

# Lab on a Chip

Devices and applications at the micro- and nanoscale  
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## IN THIS ISSUE

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**Cover**  
See Mengxi Wu, Junshan Liu *et al.*, pp. 5150–5161.  
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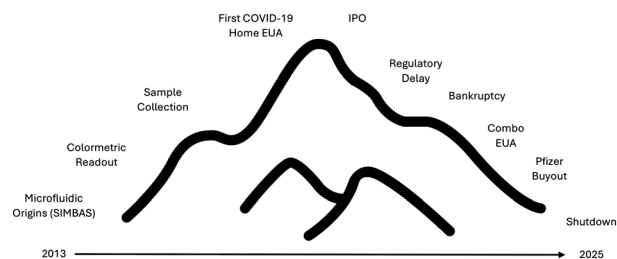
**Inside cover**  
See Yu-Hsiang Hsu *et al.*, pp. 5162–5179.  
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## PERSPECTIVE

5115

### From startup to shutdown: the dramatic rise and fall of the first at-home combo test for flu and COVID-19

Morgan N. Greenleaf, Gregory L. Damhorst, Eric M. Vogel, Greg S. Martin and Wilbur A. Lam\*

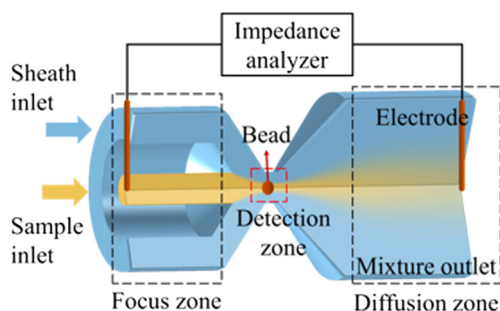


## COMMUNICATIONS

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### A high-sensitivity and clogging-free microfluidic impedance flow cytometer based on three-dimensional hydrodynamic focusing

Xiao Chen, Tingxuan Fang, Yimin Li, Jie Zhang, Xiaoye Huo, Junbo Wang, Xuzhen Qin, Yueying Li,\* Yi Zhang\* and Jian Chen\*





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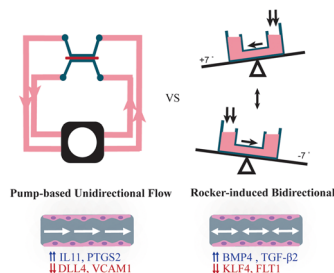
## COMMUNICATIONS

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### Rocker or pump? Transcriptomic response of endothelial cells exposed to peristaltic pump-based unidirectional flow vs. rocker-induced bidirectional flow

Negar Vahdani, Prateek Arora, Lisette van Os, Denise Ackermann, Nadia Mercader and Olivier T. Guenat\*

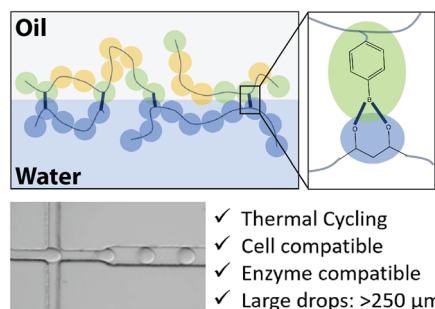
Common Organs-on-Chip Flow Setups



5141

### A biocompatible surfactant film for stable microfluidic droplets

Brendan T. Deveney, John A. Heyman, Raoul G. Rosenthal, David A. Weitz and Jörg G. Werner\*

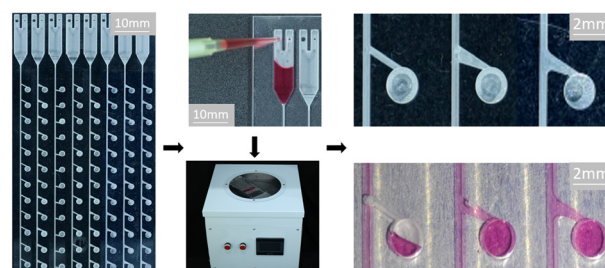


## PAPERS

5150

### Analysis of and methods for void-free liquid filling of blind microchambers in centrifugal microfluidics

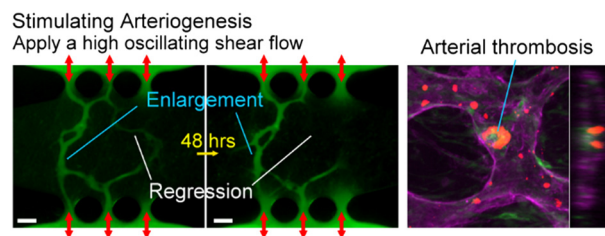
Weiyao Ni, Yi Gao, Enming Cui, Yifei Li, Yangyang Wang, Yahua Liu, Yi Li, Mengxi Wu\* and Junshan Liu\*



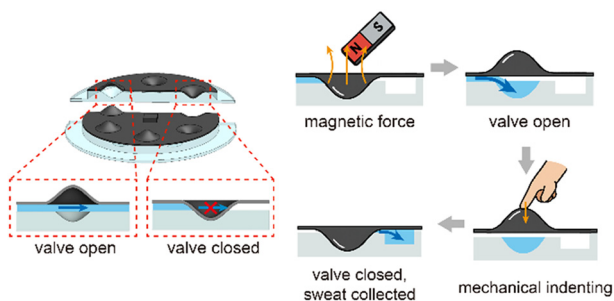
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### Self-assembled human arteriole-on-a-chip for arterial functionality testing and disease modeling

Subhashree Shivani, Hsin-Jou Wang, Yi-Ting Chen, Chih-Ting Lin and Yu-Hsiang Hsu\*



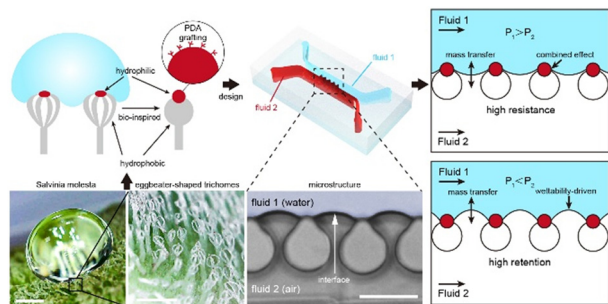
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### Bistable magnetic valves for selective sweat sampling in wearable microfluidics

Chaemin Kim, Chanyong Shin, Anna Lee,\* Jonghyun Ha\* and Jungil Choi\*

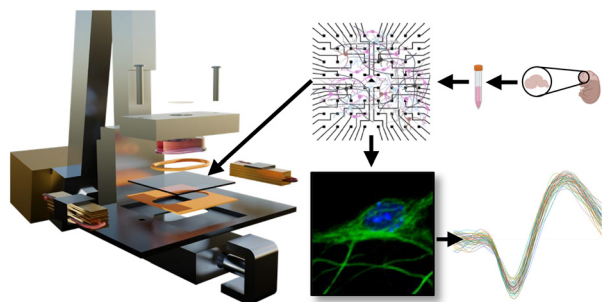
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### Salvinia-inspired architectures for enhancing interface stability and mass transfer in microchannels

Jinlong Xu, Yongjian Li\* and Haosheng Chen\*

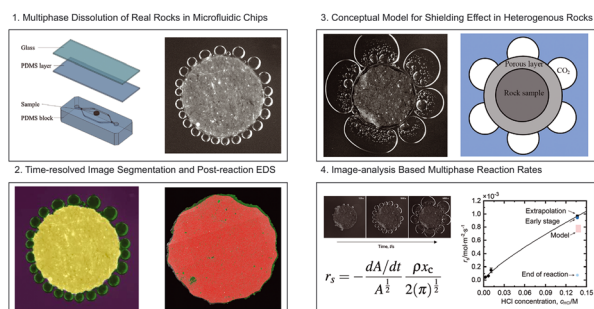
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### Concussive injuries induce neuronal stress-dependent tau mislocalization to dendritic spines with acrolein and functional network alteration in TBI-on-a-chip

Edmond A. Rogers, Tyler C. Diorio, Timothy Beauclair, Jhon Martinez, Shatha J. Mufti, David Kim, Nikita Krishnan, Vitaliy Rayz\* and Riyi Shi\*

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### Integrated physics-based modeling and microfluidics for quantifying multiphase carbonate dissolution in rocks

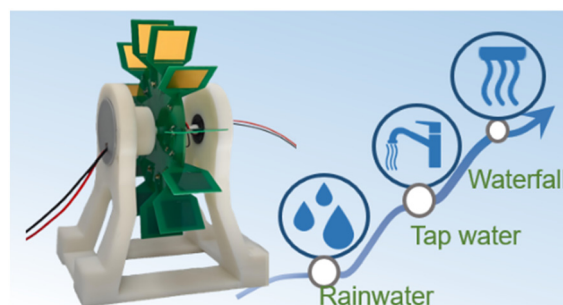
Junyoung Hwang, Siqin Yu, Cynthia M. Ross and Ilenia Battiato\*



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### A hybrid flowing water-based energy generator inspired by a rotatable waterwheel

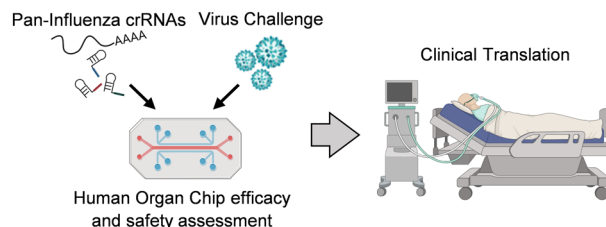
Hongbo Wang, Hangchen Liu, Yuxin Song, Xuezhi Qin, Yang Li, Kairui Tang, Huanxi Zheng, Wanghui Xu, Zuankai Wang\* and Baoping Zhang\*



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### Preclinical assessment of pan-influenza A virus CRISPR RNA therapeutics in a human lung alveolus chip

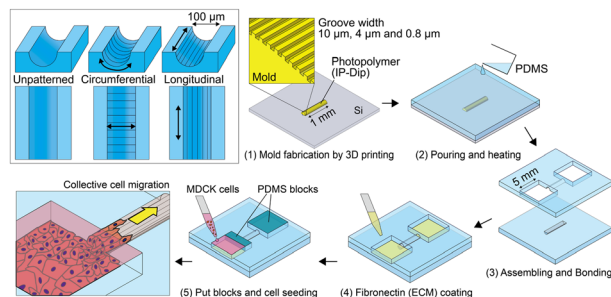
Yuncheng Man, Ryan R. Posey, Haiqing Bai, Amanda Jiang, Pere Dosta, Diana Ocampo-Alvarado, Roberto Plebani, Jie Ji, Chaitra Belgur, Natalie Artzi and Donald E. Ingber\*



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### Topographic cues regulate collective cell dynamics in curved nano/microgrooved tubular microchannels

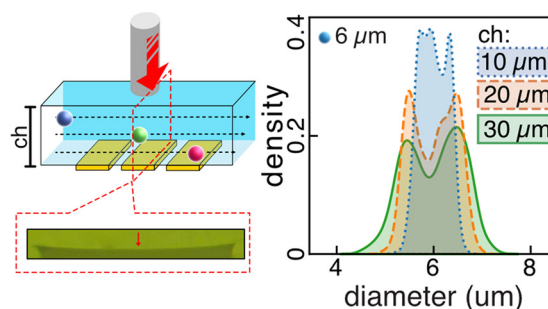
Tatsuya Matsubara, Chris P. Miller, Chanhong Min, Chia-Yi Su, Jong Seob Choi, Chwee Teck Lim, Jude M. Phillip, Joon-wan Kim and Deok-Ho Kim\*



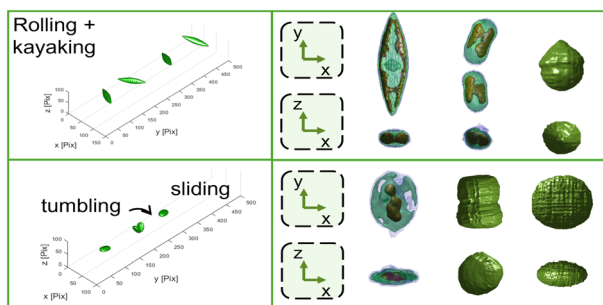
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### A long-term universal impedance flow cytometry platform empowered by adaptive channel height and real-time clogging-release strategy

Trisna Julian, Tao Tang,\* Naomi Tanga, Yang Yang, Yoichiro Hosokawa and Yaxiaer Yalikun\*



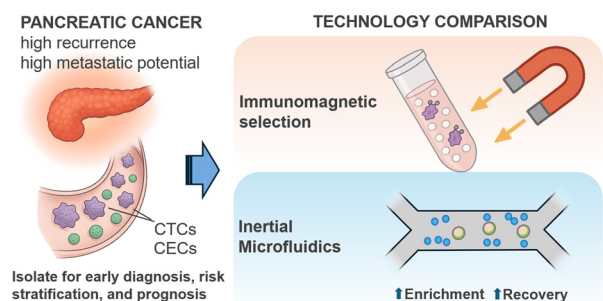
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### 3D holographic flow cytometry measurements of microalgae: strategies for angle recovery in complex rotation patterns

Francesca Borrelli, Giusy Giugliano, Emilie Houliez, Jaromir Behal, Daniele Pirone, Leonilde Roselli, Angela Sardo, Valerio Zupo, Maria Costantini, Lisa Miccio, Pasquale Memmolo, Vittorio Bianco\* and Pietro Ferraro

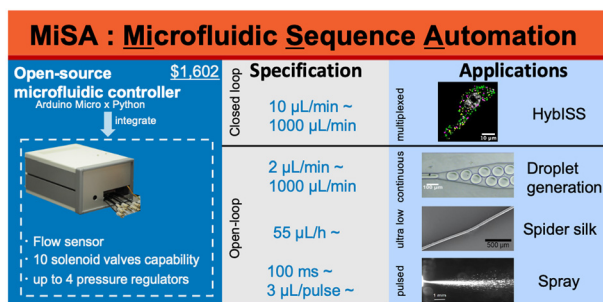
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### Benchmarking microfluidic and immunomagnetic platforms for isolating circulating tumor cells in pancreatic cancer

Celine Macaraniag, Ifra Khan, Alexandra Barabanova, Valentina Valle, Jian Zhou, Pier C. Giulianotti, Alain Borgeat, Gina Votta-Velis\* and Ian Papautsky\*

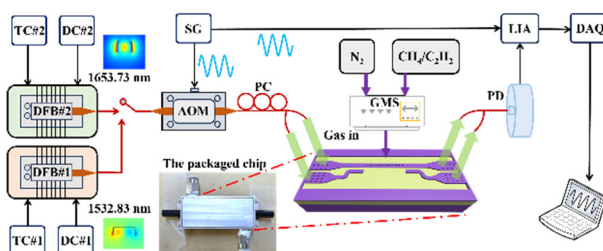
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### An open source for multiplexed, stable and transient flows to advance life sciences using microfluidic control automation

Junichi Murai, Mahmoud N. Abdelmoez, Keisuke Kondo, Kohei Takamuro, Keiji Nozaki, Tim Schiller, Thomas R. Scheibel, Keiji Numata, Hisano Yajima, Kanako Terakado Kimura, Takao Hashiguchi, Taikopaul Kaneko, Misa Minegishi and Hirofumi Shintaku\*

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### On-chip near-infrared gas sensing based on slow light mode multiplexing in photonic crystal waveguides

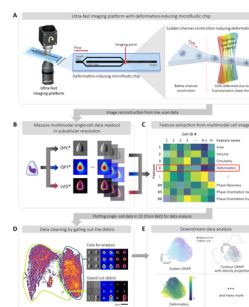
Zihang Peng, Yuting Min, Mingquan Pi, Kaiyuan Zheng,\* Fang Song, Lei Liang, Yiding Wang, Yu Zhang, Xue Bai and Chuantao Zheng\*



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### High-throughput multimodal optofluidic biophysical imaging cytometry

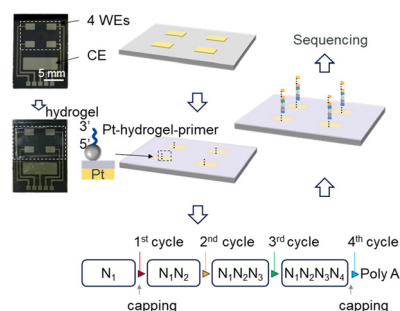
Thiel Lee, Evelyn H. Y. Cheung, Kelvin C. M. Lee, Dickson M. D. Siu, Michelle C. K. Lo, Edmund Y. Lam, Ruchi Goswami, Salvatore Girardo, Kyoo Hyun Kim, Felix Reichel, Marketa Kubankova, Martin Kräter, Jochen Guck and Kevin K. Tsia\*



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### Electronically controlled deprotection chemistry for multiplex enzymatic DNA synthesis on a chip with single-base resolution

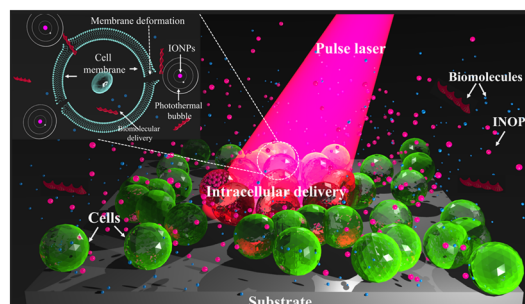
Lihuan Zhao, Qinzhuo Sun, Jian-Qiao Jiang, Xuezheng Wu, Yiming Dong, Dan Wu, Lin-Sheng Wu and Xin Zhao\*



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### Microfluidic synthesis of iron oxide nanoparticles for highly efficient intracellular delivery in stem cells and cancer cells

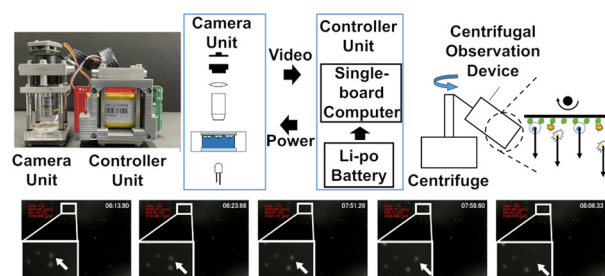
Athira Prasad, Gayathri. R, Nandhini. B, R. Jayaganthan, Srabani Kar and Tuhin Subhra Santra\*

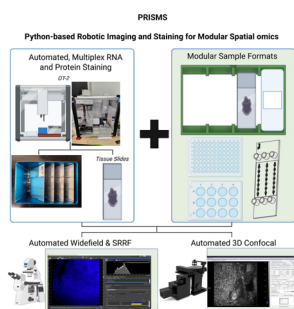


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### Adhesion-based cell sorting platform using on-chip centrifugation

Mao Otake,\* Takaaki Abe, Yoshiaki Ukita and Hiromi Miyoshi





## Modular, open-sourced multiplexing for democratizing spatial omics

Nicholas Zhang, Zhou Fang, Priyam Kadakia, Jamie Guo, Dakshin Vijay, Manoj Thapa, Samuel Dembowitz, Arash Grakoui and Ahmet F. Coskun\*

## Correction: A nanobody-based microfluidic chip for fast and automated purification of protein complexes

Phebe De Keyser, Mitch de Waard, Ignaas S. M. Jimidar, Sandrien Verloy, Steven Janvier, Valentina Kalichuk, Thomas Zögg, Alexandre Wohlkönig, Els Pardon, Jan Steyaert and Gert Desmet\*

