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.

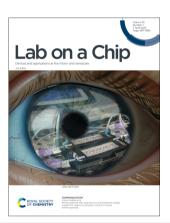
IN THIS ISSUE

ISSN 1473-0197 CODEN LCAHAM 25(7) 1617-1890 (2025)



Cover

See Marina Musa, Zetao Zhu, Yoshinobu Baba. Takao Yasui et al.. pp. 1637-1646. Image reproduced by permission of Takao Yasui from Lab Chip, 2025, 25, 1637.



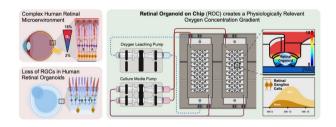
Inside cover

See Emma Drabbe et al., pp. 1626-1636. Image reproduced by permission of Ashutosh Agarwal from Lab Chip, 2025, 25, 1626.

COMMUNICATION

Retinal organoid chip: engineering a physiomimetic oxygen gradient for optimizing long term culture of human retinal organoids

Emma Drabbe, Daniel Pelaez* and Ashutosh Agarwal*

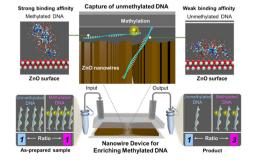


PAPERS

1637

Selective adsorption of unmethylated DNA on ZnO nanowires for separation of methylated DNA

Marina Musa,* Zetao Zhu,* Hiromi Takahashi, Wataru Shinoda, Yoshinobu Baba* and Takao Yasui*







At the heart of open access for the global chemistry community

Editor-in-chief

Russell J Cox

Leibniz Universität Hannover, Germany

We stand for:



Breadth We publish work in all areas of chemistry and reach a global readership



Quality Research to advance the chemical sciences undergoes rigorous peer review for a trusted, society-run journal



Affordability Low APCs, discounts and waivers make publishing open access achievable and sustainable



Community Led by active researchers, we publish quality work from scientists at every career stage, and all countries

Submit your work now

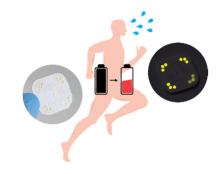
rsc.li/rsc-advances

@RSC_Adv

1647

Soft, wearable, microfluidic system for fluorometric analysis of loss of amino acids through eccrine sweat

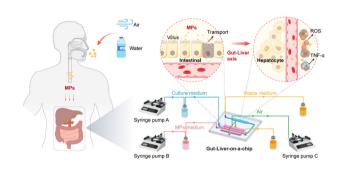
Seunghee H. Cho, Soongwon Cho, Zengyao Lv, Yurina Sekine, Shanliangzi Liu, Mingyu Zhou, Ravi F. Nuxoll, Evangelos E. Kanatzidis, Roozbeh Ghaffari, Donghwan Kim, Yonggang Huang and John A. Rogers*



1656

Revealing transport, uptake and damage of polystyrene microplastics using a gut-liver-on-achip

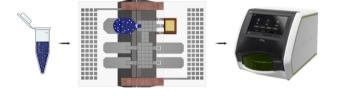
Yushen Wang, Junlei Han, Wenteng Tang, Xiaolong Zhang, Jiemeng Ding, Zhipeng Xu, Wei Song, Xinyu Li* and Li Wang*



1669

A digital microfluidic approach to increasing sample volume and reducing bead numbers in single molecule array assays

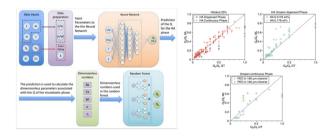
Alinaghi Salari, Jose Gilberto Camacho Valenzuela, Nguyen Le, Joshua Dahmer, Alexandros A. Sklavounos, Cheuk W. Kan, Ryan Manning, David C. Duffy, Nira R. Pollock and Aaron R. Wheeler*



1681

Dimensional analysis meets AI for non-Newtonian droplet generation

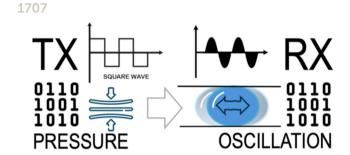
Farnoosh Hormozinezhad, Claire Barnes, Alexandre Fabregat, Salvatore Cito and Francesco Del Giudice*



1694 Gut-on-a-Chip Platform with Integrated Impedance Sensor Impedance Measurements: Gut Model Apical Channe cultivation Senescent Gut Model

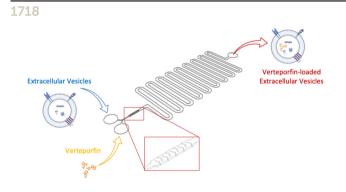
Sensor-integrated gut-on-a-chip for monitoring senescence-mediated changes in the intestinal barrier

Konstanze Brandauer, Alexandra Lorenz, Silvia Schobesberger, Patrick Schuller, Martin Frauenlob, Sarah Spitz and Peter Ertl*



Synthetic molecular communication through microfluidic oscillating droplets for intrabody physiological data transmission

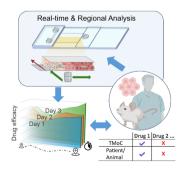
Fabrizio Pappalardo, Carla Panarello, Salvo Quattropani, Laura Galluccio, Antonino Licciardello, Roberta Ruffino. Giovanni Li-Destri, Alfio Lombardo, Giacomo Morabito and Nunzio Tuccitto*



Microfluidic loading of verteporfin into extracellular vesicles for neuroblastoma therapy

Caterina Piunti, Sara Micheli, Sara Giancaterino, Pina Fusco, Cristiana Boi and Elisa Cimetta*

1728



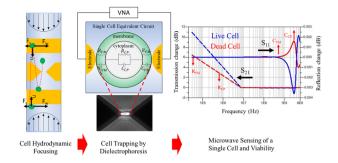
Real-time and regional analysis of the efficacy of anticancer drugs in a patient-derived intratumoral heterogeneous tumor microenvironment

Ya-Hui Lin, Chiao-Min Lin, Kee-Ming Man, Chih-Chiang Hung, Hsin-Ling Hsu, Yunching Chen, Hsuan-Yu Mu,* Tzu-Hung Hsiao* and Jen-Huang Huang*

1744

Label-free differentiation of living versus dead single yeast cells using broadband electrical impedance spectroscopy

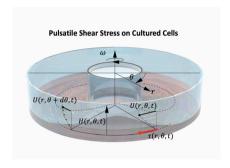
Amirhossein Favakeh, Amir Mokhtare, Mohammad Javad Asadi, James C. M. Hwang and Alireza Abbaspourrad*



1755

Pulsatile-flow culture: a novel system for assessing vascular-cell dynamics

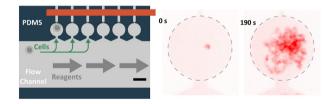
Neda Salimi-Afjani,* Robert Rieben and Dominik Obrist



1767

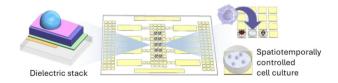
A microfluidic platform for extraction and analysis of bacterial genomic DNA

Alex Joesaar, Martin Holub, Leander Lutze, Marco Emanuele, Jacob Kerssemakers, Martin Pabst and Cees Dekker*

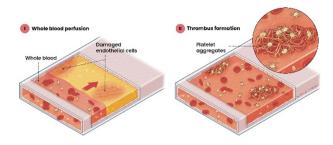


Long-term digital microfluidic chips for regulating macrophage cellular interactions in inflammation

Oksana K. Savchak and Burcu Gumuscu*



1787



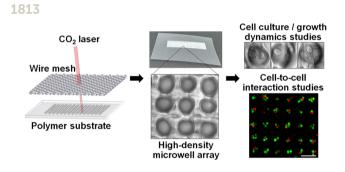
Blood-perfused Vessels-on-Chips stimulated with patient plasma recapitulate endothelial activation and microthrombosis in COVID-19

Huub J. Weener,* Thijs F. van Haaps, Ruben W. J. van Helden, Hugo J. Albers, Rozemarijn Haverkate, Heleen H. T. Middelkamp, Milan L. Ridderikhof, Thijs E. van Mens, Albert van den Berg, Christine L. Mummery, Valeria V. Orlova, Saskia Middeldorp, Nick van Es and Andries D. van der Meer

1801 C₂H₂

On-chip near-infrared multi-gas sensing using chalcogenide anti-resonant hollow-core waveguides

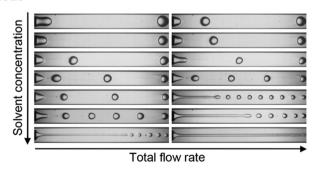
Yuting Min, Mingquan Pi, Zihang Peng, Gangyun Guan, Lei Liang, Fang Song, Yiding Wang, Yu Zhang, Xue Bai* and Chuantao Zheng*



Rapid laser ablation-based fabrication of highdensity polymer microwell arrays for highthroughput cellular studies

Desh Deepak Dixit, Kavya L. Singampalli, Amit S. Niyogi, Amanda Montoya, Alexandre Reuben and Peter B. Lillehoj*

1823



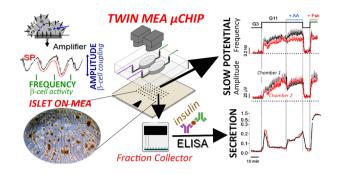
Droplet microfluidic method for measurement of ultralow interfacial tension in ternary fluid systems

Thai Dinh. Robert Casal and Thomas Cubaud*

1831

A microfluidic twin islets-on-chip device for on-line electrophysiological monitoring

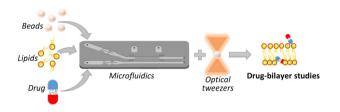
Marie Lallouet, Loic Olçomendy, Julien Gaitan, Killian Montiège, Marie Monchablon, Antoine Pirog, Dorian Chapeau, Emilie Puginier, Sylvie Renaud, Matthieu Raoux and Jochen Lang*



1842

Microfluidic system for efficient molecular delivery to artificial cell membranes

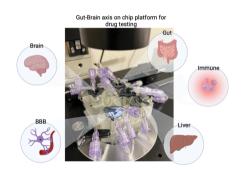
Arash Yahyazadeh Shourabi, Martina lacona and Marie-Eve Aubin-Tam*



1854

A gut-brain axis on-a-chip platform for drug testing challenged with donepezil

Francesca Fanizza, Simone Perottoni, Lucia Boeri, Francesca Donnaloja, Francesca Negro, Francesca Pugli, Gianluigi Forloni, Carmen Giordano* and Diego Albani



Suppressing parasitic flow in membraneless diffusion-based microfluidic gradient generators

Vahid Khandan, Ryan C. Chiechi, Elisabeth Verpoorte and Klaus Mathwig*

