

Journal of Materials Chemistry B

Materials for biology and medicine

rsc.li/materials-b

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 2050-750X CODEN JMCBDV 11(32) 7519–7794 (2023)



Cover

See Jiangchao Qian *et al.*, pp. 7609–7622.
Image reproduced by permission of Jiangchao Qian from *J. Mater. Chem. B*, 2023, 11, 7609.



Inside cover

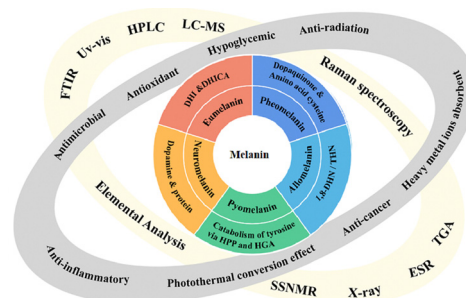
See Yong Huang, Dezhi Yang, Hong Liang *et al.*, pp. 7623–7628.
Image reproduced by permission of Yong Huang from *J. Mater. Chem. B*, 2023, 11, 7623.

REVIEWS

7528

Melanin: insights into structure, analysis, and biological activities for future development

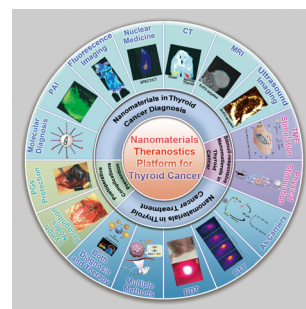
Wen Song, Haoyue Yang, Song Liu, Huahua Yu, Dan Li,* Pengcheng Li and Rong Xing*



7544

Nanomaterials: a promising multimodal theranostics platform for thyroid cancer

Lei Li, Ze Wang, Hui Guo* and Quan Lin*



Editorial Staff

Executive Editor

Michaela Mühlberg

Deputy Editor

Geraldine Hay

Editorial Production Manager

Jonathon Watson

Senior Publishing Editor

Fiona Iddon

Development Editor

Rose Wedgbury

Publishing Editors

Eleanor Griffiths, Francesca Jacklin, Brian Li

Editorial Assistant

Daniel Smith

Publishing Assistant

Jane Paterson

Publisher

Sam Keltie

For queries about submitted papers, please contact Jonathon Watson, Editorial Production Manager in the first instance. E-mail: materialsB@rsc.org

For pre-submission queries please contact Michaela Mühlberg, Executive Editor. E-mail: materialsB-rsc@rsc.org

Journal of Materials Chemistry B (electronic: ISSN 2050-7518) is published

48 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

2023 Annual (electronic) subscription price: £2192; \$3516.

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

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

For marketing opportunities relating to this journal, contact marketing@rsc.org

Journal of Materials Chemistry B

rsc.li/materials-b

Journal of Materials Chemistry A, B & C cover high quality studies across all fields of materials chemistry. The journals focus on those theoretical or experimental studies that report new understanding, applications, properties and synthesis of materials. *Journal of Materials Chemistry B* covers materials with applications in biology and medicine.

Editorial Board

Editor-in-Chief

Jeroen Cornelissen, University of Twente, The Netherlands

Associate Editors

Kaushik Chatterjee, Indian Institute of Science, India
Elizabeth Cosgriff-Hernandez, The

University of Texas at Austin, USA
Gemma-Louise Davies, University College London, UK
Håkan Engqvist, Uppsala University, Sweden
Jian Ji, Zhejiang University, China
Shaoqin Liu, Harbin Institute of Technology, China
Yoshiko Miura, Kyushu University, Japan

Jessica Winter, The Ohio State University, USA
Chengzhong Yu, University of Queensland, Australia

Member

Claus Feldmann, Karlsruhe Institute of Technology, Germany

Advisory Board

D. Benoit, University of Rochester, USA
C. Bettinger, Carnegie Mellon University, USA
W. Chan, University of Toronto, Canada
J. Chang, Shanghai Institute of Ceramics, China
H. Cölfen, University of Konstanz, Germany
T. Da Ros, Trieste University, Italy
T. Davis, Monash University, Australia
T. Desai, University of California, San Francisco, USA
X. Deng, Peking University, China
E. Duguet, University of Bordeaux, France
C. Fan, Shanghai Jiao Tong University, China
Y. Fang, NCNST, China
R. Forgan, University of Glasgow, UK
J. Fu, Ningbo Institute of Industrial Technology, Chinese Academy of Sciences, China
A. Gedanken, Bar-Ilan University, Israel
M. Grunlan, Texas A&M University, USA
Y. Gun'ko, Trinity College Dublin, Ireland
J. van Hest, Radboud University Nijmegen, The Netherlands
K. Hamad-Schifferli, University of Massachusetts Boston, USA
B. Harley, University of Illinois, USA
A. Higuchi, National Central University, Chinese Taipei, and Wenzhou Medical

University, China
S. Inal, KAUST, Saudi Arabia
Y. Ito, RIKEN, Japan
B. Keselowsky, University of Florida, USA
J. Khandare, MIT WPU Campus, India
A. Kloxin, University of Delaware, USA
N. Kotov, University of Michigan, USA
Z.-C. Li, Peking University, China
E. Lipke, Auburn University, USA
L. Liz-Marzan, CIC biomaGUNE, Spain
D. Lynn, University of Wisconsin, USA
E. D.-L. Ma, Hong Kong Baptist University, Hong Kong
G. Malliaras, University of Cambridge, UK
H.-Q. Mao, Johns Hopkins University, USA
S. Marchesan, University of Trieste, Italy
D. Martin, University of Delaware, USA
K. Masters, University of Wisconsin-Madison, USA
A. Miserez, Nanyang Technological University, Singapore
R. O'Reilly, University of Birmingham, UK
M. in het Panhuis, University of Wollongong, Australia
A. Pannier, University of Nebraska, USA
J. Park, KAIST, Korea
S. Perrier, University of Warwick, UK
X. Qu, Changchun Institute of Applied

Chemistry, Chinese Academy of Sciences, China
M. Resmini, Queen Mary University of London, UK
K. Schenke-Layland, NMI Natural and Medical Sciences Institute, University of Tübingen, Reutlingen, Germany
C. Schmidt, University of Florida, USA
L. Segatori, Rice University, USA
T. Serizawa, Tokyo Institute of Technology, Japan
Y. Shen, Zhejiang University, China
S. Staniland, University of Sheffield, UK
N. Steinmetz, University of California, San Diego, USA
M. Stenzel, University of New South Wales, Australia
M. Stevens, Imperial College London, UK
S. Stoll, Georgetown Washington, USA
L. Stugs, University of Texas at Austin, USA
M. Takai, University of Tokyo, Japan
J. Tementoff, Georgia Institute of Technology, USA
P. Théato, Karlsruhe Institute of Technology, Germany
R. Uljin, City University of New York, US
J. Zheng, University of Akron, USA

Information for Authors

Full details on how to submit material for publication in Journal of Materials Chemistry B are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be made via the journal's homepage: rsc.li/materials-b. Submissions: The journal welcomes submissions of manuscripts for publication as Full Papers, Communications, Reviews, Highlights and Applications. Full Papers and Communications should describe original work of high quality and impact which must highlight the novel properties or applications (or potential properties/applications) of the materials studied.

Additional details are available from the Editorial Office or <http://www.rsc.org/authors>

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of

Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)-Reproduced by permission of the Royal Society of Chemistry.

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

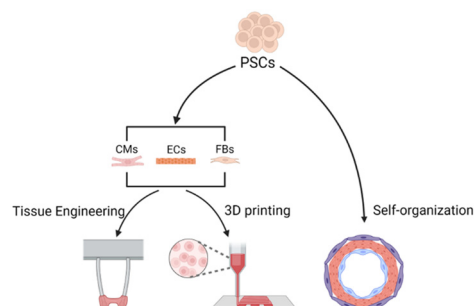


REVIEWS

7567

Cardiac organoid: multiple construction approaches and potential applications

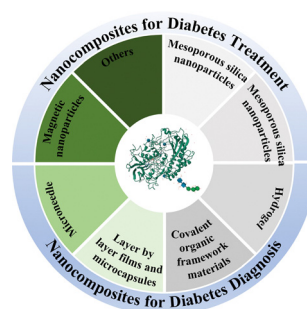
Ziyi Yang, Yajie Zhang, Jine Wang, Jingbo Yin, Zheng Wang* and Renjun Pei*



7582

Recent advances in glucose-oxidase-based nanocomposites for diabetes diagnosis and treatment

Dejun Yang, Chunyan Cai, Kai Liu, Zhaolei Peng, Chunmei Yan, Jingjing Xi, Fan Xie* and Xiaofang Li*

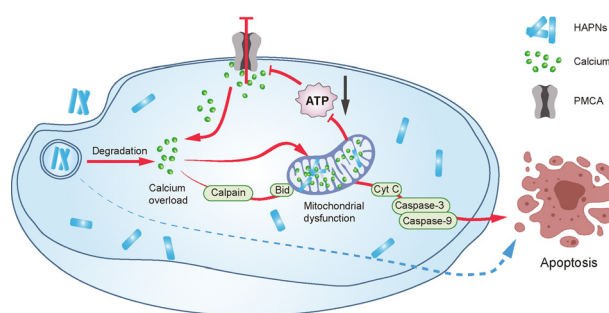


PAPERS

7609

Hydroxyapatite nanoparticles induced calcium overload-initiated cancer cell-specific apoptosis through inhibition of PMCA and activation of calpain

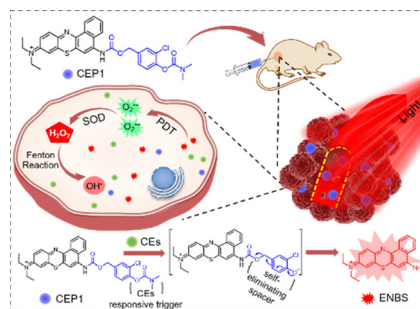
Xiulin Dong, Chunyu Zang, Yi Sun, Shuiquan Zhang, Changsheng Liu and Jiangchao Qian*



7623

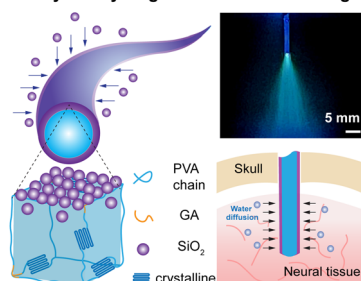
A S-substituted Nile Blue-derived bifunctional near-infrared fluorescent probe for *in vivo* carboxylesterase imaging-guided photodynamic therapy of hepatocellular carcinoma

Beilei Wang, Yong Huang,* Dezhi Yang,* Jiayao Xu, Xiaohong Zhong, Shulin Zhao and Hong Liang*



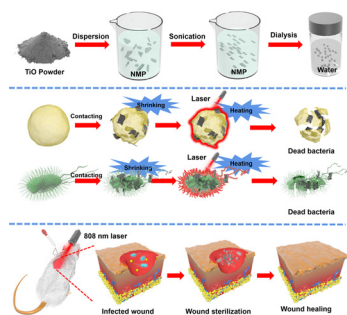
7629

Hybrid hydrogel fiber via ALD coating

A nanoscale inorganic coating strategy for stabilizing hydrogel neural probes *in vivo*

Sizhe Huang, Sabrina Urbina Villafranca, Iyanah Mehta, Omri Yosfan, Eunji Hong, Anyang Wang, Nianqiang Wu, Qianbin Wang* and Siyuan Rao*

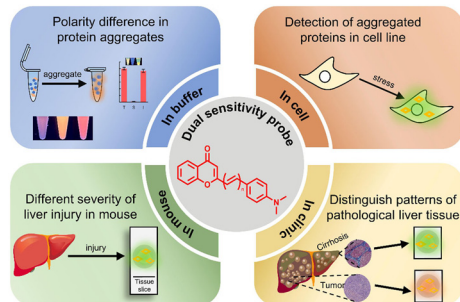
7641



Two-dimensional TiO2 nanosheets with photothermal effects for wound sterilization

Wei Zhang, Hongrang Chen, Haotian Tian, Qiang Niu, Jianghao Xing, Tao Wang, Xulin Chen and Xianwen Wang*

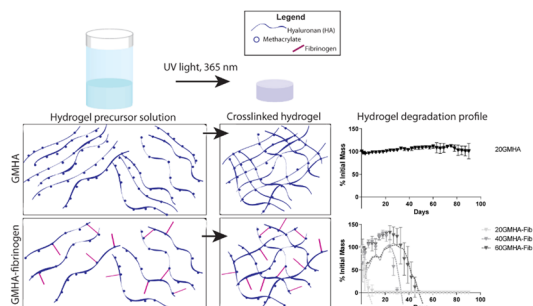
7654



Solvatochromic sensors detect proteome aggregation in stressed liver tissues with hepatic cancer and cirrhosis

Biao Jing, Junpeng Li, Kun Guo, Lianggang Zeng, Jidong Sui, Zhenduo Zhang, Zhiming Wang, Hao Jin, Jialu Sun, Zhao Xue, Qi Zhao, Wang Wan* and Xuepeng Dong*

7663



Development of a bioactive tunable hyaluronic-protein bioconjugate hydrogel for tissue regenerative applications

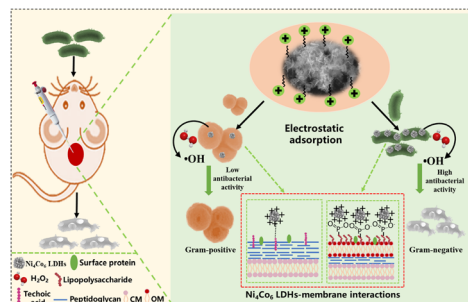
Mary Kasper, Madison Cydis, Abdullah Afridi, Bassam M. Smadi, Yuan Li, Alban Charlier, Brooke E. Barnes, Julia Hohn, Michael J. Cline, Wayne Carver, Michael Matthews, Daniel Savin, Carlos M. Rinaldi-Ramos and Christine E. Schmidt*



7675

NiCo LDH nanozymes with selective antibacterial activity against Gram-negative bacteria for wound healing

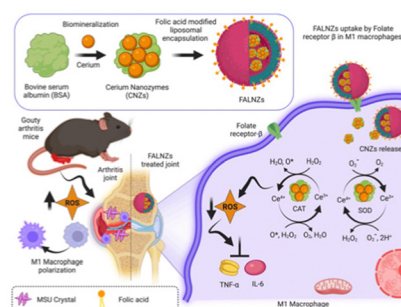
Li Su,* Sainan Qin, Xinai Yu, Yifei Chen, Liang Wang,* Wenpei Dong, Zhongjian Xie* and Han Zhang



7684

Targeted treatment of gouty arthritis by biomimetic metallic nanozyme-mediated oxidative stress-mitigating nanotherapy

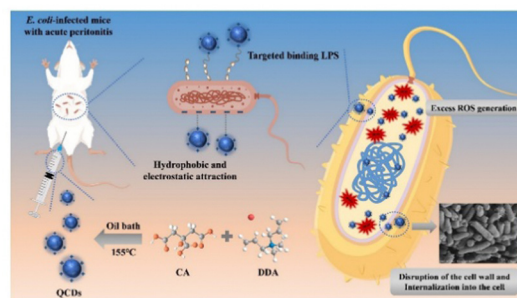
Adityanarayan Mohapatra, Ayeskanta Mohanty, Padmanaban Sathiyamoorthy, Sahil Chahal, Veena Vijayan, Santhosh Kalash Rajendrakumar and In-Kyu Park*



7696

Quaternized carbon dots with enhanced antimicrobial ability towards Gram-negative bacteria for the treatment of acute peritonitis caused by *E. coli*

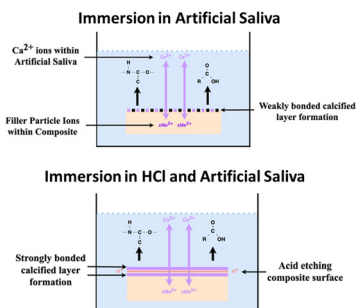
Xintian Zhang, Pingping Wu, Xiaoli Hao, Jiamiao Liu, Zhengjun Huang, Shaohuang Weng,* Weifeng Chen, Lingling Huang* and Jianyong Huang*



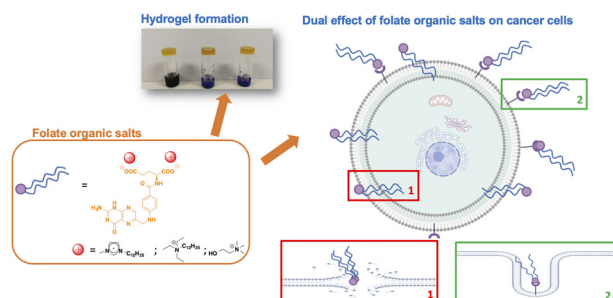
7707

Unveiling the mechanisms behind surface degradation of dental resin composites in simulated oral environments

Brenda Ah-yan Leung, William Joe, Sajjad S. Mofarah,* Charles C. Sorrell, Roozbeh Abbasi, Mohsen Azadeh, Joseph A Arsecularatne and Pramod Koshy*



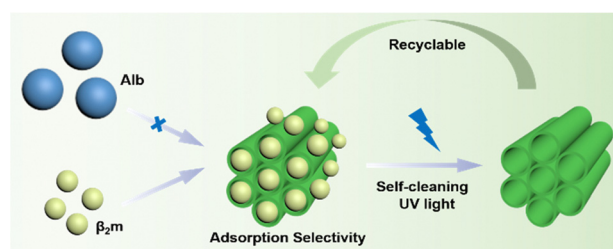
7721



Insights about the ability of folate based supramolecular gels to act as targeted therapeutic agents

Carla Rizzo, Patrizia Cancemi, Miriam Buttacavoli, Gianluca Di Cara, Cesare D'Amico, Floriana Billeci, Salvatore Marullo and Francesca D'Anna*

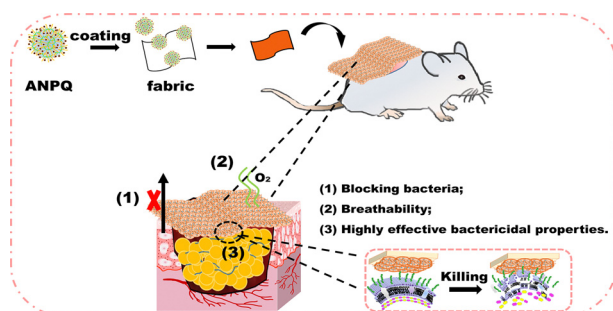
7739



A novel recyclable hemoperfusion adsorbent based on TiO₂ nanotube arrays for the selective removal of β₂-microglobulin

Minjun Zhang, Xinjie Liu, Xiaofan Li, Wan Zhou, Huibin Yu, Shenqi Wang* and Lei Zhou*

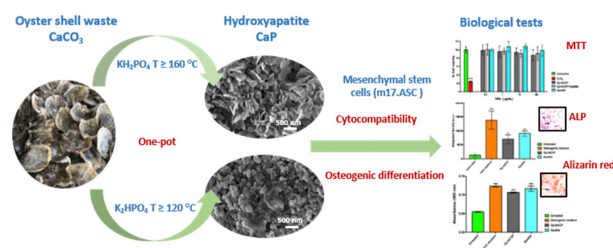
7750



Highly active nanoparticle enhanced rapid adsorption-killing mechanism to combat multidrug-resistant bacteria

Yunyun Xue, Zihao Zhao, Wenbo Huang, Zelin Qiu, Xiao Li, Yu Zhao, Chuyao Wang, Ronglu Cui, Shuyang Shen, Hua Tian, Lifeng Fang,* Rong Zhou* and Baoku Zhu*

7766



A sustainable one-pot method to transform seashell waste calcium carbonate to osteoinductive hydroxyapatite micro-nanoparticles

Raquel Fernández-Penas, Cristóbal Verdugo-Escamilla, Carla Triunfo, Stefanie Gärtner, Annarita D'Urso, Francesca Oltolina, Antonia Follenzi, Gabriele Maoloni, Helmut Cölfen, Giuseppe Falini and Jaime Gómez-Morales*



7778

Design and evaluation of propranolol hydrochloride loaded thiolated Zein/PEO electrospun fibrous matrix for transmucosal drug delivery

Medha Surendranath, Rekha M Ramesan, Prakash Nair and Ramesh Parameswaran*

