

# 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 Lorena Diéguez, Alar Ainla *et al.*, pp. 4028–4038.  
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### Inside cover

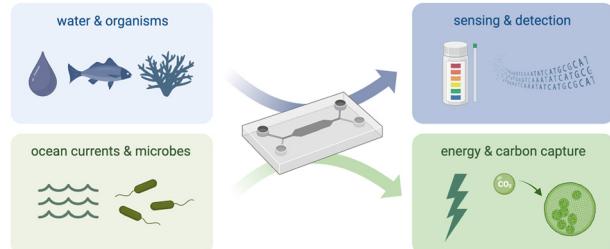
See Jianhan Lin *et al.*, pp. 4039–4049.  
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## CRITICAL REVIEW

4007

### Microfluidics for macrofluidics: addressing marine-ecosystem challenges in an era of climate change

Fangchen Liu, Cyril Deroy and Amy E. Herr\*

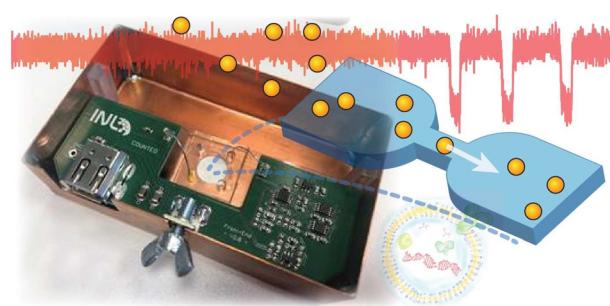


## PAPERS

4028

### Nanofluidic resistive pulse sensing for characterization of extracellular vesicles

Madalena R. C. Calado, Teresa C. Lage, Daniel A. M. André, Carlos Calaza, Carlos Marques, Carolina Herrero, João Piteira, Lars Montelius, Dmitri Y. Petrovykh, Lorena Diéguez\* and Alar Ainla\*



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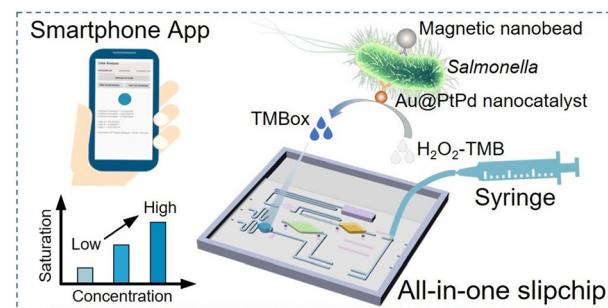


## PAPERS

4039

**An all-in-one microfluidic SlipChip for power-free and rapid biosensing of pathogenic bacteria**

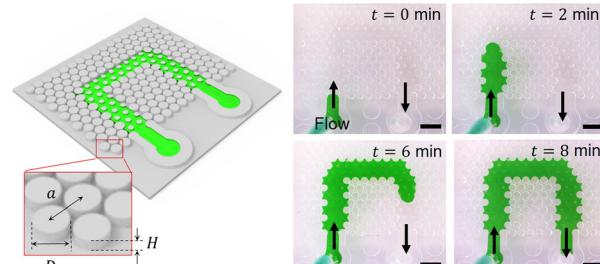
Li Xue, Ming Liao and Jianhan Lin\*



4050

**PoroFluidics: deterministic fluid control in porous microfluidics**

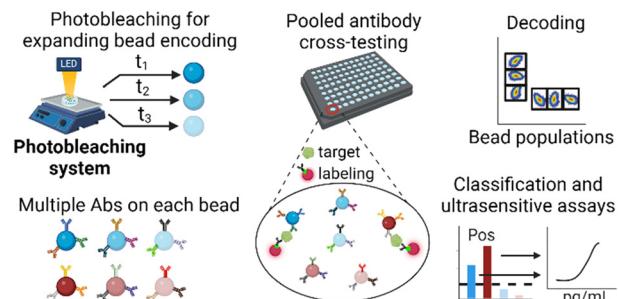
Zhongzheng Wang, Louis Jun Ye Ong, Yixiang Gan, Jean-Michel Pereira, Jun Zhang, Surasak Kasetsirikul, Yi-Chin Toh\* and Emilie Sauret\*



4060

**Efficient discovery of antibody binding pairs using a photobleaching strategy for bead encoding**

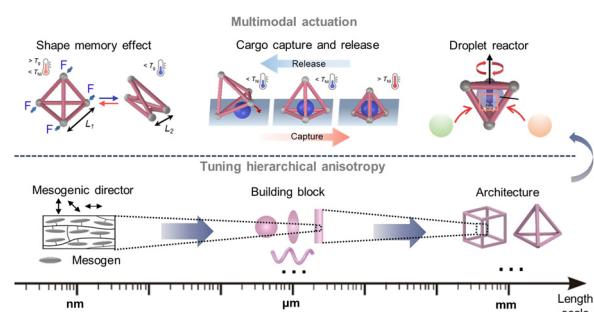
Shira Roth, Tom Ferrante and David R. Walt\*



4073

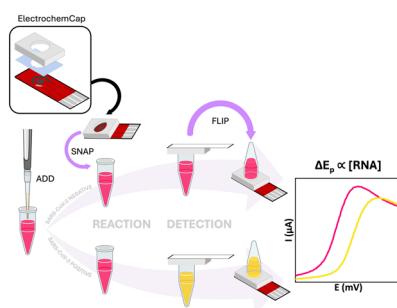
**Programming hierarchical anisotropy in microactuators for multimodal actuation**

Shiyu Wang, Shucong Li, Wenchang Zhao, Ying Zhou, Liqiu Wang,\* Joanna Aizenberg\* and Pingan Zhu\*



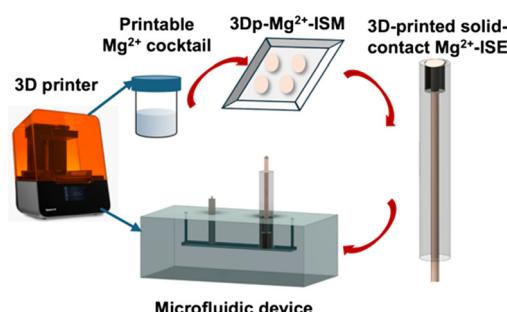
## PAPERS

4085


**ElectroChemCap: an integrated detection for loop-mediated isothermal amplification reactions**

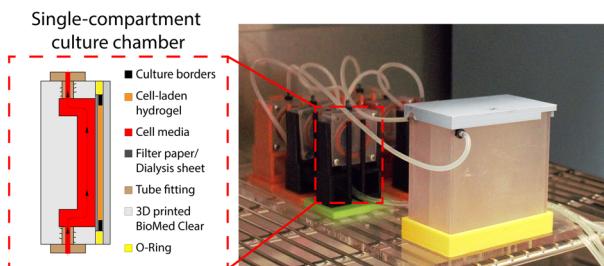
 P. Rioboó-Legaspi, E. Costa-Rama\*  
 and M. T. Fernández-Abedul\*

4096


**Integration of 3D printed  $Mg^{2+}$  potentiometric sensors into microfluidic devices for bioanalysis**

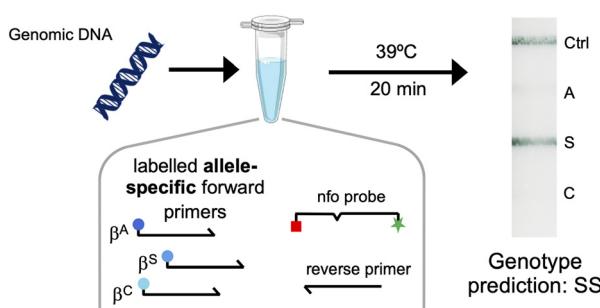
Sarah Farahani, Dalton L. Glasco, Manar M. Elhassan, Pedaballi Sireesha and Jeffrey G. Bell\*

4105


**Continuous flow delivery system for the perfusion of scaffold-based 3D cultures**

Zachary R. Sitte, Elizabeth E. Karlsson, Haolin Li, Haibo Zhou and Matthew R. Lockett\*

4115


**A multiplexed, allele-specific recombinase polymerase amplification assay with lateral flow readout for sickle cell disease detection**

Megan M. Chang, Mary E. Natoli, Alexis F. Wilkinson, Venée N. Tubman, Gladstone E. Airewele and Rebecca R. Richards-Kortum\*

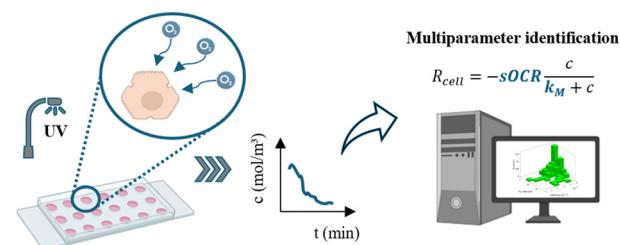


## PAPERS

4128

**Size-related variability of oxygen consumption rates in individual human hepatic cells**

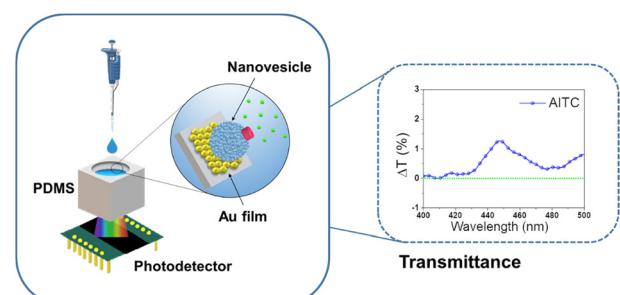
Ermes Botte, Yuan Cui, Chiara Magliaro, Maria Tenje, Klaus Koren, Andrea Rinaldo, Roman Stocker, Lars Behrendt\* and Arti Ahluwalia\*



4138

**Label-free optical detection of calcium ion influx in cell-derived nanovesicles using a conical Au/PDMS biosensor**

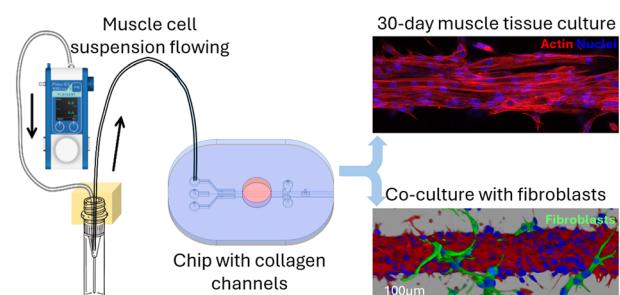
Jisung Kwak, Woochul Kim, Hyerim Cho, Jiyun Han, Sang Jun Sim, Hyun Gyu Song,\* Yusin Pak\* and Hyun Seok Song\*



4147

**Studying the impact of geometrical and cellular cues on myogenesis with a skeletal muscle-on-chip**

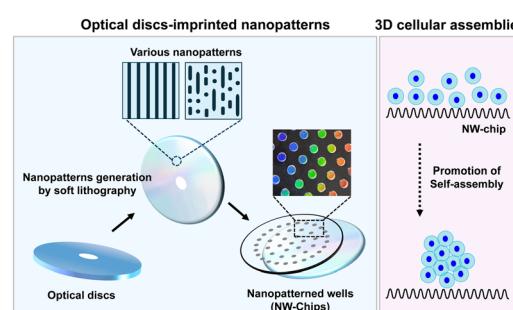
M.-L. Nguyen, N. Demri, B. Lapin, F. Di Federico, G. Gropplero, F. Cayrac, K. Hennig, Edgar R. Gomes, C. Wilhelm, W. Roman and S. Descroix\*



4161

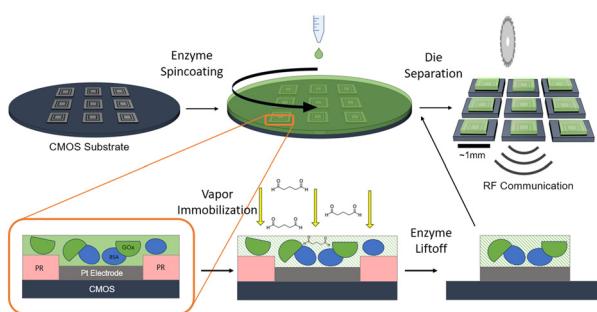
**3D cellular self-assembly on optical disc-imprinted nanopatterns**

Jeeyeon Lee\* and Chwee Teck Lim\*



## PAPERS

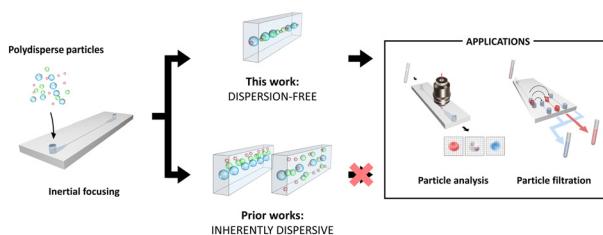
4172



**Patterned thin film enzyme electrodes *via* spincoating and glutaraldehyde vapor crosslinking: towards scalable fabrication of integrated sensor-on-CMOS devices**

Dvin Adalian,\* Xiomí Madero, Samson Chen, Musab Jilani, Richard D. Smith, Songtai Li, Christin Ahlbrecht, Juan Cardenas, Abhinav Agarwal, Azita Emami, Oliver Plettenburg, Peter A. Petillo and Axel Scherer

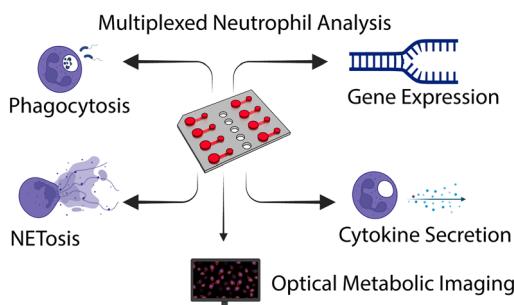
4182



**Dispersion-free inertial focusing (DIF) for high-yield polydisperse micro-particle filtration and analysis**

Kelvin C. M. Lee,\* Bob M. F. Chung, Dickson M. D. Siu, Sam C. K. Ho, Daniel K. H. Ng and Kevin K. Tsia\*

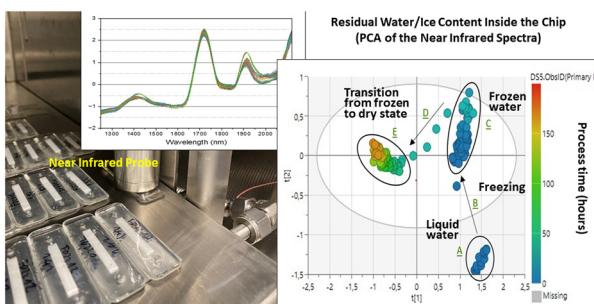
4198



**Micro blood analysis technology ( $\mu$ BAT): multiplexed analysis of neutrophil phenotype and function from microliter whole blood samples**

Terry D. Juang, Jeremiah Riendeau, Peter G. Geiger, Rupsa Datta, Marcos Lares, Ravi Chandra Yada, Anne Marie Singh, Christine M. Seroogy, James E. Gern, Melissa C. Skala, David J. Beebe\* and Sheena C. Kerr\*

4211



**Extending the shelf life of HLM chips through freeze-drying of human liver microsomes immobilized onto thiol-ene micropillar arrays**

Iiro Rautsola, Markus Haapala, Leo Huttunen, Ossi Korhonen and Tiina Sikanen\*

