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Lab on a Chip

Devices and applications at the micro- and nanoscale

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See Myeongsub Kim *et al.*, pp. 5705–5746.
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Inside cover
See Gianni Ciofani, Attilio Marino and Kamil Ziaja *et al.*, pp. 5747–5761.
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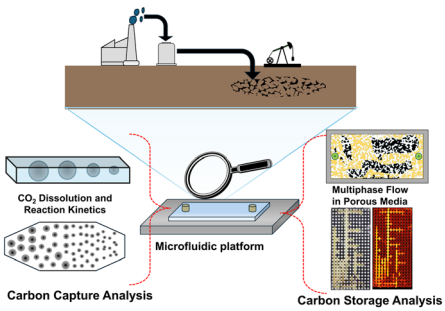
Cellular constructs generated using ChatGPT from *Lab Chip*, 2025, **25**, 5747.

CRITICAL REVIEW

5705

A review of microfluidic approaches for carbon capture and storage research

Abhishek Ratanpara, Yaofa Li and Myeongsub Kim*

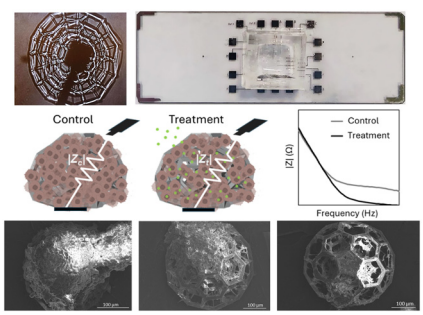


PAPERS

5747

High-throughput impedance monitoring in 3D tumor cultures: a multiplex, microfluidic-free platform for drug screening

Attilio Marino,* Kamil Ziaja,* Marie Celine Lefevre, Maria Cristina Ceccarelli, Matteo Battaglini, Carlo Filippeschi and Gianni Ciofani*



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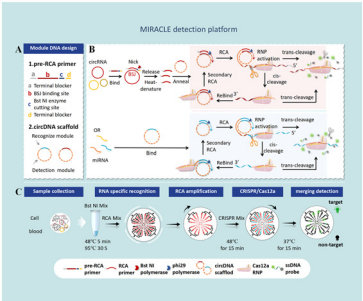
5762

Modular RCA-CRISPR/Cas12a amplification on a multi-volume SlipChip for ultrafast, single-copy quantification of circRNA and miRNA in ovarian cancer

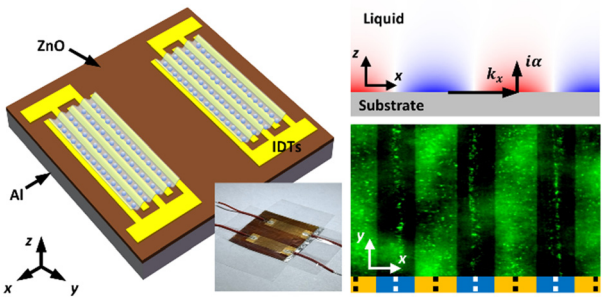
Lingxi Tian, Yan Gao, Yang Lu, Feng Xu, Zirui Feng, Lihan Zi, Zaian Deng* and Jun Yang*



5777

Trapping nanoscale particles *via* quasi-Scholte mode in acoustofluidics

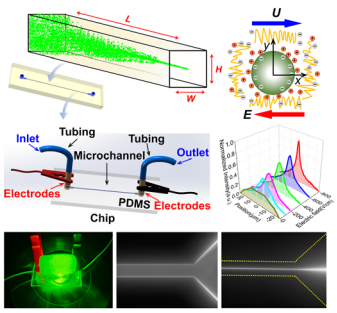
Jiaqi Liu, Yuan Yu, Rujun Zhang, Yanru Chen, Yanlong Guo, Yi Zhang, Ran Tao, Jingting Luo, Hairong Zheng, Pingfa Feng, Yongqing Fu,* Jianjian Wang* and Feiyan Cai*



5787

High-throughput nanoparticle manipulation *via* controlled electro-elasticity and Joule heating in microchannels

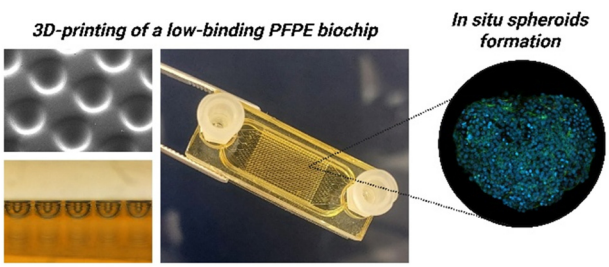
Xinlei Qi, Shuhao Ma and Guoqing Hu*



5801

***In situ* formation and culture of cell spheroids in a low-binding 3D-printed biochip**

Alexandre Martins, Sylvie Klieber, Charlotte Le Graët, Eric Leclerc, Cécile Legallais* and Rachid Jellali*



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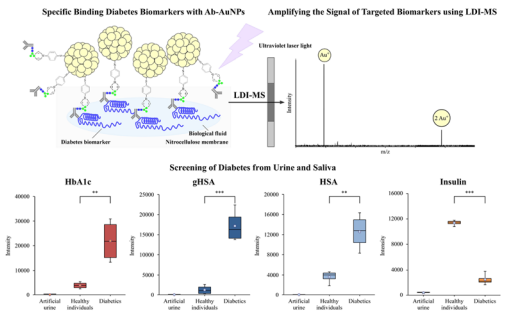
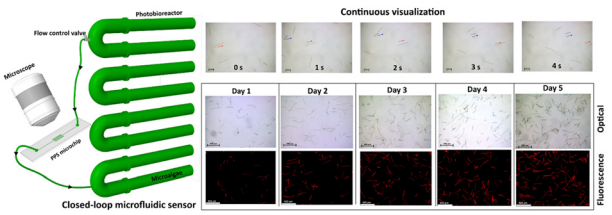


Signal amplification using Ab-AuNPs integrated with LDI-MS analysis for diabetes screening in urine and saliva

Li-Sin Tu, Tai-Wei Liu and He-Hsuan Hsiao*

5828



An integrated continuous-flow microfluidic sensor for long-term monitoring of microalgae growth in a tubular photobioreactor

R. Rahul, Nikhil Prasad, R. S. Mini* and S. Kumar Ranjith*

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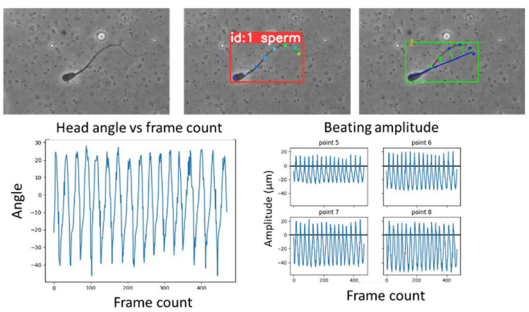
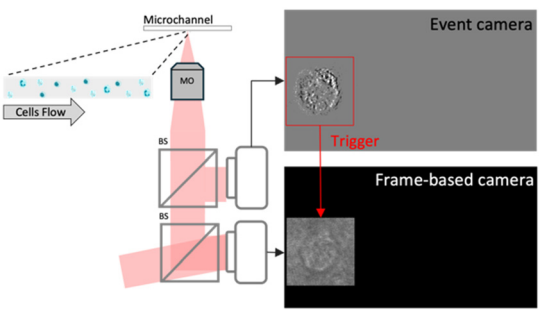


Analysis of sperm beating characteristics using microfluidic trapping and machine-learning-based flagellum tracking

Aisha Hamidu, Omar Abdelgawad, Ahmed Azmeer and Mohamed Abdelgawad*

5856



Rare cell classification using label-free imaging flow cytometry *via* motion-sensitive-triggered interferometry

Eden Dotan, Dana Yagoda-Aharoni, Eli Shapira and Natan T. Shaked*

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PAPERS

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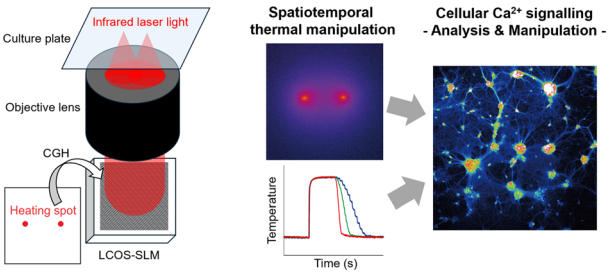
Spatiotemporal temperature control by holographic heating microscopy unveils cellular thermosensitive calcium signalling

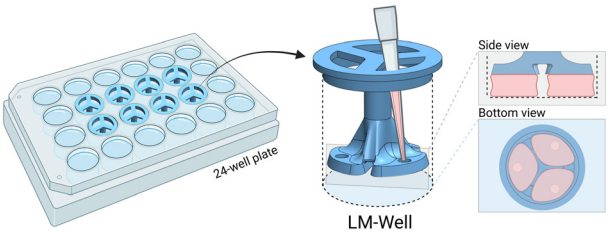
Kotaro Oyama,* Ayumi Ishii, Shuhei Matsumura, Tomoko G. Oyama, Mitsumasa Taguchi and Madoka Suzuki*



5875

Building multiple microenvironmental niches using a customizable 3D printed well insert

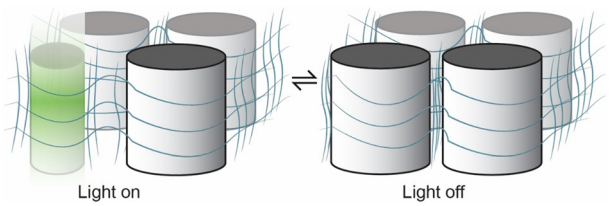
Laura A. Milton, Surasak Kasetsirikul, Jorge A. Catano, F. Sofia Hilmi, Zeheng Zhou, Thomas G. Molley, Kristopher A. Kilian, Louis J. Y. Ong, James Chirnside, Nicholas Byrom, Georgia Balshaw, Sammy Liang, Laura J. Bray, Dietmar W. Hutmacher, Christoph Meinert and Yi-Chin Toh*



5894

Stimulus-induced mechanical compaction of biological polymer networks *via* smart hydrogel microstructures

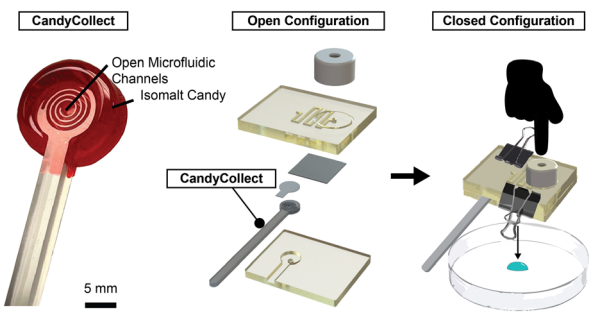
Vicente Salas-Quiroz, Katharina Esch and Katja Zieske*



5906

CandyCollect open-to-closed (O2C) microfluidic system for rapid and user-centric detection of group A *Streptococcus*

Kelsey M. Leong, J. Carlos Sanchez, Cosette Craig, John A. Tatka, René R. Arvizu, Ingrid H. Robertson, Victoria A. M. Shinkawa, Timothy R. Robinson, Megan M. Chang, Xiaojing Su, Sanitta Thongpang, Ashleigh B. Theberge, Erwin Berthier* and Ayokunle O. Olanrewaju*



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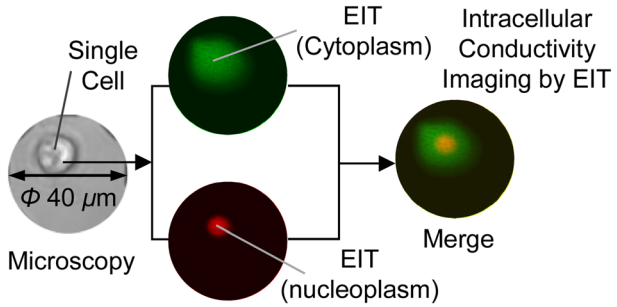

Electrical impedance tomography (EIT)-based intracellular conductivity imaging for non-invasive cell detection

Songshi Li, Daisuke Kawashima,* Zeyang Dai, Nobuyuki Aoki and Masahiro Takei

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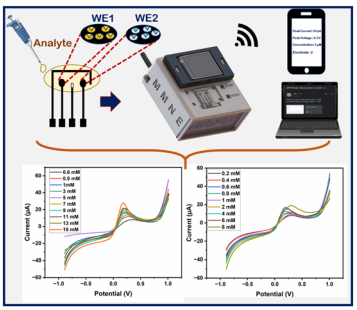
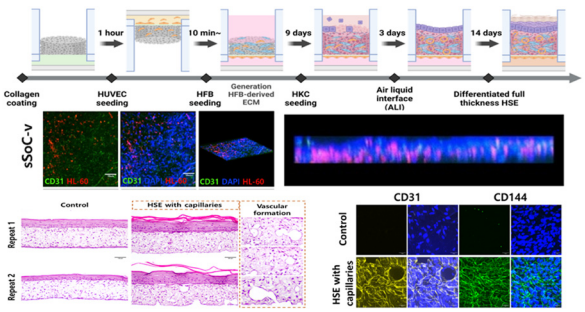


Integrated and turnkey custom-built multiplexed portable platform for on-site electrochemical detection

Parvathy Nair, Aditya Balasubramanian, Sharan K, Souvik Roy, Ponnalagu R N* and Sanket Goel*

5936



Development of a contraction-free, vascularized full-thickness skin-on-a-chip platform for modeling immune responses and inflammation in atopic dermatitis

Kyunghee Kim, Hyeji Jang, Eunyul Kim, Hyeju Kim and Gun Yong Sung*

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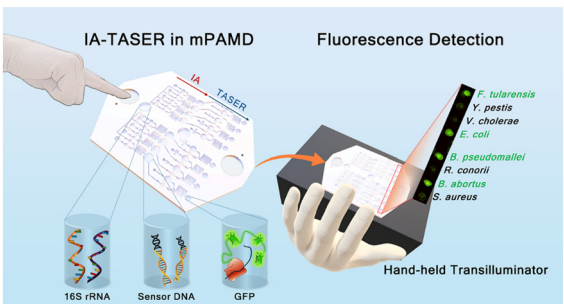

Pushbutton-activated microfluidic cell-free biosensor for multiplexed pathogen detection

Dong Hyun Han, Yurim Kim, Yu Jin Park, Dong-Yeon Song, Jongho Park, Jeonghwan Oh, Dong-Myung Kim* and Je-Kyun Park*

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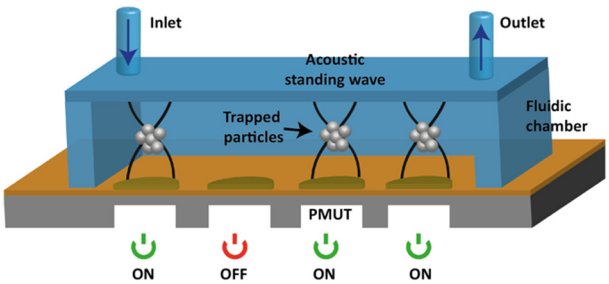
On-chip particle levitation and micromanipulation using bulk acoustic waves

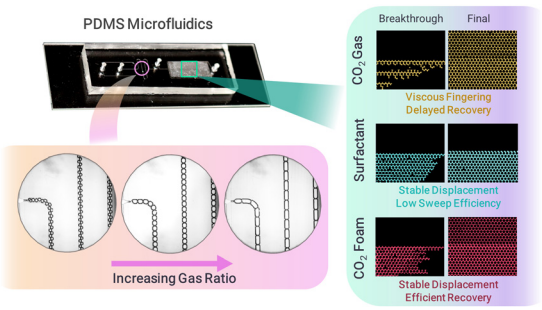
Emilie Vuille-dit-Bille, Marc-Alexandre Dubois, Junsun Hwang, Dara Bayat, Thomas Overstolz,* Amit Dolev, Sarah Heub, Gilles Weder, Michel Despont and Mahmut Selman Sakar*



5976

Microfluidic investigation of CO_2 foam flow in a heterogeneous porous medium

Nikoo Moradpour and Peichun Amy Tsai*



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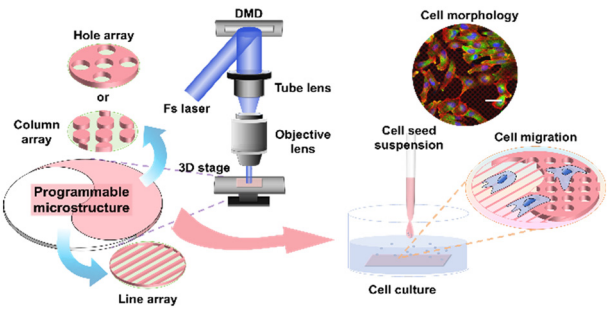
Programmable cell culture chips for topographical manipulation of living cells

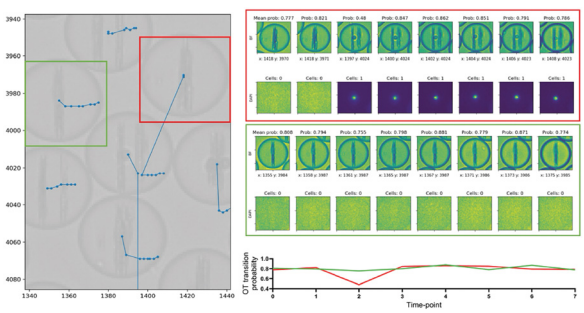
Xin-Yi Wu, Jian-Miao Zhang, Meng-Yao Niu, Fan-Chun Bin, Qi Duan, Jie Liu, Xian-Zi Dong and Mei-Ling Zheng*



6004

High-resolution time-lapse imaging of droplet-cell dynamics *via* optimal transport and contrastive learning

Luca Johannes Schlotheuber, Michael Vollenweider, Sven Gutjahr, Tiago Hungerland, Richard Danis, Weronika Ormaniec, Aline Linder, Valentina Boeva,* Ines Lüchtefeld* and Klaus Eyer*



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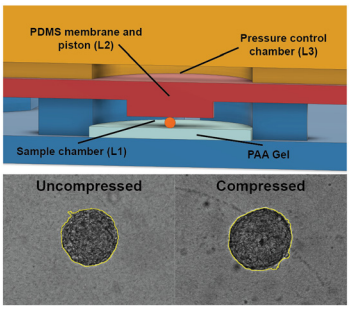
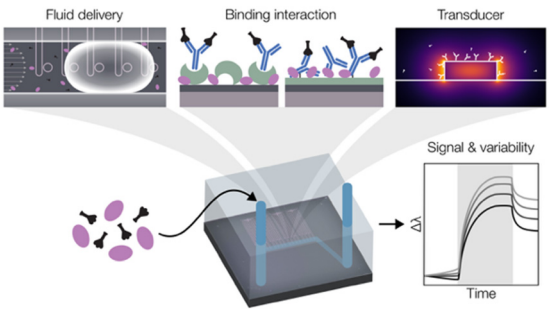


A microfluidic rheometer for tumor mechanics and invasion studies

Young Joon Suh, Manli Liu, Bangguo Zhu, Mrinal Pandey, Brian C. H. Cheung, Jaemin Kim, Nikolaos Bouklas, Chris Roh, Jeffrey E. Segall, Chung-Yuen Hui and Mingming Wu*

6033



Resonating with replicability: factors shaping assay yield and variability in microfluidics-integrated silicon photonic biosensors

Lauren S. Puumala,* Samantha M. Grist, Karyn Newton, So Jung Kim, Stephen Kioussis, Sajida Chowdhury, Maggie Wang, Myra Wei, Yas Oloumi Yazdi, Avineet Randhawa, Yuting Hou, Lukas Chrostowski, Sudip Shekhar and Karen C. Cheung

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