

# Lab on a Chip

Devices and applications at the micro- and nanoscale  
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pp. 1573–1585.  
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pp. 1557–1572.  
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## EDITORIAL

1541

The evolution of miniaturization, automation, and integration – a new scope for *Lab on a Chip*

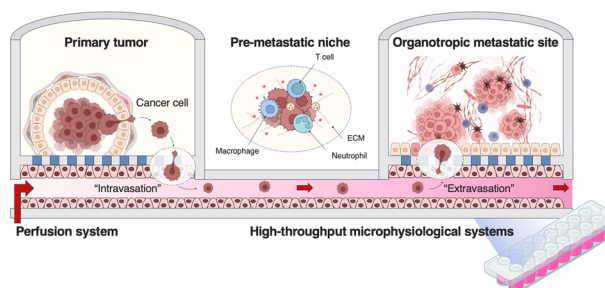


## CRITICAL REVIEW

1542

Understanding organotropism in cancer metastasis using microphysiological systems

Jihoon Ko,\* Jiyoung Song, Yedam Lee, Nakwon Choi and Hong Nam Kim\*



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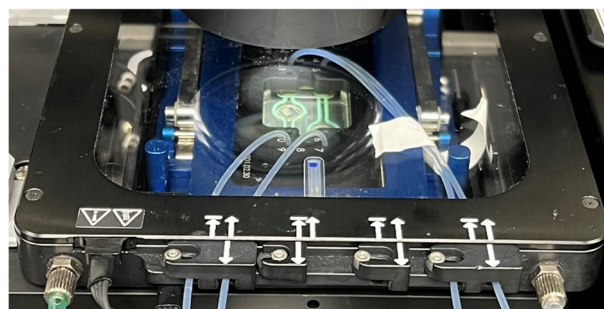


## COMMUNICATION

1557

### SliceChip: a benchtop fluidic platform for organotypic culture and serial assessment of human and rodent pancreatic slices

Charles G. Alver, Silvia Álvarez-Cubela, Isabella Altilio, Emily Hutchison, Emma Warrner, Mariana E. Viso, Giana Vitale, David Oliver, Ricardo L. Pastori,\* Juan Dominguez-Bendala\* and Ashutosh Agarwal\*

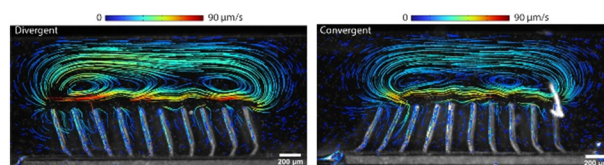


## PAPERS

1573

### Programmable metachronal motion of closely packed magnetic artificial cilia

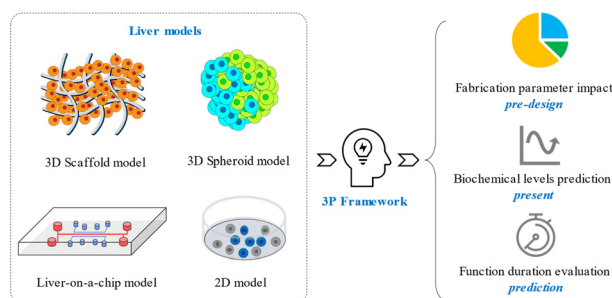
Tongsheng Wang, Tanveer ul Islam, Erik Steur, Tess Homan, Ishu Aggarwal, Patrick R. Onck, Jaap M. J. den Toonder and Ye Wang\*



1586

### Assessing bioartificial organ function: the 3P model framework and its validation

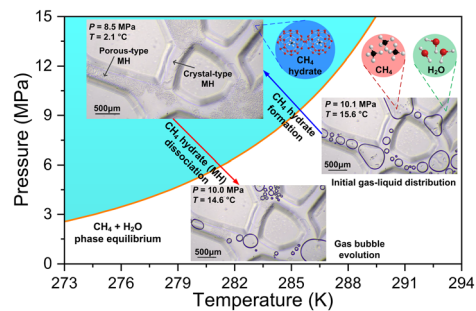
Jingmin An, Shuyu Zhang, Juan Wu, Haolin Chen, Guoshi Xu, Yifan Hou, Ruoyu Liu, Na Li, Wenjuan Cui, Xin Li,\* Yi Du\* and Qi Gu\*



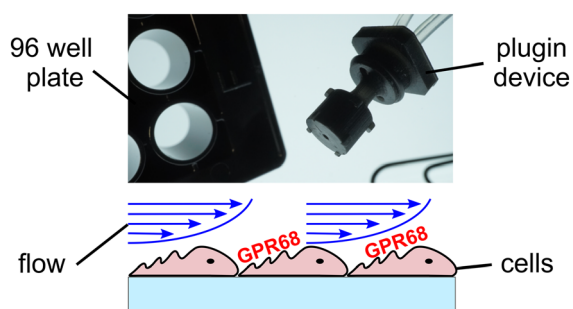
1602

### Path-dependent morphology of CH<sub>4</sub> hydrates and their dissociation studied with high-pressure microfluidics

Jidong Zhang, Zhenyuan Yin,\* Saif A. Khan, Shuxia Li, Qingping Li, Xiaohui Liu and Praveen Linga



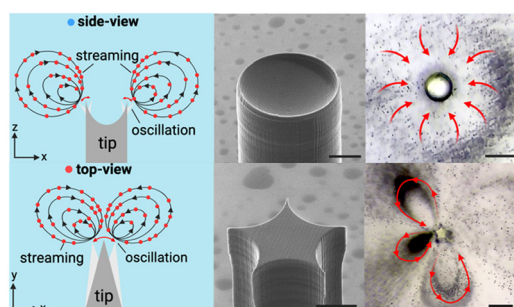
1616



### Quantitative mechanical stimulation of GPR68 using a novel 96 well flow plugin

Philipp Segeritz, Kirill Kolesnik, Daniel J. Scott\* and David J. Collins\*

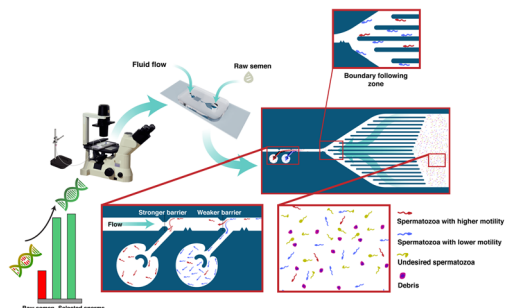
1626



### Enhanced acoustic streaming effects via sharp-edged 3D microstructures

William S. Harley, Kirill Kolesnik, Daniel E. Heath and David J. Collins\*

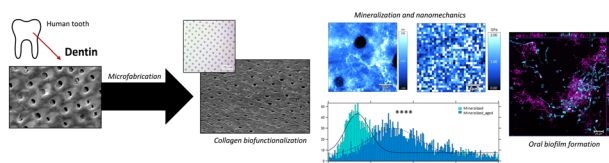
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### Bio-inspired progressive motile sperm separation using joint rheotaxis and boundary-following behavior

Mohammadjavad Bouloorchi Tabalvandani, Saeed Javadizadeh and Majid Badiroostami\*

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### Microfabrication-based engineering of biomimetic dentin-like constructs to simulate dental aging

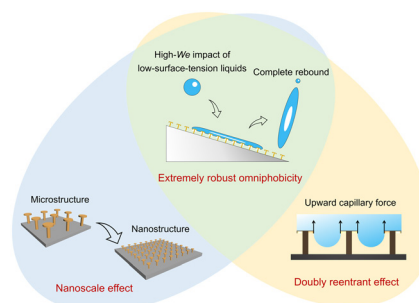
Simon Álvarez, Jose Morales, Paola Tiozzo-Lyon, Pablo Berrios, Valentina Barraza, Kevin Simpson, Andrea Ravasio, Xavier Monforte Vila, Andreas Teuschl-Woller, Christina M. A. P. Schuh and Sebastian Aguayo\*



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## Design of highly robust super-liquid-repellent surfaces that can resist high-velocity impact of low-surface-tension liquids

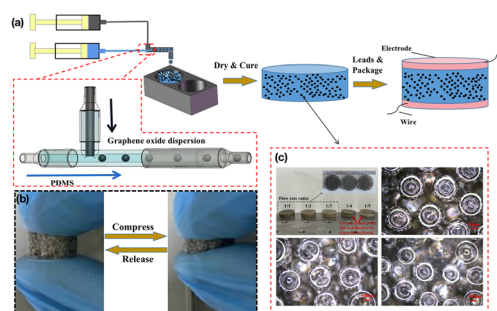
Yingke Wang, Yue Fan, Hongtao Liu, Shuai Wang, Lin Liu, Yingying Dou,\* Shilin Huang, Juan Li\* and Xuelin Tian\*



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## Fabrication of a high performance flexible capacitive porous GO/PDMS pressure sensor based on droplet microfluidic technology

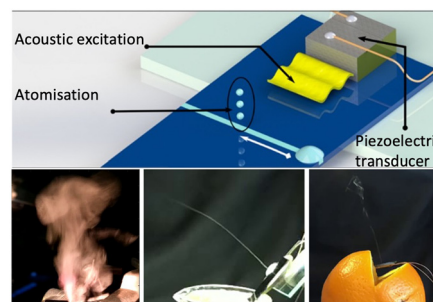
ShengYuan Pan, Tao Zhang, Cheng Zhang,\* Ningbo Liao, Miao Zhang and Tianchen Zhao



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## Oscillating high aspect ratio micro-channels can effectively atomize liquids into uniform aerosol droplets and dial their size on-demand

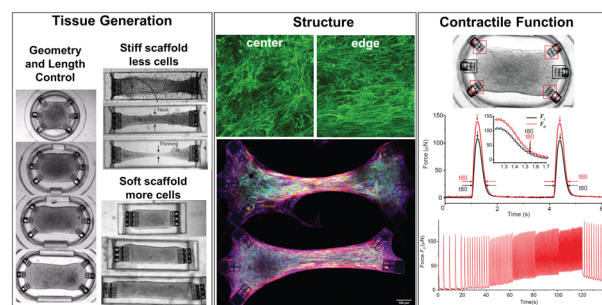
Nguyen Hoai An Le, Jason Brenker, Abanoub Shenoda, Zara Sheikh, Jackson Gum, Hui Xin Ong, Daniela Traini and Tuncay Alan\*



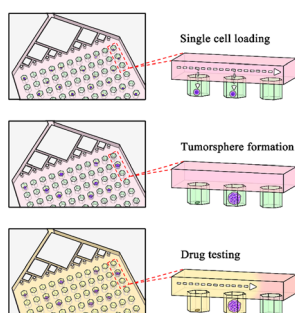
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## Geometry and length control of 3D engineered heart tissues using direct laser writing

M. Çağatay Karakan, Jourdan K. Ewoldt, Addianette J. Segarra, Subramanian Sundaram, Miranda C. Wang, Alice E. White, Christopher S. Chen and Kamil L. Ekinci



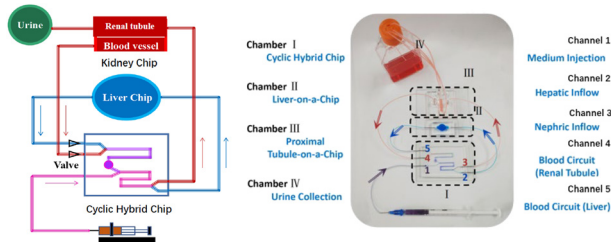
1702



### Selective expansion of renal cancer stem cells using microfluidic single-cell culture arrays for anticancer drug testing

Xiaogang Wang, Tao He, Zihe Chen, Jueming Chen, Yanzhang Luo, Dongguo Lin, Xiancheng Li\* and Dayu Liu

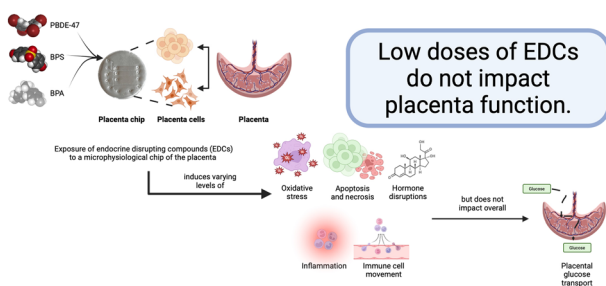
1715



### A three-dimensional (3D) liver-kidney on a chip with a biomimicking circulating system for drug safety evaluation

Qihong Huang, Tianhao Yang, Yunpeng Song, Wenxuan Sun, Jian Xu,\* Ya Cheng,\* Ruixue Yin, Lili Zhu, Mengting Zhang, Lei Ma, Honglin Li and Hongbo Zhang\*

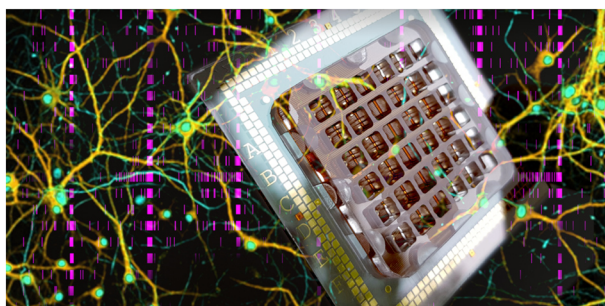
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### Endocrine-disrupting compounds and their impact on human placental function: evidence from placenta organ-on-chip studies

Manuel S. Vidal Jr., Lauren S. Richardson, Ananth Kumar Kammala, Sungjin Kim, Po Yi Lam, Rahul Cherukuri, Tilu Jain Thomas, Mohammed Bettayeb, Arum Han, Ivan Rusyn and Ramkumar Menon\*

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### A microphysiological system for parallelized morphological and electrophysiological read-out of 3D neuronal cell culture

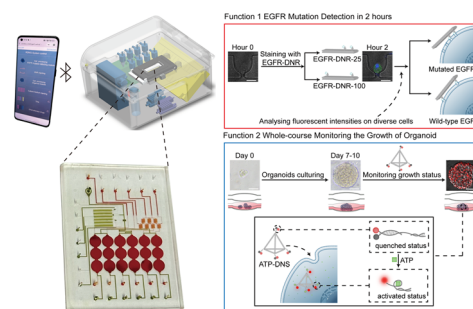
Peter D. Jones,\* Beatriz Molina-Martínez, Anita Niedworok and Paolo Cesare\*



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## A dual-functional microfluidic chip for guiding personalized lung cancer medicine: combining EGFR mutation detection and organoid-based drug response test

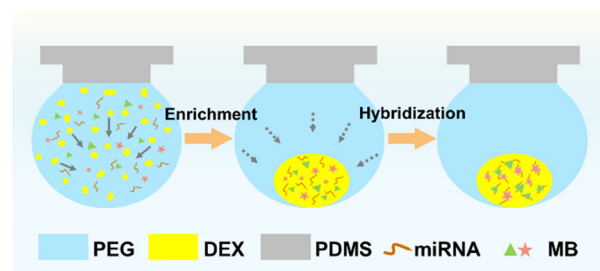
Kexin Zhang, Jiyu Xi, Huiting Zhao, Yadong Wang, Jianchao Xue, Naixin Liang\* and Zewen Wei\*



1775

## Integrated phase separation in microliter droplets for ultratrace-enriching biomarker analysis

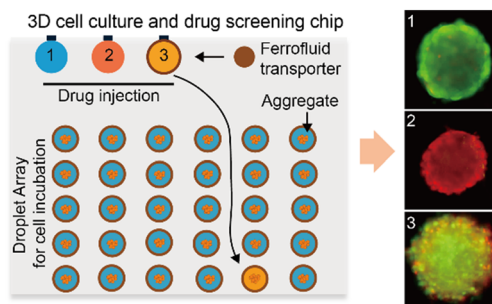
Qihao Zha, Yong Luo, Conghui Liu\* and Tailin Xu



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## On-chip droplet analysis and cell spheroid screening by capillary wrapping enabled shape-adaptive ferrofluid transporters

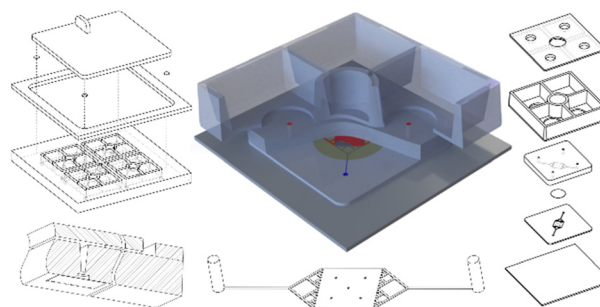
Xuejiao Wang, Xin Li, Aoyang Pu, Ho Bak Shun, Cien Chen, Liqing Ai, Zhaoling Tan, Jilin Zhang, Kai Liu, Jun Gao,\* Kiwon Ban\* and Xi Yao\*



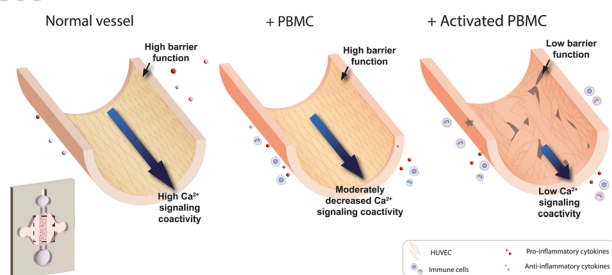
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## Gravity-perfused airway-on-a-chip optimized for quantitative BSL-3 studies of SARS-CoV-2 infection: barrier permeability, cytokine production, immunohistochemistry, and viral load assays

Shannon L. Faley, Niloufar A. Boghdeh, David K. Schaffer, Eric C. Spivey, Farhang Alem, Aarthi Narayanan, John P. Wikswa\* and Jacquelyn A. Brown



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## Immune cells and inflammatory mediators cause endothelial dysfunction in a vascular microphysiological system

Aishwarya Rengarajan, Hannah E. Goldblatt, David J. Beebe, María Virumbrales-Muñoz and Derek S. Boeldt\*

