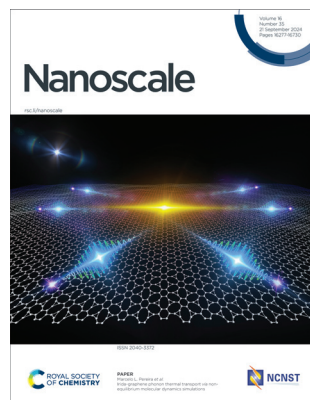


## IN THIS ISSUE

ISSN 2040-3372 CODEN NANOHL 16(35) 16277–16730 (2024)



### Cover

See Marcelo L. Pereira *et al.*, pp. 16430–16438.

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## REVIEWS

16290

### Mimicking the extracellular world: from natural to fully synthetic matrices utilizing supramolecular biomaterials

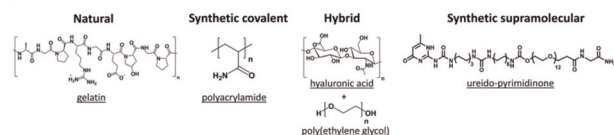
Laura Rijns, Martin G. T. A. Rutten, Annika F. Vrethen, Ana A. Aldana, Matthew B. Baker and Patricia Y. W. Dankers\*



#### Native ECM

- Excellent bioactivity
- Mechanical properties match cellular needs
- Highly dynamic on molecular, fiber and network level
- All built from monomeric building blocks

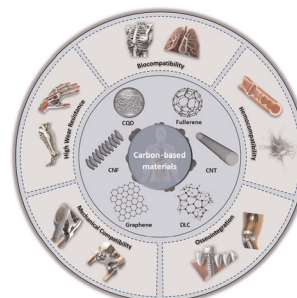
↓ ECM mimicking hydrogels



16313

### Carbon materials and their metal composites for biomedical applications: A short review

Su-Bin Kim, Choong-Hee Kim, Seul-Yi Lee\* and Soo-Jin Park\*



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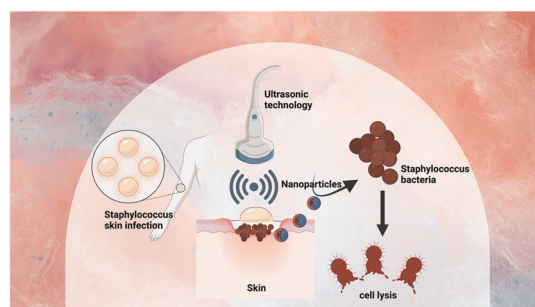
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## REVIEWS

16329

### Ultrasonic nanotechnology for the effective management of *Staphylococcus aureus* skin infections: an update

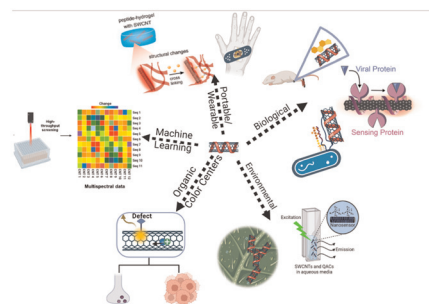
Naveen Thanjavur, Anantha Lakshmi Buddolla, Laxmi Bugude, Viswanath Buddolla\* and Young-Joon Kim\*



16344

### Recent advances on applications of single-walled carbon nanotubes as cutting-edge optical nanosensors for biosensing technologies

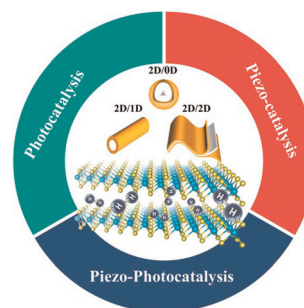
Hannah M. Dewey, Ashley Lamb and Januka Budhathoki-Uprety\*



16376

### Advances in the heterostructures for enhanced hydrogen production efficiency: a comprehensive review

Chen-Yo Tsai, Wei-Hsuan Chang, Ming-Yen Lu\* and Lih-Juann Chen\*

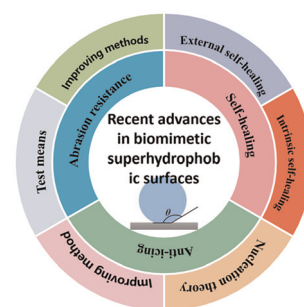


## MINIREVIEW

16404

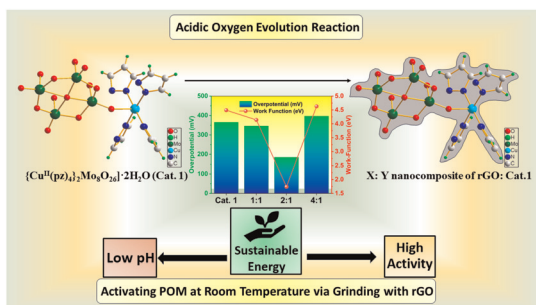
### Recent advances in biomimetic superhydrophobic surfaces: focusing on abrasion resistance, self-healing and anti-icing

Jing Luo and Zhiguang Guo\*



## COMMUNICATION

16420

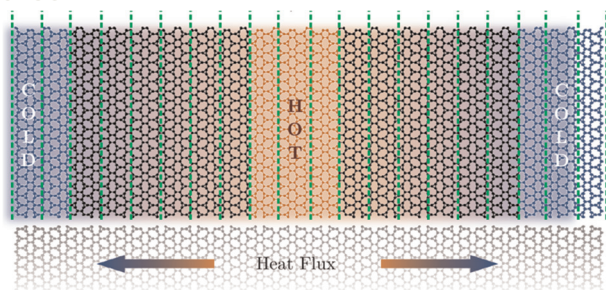


### Deciphering the work function induced local charge regulation towards activating an octamolybdate cluster-based solid for acidic water oxidation

Harshita Bagdwal, Parul Sood, Arshinder Kaur Dhillon, Ashi Singh and Monika Singh\*

## PAPERS

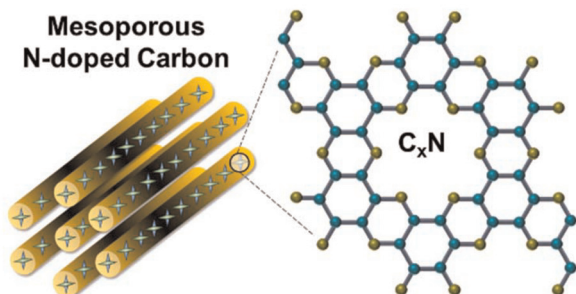
16430



### Irida-graphene phonon thermal transport *via* non-equilibrium molecular dynamics simulations

Isaac M. Felix, Raphael M. Tromer, Leonardo D. Machado, Douglas S. Galvão, Luiz A. Ribeiro, Jr and Marcelo L. Pereira, Jr\*

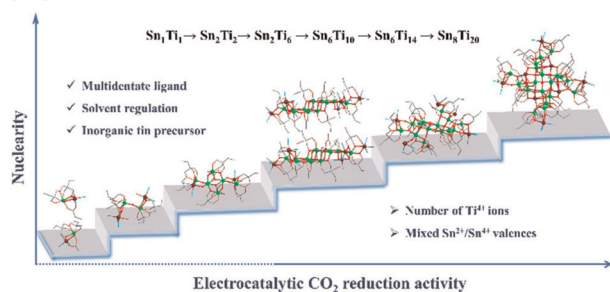
16439



### Aminotriazine derived N-doped mesoporous carbon with a tunable nitrogen content and their improved oxygen reduction reaction performance

Jefern M. Davidraj, C. I. Sathish,\* Premkumar Selvarajan, Mohammed Fawaz, Vibin Perumalsamy, Xiaojiang Yu, Mark B. H. Breese, Jiabao Yi\* and Ajayan Vinu\*

16451



### Modulated assembly and structural diversity of heterometallic Sn-Ti oxo clusters from inorganic tin precursors

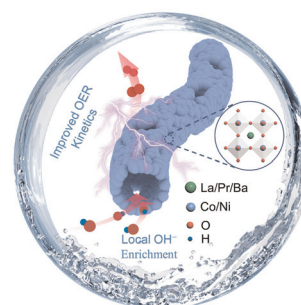
Hui-Fang Zhao, Fang-Fang Liu, Qing-Rong Ding, Di Wang, Jian Zhang and Lei Zhang\*



16458

### Local hydroxide ion enrichment at the inner surface of lacunaris perovskite nanotubes facilitates the oxygen evolution reaction

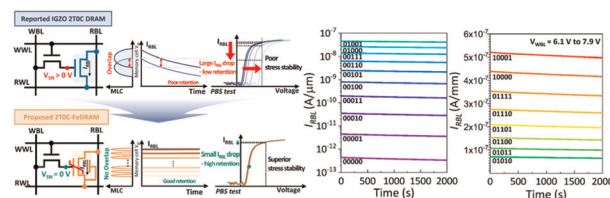
Lin-Bo Liu, Shuo Liu, Yu-Feng Tang, Yifei Sun, Xian-Zhu Fu, Jing-Li Luo and Subiao Liu\*



16467

### First demonstration of 2T0C-FeDRAM: a-ITZO FET and double gate a-ITZO/a-IGZO FeFET with a record-long multibit retention time of >4-bit and >2000 s

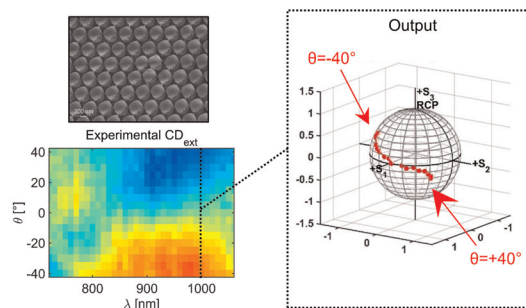
Tae Hyeon Noh, Simin Chen, Hyo-Bae Kim, Taewon Jin, Seoung Min Park, Seong Ui An, Xinkai Sun, Jaekyun Kim, Jae-Hoon Han, Ji-Hoon Ahn,\* Dae-Hwan Ahn\* and Younghyun Kim\*



16477

### Extrinsic chirality tailors Stokes parameters in simple asymmetric metasurfaces

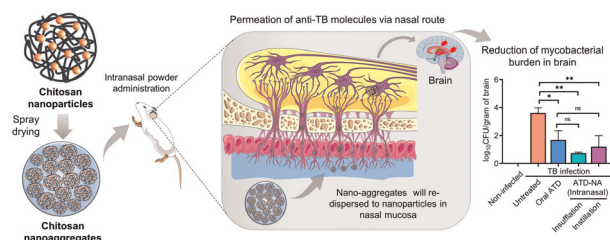
Emilija Petronijevic,\* Tiziana Cesca, Carlo Scian, Giovanni Mattei, Roberto Li Voti, Concita Sibilina and Alessandro Belardini



16485

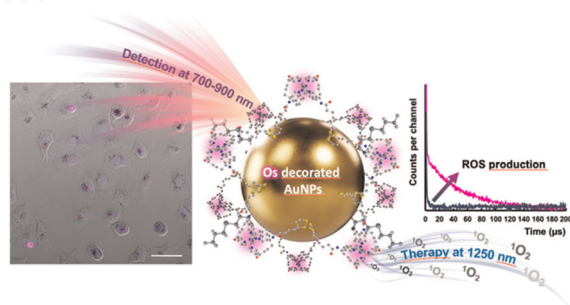
### Effective cerebral tuberculosis treatment via nose-to-brain transport of anti-TB drugs using mucoadhesive nano-aggregates

Krishna Jadhav, Agrim Jhilla, Raghuraj Singh, Eupa Ray, Vimal Kumar, Awadh Bihari Yadav, Amit Kumar Singh\* and Rahul Kumar Verma\*



## PAPERS

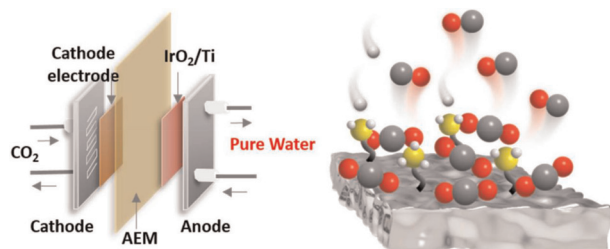
16500



### Near infra-red luminescent osmium labelled gold nanoparticles for cellular imaging and singlet oxygen generation

Luke S. Watson, Joseph Hughes, Salma T. Rafik, Asier R. Muguruza, Patricia M. Gírio, Sarah O. Akponasa, Garret Rochford, Alexander J. MacRobert, Nikolas J. Hodges, Elnaz Yaghini and Zoe Pikramenou\*

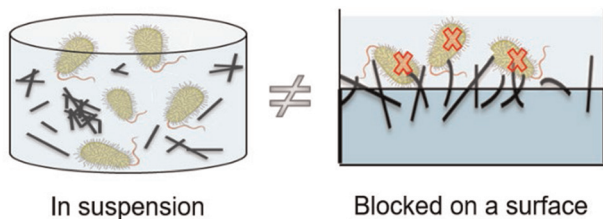
16510



### Amino-functionalization enhanced CO<sub>2</sub> reduction reaction in pure water

Junfeng Chen, Wenzhe Niu, Liangyao Xue, Kai Sun, Xiao Yang, Xinyue Zhang, Weihang Li, Shuanglong Huang, Wenjuan Shi\* and Bo Zhang\*

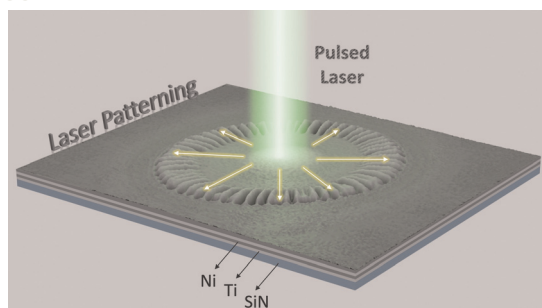
16517



### Surface-anchored carbon nanomaterials for antimicrobial surfaces

L. Giraud, O. Marsan, E. Dague, M. Ben-Neji, C. Cougoule, E. Meunier, S. Soueid, A. M. Galibert, A. Tourrette\* and E. Flahaut\*

16535



### Laser patterning captured in real-time: surface modifications of multilayer thin-films under nanosecond laser heating

Tugba Isik, Mason Freund, Will Linthicum, Bryan D. Huey and Volkan Ortolan\*

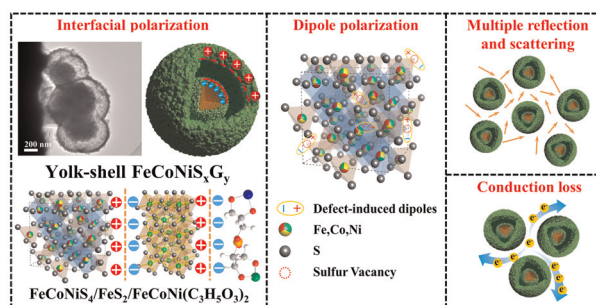


## PAPERS

16543

## Design of a yolk-shell ternary metal sulfide with a tunable structure for high-performance electromagnetic wave absorption

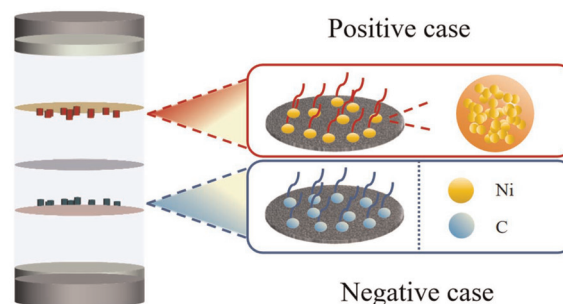
Zhaobo Liu, Yan Zhao\* and Zhiwei Liu\*



16556

## Fabrication and assembly of supercapacitors based on Ni-based MOFs and their derivative materials for enhancing their electrochemical performances

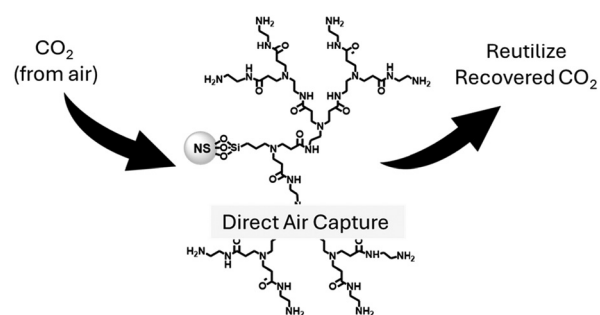
Wen-Ze Li, Ying Yang, Xiao-Sa Zhang, Yu Liu and Jian Luan\*



16571

## Nanosilica polyamidoamine dendrimers for enhanced direct air CO<sub>2</sub> capture

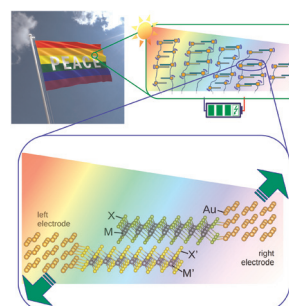
Vaishnavi Kulkarni, Jayashree Parthiban and Sanjay Kumar Singh\*



16582

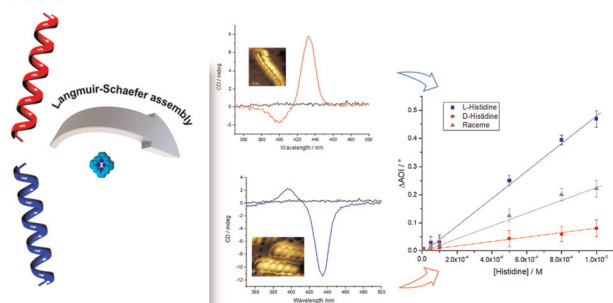
## First-principles guidelines to select promising van der Waals materials for hybrid photovoltaic-triboelectric nanogenerators

Antonio Cammarata,\* Jemal Yimer Damte\* and Tomas Polcar



## PAPERS

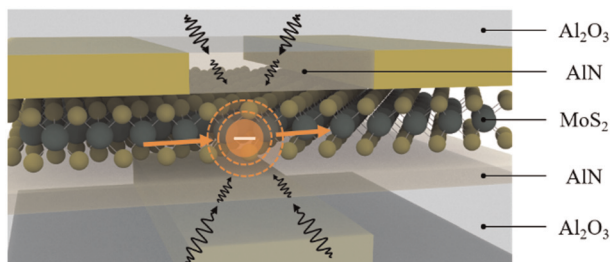
16593



### Chirality induction to porphyrin derivatives co-confined at the air–water interface with silica nano-helices: towards enantioselective thin solid film surfaces

Michela Ottolini, Zakaria Anfar, Nitika Grover, Gabriele Magna, Manuela Stefanelli, Roberto Paolesse, Mathias O. Senge, Simona Bettini,\* Ludovico Valli, Reiko Oda\* and Gabriele Giancane

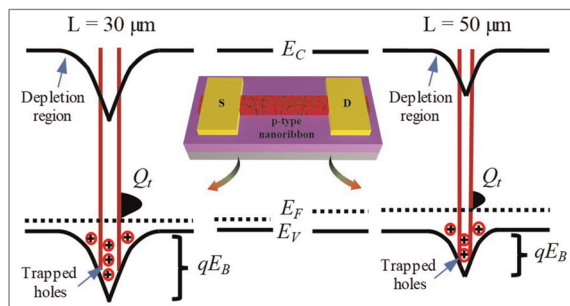
16602



### Suppression of surface optical phonon scattering by AlN interfacial layers for mobility enhancement in MoS<sub>2</sub> FETs

Woonggi Hong, Gi Woong Shim, Hyeok Jun Jin, Hamin Park, Mingu Kang, Sang Yoon Yang and Sung-Yool Choi\*

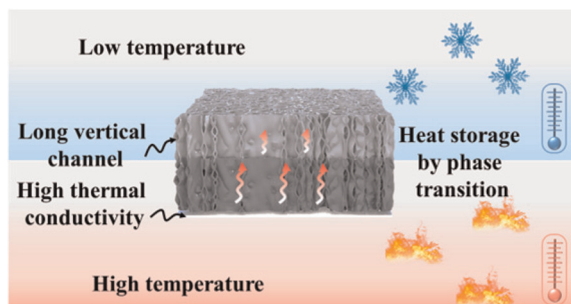
16611



### On the grain boundary charge transport in p-type polycrystalline nanoribbon transistors

Prakash Sarkar, A. V. Muhammed Ali, Gurupada Ghorai, Prabhanjan Pradhan, Biplab K. Patra, Abhay A. Sagade\* and K. D. M. Rao\*

16622



### Multifunctional phase-change composites for green electromagnetic interference shielding and thermal response prepared under the guidance of an impedance matching strategy

Jie He, Jiaozu Wu, Chul B. Park, Pengjian Gong,\* Chaobo Liang\* and Guangxian Li



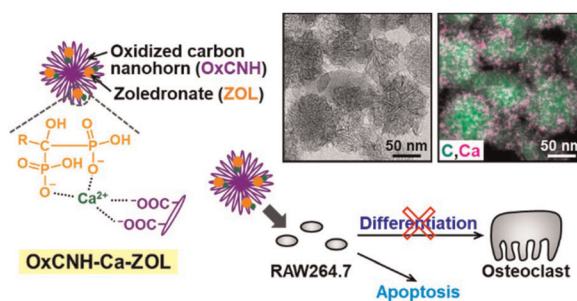


## PAPERS

16632

**Calcium-mediated zoledronate loading onto carbon nanohorns**

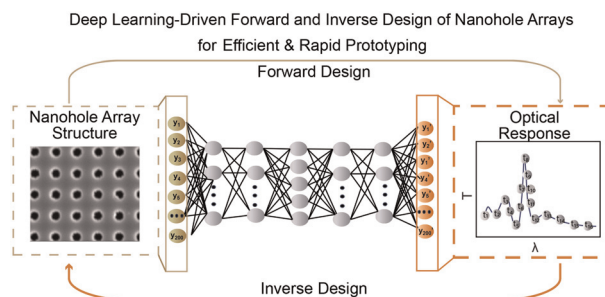
Maki Nakamura,\* Yumiko Yamamoto, Minfang Zhang, Katsuya Ueda, Kaoru Aoki, Naoto Saito and Masako Yudasaka\*



16641

**Deep learning-driven forward and inverse design of nanophotonic nanohole arrays: streamlining design for tailored optical functionalities and enhancing accessibility**

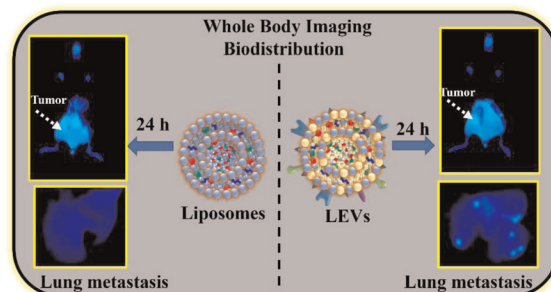
Tasnia Jahan, Tomoshree Dash, Shifat E. Arman, Reefat Inum, Sharnali Islam, Lafifa Jamal, Ahmet Ali Yanik and Ahsan Habib\*



16652

**Maximizing liposome tumor delivery by hybridizing with tumor-derived extracellular vesicles**

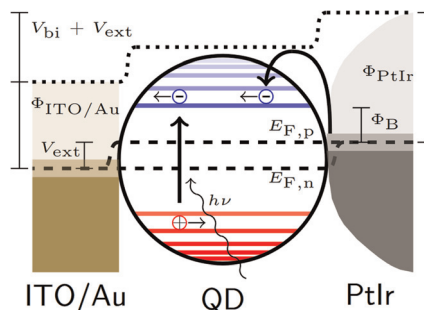
Shoukath Sulthana, Dinesh Shrestha and Santosh Aryal\*



16664

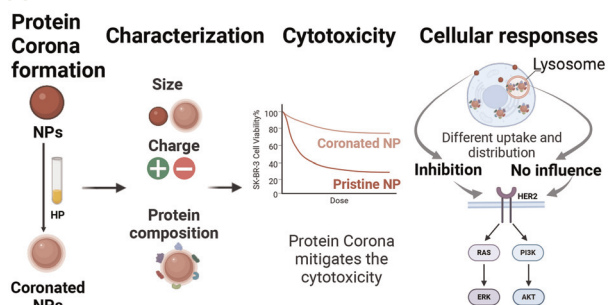
**Quantitative photocurrent scanning probe microscopy on PbS quantum dot monolayers**

Florian Küstner, Harald Ditlbacher, Andreas Hohenau, Dmitry N. Dirin, Maksym Kovalenko and Joachim R. Krenn\*



## PAPERS

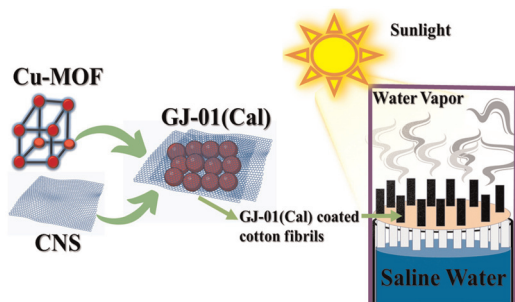
16671



### Protein corona alleviates adverse biological effects of nanoplastics in breast cancer cells

Siyao Xiao, Junbiao Wang, Luca Digiacomo, Augusto Amici, Valentina De Lorenzi, Licia Anna Pugliese, Francesco Cardarelli, Andrea Cerrato, Aldo Laganà, Lishan Cui, Massimiliano Papi, Giulio Caracciolo, Cristina Marchini\* and Daniela Pozzi\*

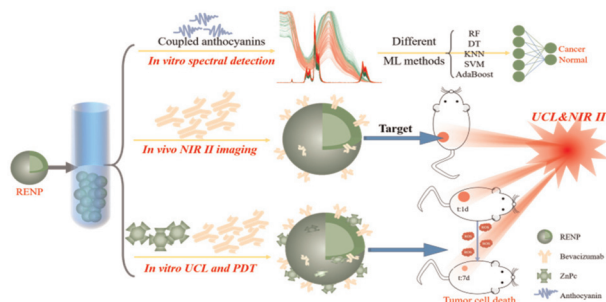
16684



### De novo Cu-MOF@CNS nanocomposite coated on a cotton fibrils framework for sustainable solar-driven desalination

Geetika Jain, Sinu Sanghamitra, Monalisa Mukherjee, Mrinal Kanti Mandal,\* Rajib Ghosh Chaudhuri\* and Sandip Chakrabarti\*

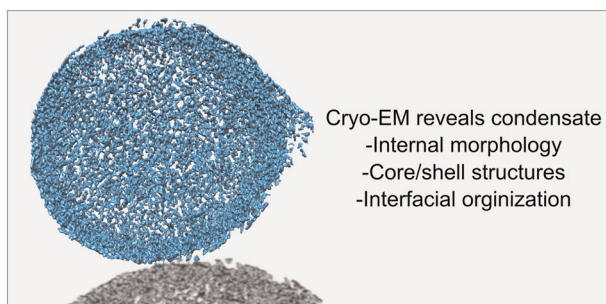
16697



### Upconversion and NIR-II luminescent rare earth nanoparticles combined with machine learning for cancer theranostics

Hanyu Liu, Ziyue Ju, Xin Hui, Wenjing Li and Ruichan Lv\*

16706



### Revealing nanoscale structure and interfaces of protein and polymer condensates via cryo-electron microscopy

Aoon Rizvi, Bruna Favetta, Nora Jaber, Yun-Kyung Lee, Jennifer Jiang, Nehal S. Idris, Benjamin S. Schuster, Wei Dai and Joseph P. Patterson\*



16718

## Field enhancement induced by surface defects in two-dimensional ReSe<sub>2</sub> field emitters

Filippo Giubileo,\* Enver Faella, Daniele Capista, Maurizio Passacantando, Ofelia Durante, Arun Kumar, Aniello Pelella, Kimberly Intonti, Loredana Viscardi, Sebastiano De Stefano, Nadia Martucciello, Monica F. Craciun, Saverio Russo and Antonio Di Bartolomeo\*

