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(13) 2793-3028 (2023)



Cover

See Rudy L Luck, Haiying Liu et al., pp. 2852-2861. Image reproduced by permission of Sarah Atkinson from J. Mater. Chem. B, 2023, 11, 2852.



Inside cover

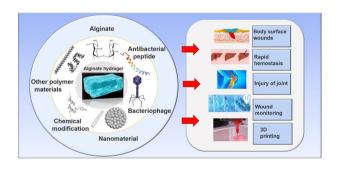
See Lin Zhao, Yunbing Wang et al., pp. 2862-2871. Image reproduced by permission of Gaocan Li from J. Mater. Chem. B, 2023, 11, 2862.

REVIEWS

2801

A review on the synthesis and development of alginate hydrogels for wound therapy

Yang Cao, Hailin Cong,* Bing Yu* and Youqing Shen



Smart microneedle patches for wound healing and management

Fangfang Hu, Qian Gao, Jinxi Liu, Wenting Chen, Caiyun Zheng, Que Bai, Na Sun, Wenhui Zhang, Yanni Zhang* and Tingli Lu*



Editorial Staff

Executive Editor

Michaela Mühlberg

Deputy Editor

Geraldine Hav

Editorial Production Manager

Ionathon Watson

Senior Publishing Editor

Fiona Iddon

Development Editor

Publishing Editors

Blake Baker, Eleanor Griffiths, Francesca Jacklin, Brian Li

Editorial Assistant

Daniel Smith

Publishing Assistant

Iane Paterson

Publisher

Sam Keltie

For queries about submitted papers, please contact Ionathon 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

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

Jiang Chang, Shanghai Institute of Ceramics,

Elizabeth Cosgriff-Hernandez, The University of Texas at Austin, USA

Gemma-Louise Davies, University College London, UK

Jian Ji, Zhejiang University, China Shaoqin Liu, Harbin Institute of Technology,

Yoshiko Miura, Kyushu University, Japan Marc in het Panhuis, University of Wollongong, Australia

Xiaogang Qu, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, China Jessica Winter, The Ohio State University,

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 K. Chatterjee, Indian Institute of Science,

India H. Cölfen, University of Konstanz, Germany

T. Da Ros, Trieste University, Australia 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,

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, Saudia 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 Triest , Italy D. Martin, University of Delaware, USA

K. Masters, University of Wisconsin-Madison, A. Miserez, Nanyang Technological

University, Singapore R. O'Reilly, University of Birmingham, UK A. Pannier, University of Nebraska, USA I. Park, KAIST, Korea

S. Perrier, University of Warwick, UK 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, Iapan

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. Suggs, University of Texas at Austin, USA M. Takai, University of Tokyo, Japan

J. Temenoff, Georgia Institute of Technology, USA P. Théato, Karlsruhe Institute of Technology,

Germany R. Ulijn, 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.

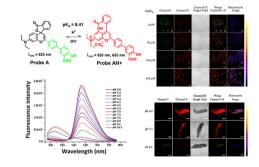
Registered charity number: 207890



2852

Near-infrared rhodol dyes bearing salicylaldehyde moieties for ratiometric pH sensing in live cells during mitophagy and under hypoxia conditions

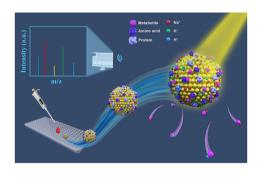
Sushil K. Dwivedi, Dilka Liyana Arachchige, Tara Vohs, Jiani Tang, Kyle Usimaki, Adenike Mary Olowolagba, Delaney Raine Fritz, Rudy L Luck,* Thomas Werner and Haiying Liu*



2862

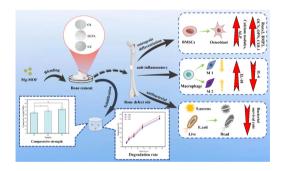
SiO₂@Au nanoshell-assisted laser desorption/ionization mass spectrometry for coronary heart disease diagnosis

Yanyan Li, Hua Zhang, Jingjing Jiang, Lin Zhao* and Yunbing Wang*



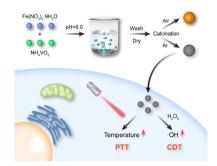
Multifunctional magnesium-organic framework doped biodegradable bone cement for antibacterial growth, inflammatory regulation and osteogenic differentiation

B. Wang, H. Chen, S. Peng, X. Li, X. Liu, H. Ren, Y. Yan* and Q. Zhang*



Calcination-controlled performance optimization of iron-vanadium bimetallic oxide nanoparticles for synergistic tumor therapy

Jiaxin Hu, Bin Yu, Wenbo Sun* and Lehui Lu*



2895

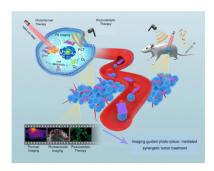
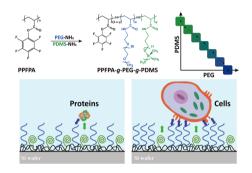


Photo-/piezo-activated ultrathin molybdenum disulfide nanomedicine for synergistic tumor therapy

Lili Xia, Junjie Chen, Yujie Xie,* Shan Zhang,* Weiwei Xia,* Wei Feng* and Yu Chen

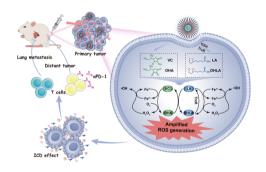
2904



Dual functionalized brush copolymers as versatile antifouling coatings

Jihyo Kil, Rafia Tasnim Rahman, Wenxuan Wang, Saehan Choi, Yoon Sung Nam* and Sheng Li*

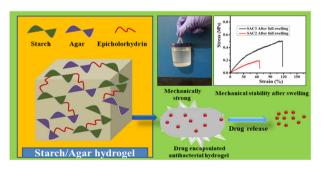
2916



Nanodrug constructed using dietary antioxidants for immunotherapy of metastatic tumors

Xiao Wu, Yifeng Tan, Jing Zhang, Rong Cui, Chunyan Liao* and Shiyong Zhang*

2927



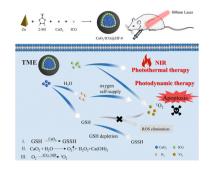
Swelling induced mechanically tough starch-agar based hydrogel as a control release drug vehicle for wound dressing applications

Dimpee Sarmah, Munmi Borah, Manabendra Mandal and Niranjan Karak*

2937

Calcium-peroxide-mediated cascades of oxygen production and glutathione consumption induced efficient photodynamic and photothermal synergistic therapy

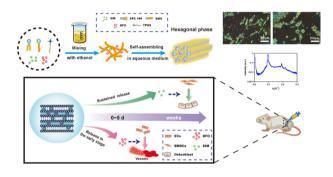
Lanfang Zhang, Hui Lu, Yu Tang, Xiaojie Lu, Zhendong Zhang, Yan Zhang, Ying Liu* and Chenhui Wang*



2946

An intelligent phase transformation system based on lyotropic liquid crystals for sequential biomolecule delivery to enhance bone regeneration

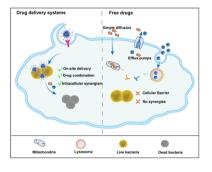
Rui Li, Jiao Zhang, Jingyu Shi, Jiang Yue, Yongzhi Cui, Qingsong Ye, Gang Wu, Zhiping Zhang, Yuanyuan Guo* and Dehao Fu*



2958

Dual-targeted poly(amino acid) nanoparticles deliver drug combinations on-site: an intracellular synergistic strategy to eliminate intracellular bacteria

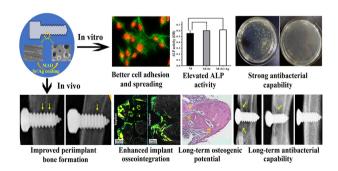
Dongdong Zhao, Wenli Feng, Xiaoxu Kang, Haofei Li, Fang Liu, Weitao Zheng, Guofeng Li* and Xing Wang*



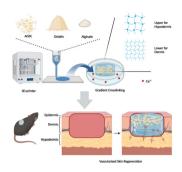
2972

Osteogenic and long-term antibacterial properties of Sr/Ag-containing TiO₂ microporous coating in vitro and in vivo

Huan Wang, Tian-Xia Zheng, Nuo-Ya Yang, Ying Li, Hong Sun, Wei Dong, Li-Fang Feng, Jiu-Peng Deng and Meng-Chun Qi*



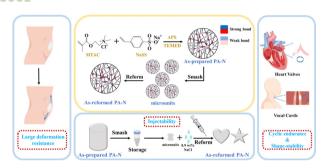
2989



3D bioprinting of a gradient stiffened gelatin-alginate hydrogel with adipose-derived stem cells for full-thickness skin regeneration

Yuan Ma, Yilin Wang, Danni Chen, Ting Su, Qiang Chang,* Wenhua Huang* and Feng Lu*

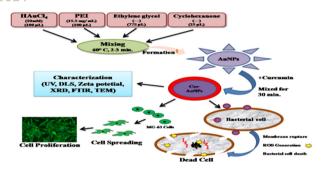
3001



Highly stretchable, injectable hydrogels with cyclic endurance and shape-stability in dynamic mechanical environments, by microunit reformation

Meiru Li, Yuwei Zhou, Xueping Li, Sidi Li, Jin Zhao,* Xin Hou* and Xubo Yuan

3014



Synthesis and in vitro antibacterial behavior of curcumin-conjugated gold nanoparticles

Maneesha Pandey,* Ashish Kumar Singh and P. C. Pandey