

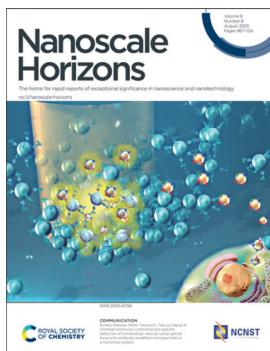
# Nanoscale Horizons

The home for rapid reports of exceptional significance in nanoscience and nanotechnology  
[rsc.li/nanoscale-horizons](https://rsc.li/nanoscale-horizons)

*The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.*

## IN THIS ISSUE

ISSN 2055-6756 CODEN NHAOAW 8(8) 967–1124 (2023)



### Cover

See Ikuhiko Nakase, Shiho Tokonami, Takuya Iida *et al.*, pp. 1034–1042. Image reproduced by permission of Takuya Iida from *Nanoscale Horiz.*, 2023, **8**, 1034.



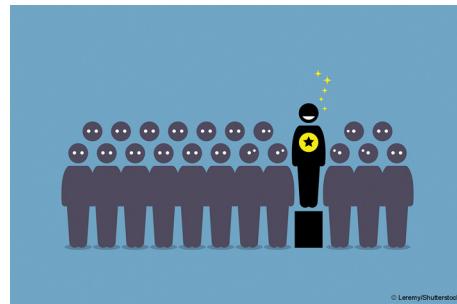
### Inside cover

See Xing-Jie Liang, Qian Hua *et al.*, pp. 976–990. Image reproduced by permission of Ya-Li Zhang, Xing-Jie Liang and Qian Hua from *Nanoscale Horiz.*, 2023, **8**, 976.

## EDITORIAL

975

Outstanding Reviewers for *Nanoscale Horizons* in 2022

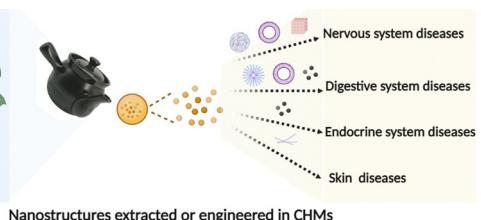


## REVIEWS

976

**Nanostructures in Chinese herbal medicines (CHMs) for potential therapy**

Ya-Li Zhang, Ya-Lei Wang, Ke Yan, Qi-Qi Deng, Fang-Zhou Li, Xing-Jie Liang\* and Qian Hua\*



**Editorial Staff****Executive Editor**

Michaela Mühlberg

**Managing Editor**

Heather Montgomery

**Editorial Production Manager**

Jonathon Watson

**Senior Publishing Editor**

Alex Metherell

**Development Editor**

Edward Gardner

**Publishing Editors**

Matthew Blow, Chris Dias, Rob Hinde, Ash Hyde, Evie Karkera, Tamara Kosikova, Carole Martin, Kirsty McRoberts, Cat Schofield, Ella White, Tom Williams

**Editorial Assistant**

Elizabeth So

**Assistant Editors**

Jie Gao, Yu Zhang

**Publisher**

Sam Keltie

For queries about submitted papers, please contact Jonathon Watson, Editorial Production Manager in the first instance.

E-mail: [nanoscalehorizons@rsc.org](mailto:nanoscalehorizons@rsc.org)

For pre-submission queries please contact

Michaela Mühlberg, Executive Editor.

E-mail: [nanoscalehorizons-rsc@rsc.org](mailto:nanoscalehorizons-rsc@rsc.org)

Nanoscale Horizons (print: ISSN 2055-6756 electronic: ISSN 2055-6764) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK

Tel +44 (0)1223 432398; E-mail [orders@rsc.org](mailto:orders@rsc.org)

2023 Annual (electronic) subscription price: £2727; \$4500.

Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at [www.rsc.org/ip](http://www.rsc.org/ip)

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office:

Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017; E-mail [advertising@rsc.org](mailto:advertising@rsc.org)

For marketing opportunities relating to this journal, contact [marketing@rsc.org](mailto:marketing@rsc.org)

# Nanoscale Horizons

[rsc.li/nanoscale-horizons](http://rsc.li/nanoscale-horizons)

*Nanoscale Horizons* is the home for urgent short reports of exceptionally high quality & innovative nanoscience & nanotechnology



Published in collaboration with the National Centre for Nanoscience and Technology, Beijing, China

## Editorial Board

**Chair**

Katharina Landfester, Max Planck Institute for Polymer Research, Germany

**Scientific Editors**

Katsuhiko Ariga, National Institute for Materials Science (NIMS), Japan

Wenlong Cheng, Monash University, Australia

Yves Dufrêne, Université Catholique de Louvain, Belgium

Anna Fontcuberta i Morral, École polytechnique fédérale de Lausanne, Switzerland

Dirk Guldi, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Zhiyong Tang, National Center for Nanoscience and Technology, China

Jinlan Wang, Southeast University, China

**Members**

Miaofang Chi, Oak Ridge National Laboratory, USA

Jin-Hong Park, Pohang University of Science and Technology, South Korea

Miqin Zhang, University of Washington, USA

## Advisory Board

Chunli Bai, Chinese Academy of Sciences, China

Uri Banin, Hebrew University of Jerusalem, Israel

Frank Caruso, University of Melbourne, Australia

Cinzia Casiraghi, The University of Manchester, UK

Paola Ceroni, University of Bologna, Italy

Chunying Chen, National Center for Nanoscience and Technology, China

Xiaodong Chen, Nanyang Technological University, Singapore

Serena Cussen, University of Sheffield, UK

Harold Craighead, Cornell University, USA

Qing Dai, National Center for Nanoscience and Technology, China

Stefan Maier, Monash University, Australia

Liberato Manna, Istituto Italiano di Tecnologia, Italy

Chad Mirkin, Northwestern University, USA

Paul Mulvaney, University of Melbourne, Australia

Catherine Murphy, University of Illinois at Urbana-Champaign, USA

Valeria Nicolosi, Trinity College Dublin, Ireland

Dong Qin, Georgia Institute of Technology, USA

Sandra Rosenthal, Vanderbilt University, USA

Jungki Ryu, Ulsan National Institute of Science and Technology, Korea

Michael Sailor, University of California, San Diego, USA

Paolo Samori, Université de Strasbourg, France

Ester Segal, Technion - Israel Institute of Technology, Israel

Yamuna Krishnan, University of Chicago, USA

Tai Wei David Leong, National University of Singapore, Singapore

Li Li, Northeastern University, USA

Quan Li, Chinese University of Hong Kong, Hong Kong

Xing Yi Ling, Nanyang Technological University, Singapore

Jie Liu, Duke University, USA

Xiaogang Liu, National University of Singapore, Singapore

Renzi Ma, National Institute for Materials Science, Japan

Yelena Shevchenko, Argonne National Laboratory, USA

Hisanori Shinohara, Nagoya University, Japan

Zuzanna Siwy, University of California, Irvine, USA

Sara Skrabalak, Indiana University, USA

Francesco Stellacci, École polytechnique fédérale de Lausanne, Switzerland

Ling-Dong Sun, Peking University, China

Shouheng Sun, Brown University, USA

Sarah Tolbert, University of California, Los Angeles, USA

Jonathan Veinot, University of Alberta, Canada

Umesh Waghmare, Jawaharlal Nehru Centre for Advanced Scientific Research, India

Jianfang Wang, Chinese University of Hong Kong, Hong Kong SAR

Sharon Weiss, Vanderbilt University, USA

Benjamin Wiley, Duke University, USA

Wenzhuo Wu, Purdue University, USA

Nobuhiro Yanai, Kyushu University, Japan

Stefan Zauscher, Duke University, USA

Xiao Cheng Zeng, University of Nebraska-Lincoln, USA

Hongjie Zhang, Changchun Institute of Applied Chemistry, China

Hua Zhang, City University of Hong Kong, China

Manzhou Zhu, Anhui University, China

Jin Zou, University of Queensland, Australia

Yanlong Wang, Dalian Institute of Chemical Physics, China

Jiangjixing Wu, Tianjin University, China

Tong Wu, Qingdao University, China

Xiuqiang Xie, Hunan University, China

Yikai Xu, Queen's University Belfast, UK

Fei Zhang, Tianjin University, China

Zishuai Zhang, The University of British Columbia, Canada

Kai Zhu, Harbin Engineering University, China

Xiaolu Zhuo, The Chinese University of Hong Kong, China

## Community Board

Arun Richard Chandrasekaran, The RNA Institute, University at Albany, SUNY, USA

Yuanxing Fang, Fuzhou University, China

Azhar Fakharuddin, Interuniversity Microelectronics Centre, Belgium

Calum T. J. Ferguson, Max Planck Institute for Polymer Research, Germany

Lucas Güniat, EPFL, Switzerland

Marilena Hadjimichael, University of Manchester, UK

Shumeng Hao, Georgia Institute of Technology, USA

Jundie Hu, Suzhou University of Science and Technology, China

Shuaidong Huo, Xiamen University, China

Ignacio Insua, University of Santiago de Compostela, Spain

Education and Research Mohali, India

Zhiyuan Liu, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

Sandeep Naeemidashtarjani, The University of Texas at Austin, USA

Pepita Pla-Vilanova, University of Lleida, Spain

Satyajit Ratha, Indian Institute of Technology Bhubaneswar, India

Pengzhan Sun, University of Manchester, UK

Yanlong Wang, Dalian Institute of Chemical Physics, China

Jiangjixing Wu, Tianjin University, China

Tong Wu, Qingdao University, China

Xiuqiang Xie, Hunan University, China

Yikai Xu, Queen's University Belfast, UK

Fei Zhang, Tianjin University, China

Zishuai Zhang, The University of British Columbia, Canada

Kai Zhu, Harbin Engineering University, China

Xiaolu Zhuo, The Chinese University of Hong Kong, China

This journal is © The Royal Society of Chemistry 2023.

Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

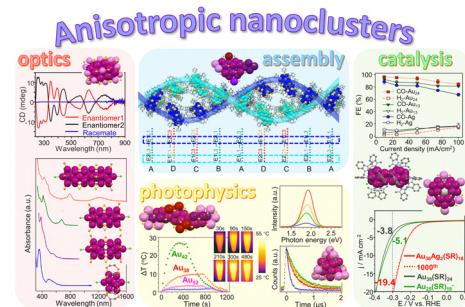
Registered charity number: 207890

## REVIEWS

991

**Shape control with atomic precision: anisotropic nanoclusters of noble metals**

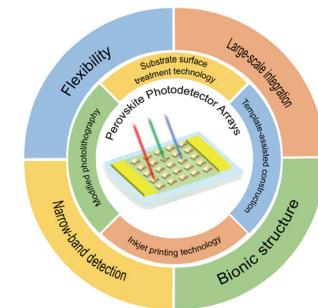
Yingwei Li\* and Rongchao Jin\*



1014

**Recent progress in construction methods and applications of perovskite photodetector arrays**

Hui Lu, Wenqiang Wu, Zeping He, Xun Han\* and Caofeng Pan\*

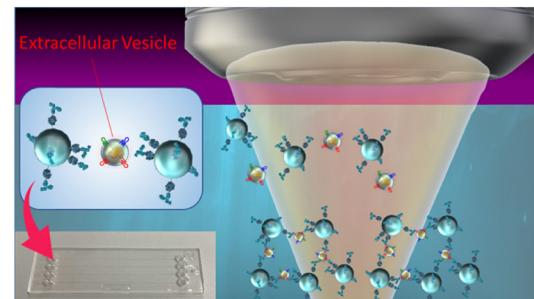


## COMMUNICATIONS

1034

**Ultrafast sensitivity-controlled and specific detection of extracellular vesicles using optical force with antibody-modified microparticles in a microflow system**

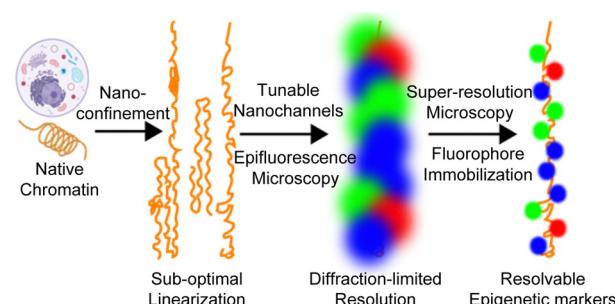
Kana Fujiwara, Yumiko Takagi, Mamoru Tamura, Mika Omura, Kenta Morimoto, Ikuhiko Nakase,\* Shiro Tokonami\* and Takuya Iida\*



1043

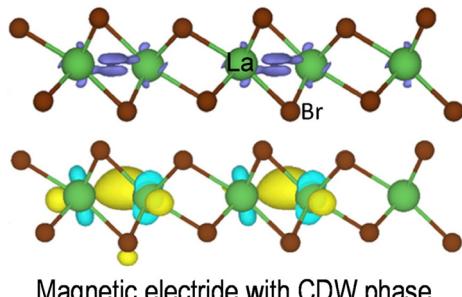
**Super-resolution imaging of linearized chromatin in tunable nanochannels**

Ji-Hoon Lee, Joyce Han-Ching Chiu, Nicholas J. Ginga, Tasdiq Ahmed, M. D. Thouless, Yifan Liu\* and Shuichi Takayama\*



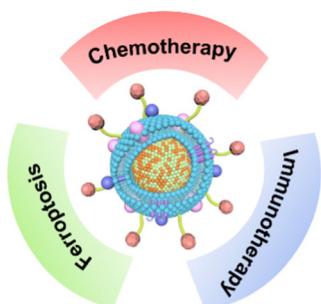
## COMMUNICATIONS

1054

Coexistence of ferromagnetism and charge density waves in monolayer  $\text{LaBr}_2$ 

Jun Zhou, Zishen Wang, Shijie Wang, Yuan Ping Feng,\* Ming Yang\* and Lei Shen\*

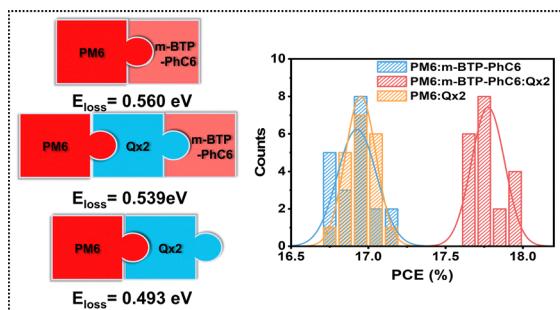
1062



## Engineering magnetotactic bacteria MVs to synergize chemotherapy, ferroptosis and immunotherapy for augmented antitumor therapy

Gexuan Jiang, Zhichu Xiang\* and Qiaojun Fang\*

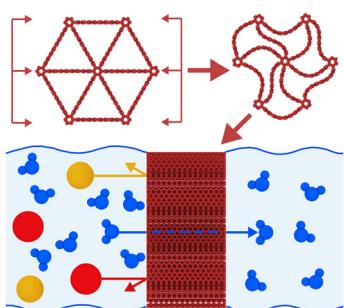
1073



## Improving the efficiency of ternary organic solar cells by reducing energy loss

Mengni Wang, Yanan Shi, Ziqi Zhang, Yifan Shen, Min Lv, Yangjun Yan, Huiqion Zhou, Jianqi Zhang, Kun Lv, Yajie Zhang,\* Hailin Peng and Zhixiang Wei\*

1082



## Graphene foam membranes with tunable pore size for next-generation reverse osmosis water desalination

Duc Tam Ho, Thi Phuong Nga Nguyen, Arun Jangir and Udo Schwingenschlögl\*

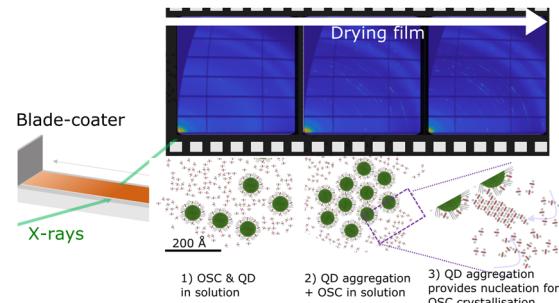


## COMMUNICATIONS

1090

**Insights into the kinetics and self-assembly order of small-molecule organic semiconductor/quantum dot blends during blade coating**

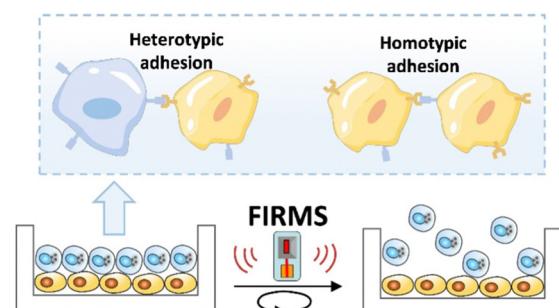
Daniel T. W. Toolan,\* Michael P. Weir, Shuangqing Wang, Simon A. Dowland, Zhilong Zhang, James Xiao, Jonathan Rawle, Neil Greenham, Richard H. Friend, Akshay Rao, Richard A. L. Jones and Anthony J. Ryan



1098

**Homotypic and heterotypic adhesion of cancer cells revealed by force-induced remnant magnetization spectroscopy**

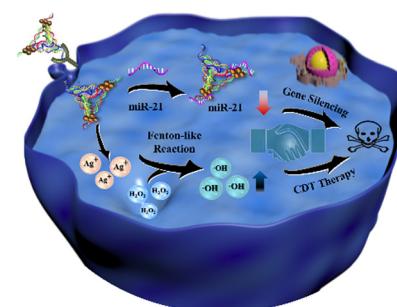
Jinxiu Zhan, Di Zhang, Feng Feng, Min Xu and Li Yao\*



1106

**Multifunctional DNA nanoprobe for tumor-targeted synergistic therapy by integrating chemodynamic therapy with gene silencing**

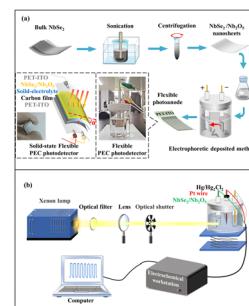
Qiaorong Tang, Qianqian Li, Lu Shi, Wei Liu, Baoxin Li and Yan Jin\*



1113

**Two dimensional NbSe<sub>2</sub>/Nb<sub>2</sub>O<sub>5</sub> metal–semiconductor heterostructure-based photoelectrochemical photodetector with fast response and high flexibility**

Xiang Xu,\* Chunhui Lu, Ying Wang, Xing Bai, Zenghui Liu, Ying Zhang and Dengxin Hua



## CORRECTION

1122

**Correction: Multiplexed molecular imaging with surface enhanced resonance Raman scattering nanoprobes reveals immunotherapy response in mice via multichannel image segmentation**

Chrysafis Andreou,\* Konstantinos Plakas, Naxhije Berisha, Mathieu Gigoux, Lauren E. Rosch, Rustin Mirsafavi, Anton Oseledchyk, Suchetan Pal, Dmitriy Zamarin, Taha Merghoub, Michael R. Detty and Moritz F. Kircher

