

# 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 Ainara Vallejo-Illarramendi, Jacobo Paredes *et al.*, pp. 4741-4754.  
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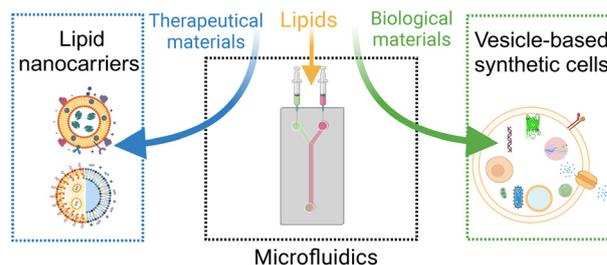
**Inside cover**  
See Lidija Malic *et al.*, pp. 4755-4765.  
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## TUTORIAL REVIEW

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### Microfluidic technologies for lipid vesicle generation

Yu Cheng, Callum D. Hay, Suchaya M. Mahuttanatan, James W. Hindley,\* Oscar Ces\* and Yuval Elani\*



## CRITICAL REVIEW

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### CRISPR for companion diagnostics in low-resource settings

Xu Qian,\* Qiang Xu, Christopher J. Lyon and Tony Y. Hu\*



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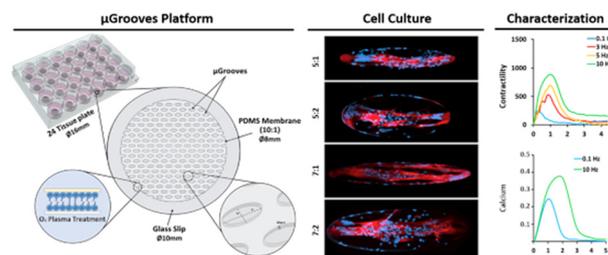
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4741

## Development of an *in vitro* platform for the analysis of contractile and calcium dynamics in single human myotubes

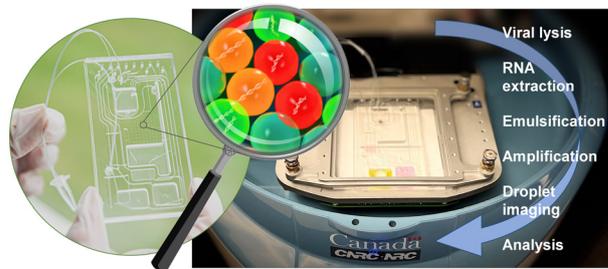
Camila Vesga-Castro, Laura Mosqueira-Martín, Paul Ubiria-Urkola, Pablo Marco-Moreno, Klaudia González-Imaz, Jorge Rendon-Hinestroza, Ainara Vallejo-Illarramendi\* and Jacobo Paredes\*



4755

## Sample-to-answer centrifugal microfluidic droplet PCR platform for quantitation of viral load

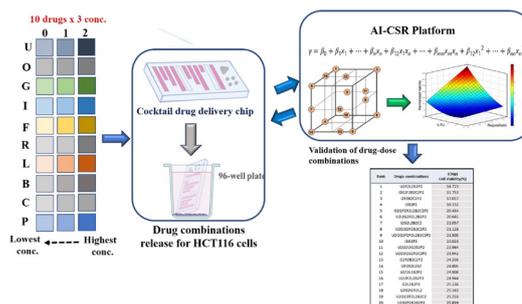
Lidija Malic,\* Liviu Clime, Byeong-Ui Moon, Christina Nassif, Dillon Da Fonte, Daniel Brassard, Ljuboje Lukic, Matthias Geissler, Keith Morton, Denis Charlebois and Teodor Veres



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## Selectively cross-linked hydrogel-based cocktail drug delivery micro-chip for colon cancer combinatorial drug screening using AI-CSR platform for precision medicine

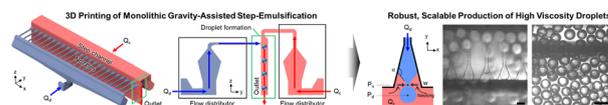
Kiran Kaladharan, Chih-Hsuan Ouyang, Hsin-Yu Yang and Fan-Gang Tseng\*



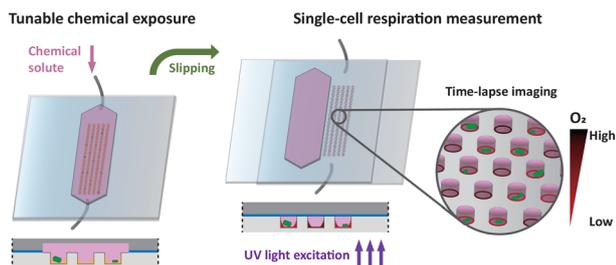
4778

## 3D printing of monolithic gravity-assisted step-emulsification device for scalable production of high viscosity emulsion droplets

Yoon-Ho Hwang, Je Hyun Lee, Taewoong Um and Hyomin Lee\*



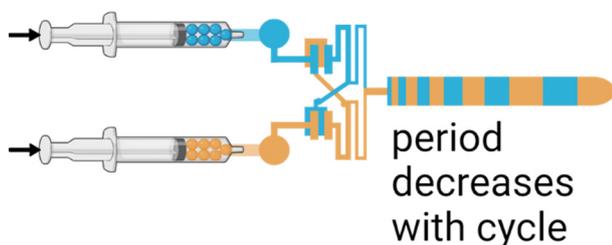
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### SlipO<sub>2</sub>Chip – single-cell respiration under tuneable environments

Yuan Cui, Milena De Albuquerque Moreira, Kristen E. Whalen, Laurent Barbe, Qian Shi, Klaus Koren, Maria Tenje and Lars Behrendt\*

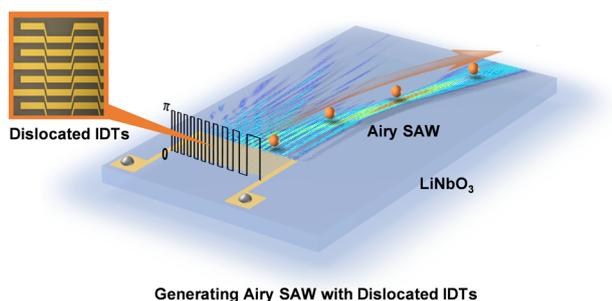
4798



### Forced air oscillations – pneumatic capacitance in microfluidic oscillators produces non-linear responses and emergent behaviors

Sasha Cai Leshner-Pérez, Vishwa Vasani, Jihye So and Shuichi Takayama\*

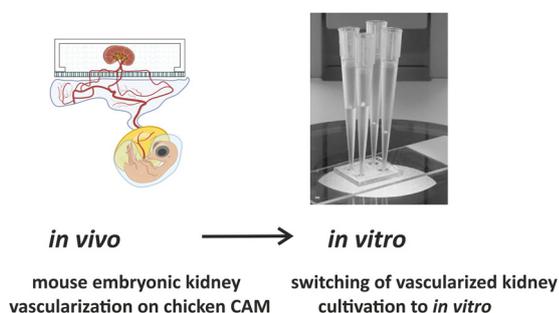
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### Generating Airy surface acoustic waves with dislocated interdigital transducers

Zongjun Ma, Delai Kong, Wenfeng Cai, Zhenming Wang, Ming Cheng, Zixuan Wu, Xueqian Zhao, Mengjia Cen, Haitao Dai, Shifeng Guo and Yan Jun Liu\*

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### From *ex ovo* to *in vitro*: xenotransplantation and vascularization of mouse embryonic kidneys in a microfluidic chip

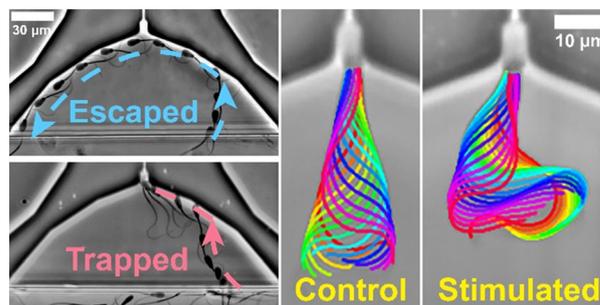
Micaela Oliveira, Partha Protim Sarker, Ilya Skovorodkin, Ali Kalantarifard, Tugce Haskavuk, Jonatan Mac Intyre, Elizabeth Nallukunnel Raju, Samin Noorian, Hiroki Shioda, Masaki Nishikawa, Yasuyuki Sakai, Seppo J. Vainio,\* Caglar Elbuken\* and Irina Raykhel\*



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### Microfluidic sperm trap array for single-cell flagellar analysis with unrestricted 2D flagellar movement

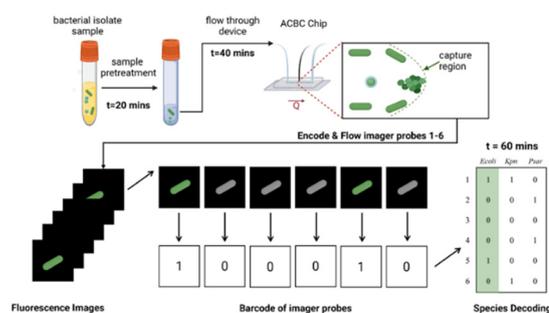
Kaiyu Wang, Antai Tao, Rongjing Zhang\* and Junhua Yuan\*



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### Rapid identification of bacterial isolates using microfluidic adaptive channels and multiplexed fluorescence microscopy

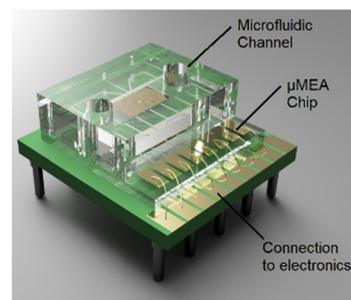
Stelios Chatzimichail,\* Piers Turner, Conor Feehily, Alison Farrar, Derrick Crook, Monique Andersson, Sarah Oakley, Lucinda Barrett, Hafez El Sayyed, Jingwen Kyropoulos, Christoffer Nellåker, Nicole Stoesser and Achillefs N. Kapanidis\*



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### Integrated microfluidic multiple electrode aggregometry for point-of-care platelet function analysis

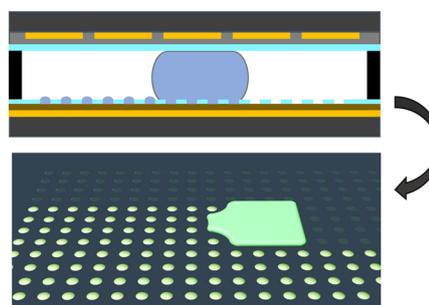
X. Zhao,\* V. R. Gopal, F. Lozano-Juan, K. Kolandaivelu, A. Sarkar, D. Wu, J. Su, Q. Cheng, R. Pang and L.-S. Wu



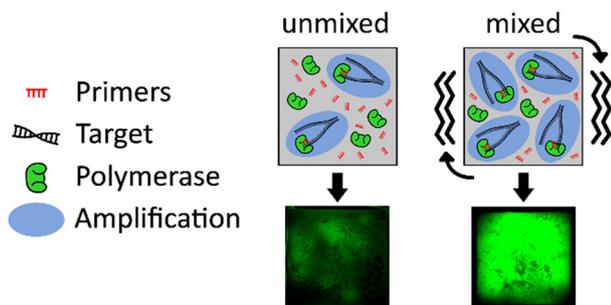
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### Improved Teflon lift-off for droplet microarray generation and single-cell separation on digital microfluidic chips

Chuanjie Shen, Zhaoduo Tong, Xin Xu and Hongju Mao\*



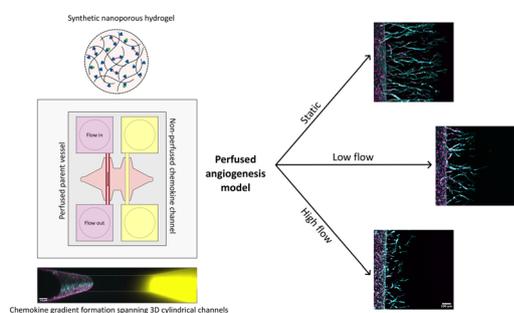
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### Vibration mixing for enhanced paper-based recombinase polymerase amplification

Kelli N. Shimazu, Andrew T. Bender, Per G. Reinhall and Jonathan D. Posner\*

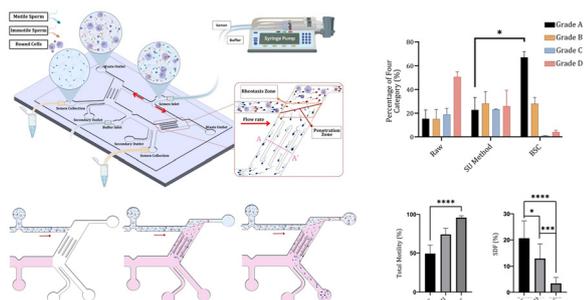
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### A nanoporous hydrogel-based model to study chemokine gradient-driven angiogenesis under luminal flow

Nidhi Mote, Sarah Kubik, William J. Polacheck, Brendon M. Baker and Britta Trappmann\*

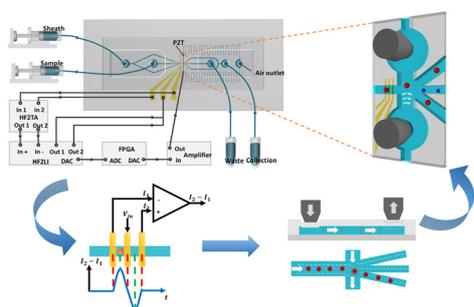
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### High-throughput selection of sperm with improved DNA integrity and rapidly progressive motility using a butterfly-shaped chip compared to the swim-up method

Ali Sharafatdoust Asl, Mohammad Zabetian Targhi,\* Soroush Zeaei, Iman Halvaei and Reza Nosrati\*

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### Label-free high-throughput impedance-activated cell sorting

Kui Zhang, Ziyang Xia, Yiming Wang, Lisheng Zheng, Baoqing Li\* and Jiaru Chu\*

