Biomaterials Science

An international high impact journal exploring the underlying science behind the function, interactions and design of biomaterials

rsc.li/biomaterials-science

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 2047-4849 CODEN BSICCH 11(22) 7221-7460 (2023)



Cover

See Donny Hanjaya-Putra et al., pp. 7346-7357.

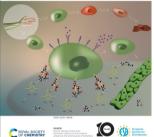


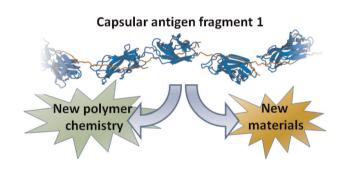
Image reproduced by permission of Fransisca Puspa Dewi from Biomater. Sci., 2023, **11**, 7346.

REVIEWS

7229

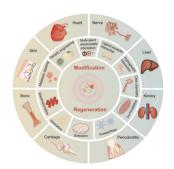
The polymer and materials science of the bacterial fimbriae Caf1

David A. Fulton,* Gema Dura and Daniel T. Peters



Engineered exosomes for tissue regeneration: from biouptake, functionalization and biosafety to applications

Mu Zhang, Lei Wan, Ruigi Li, Xiaoling Li, Taifu Zhu and Haibin Lu*



Editorial Staff

Executive Editor

Maria Southall

Deputy Editor

Laura Ghandhi

Editorial Production Manager Cara Sutton

Assistant Editors

Sean Browner, Molly Colgate, Paul Scott, Alison Winder

Editorial Assistant

Publishing Assistant

Allison Holloway Publisher

Sam Keltie

For queries about submitted papers, please contact Cara Sutton, Editorial Production Manager in the first instance. E-mail: biomaterialsscience@rsc.org

For pre-submission queries please contact Maria Southall, Executive Editor. E-mail: biomaterialsscience-rsc@rsc.org

Biomaterials Science (electronic: ISSN 2047-4849) is published 24

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 OWF, UK

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

2023 Annual (electronic) subscription price: £2450, \$4518. 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,

Advertisement sales

Telephone: +44 (0) 207 4378 6556.

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

Biomaterials Science

rsc.li/biomaterials-science

An international high impact journal exploring the science of biomaterials and their translation towards clinical use.

Editorial Board

Jianjun Cheng, Westlake University, China

Associate Editors Khuloud Al-Jamal, King's College London, UK Nasim Annabi, University of California, Los Angeles USA

Lino Ferreira, UC-Biotech, Portugal Jöns Hilborn, Uppsala University, Sweden Won Jong Kim, POSTECH, Korea Shyni Varghese, Duke University, USA Fu-Jian Xu, Beijing Univeristy of Chemical Technology, China Lichen Yin, Soochow University. China

Chuan Zhang, Shanghai Jiao Tong University Pamela Habibovic, Maastricht University, Netherlands Xinvuan Zhu, Shanghai Jiao Tong University, China

Advisory Board

Lihi Adler-Abramovich, Tel Aviv University, Israel Kazunari Akiyoshi, iCeMS, Japan Cameron Alexander, University of Nottingham, UK Edmondo Benetti, ETH Zürich, Switzerland Mark Bradley, University of Edinburgh, UK Jayanta Chatterjee, IISC, India Arabinda Chaudhuri, CSIR-Indian Institute of

Chemical Technology, India Guoping Chen, National Institute for Materials Science (NIMS), Japan

Yiyun Cheng, East China Normal University, China Joel Collier, Duke University, USA Justin Cooper-White, University of Queensland,

Honggang Cui, Johns Hopkins University, USA Jianwu Dai, Institute of Genetics and Developmental Biology of CAS, China Cole DeForest, University of Washington, USA Andrew Dove, University of Birmingham, UK Yizhou Dong, The Ohio State University, USA Hongwei Duan, Nanyang Technological University (NTU), Singapore

Christine Dufes, University of Strathclyde, UK Nicholas Dunne, Dublin City University, Ireland Jennifer Elisseeff, Johns Hopkins University, USA

Elisabeth Engel Lopez, IBEC, Spain Shaoqin Sarah Gong, University of Wisconsin-Madison, USA

Dong Keun Han, Cha University, Korea Ngan Huang, Stanford, USA Chris Jewell, University of Maryland, USA Jian Ji, Zhejiang University, China Ali Khademhosseini, Terasaki Institute for Biomedical Innovation, USA April Kloxin, University of Delaware, USA Veena Koul, IIT Delhi, India Christine Le Maitre, University of Sheffield, UK Haeshin Lee, KAIST, Republic of Korea Khoon Lim, University of Sydney, Australia Matthias Lutolf, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Atsushi Maruyama, Tokyo Institute of Technology, Phillip Messersmith, University of California,

Berkeley, USA Aline Miller, University of Manchester, UK Hyejung Mok, Konkuk University, Korea Steve Oh, A*STAR, Singapore Shaunak Pandya, Prolong Pharmaceuticals, USA Ling Peng, Aix-Marseille University, France

Nicholas Peppas, University of Texas at Austin, USA Catherine Picart, Grenoble INP, France Tilo Pompe, University of Leipzig, Germany Suzie Pun, University of Washington, USA Shun Shen, Tongji University, China Heungsoo Shin, Hanyang University, Korea Molly Shoichet, University of Toronto, Canada Xintao Shuai, Sun Yat-Sen University, China Aasheesh Srivastava, IISER, India Patrick Stayton, University of Washington, USA Marcus Textor, ETH Zurich, Switzerland Takafumi Ueno, Tokyo Institute of Technology,

Jun Wang, South China University of Technology,

Tanja Weil, Max Planck Institute for Polymer Research, Germany Stephanie Willerth, University of Victoria, Canada Zimei Wu, University of Auckland, New Zealand Evelyn Yim, Waterloo, Canada

Can Zhang, China Pharmaceutical University, China

Information for Authors

Full details on how to submit material for publication in Biomaterials Science form: (Original Citation)-Reproduced by permission of the Royal Society 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/ biomaterials-science. Submissions:

The journal welcomes submissions of manuscripts for publication as Full Papers, Communications, Minireviews and Reviews. Full Papers and Communications should describe original work of high quality and impact.

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

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

7268

Metal ions: the unfading stars of bone regeneration -from bone metabolism regulation to biomaterial applications

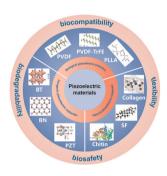
Yankun Luo, Hanghang Liu, Yaowen Zhang, Yao Liu, Shibo Liu. Xian Liu* and En Luo*



7296

Piezoelectric materials for neuroregeneration: a review

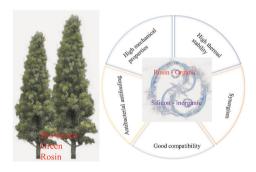
Linliang Wu, Hongxia Gao, Qi Han, Wenchao Guan, Shaolan Sun, Tiantian Zheng, Yaqiong Liu, Xiaolu Wang, Ran Huang and Guicai Li*



7311

From rosin to novel bio-based silicone rubber: a review

Qiaoguang Li, Yuxin He, Jie Yan, Yongquan Li,* Junfeng Feng* and Zhihong Wang*

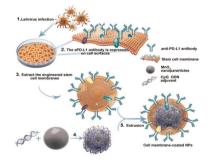


COMMUNICATIONS

7327

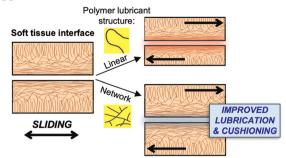
Bioinspired immuno-radio-enhancers toward synergistic nanomedicine through radiationinduced abscopal effects and immunocheckpoint blockade therapies

Pengfei Zhang, Hu Chen, Chuan Chen, Xuan Liu, Hongwei Cheng, Yaming Wu, Xiaoyong Wang, Gang Liu* and Yun Zeng*



COMMUNICATIONS

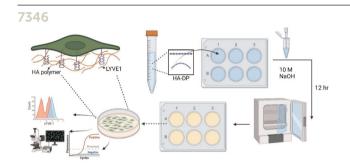
7339



A polymer network architecture provides superior cushioning and lubrication of soft tissue compared to a linear architecture

Benjamin G. Cooper, Christian D. DeMoya, Katie J. Sikes, David D. Frisbie, Nikki Phillips, Brad B. Nelson, C. Wayne McIlwraith, Chris E. Kawcak, Laurie R. Goodrich,* Brian D. Snyder* and Mark W. Grinstaff*

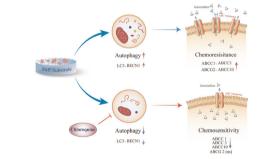
PAPERS



Synthetic hyaluronic acid coating preserves the phenotypes of lymphatic endothelial cells

Sanjoy Saha, Fei Fan, Laura Alderfer, Francine Graham, Eva Hall and Donny Hanjaya-Putra*

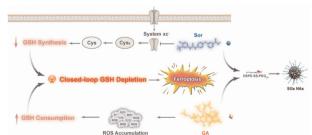
7358



Matrix stiffness triggers chemoresistance through elevated autophagy in pancreatic ductal adenocarcinoma

Haopeng Pan, Shajun Zhu, Tiancheng Gong, Di Wu, Yahong Zhao, Jiashuai Yan, Chaolun Dai, Yan Huang, Yumin Yang* and Yibing Guo*

7373



Self-engineered binary nanoassembly enabling closed-loop glutathione depletion-amplified tumor ferroptosis

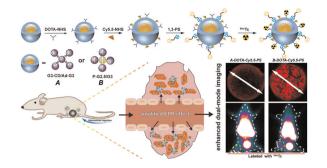
Jin Lei, Shenwu Zhang, Zehua Wu, Xinxin Sun, Binghong Zhou, Peiqi Huang, Mingzhu Fang, Lin Li,* Cong Luo* and Zhonggui He*

PAPERS

7387

Phosphorus core-shell tecto dendrimers for enhanced tumor imaging: the rigidity of the backbone matters

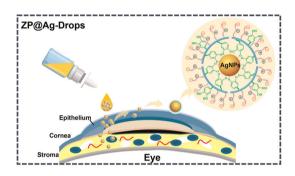
Mengsi Zhan, Dayuan Wang, Lingzhou Zhao, Liang Chen, Zhijun Ouyang, Serge Mignani, Jean-Pierre Majoral, Jinhua Zhao, * Guixiang Zhang, * Xiangyang Shi* and Mingwu Shen*



7397

Zwitterionic silver nanoparticle based antibacterial eye drops for efficient therapy of bacterial keratitis

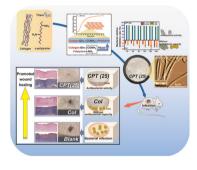
Yangjing Bai, Li Ma, Yingchun Huang, Shiying Lang, Wenjie Fan* and Gongyan Liu*



7408

An antibacterial and healing-promoting collagen fibril constructed by the simultaneous strategy of fibril reconstitution and ε -polylysine anchoring for infected wound repair

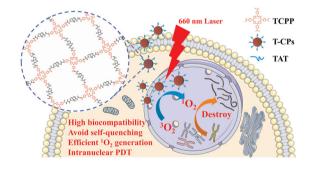
Xiaoxia Zhang, Changkai Yang, Xin Guo, Chun Yang and Guoying Li*



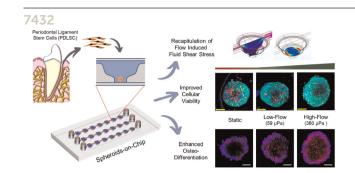
7423

Carbon network-hosted porphyrin as a highly biocompatible nanophotosensitizer for enhanced photodynamic therapy

Min Wang, Yanlin Zheng, Huaming He, Tong Lv, Xin Xu, Xiao Fang, Chunhua Lu* and Huanghao Yang



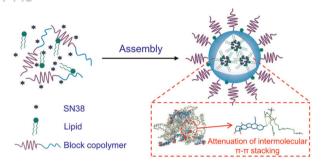
PAPERS



Fluid flow-induced modulation of viability and osteodifferentiation of periodontal ligament stem cell spheroids-on-chip

Apurva Mishra, Ren Kai, Srividya Atkuru, Yichen Dai, Filippo Piccinini, Philip M. Preshaw and Gopu Sriram*

7445



Lipid-assisted PEG-b-PLA nanoparticles with ultrahigh SN38 loading capability for efficient cancer therapy

Xiaoyi Huang, Jieyi Li, Yanfang Yang, Zi-Lu Wang, Xian-Zhu Yang, Zi-Dong Lu* and Cong-Fei Xu*

RETRACTION

7458

Retraction: Construction of a temperature-responsive terpolymer coating with recyclable bactericidal and self-cleaning antimicrobial properties

Bailiang Wang, Zi Ye, Qingwen Xu, Huihua Liu, Quankui Lin, Hao Chen* and Kaihui Nan*