

Lab on a Chip

Devices and applications at the micro- and nanoscale
rsc.li/loc

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 1473-0197 CODEN LCAHAM 26(5) 1003-1788 (2026)



Cover
See Jian Zhou, Ian Papautsky *et al.*, pp. 1123–1147.
Image reproduced by permission of Kaya Yasar at Spherical Chicken Studios from *Lab Chip*, 2026, 26, 1123.



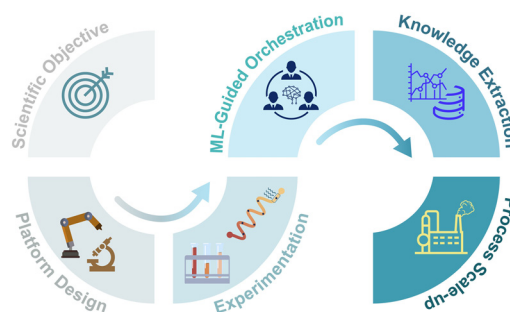
Inside cover
See Jianfeng Yang and Hao Zeng, pp. 1148–1161.
Image reproduced by permission of Duy Huynh from *Lab Chip*, 2026, 26, 1148.

PERSPECTIVE

1014

Autonomous microfluidic labs: progress and prospects

Suyash Damir, Fernando Delgado-Licona, Andrew deMello* and Milad Abolhasani*

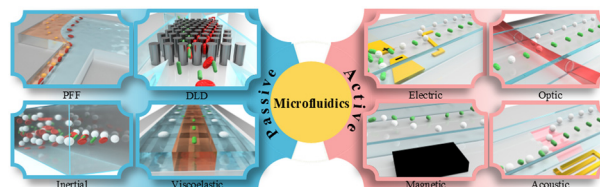


TUTORIAL REVIEWS

1025

Microfluidic shape-based separation for cells and particles: recent progress and future perspective

Muhammad Soban Khan, Raihan Hadi Julio, Mushtaq Ali, Sebastian Sachs, Christian Cierpka, Jörg König* and Jinsoo Park*



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



**SAVE
10%**

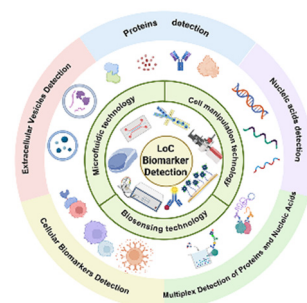


TUTORIAL REVIEWS

1053

Lab-on-a-chip for biomarker detection: advances, practical applications, and future perspectives

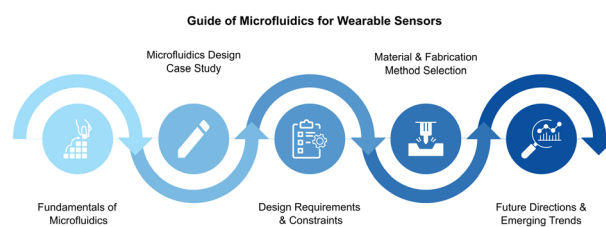
Tianfeng Xu, Hao Bai, Jie Hu,* Limei Zhang, Weihua Zhuang, Chang Zou, Yongchao Yao,* Wenchuang (Walter) Hu* and Jin Huang*



1080

Flow by design: a guided review of microfluidics for wearable biosensors

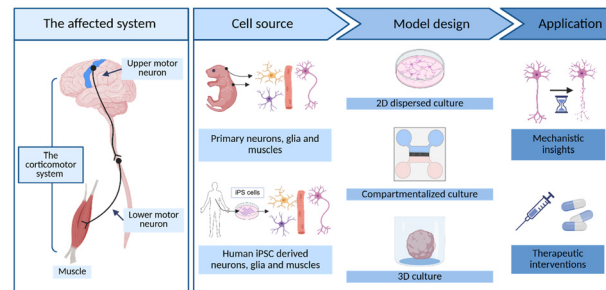
Julieta Nava-Granados, Katherine Vasquez, Bryan U. Medina, Catherine Wang, Jose R. Moreto and Juliane Sempionatto*



1108

Modeling amyotrophic lateral sclerosis (ALS) *in vitro*: from mechanistic studies to translatable drug discovery

Kathryn G. Maskell,* Anthony L. Cook, Anna E. King, Tracey C. Dickson and Catherine A. Blizzard*

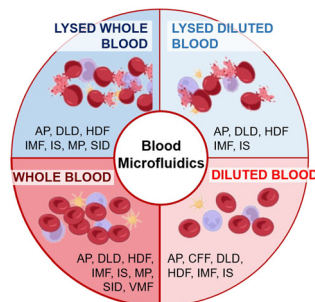


CRITICAL REVIEWS

1123

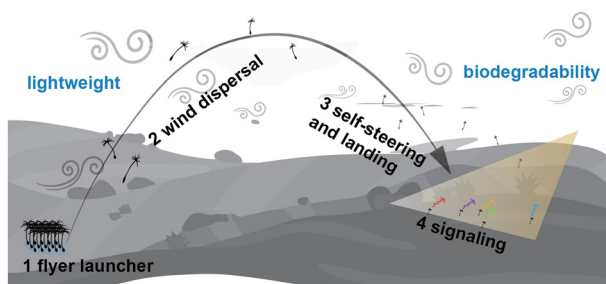
Blood microfluidics: progress and challenges

Sana Sheybanikashani, Jian Zhou* and Ian Papautsky*



CRITICAL REVIEWS

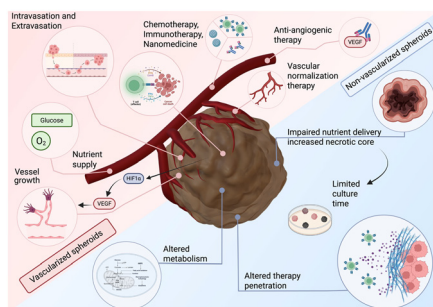
1148



Light driven polymer thin films as flying robotic chips in the sky

Jianfeng Yang* and Hao Zeng*

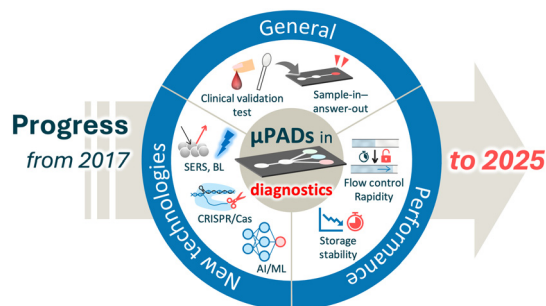
1162



Engineering perfusion to meet tumor biology: are vascularized tumor-on-a-chip models ready to drive therapy innovation?

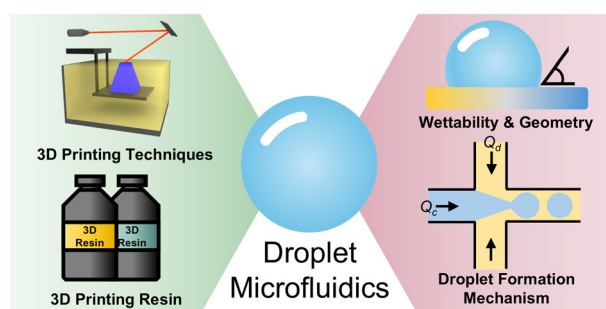
Ines Poljak, Ciro Chiappini and Giulia Adriani*

1191

Progress toward real-world diagnostic applications of microfluidic paper-based analytical devices (μ PADs)

Yohei Tanifuji and Daniel Citterio*

1219



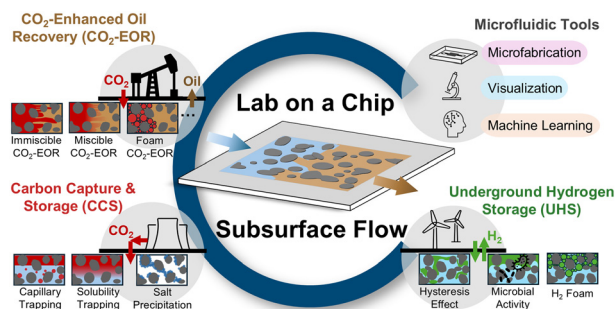
3D printing of droplet microfluidic devices: principles, wetting control, scale-up, and beyond

Je Hyun Lee, Taesoo Jang, Soeun Park, Su-Bin Shin, Jaemoon Lee, Yoon-Ho Hwang* and Hyomin Lee*



CRITICAL REVIEWS

1352



Lab-on-a-chip insights: advancing subsurface flow applications in carbon management and hydrogen storage

Junyi Yang, Nikoo Moradpour, Lap Au-Yeung and Peichun Amy Tsai*

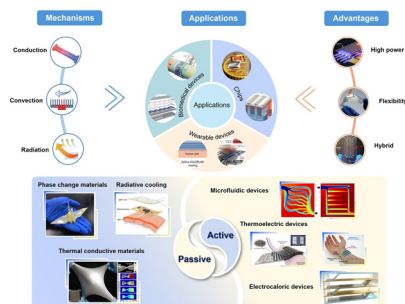
1394



Microcavity-assisted microfluidic physical sensors: materials, structures, and multifunctional applications

Xinyi Qu, Jianfeng Ma, Degong Zeng, Jinan Luo, Jingzhi Wu, Chuting Liu, Zhikang Deng, Lvjie Chen, Rongkuan Han, Yancong Qiao* and Jianhua Zhou*

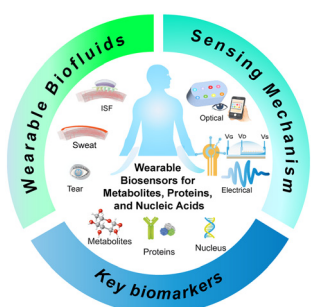
1417



A review of microfluidic technologies for thermal management in flexible electronics

Mingzi Liu, Jiahao Sun, Zuowei Sun, Yawen Xiao, Yi Chen, Jiyu Li* and Xinge Yu*

1444



Wearable biosensors for disease diagnostics and health monitoring: recent progress and emerging technologies

Zixuan Ren and Yue Cui*

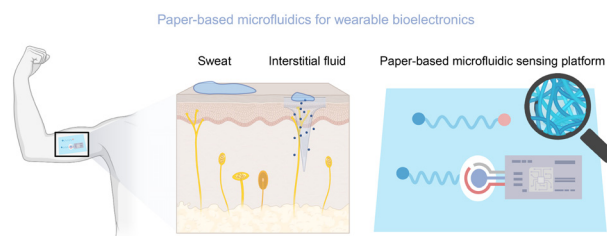


CRITICAL REVIEWS

1471

Paper-based microfluidics for wearable soft bioelectronics

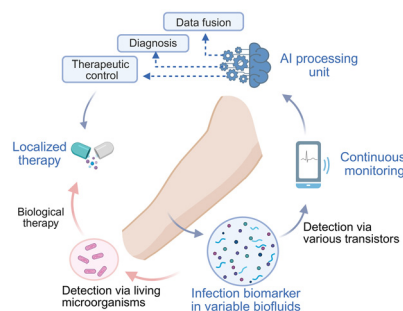
Feng Zhang, Ganggang Zhao, Qunle Ouyang, Sicheng Chen and Zheng Yan*



1489

AI-enabled wearable microfluidics for next-generation infection monitoring and therapeutics

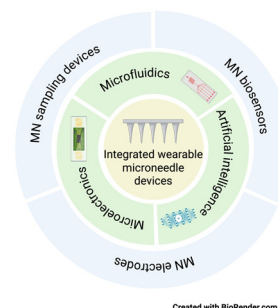
Yan Zhou, Xiaoyu Zhu, Kai Qu* and Feng Xu*



1510

Microneedle-integrated wearable devices for healthcare monitoring

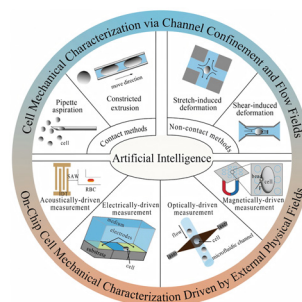
Tianli Hu, Eira Beryle Ko, Yu Song and Chenjie Xu*



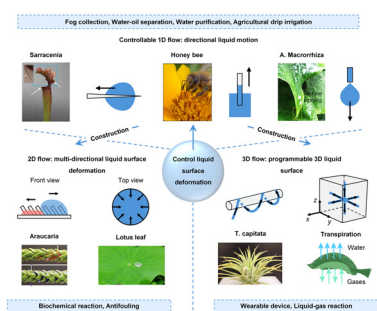
1528

On-chip characterization of cell mechanics assisted by external physical fields and artificial intelligence

Jingjin Ge, Chenhao Bai, Zhuo Chen,* Toshio Fukuda, Tatsuo Arai and Xiaoming Liu*



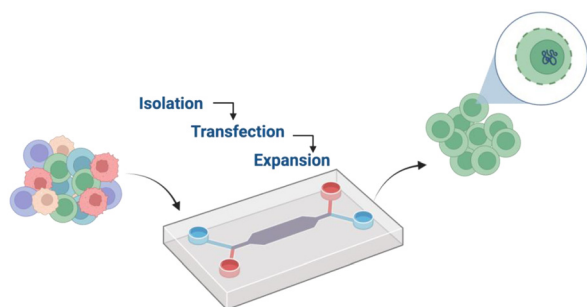
1547



Structure-enabled liquid manipulation: bioinspired control across all dimensions

Siqi Sun, Liqiu Wang* and Yiyuan Zhang*

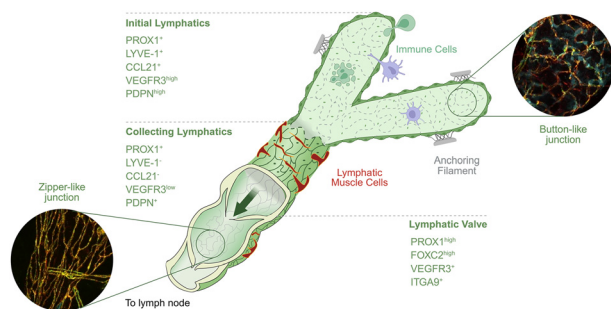
1566



Microfluidics for cell therapy and manufacturing in oncology and regenerative medicine

Josie L. Duncan, Julio P. Arroyo and Rafael V. Davalos*

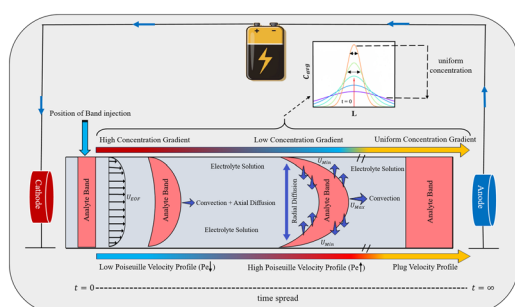
1588



Lymphatics-on-a-chip microphysiological system: engineering lymphatic structure and function *in vitro*

Yansong Peng and Esak Lee*

1610



A deep dive into hydrodynamic dispersion in microfluidic systems

Seyed Nezameddin Ashrafizadeh,* Mahdi Khatibi and Iman Aslani

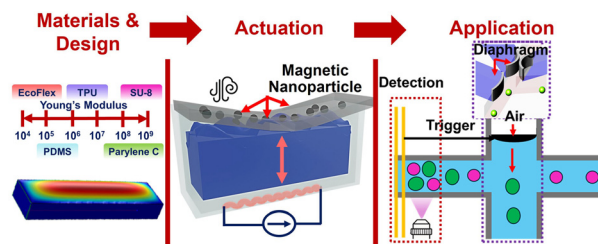


CRITICAL REVIEWS

1658

Diaphragm-based microfluidic platforms for reconfigurable sample manipulation: from enrichment to activated sorting

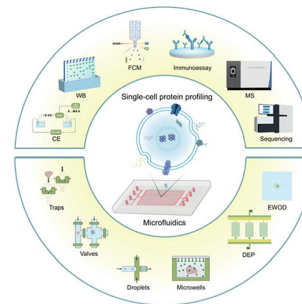
Abdullah-Bin Siddique,* Shaghayegh Mirhosseini and Nathan S. Swami*



1682

Single-cell protein profiling energized by microfluidic technology

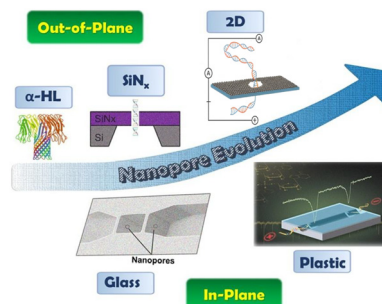
Ruizhe Yang, Qingyu Ruan,* Wenshang Guo, Haicong Shen, Xiaoye Lin, Yingwen Chen, Ye Tao, Chaoyong Yang and Yukun Ren*



1709

The evolution of nanopore measurements: from biological out-of-plane pores to plastic in-plane pores

Khurshed Akabirov, Hanna Nguyen, Shakila Peli Thanthri, Sheila M. Barros, Maximillian Chibuike, Sunggook Park and Steven A. Soper*



1739

Engineering organs-on-a-chip via multi-channel microfluidics

Ji Qiu, Jia Yang, Lihao Liu, Jiameng Wen, Jiachen Yang, Wenwan Shi, Xiaoxiang Gao, Jing Sun, Ling Bai,* Xiaojiang Liu* and Zhongze Gu*

