

# Journal of Materials Chemistry B

Materials for biology and medicine

[rsc.li/materials-b](https://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(23) 6563–6886 (2025)



### Cover

See Ming Zhao, Shiqi Peng  
*et al.*, pp. 6679–6688.

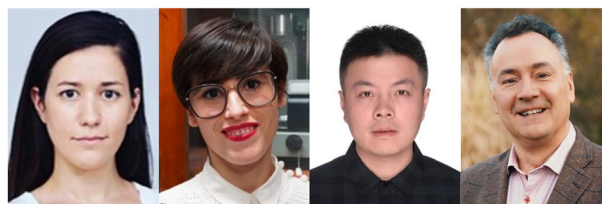
Image reproduced  
by permission of  
Shiqi Peng from  
*J. Mater. Chem. B*,  
2025, 13, 6679.

## EDITORIAL

6572

### Bioelectronics: Emerging trends and applications

Anna-Maria Pappa, Eleonora Macchia, Hong Liu and  
George Malliaras

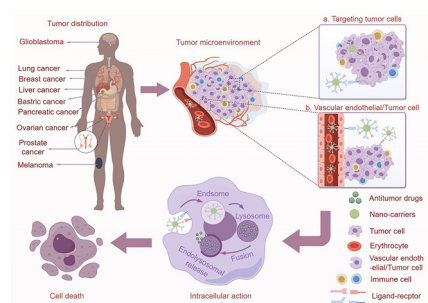


## REVIEWS

6574

### A superior method for antitumor therapy and application: dual-ligand nanomedicines

Ailing Wang, Xuejun Wang, Dan Li, Aixue Li,  
Mengyuan He, Yingying Yuan, Li Ye\* and Jiyong Liu\*



# Royal Society of Chemistry approved training courses

Explore your options.  
Develop your skills.  
Discover learning  
that suits you.

**Courses in the classroom,  
the lab, or online**

Find something for every  
stage of your professional  
development. Search our  
database by:

- subject area
- location
- event type
- skill level

Members **get at least 10% off**

Visit [rsc.li/cpd-training](https://rsc.li/cpd-training)

**SAVE  
10%**

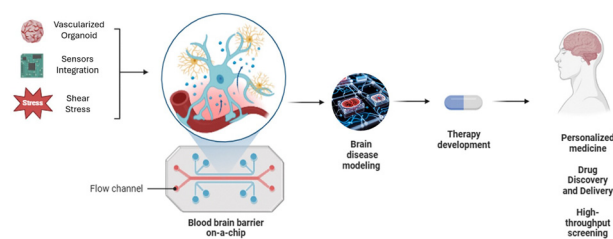


## REVIEWS

6597

## Recent advances in 3D models for multiparametric blood–brain barrier detection in microfluidic systems

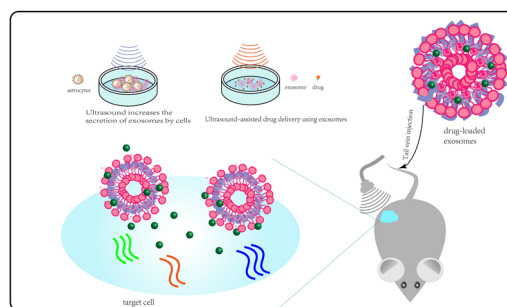
Chiara Boncristiani, Alessia Di Gilio,\* Federica De Castro, Alessandra Nardini, Jolanda Palmisani, Rebeca Martínez Vázquez, Gianluigi de Gennaro, Francesco Paolo Fanizzi, Giuseppe Ciccarella and Viviana Vergaro\*



6626

## The combined application of exosomes/exosome-based drug preparations and ultrasound

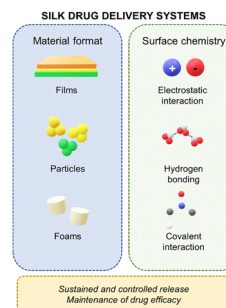
Xiuli Wen and Yi Hao\*



6638

## Influence of material format and surface chemistry for the sustained delivery and efficacy of silk drug delivery systems *in vivo*

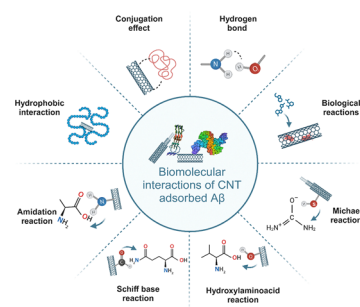
Christine Jurene O. Bacal, Benjamin J. Allardyce\* and Filippo Valente\*



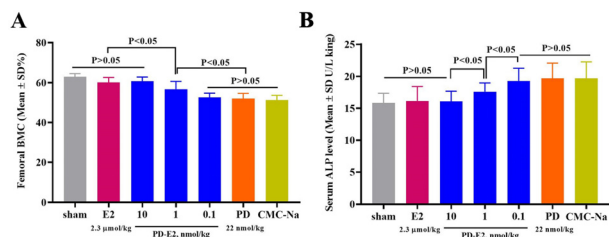
6664

## Biomolecular interactions of carbon nanotubes with amyloid- $\beta$ proteins

Jinxia Cai, Bowen Li, Guoqing Feng, Jie Zhang, Haojun Fan\* and Bin Zheng\*



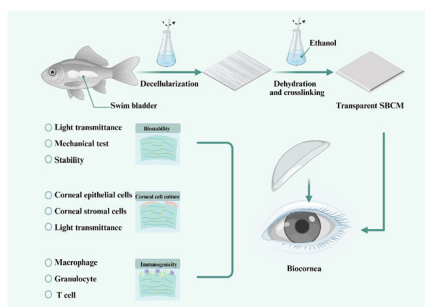
6679



### PD-E2: a nano-scaled delivery for estradiol to decrease uterus damage and increase bone mineral density

Qiqi Feng, Hao Gong, Haimei Zhu, Xiaoyi Zhang, Yaonan Wang, Yifan Yang, Jianhui Wu, Ming Zhao\* and Shiqi Peng\*

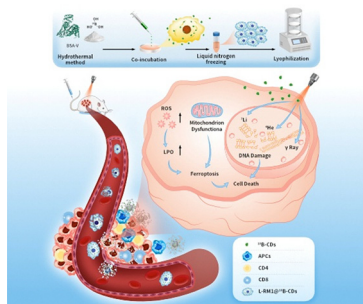
6689



### Highly transparent and elastic acellular swim bladder with potential application in cornea implantation

Yue Yin, Linyu Long, Ningxin Wang, Ran Wei, Mengna Guo, Daihua Fu, Fanju Zhang, Ke Ma,\* Li Yang\* and Yunbing Wang

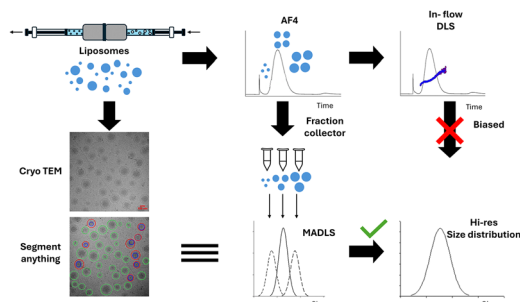
6701



### Lyophilized tumour cell-loaded $^{10}\text{B}$ -doped carbon dots for simultaneous boron neutron capture therapy and enhancement of antitumor immunity of prostate cancer

Yongjin Yang, Zhiyi Zhao, Chengyu You, Miao Pang, Tianyuan Zhong, Qingchao Li, Shiwei Jing, Yanxin Qi,\* Yubin Huang\* and Zhilong Dong\*

6712



### Going hi-res in bulk: flowless multiangle dynamic light scattering for detection on asymmetric flow field flow fractionation

Lavinia Rita Doveri, Giorgia Dal Pan, Giovanni Tomaselli, Tomás Muñoz Santoro, Piersandro Pallavicini, Carlos Ortiz de Solorzano and Yuri Antonio Diaz Fernandez\*

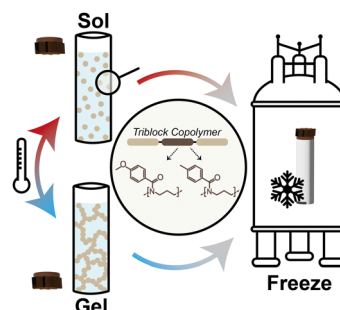


## PAPERS

6727

### Capturing the sol and gel states of thermoresponsive poly(2-oxazoline)/-(2-oxazine) hydrogels by ambient and subambient solid-state NMR

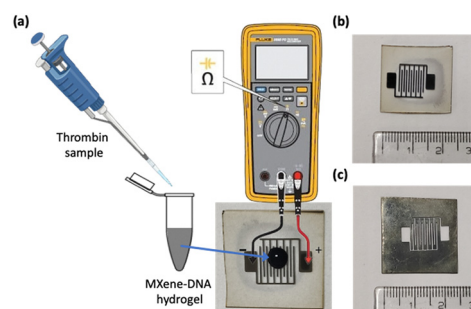
Theresa Zorn, Stephanie Bachmann, Lando Polzin, Johannes Greiner, Robert Luxenhofer and Ann-Christin Pöpler\*



6742

### A functional 2D MXene–DNA hybrid hydrogel for portable detection of blood disorder biomarker thrombin in human plasma

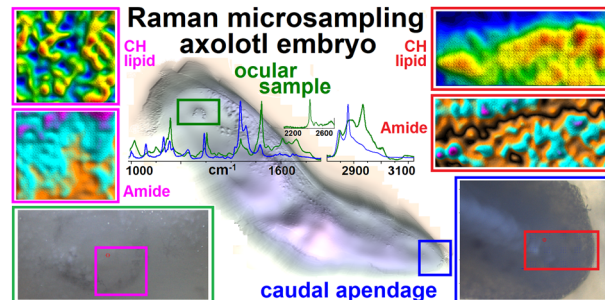
Vinod Morya, Dhiraj Bhatia, Chinmay Ghoroi\* and Amit K. Yadav\*



6755

### Raman microscopy as a tool to study changes in chemical composition upon structural differentiation of *Ambystoma* embryo

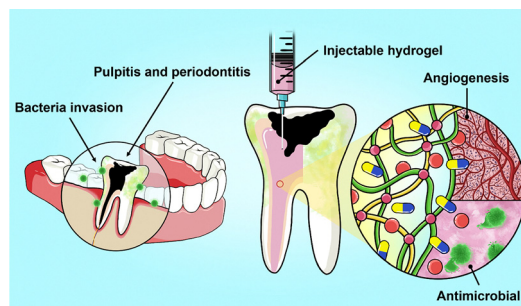
Victor V. Volkov and Carole C. Perry\*



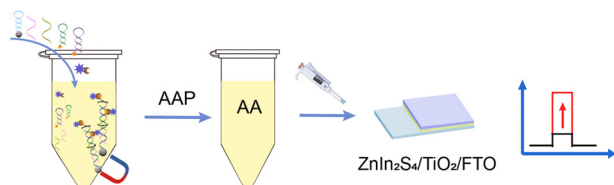
6765

### Dual-functional injectable hydrogels as antimicrobial and angiogenic therapeutics for dental pulp regeneration

Nhu-Quynh Thi Nguyen, Cuong Hung Luu, Ngoc-Dan Ho Nguyen, Duy Quoc Vo, Ngoc Hong T. Luu, Nhu-Y Ngoc Ha, Thanh-Truc Ngoc Vo, Que-Phuong Le Huynh, Thavasyappan Thambi, Chau T. T. Ngo\* and Giang V. H. Phan\*



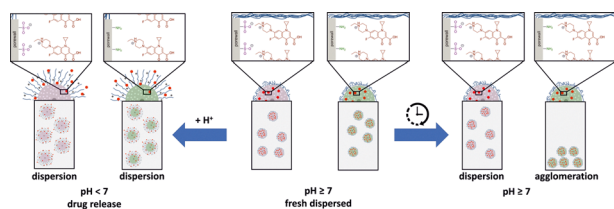
6784



### Split-type photoelectrochemical biosensing for miRNA-144 assay based on a ZnIn<sub>2</sub>S<sub>4</sub>/TiO<sub>2</sub> heterojunction

Ying Zheng, Fan Mo, Qian Sun, Xinzhou Huang, Yijie Du, Xiaomei An, Haoning Ma, Guoqiu Wu, Yuanjian Zhang and Yanfei Shen\*

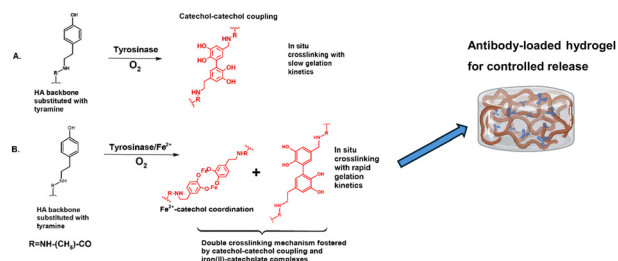
6792



### Stimuli-responsive core-shell-shell nanocarriers for implant-directed magnetic drug targeting

Timo Herrmann, Nina Angrisani, Janin Reifenrath, Jessica Meißner, Adrian Hannebauer, Lukas Mönkeberg, Valentin Hagemann, Irene Morales, Peter Behrens, Nina Ehlert\* and Sebastian Polarz\*

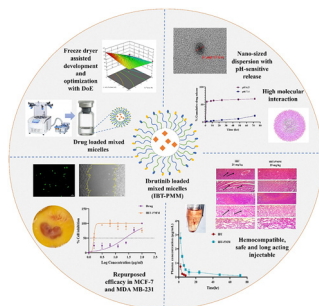
6804



### Iron(II)-catalysed tyrosinase crosslinked hyaluronic acid hydrogel for the controlled release of human antibodies

Seth Asamoah,\* Martin Pravda,\* Jana Matonohová, Tereza Bártová, Eva Šnejdrová, Sebastian Spiegel, Andrew Chan, Vincent Pernet and Vladimír Velebný

6819



### Benchmarking of pH-responsive mixed micelles for repurposed breast cancer therapy of ibrutinib with molecular modeling and pharmacokinetic insights

Indrani Maji, Sharon Munagalasetty, Lakshmi Tulasi Narahariseti, Ezhilmathe A., Srushti Mahajan, Mayur Aalhathe, Ujala Gupta, Pooja Yadav, Vasundhara Bhandari, Chandraiah Godugu, Manish Kumar Chourasia and Pankaj Kumar Singh\*

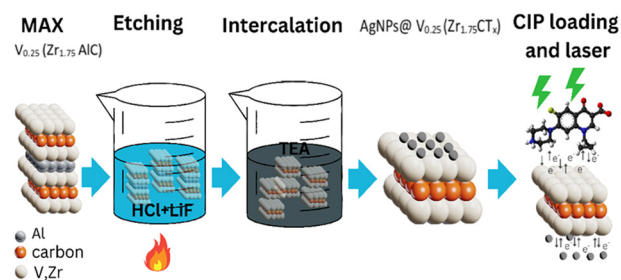


## PAPERS

6843

# Tailoring the synthesis of $V_{0.25}(Zr_{1.75})C$ MXene for sensitive SERS quantification of ciprofloxacin antibiotics: spectroscopic and DFT investigation

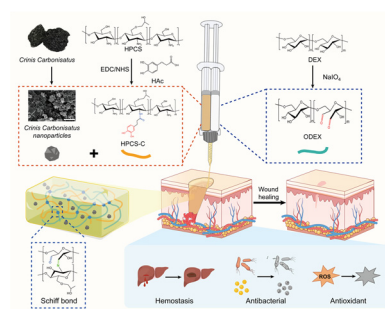
Nasurullah Mahar, Areej H. Al-Mebti, Sajjad Hussain and Abdulaziz A. Al-Saadi\*



6855

# Injectable self-healing hydrogels loaded with Crinis Carbonisatus nanoparticles for rapid hemostasis and wound healing

Rui Tian, Fazhen Luo, Yilin Yu, Jinxia Mi, Xiaoya Gao, Zhengtao Wang\* and Yan Xie\*



6873

# Rational design of near-infrared carbon dots as polarity-sensitive fluorescent probes for imaging of lipid droplets

Zheng Yang,\* Ying Peng, Mengyao Qu, Haonan Yang, Xiaodan Jia and Xiangrong Liu

