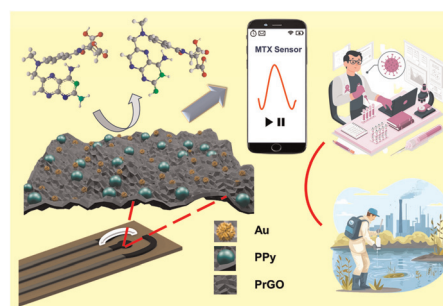
Zhilin Xiao, Binghuan Zeng, Fang Xu, Guangjian Liu, Hua Zhou, Jiaqi Chen, Linfeng Fei, Xiaxia Liao,\* Jiaren Yuan and Yangbo Zhou



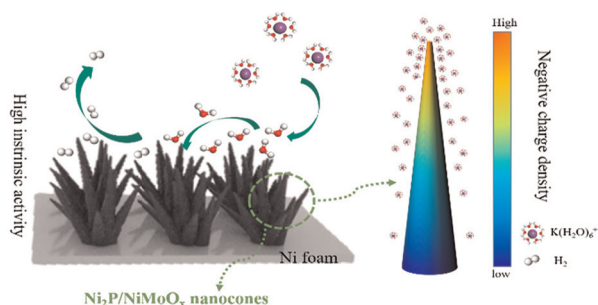
4472

**Eco-friendly synthesis of a porous reduced graphene oxide–polypyrrole–gold nanoparticle hybrid nanocomposite for electrochemical detection of methotrexate using a strip sensor**

Reshmi A. Sukumaran, Kavitha Lakavath, V. V. N. Phani Kumar, Sampath Karingula, Kuldeep Mahato and Yugender Goud Kotagiri\*



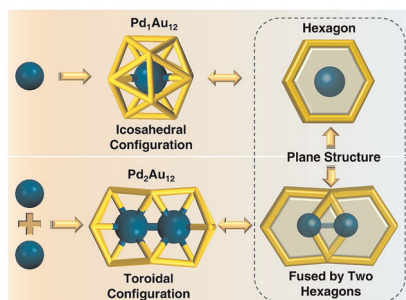
4485



### A Ni<sub>2</sub>P/NiMoO<sub>x</sub> nanocone electrocatalyst for efficient hydrogen evolution: tip-enhanced local electric field effect

Le Yu, Xia Chen, Shunda Cheng, Tingfeng Zhong, Ruifan Zhou, Zihua Deng\* and Li Li

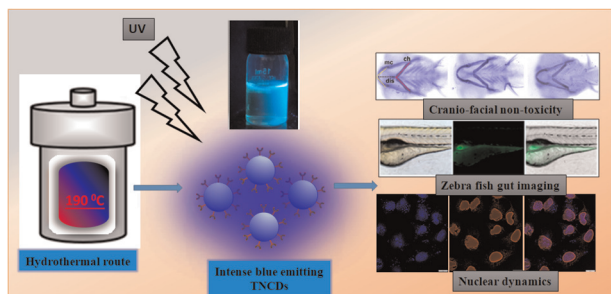
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### Heteroatom number-dependent cluster frameworks in structurally comparable Pd–Au nanoclusters

Ziwei Fu, Chen Li, Ye Tian, Fakhari Alam, Daqiao Hu, Honglei Shen,\* Xi Kang\* and Manzhou Zhu

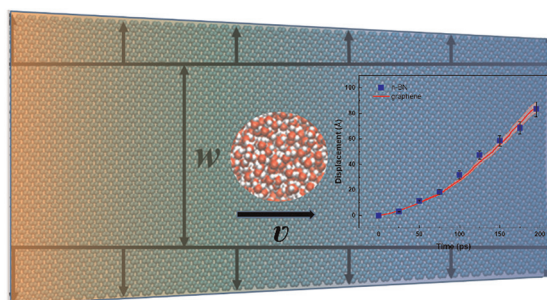
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### Fluorescence tunable carbon dots for *in vitro* nuclear dynamics and gastrointestinal imaging in live zebrafish and their *in vivo* toxicity evaluation by cardio-craniofacial disfunction assessment

Bijaideep Dutta,\* Ashwini Waghmare, Sourav Kumar Das, Yogesh Bhargava, Amit Kumar, A. K. Debnath, K. C. Barick\* and P. A. Hassan

4524



### Superfast nanodroplet propulsion in 2D nanochannels tuned by strain gradients

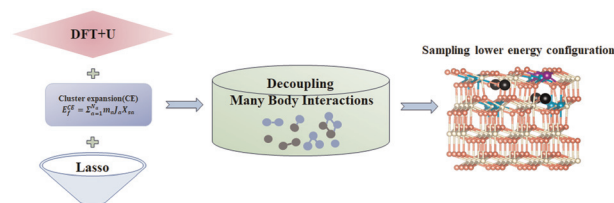
Chun Li, Jun Yang, Yujuan Wang,\* Guangtai Zhang and Kedong Bi\*



4531

### Decoupling many-body interactions in the CeO<sub>2</sub>(111) oxygen vacancy structure with statistical learning and cluster expansion

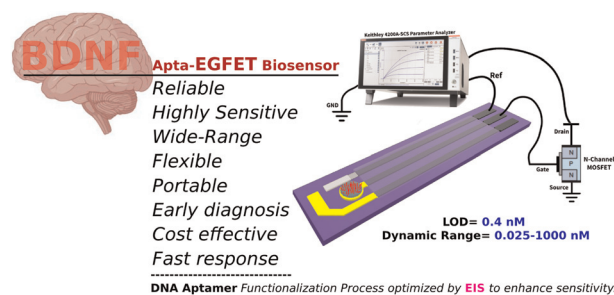
Yujing Zhang, Zhong-Kang Han, Beien Zhu, Xiaojuan Hu, Maria Troppenz, Santiago Rigamonti, Hui Li,\* Claudia Draxl, M. Verónica Ganduglia-Pirovano\* and Yi Gao\*



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### Enhanced detection of Brain-Derived Neurotrophic Factor (BDNF) using a reduced graphene oxide field-effect transistor aptasensor

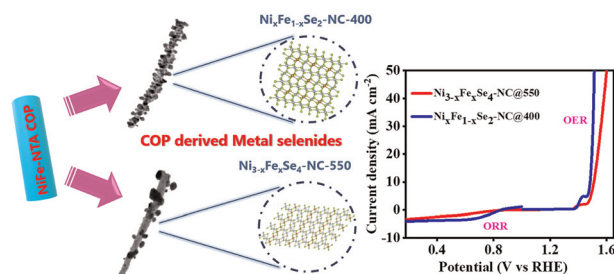
Mostafa Salehrozveh, Robin Bonné, Peeyush Kumar, Farbod Abazar, Parisa Dehghani,\* Ivan Mijakovic\* and Vellaisamy A. L. Roy



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### Phase-dependent electronic structure modulation of nickel selenides by Fe doping for enhanced bifunctional oxygen electrocatalysis

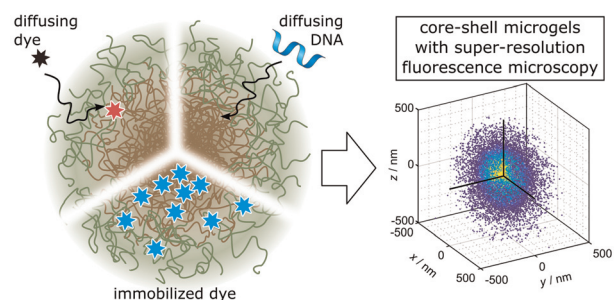
Vigneshraaj A. S., Siva Kumar Ramesh, Jinkwon Kim and Kavita Pandey\*



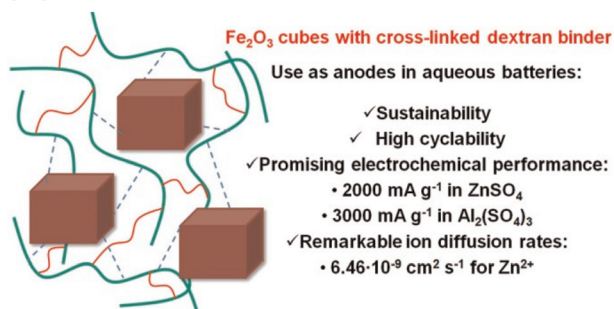
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### Nanosized core-shell bio-hybrid microgels and their internal structure

Pia Lenßen, Rebecca Hengsbach, Anne Frommelius, Samira Cammeraat, Koen Linssen, Ulrich Simon and Dominik Wöll\*



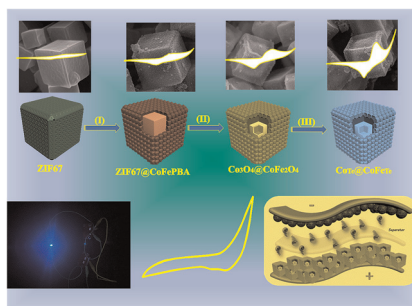
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### Dextran stabilised hematite: a sustainable anode in aqueous electrolytes

Sofia Panagiotidou, Evangelia Vasilaki,\* Nikos Katsarakis, Dimitra Vernardou\* and Maria Vamvakaki

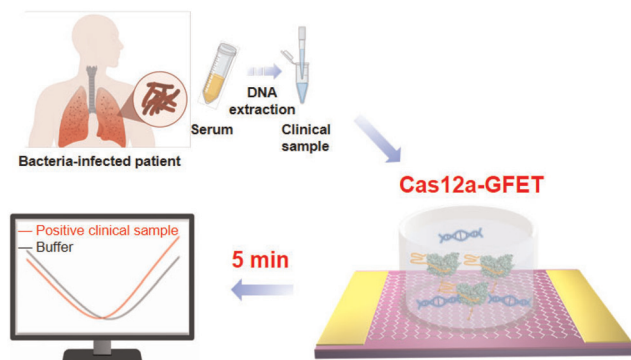
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### High-performance hybrid supercapacitors enabled by CoTe@CoFeTe double-shelled nanocubes

Helya Gholami Shamami, Akbar Mohammadi Zardkhoshouli\* and Saied Saied Hosseiny Davarani\*

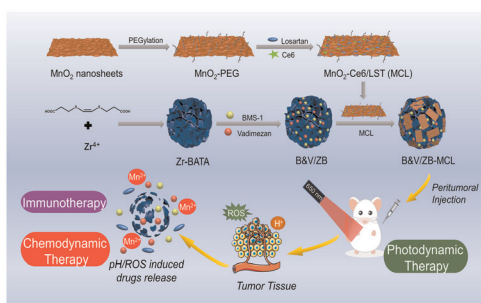
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### Amplification-free detection of *Mycobacterium tuberculosis* using CRISPR-Cas12a and graphene field-effect transistors

Weiqi Wang, Huanyu Du, Changhao Dai, Hongwenjie Ma, Shi Luo, Xuejun Wang, Mingquan Guo,\* Derong Kong\* and Dacheng Wei\*

4610



### A responsive cocktail nano-strategy breaking the immune excluded state enhances immunotherapy for triple negative breast cancer

Jingxian Yang, Mengyao Chen, Ruihao Li, Yanting Sun, Pingting Ye, Kang Fang, Chunhui Wang, Shuo Shi\* and Chunyan Dong\*

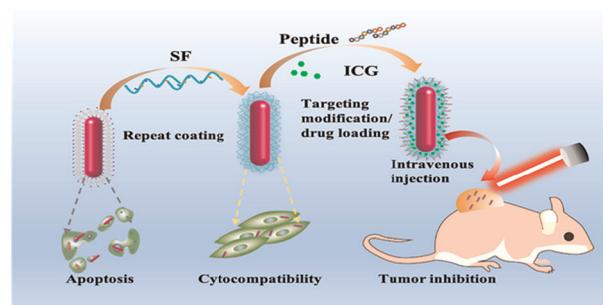


## PAPERS

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### Gold nanorods coated with self-assembled silk fibroin for improving their biocompatibility and facilitating targeted photothermal–photodynamic cancer therapy

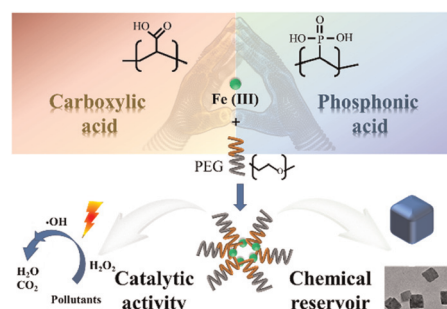
Jie Wang,\* Na Jin, Zheyu Xie, Qichao Cheng, Bo Jiang, Yajun Shuai, Zongpu Xu, Quan Wan, Yuyin Chen, Chuanbin Mao and Mingying Yang\*



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### How tailor-made copolymers can control the structure and properties of hybrid nanomaterials: the case of polyionic complexes

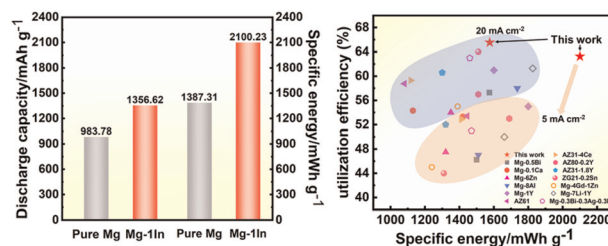
Liming Peng, Maksym Odnoroh, Mathias Destarac, Yannick Coppel, Céline Delmas, Florence Benoit-Marquié, Christophe Mingotaud and Jean-Daniel Marty\*



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### Activating discharge and inhibiting self-corrosion by adding indium to the anode of Mg–air battery

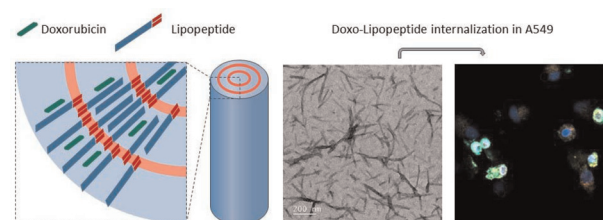
Donghu Li, Lifeng Hou,\* Huayun Du, Huan Wei, Xiaoda Liu, Qian Wang,\* Chengkai Yang\* and Yinghui Wei\*



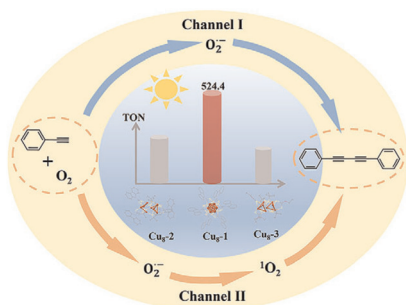
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### Lauryl-NrTP6 lipopeptide self-assembled nanorods for nuclear-targeted delivery of doxorubicin

Amanda Phungula, Sofia Zuffi, Sunisa Thongsom, Paolo Di Gianvincenzo, Santiago Gimenez Reyes, Ana Beatriz Caribé dos Santos Valle, Frederico Pittella, Fernando Albericio, Beatriz G. de la Torre\* and Sergio E. Moya\*



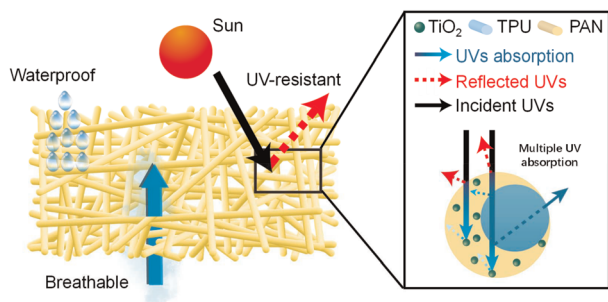
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### Double reactive oxygen species system photoinduced by Cu<sub>8</sub> NCs: synergistic catalysis of phenylacetylene self-coupling reaction

Tingyu Guo, Yapei Yun,\* Tianrong Li, Jun Xia, Jinyan Zhou, Hongting Sheng\* and Manzhou Zhu\*

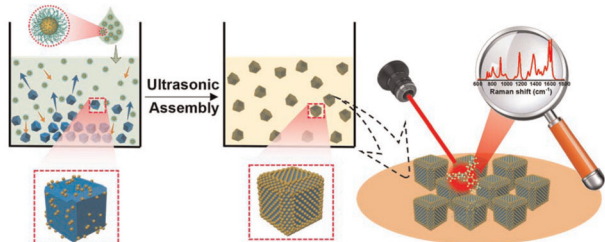
4676



### Effects of an electrospun Janus structure on enhanced UV resistance performance

Bingying Chen, Junli Guo, Chen Chen, Yueling Shen, Yaoyao Yang\* and DengGuang Yu\*

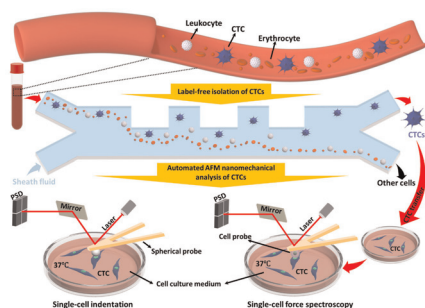
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### Engineering ZIF-8@Ag core-satellite superstructures through solvent-induced tunable self-assembly for surface-enhanced Raman spectroscopy

Yanyan Chen, Yan Xia,\* Mengqi Lyu, Ming Jiang, Yutong Hong, Zhenghong Guo, Juan Li\* and Zhengping Fang

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### Atomic force microscopy combined with microfluidics for label-free sorting and automated nanomechanics of circulating tumor cells in liquid biopsy

Xiaoqun Qi, Sen Lin and Mi Li\*

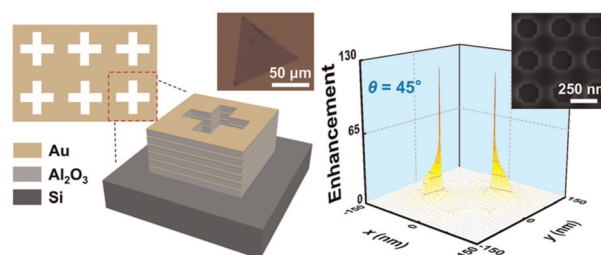


## PAPERS

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### Broadband and large surface enhancements of the local electric field enabled by cross-etched hyperbolic metamaterials

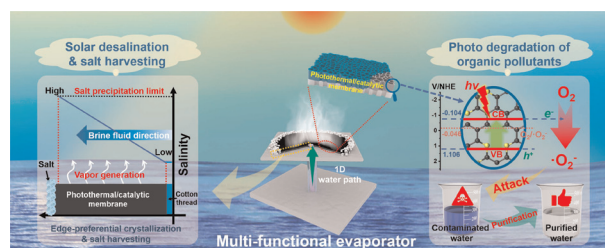
Zixian Li, Houjiao Zhang, Zhonghong Shi, Haoyang Li, Guoli He, Shuang Qiu and Zhang-Kai Zhou\*



4721

### All-in-one photothermal/catalytic flexible membrane for highly efficient desalination and organic pollutant degradation

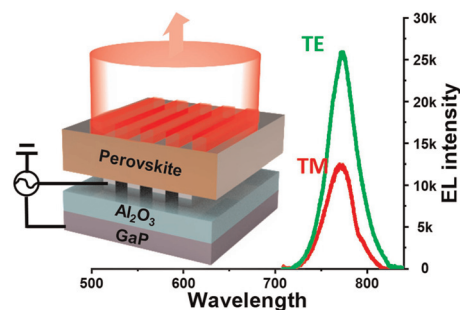
Guanyu Zhao, Xuzhen Wang,\* Zihan Qiu, Runmeng Zhang, Qinqin Du, Zongbin Zhao and Jieshan Qiu



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### A linearly polarized AC-driven perovskite light emitting device with nanoscale metal contact

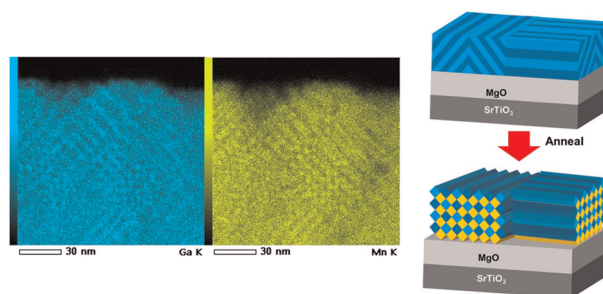
Li-Ming Chiang, Chi-Peng Tu, James Singh Konthoujam, Hai-Pang Chiang,\* Tsung-Sheng Kao and Min-Hsiung Shih\*



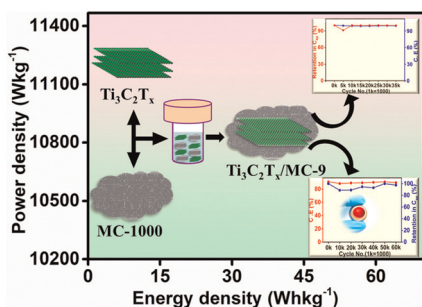
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### Asymmetric self-organization from a symmetric film by phase separation

Tomoya Horide,\* Miya Usuki, Manabu Ishimaru and Yoichi Horibe



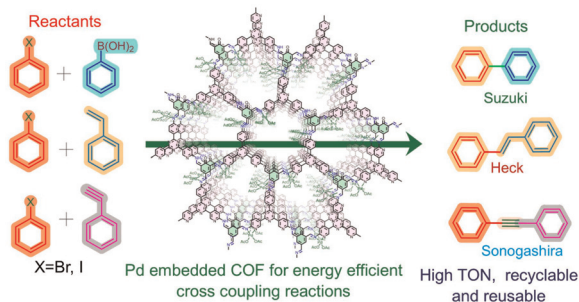
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### A $\text{Ti}_3\text{C}_2\text{T}_x$ MXene/alginate-derived mesoporous carbon nanocomposite as a potential electrode material for coin-cell asymmetric supercapacitors

Sanjay D. Sutar and Anita Swami\*

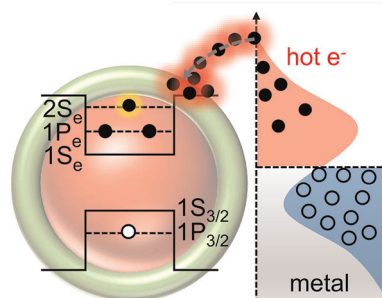
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### Simultaneous pore confinement and sidewall modification of an N-rich COF with Pd(II): an efficient and sustainable heterogeneous catalyst for cross-coupling reactions

Atikur Hassan, Ayush Kumar, Sk Abdul Wahed, Subhadip Mondal, Amit Kumar\* and Neeladri Das\*

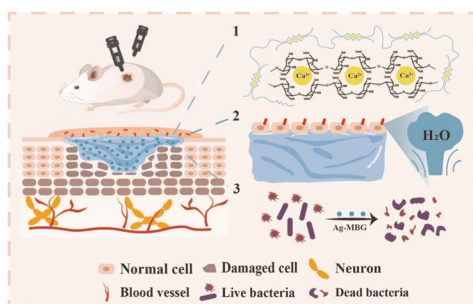
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### Realizing zero-threshold population inversion via plasmonic doping

Mohsin Ijaz, Hao Zhang, Isabella Wagner, Fengjiang Liu, Margarita Samoli, Zeger Hens, Pieter Geiregat, Justin M. Hodgkiss, Richard J. Blaikie, Boyang Ding, Yu-Hui Chen,\* Kai Chen\* and Min Qiu\*

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### Top-down curing to construct self-retaining and moisture-pumping double-layered dressing with enhanced antibacterial, hemostatic, and wound healing performances

Hao Yang, Yi Zhuang, Yulin Jiang, Huilun Xu, Zheng Liu, Yubao Li, Shuyu Zhang, Tao Guo, Lin Qi\* and Li Zhang\*

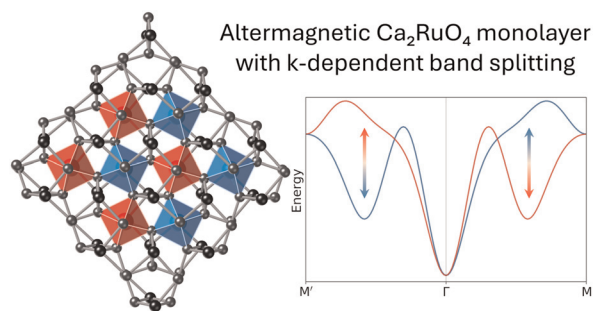


## PAPERS

4796

**Altermagnetism in two-dimensional  $\text{Ca}_2\text{RuO}_4$  perovskite**

J. W. González,\* A. M. León, C. González-Fuentes and R. A. Gallardo



## CORRECTIONS

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**Correction: Unveiling the potential of Cu–Pd/CdS catalysts to supply and rectify electron transfer for  $\text{H}_2$  generation from water splitting**

Ejaz Hussain,\* Memuna Idrees, Muhammad Jalil, Muhammad Zeeshan Abid, Khalid Aljohani and Khezina Rafiq\*

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**Correction: Dynamic response of a ferromagnetic nanofilament under rotating fields: effects of flexibility, thermal fluctuations and hydrodynamics**

Pedro A. Sánchez,\* Antonio Cerrato, Joan J. Cerdà, Carles Bona-Casas, Tomás Sintés and Joan Massó

