

The 12<sup>th</sup> International Conference on  
Miniaturized Systems for Chemistry and Life Sciences

# $\mu$ TAS 2008 San Diego

San Diego Sheraton Hotel & Marina San Diego, California, USA

**October 12-16, 2008**

# $\mu$ TAS 2008 Advance Program

Sponsored by  
The Chemical and Biological Microsystems Society

<b>Sunday</b>	16:00 - 19:00	Conference Registration and Check-In		
	17:00 - 19:00	Wine & Cheese Welcome Reception		
<b>Monday</b>	08:00 - 08:20	Opening Remarks		
	08:20 - 09:00	<b>PLENARY I</b> - Jeremy Nicholson, Imperial College, UK		
	09:15 - 10:15	<b>Session 1A1</b> Single Cell Analysis	<b>Session 1B1</b> Sample Preparation & Separation	
	10:15 - 10:45	Break & Exhibit Inspection		
	10:45 - 11:45	<b>Session 1A2</b> Cell Interactions	<b>Session 1B2</b> Single Molecular Manipulation & Measurement	
	11:45 - 13:00	Lunch & Exhibit Inspection		
	13:00 - 13:40	<b>PLENARY II</b> - Harold Craighead, Cornell University, USA		
	13:40 - 14:00	Innovation In Science Award		
	14:00 - 16:20	Poster Session 1		
	16:20 - 17:20	<b>Session 1A3</b> Tools for Nucleic Acid Research & Discovery	<b>Session 1B3</b> Mapping & Imaging	
	<b>Tuesday</b>	08:00 - 08:40	<b>PLENARY III</b> - Teruo Fujii, University of Tokyo, JAPAN	
08:55 - 09:55		<b>Session 2A1</b> Fluidic Design & Assembly	<b>Session 2B1</b> Channels, Tubes and Pores on the Nanoscale	
09:55 - 10:25		Break & Exhibit Inspection		
10:25 - 11:25		<b>Session 2A2</b> Clinical Diagnostic 1	<b>Session 2B2</b> On Chip Synthesis and Production	
11:25 - 12:40		Lunch & Exhibit Inspection		
12:40 - 13:20		<b>PLENARY IV</b> - Andrew Griffiths, Institut de Science et d'Ingenierie Supermoleculaires, FRANCE		
13:20 - 15:40		Poster Session 2		
15:40 - 16:40		<b>Session 2A3</b> Extreme Multiplexed Analysis	<b>Session 2B3</b> Analyzing Blood Components	
18:00 - 22:00		Conference Banquet at the San Diego Zoo		
<b>Wednesday</b>		08:00 - 08:20	Announcement of MicroTAS 2009	
		08:20 - 09:00	<b>PLENARY V</b> - Tomokazu Matsue, Tohoku University, JAPAN	
	09:15 - 10:15	<b>Session 3A1</b> Cell Sorting	<b>Session 3B1</b> Innovative Chemistries for Microfluidics	
	10:15 - 10:45	Break & Exhibit Inspection		
	10:45 - 11:45	<b>Session 3A2</b> Sample Preparation	<b>Session 3B2</b> Tools for Controlled Cell Culture I	
	11:45 - 13:00	Lunch & Exhibit Inspection		
	13:00 - 13:40	<b>PLENARY VI</b> - Julio M. Ottino, Northwestern University, USA		
	13:40 - 14:00	Art In Science Award		
	14:00 - 16:20	Poster Session 3		
	16:20 - 17:20	<b>Session 3A3</b> Protein Expression & Characterization	<b>Session 3B3</b> Clinical & Biomolecular Analysis	
	<b>Thursday</b>	08:00 - 08:40	Poster Awards Ceremony	
09:00 - 10:00		<b>Session 4A1</b> Microfluidic Integrated Optics	<b>Session 4B1</b> In Vivo & Cellular Screening	
10:00 - 10:30		Break & Exhibit Inspection		
10:30 - 11:30		<b>Session 4A2</b> Tools for Controlled Cell Culture II	<b>Session 4B2</b> Innovative Microfluidic Applications	
11:30		Conference Adjourns		

# Technical Program

## Monday, October 13, 2008

08:00 – 08:20	Opening Remarks
08:20 - 09:00	<b>Plenary I</b> STATISTICAL SPECTROSCOPY AND METABOLOME-WIDE ASSOCIATION APPROACHES IN PERSONAL AND PUBLIC HEALTH INVESTIGATIONS J. Nicholson <i>Imperial College London, UK</i>

Grand Ballroom A-B	Grand Ballroom C
<b>Session 1A1</b> Single Cell Analysis	<b>Session 1B1</b> Sample Preparation & Separation
<b>09:15 - 09:35</b>	
<b>USING MICROFLUIDICS TO CONTROL THE EXTRACELLULAR ENVIRONMENT AND TO MEASURE RELEASE FROM SELECTED NEURONS</b> J.V. Sweedler <sup>1</sup> , M. Zhong <sup>1</sup> , J.N. Hanson <sup>1</sup> , K. Jo <sup>2</sup> , L. Millet <sup>1</sup> , S.S. Rubakhin <sup>1</sup> , M.U. Gillette <sup>1</sup> and R.G. Nuzzo <sup>1</sup> <sup>1</sup> University of Illinois, Urbana-Champaign, USA and <sup>2</sup> Songang University, KOREA	<b>HYBRID DIGITAL-CHANNEL MICROFLUIDICS FOR PRE-PROCESSING AND SEPARATIONS</b> A.R. Wheeler, M. Abdelgawad, and M.W. Watson <i>University of Toronto, CANADA</i>
<b>09:35- 09:55</b>	
<b>QUANTIFICATION OF AMYLOID SECRETION IN ISOLATED OPTOFLUIDIC CHAMBER ARRAY</b> L.Y. Wu, Y. Choi, S.G. Hong, H. Wu, M. Dueck, and L.P. Lee <i>University of California, Berkeley, USA</i>	<b>INTEGRATED FLUORESCENCE-LABELING AND POLYACRYLAMIDE GEL ELECTROPHORESIS FOR ANALYSIS OF PROTEIN ISOFORMS</b> A. Apori and A.E. Herr <i>University of California, Berkeley, USA</i>
<b>09:55- 10:15</b>	
<b>SINGLE-CELL LEVEL GENE EXPRESSION PROFILING USING MICROFLUIDIC LINEAR AMPLIFICATION</b> J.G. Kralj <sup>1</sup> , A. Player <sup>2</sup> , M.S. Munson <sup>1</sup> , S.P. Forry <sup>1</sup> , D. Petersen <sup>2</sup> , D. Edelman <sup>2</sup> , E. Kawasaki <sup>2</sup> , P. Meltzer <sup>2</sup> , and L.E. Locascio <sup>1</sup> <sup>1</sup> National Institute of Standards and Technology (NIST), USA and <sup>2</sup> National Cancer Institute, National Institute of Health (NIH), USA	<b>A MICROFLUIDIC MOLECULAR TRACKING SYSTEM DETECTS A TIME-TO-SEARCH DNA SEQUENCE TO BE CLEAVED BY RESTRICTION ENZYMES</b> D. Onoshima <sup>1</sup> , N. Kaji <sup>1</sup> , M. Tokeshi <sup>1</sup> , and Y. Baba <sup>1,2,3</sup> <sup>1</sup> Nagoya University, JAPAN, <sup>2</sup> National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and <sup>3</sup> Institute for Molecular Science, JAPAN

10:15 – 10:45 | Break & Exhibit Inspection

Grand Ballroom A-B	Grand Ballroom C
<b>Session 1A2</b> Cell Interactions	<b>Session 1B2</b> Single Molecule Manipulation & Measurement
<b>10:45 - 11:05</b>	
<b>A CHIP-BASED <i>IN VITRO</i> MODEL FOR CYTOTOXICITY TEST USING CACO-2 AND HEP G2</b> H. Kimura, T. Yamamoto, Y. Sakai, and T. Fujii <i>University of Tokyo, JAPAN</i>	<b>THE TOMO-TWEEZERS: A NEW INSTRUMENT COMBINING MAGNETIC TWEEZERS AND MICROCHIP TECHNOLOGY FOR SINGLE MOLECULE STUDIES</b> L. Disseau <sup>1</sup> , J. Miné <sup>1</sup> , M. Dilhan <sup>2</sup> , H. Camon <sup>2</sup> , G. Cappello <sup>1</sup> , and J.-L. Viovy <sup>1</sup> <sup>1</sup> Institut Curie, FRANCE and <sup>2</sup> LAAS, FRANCE
<b>11:05- 11:25</b>	
<b>MICROFLUIDIC PLATFORM TO STUDY THREE DIMENSIONAL CELL MIGRATION &amp; CAPILLARY MORPHOGENESIS</b> S. Chung, R. Sudo, I. Zervantonakis, T. Rimchala, P.J. Mack, C.-R. Wan, V. Vickerman, and R.D. Kamm <i>Massachusetts Institute of Technology, USA</i>	<b>A MICROFLUIDIC NANOPORE SYSTEM FOR SINGLE MOLECULE MASS DISCRIMINATION</b> L.P. Hromada, Jr. <sup>1</sup> , B.J. Nablo <sup>2</sup> , J.J. Kasianowicz <sup>2</sup> , M.A. Gaitan <sup>2</sup> , D.L. DeVoe <sup>1</sup> , and J.W.F. Robertson <sup>2</sup> <sup>1</sup> University of Maryland, USA and <sup>2</sup> National Institute of Standards and Technology, USA
<b>11:25- 11:45</b>	
<b>HYDRODYNAMIC CELLULAR PATTERNING FOR 3D CO-CULTURE</b> Y.-S. Torisawa, B. Mosadegh, G.D. Luker, and S. Takayama <i>University of Michigan, USA</i>	<b>ISOLATION OF SINGLE DNA MOLECULE IN A PICOLITRE-SIZED DROPLET FORMED BY LIQUID DIELECTROPHORESIS</b> B. Wee, M. Kumemura, D. Collard, and H. Fujita <i>University of Tokyo, JAPAN</i>

11:45 – 13:00	Lunch & Exhibit Inspection
13:00 - 13:40	<b>Plenary II</b> NANOSTRUCTURE INCORPORATION IN MICROANALYTICAL SYSTEMS H. Craighead <i>Cornell University, USA</i>
13:40 - 14:00	<b>Innovation In Science</b> AWARD sponsored by Analytical Chemistry
14:00 - 16:20	<b>Poster Session I</b>

### Microfluidics

#### Fluid Mechanics & Modeling

**M1A****A FAST AND ACCURATE ISOTACHOPHORESIS SIMULATION CODE**

M. Bercovici, S.K. Lele, and J.G. Santiago  
*Stanford University, USA*

**M2A****MATHEMATICAL AND EXPERIMENTAL STUDY ON BACKWARD FLOW IN A SURFACE TENSION DRIVEN MICROPUMP**

J. Ju<sup>1</sup>, J.Y. Park<sup>1</sup>, E. Berthier<sup>2</sup>, D.J. Beebe<sup>2</sup>, and S.H. Lee<sup>1</sup>  
<sup>1</sup>*Korea University, KOREA* and <sup>2</sup>*University of Wisconsin, USA*

**M3A****FLUID FLOW SIMULATIONS AND MEASUREMENT OF OXYGEN CONSUMPTION OF HEPATOCYTES IN PERFUSED MULTIWELL BIOREACTOR**

K. Domansky<sup>1</sup>, M.H.M. Lim<sup>2</sup>, A. Dash<sup>1</sup>, J.R. Llamas Vidales<sup>1</sup>, and L.G. Griffith<sup>1</sup>  
<sup>1</sup>*Massachusetts Institute of Technology, USA* and <sup>2</sup>*University of Cambridge, UK*

**M4A****JOULE HEATING EFFECTS ON INSULATOR-BASED DIELECTROPHORESIS**

P. Sabouchi<sup>1</sup>, D.E. Huber<sup>2</sup>, M.P. Kanouff<sup>1</sup>, A.E. Harris<sup>1</sup>, and B.A. Simmons<sup>1</sup>  
<sup>1</sup>*Sandia National Laboratories, USA*, and <sup>2</sup>*Stanford University, USA*

**M5A****MICROFLUIDIC DRIFTING: THREE DIMENSIONAL HYDRODYNAMIC FOCUSING OF MICROPARTICLES**

X. Mao and T.J. Huang  
*Pennsylvania State University, USA*

**M6A****SINGLE-PHASE DIGITAL MICROFLUIDICS BASED ON ISOTACHOPHORETIC TRANSPORT**

F. Schönfeld<sup>1</sup>, G. Goet<sup>1</sup>, K.S. Drese<sup>1</sup>, and S. Hardt<sup>2</sup>  
<sup>1</sup>*Institut für Mikrotechnik Mainz GmbH, GERMANY* and <sup>2</sup>*Leibniz Universität Hannover, GERMANY*

**M7A****THREE-DIMENSIONAL HYDRODYNAMICALLY ADJUSTABLE LENS CHIP FABRICATED BY RAPID PROTOTYPING**

M. Rosenauer and M.J. Vellekoop  
*Vienna University of Technology, AUSTRIA*

### Microfluidics

#### World-to-Chip Interfacing

**M8A****AUTOMATED DELIVERY OF SMALL FLUID VOLUMES THROUGH TUBING TO MICROFLUIDIC CHIPS**

K. Liu, C. Xia, C.K.-F. Shen, and R.M. van Dam  
*University of California, Los Angeles, USA*

**M9A****LOCALIZED BRAIN SLICE CHEMICAL STIMULATION USING A MICROFLUIDIC DEVICE AND OFF-THE-SHELF PERFUSION CHAMBER**

H.H. Caicedo, J. Shaikh Mohammed, and C.P. Fall, and D.T. Eddington  
*University of Illinois, Chicago, USA*

### Microfluidics

#### Aliquoting, Mixing & Pumping

**M10A****A NEW VORTEX-TYPE MICROMIXER**

S.-Y. Yang<sup>1</sup> and G.-B. Lee<sup>1,2</sup>  
<sup>1</sup>*National Cheng Kung University, TAIWAN* and <sup>2</sup>*Industrial Technology Research Institute, TAIWAN*

**M11A****A VERTICAL LAMINATING MICROMIXER (VLM)**

W.S. Yang<sup>1</sup>, J.-O. Ryu<sup>2</sup>, and D.S. Kim<sup>1</sup>  
<sup>1</sup>*Chung-Ang University, KOREA* and <sup>2</sup>*Allmedicus Co. Ltd, KOREA*

**M12A****AU/PPY ACTUATORS FOR ACTIVE MICROMIXING AND MASS TRANSPORT ENHANCEMENT**

X. Casadevall i Solvas, R.A. Lambert, R.H. Rangel, and M.J. Madou  
*University of California, Irvine, USA*

**M13A****CONTINUOUS MICROFLUIDIC IMMUNOSENSING WITH ANTIBODY CONJUGATED PARAMAGNETIC BEADS**

L.A. Sasso and J.D. Zahn  
*Rutgers University, USA*

**M14A****EFFECTIVE MIXING OF LAMINAR FLOWS AT A DENSITY INTERFACE BY AN INTEGRATED ULTRASONIC TRANSDUCER**

L. Johansson, S. Johansson, F. Nikolajeff, and S. Thorstlund  
*Uppsala University, SWEDEN*

**M15A****HIGH-SPEED CHEMICAL SIGNAL GENERATION WITH MULTI-PLUG MODULATORS**

F. Azizi and C.H. Mastrangelo  
*Case Western Reserve University, USA*

**M16A****ON-DEMAND DROPLET METERING AND FUSION UTILIZING MEMBRANE ACTUATION**

B.-C. Lin and Y.-C. Su  
*National Tsing Hua University, TAIWAN*

**M17A****RAPID MIXING BY MICRO-VORTEX IN A CONTRACTION-EXPANSION ARRAY MICROCHANNEL**

S. Choi, M.G. Lee, and J.-K. Park  
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**M18A****SIMULATION OF MICROFLUIDIC FLUID MIXING USING ARTIFICIAL CILIA**

M.G.H.M. Baltussen<sup>1</sup>, J.M.J. den Toonder<sup>1,2</sup>, F.M. Bos<sup>1</sup>, and P.D. Anderson<sup>1</sup>  
<sup>1</sup>*Technische Universiteit Eindhoven, THE NETHERLANDS* and <sup>2</sup>*Philips Research, THE NETHERLANDS*

**W19A****TIPPING THE BALANCE WITH DIELECTROPHORETIC FORCES - AN ELECTRIC DETERMINISTIC LATERAL DISPLACEMENT DEVICE**

J.P. Beech, P. Jönsson, and J.O. Tegenfeldt  
*Lund University, SWEDEN*

**M20A****TUNABLE DELIVERY OF CHEMICAL GRADIENTS OVER LARGE CELL CULTURE SUBSTRATES USING STACKED FLOWS**

C. Sip, H. Lai, and A. Folch  
University of Washington, USA

**M21A****VENTURI-BASED TWO-LAYER MICROFLUIDIC PUMPING SYSTEM**

K. Hettiarachchi and A.P. Lee  
University of California, Irvine, USA

## Microfluidics

### Multi-Phase Microfluidics

**M22A****A NEW MICROFLUIDIC DEVICE FOR FORMATION AND SWITCHING OF MICRO-DROPLETS**

C.-Y. Lee<sup>1</sup>, Y.-H. Lin<sup>2</sup>, and G.-B. Lee<sup>1,2</sup>  
<sup>1</sup>National Cheng Kung University, TAIWAN and  
<sup>2</sup>Industrial Technology Research Institute, TAIWAN

**M23A****MICROFLUIDIC ASSEMBLY OF CELL-LIKE SYSTEMS IN GIANT UNILAMELLAR LIPID VESICLES**

J.C. Stachowiak, T.H. Li, D.L. Richmond, and D.A. Fletcher  
University of California, Berkeley, USA

**M24A****CLUSTER FORMATION AND EVOLUTION IN PARTICLE-LADEN MICROCHANNEL FLOW**

T. Gudipaty, L.S.L. Cheung, L. Jiang, and Y. Zohar  
University of Arizona, USA

**M25A****DESIGN AND CHARACTERISATION OF MULTIPHASE LPG INTERFEROMETER USING DROPLET MICROFLUIDICS**

L.K. Chin, C.S. Lim, and A.Q. Liu  
Nanyang Technological University, SINGAPORE

**M26A****DISPOSABLE, CONTINUOUS-FLOW BIOSENSOR FOR MULTI-ANALYTE MONITORING AND MICROFLUIDIC CONTROL OF THE LINEAR RANGE**

O. Frey, S. Talaei, N.F. de Rooij, and M. Koudelka-Hep  
University of Neuchâtel, SWITZERLAND

**M27A****FAST, ROBUST AND SIMULTANEOUS SORTING WITH DROPLET GENERATION BY SYNCHRONIZED HIGH SWITCHING FREQUENCY OF ELECTROSTATIC ACTUATION**

B. Ahn, R. Panchapakesan, K. Lee, and K.W. Oh  
State University of New York, Buffalo, USA

**M28A****HIGH EFFICIENCY OF BIOCONJUGATION ON CARBOXYLATED COPOLYMER PARTICLES FABRICATED VIA A MICROFLUIDIC DEVICE**

S.-H. Huang<sup>1</sup>, H.S. Khoo<sup>2</sup>, and F.-G. Tseng<sup>2</sup>  
<sup>1</sup>National Taiwan Ocean University, TAIWAN and <sup>2</sup>National Tsing Hua University, TAIWAN

**M29A****LIQUID CRYSTALLOGRAPHY IN MICROCHANNELS**

L. Shui<sup>1</sup>, S. Kooij<sup>2</sup>, J. C.T. Eijkel<sup>1</sup>, and A. van den Berg<sup>1</sup>  
<sup>1</sup>MESA+, University of Twente, THE NETHERLANDS and <sup>2</sup>University of Twente, THE NETHERLANDS

**M30A****MICROFLUIDIC DROPLET ADDER IN MICROCHANNELS**

E. Um and J.-K. Park  
Korea Advanced Institute of Science and Technology (KAIST), KOREA

**M31A****MICROFLUIDIC SPINNING OF BIODEGRADABLE POLYMER AND CELL ORIENTATION CONTROL ON THE FIBERS**

C.M. Hwang<sup>1</sup>, K. Sun<sup>1</sup>, A. Khademhosseini<sup>2,3</sup>, and S.H. Lee<sup>1</sup>  
<sup>1</sup>Korea University, KOREA, <sup>2</sup>Massachusetts Institute of Technology, USA, and  
<sup>3</sup>Brigham and Women's Hospital, Harvard Medical School, USA

**M32A****OPTOFLUIDIC ENCAPSULATION OF CRYSTALLINE COLLOIDAL ARRAYS USING PHOTOCURABLE DOUBLE EMULSION DROPLETS**

S.-H. Kim, S.-J. Jeon, and S.-M. Yang  
Korea Advanced Institute of Science and Technology (KAIST), KOREA

**M33A****MICROWAVE TECHNIQUE FOR MONITORING PHASE SEPARATION OF A MULTIPHASE-FLOW REGIME UTILISED FOR CONTINUOUS MOLECULAR ENRICHMENT**

O. Castell, A. Masood, R. Göritz, D. Barrow, C. Allender, and A. Porch  
Cardiff University, UK

**M34A****SINGLE MOLECULE DETECTION AND ISOLATION USING DROPLET MICROFLUIDICS**

M. Srisa-Art and J.B. Edel  
Imperial College London, UK

**M35A****TWO-PHASE STRATIFIED FLOW OF LIQUID AND AIR IN PDMS MICROFLUIDIC CHANNELS FOR OPTOFLUIDIC WAVEGUIDES**

J.-M. Lim, S.-H. Kim, J.-H. Choi, and S.-M. Yang  
Korea Advanced Institute of Science and Technology (KAIST), KOREA

## Microfluidics

### Separation Methods

**M36A****ACOUSTOPHORESIS IN WET-ETCHED GLASS CHIPS**

A. Lenshof, M. Evander, T. Laurell, and J. Nilsson  
Lund University, SWEDEN

**M37A****CONTINUOUS SEPARATION OF PARTICLES USING INERTIAL LIFT FORCE AND VORTICITY VIA MULTI-ORIFICE MICROCHANNEL**

J.S. Park and H.-I. Jung  
Yonsei University, KOREA

**M38A****MICROFLUIDIC SELECTIVE ELECTROCHEMICAL LYSIS (μSEL) FOR ISOLATING PROKARYOTES FROM BIOLOGICAL SAMPLES**

R.M. Cooper, J.T. Nevill, M. Dueck, and L.P. Lee  
University of California, Berkeley, USA

**M39A****HIGH-THROUGHPUT CELL SORTER WITH PIEZOELECTRIC ACTUATION**

C.H. Chen, S.H. Cho, A. Erten, and Y.-H. Lo  
University of California, San Diego, USA

**M40A****INTEGRATED IMMUNOAFFINITY MONOLITH/POLYACRYLAMIDE-MEMBRANE/ELECTROPHORESIS MICRODEVICES FOR TRACE BIOMARKER ANALYSIS**

W. Yang, X. Sun, and A.T. Woolley  
Brigham Young University, USA

**M41A****MULTIPLE NODE ULTRASONIC STANDING WAVE SEPARATION IN MICROCHANNELS IMPROVES LIPID DISCRIMINATION FROM COMPLEX BIO-SUSPENSIONS**

C. Grenvall<sup>1</sup>, P. Augustsson<sup>1</sup>, H. Matsuoka<sup>2</sup>, and T. Laurell<sup>1</sup>  
<sup>1</sup>Lund University, SWEDEN and <sup>2</sup>Tokyo University of Agriculture and Technology, JAPAN

**M42A****PINCHED FLOW FRACTIONATION DEVICE FOR SIZE- AND DENSITY-DEPENDENT SEPARATION OF PARTICLES UTILIZING CENTRIFUGAL PUMPING**

S. Sunahiro<sup>1</sup>, M. Senaha<sup>2</sup>, M. Yamada<sup>3</sup>, and M. Seki<sup>1,2</sup>  
<sup>1</sup>Osaka Prefecture University, JAPAN, <sup>2</sup>Chiba University, JAPAN, and  
<sup>3</sup>Tokyo Women's Medical University, JAPAN

**M43A****RAPID AND SELECTIVE CONCENTRATION OF MICROPARTICLES USING OPTOELECTRO-OSMOTIC FLOW IN LAB-ON-A-DISPLAY**

H. Hwang and J.-K. Park

*Korea Advanced Institute of Science and Technology (KAIST), KOREA***M44A****SIZE SEPARATION OF PARTICLES USING FLOW-INDUCED ELECTROKINETIC TRAPPING**L.C. Jellema<sup>1</sup>, A.P. Markesteijn<sup>2</sup>, J. Westerweel<sup>2</sup>, and E.M.J. Verpoorte<sup>1</sup><sup>1</sup>*University of Groningen, THE NETHERLANDS* and <sup>2</sup>*Delft University of Technology, THE NETHERLANDS***M45A****SPATIALLY-MULTIPLEXED PROTEIN SEPARATIONS ENABLED BY MULTIFUNCTIONAL PHOTOPOLYMERIZED GELS**

S. Yang, J. Liu, and D.L. DeVoe

*University of Maryland, USA***Microfluidics****M46A****A DROPLET ON DEMAND MICROFLUIDIC DEVICE FOR DETECTING DNA SINGLE BASE SUBSTITUTION USING PNA PROBE**

S. Kaneda, T. Nojima, T. Yamamoto, and T. Fujii

*University of Tokyo, JAPAN***M47A****APPLICATION OF TOPOLOGY OPTIMIZATION IN LAB-ON-A-CHIP DESIGN**

F. Okkels and H. Bruus

*Technical University of Denmark, DENMARK***M48A****ELECTROCHEMICAL BUBBLE-ACTUATED MICROVALVES AND PERISTALTIC PUMPS BASED ON EMBEDDED SU-8 MICROcantilevers**A. Ezkerra<sup>1</sup>, L.J. Fernández<sup>1</sup>, A. Wolff<sup>2</sup>, K. Mayora<sup>1</sup>, and J.M. Ruano-López<sup>1</sup><sup>1</sup>*Ikerlan S. Coop., SPAIN* and <sup>2</sup>*Technical University of Denmark (DTU), DENMARK***M49A****A MICROFLUIDIC DEVICE FOR TISSUE BIOPSY CULTURE AND INTERROGATION**

A. Webster, C.E. Dyer, K.J. Welham, A.M.L. Seymour, J. Greenman, and S.J. Haswell

*University of Hull, UK***M50A****ON-CARD DRY REAGENT STORAGE FOR DISPOSABLE MICROFLUIDIC IMMUNOASSAYS**D.Y. Stevens<sup>1</sup>, C.R. Petri<sup>2</sup>, and P. Yager<sup>1</sup><sup>1</sup>*University of Washington, USA* and <sup>2</sup>*Boston College, USA***M51A****SOLVING THE SHRINKAGE-INDUCED PDMS REGISTRATION PROBLEM IN MULTILAYER SOFT LITHOGRAPHY**

C. Moraes, C.A. Simmons, and Y. Sun

*University of Toronto, CANADA***M52A****TOWARDS SIMULTANEOUS ELECTRICAL AND OPTICAL INVESTIGATION OF BLMS USING A NOVEL MICROFLUIDIC DEVICE**

I. van Uitert, Y. Cesa, H. de Boer, J. Bomer, M. Bennink, S. Le Gac, and A. van den Berg

*University of Twente, THE NETHERLANDS***Nanotechnology**  
Nanofluidics**M1B****AMPLIFIED ELECTROKINETIC FLUID PUMPING AND SWITCHING BY CONCENTRATION POLARIZATION NEAR NANOFUIDIC CHANNEL**

S.J. Kim and J. Han

*Massachusetts Institute of Technology, USA***M2B****ELECTRO-PRECONCENTRATION OF BIO-MOLECULES IN NANOFUIDIC DEVICES**

A. Plecis, C. Nanteuil, A.M. Haghiri-Gosnet, and Y. Chen

*Centre National de la Recherche Scientifique (CNRS), Marcoussis, FRANCE***M3B****FABRICATION AND CHARACTERIZATION OF REVERSIBLY BONDED NANOFUIDIC CHANNELS**

P. Kim, J.K. Kim, and K.Y. Suh

*Seoul National University, KOREA***M4B****ION PUMPING IN NANOCANNELS USING AN ASYMMETRIC ELECTRODE ARRAY**

W. Sparreboom, C.F. Cucu, J.C.T. Eijkel, and A. van den Berg

*University of Twente, THE NETHERLANDS***M5B****OPTOFUIDIC MANIPULATION WITH SUB-WAVELENGTH SCALE PHOTONICS**

A.H.J. Yang, S.D. Moore, B.S. Schmidt, M. Lipson, and D. Erickson

*Cornell University, USA***M6B****THE EFFECTS OF CONCENTRATION POLARIZATION ON MOLECULE TRANSLLOCATION IN A NANOPORE DEVICE**

T.A. Zangle, A.H. Talasaz, R.W. Davis, and J.G. Santiago

*Stanford University, USA***Nanotechnology**  
Nanobiotechnology**M7B****CELL RUPTURE MICROFLUIDIC DEVICE USING NANO NEEDLE ALLAY FOR DAMAGE-FREE EXTRACTION OF ORGANELLES**T. Arakawa<sup>1,3</sup>, Y. Shirasaki<sup>2</sup>, D. Yamazaki<sup>1</sup>, T. Funatsu<sup>3</sup>, and S. Shoji<sup>1</sup><sup>1</sup>*Waseda University, JAPAN*, <sup>2</sup>*Kazusa DNA Research Institute, JAPAN*, and<sup>3</sup>*University of Tokyo, JAPAN***M8B****ENCAPSULATION OF PAL ENZYMES IN FLUORINATED REVERSE EMULSIONS**P.R. Marcoux<sup>1</sup>, N. Faure<sup>2</sup>, V. Lanet<sup>2</sup>, P. Joly<sup>1</sup>, M. Dupuy<sup>1</sup>, F. Rivera<sup>1</sup>, F. Mallard<sup>2</sup>, and J.-P. Moy<sup>1</sup><sup>1</sup>*CEA-LETI, FRANCE* and <sup>2</sup>*bioMérieux, FRANCE***M9B****INTEGRATION OF IMMUNOASSAY INTO EXTENDED NANOSPACE FOR ANALYSIS AT SINGLE-MOLECULE LEVEL**F. Hiruma<sup>1</sup>, K. Mawatari<sup>2</sup>, T. Tsukahara<sup>1</sup>, and T. Kitamori<sup>1,2</sup><sup>1</sup>*University of Tokyo, JAPAN* and <sup>2</sup>*Kanagawa Academy of Science and Technology, JAPAN***M10B****MICROFLUIDIC SELECTION OF LIBRARY ELEMENTS**

D.J. Solis, R. Lovchik, and E. Delamarque

*IBM Research GmbH, SWITZERLAND***M11B****NANOTECHNOLOGY MEETS PLANT BIOTECHNOLOGY: CARBON NANOTUBES DELIVER DNA AND INCORPORATE INTO THE PLANT CELL STRUCTURE**M. Fouad<sup>1</sup>, N. Kaji<sup>1</sup>, M. Jabasini<sup>1</sup>, M. Tokeshi<sup>1</sup>, and Y. Baba<sup>1,2</sup><sup>1</sup>*Nagoya University, JAPAN* and<sup>2</sup>*National Institute of Advanced Industrial Science & Technology (AIST), JAPAN***Nanotechnology**  
Nanoassembly**M12B****CELL DRIVEN NANO LOCOMOTION**T. Hoshino<sup>1</sup>, Y. Hori<sup>1</sup>, T. Konno<sup>2</sup>, K. Ishihara<sup>2</sup>, and K. Morishima<sup>1</sup><sup>1</sup>*Tokyo University of Agriculture and Technology, JAPAN* and <sup>2</sup>*University of Tokyo, JAPAN*

**M13B****ELECTRICAL MANIPULATION OF GOLD NANOPARTICLES FOR MICROFLUIDIC APPLICATIONS**

D.R. Reyes, G.I. Mijares, K.A. Briggman, J. Geist, and M. Gaitan  
National Institute of Standards and Technology (NIST), USA

**M14B****TEMPLATE-GUIDED SELF-ASSEMBLY OF BIOMIMETIC POLYMERS USING EVAPORATION-ASSISTED PLASMA LITHOGRAPHY**

J. Keyes<sup>1</sup>, M. Junkin<sup>1</sup>, J. Cappello<sup>2</sup>, X. Wu<sup>1</sup>, and P.K. Wong<sup>1</sup>  
<sup>1</sup>University of Arizona, USA and <sup>2</sup>Protein Polymer Technologies, Inc., USA

**Nanotechnology****M15B****NANOCAVITY-NANOPARTICLE MIRROR STRUCTURE FOR OPTIMIZATION OF LOCAL FIELD ENHANCEMENT**

B.M. Ross and L.P. Lee  
University of California, Berkeley, USA

**Materials**  
Surface Modification**M1C****A UNIVERSAL SURFACE MODIFICATION PROTOCOL FOR ACTIVE SURFACE CATALYTIC MICRODEVICES**

C.J. Cullen<sup>1</sup>, P. Williams<sup>2</sup>, and R.C.R. Wootton<sup>2</sup>  
<sup>1</sup>Imperial College London, UK and <sup>2</sup>Liverpool John Moores University, UK

**M2C****CARBON NANOTUBES PRESSURE SENSORS MODIFIED FOR CHEMICAL ANALYSIS**

R. Ficek<sup>1</sup>, R. Vrba<sup>1</sup>, L. Zajickova<sup>2</sup>, O. Jasek<sup>2</sup>, and F. Matejka<sup>3</sup>  
<sup>1</sup>Brno University of Technology, CZECH REPUBLIC, <sup>2</sup>Masaryk University, CZECH REPUBLIC, and <sup>3</sup>Academy of Sciences of the Czech Republic, CZECH REPUBLIC

**M3C****DUAL FUNCTION SURFACE PREPARED ON POLYMERIC SUBSTRATE FOR HIGHLY SENSITIVE IMMUNOASSAY-BASED MICROARRAY BIOSENSORS**

J. Sibarani<sup>1,2</sup>, M. Takai<sup>1</sup>, and K. Ishihara<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>University of Udayana, INDONESIA

**M4C****ROBUST SURFACE MODIFICATION FOR PROTEIN SEPARATION CHIP USING A FILM OF A CELLULOSE DERIVATIVE**

H. Okada<sup>1</sup>, N. Kaji<sup>1</sup>, M. Tokeshi<sup>1</sup>, and Y. Baba<sup>1,2</sup>  
<sup>1</sup>Nagoya University, JAPAN and <sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

**M5C****SURFACE MODIFICATION OF POLY(METHYL METHACRYLATE) MICROFLUIDIC DEVICES USING THIN FILMS WITH ENTRAPPED HYDROXYPROPYL CELLULOSE**

X. Sun, W. Yang, and A.T. Woolley  
Brigham Young University, USA

**Materials**  
Interface Characterization**M6C****CREATING CELLULAR MICROPATTERNS BY SWITCHING FOULING PROPERTIES OF ELECTROACTIVE ITO SURFACES**

S.S. Shah, J.Y. Lee, and A. Revzin  
University of California, Davis, USA

**Materials**

## Nanostructured Materials

**M7C****A HYDRODYNAMICALLY FOCUSED STREAM AS A DYNAMIC TEMPLATE FOR SITE-SPECIFIC ELECTROCHEMICAL MICROPATTERNING OF CONDUCTING POLYMERS**

S. Wang, S. Hou, Z.T.F. Yu, K. Liu, J. Sun, W.-Y. Lin, C.K.F. Shen, and H.R. Tseng  
University of California, Los Angeles, USA

**M8C****FLUORESCENCE ENHANCEMENT USING SILVER NANO PARTICLES FABRICATED BY MODIFIED SILVER MIRROR REACTION**

K. Kurooka<sup>1</sup>, K. Hanada<sup>1</sup>, K. Deguchi<sup>1</sup>, H. Kojima<sup>1</sup>, T. Chishiro<sup>1</sup>, D. Citterio<sup>1,2</sup>, K. Suzuki<sup>1,2</sup>, T. Saiki<sup>1,2</sup>, and N. Miki<sup>1,2</sup>  
<sup>1</sup>Keio University, JAPAN and <sup>2</sup>Kanagawa Academy of Science and Technology, JAPAN

**M9C****METALLIZATION OF SILICON NANOWIRES AND SERS RESPONSE FROM A SINGLE METALLIZED NANOWIRE**

C. Fang, A. Agarwal, L. Linn, and N. Balasubramanian  
Agency for Science, Technology and Research (A\*Star), SINGAPORE

**M10C****SYNTHESIS OF PALLADIUM NANOPARTICLES FROM ORGANOMETALLIC CHEMISTRY ROUTE IN A TWO PHASE FLOW MICROREACTOR**

S. Desportes, D.M. Fries, F. Trachsel, and P. Rudolf von Rohr  
ETH Zurich, SWITZERLAND

**Materials**

## Innovative Chip Materials

**M11C****FEMTOSECOND-LASER-BASED FUSED SILICA MICROMACHINING FOR μTAS**

T. Haddock, and P. Bado  
Translume, Inc., USA

**M12C****SHRINKY-DINK WRINKLES**

C.-S. Chen, A. Grimes, A. Gopinathan, and M. Khine  
University of California, Merced, USA

**M13C****VISCOELASTIC CHARACTERIZATION OF SOFT MICROPILLARS FOR CELLULAR MECHANICS STUDY**

I.-K. Lin, Y.-M. Liao, K.-S. Chen, and X. Zhang  
<sup>1</sup>Boston University, USA and <sup>2</sup>National Cheng Kung University, TAIWAN

**Detection Technologies**

## Optical

**M1D****A HIGH-SENSITIVITY ON-CHIP FLUORESCENCE DETECTION FOR LAB-ON-A-CHIP**

Y. Shuai, A. Banerjee, D. Klotzkin, and I. Papautsky  
University of Cincinnati, USA

**M2D****A NOVEL AIR/NANOPOROUS DIELECTRIC CLAD OPTOFLUIDIC WAVEGUIDE SYSTEM FOR SENSOR APPLICATIONS**

V. Korampally, M. Hossain, M. Yun, K. Gangopadhyay, L. Polo-Parada, and S. Gangopadhyay  
University of Missouri, USA

**M3D****A THERMALLY TUNABLE MICROLENS ARRAY ON INDIUM TIN OXIDE GLASS**

X. Huang, B. Wang, J. Song, and Q. Lin  
Columbia University, USA

**M4D****DETECTION OF THROMBIN BY APTAMER-BASED SURFACE ENHANCED RESONANCE RAMAN SPECTROSCOPY**

H. Cho<sup>1</sup>, B.R. Baker<sup>2</sup>, S. Wachsmann-Hogiu<sup>3</sup>, C. Pagba<sup>3</sup>, T. Laurence<sup>2</sup>, S.M. Lane<sup>3</sup>, L.P. Lee<sup>1</sup>, and J.B.-H. Tok<sup>2</sup>

<sup>1</sup>University of California, Berkeley, USA, <sup>2</sup>Lawrence Livermore National Laboratory, USA, and <sup>3</sup>University of California, Davis, USA

**M5D****DEVELOPMENT OF SOLID STATE LASER-INDUCED-FLUORESCENCE DETECTION SYSTEM**

K. Yano<sup>1,3</sup>, T. Ohtsuka<sup>2</sup>, M. Katayama<sup>2</sup>, T. Kanie<sup>2</sup>, and D. Ehrlich<sup>3</sup>

<sup>1</sup>afizEx Technologies, Inc., USA, <sup>2</sup>Sumitomo Electric Industries, Ltd. JAPAN, and <sup>3</sup>Massachusetts Institute of Technology, USA

**M6D****DYNAMIC IMAGING OF SINGLE BIOMOLECULAR INTERACTION USING FLOW CONTROL AND TIRFM**

T. Arakawa<sup>1,3</sup>, T. Sameshima<sup>3</sup>, Y. Sato<sup>1</sup>, Y. Sumiyoshi<sup>1</sup>, T. Ueno<sup>3</sup>, Y. Shirasaki<sup>2</sup>, T. Funatsu<sup>3</sup>, and S. Shoji<sup>1</sup>

<sup>1</sup>Waseda University, JAPAN, <sup>2</sup>Kazusa DNA Research Institute, JAPAN, and <sup>3</sup>University of Tokyo, JAPAN

**M7D****GENERATION AND DETECTION OF LAMINAR FLOW WITH LATERALLY-VARYING OXYGEN CONCENTRATION LEVELS**

V. Nock, R.J. Blaikie, and T. David

University of Canterbury, NEW ZEALAND

**M8D****HIGH SENSITIVITY SESSILE DROPLET RESONATOR FOR LOW CONCENTRATION PROTEIN DETECTION**

Y.F. Yu<sup>1,2</sup>, T. Bourouina<sup>2</sup>, C.S. Lim<sup>1</sup>, M.K. Chin<sup>1</sup>, and A.Q. Liu<sup>1</sup>

<sup>1</sup>Nanyang Technological University, SINGAPORE and

<sup>2</sup>Ecole Supérieure d'Ingenieurs en Electronique et Electrotechnique, FRANCE

**M9D****LASER-SCANNING FLOW CYTOMETER WITH A THREE-DIMENSIONAL MICROFLUIDIC CHIP**

S. Imanishi<sup>1</sup>, M. Furuki<sup>1</sup>, M. Shinoda<sup>1</sup>, Y. Morita<sup>2</sup>, Y. Yamazaki<sup>2</sup>, and H. Nakauchi<sup>2</sup>

<sup>1</sup>Sony Corporation, JAPAN and <sup>2</sup>University of Tokyo, JAPAN

**M10D****MICROGAP FILTERING BASED LASER-INDUCED FLUORESCENCE DETECTION SYSTEM FOR HING-EFFICIENCY MICROFLUIDIC ELECTROPHORESIS ANALYSIS**

Q.-H. Jin, B.-J. Xu, X.-C. Liao, H.-L. Zhang, and J.-L. Zhao

Shanghai Institute of Microsystem and Information Technology, CHINA

**M11D****ON-CHIP ELECTROKINETIC SAMPLE FOCUSING FOR MICROARRAY-BASED BIOMOLECULAR INTERACTION ASSAYS**

G. Krishnamoorthy, E.T. Carlen, D. Kohlheyer, R. Schasfoort, and A. van den Berg

MESA+, University of Twente, THE NETHERLANDS

**M12D****OPTOFLUIDIC DEVICE FOR ULTRA-SENSITIVE MOLECULE DETECTION USING SURFACE-ENHANCED RAMAN SPECTROSCOPY**

M. Wang, N. Jing, M. Benford, I.-H. Chou, H.T. Beier, G.L. Coté, and J. Kameoka

Texas A&M University, USA

**M13D****SENSITIVE OPTICAL ABSORBANCE MEASUREMENTS ON A MICROFLUIDIC DEVICE USING CONDUCTIVITY-BASED PHOTOTHERMAL DETECTION**

E.R. Ferguson, P.J. Dennis, J.P. Alarie, J.M. Ramsey, and J.W. Jorgenson

University of North Carolina, Chapel Hill, USA

**Detection Technologies**

Electrochemical

**M14D****A MINIATURIZED CMOS MICROELECTRODE ARRAY SYSTEM FOR SINGLE DROPLET ELECTROCHEMISTRY APPLICATIONS**

S. Hwang, V. Agarwal, C. LaFratta, J. Yu, D. Walt, and S.Sonkusale

Tufts University, USA

**M15D****HIGH SENSITIVITY PH SENSING USING SCHOTTKY CONTACTED SILICON NANOWIRE FIELD-EFFECT TRANSISTOR**

S.K. Yoo, I.-H. Hwang, B.P. Mun, and J.H. Lee

Gwangju Institute of Science and Technology (GIST), KOREA

**M16D****MULTIMODAL PH AND LIGHT IMAGING DEVICES FOR DYNAMIC CHEMICAL REACTION OBSERVATION**

J. Matsuo<sup>1</sup>, K. Sawada<sup>1,2,3</sup>, H. Takao<sup>1,2,3</sup>, and M. Ishida<sup>1,2,3</sup>

<sup>1</sup>Toyoashi University of Technology, JAPAN, <sup>2</sup>Intelligent Sensing System Research Center, JAPAN, and

<sup>3</sup>Japan Science and Technology Agency (JST), JAPAN

**M17D****APPLYING ELECTRIC CELL-SUBSTRATE IMPEDANCE SENSING (ECIS) TO STUDY CELL ADHESION AND CELL SPREADING OF AN INDIVIDUAL CELL**

P. Seriburri and D.R. Meldrum

Microscale Life Sciences Center, USA

**Detection Technologies****M18D****IMPROVED PROTEIN BINDING RATE FOR BIOSENSORS USING AC ELECTROOSMOSIS**

R. Hart, R.M. Lec, and H. Noh

Drexel University, USA

**M19D****LABEL-FREE, SINGLE-CELL CYTOTOXIN KINETICS ASSAY BY DIFFERENTIAL IMPEDANCE SPECTROSCOPY**

D. Malleo<sup>1</sup>, J.T. Nevill<sup>2</sup>, L.P. Lee<sup>2</sup>, and H. Morgan<sup>1</sup>

<sup>1</sup>University of Southampton, UK and <sup>2</sup>University of California, Berkeley, USA

**M20D****ON-CHIP COULTER COUNTER WITH VARIABLE APERTURE USING A TWO LAYER SU-8 PROCESS FOR IMPROVED SAMPLE FOCUSING**

S. Kostner and M.J. Vellekoop

Vienna University of Technology, AUSTRIA

**M21D****QUANTIFICATION OF AMYLOID FIBRILIZATION BY SIMULTANEOUS DUAL MODE DETECTION WITH OPTICAL SCATTERING IMAGE DIELECTRIC RELAXATION SPECTROSCOPY**

Y. Choi and L.P. Lee

University of California, Berkeley, USA

**MEMS & NEMS Technologies**

Micro &amp; Nano-Machining

**M1E****A SINGLE MASK SINGLE-ETCH PROCESS FOR CONSTRUCTING THREE DIMENSIONAL MICRO TOTAL ANALYSIS SYSTEMS**

P.A. Zellner and M. Agah

Virginia Polytechnic Institute and State University, USA

**M2E****CONTROLLED MICROFRACTURE AND FOCUSED ION BEAM FOR MICRONOZZLE PROCESSING**

M.J. Lopez<sup>1</sup>, E.M. Campo<sup>1</sup>, R. Pérez-Castillejos<sup>1,2</sup>, J. Esteve<sup>1</sup>, and J.A. Plaza<sup>1</sup>

<sup>1</sup>Centro Nacional de Microelectrónica, SPAIN and <sup>2</sup>Harvard University, USA

**M3E****FABRICATION OF HYDRODYNAMICALLY-SHAPED SUB-MICRON PMMA FILAMENTS**

A.L. Thangawng, J.S. Erickson, P.B. Howell, and F.S. Ligler

Naval Research Laboratory, USA

**M4E****MICROFABRICATION OF DUAL OPPOSITE SILVER ELECTRODES INSIDE A MICROCHANNEL BY MEANS OF MULTIPHASE LAMINAR FLOW WITH DENSITY DIFFERENCE**

S.-H. Paek<sup>1</sup>, J.S. Kim<sup>2</sup>, C.J. Hwang<sup>2</sup>, Y.K. Choi<sup>1</sup>, and D.S. Kim<sup>1</sup>

<sup>1</sup>Chung-Ang University, KOREA and <sup>2</sup>Korea Institute of Industrial Technology (KITECH), KOREA



**M5E**

**MONOLITHICAL INTEGRATION OF FORCE SENSOR, SIGNAL-PROCESSING CIRCUITRY AND SELF-ASSEMBLED CELLS FOR CHARACTERIZATION OF MUSCLES' MECHANICS**

X. Ji, L. Wang, J. Xi, and Z.H. Li  
Peking University, CHINA

**MEMS & NEMS Technologies**  
Microfluidic Components

**M6E**

**A MODULAR DISPENSING SYSTEM FOR LEAKAGE-FREE PICOLITER DROPLET RELEASE IN LIQUID ENVIRONMENTS**

J. Steigert, M. Strasser, O. Brett, N. Wangler, W. Streule, P. Koltay, M. Daub, and R. Zengerle  
University of Freiburg (IMTEK), GERMANY

**M7E**

**ASSEMBLY-FREE MICROFABRICATION PROCESS FOR MULTI-LAYERED MICROFLUIDIC NETWORKS USING SINGLE-MASK MULTIDIRECTIONAL PHOTOLITHOGRAPHY**

T. Suzuki<sup>1</sup>, Y. Hirabayashi<sup>2</sup>, I. Kanno<sup>2</sup>, M. Washizu<sup>3,4</sup>, and H. Kotera<sup>2,4</sup>  
<sup>1</sup>Kagawa University, JAPAN, <sup>2</sup>Kyoto University, JAPAN, <sup>3</sup>Japan Science and Technology Agency (JST), JAPAN, and <sup>4</sup>University of Tokyo, JAPAN

**M8E**

**DETERMINISTIC STORAGE OF LIQUID PLUGS IN MICROFLUIDIC CHANNELS USING PASSIVE VALVES**

J. Atencia and L.E. Locascio  
National Institute of Standards and Technology (NIST), USA

**M9E**

**ELECTROSTATIC HYDRAULIC THREE-WAY GAS MICROVALVE FOR HIGH-PRESSURE APPLICATIONS**

H. Kim and K. Najafi  
University of Michigan, USA

**M10E**

**FAST SELF-DIRECTED MICROLITER DROPLET MOVEMENTS INDUCED BY NANOTOPOGRAPHIC-ENHANCED GRADIENT SURFACES**

H.S. Khoo<sup>1</sup> and F.-G. Tseng<sup>1,2</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN and <sup>2</sup>Academia Sinica, TAIWAN

**M11E**

**MASSIVE FORMATION OF UNIFORM-SIZED EMBRYONID BODIES IN ALGINATE WITH THE REGULATION OF ENCAPSULATED CELL NUMBER**

C. Kim<sup>1,2</sup>, K.S. Lee<sup>3</sup>, E. Kang<sup>1</sup>, J.H. Kim<sup>1</sup>, K.J. Lee<sup>2</sup>, T.S. Kim<sup>1</sup>, and J.Y. Kang<sup>1</sup>  
<sup>1</sup>Korea Institute of Science and Technology (KIST), KOREA, <sup>2</sup>Korea University, KOREA, and <sup>3</sup>State University of New York, Buffalo, USA

**M12E**

**MICROFLUIDIC GLASS NEEDLE ARRAYS FOR DRUG DOSING DURING NEURAL RECORDING**

E. Vrouwe, A.J. Kelderman, and M. Blom  
Micronit Microfluidics, THE NETHERLANDS

**M13E**

**OPTICAL TRAPPING IN A MICROFLUIDIC CHANNEL USING AN INTEGRATED FRESNEL ZONE PLATE**

E. Schonbrun<sup>1</sup>, J. Wong<sup>2</sup>, and K.B. Crozier<sup>1</sup>  
<sup>1</sup>Harvard University, USA and <sup>2</sup>Schlumberger-Doll Research Center, USA

**M14E**

**PORTABLE MICRO LIQUID DISPENSER SYSTEM WITH PRESSURIZATION AND DECOMPRESSION SWITCHABLE MICRO PUMP CHIP**

T. Hasegawa<sup>1</sup>, F. Omatsu<sup>2</sup>, and K. Ikuta<sup>3</sup>  
<sup>1</sup>Shibaura Institute of Technology, JAPAN, <sup>2</sup>Osaka Institute of Technology, JAPAN, and <sup>3</sup>Nagoya University, JAPAN

**M15E**

**PROPOSAL OF A MICRO LIQUID ROTOR OPERATED BY SURFACE-ACOUSTIC-WAVE**

T. Saiki<sup>1,2</sup>, K. Okada<sup>2</sup>, and Y. Utsumi<sup>2</sup>  
<sup>1</sup>Hyogo Prefectural Institute of Technology, JAPAN and <sup>2</sup>University of Hyogo, JAPAN

**M16E**

**SYNTHESIS OF CARBON NANOTUBES AT "ROOM TEMPERATURE" USING CAPILLARY MICROFLUIDICS AND DIP PEN TECHNIQUES**

R. Gargate and D. Banerjee  
Texas A&M University, USA

**MEMS & NEMS Technologies**

Hybrid Devices, Packaging & Components Interfacing

**M17E**

**A NEW FLEXIBLE MICROFABRICATED POLYIMIDE-BASED PLATINUM ELECTRODES FOR STIMULATION OF RAT RETINAL TISSUE *IN VITRO* AND RECORDING USING A MULTI-ELECTRODE ARRAY**

H. Kasi<sup>1</sup>, B. Kolomiets<sup>3,4</sup>, S. Picaud<sup>2,3,4</sup>, J.A. Sahel<sup>3</sup>, and P. Renaud<sup>1</sup>  
<sup>1</sup>Swiss Federal Institute of Technology at Lausanne (EPFL), SWITZERLAND, <sup>2</sup>INSERM-U592, FRANCE, <sup>3</sup>Fondation Ophtalmologique Ade Rothschild, FRANCE, and <sup>4</sup>Université Pierre et Marie Curie, FRANCE

**M18E**

**MICROMANIPULATION OF MICROTOOLS MADE OF SU-8 BY INTEGRATED OPTICAL TWEEZERS**

F. Arai, K. Onda, H. Matsumoto, and R. Iitsuka  
Tohoku University, JAPAN

**M19E**

**ROBUST HYBRIDIZATION OF NANOSTRUCTURED BURIED INTEGRATED OPTICAL WAVEGUIDE SYSTEMS WITH ON-CHIP FLUID HANDLING FOR CHEMICAL ANALYSIS**

K.B. Gylfason<sup>1</sup>, B. Sánchez<sup>2</sup>, A. Griol<sup>2</sup>, C.A. Barrios<sup>3</sup>, H. Sohlström<sup>1</sup>, M.J. Bañuls<sup>2</sup>, V. González-Pedro<sup>2</sup>, Á. Maquieira<sup>2</sup>, M. Holgado<sup>3</sup>, R. Casquei<sup>3</sup>, D. Hill<sup>2</sup>, and G. Stemme<sup>1</sup>  
<sup>1</sup>Royal Institute of Technology (KTH), SWEDEN, <sup>2</sup>Universidad Politécnica de Valencia, SPAIN, and <sup>3</sup>Universidad Politécnica de Madrid, SPAIN

**MEMS & NEMS Technologies**

Integration "Sample to Result" Systems

**M20E**

**A COMPACT MICROFLUIDIC SYSTEM WITH AN INTEGRATED OPTICAL SYSTEM FOR SINGLE-MOLECULE DETECTION VIA FLUORESCENCE RESONANCE ENERGY TRANSFER FOR REAL-TIME MOLECULAR ANALYSES**

J.M. Emory, Z. Peng, F. Crawford-Drake, P.-C. Chen, M.C. Murphy, and S.A. Soper  
Louisiana State University, USA

**M21E**

**CONTINUOUS MONITORING OF RARE WATERBORNE BACTERIA *VIA* DIELECTROPHORESIS-ENHANCED POLYMERASE CHAIN REACTION (DEPCR) DEVICE**

K. Hsieh, B.S. Ferguson, and H.T. Soh  
University of California, Santa Barbara, USA

**M22E**

**INTEGRATED MICROFLUIDIC CAPILLARY ELECTROPHORESIS SYSTEM FOR BIOCHEMICAL ANALYSIS ON MARS AS PART OF THE UREY INSTRUMENT**

P.A. Willis<sup>1</sup>, J.A. Smith<sup>1</sup>, F. Greer<sup>1</sup>, F.J. Grunthaler<sup>1</sup>, L. Epp<sup>1</sup>, D. Hoppe<sup>1</sup>, T.N. Chiesi<sup>2</sup>, R.A. Mathies<sup>2</sup>, J.J. Sprague<sup>3</sup>, and J.P. Rolland<sup>3</sup>  
<sup>1</sup>NASA Jet Propulsion Laboratory, USA, <sup>2</sup>University of California, Berkeley, USA, and <sup>3</sup>Liquidia Technologies Inc., USA

**M23E**

**LOW-COST, FULLY INTEGRATED LIQUID HANDLING PLATFORM FOR PROTEIN ASSAYS**

J. Nestler<sup>1</sup>, K. Hiller<sup>1</sup>, A. Morschhauser<sup>1</sup>, S. Bigot<sup>2</sup>, C. Griffiths<sup>2</sup>, J. Auerswald<sup>3</sup>, J. Gavillet<sup>4</sup>, G. Nonglaton<sup>4</sup>, T. Otto<sup>5</sup>, and T. Gessner<sup>1,5</sup>  
<sup>1</sup>Chemnitz University of Technology, GERMANY, <sup>2</sup>Cardiff University, UK, <sup>3</sup>CSEM, SWITZERLAND, <sup>4</sup>Commissariat à l'Energie Atomique (CEA), FRANCE, and <sup>5</sup>Fraunhofer Research Institution for Electronic Nano Systems (ENAS), GERMANY

**M24E**

**INTEGRATED MICROFLUIDIC ELECTROCHEMICAL DNA SENSOR (IMED)**

B.S. Ferguson, J.S. Swensen, K. Hsieh, and H.T. Soh  
University of California, Santa Barbara, USA

**M25E**

**RAPID POINT OF CARE (POC) BLOOD ANALYSIS USING INTEGRATED DYNAMIC BLOOD SEPARATION AND SANDWICH IMMUNOASSAY ON A POLYMER LAB CHIP**

A.W. Browne, W.Jung, K.K. Lee, S.H. Lee, J. Do, and C.H. Ahn  
University of Cincinnati, USA

## Applications

### Genomics & Proteomics

#### M1F

##### DEVELOPMENT OF APTAMER-BASED AFFINITY ASSAYS USING TEMPERATURE GRADIENT FOCUSING: MINIMIZATION OF THE LIMIT OF DETECTION

M.S. Munson, J.M. Meacham, D. Ross, and L.E. Locascio  
National Institute of Standards and Technology (NIST), USA

#### M2F

##### INTEGRATED ONE-STEP AND TWO-STEP GENE SYNTHESIS ON A CHIP

M.C. Huang, Y.K. Kuan, H. Ye, M.-H. Li, and J.Y. Ying  
Institute of Bioengineering and Nanotechnology, SINGAPORE

#### M3F

##### MICROCHIP INTEGRATED ROLLING CIRCLE AMPLIFICATION FOR SINGLE DNA MOLECULE DETECTION IN MINUTE SAMPLE VOLUMES

A. Tachihara<sup>1</sup>, K. Sato<sup>1</sup>, B. Renberg<sup>1</sup>, Y. Tanaka<sup>2</sup>, J. Jarvius<sup>2</sup>, M. Nilsson<sup>2</sup>, and T. Kitamori<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Uppsala University, SWEDEN

#### M4F

##### MICROFLUIDIC REVERSED PHASE COLUMN ARRAY FOR LIQUID CHROMATOGRAPHY - DUAL IONIZATION MODE MASS SPECTROMETRY SHOTGUN PROTEOMIC ANALYSIS

D.R. Knapp, J. Liu, R. Nayak, and D. Higbee  
Medical University of South Carolina, USA

#### M5F

##### NANOPILLAR CHIPS ARRANGED IN TILTED ARRAY PATTERN FOR FAST SEPARATION OF DNA AND PROTEINS

T. Yasui<sup>1</sup>, N. Kaji<sup>1</sup>, M. Reza Mohamadi<sup>2</sup>, R. Ogawa<sup>3</sup>, S. Hashioka<sup>3</sup>, M. Tokeshi<sup>1</sup>, Y. Horiike<sup>3</sup>, and Y. Baba<sup>1,4,5</sup>  
<sup>1</sup>Nagoya University, JAPAN, <sup>2</sup>Institut Curie, FRANCE, <sup>3</sup>National Institute for Materials Science, JAPAN, <sup>4</sup>National Institute for Advanced Industrial Science and Technology (AIST), JAPAN, and <sup>5</sup>Institute for Molecular Science, JAPAN

#### M6F

##### ON-LINE DETECTION OF PRION PROTEIN IN A MICROFLUIDIC CHIP

A. Le Nel<sup>1</sup>, C. Smadja<sup>2</sup>, J.-M. Peyrin<sup>3</sup>, J.-L. Viovy<sup>1</sup>, and M. Taverna<sup>2</sup>  
<sup>1</sup>Curie Institute, FRANCE, <sup>2</sup>University of Paris, Sud, FRANCE, and <sup>3</sup>CNRS-UMR7102, FRANCE

#### M7F

##### PARALLEL MONITORING OF SINGLE CELL RESPIRATION ACTIVITY BY USING MICROARRAYED OXYGEN SENSORS

M. Suzuki, T. Yamada, S. Kato, and Y. Iribe  
University of Toyama, JAPAN

#### M8F

##### REAL-TIME MONITORING OF CONFORMATIONAL TRANSITION OF DNA AT A SINGLE MOLECULE LEVEL IN MICROFLUIDIC DEVICES

K. Fujiyoshi<sup>1</sup>, N. Kaji<sup>1</sup>, M. Tokeshi<sup>1</sup>, and Y. Baba<sup>1,2</sup>  
<sup>1</sup>Nagoya University, JAPAN and <sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

#### M9F

##### SYNTHESIS OF SILICA MICROPARTICLES WITH STEP-EMULSIFICATION MICROFLUIDICS

V. Chokkalingam<sup>1</sup>, B. Weidenhof<sup>2</sup>, W.F. Maier<sup>2</sup>, S. Herminghaus<sup>1</sup>, and R. Seemann<sup>1,2</sup>  
<sup>1</sup>Max Planck Institute for Dynamics and Self-Organization, GERMANY and <sup>2</sup>Saarland University, GERMANY

## Applications

### Clinical Diagnostics

#### M10F

##### 96-IMMUNOASSAY DIGITAL MICROFLUIDIC MULTIWELL PLATE

R.S. Sista, A. Sudarsan, V. Srinivasan, A.E. Eckhardt, M.G. Pollack, and V.K. Pamula  
Advanced Liquid Logic Inc., USA

#### M11F

##### A VERSATILE PLATFORM FOR RAPID LABEL-FREE DETECTION OF PROTEINS AND SMALL MOLECULES USING MICROFABRICATED ELECTRODE ARRAYS

Y.-W. Huang, F.A. Shaikh, and V.M. Ugaz  
Texas A&M University, USA

#### M12F

##### ANALYSIS OF WHOLE BLOOD PLATELET TRANSLOCATION ON A VWF-COATED MICROFLUIDIC FLOW CHAMBER

B. Lincoln<sup>1</sup>, G. Meade<sup>2</sup>, N. Kent<sup>1</sup>, L. Basabe-Desmonts<sup>1</sup>, D. Kenny<sup>2</sup>, A.J. Ricco<sup>1</sup>, and L.P. Lee<sup>1,3</sup>  
<sup>1</sup>Dublin City University, IRELAND, <sup>2</sup>Royal College of Surgeons in Ireland, IRELAND, and <sup>3</sup>University of California, Berkeley, USA

#### M13F

##### CELLSCOPE: MOBILE MICROSCOPY FOR SINGLE CELL ANALYSIS

D.N. Breslauer<sup>1</sup>, R.N. Maamari<sup>1</sup>, W. Lam<sup>2</sup>, T. Hunt<sup>1</sup>, L.P. Lee<sup>1</sup>, and D.A. Fletcher<sup>1</sup>  
<sup>1</sup>University of California, Berkeley, USA and <sup>2</sup>University of California, San Francisco, USA

#### M14F

##### HIGH PERFORMANCE ACETYLCHOLINE BIOSENSOR USING CHARGE TRANSFER TECHNIQUE

S.-R. Lee<sup>1</sup>, K. Sawada<sup>1</sup>, H. Takao<sup>1</sup>, M. Ishida<sup>1</sup>, and H.D. Seo<sup>2</sup>  
<sup>1</sup>Toyohashi University of Technology, JAPAN and <sup>2</sup>Yeungnam University, JAPAN

#### M15F

##### LAB-ON-A-DISC FOR SIMULTANEOUS ANALYSIS OF BLOOD CHEMISTRY AND IMMUNOASSAY

Y.-K. Cho<sup>1</sup>, J.-M. Park<sup>2</sup>, B.-S. Lee<sup>2</sup>, S. Kim<sup>2</sup>, and J.-G. Lee<sup>2</sup>  
<sup>1</sup>Ulsan National Institute of Science and Technology (UNIST), KOREA and <sup>2</sup>Samsung Advanced Institute of Technology (SAIT), KOREA

#### M16F

##### MICROFLUIDIC ENUMERATION PROTOCOL FOR COMPREHENSIVE PROFILING OF NUCLEATED CELLS IN MILD PHENOTYPE SICKLE CELL DISEASE (SCD)

W.N. White, A. Raj, M.D. Nguyen, S.J. Bertolone, and P. Sethu  
University of Louisville, USA

#### M17F

##### PORTABLE MICROELISA SYSTEM FOR TOXICOLOGICAL HAIR ANALYSIS

T. Ohashi<sup>1</sup>, H. Miyaguchi<sup>2</sup>, H. Takahashi<sup>1</sup>, K. Mawatari<sup>1</sup>, Y.T. Iwata<sup>2</sup>, H. Inoue<sup>2</sup>, and T. Kitamori<sup>1,3</sup>  
<sup>1</sup>Kanagawa Academy of Science and Technology, JAPAN, <sup>2</sup>National Research Institute of Police Science, JAPAN, and <sup>3</sup>University of Tokyo, JAPAN

#### M18F

##### ON-CHIP SURFACE PLASMON RESONANCE MEASUREMENT OF DISEASE MARKER PROTEIN AND SMALL METABOLITE COMBINED WITH IMMUNO AND ENZYMIC REACTIONS

K. Nakamoto<sup>1,2</sup>, N. Sekioka<sup>1,2</sup>, R. Kurita<sup>2</sup>, and O. Niwa<sup>1,2</sup>  
<sup>1</sup>University of Tsukuba, JAPAN and <sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

## Applications

### Microarrays

#### M19F

##### DYNAMIC MICROFLUIDIC DEVICES WITH NANOCANNELS FOR THE ARRAY OF 1MICRON-SIZED OBJECTS

K. Iwai, N. Misawa, and S. Takeuchi  
University of Tokyo, JAPAN

#### M20F

##### HIGHLY EFFICIENT SINGLE CELL CAPTURING IN MICROWELL ARRAY USING HYDRODYNAMIC GUIDING STRUCTURES

J. Chung<sup>1</sup>, Y.-J. Kim<sup>1</sup>, I.-J. Cho<sup>2</sup>, and E. Yoon<sup>2</sup>  
<sup>1</sup>University of Minnesota, USA and <sup>2</sup>University of Michigan, USA

#### M21F

##### MICROFLUIDIC PROCESSING OF DIAGNOSTIC AND COMMERCIAL DNA MICROARRAYS

J. Petersen<sup>1</sup>, L. Poulsen<sup>2</sup>, L.B. Moller<sup>3</sup>, H.S. Birgens<sup>1</sup>, and M. Dufva<sup>2</sup>  
<sup>1</sup>Copenhagen University Hospital, DENMARK, <sup>2</sup>Technical University of Denmark, DENMARK, and <sup>3</sup>Kennedy Center, DENMARK

**M22F**

**SEQUENTIALLY ADDRESSABLE TWO-DIMENSIONAL MICROWELL ARRAY FOR HIGH-THROUGHPUT SINGLE CELL-BASED ASSAY**

Y.-J. Kim<sup>1</sup>, H.-K. Lee<sup>2</sup>, J. Chung<sup>1</sup>, I.-J. Cho<sup>3</sup>, and E. Yoon<sup>1,3</sup>

<sup>1</sup>University of Minnesota, USA, <sup>2</sup>Seagate Technology, USA, and <sup>3</sup>University of Michigan, USA

**Applications**  
Separation Science

**M23F**

**DEVELOPMENT OF A MICROFLUIDIC SOUTHERN HYBRIDIZATION ANALYSIS SYSTEM**

K. Sato<sup>1,2</sup>, H. Harada<sup>1</sup>, Y. Sakamoto<sup>1</sup>, and E. Yoshimura<sup>1</sup>

<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Japan Science and Technology Agency, JAPAN

**M24F**

**HIGH PERFORMANCE MULTIPLE BIOMOLECULES SORTING SYSTEM**

K. Ozaki<sup>1</sup>, H. Sugino<sup>2</sup>, T. Arakawa<sup>1,2</sup>, Y. Shirasaki<sup>3</sup>, T. Funatsu<sup>2</sup>, and S. Shoji<sup>1</sup>

<sup>1</sup>Waseda University, JAPAN, <sup>2</sup>University of Tokyo, JAPAN, and <sup>3</sup>KAZUSA DNA Research Institute, JAPAN

**M25F**

**MICROFLUIDIC PROTEIN SEPARATION BY FREE FLOW ISOELECTRIC FOCUSING**

J. Wen, J. Albrecht, E.W. Wilker, M.B. Yaffe, and K.F. Jensen

Massachusetts Institute of Technology, USA

**M26F**

**QUANTITATIVE EVALUATION OF DYNAMIC COATING ON PLASTIC MICROCHIPS FOR PREVENTING PROTEIN ADSORPTION**

M.R. Mohamadi<sup>1</sup>, T. Yasui<sup>2</sup>, N. Kaji<sup>2</sup>, M. Tokeshi<sup>2</sup>, and Y. Baba<sup>2</sup>

<sup>1</sup>Institut Curie, FRANCE and <sup>2</sup>Nagoya University, JAPAN

**M27F**

**SPINTRONIC DEVICE FOR CELL/MAGNETIC PARTICLE SORTING AND COUNTING**

J. Loureiro<sup>1,2</sup>, R. Ferreira<sup>1,2</sup>, S. Cardoso<sup>1,2</sup>, J. Germano<sup>1,3</sup>, D. Snakenborg<sup>4</sup>, J.M.S. Cabral<sup>2,5</sup>, and P.P. Freitas<sup>1,2</sup>

<sup>1</sup>Universidade Técnica de Lisboa, PORTUGAL,

<sup>2</sup>Instituto Superior Técnico (IST), PORTUGAL, <sup>3</sup>INESC-Investigação e Desenvolvimento, PORTUGAL,

<sup>4</sup>Technical University of Denmark, DENMARK, and

<sup>5</sup>IBB- Institute for Biotechnology and Bioengineering, PORTUGAL

**Applications**  
Cell Handling & Analysis

**M28F**

**4D IMAGING OF INTRACELLULAR RESPONSE TO LOCALIZED STIMULUS ON TISSUE-MIMICKING MICRODEVICE**

K. Terao<sup>1</sup>, A. Okonogi<sup>1</sup>, T. Okitsu<sup>2</sup>, T. Suzuki<sup>3</sup>, M. Washizu<sup>4</sup>, and H. Kotera<sup>2</sup>

<sup>1</sup>Kyoto University, JAPAN, <sup>2</sup>Kyoto University Hospital, JAPAN, and <sup>3</sup>Kagawa University, JAPAN, and

<sup>4</sup>University of Tokyo, JAPAN

**M29F**

**A MICRO CELL CHIP INTEGRATED WITH A CAPACITIVE PRESSURE SENSOR ARRAY FOR THE STUDY OF STIMULATION EFFECT ON THE STEM CELL DIFFERENTIATION**

W.-Y. Sim, S.-W. Lee<sup>1</sup>, S.-W. Park<sup>1</sup>, S.-S. Yang<sup>1</sup>, S.-H. Park<sup>2</sup>, and B.-H. Min<sup>1</sup>

<sup>1</sup>Ajou University, KOREA and <sup>2</sup>Tufts University, USA

**M30F**

**A MULTIPLE RECORDING PATCH CLAMP CHIP WITH INTEGRATED SUBTERRANEAN MICROFLUIDIC CHANNELS FOR CULTURED NEURONAL NETWORKS**

C. Py<sup>1</sup>, G. Mealing<sup>1</sup>, M. Denhoff<sup>1</sup>, A. Charrier<sup>2</sup>, R. Monette<sup>1</sup>, T. Comas<sup>1</sup>, T. Ahuja<sup>1</sup>, D. Martinez<sup>1</sup>, A. Krantis<sup>3</sup>, and S. Wingar<sup>1</sup>

<sup>1</sup>National Research Council, CANADA,

<sup>2</sup>Centre National de la Recherche Scientifique (CNRS), FRANCE, and

<sup>3</sup>University of Ottawa, CANADA

**M31F**

**A NOVEL VERSATILE BIOMECHANO SENSOR FOR REAL TIME VASCULAR CELL CONTRACTILITY MAPPING**

X. Zheng<sup>1</sup>, H. Surks<sup>2</sup>, and X. Zhang<sup>1</sup>

<sup>1</sup>Boston University, USA and <sup>2</sup>Tufts Medical School, USA

**M32F**

**ANALYSIS OF BACTERIAL CHEMOTAXIS USING MICROFLUIDIC CONTACTING**

S.-H. Lee<sup>1</sup>, H.-E. Kim<sup>2</sup>, C.-S. Lee<sup>2</sup>, and H. Kang<sup>1</sup>

<sup>1</sup>Korea Institute of Industrial Technology (KITECH), KOREA and

<sup>2</sup>Chungnam National University, KOREA

**M33F**

**BIOLOGICAL VALIDATION OF HIGH THROUGHPUT MICROCHANNEL CULTURE**

J.P. Puccinelli, A.L. Paguirigan, and D.J. Beebe

University of Wisconsin, USA

**M34F**

**CELL TRAPPING PLATFORM TOWARDS A PATCH-CLAMP MICROCHANNEL ARRAY**

M. Alberti, D. Snakenborg, and J.P. Kutter

Technical University of Denmark (DTU), DENMARK

**M35F**

**CONTROL OF 3D COLLAGEN MATRIX POLYMERIZATION FOR HUMAN MAMMARY FIBROBLAST (HMF) CULTURE**

K.E. Sung<sup>1</sup>, G. Su<sup>1</sup>, A. Friedl<sup>1,2</sup>, and D.J. Beebe<sup>1</sup>

<sup>1</sup>University of Wisconsin, USA and <sup>2</sup>Department of Veteran Affairs Medical Center, USA

**M36F**

**DEVELOPMENT OF MICROFLUIDIC CHIP-BASED ALGINATE MICROTUBE FOR ANGIOGENESIS**

S.J. Shin, K.H. Lee, and S.H. Lee

Korea University, KOREA

**M37F**

**DROPLET-BASED MICROFLUIDIC SYSTEM FOR ENCAPSULATION AND CULTURE OF NEURON CELLS IN MICRO-GEL-PARTICLES**

S. Long<sup>1</sup>, D.P. Desai<sup>1</sup>, K. Kumar<sup>1</sup>, C.-C. Chen<sup>1,2</sup>, P. Ingram<sup>1</sup>, C.E. Schmidt<sup>1</sup>, and X. Zhang<sup>1</sup>

<sup>1</sup>University of Texas, Austin, USA and <sup>2</sup>Industrial Technology Research Institute, TAIWAN

**M38F**

**AN INTEGRATED MICROFLUIDIC FISH CHIP: ENUMERATING CHROMOSOMES ON A CELL-BY-CELL BASIS IN LESS THAN 1 HOUR**

V.J. Sieben, C.S. Debes-Marun, L.M. Pilarski, and C.J. Backhouse

University of Alberta, CANADA

**M39F**

**FLEXIBLE AND AUTOMATED MICROFLUIDIC PICOLITER DROPLET SYSTEM FOR SINGLE CELL ANALYSIS**

S.-Q. Gu, W.-B. Du, and Q. Fang

Zhejiang University, CHINA

**M40F**

**HIGH FREQUENCY CHEMICAL STIMULATION OF LIVING DICTYOSTELIUM DISCOIDEUM CELLS**

J.-C. Galas, S. Dorent, D. Bartolo, and V. Studer

Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE

**M41F**

**HIGH-YIELD PARALLEL ELECTRO-FUSION DEVICE BASED ON FIELD CONSTRICTION AT AN ORIFICE ARRAY**

Y. Kimura<sup>1,2</sup>, M. Gel<sup>1</sup>, B. Techaumnut<sup>2</sup>, K. Tsuda<sup>1</sup>, H. Oana<sup>1,2</sup>, H. Kotera<sup>2,4</sup>, T. Tada<sup>2,4</sup>, and M. Washizu<sup>1,2</sup>

<sup>1</sup>University of Tokyo, JAPAN, <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN,

<sup>3</sup>Chulalongkorn University, THAILAND, and <sup>4</sup>Kyoto University, JAPAN

**M42F**

**INVESTIGATING THE POROSITY OF TRABECULAR MESHWORK USING MICROFABRICATED STRUCTURES FOR GLAUCOMA TREATMENTS**

S.W. Price, B. Kim, C.J. Roberts, D.M. Grzybowski and Y. Zhao

Ohio State University, USA

**M43F**

**MICROCHIP ANALYSIS OF CELLULAR RESPIRATORY ACTIVITY ON PDMS MEMBRANE HAVING GAS PERMELECTIVE PROPERTY**

T. Shirai<sup>1</sup>, T. Sakata<sup>1</sup>, M. Takai<sup>1</sup>, Y. Miyahara<sup>1,2</sup>, and K. Ishihara<sup>1</sup>

<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>National Institute for Material Science, JAPAN

**M44F****MICROFLUIDIC APOPTOSIS CHIP FOR DRUG SCREENING TO IMPROVE AND PERSONALIZE CANCER THERAPY**F. Wolbers<sup>1</sup>, H.R. Franke<sup>2</sup>, H. Andersson-Svahn<sup>3</sup>, I. Vermes<sup>2</sup>, and A. van den Berg<sup>1</sup><sup>1</sup>MESA+, University of Twente, THE NETHERLANDS, <sup>2</sup>Medisch Spectrum Twente, THE NETHERLANDS, and <sup>3</sup>Royal Institute of Technology (KTH), SWEDEN**M45F****MICROFLUIDIC MAGNETIC CELL SORTING SYSTEM FOR CANCER DIAGNOSIS**L. Saïas<sup>1</sup>, A.-E. Saliba<sup>1</sup>, J.-Y. Pierga<sup>1</sup>, P. Vielh<sup>2</sup>, F. Farace<sup>2</sup>, and J.-L. Viovy<sup>1</sup><sup>1</sup>Institut Curie, FRANCE and <sup>2</sup>Institut Gustave Roussy, FRANCE**M46F****MICROFLUIDIC TECHNOLOGIES FOR SINGLE CELL GENETIC AND EXPRESSION ANALYSIS**

Y. Zeng, P. Kumaresan, N.M. Toriello, E.S. Douglas, C.J. Yang, R.G. Blazej, S.A. Cronier, N. Thairong, S.C.H. Hsiao, M.B. Francis, C.R. Bertozzi, and R.A. Mathies

University of California, Berkeley, USA

**M47F****A MICROFLUIDIC-BASED PLATE SYSTEM FOR CELL BASED ASSAYS WITH REDUCED CELL USAGE AND INTEGRATED COMPOUND DILUTION**C. Park<sup>1</sup>, I. Kazakova<sup>1</sup>, J. Kim<sup>1</sup>, J. Farinas<sup>1</sup>, A. Chow<sup>1</sup>, and P. Tagari<sup>2</sup><sup>1</sup>Caliper Life Sciences, USA and <sup>2</sup>Amgen, USA**M48F****MICROVALVE-ASSISTED PATTERNING PLATFORM FOR 3D CELL CULTURE AND IN SITU CELL-BASED ASSAYS**

M.S. Kim and J.-K. Park

Korea Advanced Institute of Science and Technology (KAIST), KOREA

**M49F****ON-CHIP CO<sub>2</sub> CONTROL FOR MICROFLUIDIC CELL CULTURE**S.P. Forry<sup>1</sup>, A. Tona<sup>1</sup>, P.C. Thomas<sup>1,2</sup>, and L.E. Locascio<sup>1</sup><sup>1</sup>National Institute of Standards and Technology (NIST), USA and <sup>2</sup>University of Maryland, USA**M50F****ORGANIZING COMPLEX MULTICELLULAR CONSTRUCTS USING STENCIL-DELINEATED ELECTROACTIVE PATTERNING (S-DEP)**

S. Sampattavanich, B.M. Taff, S. Desai, and J. Voldman

Massachusetts Institute of Technology, USA

**M51F****PATTERNING ADHERENT CELLS WITHIN MICROCHANNELS BY COMBINATION OF ELECTROCHEMICAL BIOLITHOGRAPHY AND DIELECTROPHORESIS**

H. Kaji, M. Hashimoto, and M. Nishizawa

Tohoku University, JAPAN

**M52F****REAL-TIME MONITORING GLUCOSE UTILIZATION IN SINGLE CELL USING A CELL CULTURE CHIP WITH AN EMBEDDED DETECTOR**Z.T.F. Yu<sup>1</sup>, N.T. Vu<sup>1</sup>, K. Kamei<sup>1</sup>, C.Y.N. Chang<sup>1</sup>, R.W. Silverman<sup>1</sup>, R. Farrell<sup>2</sup>, K.S. Shah<sup>2</sup>, M.E. Phelps<sup>1</sup>, C.G. Radu<sup>1</sup>, A.F. Chatzioannou<sup>1</sup>, and H.-R. Tseng<sup>1</sup><sup>1</sup>University of California, Los Angeles, USA and <sup>2</sup>Radiation Monitoring Devices Inc., USA**M53F****PCR AMPLIFICATION AND GENETIC ANALYSIS IN A MICROWELL CELL CULTIVATION CHIP**

S. Lindström, M. Hammond, J. Gantelius, A. Ahmadian, and H. Andersson-Svahn

Royal Institute of Technology (KTH), SWEDEN

**M54F****STRETCHABLE SUBSTRATES USING PNEUMATIC ACTUATORS FOR MONITORING MECHANICAL-STRESS-DEPENDENT CELL RESPONSE**

Y.J. Heo, E. Iwase, K. Matsumoto, and I. Shimoyama

University of Tokyo, JAPAN

**M55F****SURFACE PROTEIN PATTERNING FOR AXON GUIDANCE AND NEURAL MATURATION**P. Björk<sup>1,2</sup>, S. Khalifa<sup>2</sup>, T. Schönberg<sup>1</sup>, B. Kostyszyn<sup>2</sup>, P. Linderholm<sup>1,2</sup>, A. Magnusson<sup>2</sup>, A. Erlandsson<sup>2</sup>, E. Scarfone<sup>2,3</sup>, C. Vieider<sup>1</sup>, and M. Ulfendahl<sup>2</sup><sup>1</sup>Acreo AB, SWEDEN, <sup>2</sup>Karolinska Institute, SWEDEN, and <sup>3</sup>CNRS, FRANCE**M56F****THE VIABILITY ENHANCEMENT OF ENCAPSULATED CELLS IN ALGINATE BEADS USING HYDRODYNAMIC REMOVAL OF TOXIC OLEIC ACID**C. Kim<sup>1,2</sup>, K.S. Lee<sup>3</sup>, E. Kang<sup>1</sup>, J.H. Kim<sup>1</sup>, K.J. Lee<sup>2</sup>, S.H. Kim<sup>4</sup>, T.S. Kim<sup>1</sup>, and J.Y. Kang<sup>1</sup><sup>1</sup>Korea Institute of Science and Technology (KIST), KOREA, <sup>2</sup>Korea University, KOREA, <sup>3</sup>State University of New York, Buffalo, USA, and <sup>4</sup>Kyungwon University, KOREA**Applications**  
Drug Discovery**M57F****DEVELOPMENT OF A MICRO TOTAL BIOASSAY SYSTEM MIMICKING THE HUMAN BODY FOR ORAL MEDICINES**

Y. Imura, E. Yoshimura, and K. Sato

University of Tokyo, JAPAN

**M58F****MICROFLUIDIC CHIP-BASED IN VIVO-LIKE DRUG PERMEABILITY ASSAY SYSTEM**

J.H. Yeon and J.-K. Park

Korea Advanced Institute of Science and Technology (KAIST), KOREA

**M59F****POLYMER-BASED DENSE FLUIDIC NETWORKS FOR HIGH THROUGHPUT SCREENING (HTS) WITH ULTRASENSITIVE FLUORESCENCE**

P.I. Okagbare, J. Gottert, P. Datta, V. Singh, and S.A. Soper

Louisiana State University, USA

**Applications**  
Environmental**M60F****BIOLUMINESCENT WHOLE-CELL BIOSENSOR FOR ON-LINE WATER TOXICITY DETECTION**R. Almog<sup>1</sup>, R. Daniel<sup>1</sup>, S. Yagur-kroll<sup>2</sup>, T. Elad<sup>2</sup>, S. Melamed<sup>2</sup>, S. Belkin<sup>2</sup>, and Y. Shacham-Diamond<sup>1</sup><sup>1</sup>Tel-Aviv University, ISRAEL and <sup>2</sup>Hebrew University of Jerusalem, ISRAEL**M61F****MONITORING OF PHOSPHATE LEVELS IN WASTEWATER USING AN AUTONOMOUS MICROFLUIDIC SENSOR**J. Cleary<sup>1</sup>, C. Slater<sup>1</sup>, D. Kim<sup>1</sup>, W.S. Yerezunis<sup>2</sup>, and D. Diamond<sup>1</sup><sup>1</sup>Dublin City University, IRELAND and <sup>2</sup>Mitsubishi Electric Research Laboratories, USA**Applications**  
Chemical Synthesis**M62F****APPLICATION OF A MICROFLUIDIC DROPLET MIXER FOR [<sup>18</sup>F]FLUORINE LABELING OF BIOMOLECULES FOR POSITRON EMISSION TOMOGRAPHY**

S. Olma, K. Liu, Y.-C. Chen, H.R. Tseng, R.M. van Dam, and C.K.F. Shen

University of California, Los Angeles, USA

**M63F****MULTI-STEP PARALLEL PROCESSING ON A CHIP FOR ENZYMATIC REACTIONS**J.Y. Yun<sup>1</sup>, D. Kim<sup>1,2</sup>, S. Jambovane<sup>1</sup>, and J.W. Hong<sup>1</sup><sup>1</sup>Auburn University, USA and <sup>2</sup>Korea Institute of Machinery and Materials (KIMM), KOREA**M64F****PREPARATION AND CHARACTERIZATION OF MICROCAPSULES CONTAINING FLUORESCENT NANOPARTICLES SENSITIVE TO ORGANIC SOLVENT**M.J. Kim<sup>1</sup>, J.C. Park<sup>1</sup>, J.M. Cha<sup>1</sup>, D.G. Won<sup>1</sup>, T. Arakawa<sup>2</sup>, S. Shoji<sup>2</sup>, and J.S. Go<sup>1</sup><sup>1</sup>Pusan National University, KOREA and <sup>2</sup>Waseda University, JAPAN

**Applications**

**M65F**

**A MICROFLUIDIC PLATFORM FOR FOCAL CHEMICAL STIMULATION OF CELLS**

G. Mallén-Ornelas, L. Chang, P.Y. Li, T. Hoang, L.J. Ho, K. Swertfager, and E. Meng  
*University of Southern California, USA*

**M66F**

**BRAIN INTERFACE DEVICE FOR LONG-TERM OBSERVATION OF NEURAL CELLS IN VIVO USING 2-PHOTON LASER SCANNING MICROSCOPY**

H. Takehara, A. Nagaoka, J. Noguchi, T. Akagi, H. Kasai, and T. Ichiki  
*University of Tokyo, JAPAN*

**M67F**

**DESIGN AND PERFORMANCE OF A RAPID, NANOLITER, CONTINUOUS FLOW POLYMERASE CHAIN REACTOR FOR A HIGH THROUGHPUT MICROSYSTEM**

P.C. Chen<sup>1</sup>, D.S. Park<sup>1</sup>, B.H. You<sup>1</sup>, N. Kim<sup>1</sup>, T. Park<sup>1</sup>, P. Datta<sup>1</sup>, Y. Desata<sup>2</sup>, S.A. Soper<sup>1</sup>, D.E. Nikitopoulos<sup>1</sup>, and M.C. Murphy<sup>1</sup>

<sup>1</sup>*Louisiana State University, USA* and <sup>2</sup>*BioFluidica Microtechnologies, USA*

**M68F**

**LAB-ON-A-CHIP FOR LABEL-FREE MULTIDETECTION OF RESIDUAL ANTIBIOTICS IN MILK**

Y.-H. Jin<sup>1</sup>, G. Suárez<sup>2</sup>, S. Berchtold<sup>2</sup>, J. Auerswald<sup>2</sup>, J.-M. Diserens<sup>3</sup>, A Sayah<sup>1</sup>, Y. Leterrier<sup>1</sup>, J.-A.E. Manson<sup>1</sup>, and G. Voirin<sup>2</sup>

<sup>1</sup>*Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND,*

<sup>2</sup>*Centre Suisse d'Electronique et de Microtechnique, SWITZERLAND,* and

<sup>3</sup>*Nestlé Research Center, SWITZERLAND*

**M69F**

**MICROFLUIDIC CO-CULTURE PLATFORM FOR CNS AXON MYELINATION**

J. Park, H. Koito, J. Li, and A. Han

*Texas A&M University, USA*

**M70F**

**QUANTITATIVE PHENOTYPING OF C.ELEGANS BEHAVIOR IN AN AUTOMATED MICROSYSTEM**

G. Cremona, J. Stirman, and H. Lu

*Georgia Institute of Technology, USA*

**M71F**

**SPONTANEOUS FORMATION OF POLYMER VESICLES FROM MICRODROPLETS OF POLYION COMPLEX VIA MICROPHASE SEPARATION**

H. Oana<sup>1</sup>, K. Yonehara<sup>1,2</sup>, A. Kishimura<sup>1</sup>, Y. Yamasaki<sup>1,2</sup>, K. Kataoka<sup>1,2</sup>, and M. Washizu<sup>1,2</sup>

<sup>1</sup>*University of Tokyo, JAPAN* and <sup>2</sup>*Japan Science and Technology Agency (JST), JAPAN*

**Grand Ballroom A-B**

**Grand Ballroom C**

**Session 1A3**

Tools for Nucleic Acid Research and Discovery

**Session 1B3**

Mapping and Imaging

**16:20 - 16:40**

**DNA SEQUENCING BY LIGATION ON SURFACE-BOUND BEADS IN A MICROCHANNEL ENVIRONMENT**

C.R. Forest, A.M. Rosenbaum, and G.M. Church  
*Harvard University, USA*

**QUANTITATIVE EVALUATION OF PATTERNED SELF-ASSEMBLED MONOLAYERS BY COLOR IMAGING OF ZETA-POTENTIAL OBTAINED FROM TWO-COLOR FLUORESCENCE AND EVANESCENT WAVE ILLUMINATION**

Y. Kazoe, S. Miyakawa, N. Miki, and Y. Sato  
*Keio University, JAPAN*

**16:40 - 17:00**

**MICROFLUIDIC DARWINIAN EVOLUTION**

B.M. Paegel and G.F. Joyce  
*Scripps Research Institute, USA*

**THREE-DIMENSIONAL IN SITU TEMPERATURE MEASUREMENT IN MICROFLUIDIC SYSTEM USING BROWNIAN MOTION OF NANOPARTICLES**

K. Chung, J. Cho, L. Cheplen, V. Breedveld, and H. Lu  
*Georgia Institute of Technology, USA*

**17:00 - 17:20**

**INTEGRATED NASBA ARRAY FOR DRUG SCREENING AND EXPRESSION PROFILING**

I.K. Dimov<sup>1</sup> and L.P. Lee<sup>1,2</sup>  
<sup>1</sup>*Biomedical Diagnostics Institute, IRELAND* and <sup>2</sup>*University of California, Berkeley, USA*

**NOVEL APPROACH FOR 3D LIVE CELL FLUORESCENCE MICROSCOPY BASED ON MICROFABRICATED MIRRORS**

H. Hajjoui<sup>1</sup>, J. Girard<sup>1</sup>, M. Dilhan<sup>1</sup>, S. Kocanova<sup>2</sup>, K. Bystrycky<sup>2</sup>, and A. Bancaud<sup>1</sup>  
<sup>1</sup>*Centre National de la Recherche Scientifique (CNRS)-LAAS, FRANCE* and  
<sup>2</sup>*Centre National de la Recherche Scientifique (CNRS)-LBME, FRANCE*

17:20 **Adjourn for the Day**

## Tuesday, October 14, 2008

08:00 - 08:40

**Plenary III**CELLS AND TISSUES ON A DEVICE: SHOWCASING THEIR INTEGRATIVE DYNAMICS *IN VITRO*

T. Fujii

University of Tokyo, JAPAN

**Grand Ballroom A-B****Grand Ballroom C****Session 2A1**

Fluidic Design and Assembly

**Session 2B1**

Channels, Tubes and Pores on the Nanoscale

08:55 - 09:15

**ADVANCES TOWARDS PROGRAMMABLE MATTER**M.T. Tolley, M. Krishnan, H. Lipson, and D. Erickson  
Cornell University, USA**STOCHASTIC SENSING USING CHEMICALLY MODIFIED SOLID-STATE NANOPORES**A.L.R. Holland, L.D. Menard, and J.M. Ramsey  
University of North Carolina, Chapel Hill, USA

09:15 - 09:35

**FABRICATION AND HETEROGENOUS ASSEMBLY OF MICROGEL ARRAY USING RAILED MICROFLUIDICS**W. Park, S. Shin, S.-H. Lee, S.E. Choi, and S. Kwon  
Seoul National University, KOREA**INTEGRATION OF CARBON NANOTUBES IN ELECTROKINETIC SEPARATION DEVICES**K.B. Mogensen<sup>1</sup>, L. Gangloff<sup>2</sup>, P. Boggild<sup>1</sup>, K.B.K. Teo<sup>2</sup>, W.I. Milne<sup>2</sup>, and J.P. Kutter<sup>1</sup>  
<sup>1</sup>Technical University of Denmark (DTU), DENMARK and <sup>2</sup>University of Cambridge, UK

09:35 - 09:55

**MICROFLUIDICS-BASED LITHOGRAPHY FOR FABRICATING CERAMIC AND CELL-LADEN MICROPARTICLES**P. Panda<sup>1</sup>, R.E. Shepherd<sup>2</sup>, Z. Bao<sup>3</sup>, S. Ali<sup>4</sup>, E. Lo<sup>4</sup>, B.G. Chung<sup>4</sup>, K.H. Sandhage<sup>3</sup>, J.A. Lewis<sup>2</sup>, A. Khademhosseini<sup>4</sup>, T.A. Hatton<sup>1</sup>, and P.S. Doyle<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, USA, <sup>2</sup>University of Illinois, Urbana-Champaign, USA, <sup>3</sup>Georgia Institute of Technology, USA, and <sup>4</sup>Harvard-MIT Division of Health Sciences, USA**POLARIZATION ANISOTROPY OF DNA IN NANOCHANNELS**F. Persson<sup>1</sup>, F. Westerlund<sup>2</sup>, J.O. Tegenfeldt<sup>3</sup>, and A. Kristensen<sup>1</sup><sup>1</sup>Technical University of Denmark (DTU), DENMARK, <sup>2</sup>Copenhagen University, DENMARK, and <sup>3</sup>Lund University, SWEDEN

09:55 - 10:25

Break &amp; Exhibit Inspection

**Grand Ballroom A-B****Grand Ballroom C****Session 2A2**

Microfluidic Cell Signaling and Response

**Session 2B2**

Fluid Circuits

10:25 - 10:45

**FLOW-THROUGH CHIP FOR SEQUENTIAL TREATMENT AND ANALYTE ELUTION FROM BEADS OR CELLS**P. Augustsson, T. Laurell, and S. Ekström  
Lund University, SWEDEN**CHANNEL SWITCHING AND CROSS-T INJECTION WITHOUT EXTERNALLY ACTIVATED VALVES**D.C. Leslie<sup>1</sup>, E. Seker<sup>1</sup>, C.J. Easley<sup>2</sup>, J.P. Landers<sup>1</sup>, M. Utz<sup>1</sup>, and M.R. Begley<sup>1</sup>  
<sup>1</sup>University of Virginia, USA and <sup>2</sup>Vanderbilt University, USA

10:45 - 11:05

**MICROFLUIDIC TEMPORAL CELL STIMULATION**N. Andrew<sup>1</sup>, D. Craig<sup>2</sup>, J.P. Urbanski<sup>1</sup>, J. Gunawardena<sup>1</sup>, and T. Thorsen<sup>2</sup>  
<sup>1</sup>Harvard University, USA and <sup>2</sup>Massachusetts Institute of Technology, USA**MULTIPLEXED PNEUMATIC VALVE CONTROL SYSTEM FOR LARGE SCALE INTEGRATED MICROFLUIDIC CIRCUIT (LSIMC)**K. Kawai<sup>1</sup>, Y. Shibata<sup>1</sup>, M. Kanai<sup>2</sup>, and S. Shoji<sup>1</sup>  
<sup>1</sup>Waseda University, JAPAN and <sup>2</sup>Shimadzu Corporation, JAPAN

11:05 - 11:25

**MICROFLUIDIC CONTROL OF STEM CELL DIFFUSIBLE SIGNALING**K. Blagovic, L.Y. Kim, A.M. Skelley, and J. Voldman  
Massachusetts Institute of Technology, USA**A TERNARY MICROFLUIDIC MULTIPLEXER USING DIFFERENT THRESHOLD PRESSURE VALVES**D.W. Lee and Y.-H. Cho  
Korea Advanced Institute of Science and Technology (KAIST), KOREA

11:25 – 12:40 | Lunch & Exhibit Inspection

12:40 - 13:20 | **Plenary IV**  
**MINIATURIZING THE LABORATORY IN EMULSION DROPLETS**  
 A. Griffiths  
*Institut de Science et d'Ingenierie Supramoleculaires, FRANCE*

13:20 - 15:40 | **Poster Session II**

**Microfluidics**  
 Fluid Mechanics & Modeling

**T1A**  
**A METHOD FOR SIMULATING DNA ELECTROPHORESIS IN ELECTRICALLY INSULATING MICROFLUIDIC AND NANOFUIDIC GEOMETRIES**  
 J. Cho and K.D. Dorfman  
*University of Minnesota, USA*

**T2A**  
**FLUID-PARAMETER-INDEPENDENT MICRO-FLUIDIC DEVICE FOR RELIABLE GENERATION OF MULTI-COMPONENT DROPLETS**  
 K. Liu, Y.-C. Chen, H.-R. Tseng, C.K.-F. Shen, and R.M. van Dam  
*University of California, Los Angeles, USA*

**T3A**  
**MEASURING METHOD OF ELECTROSMOTIC FLOW VELOCITY AND ELECTRIC FIELD DISTRIBUTIONS USING MICRO-PIV**  
 K. Tatsumi, K. Fukuda, Y. Katsumoto, and K. Nakabe  
*Kyoto University, JAPAN*

**T4A**  
**MULTIMODE COMPUTATIONAL MODELS OF ISOTACHOPHORETIC SAMPLE CONCENTRATION COMBINED WITH BINDING REACTION KINETICS**  
 L. Bousse, C. Li, T. Kawabata, and G. Wada  
*Wako Pure Chemical Industries, USA*

**T5A**  
**THERMALLY INDUCED DEFLECTION OF MICROJETTS**  
 K.M. Vaeth, J. Grace, E. Furlani, and K. Ng  
*Eastman Kodak Company, USA*

**T6A**  
**THREE-DIMENSIONAL VISUALIZATION OF MICROSCOPIC FLUIDIC STRUCTURES FORMED IN VISCOELASTIC FLUID FLOW**  
 H. Kinoshita<sup>1</sup>, F.-C. Li<sup>2</sup>, N. Oshima<sup>3</sup>, M. Oshima<sup>1</sup>, and T. Fujii<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN, <sup>2</sup>Harbin Institute of Technology, CHINA, and <sup>3</sup>Hokkaido University, JAPAN

**Microfluidics**  
 World-to-Chip Interfacing

**T7A**  
**CHARACTERIZATION AND FABRICATION OF HIGH-DENSITY, ON-DEMAND, REUSABLE, IN-PLANE POLYMER INTERCONNECTS TOWARDS STANDARDIZED MICROFLUIDIC PACKAGING**  
 R. Lo and E. Meng  
*University of Southern California, USA*

**T8A**  
**MODULAR MICROFLUIDIC SYSTEM WITH A CAST PDMS PUMPING BED AND PLANAR PDMS INTERCONNECTION BLOCKS**  
 D. Sabourin, D. Snakenborg, P. Skafte-Pedersen, J.P. Kutter, and M. Dufva  
*Technical University of Denmark (DTU), DENMARK*

**Microfluidics**  
 Aliquoting, Mixing & Pumping

**T9A**  
**PROPOSAL OF A NOVEL CONTINUOUS FLOW PUMPING OPERATED BY SURFACE ACOUSTIC WAVE**  
 Y. Utsumi<sup>1</sup>, T. Saiki<sup>1,2</sup>, and K. Okada<sup>1</sup>  
<sup>1</sup>University of Hyogo, JAPAN and <sup>2</sup>Hyogo Prefectural Institute of Technology, JAPAN

**T10A**  
**AC ELECTROSMOTIC PUMPING IN 3D C-MEMS STRUCTURES**  
 H.A. Rouabah<sup>1</sup>, B.Y. Park<sup>2</sup>, R.B. Zaouk<sup>2</sup>, M.J. Madou<sup>2</sup>, H. Morgan<sup>1</sup>, and N.G. Green<sup>1</sup>  
<sup>1</sup>University of Southampton, UK and <sup>2</sup>University of California, Irvine, USA

**T11A**  
**AC FIELD EFFECT FLOW CONTROL OF EOF IN COMPLEX MICROFLUIDIC SYSTEMS WITH INTEGRATED ELECTRODES**  
 E.J. van der Wouden<sup>1</sup>, S. Pennathur<sup>2</sup>, and A. van den Berg<sup>1</sup>  
<sup>1</sup>MESA+, University of Twente, THE NETHERLANDS and <sup>2</sup>University of California, Santa Barbara, USA

**T12A**  
**CHARACTERIZATION OF ADVECTIVE MICRO-SCALE MIXING IN 3D BY MEANS OF A STEREOSCOPIC PARTICLE IMAGING SYSTEM**  
 R. Lindken<sup>1</sup>, J. van Esch<sup>1</sup>, B. Wieneke<sup>2</sup>, and J. Westerweel<sup>1</sup>  
<sup>1</sup>Delft University of Technology, THE NETHERLANDS and <sup>2</sup>LaVision GmbH, GERMANY

**T13A**  
**CONTROLLED SEQUENTIAL DROPLET MANIPULATION IN RATCHETED MICRO-CHANNELS THROUGH AMPLITUDE MODULATED VIBRATIONS**  
 Z. Ding and B. Ziaie  
*Purdue University, USA*

**T14A**  
**ELECTRICAL EQUIVALENT CIRCUIT MODEL OF MICROFLUIDIC SYSTEM CONTAINING PIEZOELECTRIC VALVELESS MICROPUMP AND VISCOELASTIC PDMS MICROCHANNEL**  
 A. Nakata, S. Tanaka, K. Sugano, T. Tsuchiya, and O. Tabata  
*Kyoto University, JAPAN*

**T15A**  
**INTEGRATED LIQUID AND DROPLET DEP FOR LAB ON A CHIP APPLICATIONS**  
 D. Chugh and K.V.I.S. Kaler  
*University of Calgary, CANADA*

**T16A**  
**MICROPARTICLE-ASSISTED CONTINUOUS 2-DIMENSIONAL GRADIENTS OF THERAPEUTIC AGENTS IN MICROCHANNEL FOR DRUG TESTS**  
 M. Estes and C.H. Ahn  
*University of Cincinnati, USA*

**T17A**  
**PASSIVE FLOW-RATE REGULATORS USING PRESSURE-DEPENDENT AUTONOMOUS DEFLECTION OF PARALLEL MEMBRANE VALVES**  
 I. Doh and Y.-H. Cho  
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**T18A**  
**REAL-TIME MONITORING OF BINDING ASSAYS ON MICROFLUIDIC DEVICES WITH CONTACTLESS CONDUCTIVITY DETECTION**  
 W.K.T. Coltro<sup>1</sup>, J.A. Fracassi da Silva<sup>2</sup>, and E. Carrilho<sup>1</sup>  
<sup>1</sup>Universidade de São Paulo, BRAZIL and <sup>2</sup>Universidade Estadual de Campinas, BRAZIL

**T19A****SUB-NANOLITER PER MINUTE FLOW RATES WITH CUSTOM MICROSYRINGE PUMPS IN A MICROFLUIDIC CHIP: THE IMPORTANCE OF TEMPERATURE CONTROL**

J.T. Nevill, D.M. Hartmann, D. Wyrick, G. Votaw, C. Buckner, and H.C. Crenshaw  
*GlaxoSmithKline, USA*

**T20A****UNIDIRECTIONAL SHAKE-MODE FOR MIXING HIGHLY WETTING FLUIDS ON CENTRIFUGAL PLATFORMS**

S. Lutz<sup>1</sup>, V. Reitenbach<sup>1</sup>, D. Mark<sup>1</sup>, J. Ducree<sup>1</sup>, R. Zengerle<sup>1,2</sup>, and F. von Stetten<sup>1,2</sup>  
<sup>1</sup>Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY and <sup>2</sup>University of Freiburg, GERMANY

## Microfluidics

### Multi-Phase Microfluidics

**T21A****MULTIPLE GENE ANALYSIS WITHIN A SIMPLE DROPLET-IN-OIL MICROFLUIDIC PCR PLATFORM**

Y. Zhang, V. Bailey, C.M. Puleo, C. Chen, and T.H. Wang  
*Johns Hopkins University, USA*

**T22A****AC ELECTROKINETIC PHASE SEPARATION, FOCUSING AND CONCENTRATION IN MICROCHANNEL**

N. Sasaki, K. Hosokawa, and M. Maeda  
*RIKEN, JAPAN*

**T23A****AUTOMATED CONTINUOUS FLOW PLATFORM FOR DNA DETECTION BY HYPERBRANCHED ROLLING CIRCLE AMPLIFICATION IN DROPLETS**

G. Colas, S. Begolo, M. Chabert, and J.-L. Viovy  
*Institut Curie, FRANCE*

**T24A****CONTROLLABLE GENERATION AND TRANSFORMATION OF HIGHLY UNIFORM NONSPHERICAL DROPLETS IN MICROCHANNEL ARRAY DEVICES**

I. Kobayashi<sup>1</sup>, K. Uemura<sup>1</sup>, and M. Nakajima<sup>1,2</sup>  
<sup>1</sup>National Food Research Institute, JAPAN and <sup>2</sup>University of Tsukuba, JAPAN

**T25A****DIGITAL MICROFLUIDICS FOR SCREENING ASSAYS**

A.R. Wheeler, E.M. Miller, I. Barbulovic-Nad, and V.N. Luk  
*University of Toronto, CANADA*

**T26A****EFFECTIVE DILUTION OF PROTEIN FOR SINGLE MOLECULE ASSAY IN AN INTEGRATED ASSAY DEVICE**

T. Nakayama<sup>1</sup>, K. Tabata<sup>2</sup>, H. Noji<sup>2</sup>, and R. Yokokawa<sup>1,3</sup>  
<sup>1</sup>Ritsumeikan University, JAPAN, <sup>2</sup>Osaka University, JAPAN, and  
<sup>3</sup>Japan Science and Technology Agency (JST), JAPAN

**T27A****FORMATION OF POLYMER VESICLES UTILIZING PDMS DOUBLE EMULSIFICATION DEVICES**

C.-Y. Liao and Y.-C. Su  
*National Tsing Hua University, TAIWAN*

**T28A****IMPROVING THE OPERATION OF ELECTROWETTING-BASED DIGITAL MICROFLUIDIC SYSTEMS BY USING WATER-OIL CORE-SHELL DROPLETS**

D. Brassard<sup>1,2</sup>, L. Malic<sup>1,3</sup>, F. Normandin<sup>1</sup>, M. Tabrizian<sup>3</sup>, and T. Veres<sup>1,2</sup>  
<sup>1</sup>National Research Council, CANADA, <sup>2</sup>Laval University, CANADA, and <sup>3</sup>McGill University, CANADA

**T29A****LOCALLY DEFINED THERMALLY REVERSIBLE HYDROGEL FORMATION IN MICROCHANNELS**

J. Flueckiger and K. Cheung  
*University of British Columbia, CANADA*

**T30A****MICROFLUIDIC INVESTIGATION OF MASS TRANSPORT ENHANCEMENT IN NANOPARTICLE SUSPENSIONS**

S. Ozturk, Y.A. Hassan, and V.M. Ugaz  
*Texas A&M University, USA*

**T31A****NOVEL METHOD FOR ANALYSING PHASE DIAGRAMS USING PERVAPORATION**

A. Moumen<sup>1</sup>, J. Leng<sup>2</sup>, M. Joanicot<sup>2</sup>, and P. Tabeling<sup>1</sup>  
<sup>1</sup>Ecole Supérieure de Physique et de Chimie Industriels (ESPCI), FRANCE and <sup>2</sup>Lab of the Future, FRANCE

**T32A****PREPARATION OF WATER-IN-OIL-IN-WATER EMULSION WITH ULTRA-THIN OIL PHASE LAYER USING HYDROPHOBIC MICROCHANNEL WITH STEP STRUCTURE**

D. Saeki<sup>1,2</sup>, S. Sugijura<sup>1</sup>, T. Baba<sup>1</sup>, T. Kanamori<sup>1</sup>, S. Sato<sup>2</sup>, and S. Ichikawa<sup>2</sup>  
<sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and  
<sup>2</sup>University of Tsukuba, JAPAN

**T33A****SELECTIVE EXTRACTION OF RECOMBINANT PROTEINS BY MULTIPLE-AFFINITY TWO-PHASE PARTITIONING IN MICROCHANNELS**

R.J. Meagher, Y.K. Light, and A.K. Singh  
*Sandia National Laboratories, USA*

**T34A****THE EFFECT OF INTERFACIAL FORCES ON 2-PHASE MICROFLUIDICS**

L. Shui, J.C.T. Eijkel, D. Wijnperlé, and A. van den Berg  
*University of Twente, THE NETHERLANDS*

## Microfluidics

### Separation Methods

**T35A****A FULLY AUTOMATED MICRO-SOLID PHASE EXTRACTION CHIP USING MONOLITHIC HIGH PRESSURE MICROVALVES**

S.-I. Han, H. Lee, and K.-H. Han  
*Inje University, KOREA*

**T36A****CONTINUOUS, HIGH THROUGHPUT MAGNETIC SEPARATION OF PATHOGENS FROM BLOOD**

J. Fiering<sup>1</sup>, C.W. Yung<sup>2</sup>, A.J. Mueller<sup>1</sup>, M. Varghese<sup>1</sup>, K.M. Isaac<sup>3</sup>, and D.E. Ingber<sup>2</sup>  
<sup>1</sup>Charles Stark Draper Laboratory, USA, <sup>2</sup>Harvard Medical School & Children's Hospital, USA, and  
<sup>3</sup>Missouri University of Science and Technology, USA

**T37A****GRADIENT ELUTION MICROCHIP ELECTROCHROMATOGRAPHY USING A MONOLITH STATIONARY PHASE**

A.G. Chambers and J.M. Ramsey  
*University of North Carolina, Chapel Hill, USA*

**T38A****IMPROVED BACTERIAL AND VIRAL RECOVERIES FROM COMPLEX SAMPLES USING ELECTROPHORETICALLY ASSISTED ACOUSTIC FOCUSING**

K.D. Ness, K.A. Rose, B. Jung, K. Fisher, and R.P. Mariella Jr.  
*Lawrence Livermore National Laboratory, USA*

**T39A****MICROFLUIDIC DEVICE FOR BLOOD PLASMA EXTRACTION USING DIELECTROPHORETIC BLOOD CELL REMOVAL**

Y. Nakashima and T. Yasuda  
*Kyushu Institute of Technology, JAPAN*

**T40A****ON-CHIP CREATION AND ELIMINATION OF MICROBUBBLES BY ELECTROLYSIS AND EWOD FOR MICRO-OBJECT MANIPULATOR**

S.K. Chung and S.K. Cho  
*University of Pittsburgh, USA*

**T41A****A DIFFUSION-DEFINED PHOTOPOLYMERIZATION PROCESS FOR POLYACRYLAMIDE GRADIENT GELS FOR ON-CHIP PROTEIN SIZING**

C.T. Lo<sup>1</sup>, D.J. Throckmorton<sup>2</sup>, A.K. Singh<sup>2</sup>, and A.E. Herr<sup>2</sup>  
<sup>1</sup>Yale University, USA and <sup>2</sup>Sandia National Laboratories, USA



**T42A****PRESSURE-PINCHED INJECTION IN PDMS MICROCHIPS CONTAINING IN SITU PREPARED MONOLITHIC PHASES**

A. Filipowicz-Szymaska<sup>1,2</sup>, T. Rosenling<sup>2</sup>, R. Bischoff<sup>2</sup>, Z. Brzózka<sup>1</sup>, and E. Verpoorte<sup>2</sup>  
<sup>1</sup>Warsaw University of Technology, POLAND and <sup>2</sup>University of Groningen, THE NETHERLANDS

**T43A****RAPID SEPARATION AND CAPTURE OF PLATELETS FROM WHOLE BLOOD**

L. Basabe-Desmonts<sup>1</sup>, S. Ramstrom<sup>2</sup>, G. Meade<sup>2</sup>, S. O'Neill<sup>2</sup>, A. Riaz<sup>1</sup>, L. Kent<sup>1</sup>, D. Kenny<sup>2</sup>, L.P. Lee<sup>1,3</sup>, and A.J. Ricco<sup>1</sup>  
<sup>1</sup>Dublin City University, IRELAND, <sup>2</sup>Royal College of Surgeons in Ireland (RCSI), IRELAND, and <sup>3</sup>University of California, Berkeley, USA

**T44A****SIZE-BASED PARTICLE SORTING BY CALIPER WALLS IN A WIDE MICROFLUIDIC CHANNEL**

K. Mogi, T. Yamamoto, H. Kinoshita, and T. Fujii  
 University of Tokyo, JAPAN

**T45A****SWEEPING FLOW ELECTROPHORESIS (SFE): A NEW CONTINUOUS SEPARATION TECHNIQUE**

P. Vulto<sup>1</sup>, D. Kohlheyer<sup>2</sup>, G.A. Urban<sup>1</sup>, and R.B.M. Schasfoort<sup>2</sup>  
<sup>1</sup>University of Freiburg (IMTEK), GERMANY and <sup>2</sup>MESA+, University of Twente, THE NETHERLANDS

**Microfluidics****T46A****A MONOLITHIC PASSIVE CHECK-VALVE FOR SYSTEMATIC CONTROL OF TEMPORAL ACTUATION IN MICROFLUIDIC DEVICES**

B. Mosadegh, C.-H. Kuo, Y.-C. Tung, Y.-S. Torisawa, and S. Takayama  
 University of Michigan, USA

**T47A****DETECTION OF DNA HYBRIDIZATION ON A CONFIGURABLE DIGITAL MICROFLUIDIC BIOCHIP USING SPR IMAGING**

L. Malic<sup>1</sup>, T. Veres<sup>2</sup>, and M. Tabrizian<sup>1</sup>  
<sup>1</sup>McGill University, CANADA and <sup>2</sup>National Research Council, CANADA

**T48A****ENGINEERING 3D ECM MICROARCHITECTURES FOR CELL CO-CULTURE STUDIES**

C.P. Huang, H. Seon, J. Lu, A. Putnam, and N.L. Jeon  
 University of California, Irvine, USA

**T49A****MOVING MASK LITHOGRAPHY FOR REAL-TIME SYNTHESIS OF PHOTOPOLYMERIZED MICROSTRUCTURES IN MICROFLUIDIC CHANNELS**

H. Park<sup>1</sup>, K. Yu<sup>2</sup>, H. Kim<sup>1</sup>, N. Park<sup>1</sup>, and S. Kwon<sup>1</sup>  
<sup>1</sup>Seoul National University, KOREA and <sup>2</sup>University of California, Berkeley, USA

**T50A****ON-DEMAND FLUID CONTROL ON MICROCHIP BY MICRO-PATTERNED LIGHT IRRADIATION USING PHOTO-RESPONSIVE HYDROGELS**

S. Sugiura<sup>1</sup>, A. Szilágyi<sup>1,2</sup>, K. Sumaru<sup>1</sup>, T. Takagi<sup>1</sup>, M. Zrínyi<sup>2</sup>, and T. Kanamori<sup>1</sup>  
<sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and <sup>2</sup>Budapest University of Technology and Economics, HUNGARY

**T51A****THE GENERATION OF STATIONARY CHEMICAL GRADIENTS AROUND STAGNANT POINTS USING A MICROFLUIDIC PROBE**

M.A. Qasaimeh, P. Sanyal, R. Safavieh, C.M. Perrault, A. Queval, and D. Juncker  
 McGill University, CANADA

**T52A****TUNABLE LIQUID GRADIENT REFRACTIVE INDEX (L-GRIN) LENS**

X. Mao, S.-C.S. Lin, J. Shi, M.I. Lapsley, and T.J. Huang  
 Pennsylvania State University, USA

**Nanotechnology**  
Nanofluidics**T1B****ANALYSIS OF SINGLE DNA MOLECULES TRANSLOCATING THROUGH NANOCANNELS FABRICATED IN SiO<sub>2</sub>**

L.D. Menard<sup>1</sup>, S.A. Soper<sup>2</sup>, K.L. Braun<sup>1</sup>, C. Huang<sup>1</sup>, and J.M. Ramsey<sup>1</sup>  
<sup>1</sup>University of North Carolina, Chapel Hill, USA and <sup>2</sup>Louisiana State University, USA

**T2B****ELECTROKINETIC TRAPPING AT SINGLE NANOPORES INTEGRATED IN MICROFLUIDIC DEVICES**

M.L. Kovarik, K. Zhou, and S.C. Jacobson  
 Indiana University, USA

**T3B****FABRICATION OF MASSIVELY-PARALLEL REGULAR NANOFILTERS FOR HIGH-THROUGHPUT BIOMOLECULE SEPARATION**

P. Mao and J. Han  
 Massachusetts Institute of Technology, USA

**T4B****LENGTH-BASED SEPARATION OF SHORT DNA USING NANOSLIT ARRAYS**

E.A. Strychalski, H.W. Lau, L. Archer, and H.G. Craighead  
 Cornell University, USA

**T5B****RAPID IMMUNOASSAY USING STEADY-STATE DISPERSION EFFECTS IN NANOCANNELS**

N.F.Y. Durand, E. Saveriades, A. Valero, and P. Renaud  
 Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

**Nanotechnology**  
Nanoengineering**T6B****ISOLATION AND MANIPULATION OF SINGLE MICROTUBULE BY SILICON MICROTWEEZERS**

M.C. Tarhan<sup>1</sup>, D. Collard<sup>1</sup>, C. Bottier<sup>1</sup>, R. Yokokawa<sup>2</sup>, M. Hosogi<sup>3</sup>, G. Hashiguchi<sup>3</sup>, and H. Fujita<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN, <sup>2</sup>Ritsumeikan University, JAPAN, and <sup>3</sup>Shizuoka University, JAPAN

**Nanotechnology**  
Nanobiotechnology**T7B****DETERMINATION OF PROTEIN CONCENTRATION WITH TWO-DIMENSIONAL (2D) PHOTON BURST DIAGRAMS USING MICROFLUIDIC CHANNEL**

N. Jing<sup>1</sup>, C.B. Su<sup>1</sup>, C.-K. Chou<sup>2</sup>, M.-C. Hung<sup>2</sup>, and J. Kameoka<sup>1</sup>  
<sup>1</sup>Texas A&M University, USA and <sup>2</sup>University of Texas, M.D. Anderson Cancer Center, USA

**T8B****FIELD-EFFECT BASED SILICON NANOWIRE WHOLE-CELL BACTERIAL BIOSENSORS FOR NEUTRAL SPECIES DETECTION**

I.K. Lao, A. Agarwal, and N. Balasubramanian  
 A\*Star (Agency for Science, Technology and Research), SINGAPORE

**T9B****KINESIN-BASED TRANSPORTATION AND ELECTROFUSION OF LIPID VESICLES**

C. Bottier<sup>1</sup>, M.C. Tarhan<sup>1</sup>, D. Collard<sup>1</sup>, R. Yokokawa<sup>2</sup>, and H. Fujita<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Ritsumeikan University, JAPAN

**T10B****MITOCHONDRIAL AND GENOMIC DNA DAMAGE ANALYSIS IN MICROFLUIDIC CHIPS**

Y. Tanaka<sup>1</sup>, H. Johansson<sup>1</sup>, C. Larsson<sup>1</sup>, J. Jarvius<sup>1</sup>, T. Kitamori<sup>2</sup>, and M. Nilsson<sup>1</sup>  
<sup>1</sup>Uppsala University, SWEDEN and <sup>2</sup>University of Tokyo, JAPAN

**T11B****SURFACE-ENHANCED RAMAN SPECTROSCOPY AND CONFOCAL IMAGING OF PERIODIC NANOHOLE ARRAYS SURROUNDED BY PLASMONIC BRAGG MIRRORS**

N.C. Lindquist, H. Im, K.C. Bantz, A. Lesuffleur, C.L. Haynes, and S.-H. Oh  
 University of Minnesota, USA

## Nanotechnology

### Nanoassembly

#### T12B

##### DETERMINISTIC TRANSPLANTING ASSEMBLY OF INDIVIDUAL CARBON NANOTUBES TO MEMS CANTILEVERS FOR BIOSCANNING

S. Kim, H.W. Lee, and S.-G. Kim

*Massachusetts Institute of Technology, USA*

#### T13B

##### RAPID ELECTROKINETIC PATTERNING OF COLLOIDAL PARTICLES WITH OPTICAL LANDSCAPES

A. Kumar, S.J. Williams, and S.T. Wereley

*Purdue University, USA*

#### T14B

##### UNEXPECTEDLY HIGH ENTRAPMENT EFFICIENCIES IN NANOMETER SCALE LIPOSOMES WITH HYDRODYNAMIC FOCUSING USING CONTINUOUS-FLOW MICROFLUIDICS

A. Jahn<sup>1,2</sup>, J.E. Reiner<sup>1</sup>, W.N. Vreeland<sup>1</sup>, D.L. DeVoe<sup>2</sup>, L.E. Locascio<sup>1</sup>, and M. Gaitan<sup>1</sup>

<sup>1</sup>National Institute of Standards and Technology (NIST), USA and <sup>2</sup>University of Maryland, USA

## Nanotechnology

#### T15B

##### SIMULATION OF NANOCROWN FOR BIOMOLECULAR PLASMONICS

S.G. Hong and L.P. Lee

*University of California, Berkeley, USA*

## Materials

### Surface Modification

#### T1C

##### A VERSATILE METHOD FOR THE SURFACE MODIFICATION OF THE MICROCHANNEL IN POLYMER MICROCHIPS

Y. Okamoto<sup>1</sup>, Y.-S. Park<sup>1</sup>, N. Kaji<sup>1</sup>, M. Tokeshi<sup>1</sup>, and Y. Baba<sup>1,2</sup>

<sup>1</sup>Nagoya University, JAPAN and

<sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

#### T2C

##### DEVELOPMENT OF SINGLE-STEP HETEROGENEOUS SANDWICH CAPILLARY IMMUNOSENSOR FOR CAPILLARY-ASSEMBLED MICROCHIP (CA<sub>s</sub>-CHIP) INTEGRATION

T.G. Henares, H. Yoshimura, T. Yao, and H. Hisamoto

*Osaka Prefecture University, JAPAN*

#### T3C

##### ELECTRIC DISCHARGE METHOD FOR SELECTIVE SURFACE PATTERNING IN THE FABRICATION OF MICROFLUIDIC STRUCTURES

N. Suni<sup>1</sup>, M. Haapala<sup>1</sup>, A. Mäkinen<sup>2</sup>, L. Sainiemi<sup>3</sup>, S. Franssila<sup>3</sup>, E. Färm<sup>1</sup>, E. Puukilainen<sup>1</sup>, M. Ritala<sup>1</sup>, and R. Kostiaainen<sup>1</sup>

<sup>1</sup>University of Helsinki, FINLAND, <sup>2</sup>University of Oulu, FINLAND, and

<sup>3</sup>Helsinki University of Technology, FINLAND

#### T4C

##### SELECTIVE CONTROL OF CELL ATTACHMENT IN MICROCHANNEL USING PHOTOCHEMICAL REACTION

K.H. Jang, K. Sato, T. Konno, K. Ishihara, and T. Kitamori

*University of Tokyo, JAPAN*

#### T5C

##### TARGETED PATTERNING OF NUCLEIC ACID PROBES ON OPTICAL NANOSTRUCTURES

J.M. Goddard, S. Mandal, and D. Erickson

*Cornell University, USA*

## Materials

### Interface Characterization

#### T6C

##### MEASURING SURFACE STRESS CURVATURE OF INDUCED, LIPID BILAYERS USING MICROCANTILEVERS

K.W. Liu and S.L. Biswal

*Rice University, USA*

## Materials

### Nanostructured Materials

#### T7C

##### APPLICATION OF MICRON-SPIKED ELECTRODES PRODUCED BY THE PHASE TRANSFORMATION PHENOMENON OF STAINLESS STEEL FOR GENE TRANSFER DEVICE

N. Miyano<sup>1</sup>, M. Morieda<sup>1</sup>, Y. Inoue<sup>2</sup>, Y. Teramura<sup>1</sup>, F. Tsumori<sup>1</sup>, H. Iwata<sup>1</sup>, and H. Kotera<sup>1</sup>

<sup>1</sup>Kyoto University, JAPAN and <sup>2</sup>University of Tokyo, JAPAN

#### T8C

##### GENERATION AND SELF-REPLICATION OF MONOLITHIC, DUAL-SCALE POLYMER STRUCTURES BY TWO-STEP CAPILLARY FORCE LITHOGRAPHY

H.E. Jeong, R. Kwak, J.K. Kim, and K.Y. Suh

*Seoul National University, KOREA*

## Materials

### Innovative Chip Materials

#### T9C

##### CONTACTLESS CONDUCTIVITY DETECTION IN LTCC TECHNOLOGY FOR MICROCHIP ELECTROPHORESIS

G. Fercher<sup>1,2</sup>, W. Smetana<sup>1</sup>, and M.J. Vellekoop<sup>1</sup>

<sup>1</sup>Technical University Wien, AUSTRIA and <sup>2</sup>Integrated Microsystems Austria GmbH, AUSTRIA

#### T10C

##### PLASTIC-PDMS HYBRID DEVICES FOR HIGH PRESSURE HYDROLYTICALLY STABLE ACTIVE MICROFLUIDICS

K.S. Lee and R.J. Ram

*Massachusetts Institute of Technology, USA*

#### T11C

##### SMART GLASS MANUFACTURING: LOW COST / HIGH VOLUME FABRICATION METHOD FOR GLASS MICROFLUIDIC DEVICES

E. Brunet<sup>1</sup>, G. Duisit<sup>1</sup>, H. Gascon<sup>1</sup>, and V. Labrot<sup>2</sup>

<sup>1</sup>Saint-Gobain Recherche, FRANCE and <sup>2</sup>Lab of the Future, FRANCE

## Detection Technologies

### Optical

#### T1D

##### A LABEL-FREE BIOSENSOR BASED ON PROTEIN-FORMED DIFFRACTION GRATING ON OPTICAL WAVEGUIDE

Z. Lai<sup>1</sup>, Y. Wang<sup>2</sup>, N. Allbritton<sup>2</sup>, G.P. Li<sup>1</sup>, and M. Bachman<sup>1</sup>

<sup>1</sup>University of California, Irvine, USA and <sup>2</sup>University of North Carolina, Chapel Hill, USA

#### T2D

##### A PLATFORM FOR *IN SITU* SENSING OF BIOMOLECULAR REACTION PRODUCTS USING A CHITOSAN MEDIATED SERS SUBSTRATE FABRICATED IN MICROFLUIDICS

S. Buckhout-White, X. Luo, D.L. Berlin, and G.W. Rubloff

*University of Maryland, USA*

**T3D****A TUNABLE FLUIDIC MICROLENS WITH FLUORESCENCE ENHANCEMENT**

L.K. Chin, Y.C. Seow, C.S. Lim, and A.Q. Liu  
*Nanyang Technological University, SINGAPORE*

**T4D****DEVELOPMENT AND ANALYSIS OF A MICROFLUIDIC PHOTOTHERMAL ABSORBANCE DETECTOR USING POLYELECTROLYTIC GEL ELECTRODES**

H. Chun, P.J. Dennis, E.R. Ferguson, J.P. Alarie, J.W. Jorgenson, and J.M. Ramsey  
*University of North Carolina, Chapel Hill, USA*

**T5D****PMMA BIOSENSOR FOR NUCLEIC ACIDS WITH INTEGRATED MIXER AND ELECTROCHEMICAL DETECTION**

S.R. Nugen, P.J. Asiello, J.T. Connelly, and A.J. Baeumner  
*Cornell University, USA*

**T6D****DIGITALLY-MODULATED LIGHT SOURCE UTILIZING A LOW-COST LCD PROJECTOR FOR HIGH THROUGHPUT CAPILLARY ELECTROPHORESIS DETECTION**

S.-W. Lin<sup>1</sup>, D.-Y. Wu<sup>2</sup>, L.-M. Fu<sup>3</sup>, and C.-H. Lin<sup>2</sup>  
<sup>1</sup>*National Cheng Kung University, TAIWAN*, <sup>2</sup>*National Sun Yat-Sen University, TAIWAN*, and  
<sup>3</sup>*National Pingtung University of Science and Technology, TAIWAN*

**T7D****GENETIC ANALYSIS INSTRUMENT CONSISTING OF A SINGLE MICROELECTRONIC CHIP**

M. Behnam, G. Kaigala, M. Khorasani, D. Elliott, and C. Backhouse  
*University of Alberta, CANADA*

**T8D****HUMAN IDENTIFICATION USING ALUs ANALYZED VIA AN INTEGRATED MICROFLUIDIC SYSTEM WITH MULTICOLOR FLUORESCENCE AND MICROCHIP FREE SOLUTION CONJUGATE ELECTROPHORESIS**

S.K. Njoroge<sup>1</sup>, M.A. Witek<sup>1</sup>, M.L. Hupert<sup>1</sup>, J. Coyne<sup>2</sup>, A. Barron<sup>2</sup>, M.A. Batzer<sup>1</sup>, and S.A. Soper<sup>1</sup>  
<sup>1</sup>*Louisiana State University, USA* and <sup>2</sup>*Stanford University, USA*

**T9D****INTEGRATED pH AND OXYGEN SENSOR ARRAY PREPARED BY MICROCONTACT DOUBLE PRINTING**

M. Suzuki, A. Nomura, M. Yamamoto, and Y. Iribe  
*University of Toyama, JAPAN*

**T10D****A LIQUID-WAVEGUIDE-BASED EVANESCENT WAVE SENSOR FOR HIGH SENSITIVITY REAL TIME DETECTION AND LABEL FREE BIOSENSING APPLICATIONS**

X.C. Li<sup>1,2</sup>, Y.C. Seow<sup>2</sup>, J. Wu<sup>1</sup>, K. Xu<sup>1</sup>, J.T. Lin<sup>1</sup>, and A.Q. Liu<sup>2</sup>  
<sup>1</sup>*Beijing University of Posts and Telecommunications, CHINA* and  
<sup>2</sup>*Nanyang Technological University, SINGAPORE*

**T11D****NANO-LAMP ARRAYS FOR MULTIPLEX MICROFLUIDIC SPR BIOSENSING**

A. Lesuffleur, H. Im, N.C. Lindquist, K.S. Lim, and S.-H. Oh  
*University of Minnesota, USA*

**T12D****ON-CHIP LOCAL PH MEASUREMENT AROUND INDIVIDUAL CELL USING OPTICALLY MANIPULATED GEL-TOOL WITH ADHESIVE-CONTROLLABILITY**

H. Maruyama<sup>1</sup>, F. Arai<sup>1</sup>, and T. Fukuda<sup>2</sup>  
<sup>1</sup>*Tohoku University, JAPAN* and <sup>2</sup>*Nagoya University, JAPAN*

**T13D****PHOTONIC CRYSTAL SENSOR INTEGRATED IN A MICROFLUIDIC SYSTEM**

P.S. Nunes, N.A. Mortensen, J.P. Kutter, and K.B. Mogensen  
*Technical University of Denmark, DENMARK*

**T14D****SERS SIGNAL AMPLIFICATIONS VIA BIOFLUIDIC-ADSORPTION PRECONCENTRATION IN CD PLATFORM**

D. Choi, Y. Choi, T. Kang, H. Cho, and L.P. Lee  
*University of California, Berkeley, USA*

**Detection Technologies****Electrochemical****T15D****DEVELOPMENT OF EMBEDDED METAL LINES IN A PLASTIC ELECTROCHEMICAL MICROFLUIDIC DEVICE BY BLANKET MOLD IMPRINTING**

J.-H. Seo<sup>1</sup>, J.-Y. Kim<sup>1</sup>, H.-W. Lim<sup>1</sup>, J.-G. Park<sup>1</sup>, P.L. Leow<sup>2</sup>, B.A. Patel<sup>2</sup>, and D. O'Hare<sup>2</sup>  
<sup>1</sup>*Hanyang University, KOREA* and <sup>2</sup>*Imperial College London, UK*

**T16D****IMPEDANCE-SENSING ASSAY FOR REAL-TIME MONITORING ONGOING CARDIOMYOCYTE APOPTOSIS**

Y. Qiu<sup>1</sup>, R. Liao<sup>2</sup>, and X. Zhang<sup>1</sup>  
<sup>1</sup>*Boston University, USA* and <sup>2</sup>*Brigham and Women's Hospital, Harvard Medical School, USA*

**T17D****ON-CHIP ELECTRICAL IMPEDANCE TOMOGRAPHY FOR MONITORING THE KINETICS IN THE CELL CULTURE**

T. Sun, S. Tsuda, N.G. Green, K.P. Zauner, and H. Morgan  
*University of Southampton, UK*

**Detection Technologies****T18D****A MICROFLUIDIC CHIP BASED ELECTROSPRAY INTERFACE FOR MASS SPECTROMETRY WITH A LOW-TEMPERATURE ALLOY MICROELECTRODE**

Y. Zhu, J. Pan, Y. Su, and Q. Fang  
*Zhejiang University, CHINA*

**T19D****LABEL-FREE ELECTRICAL DETECTION OF PSA BY A NANOGAP FIELD EFFECT TRANSISTOR**

J.-H. Ahn, M. Im, and Y.-K. Choi  
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**T20D****MEASUREMENT OF PROTEIN CONCENTRATION USING THE BINDING FORCE BETWEEN TWO SURFACES**

K. Kuwana, K. Matsumoto, and I. Shimoyama  
*University of Tokyo, JAPAN*

**T21D****ON-CHIP IMPEDANCE SPECTROSCOPY OF pH-RESPONSIVE POLYELECTROLYTE MICROCAPSULES**

C. Bernabini<sup>1</sup>, D. Holmes<sup>1</sup>, M. Bedard<sup>2</sup>, G.B. Sukhorukov<sup>2</sup>, and H. Morgan<sup>1</sup>  
<sup>1</sup>*University of Southampton, UK* and <sup>2</sup>*Queen Mary University of London, UK*

**MEMS & NEMS Technologies****Micro & Nano-Machining****T1E****BLOW MOLDING OF POLYMER FOILS FOR RAPID PROTOTYPING OF MICROFLUIDIC CARTRIDGES**

M. Focke<sup>1</sup>, B. Faltin<sup>1</sup>, T. Hösel<sup>1</sup>, C. Müller<sup>1</sup>, J. Ducrée<sup>2</sup>, R. Zengerle<sup>1,2</sup>, and F. von Stetten<sup>1,2</sup>  
<sup>1</sup>*University of Freiburg (IMTEK), GERMANY* and  
<sup>2</sup>*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*

**T2E****DIFFRACTION MOIRE: DECOUPLING DISTORTIONS IN PERIODIC POLYMERIC POST ARRAYS FOR BIOLOGICAL APPLICATIONS**

X. Zheng and X. Zhang  
*Boston University, USA*

**T3E****FABRICATION OF PDMS MICROLENSES WITH VARIOUS CURVATURES USING A WATER-BASED MOLDING METHOD**

H.-K. Kim and K.-S. Yun  
*Sogang University, KOREA*

**T4E****MICROVALVE-ADDRESSABLE PICOLITER CHAMBERS FOR SINGLE-MOLECULE ENZYMOLOGY**

D. Cate, N. Li, and A. Folch  
University of Washington, USA

**T5E****QUICK AND EASY FABRICATION OF MICROFLUIDIC CHANNELS WITH WATER-SOLUBLE MOLDS**

R. Gojo<sup>1</sup>, Y. Morimoto<sup>1</sup>, and S. Takeuchi<sup>1,2</sup>

<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN

## MEMS & NEMS Technologies

### Microfluidic Components

**T6E****A PDMS PINCH VALVE WITH ZERO DEAD VOLUME AS A VALVING MODULE FOR RIGID POLYMER LAB CHIPS**

A.W. Browne and C.H. Ahn  
University of Cincinnati, USA

**T7E****BUBBLE INCLUSION AND REMOVAL USING PDMS MEMBRANE-BASED GAS PERMEATION FOR APPLICATIONS IN PUMPING AND MIXING IN MICROFLUIDIC DEVICES**

M. Johnson, G. Liddiard, M. Eddings, and B. Gale  
University of Utah, USA

**T8E****DEVELOPMENT OF A NOVEL PNEUMATIC DISPENSER USING AN INTEGRATED BACKFLOW STOPPER**

S. Lee and J. Kim  
Pohang University of Science and Technology (POSTECH), KOREA

**T9E****PILLAR ARRAY MICRO-TRAPS WITH NEGATIVE DIELECTROPHORESIS**

H.H. Cui<sup>1</sup>, J. Voldman<sup>1,2</sup>, and K.M. Lim<sup>1,2</sup>

<sup>1</sup>National University of Singapore, SINGAPORE and <sup>2</sup>Massachusetts Institute of Technology, USA

**T10E****FORMATION OF MONODISPERSE MICROSIZED-EMULSIONS USING AN AXISYMMETRIC FLOW-FOCUSING DEVICE FABRICATED BY PHOTOLITHOGRAPHY AND STEREO-LITHOGRAPHY**

Y. Morimoto, K. Kuribayashi, and S. Takeuchi  
University of Tokyo, JAPAN

**T11E****MICROFLUIDIC ASSEMBLY BLOCKS**

M. Rhee and M.A. Burns  
University of Michigan, USA

**T12E****MICROPORE FORMATION USING OVERLAPPED ETCH FRONTS IN INTEGRATED DEVICES FOR CELLULAR ANALYSIS**

T.D. Perroud, M. Wu, R.F. Renzi, A.K. Singh, and K.D. Patel  
Sandia National Laboratories, USA

**T13E****PASSIVE MICROFLUIDIC SORTING OF PARTICLES USING DIFFERENTIAL MIGRATION**

A.A.S. Bhagat, S.S. Kuntaegowdanahalli, and I. Papautsky  
University of Cincinnati, USA

**T14E****PRINTING OF TEMPERATURE-SENSITIVE HYDROGELS FOR COMPACT MICROFLUIDIC VALVES**

N.E. Reticker-Flynn, H.W. Lee, and S.-G. Kim  
Massachusetts Institute of Technology, USA

**T15E****SILICON-BASED MHZ ULTRASONIC NOZZLES**

C.S. Tsai<sup>1</sup>, Y.L. Song<sup>1,2</sup>, C.H. Cheng<sup>3</sup>, N. Wang<sup>1</sup>, R.W. Mao<sup>1</sup>, C.T. Lee<sup>2</sup>, and S.C. Tsai<sup>4</sup>

<sup>1</sup>University of California, Irvine, USA, <sup>2</sup>National Cheng-Kung University, TAIWAN,

<sup>3</sup>National Taiwan University, TAIWAN, and <sup>4</sup>California State University, Long Beach, USA

**T16E****WORM-ON-CHIP TECHNOLOGY FOR STUDYING AGING OF THE NERVOUS SYSTEM IN *c. elegans***

A. Tripathi, T.V. Chokshi, and N. Chronis  
University of Michigan, USA

## MEMS & NEMS Technologies

### Hybrid Devices, Packaging & Components Interfacing

**T17E****EXCHANGEABLE, PRE-LOADED "SKIN DEPOT" FOR DIGITAL MICROFLUIDICS**

H. Yang, V.N. Luk, M. Abdelgawad, I. Barbulovic-Nad, and A.R. Wheeler  
University of Toronto, CANADA

**T18E****MINIMIZING PARASITIC REACTIONS FOR ENZYME-CONTROLLED METABOLIC PATHWAYS INVESTIGATED IN BIOMEMS**

X. Luo, D.L. Berlin, S. Buckhout-White, W.E. Bentley, G.F. Payne, R. Ghodssi, and G.W. Rubloff  
University of Maryland, USA

**T19E****SELF-SEALED VERTICAL NANOPOROUS JUNCTIONS FOR INTEGRATING VARIOUS NANOMATERIALS IN PDMS MICROFLUIDIC SYSTEM**

S.J. Kim and J. Han  
Massachusetts Institute of Technology, USA

## MEMS & NEMS Technologies

### Integration "Sample to Result" Systems

**T20E****ANALYSIS OF POLYMER DEGRADATION UNDER HIGH SHEARS IN MICROFLUIDIC CHIPS**

P. Nghe, P. Tabeling, A. Ajdari, and P. Mary  
Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE

**T21E****DEVELOPMENT OF A MICROFLUIDIC PLATFORM AND DETECTION SYSTEM FOR PLATELET FUNCTION ANALYSIS**

N.J. Kent<sup>1</sup>, G. Meade<sup>1,2</sup>, L. Basabe-Desmonts<sup>1</sup>, B. Lincoln<sup>1</sup>, D. Kenny<sup>1,3</sup>, A.J. Ricco<sup>1</sup>, B.D. MacCraith<sup>1</sup>, and B.G. Corcoran<sup>2</sup>

<sup>1</sup>Dublin City University, IRELAND and <sup>2</sup>Royal College of Surgeons in Ireland, IRELAND

**T22E****INTEGRATED MICROFLUIDIC SAMPLE PRECONCENTRATOR AND IMPEDANCE DETECTION PLATFORM FOR PATHOGEN MONITORING**

P. Sabouchi<sup>1</sup>, A.M. Morales<sup>1</sup>, B.A. Simmons<sup>1</sup>, and R.V. Davalos<sup>2</sup>  
<sup>1</sup>Sandia National Laboratories, USA and <sup>2</sup>Virginia Tech-Wake Forest University, USA

**T23E****MICRO Q-PCR CHIP ON A MINIATURIZED DETECTION SYSTEM FOR DNA DETECTION AND QUANTIFICATION**

J.-H. Wang<sup>1</sup>, L.-J. Chien<sup>1</sup>, T.-M. Hsieh<sup>1</sup>, C.-H. Luo<sup>1</sup>, P.-H. Chen<sup>2</sup>, P.-J. Chen<sup>2</sup>, D.-S. Lee<sup>3</sup>, and G.-B. Lee<sup>1,4</sup>

<sup>1</sup>National Cheng Kung University, TAIWAN, <sup>2</sup>Taiwan University, TAIWAN,

<sup>3</sup>Taipei University of Technology, TAIWAN, and

<sup>4</sup>Industrial Technology Research Institute, TAIWAN

**T24E****MULTIPURPOSE MICROCHIP SYSTEM FOR PHOTOMETRIC CHEMICAL ANALYSIS INTEGRATED WITH TEMPERATURE CONTROLLED SOLUTION MIXER**

T. Noda<sup>1</sup>, N. Hirokubo<sup>1</sup>, Y.S. Shin<sup>1</sup>, K. Miyamura<sup>2</sup>, K. Matsumoto<sup>2</sup>, H. Takao<sup>1,3</sup>, K. Sawada<sup>1,3</sup>, and M. Ishida<sup>1,3</sup>

<sup>1</sup>Toyohashi University of Technology, JAPAN, <sup>2</sup>HORIBA, Ltd., JAPAN, and

<sup>3</sup>Japan Science and Technology Agency (JST), JAPAN

**T25E****TOTAL INTEGRATED IMMUNE ASSAY SYSTEM EMPLOYING SIMPLE AND ACCURATE CHECK VALVE-PUMP FLOW CONTROL WITH NON-LABEL HIGH SENSITIVE ELECTROCHEMICAL DETECTION FOR CLINICAL DIAGNOSIS**

Y. Takamura<sup>1</sup>, S. Torai<sup>1</sup>, M. Chikae<sup>1</sup>, Y. Tsujita<sup>2</sup>, K. Maehashi<sup>2</sup>, K. Matsumoto<sup>2</sup>, and E. Tamiya<sup>2</sup>

<sup>1</sup>Japan Advanced Institute Science Technology (JAIST), JAPAN and <sup>2</sup>Osaka University, JAPAN

## Applications

### Genomics & Proteomics

#### T1F

##### PHYSICAL TRAPPING AND ELECTRIC LYSIS OF BACTERIAL CELLS IN A MICROFLUIDIC DEVICE

N. Bao and C. Lu  
Purdue University, USA

#### T2F

##### CHEMICAL-MEDIATED MELTING CURVE ANALYSIS FOR GENOTYPING OF SINGLE NUCLEOTIDE POLYMORPHISMS

A. Russom, D. Irimia, W. White, and M. Toner  
Massachusetts General Hospital, Harvard Medical School and Shriners Hospital for Children, USA

#### T3F

##### DNA EXTRACTION, USING CARRIER RNA, INTEGRATED WITH AGAROSE GEL-BASED POLYMERASE CHAIN REACTION IN A MICRO FLUIDIC DEVICE

K.J. Shaw, J. Oakley, P.T. Docker, C.E. Dyer, J. Greenman, G.M. Greenway, and S.J. Haswell  
University of Hull, UK

#### T4F

##### INTEGRATION OF PROTEIN PROCESSING STEPS ON A DIGITAL MICROFLUIDICS PLATFORM FOR ANALYSIS BY MALDI-MS

D. Chatterjee, A.J. Ytterberg, S.U. Son, J.A. Loo, and R.L. Garrell  
University of California, Los Angeles, USA

#### T5F

##### MICROFLUIDIC DEVICE FOR DNA ENRICHMENT AND THE APPLICATION OF "CHROMATIN IMMUNOPRECIPITATION"

H.J. Oh<sup>1</sup>, S.E. Park<sup>1</sup>, B.Y. Lee<sup>1</sup>, J.S. Park<sup>1</sup>, H.M. Jung<sup>1</sup>, T.J. Yoon<sup>1</sup>, and S.H. Lee<sup>2</sup>  
<sup>1</sup>Seoul Bioscience Institute, KOREA and <sup>2</sup>Korea University, KOREA

#### T6F

##### MINIATURIZED SYSTEM FOR REAL-TIME PCR IN LOW-COST DISPOSABLE LTCC CHIP WITH INTEGRATED OPTICAL WAVEGUIDE

R.W. Walczak<sup>1,2</sup>, P.B. Bemnowicz<sup>1</sup>, P.S. Szczepanska<sup>1</sup>, J.A. Dziuban<sup>1,2</sup>, L. Golonka<sup>1</sup>, J. Koszur<sup>2</sup>, and D.D. Bong<sup>3</sup>  
<sup>1</sup>Wroclaw University of Technology, POLAND, <sup>2</sup>Institute of Electron Technology, POLAND, and <sup>3</sup>Technical University of Denmark (DTU), DENMARK

#### T7F

##### ON-CHIP DEVICE FOR ISOTHERMAL, CHEMICAL CYCLING POLYMERASE CHAIN REACTION

A. Persat and J.G. Santiago  
Stanford University, USA

#### T8F

##### PROCESSING PROTEINS IN SERUM BY DIGITAL MICROFLUIDICS

M.J. Jebrail, V.N. Luk, and A.R. Wheeler  
University of Toronto, CANADA

#### T9F

##### SELEX-ON-A-CHIP: MICROFLUIDIC CHIP INTEGRATION OF THE SOL-GEL DERIVED AFFINITY COLUMN FOR MONITORING RNA-PROTEIN INTERACTION

S.-M. Park<sup>1</sup>, J. Ahn<sup>1,2</sup>, M. Jo<sup>2</sup>, S. Kim<sup>2</sup>, J.T. Lis<sup>1</sup>, and H.G. Craighead<sup>1</sup>  
<sup>1</sup>Cornell University, USA and <sup>2</sup>Dongguk University, KOREA

## Applications

### Clinical Diagnostics

#### T10F

##### A HIGH-THROUGHPUT MICROFLUIDIC PLATFORM FOR *IN VITRO* TOXICITY ASSAYS

G.A. Cooksey, J.T. Elliott, and A.L. Plant  
National Institute of Standards and Technology (NIST), USA

#### T11F

##### AN ENZYMATIC MICROREACTOR FOR CONTINUOUS GLUCOSE MONITORING

B.-U. Moon, A.J.M. Schoonen, B.H.C. Westerink, and E. Verpoorte  
University of Groningen, THE NETHERLANDS

#### T12F

##### AUTOMATED CHIP-BASED EXTRACTION OF HPV mRNA FROM CERVICAL SAMPLES

T. Baier<sup>1</sup>, T. Hansen-Hagge<sup>1</sup>, R. Gränsse<sup>1</sup>, A. Crombé<sup>1</sup>, S. Schmah<sup>1</sup>, K.S. Drese<sup>1</sup>, P. Grønn<sup>2</sup>, L. Solli<sup>2</sup>, I.M. Falang<sup>2</sup>, C. Martin<sup>3</sup>, H. Keegan<sup>3</sup>, and L. Furberg<sup>4</sup>  
<sup>1</sup>Institut für Mikrotechnik Mainz GmbH, GERMANY, <sup>2</sup>Norchip AS, NORWAY, <sup>3</sup>Coombe Womens Hospital Dublin, IRELAND, and <sup>4</sup>SINTEF Microsystems and Nanotechnology, NORWAY

#### T13F

##### DENGUE RNA EXTRACTION IN A FULLY-ENCLOSED SELF-CONTAINED LAB-ON-A-CHIP (LOC) CARTRIDGE

L. Yobas<sup>1</sup>, S. Rafeah<sup>1</sup>, Z. Li<sup>1</sup>, S.-E. Yong<sup>1</sup>, K.-Z. Ong<sup>1</sup>, K. Lau<sup>2</sup>, V.T.K. Chow<sup>2</sup>, and C.-K. Heng<sup>2</sup>  
<sup>1</sup>Institute of Microelectronics, SINGAPORE and <sup>2</sup>National University of Singapore, SINGAPORE

#### T14F

##### INTEGRATED MICROFLUIDIC CYTOMETER FOR THE DIRECT ANALYSIS OF LEUKOCYTES IN WHOLE BLOOD

J.K. Herr<sup>1</sup>, J.P. Alarie<sup>1</sup>, J. Soohoo<sup>2</sup>, G.M. Walker<sup>1,2</sup>, N. Sharpless<sup>1</sup>, and J.M. Ramsey<sup>1,2</sup>  
<sup>1</sup>University of North Carolina, Chapel Hill, USA and <sup>2</sup>North Carolina State University, USA

#### T15F

##### MECHANICAL AND THERMAL MODELING OF A PARYLENE ELECTROTHERMAL VALVE FOR MAPPING BRAIN FUNCTION IN FREELY MOVING SUBJECTS

P.-Y. Li, T.K. Givrad, D.P. Holschneider, J.-M.I. Maarek, and E. Meng  
University of Southern California, USA

#### T16F

##### MICROFLUIDIC IMAGING CYTOMETRY (MIC) TECHNOLOGY FOR *IN VITRO* MOLECULAR DIAGNOSTICS

J. Sun, M. Ohashi, K.I. Kamei, H. Wang, M. Masterman-Smith, Z.T.-F. Yu, H.I. Kornblum, P.S. Mischel, and H.-R. Tseng  
University of California, Los Angeles, USA

#### T17F

##### RAPID AND EASY-TO-USE MULTIPLEX IMMUNOASSAY DEVICE

M. Ikami<sup>1</sup>, M. Tokeshi<sup>1,2</sup>, Y. Okamoto<sup>1,2</sup>, N. Kaji<sup>1,2</sup>, and Y. Baba<sup>1,2,3</sup>  
<sup>1</sup>Nagoya University, JAPAN, <sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and <sup>3</sup>Institute for Molecular Science, JAPAN

#### T18F

##### RAPID, MULTI-STEP BIOASSAYS ON THE SURFACE OF MOBILE MAGNETIC PARTICLES IN CONTINUOUS FLOW

S.A. Peyman, A. Iles, and N. Pamme  
University of Hull, UK

## Applications

### Microarrays

#### T19F

##### A FULLY-INTEGRATED CMOS MICROSENSOR ARRAY FOR IMAGING THE HYDROGEN ION ACTIVITY OF LIVING CELLS

M.J. Milgrew, M.O. Riehle, and D.R.S. Cumming  
University of Glasgow, UK

#### T20F

##### ELECTROFORMATION OF GIANT LIPOSOMES FROM DENSELY MICRO-PATTERNED LIPID FILMS

K. Kuribayashi<sup>1</sup>, A. Utada<sup>1</sup>, and S. Takeuchi<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN

#### T21F

##### IMAGING OF PHYSIOLOGICAL CELLULAR STIMULATION-RESPONSE PHENOMENA ON TISSUE-REPRODUCING CELL ARRAY DEVICE

A. Okonogi<sup>1</sup>, K. Terao<sup>1</sup>, T. Okitsu<sup>1,2</sup>, T. Suzuki<sup>1,3</sup>, and H. Kotera<sup>1,4</sup>  
<sup>1</sup>Japan Science and Technology Agency (JST), <sup>2</sup>Kyoto University Hospital, JAPAN, <sup>3</sup>Kagawa University, JAPAN, and <sup>4</sup>Kyoto University, JAPAN

#### T22F

##### MULTICHANNEL NANOPORE BIOSENSORS FOR HIGH THROUGHPUT SINGLE MOLECULE DETECTION

T. Osaki<sup>1,2</sup>, H. Suzuki<sup>1</sup>, B. Le Plouffe<sup>2</sup>, and S. Takeuchi<sup>3</sup>  
<sup>1</sup>University of Tokyo, JAPAN, <sup>2</sup>Centre National de la Recherche Scientifique (CNRS), FRANCE, and <sup>3</sup>Japan Science and Technology (JST), JAPAN

**T23F****THREE-DIMENSIONAL (3D) HOLLOW POLYMERIC MICROSTRUCTURES FOR SHEAR-PROTECTING CELL CONTAINERS WITHIN MICROFLUIDIC CHANNEL**

S.H. Lee, H.S. Cho, C.I. Park, and K.Y. Suh  
*Seoul National University, KOREA*

## Applications

### Separation Science

**T24F****EXTERNAL FORCE RESPONSIBLE NANOGELS FOR MICROCHIP ELECTROPHORESIS OF DNA**

K. Kondo<sup>1</sup>, N. Kaji<sup>1</sup>, S. Toita<sup>2</sup>, K. Akiyoshi<sup>2</sup>, M. Tokeshi<sup>1</sup>, and Y. Baba<sup>1,2,3</sup>  
<sup>1</sup>Nagoya University, JAPAN, <sup>2</sup>Tokyo Medical and Dental University, JAPAN, and <sup>3</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

**T25F****HYBRID CERAMIC-POLYMER MICROFLUIDIC CHIPS FOR BIOMOLECULE SEPARATIONS**

T. Sikanen<sup>1</sup>, S. Aura<sup>2</sup>, L. Heikkilä<sup>1</sup>, S. Franssila<sup>2</sup>, T. Kotiaho<sup>1</sup>, and R. Kostiaainen<sup>1</sup>  
<sup>1</sup>University of Helsinki, FINLAND and <sup>2</sup>Helsinki University of Technology, FINLAND

**T26F****ONE-STEP PREPARATION OF AMINO-PEG MODIFIED PMMA MICROCHIPS FOR ELECTROPHORETIC SEPARATION OF BIOGENIC COMPOUNDS**

F. Kitagawa, K. Kubota, and K. Otsuka  
*Kyoto University, JAPAN*

**T27F****RAPID SEPARATION OF PROTEIN DIGESTS ON SU-8 BASED CAPILLARY ELECTROPHORESIS-ELECTROSPRAY IONIZATION MASS SPECTROMETRY MICROCHIPS**

N. Brenner<sup>1</sup>, T. Sikanen<sup>1</sup>, S. Aura<sup>2</sup>, S. Tuomikoski<sup>2</sup>, K. Vuorensola<sup>1</sup>, T. Kotiaho<sup>1,2</sup>, S. Franssila<sup>2</sup>, and R. Kostiaainen<sup>1</sup>  
<sup>1</sup>University of Helsinki, FINLAND and <sup>2</sup>Helsinki University of Technology, FINLAND

**T28F****SYSTEMS ANALYSIS FOR POLYMER MATRIX TECHNOLOGY TRANSFER FROM CAPILLARIES TO MICROFLUIDIC CHIPS**

D.G. Hert<sup>1</sup>, C.P. Fredlake<sup>1</sup>, and A.E. Barron<sup>2</sup>  
<sup>1</sup>Northwestern University, USA and <sup>2</sup>Stanford University, USA

## Applications

### Cell Handling & Analysis

**T29F****A MICROFLUIDIC PLATFORM FOR INVESTIGATING THE IMPAIRMENT OF MITOCHONDRIAL TRANSPORT**

H.J. Kim<sup>1</sup>, J.W. Park<sup>2</sup>, J. Harris<sup>1</sup>, B. Vahidi<sup>1</sup>, and N.L. Jeon<sup>1</sup>  
<sup>1</sup>University of California, Irvine, USA and <sup>2</sup>Gwangju Institute of Science and Technology (GIST), KOREA

**T30F****A NEW DISCRIMINATION METHOD BASED ON BULGE GENERATION BETWEEN CANCEROUS AND NORMAL CELLS**

Y.C. Kim<sup>1,2</sup>, S.-J. Park<sup>2</sup>, and J.-K. Park<sup>1</sup>  
<sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST), KOREA and <sup>2</sup>KIMM, KOREA

**T31F****A VISUAL MICROFLUIDIC DNA DETECTOR**

D.M. Finkler<sup>1</sup>, C.W. Price<sup>1</sup>, L.A. Legendre<sup>1</sup>, G.R.M. Duarte<sup>2</sup>, J.P. LeDuc<sup>1</sup>, and J.P. Landers<sup>1</sup>  
<sup>1</sup>University of Virginia, USA and <sup>2</sup>Institute of Chemistry of São Carlos, BRAZIL

**T32F****IMPROVED ACOUSTIC DIFFERENTIAL EXTRACTION ON A MICRODEVICE FOR SEPARATION OF SPERM CELLS AND EPITHELIAL CELL LYSATE**

J.V. Norris<sup>1</sup>, M. Evander<sup>2</sup>, K.M. Horsman<sup>1</sup>, J. Nilsson<sup>2</sup>, T. Laurell<sup>2</sup>, and J.P. Landers<sup>1</sup>  
<sup>1</sup>University of Virginia, USA and <sup>2</sup>Lund University, SWEDEN

**T33F****ATTACHMENT AND DETACHMENT OF PROSTATE CANCER CELLS IN A MICROFLUIDIC SYSTEM**

L.S.L. Cheung, X.J. Zheng, A. Stopa, J. Schroeder, R.L. Hemark, J.C. Baygents, R. Guzman, and Y. Zohar  
*University of Arizona, USA*

**T34F****BLOOD CELL ANALYSIS USING PORTABLE FLOW CYTOMETER WITH MICROFLUIDIC CHIPS AS CARTRIDGE**

S. Zheng<sup>1</sup>, H.L. Kasdan<sup>2</sup>, A. Fridge<sup>2</sup>, and Y.-C. Tai<sup>1</sup>  
<sup>1</sup>California Institute of Technology, USA and <sup>2</sup>Iris Diagnostics, USA

**T35F****CELLULAR MICROTISSUES SPONTANEOUSLY FORMED IN A MICROFABRICATED DEVICE FOR ANGIOGENESIS**

S. Le Gac<sup>1</sup>, N. Rivron<sup>2</sup>, D. Wijnperlé<sup>1</sup>, C. van Blitterswijk<sup>2</sup>, and A. van den Berg<sup>1</sup>  
<sup>1</sup>Universiteit Twente, THE NETHERLANDS and <sup>2</sup>BMTI, THE NETHERLANDS

**T36F****DEVELOPMENT OF A MICROFLUIDIC ON-LINE CULTURE SYSTEM FOR COMBINED ELECTROCHEMICAL AND OPTICAL REAL-TIME DETECTION OF CELLULAR PROCESSES**

A. Heiskanen<sup>1,2</sup>, C. Spégel<sup>1</sup>, J. Tønnesen<sup>1</sup>, Z. Fohlerova<sup>1</sup>, L. Goulet<sup>2</sup>, J. Hansen<sup>3</sup>, M. Kokaia<sup>1</sup>, T. Ruzgas<sup>4</sup>, M. Dufva<sup>2</sup>, and J. Emnéus<sup>2</sup>  
<sup>1</sup>Lund University, SWEDEN, <sup>2</sup>Technical University of Denmark (DTU), DENMARK, <sup>3</sup>Aquaporin A/S, DENMARK, and <sup>4</sup>Malmö University, SWEDEN

**T37F****DISCRETE STIMULATION OF SINGLE PROTOPLAST CELLS BY HIGHLY RESOLVED DRUG RELEASE**

N. Wangler, O. Brett, M. Laufer, M. Straßer, A. Dovzhenko, K. Voigt, K. Palme, M. Daub, R. Zengerle, and J. Steigert  
*University of Freiburg, GERMANY*

**T38F****DYNAMIC FLOW CYTOMETRY IN AN ACOUSTO-OPTIC MICROFLUIDIC CHIP**

J. Svennebring, O. Manneberg, H. Hertz, and M. Wiklund  
*Royal Institute of Technology (KTH), SWEDEN*

**T39F****ENUMERATING VIABLE CIRCULATING TUMOR CELLS FOR CANCER DIAGNOSTICS**

S.J. Tan<sup>1,2</sup>, L. Yobas<sup>2</sup>, G.Y.H. Lee<sup>3</sup>, C.N. Ong<sup>1</sup>, and C.T. Lim<sup>1,3</sup>  
<sup>1</sup>National University of Singapore, SINGAPORE, <sup>2</sup>Institute of Microelectronics, SINGAPORE, and <sup>3</sup>Singapore MIT-Alliance, SINGAPORE

**T40F****FORMATION OF SIMPLE THREE-DIMENSIONAL BIOLOGICAL BARRIERS BASED ON MICROFLUIDIC DEVICE**

J.-B. Shao, Q.-H. Jin, and J.-L. Zhao  
*Shanghai Institute of Microsystem and Information Technology, CHINA*

**T41F****HIGH PERFORMANCE PARALLEL BIOPARTICLE SORTER WITH 3-DIMENSIONAL PDMS CHIP**

H. Sugino<sup>1</sup>, Y. Nara<sup>2</sup>, Y. Shirasaki<sup>3</sup>, T. Arakawa<sup>1,2</sup>, S. Shoji<sup>2</sup>, and T. Funatsu<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN, <sup>2</sup>Waseda University, JAPAN, and <sup>3</sup>Kazusa DNA Research Institute, JAPAN

**T42F****HIGH-THROUGHPUT CELL AND PARTICLE CHARACTERIZATION USING ISO-DIELECTRIC SEPARATION**

M.D. Vahey and J. Voldman  
*Massachusetts Institute of Technology, USA*

**T43F****NANOFIBER MATRIX BASED MICROCHIP FOR HUMAN MESENCHYMAL STEM CELL CULTURE**

K.H. Lee<sup>1</sup>, S.J. Shin<sup>1</sup>, Y. Park<sup>1</sup>, D.K. Han<sup>2</sup>, J.J. Park<sup>1</sup>, and S.H. Lee<sup>1</sup>  
<sup>1</sup>Korea University, KOREA and <sup>2</sup>Korea Institute of Science & Technology, KOREA

**T44F****INTEGRATED MICROFLUIDIC SYSTEMS BIOLOGY PLATFORM: CELL CULTURE, DRUG TREATMENT, LYSIS, SEPARATION AND DETECTION**

A. Riaz<sup>1</sup>, I.K. Dimov<sup>1</sup>, L. Kent<sup>1</sup>, C.R. Poulsen<sup>1</sup>, S. O'Toole<sup>2</sup>, M. Radomski<sup>3</sup>, J. O'Leary<sup>2</sup>, A.J. Ricco<sup>1</sup>, and L.P. Lee<sup>1,4</sup>  
<sup>1</sup>Dublin City University, IRELAND, <sup>2</sup>St. James Hospital, IRELAND, <sup>3</sup>Trinity College Dublin, IRELAND, and <sup>4</sup>University of California, Berkeley, CA, USA

**T45F****LOCAL OXYGEN LEVEL IS DENSITY DEPENDENT IN MICROCHANNEL CULTURE**K. Hayashi<sup>1,2</sup>, E. Berthier<sup>1</sup>, J. Warrick<sup>1</sup>, M.J. McShane<sup>3</sup>, and D.J. Beebe<sup>1</sup><sup>1</sup>University of Wisconsin, USA, <sup>2</sup>NTT Microsystem Integration Laboratories, JAPAN, and<sup>3</sup>Texas A&M University, USA**T46F****MICROFABRICATED SLITS IN SERIES: A SIMPLE PLATFORM TO PROBE DIFFERENCES IN CELL DEFORMABILITY**H. Bow<sup>1</sup>, P. Abgrall<sup>1,2</sup>, and J. Han<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, USA and <sup>2</sup>Singapore-MIT Alliance, SINGAPORE/USA**T47F****MICROFLUIDIC DEVICE APPLIED TO MULTIPLE FUNCTIONAL ASSAYS FOR ISLETS: NEW METHOD FOR PRETRANSPLANT ISLET QUALITY ASSESSMENT**

J. Shaikh Mohammed, Y. Wang, T.A. Harvat, J. Oberholzer, and D.T. Eddington

University of Illinois, Chicago, USA

**T48F****MICROFLUIDIC PATTERNING OF P-SELECTIN FOR CELL SEPARATION THROUGH ROLLING**S. Bose<sup>1</sup>, S. Hong<sup>1</sup>, R. Langer<sup>1</sup>, J.M. Karp<sup>2</sup>, and R. Karnik<sup>1</sup><sup>1</sup>Massachusetts Institute of Technology, USA and <sup>2</sup>Brigham and Women's Hospital, USA**T49F****MICROPATTERNED CO-CULTURE MODEL OF BACTERIA AND EPITHELIAL CELLS FOR INVESTIGATING SIGNAL-MEDIATED HOST-PATHOGEN INTERACTIONS**

J.Y. Kim, F. Senocak, M. Hegde, and A. Jayaraman

Texas A&amp;M University, USA

**T50F****MICROVORTEX FOCUSING AND SORTING OF PARTICLES IN MICROCHANNELS**

C.H. Hsu, D. Di Carlo, C. Chen, D. Irimia, and M. Toner

Massachusetts General Hospital/Harvard Medical School, USA

**T51F****ON-CHIP DISAGGREGATION OF PRIMARY HUMAN CANCER CELLS FROM SOLID TUMOUR BIOPSIES FOR DOWNSTREAM CELLULAR ANALYSIS IN A MICROFLUIDIC DEVICE**J. Woods<sup>1</sup>, S.M. Hattersley<sup>1</sup>, P.T. Docker<sup>1</sup>, K. Jiang<sup>2</sup>, C.E. Dyer<sup>1</sup>, J. Greenman<sup>1</sup>, and S.J. Haswell<sup>1</sup><sup>1</sup>University of Hull, UK, <sup>2</sup>University of Birmingham, UK**T52F****PARTITION OF MICROCHANNELS WITH COLLAGEN FOR FABRICATING TUNABLE 3D CELLULAR MICROENVIRONMENTS**R. Perez-Castillejos<sup>1,2</sup>, A.P. Wong<sup>1</sup>, J.C. Love<sup>3</sup>, and G.M. Whitesides<sup>1</sup><sup>1</sup>Harvard University, USA, <sup>2</sup>New Jersey Institute of Technology, USA, and<sup>3</sup>Massachusetts Institute of Technology, USA**T53F****PCM-PROGRAMMABLE ARBITRARY GRADIENT GENERATOR FOR CELL CHEMOTAXIS**

Y. Xie, S. Sarkar, F. Azizi, P.J. Thomas, H. Baskaran, and C.H. Mastrangelo

Case Western Reserve University, USA

**T54F****RECEDING MENISCUS INDUCED DOCKING OF YEAST CELLS FOR QUANTITATIVE SINGLE-CELL ANALYSIS**M.C. Park<sup>1</sup>, J.Y. Hur<sup>1</sup>, J.-R. Kim<sup>2</sup>, K.-H. Cho<sup>2</sup>, K.W. Kwon<sup>1</sup>, M.K. Kwak<sup>1</sup>, H.S. Cho<sup>1</sup>, S.-Y. Hwang<sup>1</sup>,S.-H. Park<sup>1</sup>, and K.Y. Suh<sup>1</sup><sup>1</sup>Seoul National University, KOREA and <sup>2</sup>Korea Advanced Institute of Science and Technology, KOREA**T55F****SPATIOTEMPORAL ANALYSES OF INNATE IMMUNITY ENABLED BY INTEGRATED MICROFLUIDIC SINGLE-CELL PREPARATION, MICROSCOPY AND FLOW CYTOMETRY**

N. Srivastava, M. Wu, C.S. Branda, J.S. Brennan, A.E. Herr, and A.K. Singh

Sandia National Laboratories, USA

**T56F****MECHANICAL CONTROL OF STEM CELL DIFFERENTIATION USING MICRO-ENGINEERED MATRIX**

J. Fu, Y.-K. Wang, M.T. Yang, T.T. Lee, and C.S. Chen

University of Pennsylvania, USA

**T57F****THE DEVELOPMENT OF A PRECISION, REAL-TIME ON-CHIP CELL MIGRATION ASSAY UTILIZING SELF ASSEMBLED MONOLAYER MODIFICATION OF MICRO-FABRICATED ELECTRODES AND CELLULAR IMPEDANCE SENSING**

L. Wang, J. Zhu, K. Mitchelson, and J. Cheng

Tsinghua University, CHINA

**T58F****TOWARDS FAST PLASMA AND BLOOD CELL SEPARATION-PATTERN AND ARRANGEMENT INVESTIGATION OF POST ARRAYS USED IN DETERMINISTIC HYDRODYNAMICS**

J. Li, S. Le Gac, and A. van den Berg

MESA+, University of Twente, THE NETHERLANDS

**Applications**  
Drug Discovery**T59F****MICROFLUIDIC DEVICE FOR COMBINATORIAL PROTEIN REFOLDING**

S. Kondapalli and B.J. Kirby

Cornell University, USA

**T60F****NOVEL INORGANIC POLYMER DERIVED MICROREACTORS FOR THE APPLICATION OF ORGANIC MICROCHEMICAL SYNTHESIS**T.-H. Yoon<sup>1</sup>, L.-Y. Hong<sup>1</sup>, S.-H. Park<sup>1</sup>, K.-I. Min<sup>1</sup>, S.-J. Park<sup>1</sup>, and D.-P. Kim<sup>1,2</sup><sup>1</sup>Chungnam National University, KOREA and<sup>2</sup>Korea Advanced Institute of Science and Technology (KAIST), KOREA**T61F****TOWARDS IMPROVED *IN VITRO* SYSTEMS FOR ADME-TOX STUDIES: DEVELOPMENT OF AN INTESTINE-LIVER BIOCHIP**

P.M. van Midwoud, G.M.M. Groothuis, M.T. Merema, and E. Verpoorte

University of Groningen, THE NETHERLANDS

**Applications**  
Environmental**T62F****CONTINUOUS ANALYSIS OF ATMOSPHERIC AEROSOLS USING MICROCHIP ELECTROPHORESIS**S.D. Noblitt<sup>1</sup>, S.V. Hering<sup>2</sup>, J.L. Collett<sup>1</sup>, and C.S. Henry<sup>1</sup><sup>1</sup>Colorado State University, USA and <sup>2</sup>Aerosol Dynamics, Inc., USA**T63F****ON-SITE HEAVY METAL ANALYZER WITH POLYMER LAB CHIP ARRAY FOR AUTOMATIC CONTINUOUS SAMPLING AND MONITORING**

Z. Zou, E. MacKnight, A. Jang, P.M. Wu, J. Do, P.L. Bishop, and C.H. Ahn

University of Cincinnati, USA

**Applications**  
Chemical Synthesis**T64F****CONTROLLABLE SYNTHESIS OF PEPTIDE POLYMERS IN MICROFLUIDIC REACTOR**M. Miyazaki<sup>1,2</sup>, J. Kaneno<sup>3</sup>, H. Yamaguchi<sup>1</sup>, T. Honda<sup>1</sup>, E. Kanaumi<sup>3</sup>, and H. Maeda<sup>1,2</sup><sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN,<sup>2</sup>Kyushu University, JAPAN, and <sup>3</sup>NS Materials Inc., JAPAN**T65F****MULTIPHASE PHOTOCATALYTIC REACTIONS IN A MICROREACTION SYSTEM**

Y. Matsushita, Y. Satoh, N. Ohba, N. Usami, T. Suzuki, and T. Ichimura

Tokyo Institute of Technology, JAPAN

**T66F****REACTION CALORIMETRY IN MICROREACTORS: FAST REACTION SCREENING AND PROCESS DESIGN**

J. Antes, M. Gegenheimer, S. Löbbbecke, and H. Krause

Fraunhofer Institut für Chemische Technologie, GERMANY

## Applications

**T67F****A POLYMERIC ELECTROPORATION MICRONEEDLE ARRAY FOR ENHANCED INTRACELLULAR DELIVERY**

S.-O. Choi, Y.-C. Kim, J. Hutcheson, J.W. Lee, M.R. Prausnitz, and M.G. Allen  
*Georgia Institute of Technology, USA*

**T68F****CARDIOMYOCYTE ACTUATOR FOR MICROFLUIDICS PLATFORM NOZZLES-DIFFUSER PUMP**

M.-D.T. Nguyen, G. Giridharan, and P. Sethu  
*University of Louisville, USA*

**T69F****DEVELOPMENT OF MICROFLUIDIC DEVICES INTEGRATING METAL ELECTRODES FOR ON-LINE PRECONCENTRATION AND A PROTON-SENSITIVE ISFET SENSOR**

K. Takemura, F. Kitagawa, and K. Otsuka  
*Kyoto University, JAPAN*

**T70F****LABEL-FREE MICROFLUIDIC CHARACTERIZATION OF TEMPERATURE DEPENDENT BIOMOLECULAR BINDING BY MALDI-TOF MASS SPECTROMETRY**

T.H. Nguyen, R. Pei, M. Stojanovic, and Q. Lin  
*Columbia University, USA*

**T71F****ON-CHIP ATP AMPLIFICATION**

Y. Murakami, Y. Shinoda, T. Satoh, K. Noda, and A. Kuroda  
*Hiroshima University, JAPAN*

**T72F****RECHARGEABLE 3-D MICROBATTERIES FABRICATED WITH AN EXOTHERMIC NANOPOROUS CASTING PROCESS**

H. Berry, C. Whitney, and C.G. Wilson  
*Louisiana Tech University, USA*

## Grand Ballroom A-B

## Session 2A3

Extreme Multiplexed Analysis

## Grand Ballroom C

## Session 2B3

Analyzing Blood Components

15:40 - 16:00

**A "MICROFLUIDIC NOSE": LARGE-AREA MICROARRAYS OF OLFACTORY SENSORY NEURONS FOR DETECTING ODORANT RESPONSES**

X.A. Figueroa<sup>1</sup>, G.A. Cooksey<sup>1</sup>, S.V. Votaw<sup>1</sup>, L. Horowitz<sup>2</sup>, and A. Folch<sup>1</sup>  
<sup>1</sup>University of Washington, USA and <sup>2</sup>Fred Hutchinson Cancer Research Center, USA

**INERTIAL MICROFLUIDICS: HIGH-THROUGHPUT FOCUSING AND SEPARATION OF CELLS AND PARTICLES**

D. Di Carlo, D. Irimia, R.G. Tompkins, and M. Toner  
*Harvard University, USA*

16:00 - 16:20

**MULTIPLEXED "DETECTORLESS" ELECTROPHORESIS**

D. Ross and J.G. Kralj  
*National Institute of Standards and Technology (NIST), USA*

**ON-CHIP NEUTROPHIL CAPTURE AND MIGRATION ANALYSIS FROM A DROP OF BLOOD**

N. Agrawal, M. Toner, and D. Irimia  
*Massachusetts General Hospital and Harvard Medical School, USA*

16:20 - 16:40

**CONCURRENT MULTI-SAMPLE ANALYSIS OF LOW EXPRESSED BIOMARKERS ON SINGLE HUMAN CELLS BY ENZYMATICALLY AMPLIFIED IMMUNODETECTION IN DROPLETS**

H.N. Joensson<sup>1</sup>, M.L. Samuels<sup>2</sup>, E.R. Brouzes<sup>2</sup>, M. Medkova<sup>2</sup>, M. Uhlén<sup>1</sup>, H. Andersson Svahn<sup>1</sup>, and D.R. Link<sup>2</sup>  
<sup>1</sup>Royal Institute of Technology (KTH), SWEDEN and <sup>2</sup>RainDance Technologies, USA

**MICROFLUIDIC SYNTHESIS OF SQUISHY BIO-MIMETIC PARTICLES WITH TUNABLE DEFORMABILITY**

R. Haghgooei<sup>1</sup>, M. Toner<sup>1</sup>, and P.S. Doyle<sup>3</sup>  
<sup>1</sup>Harvard University, USA and <sup>2</sup>Massachusetts Institute of Technology, USA

16:40 Adjourn for the Day

18:00 -  
 22:00 Conference Banquet at the San Diego Zoo



Wednesday, October 15, 2008

08:00 - 08:20

Announcement of the µTAS 2009 Conference

08:20 - 09:00

Plenary V

INTEGRATED ELECTROCHEMICAL CELLULAR DEVICES FOR DETECTION OF GENE EXPRESSION

T. Matsue  
Tohoku University, JAPAN

Grand Ballroom A-B

Grand Ballroom C

Session 3A1

Cell Sorting

Session 3B1

Innovative Chemistries for Microfluidics

09:15 - 09:35

HIGH THROUGHPUT, MULTI-TARGET MAGNETOPHORETIC SEPARATION

J.D. Adams, U. Kim, and H.T. Soh  
University of California, Santa Barbara, USA

STUDY ON VAPOR-LIQUID PHASE TRANSITION PHENOMENA IN EXTENDED-NANO SPACES

T. Tsukahara<sup>1</sup>, T. Maeda<sup>1</sup>, K. Mawatari<sup>2</sup>, A. Hibara<sup>1</sup>, and T. Kitamori<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kanagawa Academy of Science and Technology, JAPAN

09:35 - 09:55

MICROFLUIDIC DEVICE FOR CONTINUOUS DIELECTROPHORETIC SEPARATION OF CELLS IN DIVISION

N. Demierre, T. Braschler, A. Valero, and P. Renaud  
Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

PARALLEL SCREENING OF *IN SITU* CLICK CHEMICAL LIBRARIES IN INTEGRATED MICROFLUIDIC DEVICES

W.-Y. Lin, Y. Wang, R. Lin, M.E. Phelps, C.K.-F. Shen, K. Faull, and H.-R. Tseng  
University of California, Los Angeles, USA

09:55 - 10:15

MEASURING THE IMPACT OF DIELECTROPHORESIS ON CELL PHYSIOLOGY USING A HIGH-CONTENT SCREENING PLATFORM

S.P. Desai and J. Voldman  
Massachusetts Institute of Technology, USA

LOCAL SURFACE MODIFICATION USING TRAPPING AND MELTING OF POLYMER MICROPARTICLES FOR DIVERSE PATTERNING

S. Fukushima<sup>1</sup>, M. Yamada<sup>2</sup>, M. Yamamoto<sup>3</sup>, and M. Seki<sup>1</sup>  
<sup>1</sup>Chiba University, JAPAN, <sup>2</sup>Tokyo Women's Medical University, JAPAN, and <sup>3</sup>Osaka Prefecture University, JAPAN

10:15 - 10:45

Break & Exhibit Inspection

Grand Ballroom A-B

Grand Ballroom C

Session 3A2

Sample Preparation

Session 3B2

Tools for Controlled Cell Culture I

10:45 - 11:05

ULTRA-RAPID SAMPLE PRECONCENTRATION UNDER SLANT FIELD USING HIGH-ASPECT-RATIO NANOPOROUS MEMBRANES

Y.-C. Wang, A.K. Singh, and A.V. Hatch  
Sandia National Laboratories, USA

MICROFLUIDIC CHIPS WITH "AXON DIODES" FOR DIRECTED AXONAL OUTGROWTH AND RECONSTRUCTION OF COMPLEX LIVE NEURAL NETWORKS

J.M. Peyrin<sup>1</sup>, L. Saias<sup>2</sup>, P. Gougis<sup>2</sup>, S. Magnifico<sup>1</sup>, S. Betuing<sup>1</sup>, D. Kilinc<sup>1</sup>, J.L. Viovy<sup>2</sup>, and B. Brugg<sup>1</sup>  
<sup>1</sup>Université Pierre et Marie Curie, FRANCE and <sup>2</sup>Institut Curie, FRANCE

11:05 - 11:25

HIGH-THROUGHPUT SAMPLE PREPARATION FOR MASS SPECTROMETRY BY CONTINUOUS-FLOW PI-BASED FRACTIONATION OF PEPTIDES AND PROTEINS

Y.-A. Song and J. Han  
Massachusetts Institute of Technology, USA

"MICROFLUIDIC PALETTE": GENERATION OF STABLE AND PURELY DIFFUSIVE CHEMICAL GRADIENTS INSIDE A MICROFLUIDIC CHAMBER

J. Atencia, J. Morrow, and L.E. Locascio  
National Institute of Standards and Technology (NIST), USA

11:25 - 11:45

NOVEL TWO-PHASE FLOW CONTROL CONCEPT AND MULTI-STEP EXTRACTION MICROCHIP

A. Hibara<sup>1,2,3</sup>, K. Kasai<sup>1</sup>, H. Miyaguchi<sup>4</sup>, and T. Kitamori<sup>1,2,3</sup>  
<sup>1</sup>University of Tokyo, JAPAN, <sup>2</sup>Kanagawa Academy of Science & Technology, JAPAN, <sup>3</sup>Japan Science and Technology Agency (JST), JAPAN, and <sup>4</sup>National Research Institute of Police Science, JAPAN

MICROSCALE CONTROL OF MICROPOST STIFFNESS TO INDUCE CELLULAR DUROTAXIS

R.D. Sochol, A.T. Higa, R.R.R. Janairo, K.G. Shah, T.D. Johnson, S. Li, and L. Lin  
University of California, Berkeley, USA

11:45 – 13:00 | Lunch & Exhibit Inspection

13:00 - 13:40

### Plenary VI

CREATIVITY IN SCIENCE AND TECHNOLOGY: EXAMPLES FROM FLUIDS, LESSONS FROM ART

J.M. Ottino  
Northwestern University, USA

13:40 - 14:00

**Art In Science** AWARD sponsored by National Institute of Standards and Technology (NIST), USA

14:00 - 16:20

### Poster Session III

## Microfluidics

### Fluid Mechanics & Modeling

#### W1A

A PORTABLE IMAGING DEVICE USING A CMOS DETECTOR AND OLED LIGHT SOURCE

N. Misawa, T. Yamamura, and S. Takeuchi  
University of Tokyo, JAPAN

#### W2A

EXPERIMENTAL AND THEORETICAL MEASUREMENTS OF CONCENTRATION DISTRIBUTIONS IN ACOUSTIC FOCUSING DEVICES

K.A. Rose, K. Fisher, B. Jung, K. Ness, and R.P. Mariella, Jr.  
Lawrence Livermore National Laboratory, USA

#### W3A

IN-SITU MEASUREMENT OF VISCOUS DRAG BY POLYMERIC MICROFLUIDIC FORCEMETER

S.A. Lee, J. Kim, and S. Kwon  
Seoul National University, KOREA

#### W4A

MICRO-FLUIDIC MIXING BY ACTIVE CONTROL OF THE FLOW BIFURCATION IN A T-MIXER

R. Lindken, J. Hussong, and J. Westerweel  
Delft University of Technology, THE NETHERLANDS

#### W5A

MICROFLUIDIC OSCILLATORS: FLUIDIC BAND-PASS FILTERS WITH HIGH Q-FACTORS

M.R. Begley and M. Utz  
University of Virginia, USA

#### W6A

PRESSURE CHARACTERISTICS MODELLING FOR THE RAPID DESIGN OF CAPILLARY MICROFLUIDIC SYSTEMS

T. Metz, L. Riegger, C. Ziegler, R. Zengerle, and P. Koltay  
University of Freiburg (IMTEK), GERMANY

#### W7A

THREE-DIMENSIONAL HYDRODYNAMIC FOCUSING OVER A WIDE REYNOLDS NUMBER RANGE USING A TWO-LAYER MICROFLUIDIC DESIGN

G.S. Zhuang, T.G. Jensen, and J.P. Kutter  
Technical University of Denmark, DENMARK

## Microfluidics

### World-to-Chip Interfacing

#### W8A

AN ACTIVE, INTEGRATED BUBBLE TRAP AND DEBUBBLER FOR MICROFLUIDIC APPLICATIONS

A.M. Skelley and J. Voldman  
Massachusetts Institute of Technology, USA

#### W9A

INTEGRATED PIPETTE COMPATIBLE STERILE INTERFACE TO MICROFLUIDIC CHAMBERS

H.L.T. Lee, P. Boccuzzi, R.J. Ram, and A.J. Sinskey  
Massachusetts Institute of Technology, USA

## Microfluidics

### Aliquoting, Mixing & Pumping

#### W10A

A MILLISECONDS MICROFLUIDIC MIXER BASED ON SINGLE BUBBLE STREAMING

D. Ahmed, X. Mao, B.K. Juluri, J. Shi, and T.J. Huang  
Pennsylvania State University, USA

#### W11A

A VALVE-LESS MICRO PUMP WITH PZT DIAPHRAGM

V. Thanh Dau, T. Xuan Dinh, R. Sakamoto, O. Tomonori, K. Tanaka, and S. Sugiyama  
Ritsumeikan University, JAPAN

#### W12A

ACTIVE SUPERPARAMAGNETIC BEAD MANIPULATION FOR IMMUNOASSAYS ON-CHIP

Y. Moser, T. Lehnert, E.P. Dupont, R. Afshar, and M.A.M. Gijs  
Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

#### W13A

CILIA DEVICE FOR MICROFLUID MANIPULATION

K. Oh<sup>1</sup>, J.-H. Chung<sup>1</sup>, S. Devasia<sup>1</sup>, J.J. Riley<sup>1</sup>, and K.H. Lee<sup>2</sup>  
<sup>1</sup>University of Washington, USA and <sup>2</sup>NanoFactory, Inc., USA

#### W14A

DISPENSING INDIVIDUAL FLUID PARTICLES ON DEMAND IN A MICROFLUIDIC CHIP

J. Xu and D. Attinger  
Columbia University, USA

#### W15A

HIGH-PERFORMANCE MICROMIXER FOR FULLY INTEGRATED MICROFLUIDIC SYSTEMS

D. Kim<sup>1,2</sup>, H.S. Rho<sup>1</sup>, and J.W. Hong<sup>1</sup>  
<sup>1</sup>Auburn University, USA and <sup>2</sup>Korea Institute of Machinery and Materials (KIMM), KOREA

#### W16A

LATERAL CAVITY ACOUSTIC TRANSDUCER

A.R. Tovar, R. Madangopal, J. Draper, and A.P. Lee  
University of California, Irvine, USA

#### W17A

NOVEL MICROMIXER UTILIZING FREQUENCY MODE MODULATION ON META-STRUCTURE

K. Kanda<sup>1</sup>, Y. Noda<sup>2</sup>, T. Suzuki<sup>3</sup>, I. Kanno<sup>3</sup>, and H. Kotera<sup>3</sup>  
<sup>1</sup>Advanced Software Technology and Mechatronics Research Institute of Kyoto, JAPAN,  
<sup>2</sup>Arkray Inc., JAPAN, and <sup>3</sup>Kyoto University, JAPAN

#### W18A

PEN-TYPE 3D PERISTALTIC MICROPUMP FOR PORTABLE APPLICATIONS

W. Rhie and T. Higuchi  
University of Tokyo, JAPAN

#### W19A

SELF-SYNCHRONIZED GENERATION AND CONTROLLED MERGING OF DROPLETS

P. Carreras, S. Mohr, P. Fielden, and N. Goddard  
University of Manchester, UK

#### W20A

TUBELESS MICROFLUIDIC SAMPLING/MIXING DEVICE USING WETTABILITY GRADIENT AND ELECTROWETTING

T. Yasuda and S. Harada  
Kyushu Institute of Technology, JAPAN

**W21A**

**USE OF PHOTOPATTERNED NANOPOROUS POLYMER MONOLITHS AS PASSIVE MIXERS TO ENHANCE MIXING EFFICIENCY FOR ON-CHIP LABELING REACTIONS**

D.A. Mair<sup>1</sup>, E. Geiger<sup>1,2</sup>, T. Schwei<sup>2,3</sup>, T. Dinio<sup>2,3</sup>, F. Svec<sup>2,3</sup>, and J. Fréchet<sup>2,3</sup>  
<sup>1</sup>Fluigence, LLC, USA, <sup>2</sup>Lawrence Berkeley National Laboratory, USA, and <sup>3</sup>University of California, Berkeley, USA

**Microfluidics**  
 Multi-Phase Microfluidics

**W22A**

**A MICROFLUIDIC DEVICE FOR CONTINUOUS-FLOW LAYER-BY-LAYER ENCAPSULATION OF DROPLETS WITH POLYELECTROLYTES**

S. Zhang<sup>1,2</sup>, L. Yobas<sup>1</sup>, and D. Trau<sup>2</sup>  
<sup>1</sup>Institute of Microelectronics, SINGAPORE and <sup>2</sup>National University of Singapore, SINGAPORE

**W23A**

**MICROFLUIDIC EXTRACTION IN DROPLETS AND ITS APPLICATIONS TO BIOLOGY AND ENVIRONMENTAL SCIENCE**

P. Mary<sup>1</sup>, V. Studer<sup>1</sup>, M. Stambouli<sup>2</sup>, and P. Tabeling<sup>1</sup>  
<sup>1</sup>Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE and <sup>2</sup>Ecole Centrale Paris, FRANCE

**W24A**

**CHARACTERIZATION OF LAMINAR FLOW-ASSISTED DENDRITIC AMPLIFICATION**

K. Hosokawa and M. Maeda  
 RIKEN, JAPAN

**W25A**

**DEFORMED DROPLET BREAKUP IN MICROFLUIDIC DEVICE FOR SMALLER PARTICLES GENERATION**

T. Moritani<sup>1</sup>, S. Doi<sup>2</sup>, and M. Seki<sup>1</sup>  
<sup>1</sup>Chiba University, JAPAN and <sup>2</sup>Osaka Prefecture University, JAPAN

**W26A**

**DIFFERENTIAL INERTIAL FOCUSING IN CURVED HIGH-ASPECT-RATIO CHANNELS FOR CONTINUOUS HIGH THROUGHPUT PARTICLE SEPARATION**

A. Russom, S. Nagrath, A.K. Gupta, D. DiCarlo, J.F. Edd, and M. Toner  
 Harvard Medical School, USA

**W27A**

**DISCRETE AQUEOUS TWO-PHASE MICROEXTRACTION WITH SIMULTANEOUS ELECTROHYDRODYNAMIC GENERATION OF A SINGLE DROPLET**

Y.S. Song, Y.H. Choi, G. Park, and D.H. Kim  
 Korea Advanced Institute of Science and Technology (KAIST), KOREA

**W28A**

**ENCAPSULATION OF BIOMOLECULES WITH PROGRAMMABLE CONCENTRATIONS IN MICRODROPLETS USING ELECTROKINETIC CONCENTRATOR**

Y.-A. Song, A. Sarkar, and J. Han  
 Massachusetts Institute of Technology, USA

**W29A**

**GEOMETRICALLY MEDIATED DROPLET MERGING IN MICROCHANNELS**

X. Niu and J.B. Edel  
 Imperial College London, UK

**W30A**

**LIPOSOME FORMATION BY COUNTER-CURRENT FLOWS IN MICROCHANNELS**

M. Shibata<sup>1</sup>, Y. Okamoto<sup>1</sup>, N. Kaji<sup>1</sup>, M. Tokeshi<sup>1</sup>, and Y. Baba<sup>1,2,3</sup>  
<sup>1</sup>Nagoya University, JAPAN,  
<sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and  
<sup>3</sup>Institute for Molecular Science, JAPAN

**W31A**

**MICRO-CALORIMETER WITH ENCLOSED PARYLENE CHAMBERS FOR BIO/CHEMICAL APPLICATIONS**

C.H. Lee<sup>1,3</sup>, G. Walker<sup>2</sup>, A. O'Neill<sup>2</sup>, and D.K. Manikkam<sup>1</sup>  
<sup>1</sup>California State University, Fresno, USA, <sup>2</sup>North Carolina State University, USA, and  
<sup>3</sup>Marquette University, USA

**W32A**

**MICROFLUIDIC METHOD FOR THE PRODUCTION OF MONODISPERSE ALGINATE MICROBEADS AND *IN SITU* ENCAPSULATION OF CELLS**

C.-H. Choi, J.-H. Jung, and C.-S. Lee  
 Chungnam National University, KOREA

**W33A**

**RAPID FABRICATION OF 3-D BRANCHED MICROVASCULAR FLOW NETWORKS**

J.-H. Huang, J. Kim, A. Jayaraman, and V.-M. Ugaz  
 Texas A&M University, USA

**W34A**

**SELF-SYNCHRONIZING DROPLETS WITH DOUBLE STEP-EMULSIFICATION DEVICES**

V. Chokkalingam<sup>1</sup>, S. Herminghaus<sup>1</sup>, and R. Seemann<sup>1,2</sup>  
<sup>1</sup>Max Planck Institute for Dynamics and Self-Organization, GERMANY and  
<sup>2</sup>Saarland University, GERMANY

**Microfluidics**  
 Separation Methods

**W35A**

**FAST MICROFLUIDIC PARTICLE FILTERING BY DEAN SPREADING**

Z. Wu and K. Hjort  
 Uppsala University, SWEDEN

**W36A**

**A CHANNEL-FREE SEPARATION SYSTEM BASED ON CIRCULAR SHEAR DRIVEN FLOW**

Y. Cai, D. Janasek, J. Franzke, and A. Manz  
 Institute for Analytical Sciences (ISAS), GERMANY

**W37A**

**DIELECTROPHORETIC SEPARATION OF COLLOIDAL PARTICLES USING ANGLED ELECTRODE ARRAY**

N.A. Md Yunus and N.G. Green  
 University of Southampton, UK

**W38A**

**ENHANCED MICROFLUIDIC SYSTEMATIC EVOLUTION OF LIGANDS BY EXPONENTIAL ENRICHMENT (EM-SELEX)**

J.K. Qian<sup>1</sup>, X. Lou<sup>1</sup>, Y. Zhang<sup>2</sup>, Y. Xiao<sup>1</sup>, A. Gerdon<sup>1</sup>, and H.T. Soh<sup>1</sup>  
<sup>1</sup>University of California, Santa Barbara, USA and <sup>2</sup>Cynvenio Biosystems, USA

**W39A**

**HIGH-DYNAMIC RANGE PARTICLE SEPARATION VIA INSULATING DIELECTROPHORESIS**

B.G. Hawkins and B.J. Kirby  
 Cornell University, USA

**W40A**

**INKJET-BASED DNA INJECTOR FOR MICROCHIP ELECTROPHORESIS**

Y. Inoue<sup>1</sup>, N. Kaji<sup>1</sup>, Y. Okamoto<sup>1</sup>, M. Tokeshi<sup>1</sup>, and Y. Baba<sup>1,2,3</sup>  
<sup>1</sup>Nagoya University, JAPAN,  
<sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and  
<sup>3</sup>Institute for Molecular Science, JAPAN

**W41A**

**MICROFLUIDIC CARTRIDGE FOR (BIO)CHEMICAL FUNCTIONALIZATION OF PT MICROELECTRODES INTEGRATED ON SILICON MICROPROBES**

O. Frey, B. Guélat, N.F. de Rooij, and M. Koudelka-Hep  
 University of Neuchâtel, SWITZERLAND

**W42A**

**MICROFLUIDIC SUPERPARAMAGNETIC BEAD-BASED MULTIPLEX DETECTION SYSTEM**

J. Nambi Krishnan, T.S. Kim, and S.K. Kim  
 Korea Institute of Science and Technology (KIST), KOREA

**W43A**

**ON-CHIP SEPARATION AND DETECTION OF NON-FLUORESCENT TOXINS IN WATER USING FLUORESCENT MOBILITY MARKERS**

T. Khurana and J.G. Santiago  
 Stanford University, USA

**W44A****PYKLINOPHORESIS: A NEW PARTICLE MIGRATION PRINCIPLE DRIVEN BY DENSITY GRADIENT AND APPLICATION TO ANALYSIS OF SOLUTION DENSITY IN A MICROFLUIDIC DEVICE**

J.H. Kang, B. Kim, and J.-K. Park

*Korea Advanced Institute of Science and Technology (KAIST), KOREA***W45A****SEPARATION AND COLLECTION OF MICROPARTICLES USING OSCILLATING BUBBLES**

K. Ryu, S.K. Chung, and S.K. Cho

*University of Pittsburgh, USA***W46A****SORTING CONCENTRATED SUSPENSIONS: PARTICLE INTERACTIONS, EMERGENT BEHAVIOR, AND IMPLICATIONS FOR MICROFLUIDIC SEPARATIONS**

M.D. Vahey and J. Voldman

*Massachusetts Institute of Technology, USA***Microfluidics****W47A****A NOVEL MICROFLUIDIC DEVICE FOR IMMOBILIZING AND IMAGING *DROSOPHILA* EMBRYOS**H.N. Cartwright<sup>1</sup>, S.M. Abmayr<sup>1,2</sup>, and J.W. Schwartz<sup>1,3</sup><sup>1</sup>*Stowers Institute for Medical Research, USA*, <sup>2</sup>*University of Kansas Medical Center, USA*, and<sup>3</sup>*University of Kansas, USA***W48A****DNA DIFFUSION CONTROL**J. Regtmeier<sup>1</sup>, R. Eichhorn<sup>1</sup>, P. Reimann<sup>1</sup>, A. Ros<sup>2</sup>, and D. Anselmetti<sup>1</sup><sup>1</sup>*Bielefeld University, GERMANY* and <sup>2</sup>*Arizona State University, USA***W49A****FABRICATION OF PDMS MEMBRANES WITH AQUEOUS MOLDS FOR MICROFLUIDIC SYSTEMS**

K. Bilotkach and A.P. Lee

*University of California, Irvine, USA***W50A****ON-CHIP LIQUID TUNABLE GRATING USING LAMINAR MICROFLUIDIC CONTROL SYSTEM**

Z.G. Li, L.K. Chin, H.J. Huang, H.N. Unni, and A.Q. Liu

*Nanyang Technological University, SINGAPORE***W51A****EXPANSION CHANNELS FOR LOW-PASS FILTERING OF AXIAL CONCENTRATION GRADIENTS IN MICROFLUIDIC SYSTEMS**

D.M. Hartmann, D. Wyrick, J.T. Nevill, G. Votaw, and H.C. Crenshaw

*GlaxoSmithKline, USA***W52A****THROUGHPUT THROUGH THIN-FILM FLUIDICS**J.P. Beech<sup>1</sup>, T. Mäkelä<sup>2</sup>, P. Majander<sup>2</sup>, and J.O. Tegenfeldt<sup>1</sup><sup>1</sup>*Lund University, SWEDEN* and <sup>2</sup>*VTI, FINLAND***W53A****ULTRASONIC MICRO-CAGES: A NEW APPROACH FOR MANIPULATION AND MONITORING OF INDIVIDUAL CELLS AND FOR FLUID MIXING**

O. Manneberg, J. Svennebring, H.M. Hertz, and M. Wiklund

*Royal Institute of Technology (KTH), SWEDEN***Nanotechnology****Nanofluidics****W1B****DEVELOPMENT OF PRESSURE-DRIVEN SEPARATION IN EXTENDED-NANO SPACES**M. Inaba<sup>1</sup>, M. Kato<sup>1</sup>, T. Tsukahara<sup>1</sup>, K. Mawatari<sup>2</sup>, A. Hibara<sup>1</sup>, and T. Kitamori<sup>1,2</sup><sup>1</sup>*University of Tokyo, JAPAN* and <sup>2</sup>*Kanagawa Academy of Science and Technology, JAPAN***W2B****EVALUATION OF WATER PROPERTY IN EXTENDED-NANO SPACE USING STREAMING CURRENT MEASUREMENT**K. Morikawa<sup>1</sup>, M. Kato<sup>1</sup>, T. Tsukahara<sup>1</sup>, K. Mawatari<sup>2</sup>, A. Hibara<sup>1</sup>, and T. Kitamori<sup>1,2</sup><sup>1</sup>*University of Tokyo, JAPAN* and <sup>2</sup>*Kanagawa Academy of Science and Technology, JAPAN***W3B****FORMATION OF LIQUID MENISCI IN FLEXIBLE NANOCANNELS**

J.W. van Honschoten, N.R. Tas, V.B. Svetovoy, M. Escalante, and M. Elwenspoek

*University of Twente, THE NETHERLANDS***W4B****MULTIPLE MEASUREMENTS ON THE SAME MOLECULE IN A NANOPORE SYSTEM WITH FEED-BACK CONTROL**

Y.H. Sen and R. Karnik

*Massachusetts Institute of Technology, USA***W5B****SINGLE MOLECULE ANALYSIS OF ELECTRODYNAMICALLY STRETCHED DNA IN NANOCANNELS**S.M. Stavis<sup>1,2</sup>, C.H. Reccius<sup>1,3</sup>, J.T. Mannion<sup>1</sup>, L.P. Walker<sup>1</sup>, and H.G. Craighead<sup>1</sup><sup>1</sup>*Cornell University, USA*, <sup>2</sup>*National Institute of Standards & Technology (NIST), USA*, and <sup>3</sup>*Phillips Research, UK***Nanotechnology****Nanoengineering****W6B****NOVEL SYNTHESIS OF POLYMERIC NANOPARTICLES FOR DRUG DELIVERY APPLICATIONS USING MICROFLUIDIC RAPID MIXING**P. Valencia<sup>1</sup>, P. Basto<sup>1</sup>, F. Gu<sup>1</sup>, L. Zhang<sup>1</sup>, C. Cannizzaro<sup>1</sup>, R. Langer<sup>1</sup>, O. Farokhzad<sup>2</sup>, and R. Karnik<sup>1</sup><sup>1</sup>*Massachusetts Institute of Technology, USA* and<sup>2</sup>*Brigham and Women's Hospital, Harvard Medical School, USA***Nanotechnology****Nanobiotechnology****W7B****MAPPING IN NANOCANNELS**W.W. Reisner<sup>1,2</sup>, H. Flyvbjerg<sup>2</sup>, and J. O. Tegenfeldt<sup>1</sup><sup>1</sup>*Lund University, SWEDEN* and <sup>2</sup>*Technical University of Denmark (DTU), DENMARK***W8B****HIGH-THROUGHPUT GENE ANALYSIS USING SUSPENDING DNA FIBERS (SDFs) ON A MICRO GLASS-PHONORECORD**A. Fuke<sup>1</sup>, T. Suzuki<sup>2</sup>, K. Nakama<sup>3</sup>, H. Kabata<sup>4</sup>, and H. Kotera<sup>1</sup><sup>1</sup>*Kyoto University, JAPAN*, <sup>2</sup>*Kagawa University, JAPAN*, <sup>3</sup>*Nippon Glass Sheet, JAPAN*, and<sup>4</sup>*Sysmex Corporation, JAPAN***W9B****MAGNETOPHORETIC POSITION DETECTION FOR MULTIPLEXED IMMUNOASSAYS USING COLORED MICROSPHERES**

Y.K. Hahn, Z. Jin, J.-B. Chang, H.-S. Kim, and J.-K. Park

*Korea Advanced Institute of Science and Technology (KAIST), KOREA***W10B****MOLECULAR DELIVERY INTO LIVE CELLS WITH LIGHT IMAGE PATTERNS AND A GOLD PARTICLE COATED SUBSTRATE**

S. Kalim, T.-H. Wu, C. Callahan, E.P.Y. Chiou, and M. Teitell

*University of California, Los Angeles, USA*

**W11B**

**UV-MEDIATED LIGAND IMMOBILIZATION FOR MULTIPLEXED ANALYSIS IN EXTENDED NANOSPACE CHANNELS**

B. Renberg<sup>1</sup>, K. Mawatari<sup>2</sup>, T. Tsukahara<sup>1</sup>, N. Idota<sup>1</sup>, K. Sato<sup>1</sup>, and T. Kitamori<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kanagawa Academy of Science and Technology, JAPAN

**Nanotechnology**  
 Nanoassembly

**W12B**

**PROTON TRANSPORT THROUGH SELF-ASSEMBLED FUNCTIONALIZED NANOPOROUS SILICON**

S. Moghaddam, E. Pengwang, R. Masel, and M. Shannon  
 University of Illinois, Urbana-Champaign, USA

**W13B**

**SELF ASSEMBLY OF HIGHLY ORDERED NANO-COLLOID ARRAY ON PATTERNED PEG HYDROGEL**

H. Cong, A. Revzin, and T. Pan  
 University of California, Davis, USA

**Nanotechnology**

**W14B**

**DEUTERIUM SUBSTITUTION AND SOLVENT EFFECTS ON REACTION DYNAMICS IN EXTENDED-NANO SPACES ON A CHIP**

T. Tsukahara<sup>1</sup>, K. Nagaoka<sup>1</sup>, and T. Kitamori<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kanagawa Academy of Science & Technology, JAPAN

**Materials**  
 Surface Modification

**W1C**

**A SIMPLE AND VERSATILE METHOD FOR SINGLE CELL PATTERNING**

A. Azoune<sup>1</sup>, M. Théry<sup>2</sup>, M. Bornens<sup>1</sup>, and M. Piel<sup>1</sup>  
<sup>1</sup>Institut Curie, FRANCE, <sup>2</sup>Commissariat à l'Energie Atomique (CEA), FRANCE

**W2C**

**AC-ELECTROOSMOSIS-ASSISTED LOCALISATION AND ENHANCED BIOCONCENTRATION ON ELECTROCHEMICALLY BIOFUNCTIONALIZED MICRODEVICES**

L. Tanguy<sup>1</sup>, S. Salomon<sup>1</sup>, P. Mailley<sup>2</sup>, and L. Nicu<sup>1</sup>  
<sup>1</sup>LAAS-CNRS, FRANCE and <sup>2</sup>Commissariat à l'Energie Atomique (CEA), FRANCE

**W3C**

**DEVELOPMENT OF TUNABLE SUPERHYDROPHOBIC SURFACES BY DUAL-SCALE SURFACE MODIFICATION USING SIMPLE SILICON WET ETCHING AND ZnO NANORODS FORMATION**

H. Kim and J. Kim  
 Pohang University of Science and Technology (POSTECH), KOREA

**W4C**

**MICROFLUIDICS-GENERATED IMMOBILIZED BIOMOLECULE GRADIENTS ON HYDROGELS**

S.A. Kobel, S. Cosson, and M.P. Lutolf  
 Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

**W5C**

**SURFACE MODIFICATION AND PATTERNING OF BIOMOLECULES AND CELLS, USING A POLYMER LIFT-OFF TEMPLATE**

C.P. Tan, J.M. Moran-Mirabal, D.J. Brooks, B.R. Ilic, C. Fischbach-Teschl, and H.G. Craighead  
 Cornell University, USA

**Materials**

Interface Characterization

**W6C**

**AN INTEGRATED CRACK-OPENING METHOD FOR DETERMINING THE WORK OF FRACTURE OF BONDED POLYMER INTERFACES**

H. Taylor and D. Boning  
 Massachusetts Institute of Technology, USA

**W7C**

**TRANSIENT ELECTROKINETIC PHENOMENA IN HYDROPHOBIC MICROFLUIDIC DEVICES**

V. Tandon, S.K. Bhagavatula, and B.J. Kirby  
 Cornell University, USA

**Materials**

Nanostructured Materials

**W8C**

**DROPLET EVAPORATION ON NANOSTRUCTURED SUPERHYDROPHOBIC SURFACES**

C.-H. Choi<sup>1</sup> and C.-J. Kim<sup>2</sup>  
<sup>1</sup>Stevens Institute of Technology, USA and <sup>2</sup>University of California, Los Angeles, USA

**W9C**

**METAL-SEMICONDUCTOR TRANSITION OF ssDNA DECORATED SINGLE-WALLED CARBON NANOTUBES**

M. Cha, S. Jung, J. Hwang, and J. Lee  
 Seoul National University, KOREA

**W10C**

**QUANTITATIVE END-GRAFTING OF DNA ONTO FLAT AND NANOPOROUS GOLD SURFACES**

L. Huang, E. Seker, M. Utz, M.R. Begley, and J.P. Landers  
 University of Virginia, USA

**Materials**

Innovative Chip Materials

**W11C**

**PDMS BASED NEGATIVE PHOTORESIST FOR MICROFLUIDIC APPLICATIONS**

S. Suhard<sup>1</sup>, G. Ardila<sup>1</sup>, D. Collin<sup>2</sup>, M.-F. Guimon<sup>3</sup>, A. Martinez Rivas<sup>1</sup>, P. Martinoty<sup>2</sup>, M. Mauzac<sup>1</sup>, A.-F. Mingotaud<sup>1</sup>, C. Rossi<sup>1</sup>, and C. Séverac<sup>1</sup>  
<sup>1</sup>Université de Toulouse, FRANCE, <sup>2</sup>Institut Charles Sadron, FRANCE, and <sup>3</sup>Ecole Centrale Paris, FRANCE

**W12C**

**RAPID PROTOTYPING AND NON-PLANAR PATTERNING USING PHOTODEFINABLE PDMS**

P. Jothimuthu, A.A.S. Bhagat, and I. Papautsky  
 University of Cincinnati, USA

**W13C**

**THERMOPLASTIC ELASTOMERS (TPE) BLOCK COPOLYMERS, A NEW MATERIAL PLATFORM FOR MICROFLUIDICS: PROOF OF CONCEPT FOR COMPLEX SIPHON VALVING ON CD**

E. Roy<sup>1</sup>, J. Siegrist<sup>2</sup>, R. Peytavi<sup>3</sup>, G.A. Diaz-Quijada<sup>1</sup>, H. Roberge<sup>1</sup>, F. Normandin<sup>1</sup>, G. Jia<sup>2</sup>, J. Zoval<sup>2</sup>, M. Madou<sup>2</sup>, M.G. Bergeron<sup>3</sup>, M.M. Dumoulin<sup>1</sup>, and T. Veres<sup>1</sup>  
<sup>1</sup>National Research Council, CANADA, <sup>2</sup>University of California, Irvine, USA, and <sup>3</sup>Laval University, CANADA

**Detection Technologies**

Optical

**W1D**

**A DISPOSABLE MICRO-ELECTRO-OPTICAL INTERFACE FOR FLOW MONITORING IN BIO-MICROFLUIDICS**

M. Bucolo<sup>1</sup>, V.J. Cadarso<sup>2</sup>, J. Esteve<sup>2</sup>, L. Fortuna<sup>1</sup>, A. Llobera<sup>2</sup>, F. Sapuppo<sup>1</sup>, and F. Schembri<sup>1</sup>  
<sup>1</sup>Università degli Studi di Catania, ITALY and <sup>2</sup>Centro Nacional de Microelectrónica, SPAIN

**W2D****A LIQUID WAVEGUIDE BASED TWIN MACH-ZEHNDER INTERFEROMETER FOR REAL TIME PARTICLE SORTING**X.C. Li<sup>1,2</sup>, Z.G. Li<sup>2</sup>, H.J. Huang<sup>2</sup>, J. Wu<sup>1</sup>, K. Xu<sup>1</sup>, J.T. Lin<sup>1</sup>, and A.Q. Liu<sup>2</sup><sup>1</sup>Beijing University of Posts and Telecommunications, CHINA and<sup>2</sup>Nanyang Technological University, SINGAPORE**W3D****A SIGNIFICANTLY IMPROVED LIMIT OF DETECTION OF AN INTEGRATED FLUORESCENCE DETECTOR FOR MICROFLUIDIC DEVICES**

T. Kamei, K. Matsuhiro, and A. Shikanai

National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

**W4D****AN EFFICIENT SEMICONTINUOUS BEAD TRAPPING METHOD FOR THE APPLICATION OF  $\mu$ -IMMUNOASSAY PLATFORMS**

S.K. Yoo, Y.M. Kim, J.H. Lee, and S. Yang

Gwangju Institute of Science and Technology (GIST), KOREA

**W5D****DEVELOPMENT OF DIFFERENTIAL INTERFERENCE CONTRAST THERMAL LENS MICROSCOPE FOR COUNTING INDIVIDUAL NON-FLUORESCENT MOLECULES**H. Shimizu<sup>1</sup>, K. Mawatari<sup>2</sup>, and T. Kitamori<sup>1,2,3</sup><sup>1</sup>University of Tokyo, JAPAN, <sup>2</sup>Kanagawa Academy of Science and Technology, JAPAN, and<sup>3</sup>Japan Science and Technology Agency (JST), JAPAN**W6D****HIGH SENSITIVITY PROTEIN DETECTION USING MICRO-MAGNETIC APTAMER PCR (MAP) TECHNOLOGY**A.E. Gerdon<sup>1</sup>, J. Qian<sup>1</sup>, Y. Zhang<sup>2</sup>, J.D. Adams<sup>1</sup>, S.S. Oh<sup>1</sup>, A. Csordas<sup>1</sup>, and H.T. Soh<sup>1</sup><sup>1</sup>University of California, Santa Barbara, USA and <sup>2</sup>CytomX, LLC, USA**W7D****IN VIVO-LIKE MICROSYSTEM FOR HIGH CONTENTS ANTI-INFLAMMATORY DRUG SCREENING**

K. Lee and H. Jung

Yonsei University, KOREA

**W8D****INEXPENSIVE INTEGRATED CELL IMAGING DEVICE**M. Gabriel<sup>1</sup>, V. Haguët<sup>1</sup>, N. Picollet-D'hahan<sup>1</sup>, M. Block<sup>2</sup>, B. Fouqué<sup>1</sup>, and F. Chatelain<sup>1</sup><sup>1</sup>Commissariat à l'Energie Atomique (CEA), FRANCE and <sup>2</sup>IAB, FRANCE**W9D****INTEGRATION OF EVANESCENT EXCITATION (EE)-BASED CHIP WITH MICROFLUIDIC CHANNELS FOR UPRIGHT AND INVERTED MICROSCOPE OBSERVATIONS**N.C.H. Le<sup>1</sup>, R. Yokokawa<sup>1,2</sup>, D.V. Dao<sup>1</sup>, T.D. Nguyen<sup>1</sup>, J. Wells<sup>1</sup>, and S. Sugiyama<sup>1</sup><sup>1</sup>Ritsumeikan University, JAPAN and <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN**W10D****MEASUREMENT OF THREE-DIMENSIONAL TEMPERATURE DISTRIBUTION IN MICRO ELECTROPHORESIS USING CONFOCAL TWO-COLOR LASER-INDUCED FLUORESCENCE**

S. Saeki, J. Funakoshi, T. Saito, and K. Nakamura

Yamaguchi University, JAPAN

**W11D****NOVEL, COST-EFFECTIVE, HIGH-QUALITY SURFACE PLASMON RESONANCE AND FLUORESCENCE MICROSCOPE**

R. Thariani and P. Yager

University of Washington, USA

**W12D****ON-CHIP SANDWICH IMMUNOASSAY IN AN INTEGRATED MAGNETO-OPTICAL CMOS MICROSYSTEM**

E.P. Dupont, U. Lehmann, M. Lombardini, E. Charbon, and M.A.M. Gijssels

Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

**W13D****PHOTOTHERMAL IMAGING OF ABSORBANCE DISTRIBUTION WITH SYNCHRONOUS CCD DETECTION METHOD**A. Hibara<sup>1</sup>, K. Oikawa<sup>1</sup>, and T. Kitamori<sup>1,2</sup><sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kanagawa Academy of Science & Technology, JAPAN**W14D****SIMULTANEOUS NATIVE UV FLUORESCENCE AND ABSORBANCE DETECTION FOR MICROCHIP ELECTROPHORESIS USING INTEGRATED WAVEGUIDES**

P.D. Ohlsson, O. Ordeig, K.B. Mogensen, and J.P. Kutter

Technical University of Denmark (DTU), DENMARK

**Detection Technologies**

## Electrochemical

**W15D****2D-SPR DETECTION OF INTERLEUKIN-2 IN SINGLE CELL BASED MICROWELL ARRAY**

M. Suzuki, S. Hane, and Y. Iribe

University of Toyama, JAPAN

**W16D****IN SITU MONITORING OF THE ANTICANCER DRUG EFFLUX FROM DRUG RESISTANT LUNG CANCER CELLS**Y. Chen<sup>1</sup>, H. Li<sup>2</sup>, Y. Wang<sup>1</sup>, L. Zhang<sup>1</sup>, R. Julien<sup>1</sup>, and K. Tang<sup>1</sup><sup>1</sup>Institute of Microelectronics, SINGAPORE and <sup>2</sup>Nanyang Technological University, SINGAPORE**W17D****PDMS-BASED MICROFLUIDIC PLATFORM WITH AN ION-SELECTIVE MICROELECTRODE FOR QUANTIFYING K<sup>+</sup> EFFLUX FROM CELLS**

C. Miville-Godin, L. MacQueen, S. Bychkov, M.R. Wertheimer, and O.T. Guenet

Ecole Polytechnique de Montréal, CANADA

**Detection Technologies****W18D****CONTACTLESS DIFFERENTIAL CONDUCTIVITY DETECTION**

G.A. Shaw, D. Ross, S.E. Fick, and W.N. Vreeland

National Institute of Standards and Technology (NIST), USA

**W19D****ELECTRICAL IMMUNOASSAY USING PROTEIN FUNCTIONALIZED MICROFLUIDIC CHANNELS**

M. Javanmard, A.H. Talasz, M. Nemat-Gorgani, F. Pease, M. Ronaghi, and R.W. Davis

Stanford University, USA

**W20D****SPLIT RING RESONATOR TECHNIQUE FOR COMPOSITIONAL ANALYSIS OF SOLVENTS IN MICROCAPILLARY SYSTEMS**

A. Masood, O. Castell, D.A. Barrow, C. Allender, and A. Porch

Cardiff University, UNITED KINGDOM

**W21D****POLYSACCHARIDE TEMPLATED SILVER NANOWIRE FOR ULTRASENSITIVE ELECTRICAL DETECTION OF NUCLEIC ACIDS ON NANOGAPPED BIOSENSOR**J.M. Kong<sup>1</sup>, A.R. Ferhan<sup>2</sup>, X.T. Chen<sup>1</sup>, L. Zhang<sup>1</sup>, and N. Balasubramanian<sup>1</sup><sup>1</sup>Institute of Microelectronics, SINGAPORE and <sup>2</sup>Nanyang Technological University, SINGAPORE**W22D****THE RELATION BETWEEN BIOMOLECULAR INTERACTION AND RESONANCE BEHAVIOR OF MICROcantilever**

K.S. Hwang, H.K. Jeon, S.-M. Lee, S.K. Kim, and T.S. Kim

Korea Institute of Science and Technology (KIST), KOREA

**MEMS & NEMS Technologies**  
Micro & Nano-Machining

**W1E**

**CONDUCTIVE AND FLEXIBLE NANOCOMPOSITE PATTERNS EMBEDDED IN ELASTOMER USING MICROCONTACT PRINTING AND CAST MOLDING**

C.-X. Liu and J.-W. Choi  
*Louisiana State University, USA*

**W2E**

**FABRICATION OF HOURGLASS-SHAPED MICROAPERTURE VIA TWO-STAGE LASER PULSES AND ITS APPLICATION**

C.-Y. Chen, T.-Y. Tu, D.-S. Jong, and A.M. Wo  
*National Taiwan University, TAIWAN*

**W3E**

**IN-SITU FABRICATION OF THREE-DIMENSIONAL POLYMERIC MICROSTRUCTURES USING SOFT MEMBRANE DEFORMATION AND OPTOFLUIDIC MASKLESS LITHOGRAPHY**

S.A. Lee, S.E. Chung, and S. Kwon  
*Seoul National University, KOREA*

**W4E**

**MONOLITHIC FABRICATION OF NOVEL MICROFLUIDIC COMPONENTS WITH FIXED ASPECT RATIO ROUND MICROFLUIDIC CHANNELS USING NOVEL RAPID MOLDING**

A.W. Browne, W. Jung, M.J. Rust, S. Lee, and C.H. Ahn  
*University of Cincinnati, USA*

**MEMS & NEMS Technologies**  
Microfluidic Components

**W5E**

**A MICROFLUIDIC DEVICE FOR PARTICLE SEPARATION UTILIZING EAVES STRUCTURES**

H.-W. Wu<sup>1</sup>, C.-W. Huang<sup>1</sup>, and G.-B. Lee<sup>1,2</sup>  
<sup>1</sup>*National Cheng Kung University, TAIWAN* and <sup>2</sup>*Industrial Technology Research Institute, TAIWAN*

**W6E**

**ARBITRARY SERIAL DILUTION MICROFLUIDIC NETWORK COMPOSED OF MICROCHANNELS WITH HIGH CROSS-SECTION AREA RATIO**

K. Hattori, S. Sugiura, and T. Kanamori  
*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

**W7E**

**DESIGN AND FABRICATION OF A PDMS MICROFLUIDIC CHAMBER FOR MICROFLUIDIC EXPERIMENTS WITH ORGANOTYPIC BRAIN SLICES**

A. Queval, C.M. Perrault, M.A. Qasaimeh, R.A. McKinney, and D. Juncker  
*McGill University, CANADA*

**W8E**

**DEVELOPMENT OF A VASCULAR SMOOTH MUSCLE CELL-BASED BIO-MICROACTUATOR**

Y. Tanaka<sup>1</sup>, K. Sato<sup>1</sup>, T. Shimizu<sup>2</sup>, M. Yamato<sup>2</sup>, T. Okano<sup>2</sup>, I. Manabe<sup>2</sup>, R. Nagai<sup>1</sup>, and T. Kitamori<sup>1</sup>  
<sup>1</sup>*University of Tokyo, JAPAN* and <sup>2</sup>*Tokyo Women's Medical University, JAPAN*

**W9E**

**FABRICATION AND EVALUATION OF TEMPERATURE-TOLERANT BIOACTUATOR DRIVEN BY INSECT HEART CELLS**

Y. Akiyama, K. Iwabuchi, Y. Furukawa, and K. Morishima  
*Tokyo University of Agriculture and Technology, JAPAN*

**W10E**

**LEIDENFROST LIQUID DROPLETS ON MICRO/NANO RATCHETS**

J.T. Ok, E. Lopez-Oña, H. Wong, and S. Park  
*Louisiana State University, USA*

**W11E**

**MICROFLUIDIC CHIP OF FAST DNA HYBRIDIZATION USING DENATURE AND MOTION OF NUCLEIC ACIDS**

Y.-C. Chung<sup>1</sup>, Y.-C. Lin<sup>2</sup>, C.-D. Chueh<sup>1</sup>, C.-Y. Ye<sup>1</sup>, and L.-W. Lai<sup>1</sup>  
<sup>1</sup>*Ming Chi University of Technology, TAIWAN* and <sup>2</sup>*National Cheng Kung University, TAIWAN*

**W12E**

**ON-CHIP ACTUATION OF A THERMALLY SENSITIVE HYDROGEL VALVE**

E.J. Geiger<sup>1,2</sup>, D.A. Mair<sup>2</sup>, A.P. Pisano<sup>1</sup>, and F. Svec<sup>3</sup>  
<sup>1</sup>*University of California, Berkeley, USA*, <sup>2</sup>*Fluigence, LLC, USA*, and <sup>3</sup>*Lawrence Berkeley National Laboratory, USA*

**W13E**

**POLYDIMETHYLSILOXANE (PDMS) PERISTALTIC PUMP CHARACTERIZATION FOR PROGRAMMABLE LAB-ON-A-CHIP APPLICATIONS**

H.-S. Chuang<sup>1</sup>, A.M. Amin<sup>1</sup>, S.T. Wereley<sup>1</sup>, M. Thottethodi<sup>1</sup>, T.N. Vijaykumar<sup>1</sup>, and S.C. Jacobson<sup>2</sup>  
<sup>1</sup>*Purdue University, USA* and <sup>2</sup>*Indiana University, USA*

**W14E**

**SIMULATION AND EXPERIMENTAL VERIFICATION OF A QUASI DIGITAL MICROFLOW REGULATOR**

J. Casals-Terré<sup>1</sup>, M. Duch<sup>2</sup>, J.A. Plaza<sup>2</sup>, J. Esteve<sup>2</sup>, R. Pérez-Castillejos<sup>3</sup>, E. Vallés<sup>4</sup>, and E. Gómez<sup>4</sup>  
<sup>1</sup>*Technical University of Catalonia, SPAIN*, <sup>2</sup>*Centro Nacional de Microelectrónica, SPAIN*, <sup>3</sup>*Harvard University, USA*, and <sup>4</sup>*University of Barcelona, SPAIN*

**MEMS & NEMS Technologies**  
Hybrid Devices, Packaging & Components Interfacing

**W15E**

**A FLEXIBLE PARYLENE NEURAL PROBE COMBINED WITH A MICRODIALYSIS MEMBRANE**

N. Kotake<sup>1</sup>, T. Suzuki<sup>1</sup>, K. Mabuchi<sup>1</sup>, and S. Takeuchi<sup>1,2</sup>  
<sup>1</sup>*University of Tokyo, JAPAN* and <sup>2</sup>*Japan Science and Technology Agency (JST), JAPAN*

**W16E**

**METAL-ORGANIC THIN-FILM ENCAPSULATION FOR GRAVIMETRIC GAS MICROSENSORS**

J. Fang, J. Fu, and F. Ayazi  
*Georgia Institute of Technology, USA*

**W17E**

**OPTOFLUIDIC MANIPULATION AND PACKAGING OF SILICON MICROCHIPS USING RAILED MICROFLUIDICS**

S.E. Chung, S.A. Lee, J. Kim, and S. Kwon  
*Seoul National University, KOREA*

**W18E**

**TOWARDS AN INDUSTRIAL FABRICATION PROCESS FOR ELECTROWETTING CHIP USING STANDARD MEMS TECHNOLOGY**

C. Delattre, R. Blanc, G. Castellan, C. Chabrol, N. David, E. Dubard, O. Constantin, Y. Fouillet, D. Jary, A. Rival, and P. Caillat  
*CEA-LETI-MINATEC, FRANCE*

**MEMS & NEMS Technologies**  
Integration "Sample to Result" Systems

**W19E**

**AUTOMATED MICROFLUIDIC IMMUNOASSAY (AMI) SYSTEM UTILIZING A POLYMER CHIP EQUIPPED WITH A BLOOD FILTER AND REAGENT STORAGE CHAMBERS**

K.H. Chung, H.W. Song, Y.H. Choi, and D. Lee  
*Electronics and Telecommunications Research Institute (ETRI), KOREA*

**W20E**

**DEVELOPMENT OF PORTABLE AND RAPID HUMAN DNA ANALYSIS SYSTEM AIMING ON-SITE SCREENING**

M. Asogawa<sup>1</sup>, M. Sugisawa<sup>1</sup>, K. Aoki<sup>1</sup>, H. Hagiwara<sup>2</sup>, and Y. Mishina<sup>2</sup>  
<sup>1</sup>*NEC Corporation, JAPAN* and <sup>2</sup>*Arbotech Corporation, JAPAN*

**W21E**

**LAB-ON-GLASS: INTEGRATED ELECTRONIC DISPOSABLES FOR RAPID MOLECULAR DIAGNOSTICS**

M.W.G. Ponjée<sup>1</sup>, A.A.M. Hoevenaars<sup>1</sup>, D.A. Fish<sup>2</sup>, N.N. Kahya<sup>1</sup>, C.J.M. Lasance<sup>1</sup>, W.H.M. van Beek<sup>1</sup>, P. Collins<sup>2</sup>, and J.M.J. den Toonder<sup>1</sup>  
<sup>1</sup>*Philips Research Europe, THE NETHERLANDS* and <sup>2</sup>*Philips Research Europe, UK*

**W22E****BEAD BASED TEMPERATURE CONTROLLABLE MICROCHIP FOR CANCER DIAGNOSIS**

M.-S. Kim, T.S. Sim, B.-R. Lee, H.-J. Yoon, B.-G. Kim, Y.-S. Lee, and Y.-K. Kim  
Seoul National University, KOREA

**W23E****RAPID DETECTION OF METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA) USING DIGITAL MICROFLUIDICS**

Z. Hua, D.J. Allen, P. Thwar, A.E. Eckhardt, V.K. Pamula, and M.G. Pollack  
Advanced Liquid Logic Inc., USA

**MEMS & NEMS Technologies****W24E****HIGH-FIDELITY FABRICATION OF MICROFLUIDIC CHANNELS SHAPED FOR ON-CHIP SELF-ACCUMULATION OF MICROTUBULES**

C.-T. Lin<sup>1,2</sup>, M.-T. Kao<sup>2</sup>, K. Kurabayashi<sup>2</sup>, and E. Meyhöfer<sup>2</sup>  
<sup>1</sup>National Taiwan University, TAIWAN and <sup>2</sup>University of Michigan, USA

**Applications**  
Genomics & Proteomics**W1F****A PARRALLEL FERROFLUID-DRIVEN MICROCHIP FOR HIGH-THROUGHPUT POLYMERASE CHAIN REACTION**

Y. Sun, N.T. Nguyen, and Y.C. Kwok  
Nanyang Technological University, SINGAPORE

**W2F****DEVELOPMENT OF A MICROFLUIDIC DEVICE FOR COMBINED RNA EXTRACTION AND REAL-TIME, REVERSE TRANSCRIPTION POLYMERASE CHAIN REACTION**

E.M. Hughes, K.J. Shaw, P.T. Docker, C.E. Dyer, J. Greenman, and S.J. Haswell  
University of Hull, UNITED KINGDOM

**W3F****IN VITRO SYNTHESIS OF PROTEIN IN THREE PHASE FLOW VIA MERGING OF DROPLETS OF PCR AND TRANSLATIONAL MACHINERY**

A. Asthana, K.O. Kim, J. Perumal, D.M. Kim, and D.P. Kim  
Chungnam National University, KOREA

**W4F****MICRO TOTAL ANALYSIS ASSEMBLY FOR BACTERIAL TOTAL NUCLEIC ACID ANALYSIS**

I.K. Lao<sup>1</sup>, C.-K. Yong<sup>2</sup>, and N. Thepsuparungsikul<sup>2</sup>  
<sup>1</sup>A\*Star (Agency for Science, Technology and Research), SINGAPORE and <sup>2</sup>National University of Singapore, SINGAPORE

**W5F****MICROFLUIDIC HUMAN GENETIC PROFILING USING FULLY NON-CONTACT TEMPERATURE CONTROL**

D.C. Leslie, L.A. Legendre, E. Seker, B.C. Strachan, and J.P. Landers  
University of Virginia, USA

**W6F****MULTIPLY NONCOMPETITIVE AFFINITY ASSAYS FOR PROTEIN QUANTIFICATION USING TEMPERATURE GRADIENT FOCUSING OF APTAMERS FOLLOWED BY END-POINT PCR**

M.S. Munson, J.H. McDaniel, D. Ross, M. Salit, and L.E. Locascio  
National Institute of Standards and Technology (NIST), USA

**W7F****ON-CHIP INTEGRATION OF SAMPLE PRETREATMENT AND MULTIPLEX POLYMERASE CHAIN REACTION (PCR) FOR DNA ANALYSIS**

M. Brivio<sup>1</sup>, D. Snakenborg<sup>1</sup>, E. Søgaard<sup>1</sup>, A. Ahlford<sup>2</sup>, A.-C. Syvänen<sup>2</sup>, J.P. Kutter<sup>1</sup>, and A. Wolff<sup>1</sup>  
<sup>1</sup>Technical University of Denmark (DTU), DENMARK and <sup>2</sup>Uppsala University Hospital, SWEDEN

**W8F****PROTEIN EXPRESSION IN ARRAY DEVICES WITH PASSIVE PUMPING**

R. Khnouf<sup>1</sup>, D.J. Beebe<sup>2</sup>, and Z.H. Fan<sup>1</sup>  
<sup>1</sup>University of Florida, USA and <sup>2</sup>University of Wisconsin, Madison, USA

**W9F****SIMPLE METHOD FOR QUANTITATIVE PCR USING FLOW-THROUGH PCR DEVICE**

T. Fukuba<sup>1</sup>, M. Hiraga<sup>2</sup>, A. Takamatsu<sup>2</sup>, C. Provin<sup>1</sup>, T. Yamamoto<sup>1</sup>, and T. Fujii<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Waseda University, JAPAN

**Applications**  
Clinical Diagnostics**W10F****A ONE-TOUCH TYPE HAND-OPERATED LOC FOR THE BIOELECTROCATALYTIC IMMUNOASSAY USING BACKFILLING METHOD**

S.W. Park, K.-I. Kim, J.H. Lee, H.C. Yoon, and S.S. Yang  
Ajou University, KOREA

**W11F****AN OPTO-FLUIDIC SENSOR FOR MONITORING INTRACRANIAL PRESSURE**

S.B. Kodandaramaiah and N. Chronis  
University of Michigan, USA

**W12F****AUTOMATIC MICRO-ELISA SYSTEM AND APPLICATION TO RAPID hsCRP DIAGNOSIS**

T. Ohashi<sup>1</sup>, K. Mawatari<sup>2</sup>, and T. Kitamori<sup>2,3</sup>  
<sup>1</sup>Institute of Micro Chemical Technology, JAPAN, <sup>2</sup>Kanagawa Academy of Science and Technology, JAPAN, and <sup>3</sup>University of Tokyo, JAPAN

**W13F****PALM-SIZED REAL-TIME RT-PCR SYSTEM**

P. Neuzil<sup>1</sup>, L. Novak<sup>2</sup>, J. Pipper<sup>3</sup>, S. Lee<sup>4</sup>, L.F.P. Ng<sup>5</sup>, and C. Zhang<sup>3</sup>  
<sup>1</sup>Institute of Microelectronics, SINGAPORE, <sup>2</sup>Czech Technical University, CZECH REPUBLIC, <sup>3</sup>Institute of Bioengineering and Nanotechnology, SINGAPORE, <sup>4</sup>Nanyang Polytechnic, SINGAPORE, and <sup>5</sup>Genome Institute of Singapore, SINGAPORE

**W14F****LAB-ON-A-CHIP CARTRIDGE FOR PROCESSING OF IMMUNOASSAYS WITH INTEGRATED SAMPLE PREPARATION**

S. Lutz<sup>1</sup>, P. Lang<sup>2</sup>, I. Malki<sup>1</sup>, D. Mark<sup>1</sup>, J. Ducree<sup>1</sup>, R. Zengerle<sup>1,2</sup>, and F. von Stetten<sup>1,2</sup>  
<sup>1</sup>Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY and <sup>2</sup>University of Freiburg (IMTEK), GERMANY

**W15F****MICROFLUIDIC CD-BASED SOMATIC CELL COUNTER FOR THE EARLY DETECTION OF BOVINE MASTITIS**

J.L. Garcia-Cordero<sup>1</sup>, L. Kent<sup>1</sup>, I.K. Dimov<sup>1</sup>, C. Viguier<sup>2</sup>, L.P. Lee<sup>1,3</sup>, and A.J. Ricco<sup>1</sup>  
<sup>1</sup>Dublin City University, IRELAND, <sup>2</sup>Enfer Diagnostics, IRELAND, and <sup>3</sup>University of California, Berkeley, IRELAND

**W16F****MULTIMODAL PARTICLES FOR BIOLOGICAL DETECTION AND THERAPY**

K. Hettiarachchi<sup>1</sup>, P.A. Dayton<sup>2</sup>, and A.P. Lee<sup>1</sup>  
<sup>1</sup>University of California, Irvine, USA and <sup>2</sup>University of North Carolina, Chapel Hill, USA

**W17F****RAPID AND QUANTITATIVE DETECTION OF MALARIAL ANTIGEN FOR MICROFLUIDIC POINT-OF-CARE DIAGNOSIS IN THE DEVELOPING WORLD**

D.Y. Stevens<sup>1</sup>, C.R. Petri<sup>2</sup>, J.L. Osborn<sup>1</sup>, P. Spicar-Mihalic<sup>1</sup>, K.G. McKenzie<sup>1</sup>, and P. Yager<sup>1</sup>  
<sup>1</sup>University of Washington, USA and <sup>2</sup>Boston College, USA

**Applications**  
Microarrays**W18F****ACCURATE WHOLE GENOME ANALYSIS FROM 150 CELLS SAMPLES**

D. Irimia<sup>1</sup>, M. Mindrions<sup>2</sup>, A. Russom<sup>1</sup>, W. Xiao<sup>2</sup>, R.W. Davis<sup>2</sup>, and M. Toner<sup>1</sup>  
<sup>1</sup>Harvard University, USA and <sup>2</sup>Stanford University, USA



**W19F**

**HIGH PERFORMANCE MICROFLUIDIC DEVICE FOR SEQUENTIAL TRAPPING, LABELING AND CONTENT EXTRACTION OF SINGLE CELLS**

Y. Murakami<sup>1</sup>, T. Arakawa<sup>1,2</sup>, S. Nomura<sup>1</sup>, Y. Yamaguchi<sup>1</sup>, and S. Shoji<sup>1</sup>  
<sup>1</sup>Waseda University, JAPAN and <sup>2</sup>University of Tokyo, JAPAN

**W20F**

**INTRACELLULAR POTENTIAL MEASUREMENTS OF ADHERENTLY GROWING CELLS USING MICRO-NEEDLE ARRAYS**

C. Tautorat<sup>1</sup>, P.J. Koester<sup>1</sup>, J. Held<sup>2</sup>, J. Gaspar<sup>2</sup>, P. Ruther<sup>2</sup>, O. Paul<sup>2</sup>, A. Cismak<sup>3</sup>, A. Heilmann<sup>3</sup>, J. Gimsa<sup>1</sup>, H. Beikirch<sup>1</sup>, L. Jonas<sup>1</sup>, and W. Baumann<sup>1</sup>  
<sup>1</sup>University of Rostock, GERMANY, <sup>2</sup>University of Freiburg (IMTEK), GERMANY, and <sup>3</sup>Fraunhofer Institute for Mechanics of Materials Halle, GERMANY

**W21F**

**ONE-TO-ONE GENE-ENCODED FUNCTIONAL PROTEIN MICROARRAY**

M. Biyani<sup>1</sup>, T. Osawa<sup>1</sup>, N. Nemoto<sup>2</sup>, and T. Ichiki<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Saitama University, JAPAN

**Applications**  
 Separation Science

**W22F**

**AN ON-CHIP WHOLE BLOOD/PLASMA SEPARATOR WITH COLLOIDAL SILICA BEAD-PACKED MICROCHANNEL ON COC POLYMER**

J.S. Shim, A.W. Browne, S.H. Lee, and C.H. Ahn  
 University of Cincinnati, USA

**W23F**

**HIGH EFFICIENT SPERM MOTILITY SORTING BASED ON ENCOUNTERED CURVE-STRAIGHT MICRO STREAMING FLOW**

T.-L. Wu<sup>1</sup>, D.-J. Yao<sup>1</sup>, F.-G. Tseng<sup>1,2</sup>, and L.-C. Pan<sup>3</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN, <sup>2</sup>Academia Sinica, TAIWAN, and <sup>3</sup>Taipei Medical University, TAIWAN

**W24F**

**MICROFABRICATED SEMI-PACKED GAS CHROMATOGRAPHY COLUMN WITH FUNCTIONALIZED PARYLENE AS THE STATIONARY PHASE**

T. Nakai<sup>1</sup>, S. Nishiyama<sup>1</sup>, M. Shuzo<sup>1,2</sup>, J.-J. Delaunay<sup>1,2</sup>, and I. Yamada<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN

**W25F**

**PRECISE MICROSCALE POLYMER GRADIENTS APPLIED TO ISOELECTRIC FOCUSING AND PORE LIMIT ELECTROPHORESIS**

G.J. Sommer, A.K. Singh, and A.V. Hatch  
 Sandia National Laboratories, USA

**W26F**

**SELECTIVE TWO-PHASE MINERAL SEPARATION ON A MICROFLUIDIC CHIP**

S. Klink<sup>1</sup>, C. Priest<sup>1</sup>, J. Ralston<sup>1</sup>, R. Sedev<sup>1</sup>, K. Mawatari<sup>2</sup>, and T. Kitamori<sup>2,3</sup>  
<sup>1</sup>University of South Australia, AUSTRALIA, <sup>2</sup>Kanagawa Academy of Science and Technology, JAPAN, and <sup>3</sup>University of Tokyo, JAPAN

**Applications**  
 Cell Handling & Analysis

**W27F**

**3D CELL CULTURE USING MONODISPERSE PEPTIDE HYDROGEL BEADS**

Y. Tsuda<sup>1</sup>, Y. Morimoto<sup>1</sup> and S. Takeuchi<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN

**W28F**

**A CARDIOMYOCYTE-BASED BIOSENSOR FOR THE STUDY ON HYPERTROPHY INDUCED BY TUMOR NECROSIS FACTOR ALPLA**

Y. Qiu<sup>1</sup>, R. Liao<sup>2</sup>, and X. Zhang<sup>1</sup>  
<sup>1</sup>Boston University, USA and <sup>2</sup>Harvard Medical School, USA

**W29F**

**A CONTINUOUS-FLOW CELL CULTURE ARRAY WITH CHAOTIC MIXERS FOR IDENTIFICATION OF THE OPTIMUM GROWTH FACTORS COMBINATIONS FOR MOUSE EMBRYONIC STEM CELLS DIFFERENTIATION**

Y.-H. Hsiao, K.-Y. Lee, Y.-T. Lin, I.-D. Yang, H.-Y. Chang, C.-C. Chieng, and L.-S. Fan  
 National Tsing Hua University, TAIWAN

**W30F**

**A MICROFLUIDIC PLATFORM OPTIMIZING BEAD-BASED ELISA FOR THE DETECTION OF CELL SECRETION**

B. Lincoln<sup>1</sup>, J. Garcia Cordero<sup>1</sup>, C.R. Poulsen<sup>1</sup>, and L.P. Lee<sup>1,2</sup>  
<sup>1</sup>Dublin City University, IRELAND and <sup>2</sup>University of California, Berkeley, USA

**W31F**

**A NOVEL MICROFLUIDIC DEVICE COMBINING DIELECTROPHORESIS-BASED CELL PATTERNING AND 3D BIOMATERIALS**

J.T. Lu, C.P. Huang, G. Lull, N.L. Jeon, E.S. Monuki, L.A. Flanagan, and A.P. Lee  
 University of California, Irvine, USA

**W32F**

**AN INTEGRATED MICROFLUIDIC PLATFORM FOR SYSTEMS-LEVEL INTERROGATION OF SIGNALING PATHWAYS INVOLVED IN INNATE IMMUNITY**

A.K. Singh, C.S. Branda, S.B. Branda, B. Carson, J. Brennan, C.D. James, J.N. Kaiser, T.W. Lane, R.P. Manginell, A. Martino, M.W. Moorman, J. Poschet, K.D. Patel, T.D. Perroud, R.F. Renzi, N.S. Srivastava, and M. Wu  
 Sandia National Laboratories, USA

**W33F**

**ATTACHMENT AND GROWTH BEHAVIOR OF METASTATIC BREAST CANCER CELLS IN MEMS-BASED SILICON MICROENVIRONMENTS**

M. Nikkhah<sup>1</sup>, J.S. Strobl<sup>2</sup>, A. Omotosho<sup>1</sup>, and M. Agah<sup>1</sup>  
<sup>1</sup>Virginia Polytechnic Institute and State University, USA and <sup>2</sup>Edward via Virginia College of Osteopathic Medicine, USA

**W34F**

**CELL MOTILITY ASSAY USING IMAGE-CONTROLLED OPTOELECTRONIC TRAP**

W. Choi<sup>1</sup>, S.-W. Nam<sup>2</sup>, H. Hwang<sup>1</sup>, S. Park<sup>2</sup>, and J.-K. Park<sup>1</sup>  
<sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST), KOREA and <sup>2</sup>Ewha Womans University, KOREA

**W35F**

**CONTINUOUS-FLOW CELL TRAPPING AND HYBRIDOMA-CELL PRODUCTION ON CHIP USING LIQUID ELECTRODES**

A. Valero, R. Tornay, A. de Pablo, N. Demierre, and P. Renaud  
 Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

**W36F**

**CONTROLLED ENCAPSULATION OF SINGLE-CELLS INTO MONODISPERSE PICOLITER DROPS**

J.F. Edd<sup>1</sup>, D. Di Carlo<sup>1</sup>, K.J. Humphry<sup>2</sup>, S. Köster<sup>2</sup>, D. Irimia<sup>1</sup>, D.A. Weitz<sup>2</sup>, and M. Toner<sup>1</sup>  
<sup>1</sup>Massachusetts General Hospital, USA and <sup>2</sup>Harvard University, USA

**W37F**

**DIFFERENTIAL OPTICAL FLOW FOR AUTOMATED CELL MOTILITY**

E.G.R. Kim, P. Sivasubramaniam, J.P. Wikswo, and K.T. Seale  
 Vanderbilt University, USA

**W38F**

**DISPOSABLE MICROFLUIDIC TEMPERATURE CONTROL ON CHIP CELL STUDIES**

G. Velve Casquillas<sup>1</sup>, M. Le berre<sup>2</sup>, C.R. Terrena<sup>4</sup>, C. Fu<sup>4</sup>, A.M. Haghiri-Gosnet<sup>1</sup>, J.J. Greffet<sup>3</sup>, P.T. Tran<sup>4,5</sup>, and Y. Chen<sup>2</sup>  
<sup>1</sup>Centre National de la Recherche Scientifique (CNRS), FRANCE, <sup>2</sup>Ecole Normale Supérieure, FRANCE, <sup>3</sup>Ecole Centrale Paris Scientifique, FRANCE, <sup>4</sup>University of Pennsylvania, USA, and <sup>5</sup>Institut Curie, FRANCE

**W39F**

**MICROFLUIDIC ELECTROPORATIVE FLOW CYTOMETRY FOR STUDY OF CELL MECHANICS**

N. Bao, Y. Zhan, and C. Lu  
 Purdue University, USA

**W40F****EXAMINING THE ROLE OF NEUREGULIN-1 IN SYNAPTOGENESIS USING MICROFLUIDICS**A. Wu<sup>1</sup>, S. Koirala<sup>2</sup>, G. Corfas<sup>2</sup>, and A. Folch<sup>1</sup><sup>1</sup>University of Washington, USA and <sup>2</sup>Harvard University, USA**W41F****GUIDING OF PHOTSENSITIVE CELLS BY MULTIPLE POINT ORGANIC LEDS**H. Nakamura<sup>1</sup>, N. Misawa<sup>1</sup>, T. Yamamura<sup>1</sup>, and S. Takeuchi<sup>1,2</sup><sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN**W42F****INDEPENDENT CONTROL OF OXYGEN CONCENTRATION FOR CELL CULTURE IN AN ADD-ON PLATFORM FOR MULTI- WELL PLATES**

S.C. Oppgaard, K. Nam, and D.T. Eddington

University of Illinois, Chicago, USA

**W43F****CELLULAR MICROPATTERNS WITH BUILT-IN BIOSENSORS FOR DETECTION OF EXTRACELLULAR METABOLITES**

J. Yan, J.Y. Lee, S. Shah, and A. Revzin

University of California, Davis, USA

**W44F****LONG-TERM STORAGE OF LIVING CELLS ON CHIP FOR CELL-BASED ASSAYS**

Y. Xu, T. Konno, K. Sato, K. Ishihara, and T. Kitamori

University of Tokyo, JAPAN

**W45F****MICROFLUIDIC ALIGNMENT SYSTEM FOR SINGLE CELL MANIPULATION AND CULTURE**T. Arakawa<sup>1,2</sup>, N. Takeda<sup>1</sup>, Y. Edagawa<sup>1</sup>, Y. Yamaguchi<sup>1</sup>, and S. Shoji<sup>1</sup><sup>1</sup>Waseda University, JAPAN and <sup>2</sup>University of Tokyo, JAPAN**W46F****MICROFLUIDIC SYSTEM FOR THE STUDY OF MECHANICAL AND BIOCHEMICAL RESPONSE OF ENDOTHELIAL CELLS TO FLOW-INDUCED MECHANICAL STIMULI**M. Rossi<sup>1</sup>, R. Lindken<sup>1</sup>, B.P. Hierck<sup>2</sup>, and J. Westerweel<sup>1</sup>Delft University of Technology, THE NETHERLANDS and<sup>2</sup>Leiden University Medical Center, THE NETHERLANDS**W47F****MICROPATTERNING OF HYDROGEL AND ON-CHIP LONG TIME MONITORING OF INDIVIDUAL CELLS IN A CAGE**

F. Arai, H. Matsumoto, T. Shijuku, and N. Uozumi

Tohoku University, JAPAN

**W48F****APOPTOTIC RESPONSE OF OVARIAN CANCER CELLS IN HYPOXIC CONDITIONS**C.R. Poulsen<sup>1</sup>, B. Lincoln<sup>1</sup>, I. Dimov<sup>1</sup>, J.L. Garcia-Cordero<sup>1</sup>, S. O'Toole<sup>2</sup>,M. Radomski<sup>3</sup>, J. O'Leary<sup>2</sup>, and L.P. Lee<sup>1,4</sup><sup>1</sup>Dublin City University, IRELAND, <sup>2</sup>St. James' Hospital, IRELAND,<sup>3</sup>Trinity College Dublin, IRELAND and <sup>4</sup>University of California, Berkeley, USA**W49F****ON-CHIP FLOW CYTOMETRY AND SINGLE-CELL IMAGING IN TANDEM: INTEGRATION OF A  $\mu$ FACS WITH A SINGLE-CELL ARRAY**

K.D. Patel, T.D. Perroud, C.S. Branda, T.W. Lane, and A.K. Singh

Sandia National Laboratories, USA

**W50F****PARALLEL MULTI-TIME POINT CELL STIMULUS AND LYSIS IN A MICROFLUIDIC DEVICE USING CHAOTIC MIXING AND PRESSURE RESISTANCE**

A. Hirsch, C. Rivet, B. Zhang, M. Kemp, and H. Lu

Georgia Institute of Technology, USA

**W51F****REAL-TIME MEASUREMENT OF CELLULAR REFRACTIVE INDEX AND THICKNESS USING CELL CULTURE CHIP**J.J. Gu<sup>1</sup>, Y.F. Yu<sup>1</sup>, E.P. Li<sup>2</sup>, S.H. Ng<sup>3</sup>, P.H. Yap<sup>3</sup>, X.Q. Zhou<sup>4</sup>, T.H. Cheng<sup>1</sup>, and A.Q. Liu<sup>1</sup><sup>1</sup>Nanyang Technological University, SINGAPORE, <sup>2</sup>Institute of High Performance Computing, SINGAPORE, <sup>3</sup>DSO National Laboratories, SINGAPORE, and <sup>4</sup>Institute for Infocomm Research, SINGAPORE**W52F****RECONSTRUCTION OF VASCULAR TISSUE USING A SEPARABLE MICROCHIP**T. Yamashita<sup>1</sup>, N. Idota<sup>2</sup>, and T. Kitamori<sup>1,2</sup><sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kanagawa Academy of Science & Technology, JAPAN**W53F****SMALL MOLECULE GRADIENT GENERATOR FOR MICROFLUIDIC VISCOUS SHEAR-FREE CELL CULTURE**T. Kim<sup>1</sup>, M. Pinelis<sup>2</sup>, and M.M. Maharbiz<sup>1</sup><sup>1</sup>University of California, Berkeley, USA and <sup>2</sup>University of Michigan, USA**W54F****STUDY OF SINGLE CELL KINASE ACTIVITY USING AN AUTOMATED MICROFLUIDIC DEVICE**

A.D. Hargis, C. Sims, N.L. Allbritton, and J.M. Ramsey

University of North Carolina, Chapel Hill, USA

**W55F****THE MICROFLUIDIC SAME-SINGLE-CELL ANALYSIS (SASCA) FOR MEDICAL DIAGNOSIS OF MULTI-DRUG RESISTANCE AND ITS INHIBITION**

X. Li, Y. Chen, and P.C.H. Li

Simon Fraser University, CANADA

**W56F****YEAST CELLS DETECTION IN A VERY FAST AND HIGHLY VERSATILE MICROFABRICATED CYTOMETER**R. Rodriguez-Trujillo<sup>1,2</sup>, O. Castillo-Fernandez<sup>1,2</sup>, M. Arundell<sup>1,2,3</sup>, J. Samitier<sup>1,3</sup>, and G. Gomila<sup>1,3</sup><sup>1</sup>Institute for Bioengineering of Catalonia (IBEC), SPAIN, <sup>2</sup>University of Barcelona, SPAIN, and<sup>3</sup>Centro de Investigación Biomédica en Red en Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN), SPAIN**Applications**  
Drug Discovery**W57F****MICROFLUIDIC DEVICE TO CONSTRUCT MULTIFUNCTIONAL ENVELOPE-TYPE NANODEVICE FOR GENE THERAPY**K. Kitazoe<sup>1</sup>, N. Kaji<sup>1</sup>, Y. Okamoto<sup>1</sup>, M. Tokeshi<sup>1</sup>, K. Kogure<sup>2</sup>, H. Harashima<sup>3</sup>, and Y. Baba<sup>1,4</sup><sup>1</sup>Nagoya University, JAPAN, <sup>2</sup>Kyoto Pharmaceutical University, JAPAN, <sup>3</sup>Hokkaido University, JAPAN,and <sup>4</sup>National Institute of Advanced Industrial Science and Technology (AIST), JAPAN**W58F****MICROFLUIDIC BASED STRIP ASSAY FOR SURFACE BOUND INHIBITORS IN SPINAL CORD INJURY**

B. Vahidi, J.W. Park, H.J. Kim, and N.L. Jeon

University of California, Irvine, USA

**W59F****VLSI MICROFLUIDIC WELL PLATES FOR COMBINATORIAL CHEMISTRY**

B.R. Schudel, C.J. Choi, B.T. Cunningham, and P.J.A. Kenis

University of Illinois, Urbana-Champaign, USA

**Applications**  
Environmental**W60F****MINIATURIZING THE WHOLE DEVICE: MICRO-TOTAL-ANALYSIS SYSTEM FOR *IN-SITU* COLORIMETRIC WATER QUALITY MONITORING**

C.R. Koch, J.D. Ingle, and V.T. Remcho

Oregon State University, USA

**Applications**  
Chemical Synthesis**W61F****A COMBINATORIAL MULTICOMPONENT PLUG MIXER FOR SYSTEMS CHEMISTRY**

F. Azizi, Q. Wan, T. Radivoyevitch, C. Dealwis, and C.H. Mastrangelo

Case Western Reserve University, USA

**W62F**

**AN INTELLIGENT MICROREACTOR SYSTEM FOR REAL-TIME OPTIMIZATION OF A CHEMICAL REACTION**

J.P. McMullen and K.F. Jensen  
*Massachusetts Institute of Technology, USA*

**W63F**

**DEVELOPMENT OF A MICROFLUIDIC INSTRUMENT FOR PERFORMING ENZYME KINETICS ASSAYS WITHIN A SI/GLASS MICROREACTOR**

M. Patel, J.T. Nevill, D.M. Hartmann, D. Tew, S. Thrall, G. Votaw, and H.C. Crenshaw  
*GlaxoSmithKline, USA*

**W64F**

**IN SITU RAMAN SPECTROSCOPY OF SOLID CATALYZED REACTIONS IN SUPERCRITICAL CO<sub>2</sub> WITHIN A SI/GLASS MICROREACTOR**

F. Trachsel, A. Urakawa, A. Baiker, and P. Rudolf von Rohr  
*ETH Zurich, SWITZERLAND*

**W65F**

**A SMART POLYMER LAB-ON-A-TUBE (LOT) WITH SPIRALLY-ROLLED MICROCHANNELS FOR IN-SITU DRUG DELIVERY AND BRAIN TUMOR MONITORING**

C. Li, W. Jung, A. Browne, R.K. Narayan, and C.H. Ahn  
*University of Cincinnati, USA*

**W66F**

**CONTINUOUS MEDIUM FLOW BASED PHOTOSYNTHETIC BACTERIA FUEL CELL USING WATER-ABSORBING POLYMER**

T. Moriuchi, A. Furuya, K. Morishima, and Y. Furukawa  
*Tokyo University of Agriculture and Technology, JAPAN*

**W67F**

**INSECT FLIGHT CONTROL BY NEURAL STIMULATION OF PUPAE-IMPLANTED FLEXIBLE MULTISITE ELECTRODES**

W.M. Tsang<sup>1</sup>, Z. Aldworth<sup>2</sup>, A. Stone<sup>3</sup>, A. Permar<sup>3</sup>, R. Levine<sup>3</sup>, J.G. Hildebrand<sup>3</sup>, T. Daniel<sup>2</sup>, A.I. Akinwande<sup>1</sup>, and J. Voldman<sup>1</sup>  
<sup>1</sup>*Massachusetts Institute of Technology, USA*, <sup>2</sup>*University of Washington, USA*, and <sup>3</sup>*University of Arizona, USA*

**W68F**

**LIPOSOME FORMATION ON A MICRO-PATTERNED PHOSPHOLIPID FILM**

T. Shiomitsu and T. Torii  
*University of Tokyo, JAPAN*

**W69F**

**PROTEIN REFOLDING PROMOTED BY MULTI-DILUTION MICROCHIP**

H. Yamaguchi<sup>1</sup>, M. Miyazaki<sup>1,2</sup>, and H. Maeda<sup>1,2</sup>  
<sup>1</sup>*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN* and <sup>2</sup>*Kyushu University, JAPAN*

**W70F**

**SPATIALLY TARGETED STIMULATION OF CELLS FOR QUANTITATIVE GAP JUNCTION ANALYSIS**

S. Chen and L.P. Lee  
*University of California, Berkeley, USA*

Applications

Grand Ballroom A-B

Session 3A3

Protein Expression and Characterization

Grand Ballroom C

Session 3B3

Clinical and Biomolecular Analysis

16:20 - 16:40

**AUTOMATED HIGH-THROUGHPUT STRUCTURAL PROTEIN ANALYSIS USING SMALL ANGLE X-RAY SCATTERING COMBINED WITH A MICROFLUIDIC APPROACH**

S.S. Nielsen<sup>1</sup>, D. Snakenborg<sup>1,2</sup>, K.N. Toft<sup>2</sup>, M.G. Jeppesen<sup>2</sup>, J.K. Jacobsen<sup>3</sup>, B. Vestergaard<sup>2</sup>, L. Arleth<sup>2</sup>, and J.P. Kutter<sup>1</sup>  
<sup>1</sup>*Technical University of Denmark (DTU), DENMARK* and <sup>2</sup>*Copenhagen University, DENMARK*, <sup>3</sup>*Novo Nordisk A/S, DENMARK*

**ENZYME KINETICS BY DIRECTLY IMAGING A POROUS SILICON MICROREACTOR USING DIOS MASS SPECTROMETRY**

K.P. Nichols and H.J.G.E. Gardeniers  
*MESA+, University of Twente, THE NETHERLANDS*

16:40 - 17:00

**A MICROFABRICATED DEVICE FOR PERFORMING COMPREHENSIVE ONLINE LC-CE-MS FOR PROTEOMICS APPLICATIONS**

J.S. Mellors, A.G. Chambers, W.H. Henley, and J.M. Ramsey  
*University of North Carolina, Chapel Hill, USA*

**A FIELD-DEPLOYABLE SYSTEM FOR AUTOMATED MOLECULAR TESTING USING MODULAR MICROFLUIDICS**

M.L. Hupert<sup>1</sup>, H. Wang<sup>1</sup>, H.-W. Chen<sup>1</sup>, W. Strykowski<sup>2</sup>, D. Patterson<sup>1,2</sup>, M.A. Witek<sup>1</sup>, P. Datta<sup>1</sup>, J. Goettert<sup>1</sup>, M.C. Murphy<sup>1</sup>, and S.A. Soper<sup>1,2</sup>  
<sup>1</sup>*Louisiana State University, USA* and <sup>2</sup>*BioFluidica Microtechnologies, USA*

17:00 - 17:20

**KINETICS OF PROTEIN EXPRESSION IN SINGLE CELLS USING MICROFLUIDICS**

J.-U. Shim, L. Olguin, G. Whyte, D. Bratton, F. Hollfelder, C. Abell, and W. Huck  
*University of Cambridge, UK*

**ONE-STEP IMMUNOASSAY ON CAPILLARY DRIVEN MICROFLUIDICS**

L. Gervais<sup>1,2</sup>, M. Zimmermann<sup>1,2</sup>, P. Hunziker<sup>2</sup>, and E. Delamarche<sup>1</sup>  
<sup>1</sup>*IBM Zürich Research Laboratory, SWITZERLAND* and <sup>2</sup>*University Hospital Basel, SWITZERLAND*

17:20 Adjourn for the Day

## Thursday, October 16, 2008

08:00 - 08:40

## Poster Awards Ceremony

Monday, Tuesday and Wednesday Poster Awards  
Widmer Poster Award

## Grand Ballroom A-B

## Session 4A1

Microfluidic Integrated Optics

## Grand Ballroom C

## Session 4B1

In Vivo and Cellular Screening

09:00 - 09:20

## A PLASMONIC LIQUID WAVEGUIDE SENSOR USING NANOPARTICLES FOR LABEL-FREE MEASUREMENT APPLICATIONS

H.J. Huang<sup>1</sup>, D.P. Tsai<sup>2</sup>, and A.Q. Liu<sup>1</sup><sup>1</sup>Nanyang Technological University, SINGAPORE and <sup>2</sup>National Taiwan University, TAIWAN

## DROPLET-BASED MICROFLUIDIC PLATFORMS FOR SELECTING INHIBITORS OF VIRAL CELL-ENTRY

C.A. Merten

Universite Louis Pasteur and CNRS UMR 7006, FRANCE

09:20 - 09:40

## A NEW MICRO FLOW CYTOMETER USING OPTICALLY-INDUCED DIELECTROPHORETIC FORCES FOR CONTINUOUS MICROPARTICLE COUNTING AND SORTING

Y.-H. Lin<sup>1</sup> and G.-B. Lee<sup>1,2</sup><sup>1</sup>National Cheng Kung University, TAIWAN and <sup>2</sup>Industrial Technology Research Institute, TAIWAN

## ON-CHIP SUB-CELLULAR RESOLUTION WHOLE-ANIMAL MANIPULATION FOR HIGH-THROUGHPUT IN VIVO DRUG/GENETIC SCREENING

C.B. Rohde, F. Zeng, and M.F. Yanik

Massachusetts Institute of Technology, USA

09:40 - 10:00

## A MULTI-COLOR MICROFLUIDIC COLLOIDAL LASER

S.K.Y. Tang and G.M. Whitesides

Harvard University, USA

## CROSSING STREAMLINES TO LYSE CELLS AND SIMULTANEOUSLY SEPARATE GENOMIC CONTENTS

K.J. Morton, K. Louthback, D.W. Inglis, J.C. Sturm, R.H. Austin, and S.Y. Chou

Princeton University, USA

10:00 - 10:30

## Break &amp; Exhibit Inspection

## Grand Ballroom A-B

## Session 4A2

Tools for Controlled Cell Culture II

## Grand Ballroom C

## Session 4B2

Innovative Microfluidic Applications

10:30 - 10:50

## FABRICATION OF THREE-DIMENSIONAL STRUCTURE BY SELF-FORMING MENISCUS AND ITS APPLICATION TO ON-CHIP CELL FUSION

M. Gel<sup>1</sup>, Y. Kimura<sup>1</sup>, B. Techaumnat<sup>1</sup>, O. Kurosawa<sup>2</sup>, and M. Washizu<sup>1</sup><sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>ASTEM Research Inst Kyoto, JAPAN

## MICROCHIP-BASED POLYMERIC MULTIFUNCTIONAL MICROBOTS

G.-H. Kwon<sup>1</sup>, J.-Y. Park<sup>1</sup>, E.-J. Lee<sup>1</sup>, M.L. Frisk<sup>2</sup>, D.J. Beebe<sup>2</sup>, and S.-H. Lee<sup>1</sup><sup>1</sup>Korea University, KOREA and <sup>2</sup>University of Wisconsin, USA

10:50 - 11:10

## SINGLE CELL MICROINJECTION USING COMPLIANT FLUIDIC CHANNELS

A. Noori and P.R. Selvaganapathy

McMaster University, CANADA

## MEMS-BASED MILLIMETER-SCALE POWER SOURCE WITH ON-BOARD FUEL AND PASSIVE CONTROL SYSTEM

S. Moghaddam, E. Pengwang, K. Lin, R. Masel, and M. Shannon

University of Illinois, Urbana-Champaign, USA

11:10 - 11:30

## A MICROFLUIDIC CULTURE SYSTEM FOR SCREENING OF CHEMICAL DEFINED CONDITIONS FOR HUMAN EMBRYONIC STEM CELLS (hESC)

K. Kamei<sup>1</sup>, S. Guo<sup>1</sup>, M. Ohashi<sup>1</sup>, Z.T.F. Yu<sup>1</sup>, E. Gschweng<sup>1</sup>, J. Tang<sup>1</sup>, J. McLaughlin<sup>1</sup>, K.-B. Lee<sup>2</sup>, O.N. Witte<sup>1</sup>, and H.R. Tseng<sup>1</sup><sup>1</sup>University of California, Los Angeles, USA and <sup>2</sup>Rutgers University, USA

## DEVELOPMENT AND FIELD EVALUATION OF ISFET PH SENSOR INTEGRATED WITH SELF-CALIBRATION DEVICE FOR DEEP-SEA OCEANOGRAPHY APPLICATIONS

T. Fukuba<sup>1</sup>, Y. Tamai<sup>1</sup>, M. Kyo<sup>2</sup>, K. Shitashima<sup>3</sup>, Y. Koike<sup>4</sup>, and T. Fujii<sup>1</sup><sup>1</sup>University of Tokyo, JAPAN,<sup>2</sup>Japan Agency for Marine-Earth Science and Technology (JAMSTEC), JAPAN,<sup>3</sup>Central Research Institute of Electric Power Industry (CRIEPI), JAPAN and<sup>4</sup>Civil Engineering Research and Environmental Studies, JAPAN

11:30

Conference Adjourns



