Lab on a Chip

Micro- & nano- fluidic research for chemistry, physics, biology, & bioengineering

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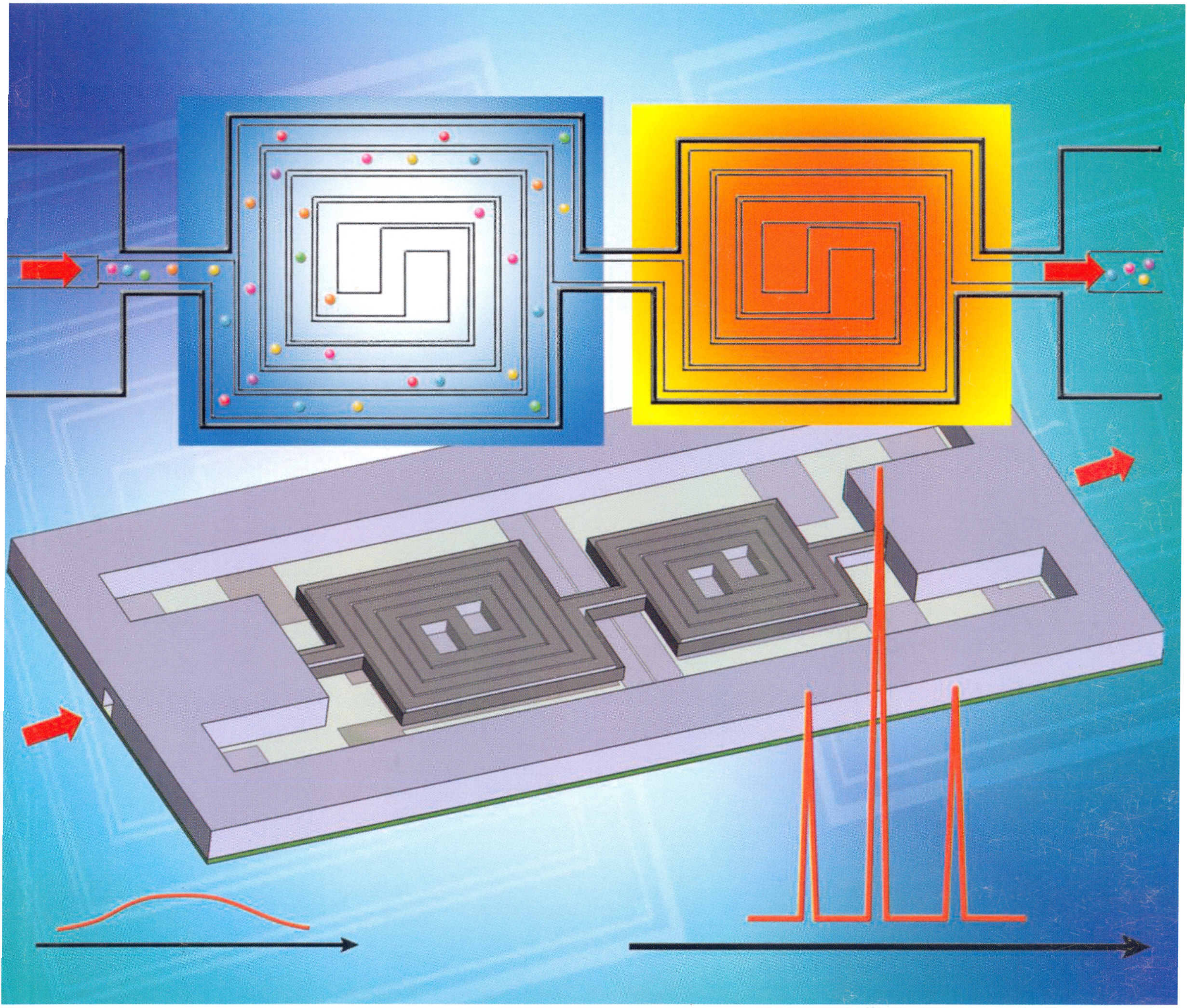
Volume 10 | Number 13 | 7 July 2010 | Pages 1633–1740



ISSN 1473-0197

RSC Publishing

Kurabayashi
2D micro gas chromatography

Ho
Continuous sorting of embryoid bodies

Celebrating 10 Years of publishing

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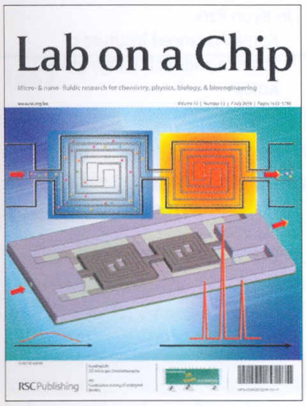
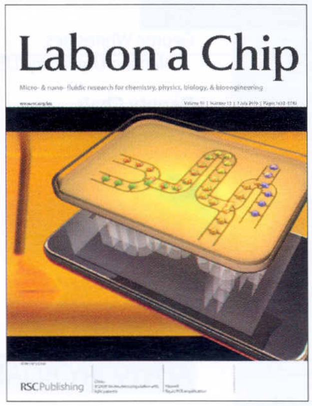
IN THIS ISSUE

ISSN 1473-0197 CODEN LCAHAM 10(13) 1633–1740 (2010)



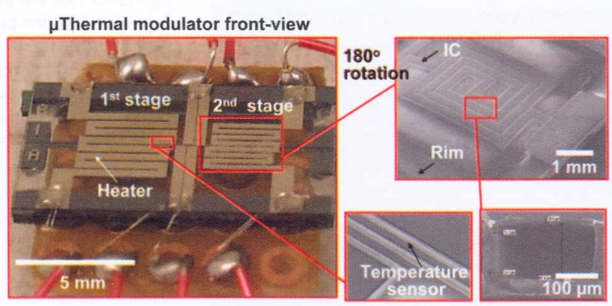
Cover
See Kurabayashi *et al.*, pp. 1647–1654
Enhancement of the analytical sensitivity and chromatographic resolution of n-alkane gas compound mixtures using a two-stage on-chip thermal modulator for comprehensive two-dimensional micro gas chromatography.
Image reproduced by permission of Sung-Jin Kim, Shaelah M. Reidy, Bruce P. Block, Kensall D. Wise, Edward T. Zellers and Katsuo Kurabayashi from *Lab Chip*, 2010, **10**, 1647.

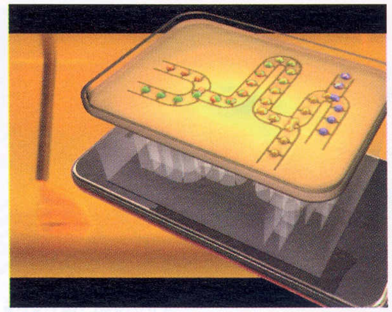


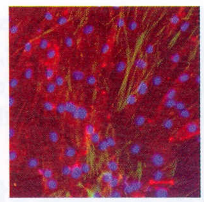
Inside cover
See Chiou *et al.*, pp. 1655–1661.
Lab on a mobile display: an extremely low light intensity is sufficient to actuate droplets on single-sided continuous optoelectrowetting (SCOEW) devices.
Image reproduced by permission of Sung-Yong Park, Michael A. Teitell and Eric P. Y. Chiou from *Lab Chip*, 2010, **10**, 1655.

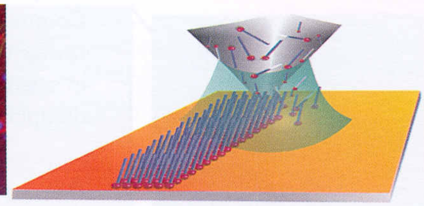
HIGHLIGHT

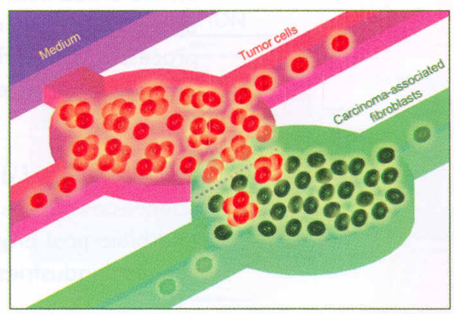
PAPERS

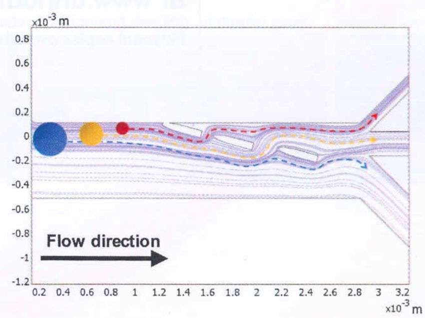









Medium
Tumor cells
Carcinoma-associated fibroblasts

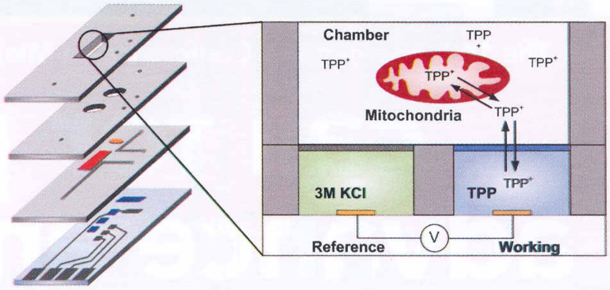

Flow direction
x10^-3 m
x10^-3 m

1683

Assessment of mitochondrial membrane potential using an on-chip microelectrode in a microfluidic device

Tae-Sun Lim,* Antonio Dávila, Douglas C. Wallace and Peter Burke

An on-chip microelectrode sensor fabricated with ion-selective membranes allows non-invasive, electrochemical, *in situ* monitor of the mitochondrial membrane potential in a controlled microfluidic environment.

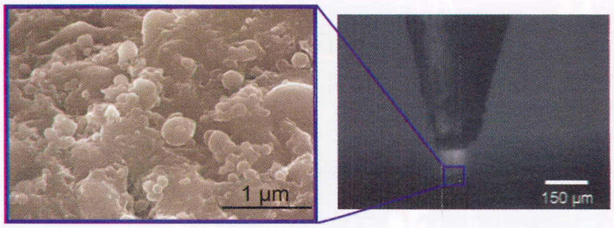


1689

Fabrication of nanocluster silicon surface with electric discharge and the application in desorption/ionization on silicon-mass spectrometry

Niina M. Suni, Markus Haapala, Elina Färm, Emma Härkönen, Mikko Ritala, Lauri Sainiemi, Sami Franssila, Tapio Kotiaho* and Risto Kostiainen*

Atmospheric pressure microdischarge to create nanocluster silicon surface.

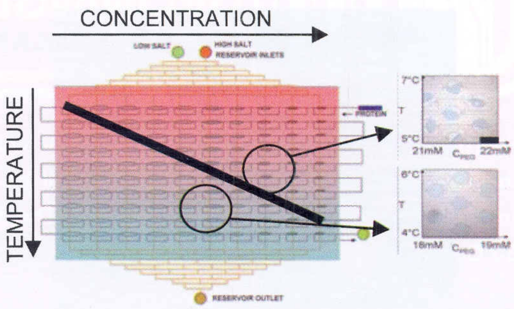


1696

Mapping and manipulating temperature–concentration phase diagrams using microfluidics

Šeila Selimović, Frédéric Gobeaux and Seth Fraden*

The PhaseChip can measure phase diagrams of aqueous solutions as a function of concentration (C) and temperature (T). The chip stores 800 drops of 20 nl volume at 400 different values of C, T.

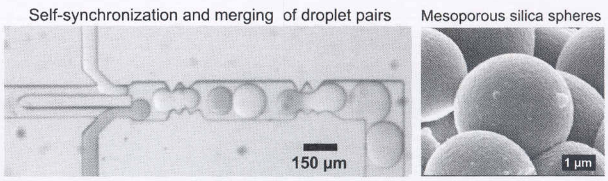


1700

Optimized droplet-based microfluidics scheme for sol–gel reactions

Venkatachalam Chokkalingam, Boris Weidenhof, Michael Krämer, Wilhelm F. Maier, Stephan Herminghaus and Ralf Seemann*

Silica particles with superior surface area are produced by an optimized sol–gel synthesis route where the chemicals are dispensed into droplet pairs, merged, mixed and pre-processed in the microfluidic device.



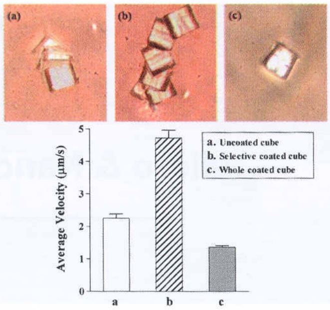
PAPERS

1706

Motility enhancement of bacteria actuated microstructures using selective bacteria adhesion

Sung Jun Park, Hyeoni Bae, Joonhwuy Kim, Byungjik Lim, Jongoh Park* and Sukho Park*

The bacteria patterned to a specific site using 5% BSA significantly increase the motility of the bacteria actuated microstructure.

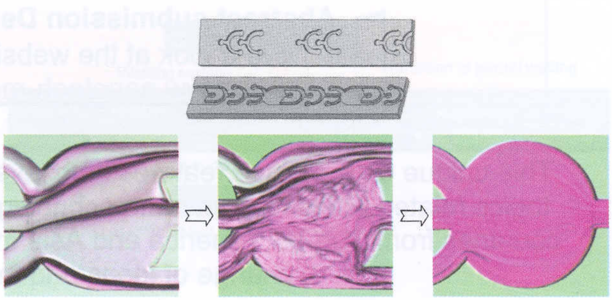


1712

A microfluidic mixer with self-excited 'turbulent' fluid motion for wide viscosity ratio applications

H. M. Xia, Z. P. Wang,* Y. X. Koh and K. T. May

While the flow in a microfluidic device is typically laminar, which greatly impedes the mixing rate, the current micromixer design produces viscous flow instabilities to achieve global 'turbulent' mixing for liquids with large viscosity contrasts.

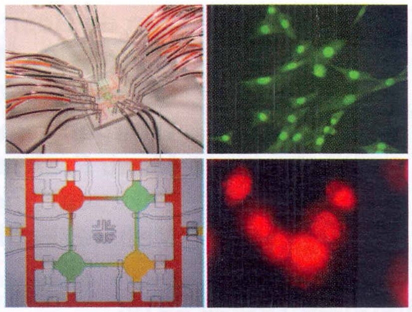


1717

An integrated microfluidic system for studying cell-microenvironmental interactions versatilely and dynamically

Wenming Liu, Li Li, Xuming Wang, Li Ren, Xueqin Wang, Jianchun Wang, Qin Tu, Xiaowen Huang and Jinyi Wang*

We present an integrated microfluidic system for the study of cell-microenvironmental interactions, which can provide precise and efficient micromechanical manipulation for positioning operation and microenvironmental transition.



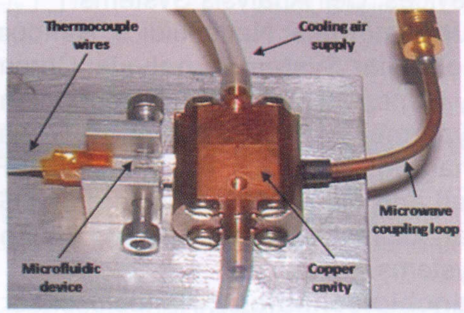
TECHNICAL NOTES

1725

Rapid PCR amplification using a microfluidic device with integrated microwave heating and air impingement cooling

Kirsty J. Shaw, Peter T. Docker, John V. Yelland, Charlotte E. Dyer, John Greenman, Gillian M. Greenway and Stephen J. Haswell*

An 8 GHz microwave based heating system with air impingement cooling offering rapid PCR thermal cycling with heating and cooling rates of up to 65 °C s^{-1} and minimal over-shooting or under-shooting (±0.1 °C).



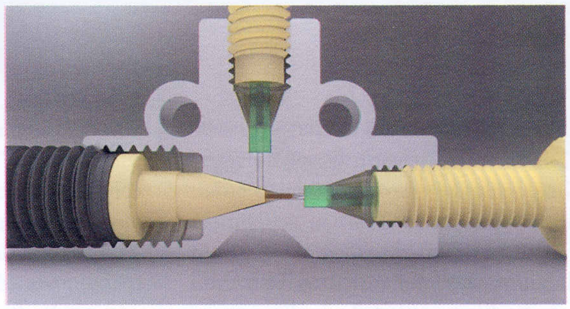
TECHNICAL NOTES

1729

"Off-the-shelf" 3-D microfluidic nozzle

Alex Terray and Sean J. Hart*

We present the construction and operation of a microfluidic nozzle created using several standard fluidic parts available commercially.

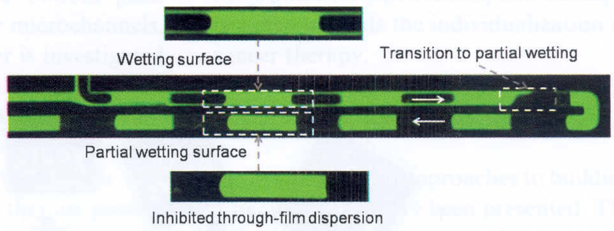


1732

Partial wetting gas–liquid segmented flow microreactor

S. Ali Kazemi Oskooei and David Sinton*

A partial wetting microfluidic reactor strategy is demonstrated that effectively eliminates dispersion between liquid plugs.



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