

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 24(2) 153-386 (2024)



Cover
See Masumi Yamada *et al.*,
pp. 171-181.
Image reproduced
by permission of
Masumi Yamada from
Lab Chip, 2024, 24, 171.



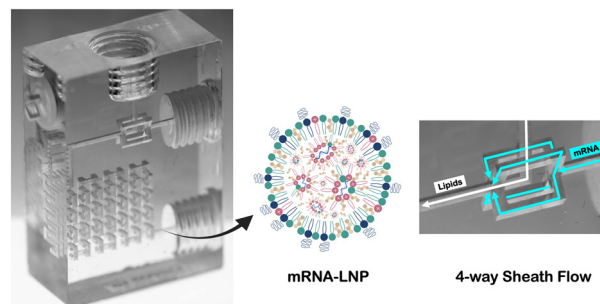
Inside cover
See Jimin Guo, Daniel Brassard,
Nadine Adam, Nathalie Corneau
and Teodor Veres *et al.*,
pp. 182-196.
Image reproduced by
permission of National Research
Council of Canada from
Lab Chip, 2024, 24, 182.
Image credit: Dr Daniel Brassard.

COMMUNICATION

162

3D-printed microfluidic device for high-throughput production of lipid nanoparticles incorporating SARS-CoV-2 spike protein mRNA

Wan-Zhen Sophie Lin, William Kristian Vu Bostic and Noah Malmstadt*

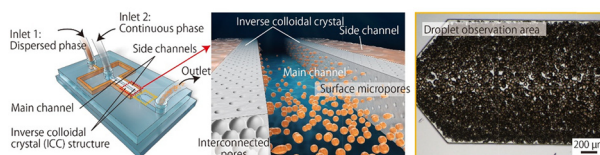


PAPERS

171

Pushing the limits of microfluidic droplet production efficiency: engineering microchannels with seamlessly implemented 3D inverse colloidal crystals

Shota Mashiyama, Runa Hemmi, Takeru Sato, Atsuya Kato, Tatsuo Taniguchi and Masumi Yamada*



Advance your career in science

with professional recognition that showcases your **experience, expertise and dedication**

Stand out from the crowd

Prove your commitment to attaining excellence in your field

Gain the recognition you deserve

Achieve a professional qualification that inspires confidence and trust

Unlock your career potential

Apply for our professional registers (RSci, RSciTech) or chartered status (CChem, CSci, CEnv)

Apply now

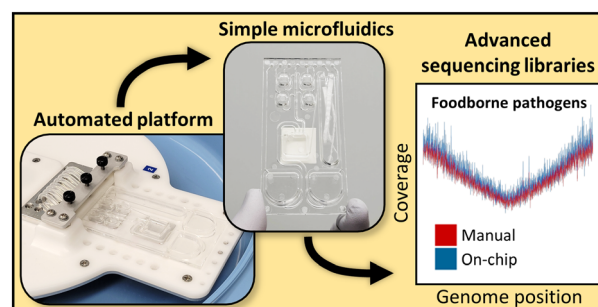
rsc.li/professional-development



182

Automated centrifugal microfluidic system for the preparation of adaptor-ligated sequencing libraries

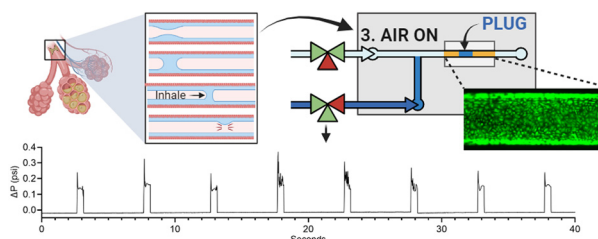
Jimin Guo, Daniel Brassard, Nadine Adam, Adrian J. Verster, Julie A. Shay, Caroline Miville-Godin, Mojra Janta-Polczynski, Jason Ferreira, Maxence Mounier, Ana V. Pilar, Kyle Tapp, Adam Classen, Matthew Shiu, Denis Charlebois, Nicholas Petronella, Kelly Weedmark, Nathalie Corneau* and Teodor Veres*



197

Liquid plug propagation in computer-controlled microfluidic airway-on-a-chip with semi-circular microchannels

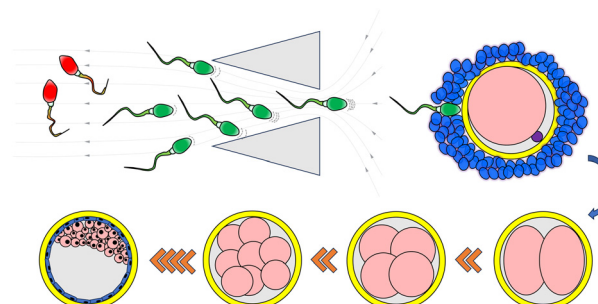
Hannah L. Viola, Vishwa Vasani, Kendra Washington, Ji-Hoon Lee, Cauviya Selva, Andrea Li, Carlos J. Llorente, Yoshinobu Murayama, James B. Grotberg, Francesco Romanò and Shuichi Takayama*



210

Faster sperm selected by rheotaxis leads to superior early embryonic development *in vitro*

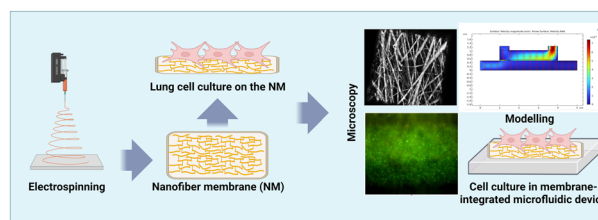
Mohammad Yaghoobi, Abdallah Abdelhady, Amirhossein Favakeh, Philip Xie, Stephanie Cheung, Amir Mokhtare, Yoke Lee Lee, Ann V. Nguyen, Gianpiero Palermo, Zev Rosenwaks, Soon Hon Cheong and Alireza Abbaspourrad*



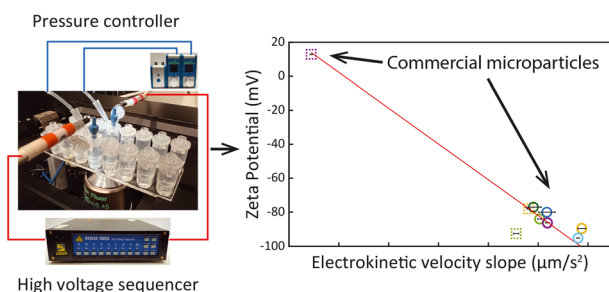
224

A hybrid fluorescent nanofiber membrane integrated with microfluidic chips towards lung-on-a-chip applications

Perizat Kanabekova, Bereke Dauletkanov, Zhibek Bekezhankyzy, Sultanali Toktarkan, Alma Martin, Tri T. Pham, Konstantinos Kostas and Gulsim Kulsharova*



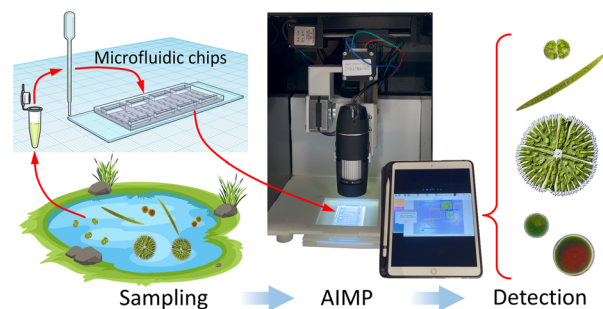
234



Zeta potential characterization using commercial microfluidic chips

Jonathan Cottet, Josephine O. Oshodi, Jesse Yebouet, Andrea Leang, Ariel L. Furst and Cullen R. Buie*

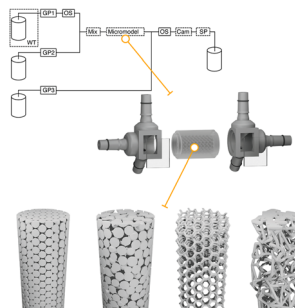
244



An automated and intelligent microfluidic platform for microalgae detection and monitoring

Jiahao Zheng, Tim Cole, Yuxin Zhang, Bayinqiaoge, Dan Yuan and Shi-Yang Tang*

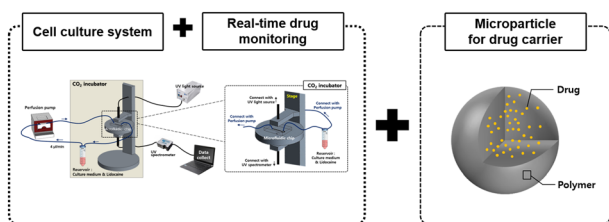
254



A versatile micromodel technology to explore biofilm development in porous media flows

Christos Papadopoulos, Anne Edith Larue, Clara Toulouze, Omar Mokhtari, Julien Lefort, Emmanuel Libert, Pauline Assémat, Pascal Swider, Laurent Malaquin and Yohan Davit*

272



Cell chip device for real-time monitoring of drug release from drug-laden microparticles

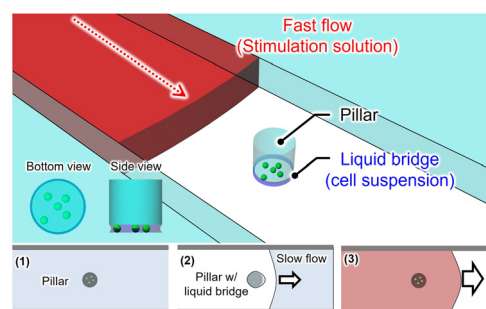
Hye Jin Choi, Min Chul Shin, Ji Hwan Han and Gyu Man Kim*



281

Instantaneous extracellular solution exchange for concurrent evaluation of membrane permeability of single cells

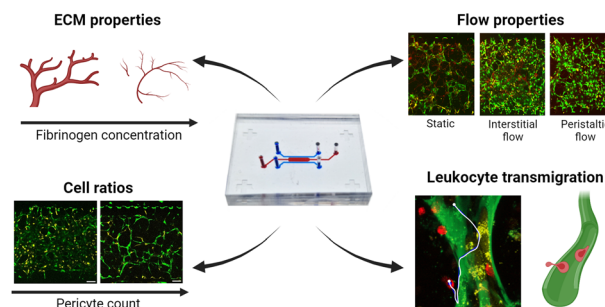
Shingo Kaneko,* Sugiura Hiroataka, Masaru Tsujii, Hisataka Maruyama, Nobuyuki Uozumi and Fumihito Arai



292

Self-assembled and perfusable microvasculature-on-chip for modeling leukocyte trafficking

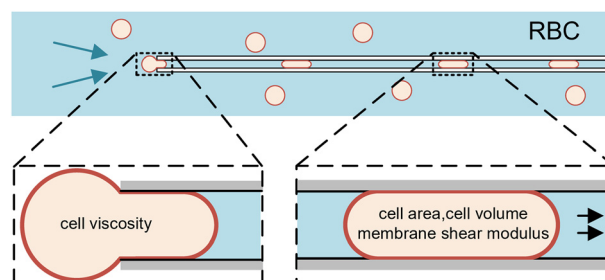
Elisabeth Hirth, Wuji Cao, Marina Peltonen, Edo Kapetanovic, Claudius Dietsche, Sara Svanberg, Maria Filippova, Sai Reddy and Petra S. Dittrich*



305

High-throughput single-cell assay for precise measurement of the intrinsic mechanical properties and shape characteristics of red blood cells

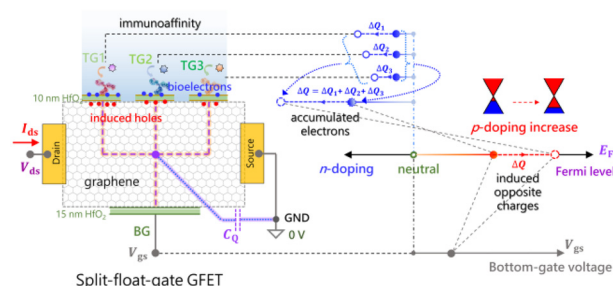
Qiaodong Wei, Ying Xiong, Yuhang Ma, Deyun Liu, Yunshu Lu, Shenghong Zhang, Xiaolong Wang, Huaxiong Huang, Yingbin Liu, Ming Dao* and Xiaobo Gong*



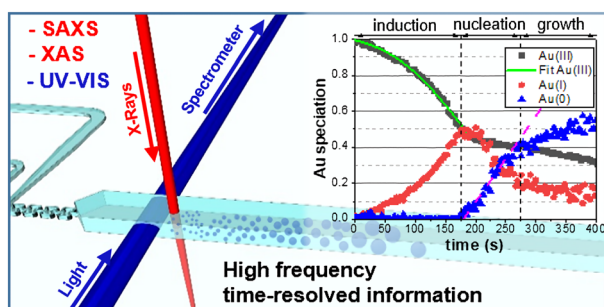
317

Multiplexed immunosensing of cancer biomarkers on a split-float-gate graphene transistor microfluidic biochip

Cheng Wang,* Tao Wang, Yujing Gao, Qiya Tao, Weixiang Ye,* Yuan Jia,* Xiaonan Zhao, Bo Zhang and Zhixing Zhang*



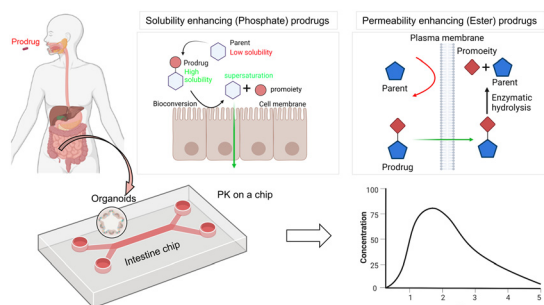
327



Sub-millisecond microfluidic mixers coupled to time-resolved *in situ* photonics to study ultra-fast reaction kinetics: the case of ultra-small gold nanoparticle synthesis

Raj Kumar Ramamoorthy, Ezgi Yildirim, Isaac Rodriguez-Ruiz,* Pierre Roblin, Lise-Marie Lacroix, Ana Diaz, Rohan Parmar, Sébastien Teychené and Guillaume Viau*

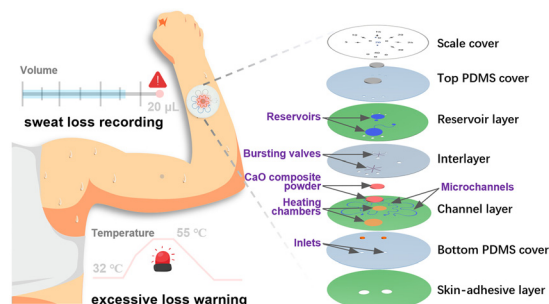
339



Developing an adult stem cell derived microphysiological intestinal system for predicting oral prodrug bioconversion and permeability in humans

Abhinav Sharma, Liang Jin, Xue Wang, Yue-Ting Wang and David M. Stresser*

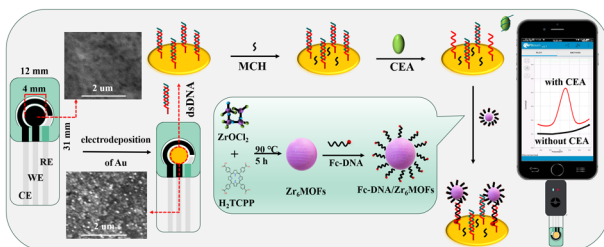
356



Skin-interfaced microfluidic sweat collection devices for personalized hydration management through thermal feedback

Hanlin Yang, Hongyan Ding, Wenkui Wei, Xiaofeng Li, Xiaojun Duan, Changgen Zhuang, Weiyi Liu, Shangda Chen and Xiufeng Wang*

367



A smartphone-based electrochemical POCT for CEA based on signal amplification of Zr₆MOFs

Shan-Shan Shi, Xiao-Jian Li, Rong-Na Ma, Lei Shang, Wei Zhang, Huai-Qing Zhao,* Li-Ping Jia* and Huai-Sheng Wang*

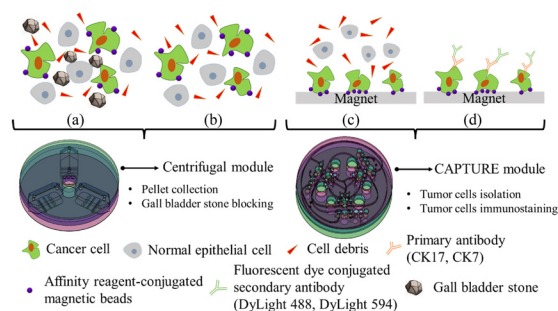


PAPERS

375

An integrated microfluidic system for automatic detection of cholangiocarcinoma cells from bile

Jui-Lin Chang, Chien-Jui Huang, Yi-Cheng Tsai, Nai-Jung Chiang, Yu-Shan Huang, Shang-Cheng Hung,* Yan-Shen Shan* and Gwo-Bin Lee*



CORRECTION

383

Correction: Sub-nL thin-film differential scanning calorimetry chip for rapid thermal analysis of liquid samples

Sheng Ni, Hanliang Zhu, Pavel Neuzil and Levent Yobas*

