

# Lab on a Chip

Devices and applications at the micro- and nanoscale  
[rsc.li/loc](http://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 25(6) 1375–1616 (2025)



### Cover

See Hadar Ben-Yoav, Janina Bahnemann et al., pp. 1404–1415.  
Image reproduced by permission of Hadar Ben-Yoav from *Lab Chip*, 2025, 25, 1404.



### Inside cover

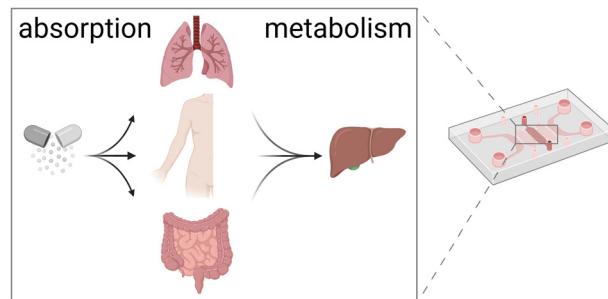
See Liuyong Shi, Hong Yan, Teng Zhou et al., pp. 1416–1428.  
Image reproduced by permission of Teng Zhou from *Lab Chip*, 2025, 25, 1416.

## TUTORIAL REVIEW

1384

### Advances of dual-organ and multi-organ systems for gut, lung, skin and liver models in absorption and metabolism studies

Konstanze Brandauer, Sophie Schweinitzer, Alexandra Lorenz, Judith Krauß, Silvia Schobesberger, Martin Frauenlob and Peter Ertl\*

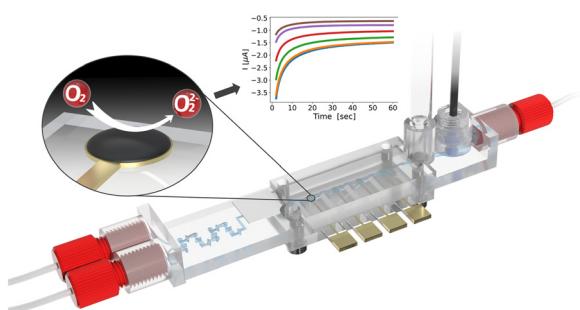


## PAPERS

1404

### Automated electrochemical oxygen sensing using a 3D-printed microfluidic lab-on-a-chip system

Daniel Kaufman, Steffen Winkler, Christopher Heuer, Ahed Shibli, Alexander Snejhko, Gideon I. Livshits, Janina Bahnemann\* and Hadar Ben-Yoav\*





# 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%**

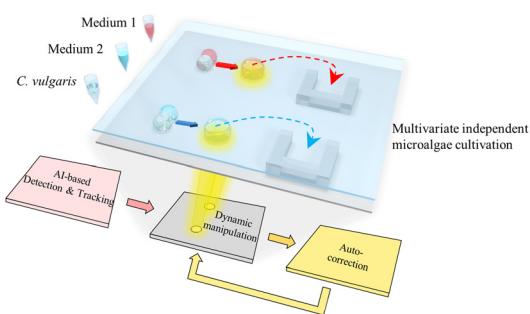


## PAPERS

1416

## Intelligent optoelectrowetting digital microfluidic system for real-time selective parallel manipulation of biological droplet arrays

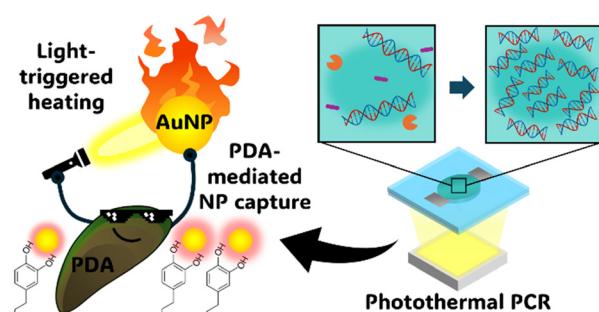
Tianyi Wang, Shizheng Zhou, Xuekai Liu, Jianghao Zeng, Xiaohan He, Zhihang Yu, Zhiyuan Liu, Xiaomei Liu, Jing Jin, Yonggang Zhu, Liuyong Shi,\* Hong Yan\* and Teng Zhou\*



1429

## Polydopamine-mediated gold nanoparticle coating strategy and its application in photothermal polymerase chain reaction

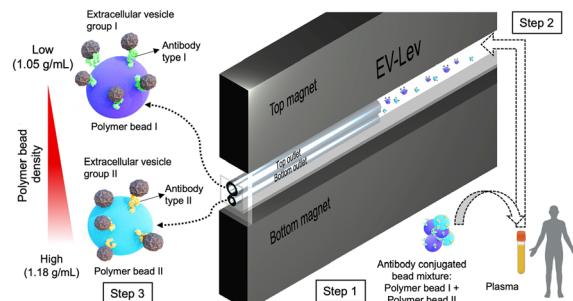
Woo Ri Chae, Yoon-Jae Song\* and Nae Yoon Lee\*



1439

## EV-Lev: extracellular vesicle isolation from human plasma using microfluidic magnetic levitation device

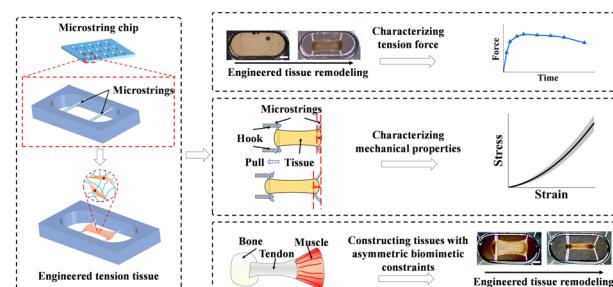
Sena Yaman, Tessa Devoe, Ugur Aygun, Ugur Parlataan, Madhusudhan Reddy Bobbili, Asma H. Karim, Johannes Grillari and Naside Gozde Durmus\*



1452

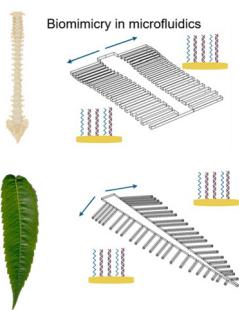
## Microstring-engineered tension tissues: a novel platform for replicating tissue mechanics and advancing mechanobiology

Zixing Zhou, Tingting Li, Wei Cai, Xiaobin Zhu, Zuoqi Zhang and Guoyou Huang\*



## PAPERS

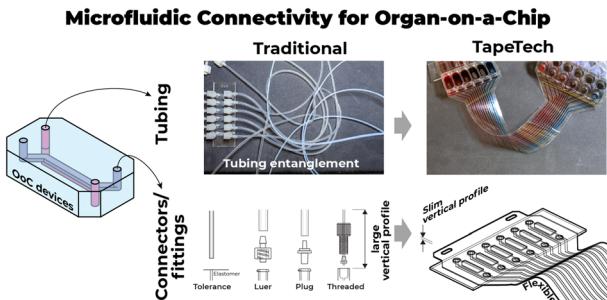
1462



### Design and simulation of biomimetic microfluidic designs to achieve uniform flow and DNA capture for high-throughput multiplexing

Enas Osman, Jonathan L'Heureux-Hache, Phoebe Li and Leyla Soleymani\*

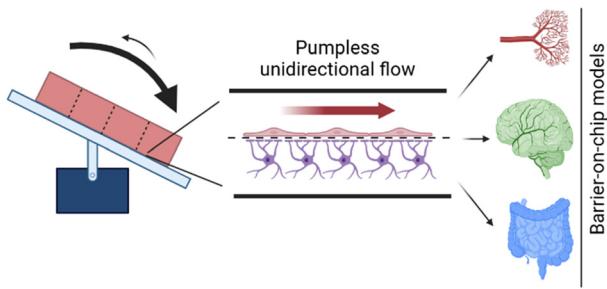
1474



### TapeTech microfluidic connectors: adhesive tape-enabled solution for organ-on-a-chip system integration

Terry Ching, Abraham C. I. van Steen, Delaney Gray-Scherr, Jessica L. Teo, Anish Vasan, Joshua Jeon, Jessica Shah, Aayush Patel, Amy E. Stoddard, Jennifer L. Bays, Jeroen Eyckmans and Christopher S. Chen\*

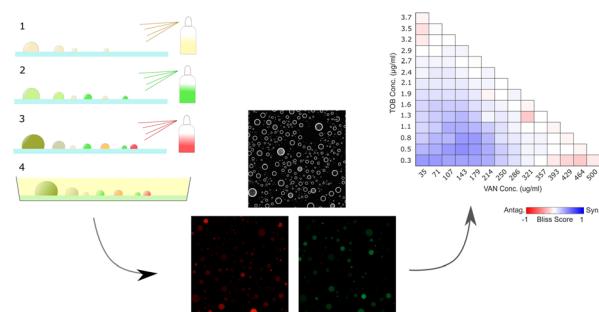
1489



### A pumpless microfluidic co-culture system to model the effects of shear flow on biological barriers

Marsel Lino, Henrik Persson, Mohammad Paknahad, Alisa Ugodnikov, Morvarid Farhang Ghahremani, Lily E. Takeuchi, Oleg Chebotarev, Caleb Horst and Craig A. Simmons\*

1502



### High-throughput, combinatorial droplet generation by sequential spraying

Rena Fukuda\* and Nate J. Cira

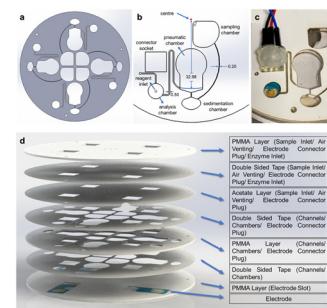


## PAPERS

1512

**An electrochemical sensor integrated lab-on-a-CD system for phenylketonuria diagnostics**

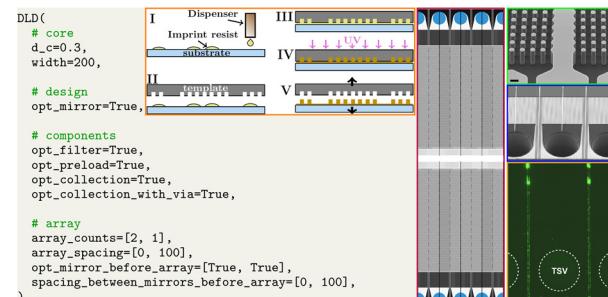
Ipek Akyilmaz, Dilan Celebi-Birand, Naim Yagiz Demir, Deniz Bas, Caglar Elbuken and Memed Duman\*



1521

**A universal framework for design and manufacture of deterministic lateral displacement chips**

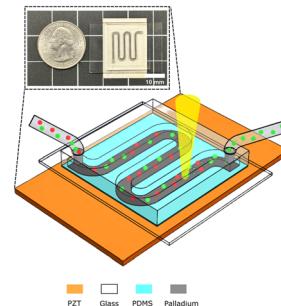
Aryan Mehboudi,\* Shrawan Singhal and S.V. Sreenivasan



1537

**Large-scale acoustic single cell trapping and selective releasing**

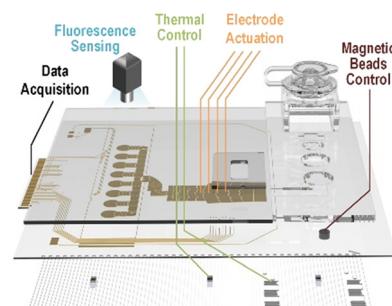
Xiang Zhang, Jacob Smith, Amanda Chengyi Zhou, Jacqueline Thuy-Tram Duong, Tong Qi, Shilin Chen, Yen-Ju Lin, Alexi Gill, Chih-Hui Lo, Neil Y. C. Lin, Jing Wen, Yunfeng Lu and Pei-Yu Chiou\*



1552

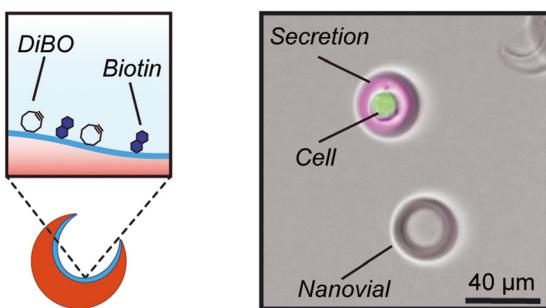
**A sample-to-answer digital microfluidic multiplexed PCR system for syndromic pathogen detection in respiratory tract infection**

Hao Bai, Jie Hu, Tangyuheng Liu, Liang Wan, Cheng Dong, Dasheng Luo, Fei Li, Zhanxin Yuan, Yunmei Tang, Tianlan Chen, Shan Wang, Hongna Gou, Yongzhao Zhou, Binwu Ying,\* Jin Huang\* and Wenchuang (Walter) Hu\*



## PAPERS

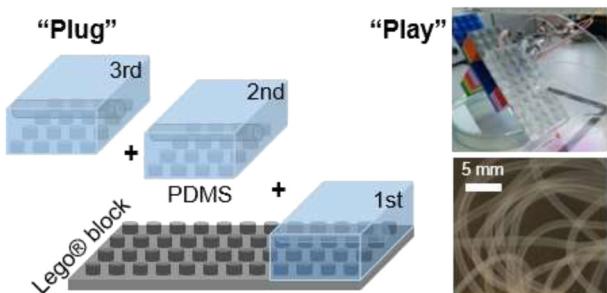
1565



### Multi-reactive hydrogel nanovials for temporal control of secretion capture from antibody-secreting cells

Michael Mellody, Yuta Nakagawa, Richard James and Dino Di Carlo\*

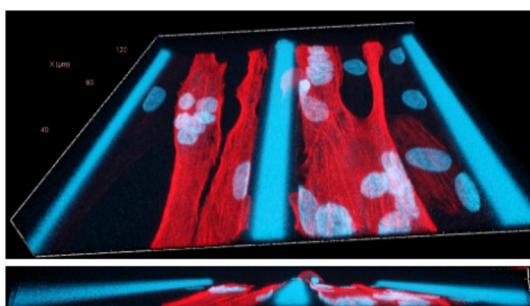
1575



### A plug-and-play microfluidic device for hydrogel fiber spinning

Kongchang Wei, Wuchao Wang, Giorgia Giovannini, Khushdeep Sharma, René M. Rossi\* and Luciano F. Boesel\*

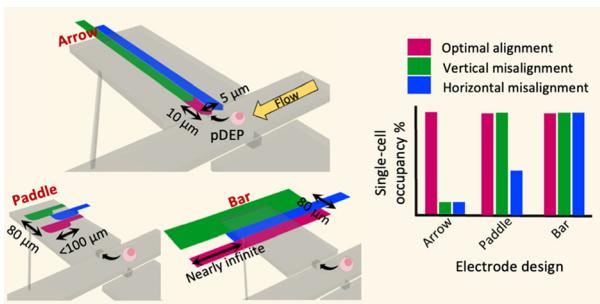
1586



### A new biofunctionalized and micropatterned PDMS is able to promote stretching induced human myotube maturation

Théo Regagnon, Fabrice Raynaud, Gilles Subra, Gilles Carnac, Gerald Hugon, Aurélien Flâtres, Vincent Humblot, Laurine Raymond, Julie Martin, Elodie Carretero, Margaux Clavié, Nathalie Saint, Sylvie Calas, Cécile Echalier, Pascal Etienne and Stefan Matecki\*

1600



### iDEP-based single-cell isolation in a two-dimensional array of chambers addressed by easy-to-align wireless electrodes

Thilini N. Rathnaweera and Robbyn K. Anand\*



## CORRECTIONS

1611

**Correction: *In vitro* vascularized liver tumor model based on a microfluidic inverse opal scaffold for immune cell recruitment investigation**

Pingwei Xu, Junjie Chi,\* Xiaochen Wang, Meng Zhu, Kai Chen, Qihui Fan,\* Fangfu Ye\* and Changmin Shao\*

1614

**Correction: Acoustic modulation and non-contact atomization of droplets based on the Fabry-Pérot resonator**

Jingjun Li, Xiukun Wang, Fan Yang, Yadong Sun and Lei Zhang\*

