

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 13(5) 1105–1358 (2025)



Cover

See Myung Sook Oh, Jaehoon Kim, Dokyoung Kim *et al.*, pp. 1189–1198.

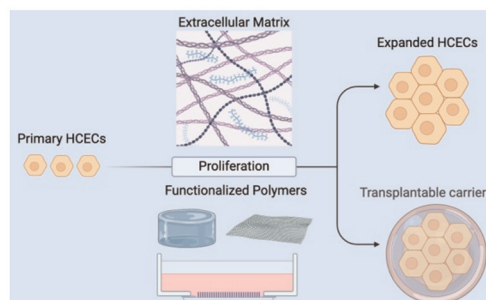
Image reproduced by permission of Dokyoung Kim from *Biomater. Sci.*, 2025, **13**, 1189.

REVIEWS

1114

Biomaterial-based strategies for primary human corneal endothelial cells for therapeutic applications: from cell expansion to transplantable carrier

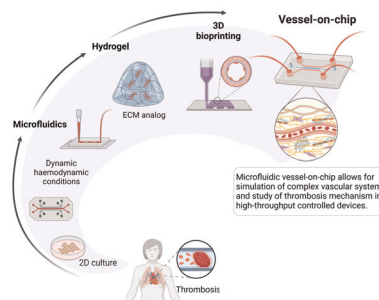
Myagmarsend Enkhbat, Jodhbir S. Mehta,* Gary S. L. Peh* and Evelyn K. F. Yim*



1131

Integrating microfluidics, hydrogels, and 3D bioprinting for personalized vessel-on-a-chip platforms

San Seint Seint Aye, Zhongqi Fang, Mike C. L. Wu, Khoon S. Lim* and Lining Arnold Ju*



**GOLD
OPEN
ACCESS**

EES Solar

**Exceptional research on solar
energy and photovoltaics**

Part of the EES family

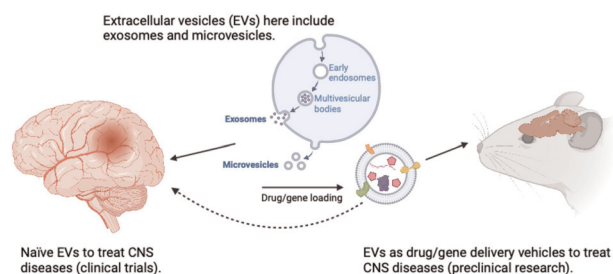
**Join
in** | Publish with us
rsc.li/EESolar

REVIEWS

1161

Extracellular vesicles as drug and gene delivery vehicles in central nervous system diseases

Xi Shi, Weilong He, Ashwin Gupta, Kyran To, Leonardo Clark, Nitya Mirle, Thomas Wynn, Daniel Wang, Akash Ganesh, Helena M. Zeng and Huiliang Wang*

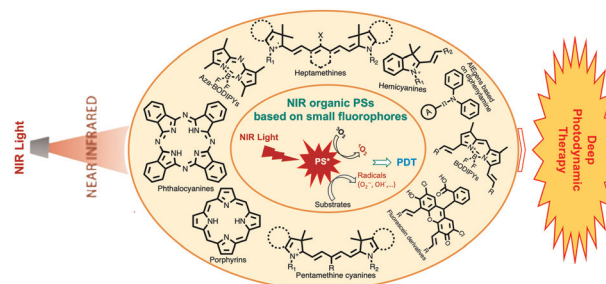


MINIREVIEW

1179

Recent advances in near-infrared organic photosensitizers for photodynamic cancer therapy

Van-Nghia Nguyen,* Minh Viet Nguyen, Huong Pham Thi, Anh-Tuan Vu and Truong Xuan Nguyen

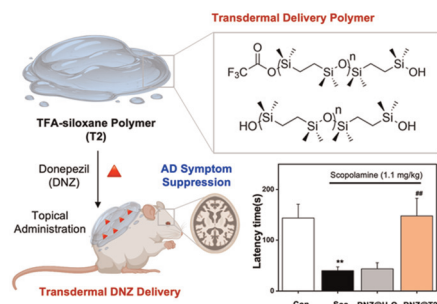


PAPERS

1189

Dimethylsiloxane polymer for the effective transdermal delivery of donepezil in Alzheimer's disease treatment

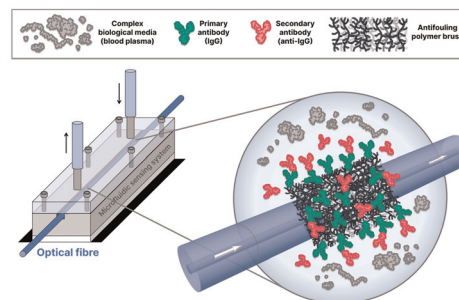
Jihyun Lee, In Gyoung Ju, Yeon-Jin Lim, Jin Hee Kim, Seungmin Lee, Yujin Choi, Myung Sook Oh,* Jaehoon Kim* and Dokyoung Kim*



1199

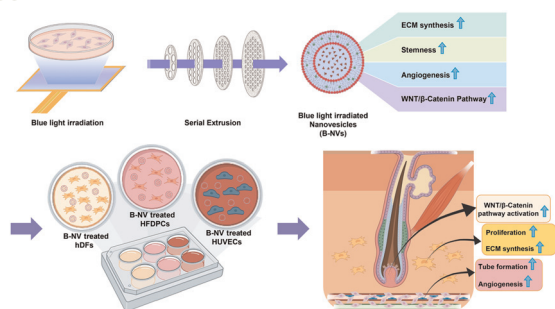
Optical fibre long-period grating sensors modified with antifouling bio-functional nano-brushes

Markéta Vrabcová, Monika Spasovová, Michala Forinová, Ambra Giannetti, Milan Houska, N. Scott Lynn, Jr., Francesco Baldini, Jaromír Kopeček, Francesco Chiavaioli* and Hana Vaisocherová-Lísalová*



PAPERS

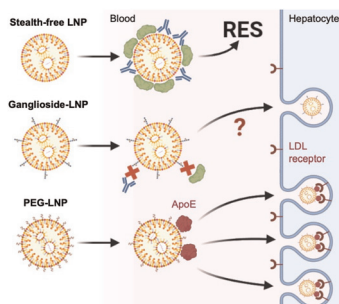
1209



Strengthening the cellular function of dermal fibroblasts and dermal papilla cells using nanovesicles extracted from stem cells using blue light-based photobiomodulation technology

Jiyu Hyun, Sang Yoon Lee, Jiseon An, You Bin Lee and Suk Ho Bhang*

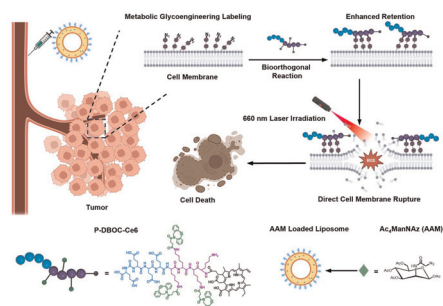
1222



Ganglioside-incorporating lipid nanoparticles as a polyethylene glycol-free mRNA delivery platform

Yafi S. Permana, Mincheol Jang, Kyunghwan Yeom, Erinn Fagan, Yong Jae Kim, Joon Hyeok Choi and Ji-Ho Park*

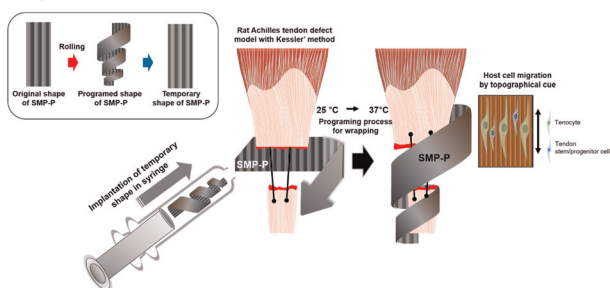
1233



Bioorthogonal reaction-mediated photosensitizer-peptide conjugate anchoring on cell membranes for enhanced photodynamic therapy

Buwei Hu, Chenlin Ji, Zhuohang Zhou, Xuehan Xu, Luyi Wang, Tingting Cao, Jianjun Cheng* and Rui Sun*

1243



Fabrication of a micropatterned shape-memory polymer patch with L-DOPA for tendon regeneration

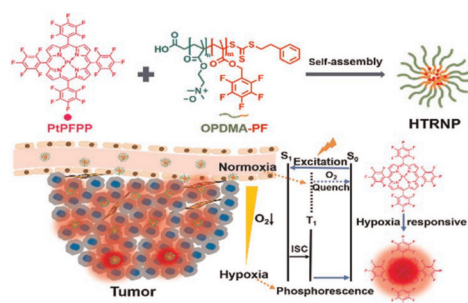
Yucheol Son, Min Suk Lee, Dong Jun Hwang, Sun Hong Lee, Albert S. Lee, Seung Sang Hwang, Dong Hoon Choi, Chris Hyunul Jo and Hee Seok Yang*



1261

A hypoxia-targeting and hypoxia-responsive nano-probe for tumor detection and early diagnosis

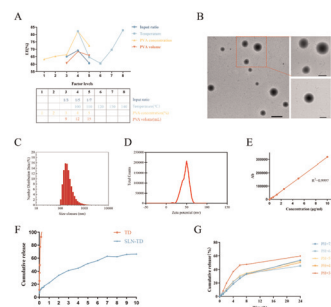
Yong Chen, Huimin Wang, Xiaodan Xu, Hongxia Xu, Bing Xiao, Pengcheng Yuan, Shiqun Shao, Wenjing Sun, Zhuxian Zhou, Youqing Shen and Jianbin Tang*



1272

Preparation and characterization of tildipirosin-loaded solid lipid nanoparticles for the treatment of intracellular *Staphylococcus aureus* infections

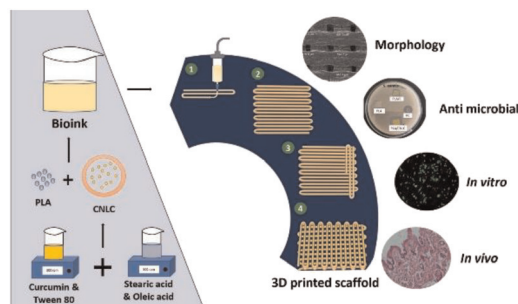
Zhixin Lei,* Xiaoli Cai, Juan Wan, Ze Li* and Taolei Sun*



1286

3D bioprinted poly(lactic acid) scaffolds infused with curcumin-loaded nanostructured lipid carriers: a promising approach for skin regeneration

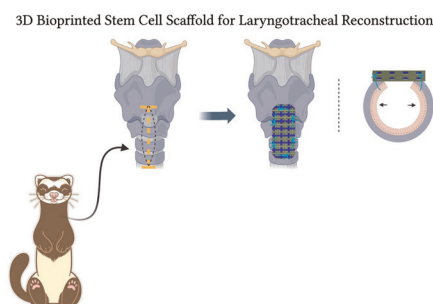
Renuka Vijayaraghavan, M. Vidyavathi,* R. V. Suresh Kumar, Sravanthi Loganathan* and Ravi Babu Valapa*



1304

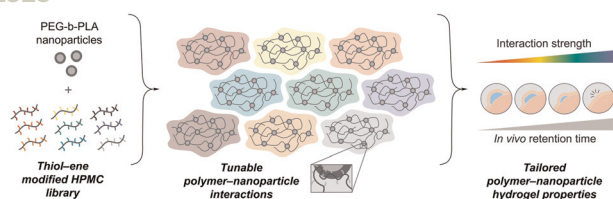
3D bioprinted ferret mesenchymal stem cell-laden cartilage grafts for laryngotracheal reconstruction in a ferret surgical model

Alexandra McMillan, Matthew R. Hoffman, Yan Xu, Zongliang Wu, Emma Thayer, Adreann Peel, Allan Guymon, Sohit Kanotra and Aliasger K. Salem*



PAPERS

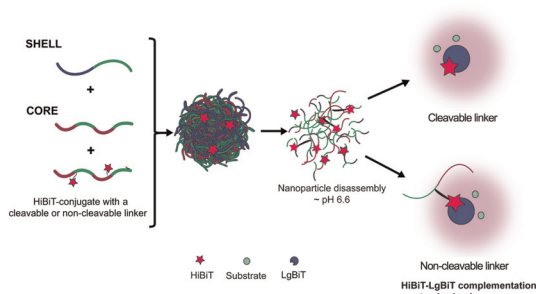
1323



A thiol-ene click-based strategy to customize injectable polymer-nanoparticle hydrogel properties for therapeutic delivery

Sophia J. Bailey, Noah Eckman, Elisa S. Brunel, Carolyn K. Jons, Samya Sen and Eric A. Appel*

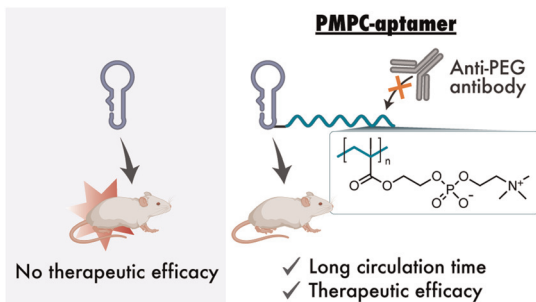
1335



Unravelling the endosomal escape of pH-responsive nanoparticles using the split luciferase endosomal escape quantification assay

Umeka Nayanathara, Fan Yang, Changhe Zhang, Yufu Wang, Bruna Rossi Herling, Samuel A. Smith, Maximilian A. Beach, Angus P. R. Johnston* and Georgina K. Such*

1347



Zwitterionic polymer with minimal reactivity against PEG antibodies to enhance the therapeutic effects of cytokine-targeting DNA aptamer

Seojung Cho, Miyuki Hori, Ryosuke Ueki, Yutaro Saito, Yukiko Nagai, Haruka Iki, Akira Tsuchiya, Tomohiro Konno, Kensuke Owari, Haishun Piao, Kazunobu Futami and Shinsuke Sando*

CORRECTIONS

1354

Correction: 3D printing of wearable sensors with strong stretchability for myoelectric rehabilitation

Jianan Zhan, Yueying Kong, Xi Zhou, Haihuan Gong, Qiwei Chen, Xianlin Zhang, Jiankai Zhang,* Yilin Wang* and Wenhua Huang*



CORRECTIONS

1355

Correction: Unraveling the mystery: effect of trapped air on platelet adhesion on hydrophobic nanostructured titanium dioxide

Zhenyu Shen, Ke Wu, Zhiwei Chen, Yun Yang* and Qiaoling Huang*

