Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

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 13(37) 11475–11874 (2025)

Cover
See Jeeyun Lee *et al.*, pp. 11597–11610. Image reproduced by permission of Sujin Hyung, Jihoon Ko, and Jeeyun Lee from *J. Mater. Chem. B*, 2025, **13**, 11597.

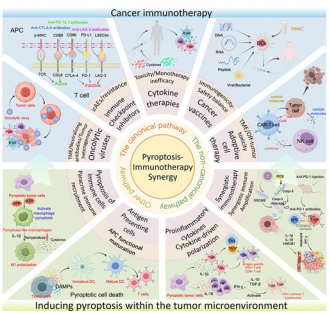
Inside cover
See Gengshen Song *et al.*, pp. 11611–11620. Image reproduced by permission of Beijing Youcare Kechuang Pharmaceutical Technology Co., Ltd. from *J. Mater. Chem. B*, 2025, **13**, 11611.

REVIEWS

11485

Overcoming cancer immunotherapy barriers *via* nanomaterial-mediated pyroptosis

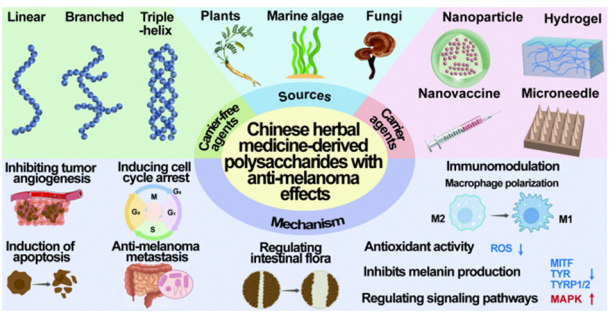
Jianlei Xie, Baoxin Peng, Yu Xiao, Xiasang Chen, Xinyin Zhang, Diqi Chen, Lijuan Song, Meiqian Xu,* Wenjing Liao* and Xiaowen Zhang*



11508

Advances of Chinese herbal medicine-derived polysaccharides as carrier-free and carrier agents in anti-melanoma therapy

Yingmin Mao, Zhiqiang Dai, Qiuyan Zhang, Fuming Peng, Quan Li,* Hanming Cui* and Yue Liu*



ROYAL SOCIETY OF CHEMISTRY

Advance your career in science

with professional recognition that showcases your **experience, expertise and dedication**

Stand out from the crowd
Prove your commitment to attaining excellence in your field

Gain the recognition you deserve
Achieve a professional qualification that inspires confidence and trust

Unlock your career potential
Apply for our professional registers (RSci, RSciTech) or chartered status (CChem, CSci, CEnv)

Apply now

rsc.li/professional-development

Registered charity number: 207890

Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

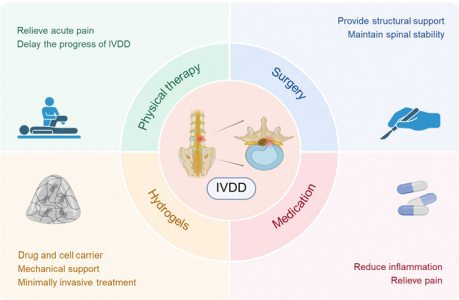
Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

REVIEWS

11525

Application and prospects of polysaccharide-based hydrogels in the treatment of intervertebral disc degeneration

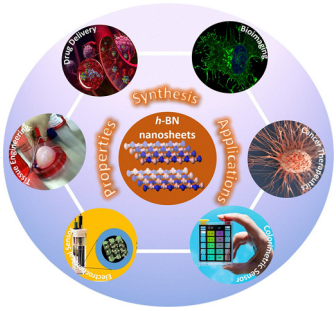
Jun-kuan Shan, Jia-qi Fang, Shu-Hao Liu, Xue-han Jin, Zhi-jie Weng, Li-ping Nan,* Jun-jian Liu* and Yun Qian*



11540

Advancements in two-dimensional boron nitride nanostructures: properties, preparation methods, and their biomedical applications

Gitashree Darabdhara,* Priyakshree Borthakur, Purna K. Boruah, Santimoy Sen, Deepak Bharadwaj Pemmaraju and Manash R. Das*

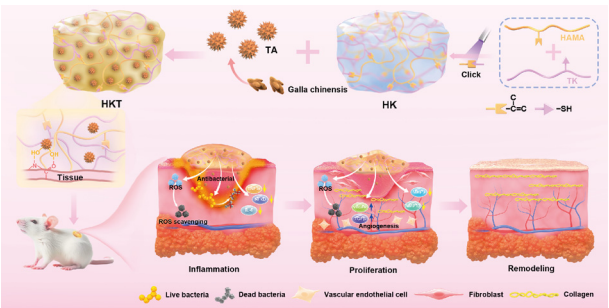


COMMUNICATION

11582

Click chemistry-driven adhesive hydrogel for efficient healing of infected wounds through multistage comprehensive management

Zheng Zheng, Ning Wang, Huiyu Yang, Xiaofei Gong, Jia Zheng, Yangyiyao Bai, Pengxin Tang, Shujiang Chen and Wenchuan Chen*

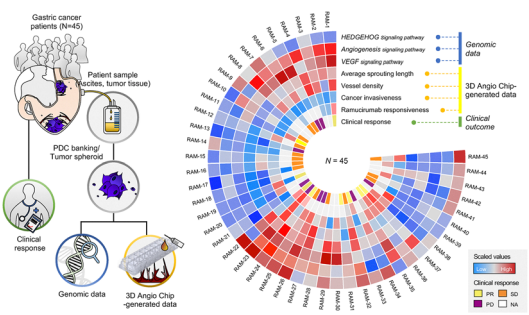


PAPERS

11597

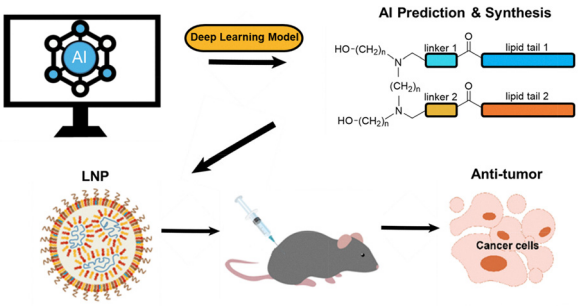
Angiogenesis gene signatures in patient-derived tumor spheroids for genetic and tumor angiogenesis profiling

Sujin Hyung, Jihoon Ko, Minae An, Seung Tae Kim, Se Hoon Park, Jung Yong Hong, Sung Hee Lim, Kyoung-Mee Kim and Jeeyun Lee*



Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

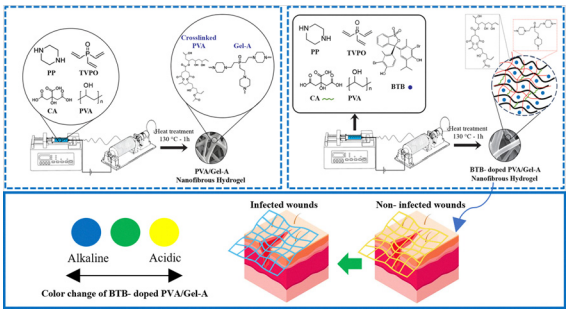
11611



Prediction of high-performing spleen-targeted lipid nanoparticles using a deep learning model for robust anticancer immunotherapy

Honglei Zhang, Jingxuan Ma, Fulu Pan, Yangjian Liu, Man Zhang, Yuqing Li, Chao Zhang, Huajie Huang, Wannian Zhang, Donghui Xiu, Wei Zhang and Gengshen Song*

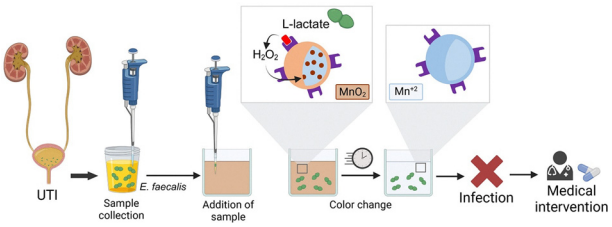
11621



Colorimetric pH-responsive nanofibrous hydrogels for *in vitro* monitoring of wound infection

Nadia Banitorfi Hoveizavi, Farzaneh Alihosseini,* Sandro Lehner, Philipp Meier and Sabyasachi Gaan*

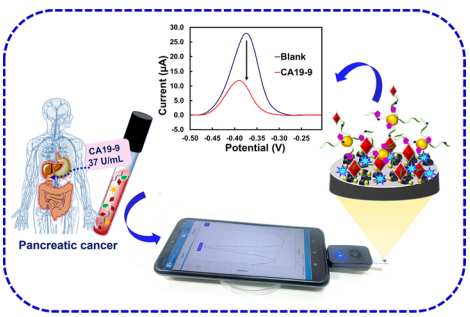
11640



Colorimetric point-of-care diagnostic to monitor *Enterococcus faecalis* causing urinary tract infection

Maria M. Morim, Patrick Rupper, Stefanie Altenried, Adrian Meier, René M. Rossi, Qun Ren, Luciano F. Boesel and Giorgia Giovannini*

11652



Competitive electrochemical assay of CA19-9 on gold nanoparticles/porous carbons nanohybrid amplified by polyoxometalate/aptamer/graphene quantum dot-decorated gold nanotags

Sopit Phetsang, Cécile Jouanne, Mohamed Mallouki, Thuan-Nguyen Pham-Truong, Sébastien Peralta, Cédric Vancaeyzeele, Philippe Banet, Pierre-Henri Aubert, Jaroon Jakmunee and Kontad Ounnunkad*

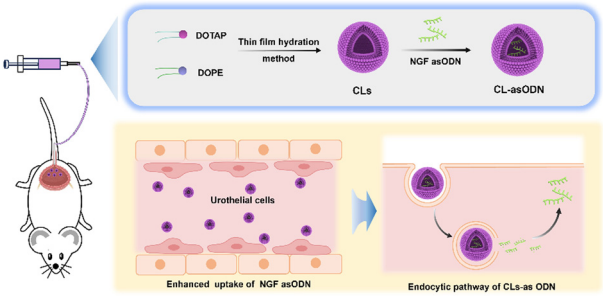
This journal is © The Royal Society of Chemistry 2025

Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

11663

Enhanced therapeutic efficacy of cationic liposome-delivered nerve growth factor antisense oligonucleotide for interstitial cystitis/bladder pain syndrome

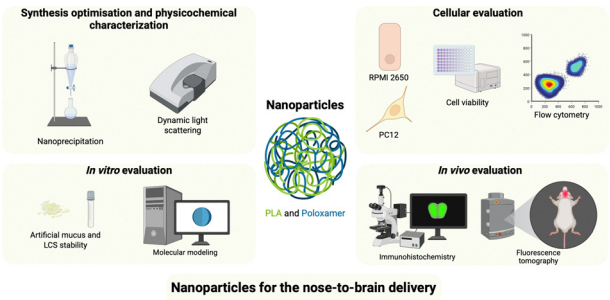
Yuan Gao, Ying Zhao, Lin Zhu, Hanwei Ke, Wenxin Li, Sulaiman Ganiu Bolaji, Huimei Wang,* Kexin Xu* and Lianyan Wang*



11674

Polymeric nanoparticles as a platform for nose-to-brain delivery

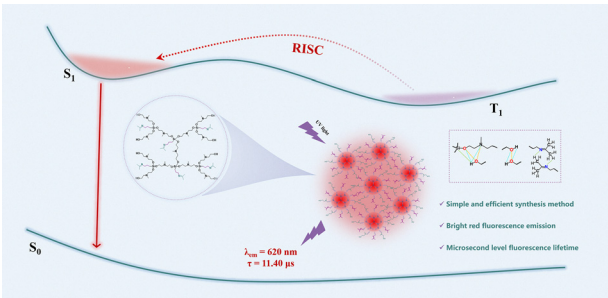
Marie Bolon, Morgane Marie, Simon Megy, Raphael Petrakis, Raphaël Terreux, Maxime Fieux, Claire Monge and Sophie Richard*



11687

A hyperbranched polysiloxane with imine bonds: red fluorescence emission with a long fluorescence lifetime at room temperature

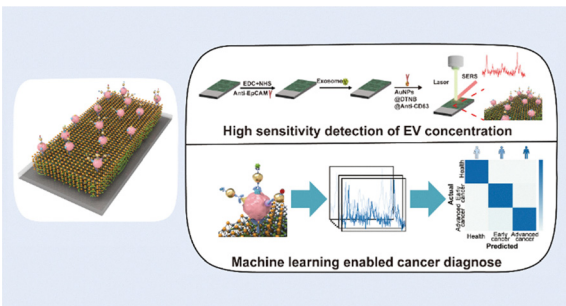
Qi Li, Yujie Qiao, Zheng Li, Rui Wu, Yekun Zhang, Yan Zhao, Wei Tian, Rumin Wang, Weixu Feng* and Hongxia Yan*



11696

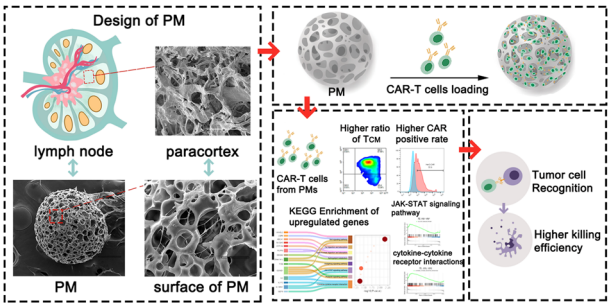
An artificial intelligence-enhanced early ovarian cancer diagnosis biosensor

Tao Hu, Haoyu Xiao, Shanling Ji, Zhihao Wu, Yunlin Quan, Wang Zhen, Xiao Li,* Jianxiong Zhu* and Zhonghua Ni*



Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

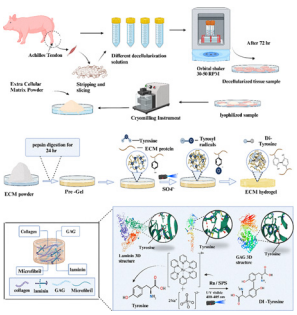
11708



Biomimetic lymph node-like scaffolds for optimized CAR-T cell expansion and potentiated antitumor efficacy

Huajin Zhang, Fujun Liu, Junyilang Zhao, Yong Wang, Yuge Shen, Qiqi Li, Hui Luo, Yu Chen, Rong Li, Fan Zhu, Shuo Xie, Yinhao Wei, Xupeng Gou, Danling Hu, Zhengji Li and Hanshuo Yang*

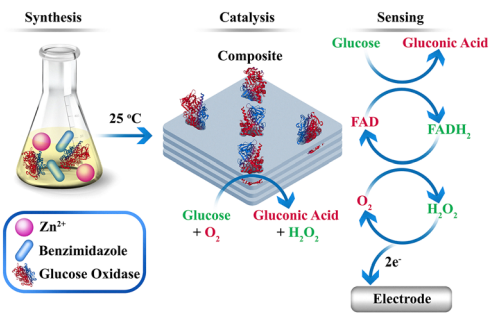
11722



Hybrid photo-crosslinked decellularized extracellular matrix scaffold from porcine Achilles tendon: a biocompatible and non-immunogenic matrix for tissue engineering

Shreeyash Shelar, Ujjwal Gupta, Mamta Kumari, Mohammed Shabib, Bitan Guchhait, Chandan Mandal, Santanu Kaity* and Subhadeep Roy*

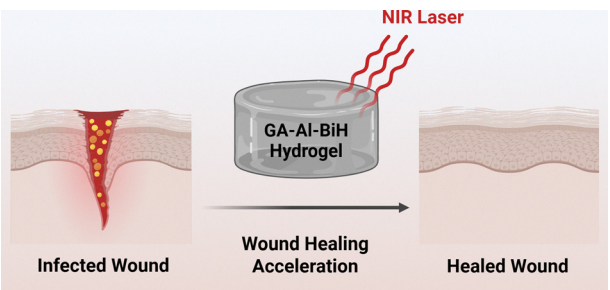
11739



Glucose oxidase immobilized on ZIF-7-III: composite formation, optimization and integration in an electrochemical biosensor for selective glucose detection

Sahar Aghayani, Shahram Tangestaninejad,* Norbert Stock,* Bastian Achenbach, Mehrnaz Bahadori,* Majid Moghadam,* S. Fatemeh Nami-Ana, Maryam Sharifi, Valiollah Mirkhani and Iraj Mohammadpoor-Baltork

11750



A near-infrared light absorbable hydrogel with antibacterial effect for mild photothermal regeneration of infected wounds

Kiyan Musaie, Mostafa Qahremani, Shima Ebadi, Hooman Haghighi, Vahideh Nosrati Siahmazgi, Samin Abbaszadeh, Mohammad Reza Eskandari, Marja Slomp, Jelly Atema-Smit, Hélder A. Santos* and Mohammad-Ali Shahbazi*

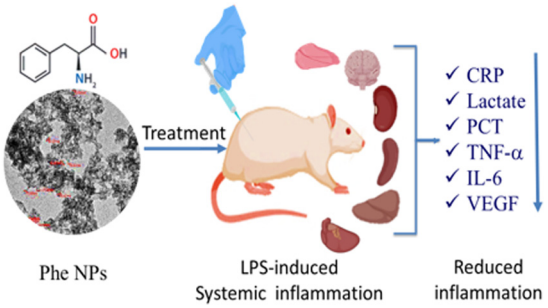
This journal is © The Royal Society of Chemistry 2025

Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

11767

Poly(*N*-acryloyl-L-phenylalanine) nanoparticles for potential treatment of inflammation in selective organs

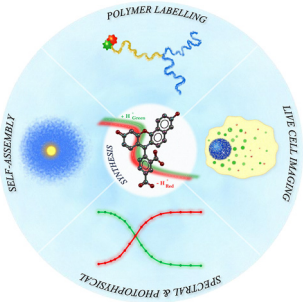
Divya Pareek, Sukanya Patra, Md. Zeyaullah, Gurmeet Singh, Taniya Das, Prakriti S. Samanta, Aman S. Kudada, Anjali Mourya, Kirti Wasnik, Rajalaxmi Pradhan, Yitzhak Mastai and Pradip Paik*



11790

Soft nanoparticles incorporating a benzo[*c*]xanthene fluorophore: facile synthesis and ratiometric pH sensing

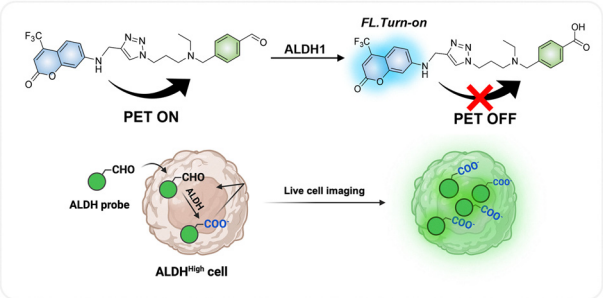
Laura McKay, Natali Joma, Dusica Maysinger* and Ashok Kakkar*



11809

PET-leveraged ALDH probe toward cancer stem cells

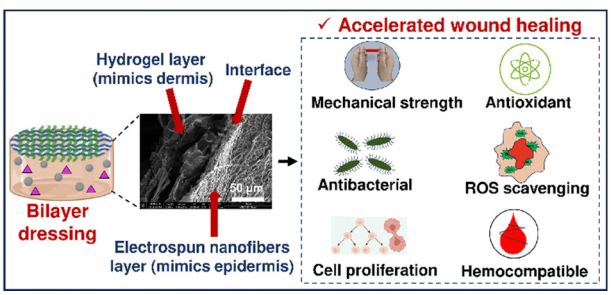
Ji Hyeon Kim, Bryan Yat Kit Hui, Jieun Lee, Kyeong-woo Lee, Jungryun Kim, Yujin Kim, Ming Hui Chua, Jianwei Xu, Min-Goo Lee,* Xiaogang Liu* and Jong Seung Kim*



11821

A multifunctional electrospun nanofiber/hydrogel-based pro-healing bilayer dressing as a next generation biomaterial for skin wound care

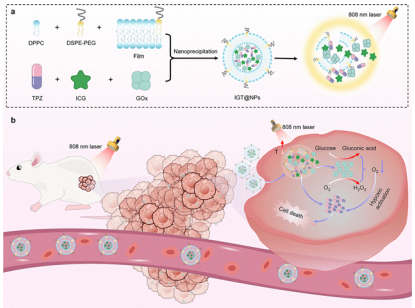
Dimpy Bhardwaj, Vatan Chawla, Vanshika Nandwani, Yashika Thakur, Yashveer Singh and Garima Agrawal*



Open Access Article. Published on 24 September 2025. Downloaded on 1/20/2026 6:33:25 PM.
This article is licensed under a Creative Commons Attribution 3.0 Unported Licence.

PAPERS

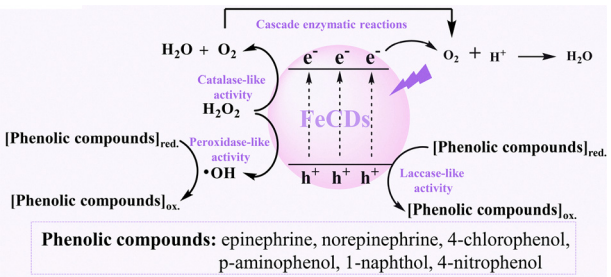
11835



A photoactivatable nano-liposome containing tripartite therapeutics for photothermal-triggered chemotherapy

Yana Li, Yiduo Zhan, Yifang Liu, Jingyang Su, Jingchao Li,* Yongzhi Men* and Na Zhu*

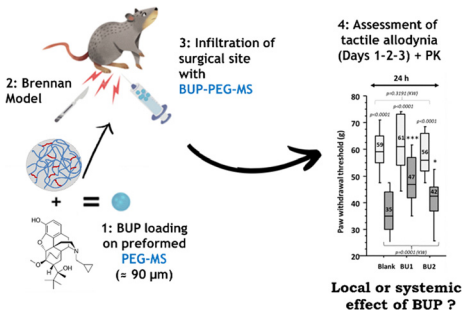
11846



Iron-doped carbon dots with multi-enzyme activities for rapid determination of phenolic compounds

Zhanghong Guo, Lin Zhou, Chan Wang* and Qijun Song*

11855



Evaluation of peripheral analgesia in a rat incisional pain model using degradable hydrophilic microspheres for sustained delivery of buprenorphine

Laurent Bédouet, Anne Beilvert, Emeline Servais, Florentina Pascale, Saïda Homayra Ghegediban, Michel Wassef, Julien Namur and Laurence Moine*

CORRECTION

11870

Correction: An octamolybdate-metal organic framework hybrid for the efficient adsorption of histidine-rich proteins

Qing Chen, Meng-Meng Wang, Xue Hu, Xu-Wei Chen* and Jian-Hua Wang*

This journal is © The Royal Society of Chemistry 2025