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See Young Hoon Roh *et al.*, pp. 3290–3308. Image reproduced by permission of Young Hoon Roh from *Nanoscale Horiz.*, 2025, 10, 3290.



### Inside cover

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Katharina Landfester



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### *Nanoscale Horizons* Emerging Investigator Series: Dr Siqi Li, Anhui University, China



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## EDITORIALS

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## Introduction to the editor's choice collection on inorganic-biomolecule nanomaterials

Mark J. MacLachlan

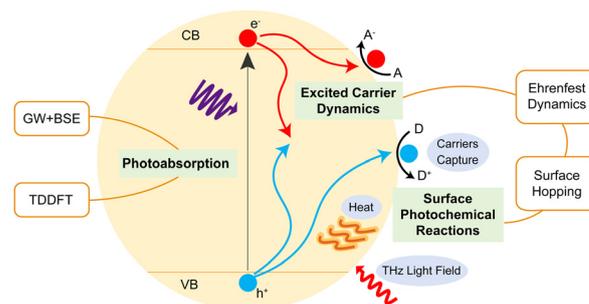


## FOCUS

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*Ab initio* perspectives on surface photocatalysis: advances, challenges, and opportunities

Chang Gao, Youyou Tu, Zhan Shi, Lili Zhang, Weibin Chu, Qijing Zheng and Jin Zhao\*

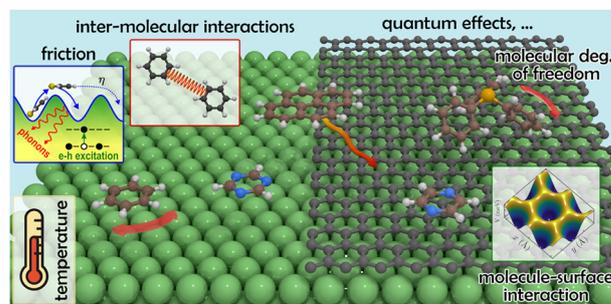


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Nanoscale motion of organic  $\pi$ -conjugated molecules: exploring van der Waals forces, friction, and quantum effects

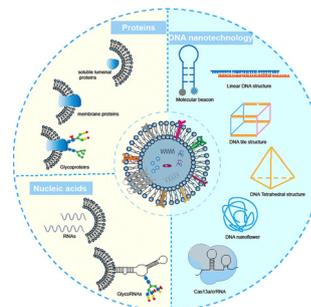
Anton Tamtögl\* and Marco Sacchi



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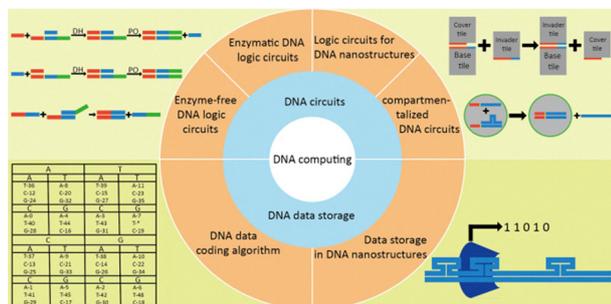
## DNA nanotechnology-enabled bioanalysis of extracellular vesicles

Li Pan and Pengfei Wang\*



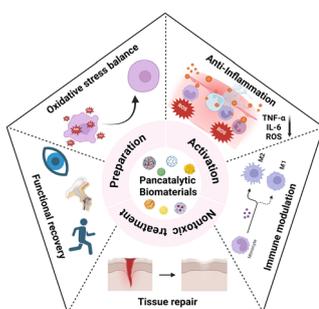
## REVIEWS

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**DNA computing: DNA circuits and data storage**

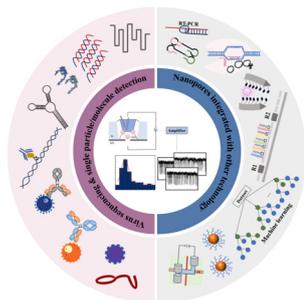
Hang Xu, Yifan Yu,\* Peixin Li, Shaowei Liu, Xuehui Yan, Zhaoyu Zhou and Ye Tian\*

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**Pancatalytic biomaterials enable inflammation-related disease intervention**

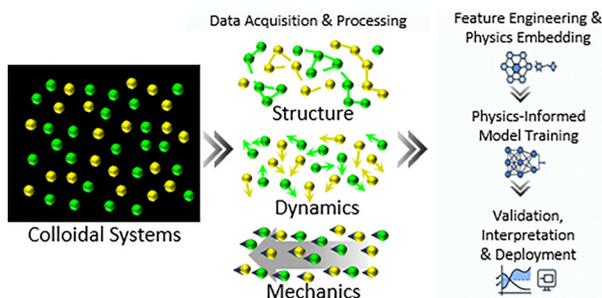
Xiaoyan Jiang and Yu Chen\*

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**Advances of nanopore sensors toward virus detection and diagnostic applications**

Lingzhi Wu, Ke Qi, Wentao Yang, Guohao Xi, Jie Ma and Jing Tu\*

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**Colloidal systems as experimental platforms for physics-informed machine learning**

Namhee Kang, Yeonsoo Joo, Hyosung An and Hyerim Hwang\*

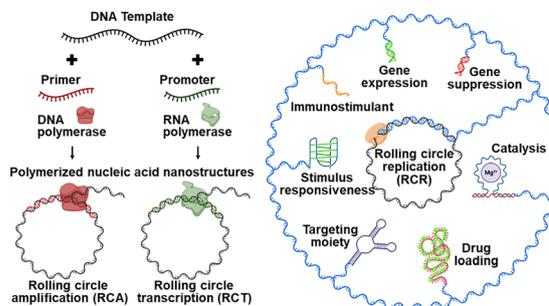


## MINIREVIEW

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## Rolling circle replication based nucleic acid nanostructures for programmable drug delivery

Kyungjik Yang, Keonwook Nam, Kyung Hoon Park, Hae Kyung Shin, Yeongmok Kim and Young Hoon Roh\*

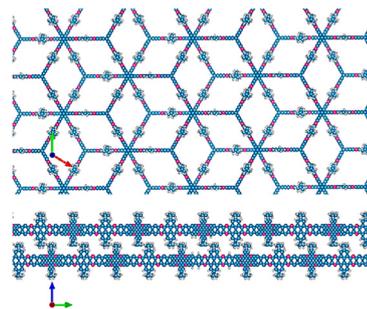


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A phenazine-linked  $\pi$ -conjugated covalent organic framework for conjugation-driven drug loading

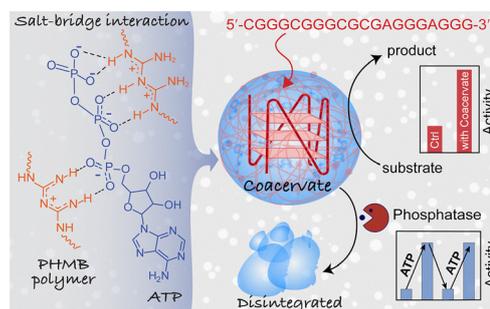
Kohki Sasaki, Tsukasa Irie, Mika Nozaki, Tokuhisa Kawawaki, Saikat Das\* and Yuichi Negishi\*



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## Adaptive catalytic compartments emerge from synergistic integration of DNA nanostructures and transient coacervates

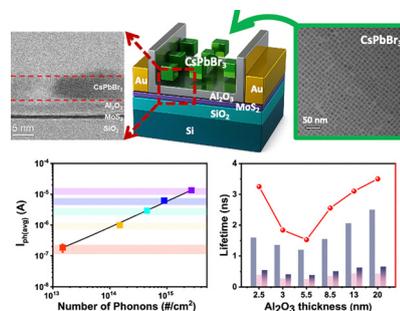
Abhay Srivastava, Parth Kumar, Mathesh Punugusamy, Sourav Das and Subinoy Rana\*



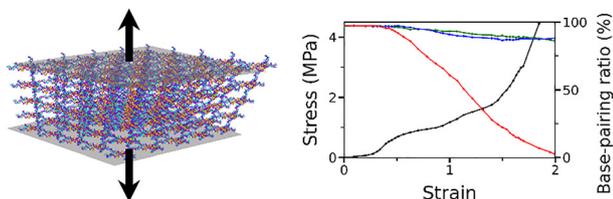
3330

## Multilevel storage and linear optoelectronic response in mixed-dimensional photomemories

Chen-Yo Tsai, Dun-Jie Jhan, Che-Ming Wu, Ming-Pei Lu\* and Ming-Yen Lu\*



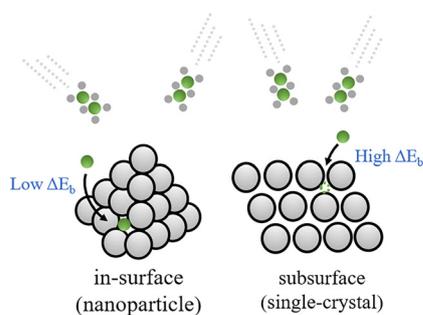
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### Understanding the structural mechanics of ligated DNA crystals *via* molecular dynamics simulation

Yoo Hyun Kim, Anirudh S. Madhvacharyula, Ruixin Li, Alexander A. Swett, Seongmin Seo, Emile J. Batchelder-Schwab, Naseem Siraj, Chengde Mao and Jong Hyun Choi\*

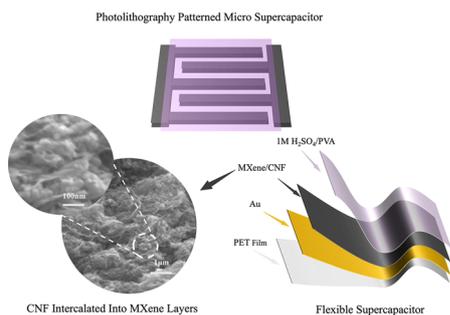
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### Boron atom incorporation into metal nanoparticles

Jie Zhao, Fernando Buendia-Zamudio and Sergey M. Kozlov\*

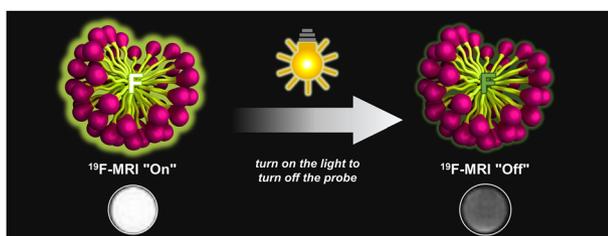
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### Flexible MXene–cellulose nanofiber based all-solid-state supercapacitors with high volumetric capacitance

Yongzan Zhou, Youchao Teng,\* Huicong Liu\* and Yimin Wu\*

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### Light-triggered quenching of the $^{19}\text{F}$ -MRI signal from micelle-encapsulated PERFECTA

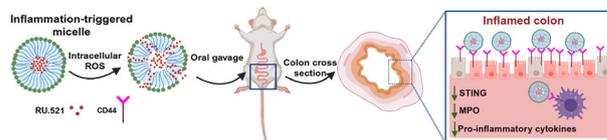
Claire Leterrier, Guillaume Pinna, Marie Vandamme, Mélissa Glatigny, Erwan Selingue, Françoise Geffroy, Sébastien Mériaux,\* Edmond Gravel\* and Eric Doris\*



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### Transformative therapy in acute microbial-induced colitis with inflammation triggered micelles and combination therapies

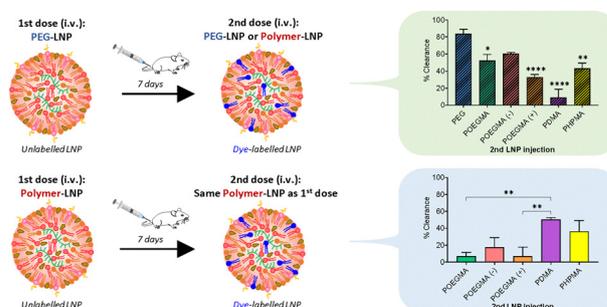
Saman Ghazvini, Sepehr Hejazi, Saji Uthaman, Tyler Harm, Michael Wannemuehler and Rizia Bardhan\*



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### Influence of hydrophilic polymers on the accelerated blood clearance of mRNA lipid nanoparticles upon repeated administration

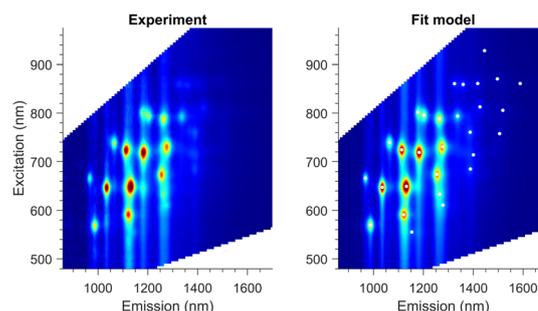
Dayangku Nordiyana B. P. Hassanel, Yi Ju, Asuka Takanashi, Azizah Algarni, Chee Leng Lee, Stephen J. Kent, Colin W. Pouton and Emily H. Pilkington\*



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### Quantitative 2D fitting of fluorescence-excitation maps: excitation lineshape of single-wall carbon nanotubes

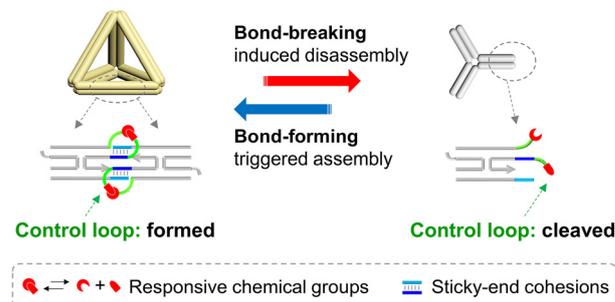
Sofie Cambré, Wouter Van Werveke, Miguel De Clercq, Maksiem Erkens, Miles Martinati and Wim Wenseleers\*



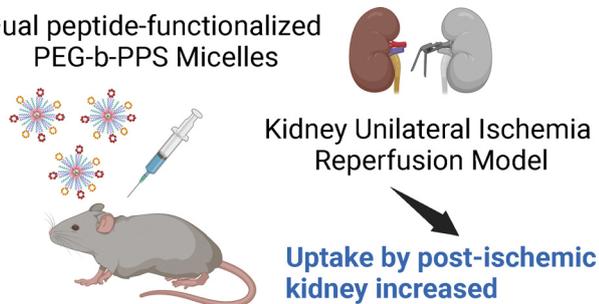
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### Rational design of dynamic DNA self-assembly through a responsive-bond-embedded loop

Zhiyuan Zhu, Mengzhou Wei and Yulin Li\*

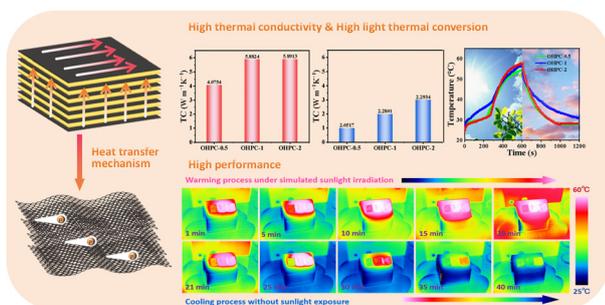


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Dual peptide-functionalized  
PEG-b-PPS MicellesEnabling organ- and injury-specific nanocarrier targeting *via* surface-functionalized PEG-*b*-PPS micelles for acute kidney injury

Boaz Y. Bishop, Swagat H. Sharma, Ratnakar Tiwari, Simseok A. Yuk, Sultan Almunif, Susan E. Quaggin, Evan A. Scott\* and Pinelopi P. Kapitsinou\*

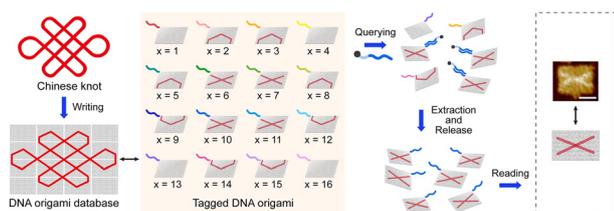
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## Highly-oriented graphite/polyimide-carbon nanotube supported composite phase change materials with high thermal conductivity and photothermal conversion performance

Yingying Tian, Jun Tong, Xingang Yu, Tianqi Zhao, Rui Wang and Xiubing Huang\*

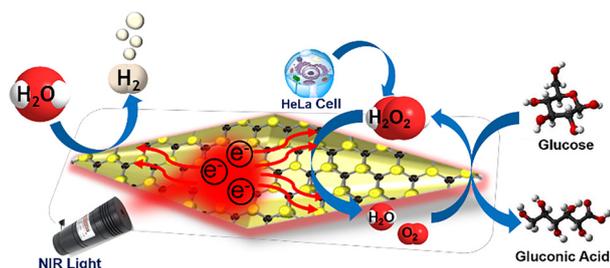
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## Structure-based DNA memory with Boolean random access

Yanyu Zhou, Lanyang Gao, Chu Jiang, Yuxi Li, Qi Liu, Chengguo Xu, Yingying Liu, Huajie Liu\* and Yinan Zhang\*

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## Anisotropic Au nanobipyramids with molybdenum disulfide for plasmon-enhanced electrocatalysis, biosensing and energy production

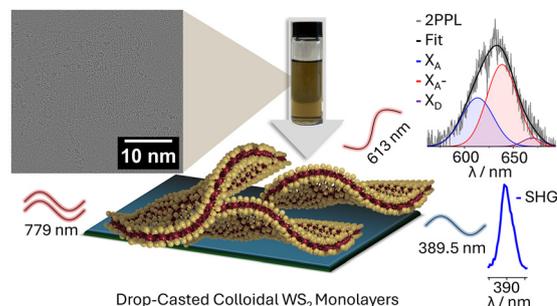
Durgadas Datta, Ramakanta Mondal, Ram Chandra Maji, Subin Yu, Dong-Il Won, Dong Ha Kim\* and Swarup Kumar Maji\*



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### Second-harmonic generation and photoluminescence properties of colloidal WS<sub>2</sub> monolayers deposited from solution

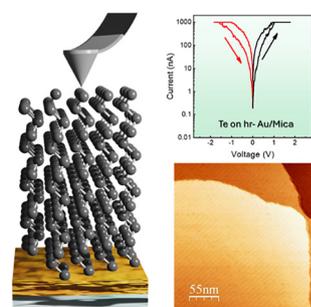
Yang Zhao, Markus Fröhlich, Marco Kögel, Onno Strolka, André Niebur, Tim Parker, Felix Schneider, Alfred J. Meixner, Jannik C. Meyer, Dai Zhang\* and Jannika Lauth\*



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### Tailoring resistive switching in ultra-thin tellurium films by interface engineering

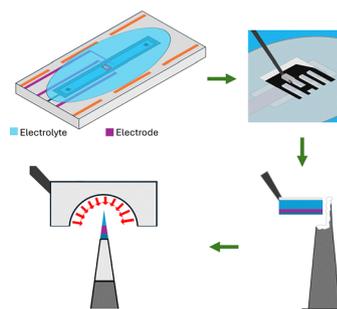
Sara Ghomi, Carlo Grazianetti, Andrea Serafini, Paolo Targa, Davide Codegoni, Alessio Lamperti, Christian Martella\* and Alessandro Molle\*



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### A workflow for correlative *in situ* nanochip liquid cell transmission electron microscopy and atom probe tomography enabled by cryogenic plasma focused ion beam

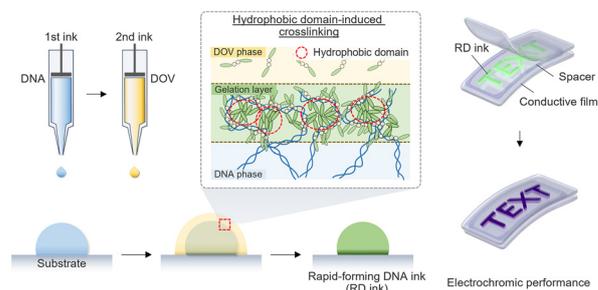
Neil Mulcahy, James O. Douglas, Syeda Ramin Jannat, Lukas Worch, Geri Topore, Baptiste Gault, Mary P. Ryan and Michele Shelly Conroy\*



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### Electrochromic DNA-based bioink with rapid interfacial gelation for bioprinting applications

Yoonbin Ji, Taehyeon Kim, Iksoo Jang and Jong Bum Lee\*



## CORRECTION

3506

**Correction: Ultrathin DNA–copper nanosheets with antibacterial and anti-biofilm activity for treatment of infected wounds**

Fangfang Chen, Mengyan Lei, Jing Luo, Jiaqi Li, Jinfang Wang, Nan Zhang, Xinyi Li, Nan Jia, Xiangyuan Ouyang\* and Huaiyu Bu\*

