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Lab on a Chip

Devices and applications at the micro- and nanoscale

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See Mais J. Jebrail *et al.*, pp. 6126–6137.
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Inside cover
See Lourdes Basabe-Desmonts, Fernando Benito-Lopez *et al.*, pp. 6075–6099.
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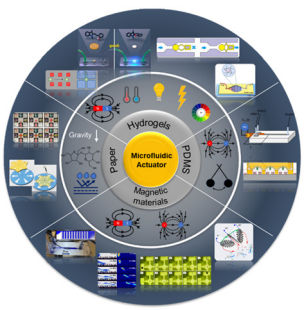
CRITICAL REVIEWS

6075

Present and future of smart functional materials as actuators in microfluidic devices

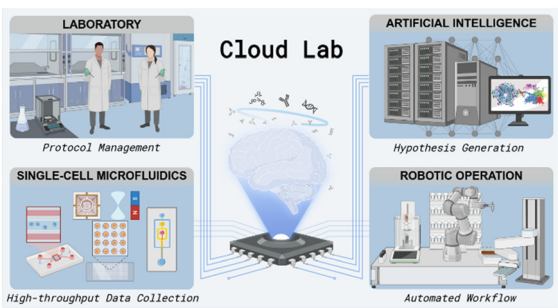
Sepideh Izaddoust, Isabel Poves-Ruiz, Enrique Azuaje Hualde, Daniel Patko, Larisa Florea, Colm Delaney, Lourdes Basabe-Desmonts* and Fernando Benito-Lopez*



6100

Transforming microfluidics for single-cell analysis with robotics and artificial intelligence

Jinxiong Cheng, Rajiv Anne and Yu-Chih Chen*



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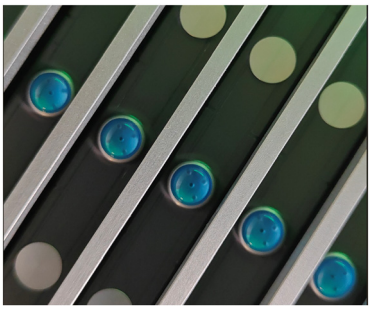
6126

Mechanical actuation on surface (MAOS) microfluidics: compression for preparation in next-generation sequencing

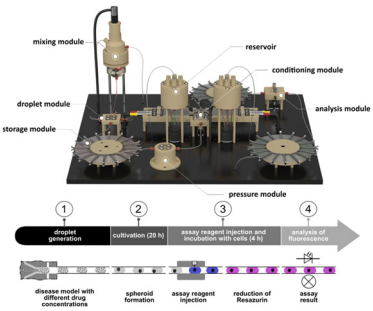
Parimala Nagaraja, Rohit Lal, Cheng-Chang Lee, Eduardo Cervantes, Foteini Christodoulou and Mais J. Jebrail*



6138

Droplet-based cell viability assay for analysis of spheroid formation, proliferation and high-resolution IC_{50} profiling

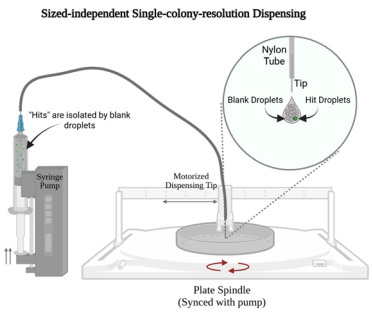
Mario Saupe,* Stefan Wiedemeier, Franziska Moll, J. Michael Köhler, Doris Heinrich and Karen Lemke



6157

Size-independent and automated single-colony-resolution microdroplet dispensing

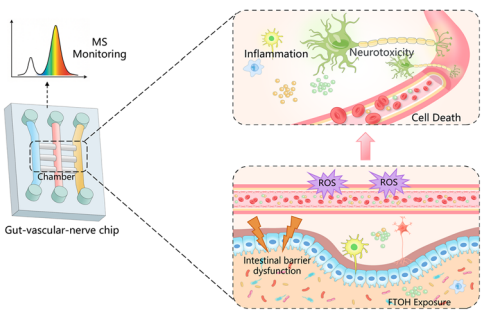
Haemin Jung, Han Zhang, Jacob Hooper, Can Huang, Rohit Gupte, Adrian Guzman, Jeong Jae Han and Arum Han*



6170

Integrated microfluidic three-organ chip for real-time toxicity analysis of fluorotelomer alcohols in the gut–vascular–nerve axis

Xiaodan Ding, Ning Xu,* Wei Zhang and Peilong Wang*



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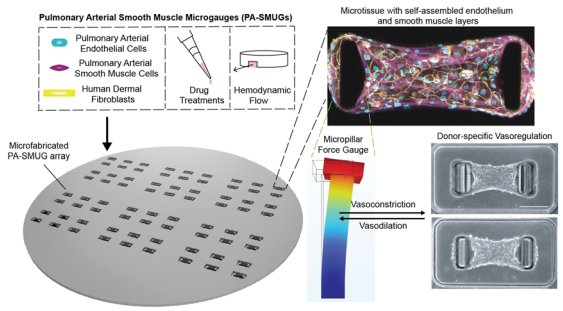
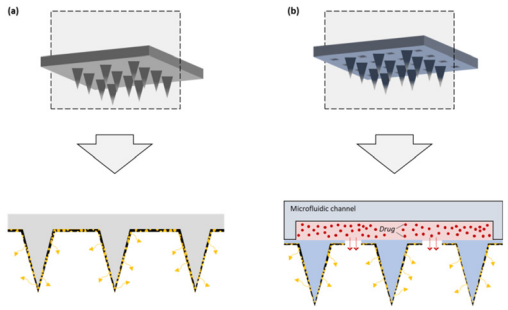


Endothelial-smooth muscle microgauges for modeling pulmonary arterial vasoregulation

Aanya Sawhney, Raymond Piatt, Mitesh Rathod, Ryan N. Stack, Chloe P. Whitworth and William J. Polacheck*

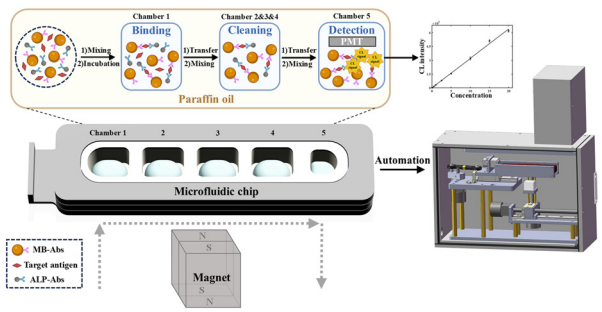
6191



Microneedle patch integrated with a pumpless microfluidic chip for heterologous drug delivery

Ji Won Park, Hye Jin Choi, Min Chul Shin, Bo Hyun Kim and Gyu Man Kim*

6202



A compact automated magnetic digital microfluidic chemiluminescence immunoassay system for rapid and sensitive detection of protein biomarkers

Chuan Lyu, Dian Yang, Xu Xu, Yu Cai, Bo Liang, Congcong Zhou, Xuesong Ye* and Jing Wang*

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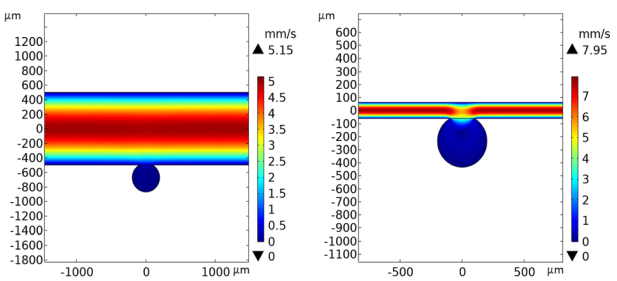

Design, fabrication, and characterization of a microbubble array microphysiological system

Lukas B. Jenkins, Hasibul Hasan Hredoy, Hossein Abolhassani, Chiao Yun Chen, Michelle Duan and Lisa A. DeLouise*

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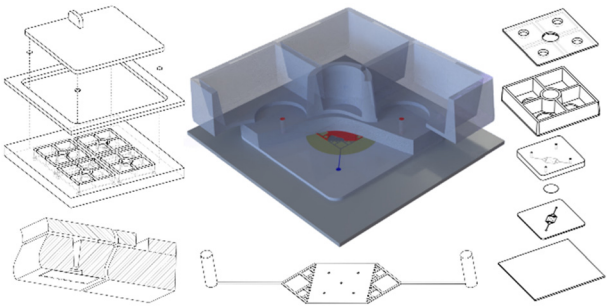
Gravity-perfused airway-on-a-chip optimized for quantitative BSL-3 studies of SARS-CoV-2 infection: barrier permeability, cytokine production, immunohistochemistry, and viral load assays

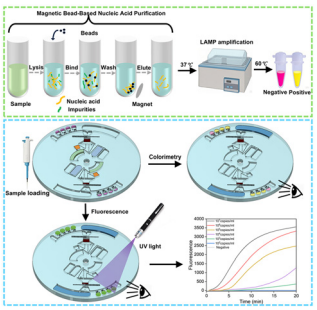
Shannon L. Faley, Niloufar A. Boghdeh, David K. Schaffer, Eric C. Spivey, Farhang Alem, Aarthi Narayanan, John P. Wikswo* and Jacquelyn A. Brown



6248

A multi-valve centrifugal microfluidic for *Mycoplasma pneumoniae* detection

Guangyao Chen, Yu Lu, Hao Shen,* Jing Zhang, Yizhu Liu, Liwei Xue and Liguo Chen*



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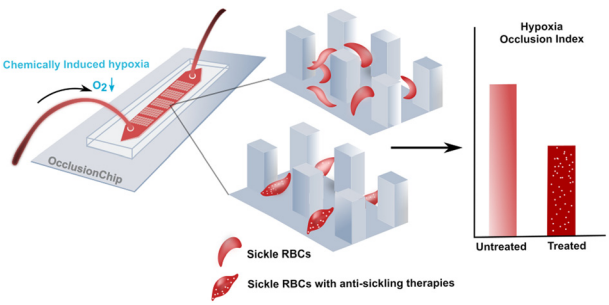
Evaluating anti-sickling therapies for sickle cell disease: a microfluidic assay for red blood cell-mediated microvascular occlusion under hypoxia

Zoe Sekyonda, Yuxuan Du, Solomon Oshabaheebwa, Payam Fadaei, Yusang B. Ley, Calvin Abonga, Michael A. Suster, Pedram Mohseni and Umut A. Gurkan*



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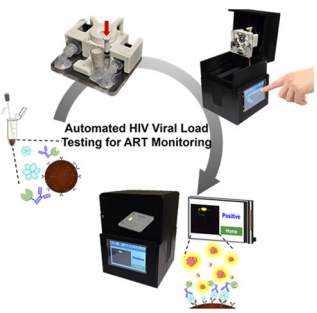
A luminescence-based point-of-care HIV viral load test for antiretroviral therapy monitoring

Sungwan Kim, Hak-Rae Hong, Jong-Min Oh, Juhyeon Chun, Adharsh Chellappaa, Jungmin Yoo, Syed Maaz Husain, Jaebaek Lee, Jisan Kim, Prudhvi Thirumalaraju, Younseong Song, Manoj K. Kanakasabapathy, Juyong Gwak, Joseph M. Hardie, Daniel R. Kuritzkes, Jonathan Z. Li, Athe M. Tsibris and Hadi Shafiee*



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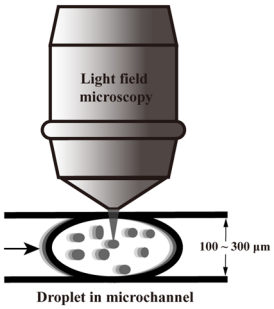

Manipulation and 3D characterization of particles and cells through integrated light field microscopy and droplet microfluidics system

Xinglong Huang, Jiayan Zhuang, Rifei Chen, Yingzhen Piao, Boris Stoeber* and Xing Cheng*

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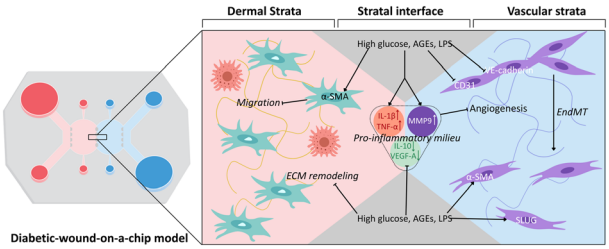
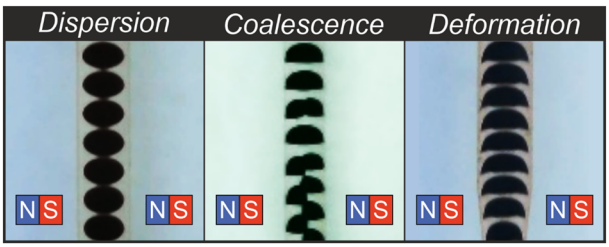


Microengineered diabetic wound-on-a-chip model for emulating chronic wound dynamics

Shivam Sharma and Anil Kishen*

6306



Active droplet generation in flow-focusing microfluidics under influence of transverse magnetic field

Boris Kichatov,* Vladimir Sudakov, Dariya Kalyuzhnaya, Alexey Korshunov and Petr Ryapolov*

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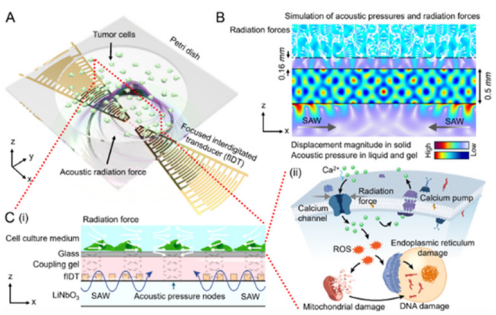

Enhancing cancer therapy *via* acoustics: chemotherapy-enhanced tunable acoustofluidic permeabilization (ChemoTAP)

Ruoyu Zhong, Ke Li, Kaichun Yang, Qian Wu, John D. H. Mai, Joseph Rich, Ying Chen,* Xianchen Xu, Jianping Xia, Neil Upreti, Ke Jin, Shujie Yang, Mingyuan Liu and Tony Jun Huang*

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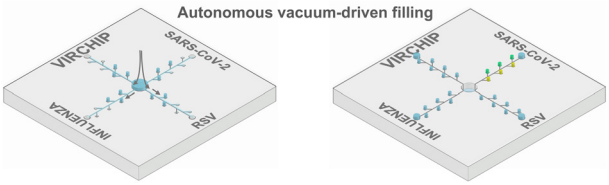
Multiplexed detection of respiratory viral pathogens by isothermal amplification on an autonomously loaded chip at the point-of-care

Beatrise Berzina, Krishna Gupta, Rayan Suliman, Peter Mirtschink, Alexander Dalpke, Carsten Werner, Elisha Krieg* and Lars David Renner*



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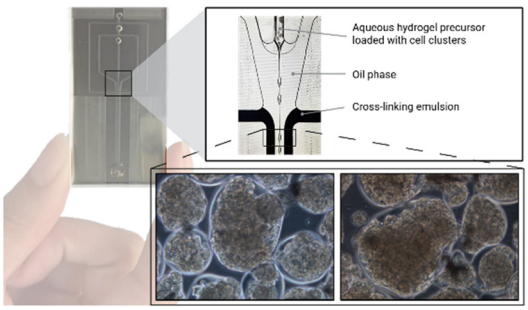
Microfluidic device for islet conformal coating with a polyethylene glycol-based hydrogel: innovating cell immunoprotection strategies in type 1 diabetes

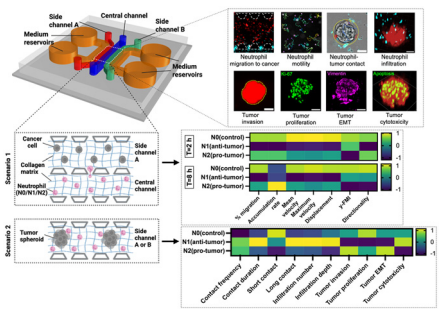
Francesca Vicinanza, Tatiana Mencarini, Francesca Verderio, Grisell C. Gonzalez, Helena Montuoro, Silvia Bozzi, Ashutosh Agarwal, Marco Rasponi, Alberto Redaelli* and Alice A. Tomei*



6349

Behaviorome profiling of anti-tumor and pro-tumor human neutrophil subtypes in a microphysiological system

Shuai Shao, Daniel Duncko and Caroline N. Jones*



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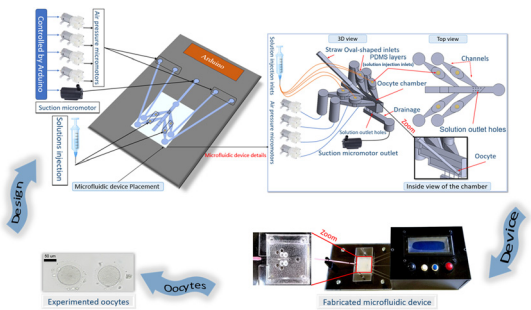
Development of a lab-on-a-chip device for optimising CPA delivery in human oocyte vitrification

Ali Hassanpour Lima,* Hadi Veladi* and Masoud Maleki



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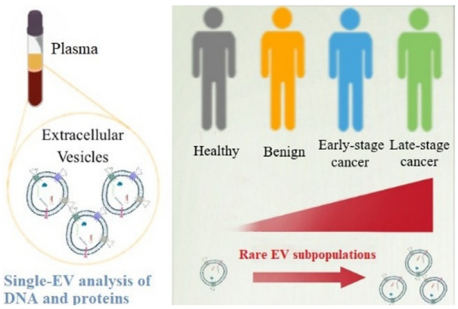
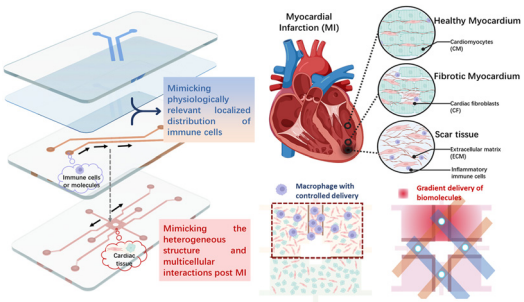


Sequencing-free, joint single-EV profiling of DNA and protein cargos enables accurate cancer detection at early stages

Yufeng Jiao, Luxuan Yao, Wenqing Zeng, Kaiyan Hao, Taotao Dong, Yawen Zheng,* Si-Yang Zheng* and Wu Liu*

6401



Immune-integrated cardiac fibrosis-on-a-chip: a 3D microfluidic device for region–specific immune–cardiac crosstalk in the fibrotic heart

Jiaying Ji, Mateo Tristan, Frank Ketchum, Wenzheng Kuang, Guosheng Fu, Xiang Ren and Pinar Zorlutuna*

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