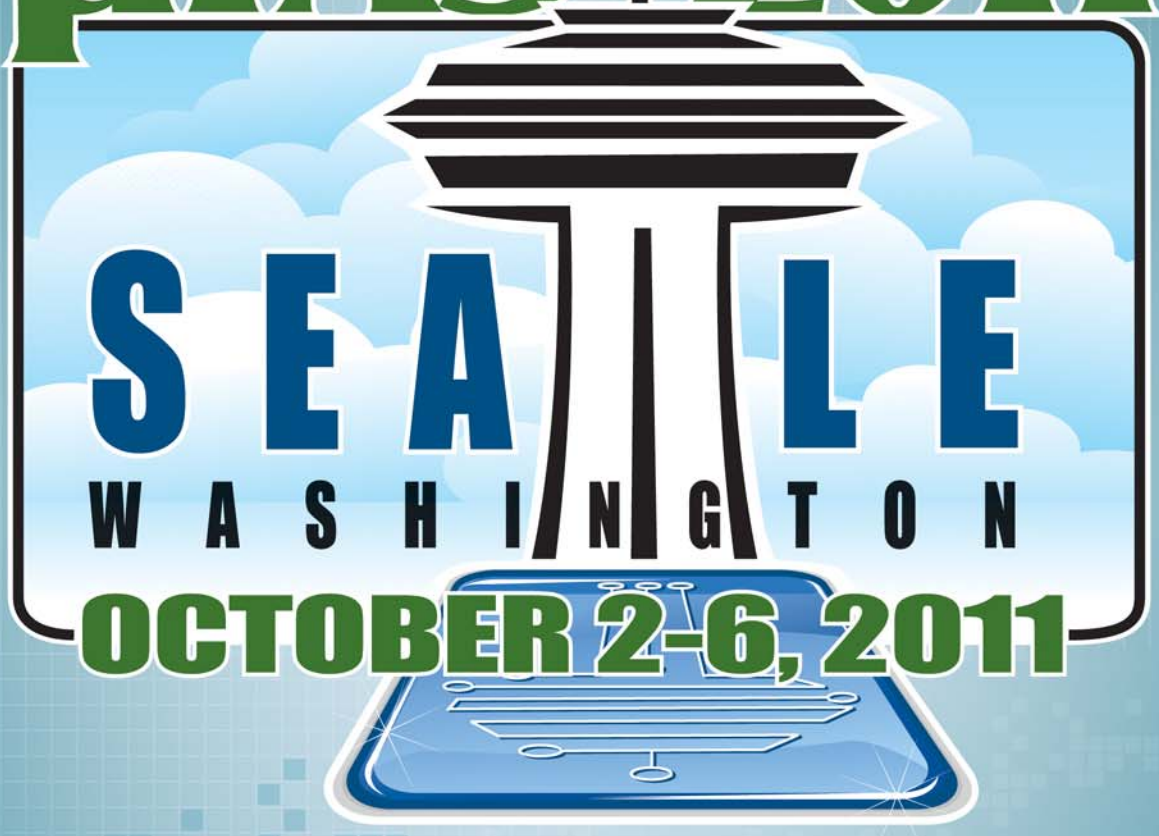
The 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences

µTAS 2011



TECHNICAL PROGRAM

Washington State Convention Center

October 2-6, 2011 | Seattle, Washington, USA

Sponsored by

CBMS

Sunday	16:00 - 19:00	Conference Registration and Check-In		
	17:00 - 19:00	Welcome Reception		
Monday	08:00 - 08:15	Opening Remarks		
	08:15 - 09:00	**PLENARY I** **GENOMIC ANALYSIS AT THE SINGLE CELL LEVEL** S.R. Quake, *Stanford University, USA*		
		Ballroom 6E	Ballroom 6D	Room 611-614
	09:15 - 10:15	**Session 1A1** Cell Analysis	**Session 1B1** Micro-Particles	**Session 1C1** Point-of-Care Testing
	10:15 - 10:45	Break and Exhibit Inspection		
	10:45 - 11:45	**Session 1A2** Stem Cell Analysis & Culture	**Session 1B2** Gradients & Dynamics	**Session 1C2** Nano- & Microchannel Separations
	11:45 - 13:00	Lunch (on own)		
	13:00 - 13:45	**PLENARY II** **ENGINEERING NANOMATERIALS FOR BIOSENSING AND REGENERATIVE MEDICINE** M.M. Stevens - *Imperial College London, UK*		
	13:45 - 16:00	**Poster Session 1**		
	16:00 - 17:20	**Session 1A3** DNA Diagnostics/Sample Preparation	**Session 1B3** Droplets: Modeling, Mixing & Control	**Session 1C3** Advanced Fabrication Techniques at Micro- & Nano-Scale
Tuesday	08:00 - 08:15	Announcements		
	08:15 - 09:00	**PLENARY III** **SELF-REPLICATION OF GENETIC INFORMATION IN MICRO-COMPARTMENTS** T. Yomo, *Osaka University, JAPAN*		
	09:15 - 10:15	**Session 2A1** Cell-Based Drug Development	**Session 2B1** Optics	**Session 2C1** DNA Detection via Hybridization
	10:15 - 10:45	Break and Exhibit Inspection		
	10:45 - 11:45	**Session 2A2** Micro-Probing Worms & Flies	**Session 2B2** PCR in Droplets	**Session 2C2** Controlling Fluidic Circuits
	11:45 - 13:00	Lunch (on own)		
	13:00 - 13:45	Awards Ceremony I		
	13:45 - 16:00	**Poster Session 2**		
	16:00 - 17:00	**Session 2A3** Cellular Response & Morphology	**Session 2B3** Fundamental Developments	**Session 2C3** Protein Biomarkers
Wednesday	08:00 - 08:15	Announcements		
	08:15 - 09:00	**PLENARY IV** **ACOUSTOPHORESIS - A SOUND APPROACH TO CHIP BASED CELL HANDLING** T. Laurell, *Lund University, SWEDEN*		
	09:15 - 10:15	**Session 3A1** Microscale Tissue Models	**Session 3B1** Integrated *Sample-to-Result* Systems	**Session 3C1** Bilayers/Vesicles/Liposomes
	10:15 - 10:45	Break		
	10:45 - 11:45	**Session 3A2** Cell Manipulation, Capture & Analysis	**Session 3B2** Energy & the Environment	**Session 3C2** Robots & Microscopy
	11:45 - 13:00	Lunch (on own)		
	13:00 - 13:45	**PLENARY V** **CENTRIFUGAL MICROFLUIDICS** Y.-K. Cho, *Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA*		
	13:45 - 16:00	**Poster Session 3**		
	16:00 - 17:00	**Session 3A3** Cell Sorting	**Session 3B3** Microparticles in Biomedicine	**Session 3C3** Nanoscale Particles & Interactions
	19:00 - 22:00	An Evening at the EMP Museum (music + sci-fi + pop-culture)		
Thursday	08:30 - 08:45	Announcements		
	08:45 - 09:30	**PLENARY VI** **SYSTEMS BIOLOGY, TRANSFORMATIONAL TECHNOLOGIES AND THE EMERGENCE OF PROACTIVE P4 MEDICINE** L. Hood, *Institute for Systems Biology, USA*		
	09:30 - 09:45	Awards Ceremony II		
	09:45 - 10:45	**Session 4A1** Circulating Tumor Cells	**Session 4B1** Protein Analysis	**Session 4C1** Process Automation & Screening
	10:45 - 11:15	Break		
	11:15 - 12:15	**Special Focus Session 4A2** Paper Microfluidics	**Special Focus Session 4B2** Forensic Analysis	**Special Focus Session 4C2** Bacterial Detection & Communication

The technical program consists of six plenary sessions. There will be three parallel oral sessions each day.

Plenary Speakers: (in order of presentation)

Monday 08:15 — Stephen R. Quake, *Stanford University, USA*
Monday 13:00 — Molly M. Stevens, *Imperial College London, UK*
Tuesday 08:15 — Tetsuya Yomo, *Osaka University, JAPAN*
Wednesday 08:15 — Thomas Laurell, *Lund University, SWEDEN*
Wednesday 13:00 — Yoon-Kyoung Cho, *Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA*
Thursday 08:45 — Leroy Hood, *Institute for Systems Biology, USA*

Guide to Understanding Session Numbering

Each session in the technical program is assigned a unique number which clearly indicates when and where the session is presented. The number of each session is shown before the session title.

Typical session number: **1A1**.

The first character (i.e., **1**) indicates the day of the Conference:

1 = Monday
2 = Tuesday
3 = Wednesday
4 = Thursday

The second character (i.e., **A**) indicates which room the session is held in:

A = Ballroom 6E **B** = Ballroom 6D **C** = Room 611-614

The third character (i.e., **1**) shows the sequence the session is held during the day:

1 = Concurrent Session 1 - morning
2 = Concurrent Session 2 - mid-morning
3 = Concurrent Session 3 - afternoon

Posters

Three poster sessions will be held in Ballroom 6A-C, from 13:45 to 16:00 on Monday, Tuesday and Wednesday. Posters will be on display and authors will be available for questions during their appointed time. All poster papers are listed on the day that they are on display.

Guide to Understanding Poster Numbering

Each poster in the technical program is assigned a unique number which clearly indicates when and where the poster is presented. The number of each poster is shown before the title.

Typical Poster number: **M1A**

The first character (i.e., **M**) indicates the day of the Conference that the poster will be on display.

M = Monday **T** = Tuesday **W** = Wednesday

The second character (i.e., **1**) is the poster board position on the floorplan.

The third character (i.e., **A**) shows the category of the poster:

A = Life Science Applications
B = Microreaction Applications
C = Microfluidic Fundamentals
D = Integrated Micro- and Nanotechnologies
E = Nanotechnologies
F = MEMS & NEMS Technologies
G = Bench-to-Bedside
H = Imaging & Detection Technologies
I = Other Applications

Monday, October 3

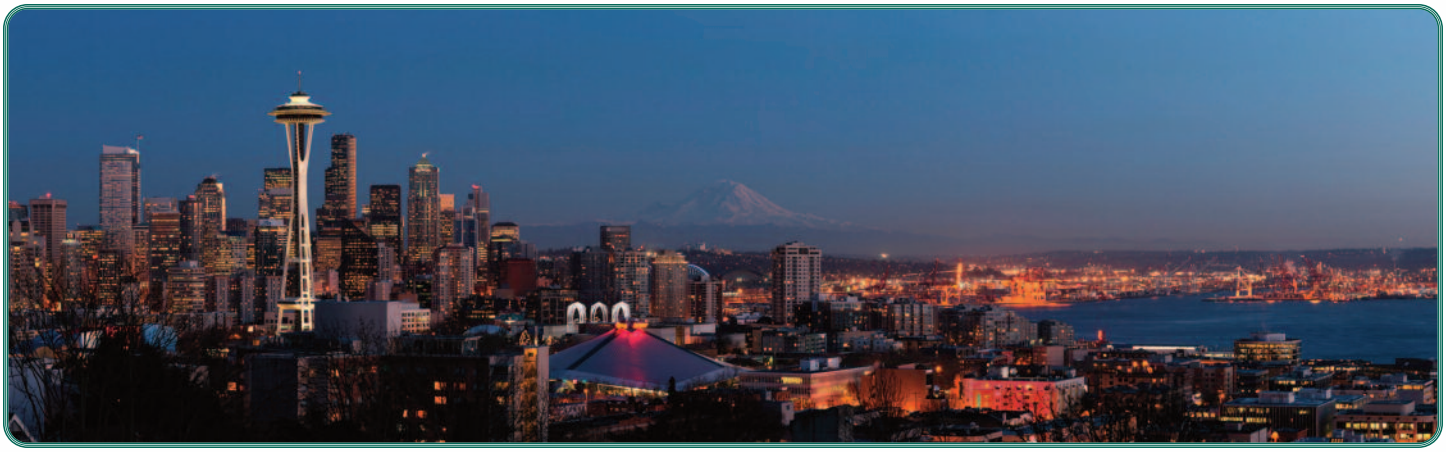
08:00 - 08:15 **Welcome and Opening Remarks -** James P. Landers, µTAS 2011 Chairman

08:15 - 09:00 **Plenary Session I -** Chair: T. Laurell, *Lund University, SWEDEN*

GENOMIC ANALYSIS AT THE SINGLE CELL LEVEL
S.R. Quake
Stanford University and Howard Hughes Medical Institute, USA

Ballroom 6E	Ballroom 6D	Ballroom 611-614
Session 1A1 **Cell Analysis** CHAIR: S. Verpoorte, *University of Groningen, THE NETHERLANDS*	**Session 1B1** **Micro-Particles** CHAIR: O. Niwa, *National Institute of Advanced Industrial Science and Technology, JAPAN*	**Session 1C1** **Point-of-Care Testing** CHAIR: A. van den Berg, *University of Twente, THE NETHERLANDS*
09:15 - 09:35		
DEFORMABILITY CYTOMETRY: APPLICATIONS IN CLINICAL CANCER DIAGNOSTICS H.T.K. Tse, D.R. Gossett, A. Lee, A. Ellison, Y. Ying, R. Kulkarni, J. Rao, and D. Di Carlo *University of California, Los Angeles, USA*	**A CENTRIFUGE-BASED DROPLET SHOOTING DEVICE FOR THE SYNTHESIS OF MULTI-COMPARTMENTAL MICROSPHERES UNDER ULTRA-HIGH GRAVITY** K. Maeda[1], M. Takinoue[1], H. Onoe[1,2], and S. Takeuchi[1,2] [1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*	**OPHTHALMOLOGIST-ON-A-CHIP: FULLY INTEGRATED MICROFLUIDIC TEAR OSMOLARITY AND PROTEIN BIOMARKER QUANTIFICATION FOR DRY EYE STRATIFICATION** K. Karns and A.E. Herr *University of California, Berkeley, USA*
09:35 - 09:55		
MEASURING SINGLE-CELL DENSITY W.H. Grover[1], A.K. Bryan[1], M. Diez-Silva[1], S. Suresh[1], J.M. Higgins[2], and S.R. Manalis[1] [1]*Massachusetts Institute of Technology, USA and* [2]*Massachusetts General Hospital and Harvard Medical School, USA*	**INTERFACE-TEMPLATED FORMATION OF MONODISPERSE DOUGHNUT-SHAPED SILICA MICROPARTICLES** A. Fang[1], C. Gosse[2], C. Gaillard[1], and J.-P. Douliez[1] [1]*National Institute for Agricultural Research (INRA), FRANCE and* [2]*LPN-CNRS, FRANCE*	**FEMTOLITER MICRODROPLET ARRAY DEVICE FOR SINGLE-MOLECULE DIGITAL ENZYME-LINKED IMMUNOSORBENT ASSAY** R. Iino[1,2], S. Araki[2,3], S.H. Kim[1,2], S. Sakakihara[3], and H. Noji[1,2] [1]*University of Tokyo, JAPAN,* [2]*Japan Science and Technology Agency (JST), JAPAN and* [3]*Osaka University, JAPAN*
09:55 - 10:15		
A MICROENGINEERED STRETCHING PLATFORM FOR LIVE-CELL MECHANOTRANSDUCTIVE RESPONSE ANALYSIS J. Mann, R.H.W. Lam, Y. Sun, S. Weng, and J. Fu *University of Michigan, USA*	**PRODUCTION OF EXTREMELY-SMALL HYDROGEL MICROSPHERES BY UTILIZING WATER- DROPLET DISSOLUTION IN A POLAR SOLVENT** S. Sugaya, M. Yamada, and M. Seki *Chiba University, JAPAN*	**POINT-OF-CARE IMMUNOASSAY CARDS FOR SAMPLE-TO-RESULT DIFFERENTIAL DIAGNOSIS OF ACUTE FEVER** L. Lafleur[1], D. Stevens[1], K. McKenzie[1], S. Ramachandran[1], P. Spicar-Mihalic[1], M. Singhal[2], A. Arjyal[3], P. Yager[1], and B. Lutz[1] [1]*University of Washington, USA,* [2]*Partnership for Appropriate Technologies in Health, USA, and* [3]*Oxford University Clinical Research Unit-Patan Academy of Health Sciences, NEPAL*

10:15 - 10:45 **Break and Exhibit Inspection**



Ballroom 6E	Ballroom 6D	Room 611-614
Session 1A2 **Stem Cell Analysis & Culture** CHAIR: J.-L. Viovy, *Instiut Curie, FRANCE*	**Session 1B2** **Gradients & Dynamics** CHAIR: G.-B. Lee, *National Tsing Hua University, TAIWAN*	**Session 1C2** **Nano- & Microchannel Separations** CHAIR: J. Santiago, *Stanford University, USA*
10:45 - 11:05		
DIFFERENTIAL ENVIRONMENTAL SPATIAL PATTERNING (δESP) RECREATES PROXIMAL-DISTAL AXIAL PATTERNS IN EMBRYONIC STEM CELL COLONIES Y.-C. Toh[1,2], K. Blagovic[1], H. Yu[2,3], and J. Voldman[1] [1]*Massachusetts Institute of Technology, USA,* [2]*National University of Singapore, SINGAPORE, and* [3]*Institute of Bioengineering and Nanotechnology, SINGAPORE*	**PROBING DYNAMIC CELL RESPONSES USING A ROBUST DIFFUSIVE GRADIENT GENERATOR** J. Atencia, G.A. Cooksey, and L.E. Locascio *National Institute of Standards and Technology (NIST), USA*	**NANOCHANNELS WITH TWO PORES IN SERIES FOR SINGLE PARTICLE SENSING AND CHARACTERIZATION** Z.D. Harms[1], K.B. Mogensen[2], P.S. Nunes[2], K. Zhou[1], B.W. Hildenbrand[1], Z. Tan[1], A. Zlotnick[1], J.P. Kutter[2], and S.C. Jacobson[1] [1]*Indiana University, USA and* [2]*Technical University of Denmark (DTU), DENMARK*
11:05 - 11:25		
"UPSIDE-DOWN" DIGITAL MICROFLUIDIC BASED EMBRYONIC STEM CELL CULTURE I.A. Eydelnant, B. Li, W.Y. Chang, W.L. Stanford, and A.R. Wheeler *University of Toronto, CANADA*	**A MICROFLUIDIC MICROELECTRODE ARRAY FOR EXTRACELLULAR RECORDINGS AND FOCAL STIMULATION OF BRAIN SLICES** A. Scott, M. Becker, W.J. Moody, and A. Folch *University of Washington, USA*	**DEPLETION ZONE ISOTACHOPHORESIS (dzITP): BEATING THE SIMPLICITY OF ELECTROPHORESIS** J. Quist, K. Janssen, P. Vulto, T. Hankemeier, and H. van der Linden *Leiden University, THE NETHERLANDS*
11:25 - 11:45		
NANOTOPOGRAPHICAL CONTROL OF HUMAN EMBRYONIC STEM CELL FUNCTION W. Chen, Y. Sun, and J. Fu *University of Michigan, USA*	**BLOOD CELL VISUALIZATION USING MULTIPLE HYDRODYNAMIC FLOW FOCUSING** F.J. Tovar-Lopez[1], G. Rosengarten[2], M. Nasabi[1], V. Sivan[1], S.P. Jackson[3], W.S. Nesbitt[3], and A. Mitchell[1] [1]*RMIT University, AUSTRALIA,* [2]*University of New South Wales, AUSTRALIA, and* [3]*Monash University, AUSTRALIA*	**LABEL-FREE DETECTION OF DNA USING DIFFRACTED LASER IN NANOWALL ARRAY STRUCTURES** T. Yasui[1], N. Kaji[1], Y. Okamoto[1], M. Tokeshi[1], Y. Horiike[2], and Y. Baba[1,3] [1]*Nagoya University, JAPAN,* [2]*National Institute for Materials Science, JAPAN, and* [3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

11:45 - 13:00	**Lunch (on own)**

13:00 - 13:45 **Plenary Session II** - Chair: A. Lee, *University of California, Irvine, USA*

ENGINEERING NANOMATERIALS FOR BIOSENSING AND REGENERATIVE MEDICINE
M.M. Stevens - *Imperial College London, UK*

13:45 - 16:00 **Poster Session I** *(refreshments will be served at 15:00)*

Life Science Applications
Genomics & Proteomics

M1A
A DNA SIZE PROBE BASED ON ENERGY MIGRATION IN CROSSLINKED CHROMATIN
M.F. Serag, N. Kaji, Y. Okamoto, M. Tokeshi, and Y. Baba
Nagoya University, JAPAN

M2A
A MICROFLUIDIC PLATFORM FOR PERSONALIZED CANCER DIAGNOSTICS BY PADLOCK PROBES LIGATION AND CIRCLE-TO-CIRCLE AMPLIFICATION
A. Ahlford[1], A.J. Conde[2], D. Sabourin[3], J.P. Kutter[3], M. Nilsson[1], M. Dufva[3], and M. Brivio[1,3]
[1]*Uppsala University, SWEDEN,*
[2]*Universidad Nacional de Tucumán, ARGENTINA, and*
[3]*Technical University of Denmark (DTU), DENMARK*

M3A
AGAROSE DROPLET MICROFLUIDIC APPROACH FOR MOLECULAR EVOLUTION OF APTAMERS
W. Zhang, W. Zhang, Z. Liu, C. Li, G. Jenkins, and C.J. Yang
Xiamen University, CHINA

M4A
COLLECTIVE TRANSFER OF BIOMOLECULES FROM GEL DROPLET MICROARRAY-TO-GEL DROPLET MICROARRAY: APPLICATION TO HIGH SENSITIVITY MULTIPLEXED BEADS-IN-GEL IMMUNOASSAYS
H. Li and D. Juncker
McGill University, CANADA

M5A
COUNTING SINGLE DNA MOLECULE BY ON-BEAD ROLLING CIRCLE AMPLIFICATION FOR QUANTITATIVE ANALYSES
R. Ishii[1], N. Sasaki[1], K. Sato[2], K. Mawatari[3], M. Nilsson[4], T. Kitamori[3], and K. Sato[1]
[1]*Japan Women's University, JAPAN,* [2]*Gunma University, JAPAN,*
[3]*University of Tokyo, JAPAN, and* [4]*Uppsala University, SWEDEN*

M6A
NOVEL 3D LITHOGRAPHICALLY-PREPARED SOLID-PHASE SURFACES MADE FROM SU-8 FOR NEXT GENERATION SEQUENCING
H. Wang[1], M. Witek[1], D. Park[1], J. Huang[2], F. Barany[2], and S.A. Soper[1,3]
[1]*Louisiana State University, USA,* [2]*Weill Cornell Medical College, USA, and*
[3]*Ulsan National Institute of Science and Technology, SOUTH KOREA*

Life Science Applications
Drug Development

M7A
AUTOMATED DRUG SCREENING SYSTEM FOR ION CHANNEL PROTEINS
R. Kawano[1], Y. Tsuji[1,3], M. Hirano[4], T. Osaki[1], H. Sasaki[1], K. Kamiya[1], N. Miki[1,3], T. Ide[4,5], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science and Technology (KAST), JAPAN,*
[2]*University of Tokyo, JAPAN,* [3]*Keio University, JAPAN,*
[4]*Institute of Physical and Chemical Research (RIKEN), JAPAN, and*
[5]*Graduate School for the Creation of New Photonics Industries, JAPAN*

M8A
HIGH-SPEED MICROFLUIDIC PRODUCTION OF PHASE-CHANGE DROPLETS FOR GAS EMBOLOTHERAPY AND AS A NOVEL ON-CHIP PUMP
D. Bardin[1], T. Martz[2,3], P.A. Dayton[2,3], and A.P. Lee[1]
[1]*University of California, Irvine, USA,* [2]*University of North Carolina, USA, and*
[3]*North Carolina State, USA*

M9A
RAPID MICROWELL PROTOTYPING, GENERATION OF 3D MULTICELLULAR CANCER AGGREGATES, AND EMT DRUG SCREENING
T.-Y. Tu[1], W. Sun[1], W.K. Peng[1], Z. Wang[1], R.Y.J. Huang[2], P.T. Matsudaira[2], J.-P. Thiery[3], and R.D. Kamm[1]
[1]*Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE,* [2]*National University of Singapore, SINGAPORE, and*
[3]*Agency for Science, Technology and Research (A*STAR), SINGAPORE*

Life Science Applications
Cell Culture / Handling / Analysis

M10A
A BIO-ARTIFICIAL PANCREAS CREATED USING CELL ENCAPSULATION IN SELF-ASSEMBLED MICROCONTAINERS ON ALGINATE SHEET
J. Park, C.L. Randall, Y.V. Kalinin, S. Pandey, and D.H. Gracias
Johns Hopkins University, USA

M11A
A LOW DILUTION RATE MICROCHEMOSTAT ARRAY WITH PROGRAMMABLE CELL POPULATION CONTROL
J. Wu, M. Polymenis, and A. Han
Texas A&M University, USA

M12A
A NEW APPROACH TO EMBED BRANCHED 3D MICROCHANNEL NETWORKS IN HYDROGEL SUBSTRATES: FABRICATION AND TRANSPORT ANALYSIS
J-H. Huang, J. Kim, A. Jayaraman, and V.M. Ugaz
Texas A&M University, USA

M13A
A SINGLE-CELL MEMBRANE DYNAMIC FROM PORATION TO RESTORATION BY BUBBLE-INDUCED JETTING FLOW
Z.G. Li[1], K.Q. Luo[1], C.D. Ohl[1], J.B. Zhang[2], and A.Q. Liu[1]
[1]*Nanyang Technological University, SINGAPORE and*
[2]*Data Storage Institute, SINGAPORE*

M14A
AEROSOL DRUG DELIVERY FOR LUNG ON A CHIP
D.C. Leslie, K. Domansky, G.A. Hamilton, A. Bahinski, and D.E. Ingber
Harvard University, USA

M15A
CARBOHYDRATE-PROTEIN COMPLEX FOR SPECIFICALLY ISOLATING METASTATIC CIRCULATING CANCER CELLS
G. Simone[1], N. Malara[2], P. Neuzil[1], E. Di Fabrizio[1,3], and A. Manz[1]
[1]*Korea Institute of Science and Technology (KIST) - Europe, GERMANY*
[2]*University of Catanzaro, ITALY, and* [3]*IIT of Genova, ITALY*

M16A
CHARACTERIZATION OF DRUG INDUCED AUTOPHAGY AND CYTOTOXICITY IN MCF7 CELLS ON MULTI-LAYER MICROFLUIDIC DEVICE
L.F. Yu and K.C. Cheung
University of British Columbia, CANADA

M17A
CONTRAST AGENT-FREE CELL SONOPORATION USING A CONTINUOUS-FLOW MICROFLUIDIC DEVICE
D. Carugo, D.N. Ankrett, P. Glynne-Jones, L. Capretto, R.J. Boltryik, P.A. Townsend, X. Zhang, and M. Hill
University of Southampton, UK

M18A
DOUBLE-STRANDED LOCKED NUCLEIC ACID PROBES FOR REVEALING INTRACELLULAR GENE EXPRESSION DYNAMICS OF CANCER CELLS NEAR MECHANICAL WOUNDS
R. Riahi and P.K. Wong
University of Arizona, USA

M19A
EX VIVO INTERMITTENT HYPOXIA PRECONDITIONING OF PANCREATIC ISLETS FOR IMPROVED FUNCTION UNDER HYPOXIA
J.F. Lo, Y. Wang, A. Blake, T.A. Harvat, J. Oberholzer, and D.T. Eddington
University of Illinois, Chicago, USA

M20A
GEOMETRICALLY-CONSTRAINED CELL MANIPULATION FOR HIGH SPEED AND FINE POSITIONING
W. Fukui[1], M. Kaneko[1], T. Kawahara[2], Y. Yamanishi[2], and F. Arai[2]
[1]*Osaka University, JAPAN and* [2]*Nagoya University, JAPAN*

M21A
HIGH RESOLUTION MICROFLUIDIC SAMPLING IN EX VIVO BIOLOGICAL TISSUES
N. Scott Lynn, C.M. Eitel, S. Tobet, C.S. Henry, and D.S. Dandy
Colorado State University, USA

M22A
IMMOBILIZATION AND CULTURING OF MAMMALIAN CELLS WITH BIOCOMPATIBLE ELECTRODEPOSITION OF CALCIUM ALGINATE GEL IN MICROFLUIDIC DEVICES
Y. Cheng, J. Terrell, X. Luo, J. Betz, H.-C. Wu, G.F. Payne, W.E. Bentley, and G.W. Rubloff
University of Maryland, USA

M23A
LONG-TERM MULTICELLULAR SPHEROIDS CULTURE AND ANTICANCER DRUG ACTIVITY EVALUATION IN A MICROFLUIDIC SYSTEM
K. Ziólkowska, A. Stelmachowska, R. Kwapiszewski, M. Chudy, A. Dybko, and Z. Brzózka
Warsaw University of Technology, POLAND

M24A
MEASURING DENSITY AND COMPRESSIBILITY OF WHITE BLOOD CELLS AND PROSTATE CANCER CELLS BY MICROCHANNEL ACOUSTOPHORESIS
R. Barnkob[1], P. Augustsson[2], C. Magnusson[3], H. Lilja[3,4], T. Laurell[2], and H. Bruus[1]
[1]*Technical University of Denmark (DTU), DENMARK,*
[2]*Lund University, SWEDEN,*
[3]*Skåne University Hospital, SWEDEN and*
[4]*Memorial Sloan-Kettering Cancer Center, USA*

M25A
MICROFLUIDIC APPROACH FOR SIMULTANEOUS MEASUREMENT OF CHOLINE AND GLUTAMATE NEUROTRANSMITTERS IN IN-VITRO MONITORING OF NEURAL CELLS
S. Talaei, P.D. van der Wal, and N.F. de Rooij
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

M26A
MICROFLUIDIC MODEL OF CYSTIC FIBROSIS BRONCHI
M. Skolimowski, M.W. Nielsen, F. Abeille, J. Lopacinska, S. Molin, R. Taboryski, O. Geschke, C. Sternberg, M. Dufva, and J. Emnéus
Technical University of Denmark (DTU), DENMARK

M27A
MICROFLUIDIC SINGLE-CELL CULTURE CHIP FOR INDIVIDUAL TRAPPING, CULTIVATION AND SELECTIVE RELEASE OF YEAST CELLS
Z. Zhu, O. Frey, and A. Hierlemann
ETH Zürich, SWITZERLAND

M28A
ON-CHIP SINGLE CELL MANIPULATION VIA MAGNETIC DOMAIN WALL CONDUITS
M. Donolato[1], A. Torti[1], E. Sogne[1], N. Kostesha[2], M. Deryabina[2], P. Vavassori[3], M.F. Hansen[2], and R. Bertacco[1]
[1]*Politecnico di Milano, ITALY,*
[2]*Danmarks Tekníske Universitet (DTU), DENMARK, and*
[3]*CIC nanoGUNE Consolider, SPAIN*

M29A
PARALLEL SCREENING OF BIOMATERIALS AND TISSUE CONSTRUCTS: DYNAMIC MECHANICAL STIMULATION AND ON-CHIP STRAIN SENSING
L.A. MacQueen, C.A. Simmons, and Y. Sun
University of Toronto, CANADA

M30A
PROBING THE TRAITS OF EPITHELIAL-MESENCHYMAL TRANSITION IN A MICROFLUIDIC DEVICE
C.T. Kuo[1], C.L. Chiang[1], R.Y.J. Huang[2,3], H. Lee[1], and A.M. Wo[1]
[1]*National Taiwan University, TAIWAN,*
[2]*National University Hospital, TAIWAN, and*
[3]*National University of Singapore, SINGAPORE*

M31A
QUANTITATIVE CYTOLOGICAL FEATURE ANALYSIS BY MICROFLUIDIC IMAGE CYTOMETRY REVEALS PHENOTYPIC DIFFERENCES AMONG HUMAN PLURIPOTENT STEM CELL LINES
K. Kamei[1], M. Ohashi[2], N.A. Graham[2], Y. Chen[1], A.T. Clark[2], O.N. Witte[2], T.G. Graeber[2], A.D. Pyle[2], and H.-R. Tseng[2]
[1]*Kyoto University, JAPAN and* [2]*University of California Los Angeles, USA,*

M32A
SINGLE CELL ANALYSIS IN A MULTILAYER MICROFLUIDIC DEVICE: MONITORING OF DRUG-INDUCED GENE EXPRESSION
C. Hanke[1], S. Waide[2], R. Kettler[2], and P.S. Dittrich[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*ISAS Dortmund, GERMANY*

M33A
SINGLE-CELL MIGRATION, PROLIFERATION, AND TOXIN RESPONSE IN REPLICATE MICROFLUIDIC ASSAYS COMPARED TO LARGER VOLUME CONDITIONS
G.A. Cooksey, J.T. Elliott, and A.L. Plant
National Institute of Standards and Technology (NIST), USA

M34A
SYNERGISTIC REGULATION OF CELL FUNCTIONS BY MATRIX RIGIDITY AND ADHESIVE PATTERN USING AN ELASTOMERIC MICROPOST ARRAY SYSTEM
S. Weng and J. Fu
University of Michigan, USA

M35A
THEORETICAL ANALYSIS OF VISCOUS CORRECTIONS TO THE ACOUSTIC RADIATION FORCE ON CELLS IN MICROCHANNEL ACOUSTOPHORESIS
M. Settnes and H. Bruus
Technical University of Denmark (DTU), DENMARK

M36A
TOROIDAL CELLULAR AGGREGATES FOR DIRECTED ASSEMBLY OF MULTICELLULAR STRUCTURE
T. Masuda[1], N. Takei[1], T. Nakano[2], and F. Arai[1,3]
[1]*Nagoya University, JAPAN,* [2]*FUJIFILM Corporation, JAPAN,*
[3]*Seoul National University, SOUTH KOREA*

M37A
USING A THREE-CHAMBER CULTURE CHIP TO STUDY THE INTERACTIONS AMONG CANCER CELLS AND TWO TYPES OF STROMAL CELLS
C.-H. Lee[1,2], T.-H. Hsu[1], Y.-L. Kao[2,3], W.-L. Lin[1], and W.-Y. Liao[4]
[1]*National Yang-Ming University, TAIWAN,*
[2]*Academia Sinica, TAIWAN,*
[3]*National Taiwan Ocean University, TAIWAN, and*
[4]*National Taiwan University Hospital, TAIWAN*

Life Science Applications
Others

M38A
BACTERIA IMMOBILIZATION IN A MICRO POROUS CARRIER BY DIELECTROPHORESIS
T. Kano, Y. Gu, T. Inaba, and N. Miki
Keio University, JAPAN

M39A
DYNAMIC STUDIES OF CERAMIDE ION CHANNELS ENABLED BY A RAPID-PERFUSION PLANAR LIPID MEMBRANE CHIP
C. Shao, B. Sun, M. Colombini, and D.L. DeVoe
University of Maryland, USA

M40A
LOCALIZED GENE DELIVERABLE ENCODED MICROPATCH IMMOBILIZED WITH VIRAL VECTOR FOR MULTIPLEX HIGH CONTENT SCREENING
W. Park, S. Han, H. Bae, M. Kim, and S. Kwon
Seoul National University, SOUTH KOREA and Inter-University Semiconductor Research Center, SOUTH KOREA

M41A
MICROFLUIDIC DROPLET BASED ENZYME VARIANT SCREENING – TOWARDS IMPROVED ENZYMES FOR INDUSTRIAL APPLICATIONS
H. Joensson, C. Zhang, S. Sjoestroem, and H. Andersson-Svahn
Royal Institute of Technology (KTH), SWEDEN

M42A
ON-CHIP SINGLE VESICLE ANALYSES OF ATP-BINDING CASSETTE (ABC) TRANSPORTERS
H. Sasaki[1], R. Kawano[1], T. Osaki[1], K. Kamiya[1,2], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science & Technology, JAPAN and*
[2]*University of Tokyo, JAPAN*

M43A
STROKE ON A CHIP: SPATIAL AND TEMPORAL CONTROL OF OXYGEN FOR IN VITRO BRAIN SLICES
G. Mauleon[1], C.P. Fall[1,2], and D.T. Eddington[1]
[1]*University of Illinois, Chicago, USA and*
[2]*Georgetown University, USA*

Microreaction Applications
Flow Chemistry / Synthesis

M1B
CHEMICALLY ROBUST, RAPIDLY PRINTED POLYURETHANE MICROREACTOR FOR SYNTHESIS OF MONODISPERSED MAGNETIC IRON OXIDE NANOPARTICLES
E.Y. Erdem, J.C. Cheng, G. Vigevani, F.M. Doyle, and A.P. Pisano
University of California, Berkeley, USA

M2B
HIGH-THROUGHPUT SYNTHESIS OF NANOSCALE LIPID VESICLES FOR CONTROLLING SIZE AND SIZE DISTRIBUTION IN A CONTRACTION–EXPANSION ARRAY MICROCHANNEL
J. Lee, M.G. Lee, C. Jung, H.G. Park, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

Microreaction Applications
In-Line Analysis/Process Control

M3B
A CENTRIFUGO-MICROFLUIDIC CARTRIDGE WITH INTEGRATED DETECTION OPTICS TOWARDS AUTOMATED AT-LINE BIOPROCESS MONITORING OF IMMUNOGLOBULIN G
J. Siegrist[1], G. Donohoe[2], M. Somers[1], D. Kurzbuch[1], R. Burger[1], S. Hearty[1], J. Murrell[2], C. Martin[2], L. Barrett[1], C. McDonagh[1], R. O'Kennedy[1], and J. Ducrée[1]
[1]*Dublin City University, IRELAND and* [2]*EMD Millipore, USA*

M4B
INLINE MONITORING OF MICROREACTION PROCESSES BY PUSHBROOM IMAGING SPECTROSCOPY
S. Panic, D. Boskovic, and S. Loebbecke
Fraunhofer Institute for Chemical Technology, GERMANY

M5B
MICROFLUIDIC PROCESSING PLATFORM FOR MULTIPLEXED MAGNETIC BEAD IMMUNOASSAYS
L.A. Sasso, I.H. Johnston, R. K. Gupte, M. Zheng, and J.D. Zahn
Rutgers University, USA

Microreaction Applications
Others

M6B
EXPERIMENTAL STUDY ON PASSIVE MICROMIXERS: OPTIMIZATION OF COUNTERCURRENT MIXING
R. Goovaerts, G. Desmet, J. Denayer, and W. De Malsche
Vrije Universiteit Brussel, BELGIUM

M7B
IMPROVED MICROCALORIMETRY FOR BIOSENSING THROUGH ACCELERATED MICROFLUIDIC MIXING WITH SURFACE ACOUSTIC WAVES (SAW)
R. Béland[1,2], A. Renaudin[1], A. Bourque-Viens[1], J.-P. Cloarec[2], V. Aimez[1], Y. Chevolot[2], and P.G. Charette[1]
[1]*Universite de Sherbrooke, CANADA and* [2]*Universite de Lyon, FRANCE*

M8B
SEQUENTIAL ENZYME IMMOBILIZATION IN A MULTI-LAYER MICROFLUIDIC CHIP FOR LACTOSE DETECTION BY CASCADE REACTIONS
P. Kuhn, S. Fornera, A.D. Schlüter, P. Walde, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Microfluidic Fundamentals
Fluid Mechanics & Modeling

M1C
CONCENTRATION POLARIZATION IN NANOCHANNEL DNA ELECTROPHORESIS
P. Dubsky, S. Das, A. van den Berg, and J.C.T. Eijkel
MESA+, University of Twente, THE NETHERLANDS

M2C
EFFECT OF ELECTRIC DOUBLE LAYER ON NEAR-WALL pH IN MICROFLUIDIC DEVICE MEASURED BY NANO-LIF
R. Kuriyama, Y. Tanaka, S. Akiyama, and Y. Sato
Keio University, JAPAN

M3C
MECHANISTIC INVESTIGATION OF ALTERNATING CURRENT CLOUD POINT EXTRACTION IN A MICROCHANNEL
N. Sasaki, A. Takemura, and K. Sato
Japan Women's University, JAPAN

M4C
DYNAMIC RUPTURE OF WATER MICROFLUIDICS
K. Ando, A.Q. Liu, and C.D. Ohl
Nanyang Technological University, SINGAPORE

Microfluidic Fundamentals
Micro Liquid Handling

M5C
A PLASMA SEPARATION DEVICE BASED ON CENTRIFUGAL EFFECT AND ZWEIFACH-FUNG EFFECT
Z. Geng[1,2,3], L. Zhang[1], Y. Ju[1], W. Wang[1], and Z. Li[1]
[1]*Peking University, CHINA,* [2]*Minzu University of China, CHINA, and*
[3]*Chinese Academy of Sciences, CHINA*

M6C
ACCURATE DISPENSING OF VOLATILE REAGENTS ON DEMAND FOR EWOD CHIPS
H. Ding, S. Sadeghi, P.Y. Keng, S. Chen, G.J. Shah, C.-J. Kim, and R.M. van Dam
University of California, Los Angeles, USA

M7C
DESIGN OF A 3-D CROSSING MICROSTRUCTURE FOR DROPLET FISSION, FUSION AND MIXING
Y.T. Chen, W.C. Chang, W.F. Fang, and J.T. Yang
National Taiwan University, TAIWAN

M8C
FLUIDIC CAPACITOR-BASED, SELF-CONTAINED AND SELF-POWERED MICROFLUIDIC CHIP
K. Xu, M. Utz, and J.P. Landers
University of Virginia, USA

M9C
IN SITU FORMATION OF HYDROGEL MEMEBRANES AND GROWTH OF COLLOIDAL CRYSTALS IN MICROCHANNELS USING ONE STEP STAMPING
E. Choi and J. Park
Sogang University, SOUTH KOREA

M10C
NANO-NOZZLE FOR FLUID INJECTION DRIVEN BY CAVITATION BUBBULE-INDUCED JETTING FLOW
Z.G. Li[1], C.D. Ohl[1], J.B. Zhang[2], and A.Q. Liu[1]
[1]*Nanyang Technological University, SINGAPORE and*
[2]*Data Storage Institute, SINGAPORE*

M11C
PROGRAMMABLE MICROFLUIDICS IN VIRTUAL ELECTROWETTING CHANNELS
A. Banerjee, E. Kreit, I. Hiekenfeld, and I. Papautsky
University of Cincinnati, USA

M12C
SERPENTINE AND LEADING EDGE CAPILLARY PUMPS
R. Safavieh and D. Juncker
McGill University, CANADA

M13C
TEMPERATURE-DRIVEN SELF-ACTUATED MICROVALVE FOR PCR
T. Naito[1], R. Arayanarakool[2], N. Kaji[1], Y. Okamoto[1], M. Tokeshi[1], S. Le Gac[2], A. van den Berg[2], and Y. Baba[1,3]
[1]*Nagoya University, JAPAN,*
[2]*MESA+, University of Twente, THE NETHERLANDS, and*
[3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

M14C
VAPOR-TIGHT ICE-VALVING IN CENTRIFUGAL MICROFLUIDICS FOR PCR APPLICATIONS
M. Amasia[1,2], M. Cozzens[1], and M. Madou[1,2]
[1]*University of California, Irvine, USA and*
[2]*Ulsan National Institute of Science and Technology, SOUTH KOREA*

Microfluidic Fundamentals
Multi-Phase & Digital Microfluidics

M15C
COALESCENCE AND MIXING OF DROPLETS WITH IDENTICAL AND DISTINCT SURFACE TENSIONS ON A WETTABILITY GRADIENT SURFACE
W.-F. Fang, S.-I. Yeh, C.-L. Lai, Y.-T. Chen, and J.-T. Yang
National Taiwan University, TAIWAN

M16C
DROPLET-BASED MICROFLUIDIC DEVICES FOR MULTIPLE-DROPLET TRAPPING, STORING, AND CLUSTERING EMFLOYING GUIDING TRACKS AND FORWARD/BACKWARD FLOWS
J. Xu, B. Ahn, H. Lee, K. Lee, R. Panchapakesan, L. Xu, and K.W. Oh
State University of New York, Buffalo, USA

M17C
IMPACT OF OSMOSIS ON MICRO-DROPLETS - A NEW ROUTE TO NOVEL SENSORS
T.W. Hofmann, S. Hänselmann, J. Janiesch, and C.H.J. Böhm
Max Planck Institute for Intelligent Systems, GERMANY and Heidelberg University, GERMANY

M18C
OPTOFLUIDIC TWEEZERS: MANIPULATION OF OIL DROPLETS WITH 105 GREATER FORCE THAN OPTICAL TWEEZERS
G.K. Kurup and A.S. Basu
Wayne State University, USA

M19C
MICROFLUIDIC MANIFOLD SYSTEM TO REDUCE THE NUMBER OF SYRINGE PUMPS IN MULTI-PHASE SYTEMS FOR GENERATING ALGINATE BEADS
C. Kim[1,2], J.H. Bang[1], Y.E. Kim[1], and J.Y. Kang[1]
[1]*Korea Institute of Science and Technology (KIST), SOUTH KOREA and*
[2]*Singapore-MIT Alliance for Research & Technology (SMART), SINGAPORE*

M20C
MULTILAYER HIGH-DENSITY 3D MICROWELL ARRAYS FOR DIGITAL BIOLOGY
A.C. Hatch, A.A. Patel, and A.P. Lee
University of California, Irvine, USA

M21C
PASSIVELY TRIGGERING ASYMMETRIC DIGITAL FLOWS AT SYMMETRIC MICROFLUIDIC JUNCTIONS
P. Parthiban[1,2] and S.A. Khan[1]
[1]*National University of Singapore, SINGAPORE and*
[2]*Singapore-MIT Alliance for Research & Technology, SINGAPORE*

M22C
STRONG ENHANCEMENT OF STREAMING CURRENT POWER BY APPLICATION OF TWO PHASE FLOW
Y. Xie[1], J.D. Sherwood[2], L. Shui[1], A. van den Berg[1], and J.C.T. Eijkel[1]
[1]*MESA+, University of Twente, THE NETHERLANDS and*
[2]*University of Cambridge, UK*

M23C
VISCOELASTIC BASED DROPLET SORTING IN MICROFLUIDIC CHANNELS
A.C. Hatch[1], A.A. Patel[1], N.R. Beer[2], and A.P. Lee[1]
[1]*University of California, Irvine, USA and*
[2]*Lawrence Livermore National Laboratories, USA*

Microfluidic Fundamentals
Multiscale/ Integrative Microfluidics

M24C
CHEMICAL WAVEFORM AND SWITCHING VIA ACOUSTICALLY ACTIVATED BUBBLES
D. Ahmed, H. Muddanna, M. Lu, X. Mao, X. Ding, P. Butler, and T.J. Huang
Pennsylvania State University, USA

M25C
HIGHLY SENSITIVE AND SPECIFIC MICROTIP-IMMUNOFLUORESCENCE SENOR FOR RAPID TB DIAGNOSIS
J.-H. Kim[1], W.-H. Yeo[1], Z. Shu[1], S.D. Soelberg[1], S. Inoue[1], D. Kalyanasundaram[1], J. Ludwig[1], K.M. Weigel[2], C.E. Furlong[1], J.A. Stamatoyannopoulos[1], J.J. Riley[1], G.A. Cangelosi[2], K. Oh[3], K.-H. Lee[3], D. Gao[1], and J.-H. Chung[1]
[1]*University of Washington, USA,* [2]*Seattle Biomedical Research Institute, USA, and* [3]*Nanofacture Inc., USA*

Microfluidic Fundamentals
Others

M26C
FLUIDIC LOGIC: USING BUBBLES AS DYNAMIC VALVES
D. van Noort and Y. Yang
National University of Singapore, SINGAPORE

M27C
QUANTIFICATION OF HIV VIRAL LOAD WITH LARGE DYNAMIC RANGE USING MULTIVOLUME DIGITAL REVERSE TRANSCRIPTION PCR ON A ROTATIONAL SLIPCHIP
F. Shen[1], B. Sun[2], J. Kreutz[2], E. Davydov[2], W. Du[2], and R.F. Ismagilov[2]
[1]*SlipChip, USA and* [2]*University of Chicago, USA*

Integrated Micro- and Nanotechnologies
Genetic Analysis Systems

M1D
AGGREGATION-BASED DNA DETECTION IN MICROSEPARATOR
Y.T. Chen, Y.C. Liu, W.F. Fang, and J.T. Yang
National Taiwan University, TAIWAN

M2D
DEVELOPMENT OF A MICROFLUIDIC SOUTHERN HYBRIDIZATION ANALYSIS SYSTEM USING MICROBEADS
K. Sato[1], M. Nishikawa[1], N. Sasaki[1], and K. Sato[2]
[1]*Japan Women's University, JAPAN and* [2]*Gunma University, JAPAN*

M3D
EPIGENETIC ANALYSIS OF A SINGLE DNA MOLECULE BY MICROFLUIDIC DEVICE WITH QUANTUM DOT
T. Sano[1], Y. Okamoto[1], N. Kaji[1], M. Tokeshi[1], and Y. Baba[1,2]
[1]*Nagoya University, JAPAN and*
[2]*National Institute of Advanced Industrial Science and Technology, (AIST), JAPAN*

M4D
MEGAPIXEL DIGITAL PCR
K.A. Heyries[1], C. Tropini[2], M. VanInsberghe[1], C. Doolin[1], O.I. Petriv[1], A. Singhal[1], K. Leung[1], C.B. Hugesman[3], and C.L. Hansen[1]
[1]*University of British Columbia, CANADA,* [2]*Stanford University, USA, and* [3]*Michael Smith Laboratories, CANADA*

M5D
MICROWAVE-ASSISTED POLYMERASE CHAIN REACTION (PCR) IN DISPOSABLE MICRODEVICES
K. Oh, A.H. Skalavounos, D.J. Marchiarullo, N.S. Barker, and J.P. Landers
University of Virginia, USA

M6D
ROTARY RT-PCR MICRODEVICE FOR ULTRAFAST GENETIC ANALYSIS
J.H. Jung, S.J. Choi, B.H. Park, and T.S. Seo
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

M7D
BIOSTICKERS: PATTERNED MICROFLUIDIC STICKERS FOR RAPID INTEGRATION WITH MICROARRAYS
C.F. Carlborg[1], M. Cretich[2], T. Haraldsson[1], L. Sola[2], M. Bagnati[2], M. Chiari[2], and W. van der Wijngaart[1]
[1]*Royal Institute of Technology (KTH), SWEDEN and*
[2]*Istituto di Chimica del Riconoscimento Molecolare, ITALY*

M8D
MICROCHANNEL-GUIDED CAPTURE ANTIBODY PATTERNING ON BEADS FOR MULTIPLE PROTEIN DETECTION ARRAYS
H.C. Tekin, S. Vaneberg, V. Sivagnanam, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

Integrated Micro- and Nanotechnologies
Single or Multi-Cell Analysis

M9D
A DNA BARCODE ASSAY INTEGRATED MICRODEVICE FOR HIGHLY SENSITIVE AND MULTIPLEX PATHOGEN DETECTION
J.H. Jung, G.-Y. Kim, and T.S. Seo
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

M10D
A MICROFLUIDIC DEVICE FOR AUTOMATED ELECTROPHYSIOLOGICAL MEASUREMENTS ON XENOPUS OOCYTES UNDER ZERO GRAVITY
D.S. Schaffhauser[1], O. Andrini[2], C. Ghezzi[2], M. Schaffner[1], I.C. Forster[2], A. Franco-Obregón[1], M. Egli[1], and P.S. Dittrich[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*University of Zurich, SWITZERLAND*

M11D
A MICROFLUIDIC PLATFORM FOR SCREENING AND SELECTION OF MONOCLONAL ANTIBODIES FROM SINGLE CELLS
A. Singhal, D. DaCosta, C. Haynes, and C. Hansen
University of British Columbia, CANADA

M12D
A PLASMA LITHOGRAPHY MICROENGINEERED ASSAY FOR STUDYING ARCHITECTURE DEPENDENT WOUND HEALING OF ENDOTHELIAL CELLS
Y. Yang and P.K. Wong
University of Arizona, USA

M13D
AGGREGATION AND LONG-TERM POSITIONING OF CELLS BY ULTRASOUND IN A MULTI-WELL MICROCHIP FOR HIGH-RESOLUTION IMAGING OF THE NATURAL KILLER CELL IMMUNE SYNAPSE
A.E. Christakou, M. Ohlin, M.A. Khorshidi, T. Frisk, B. Vanherberghen, B. Önfelt, and M. Wiklund
Royal Institute of Technology (KTH), SWEDEN

M14D
BIOHYBRID NEURAL PROBE: A NEURAL PROBE HAVING CULTURED NEURONS BETWEEN AN ELECTRODE AND TISSUE
K. Okita[1], N. Kato-Negishi[1], H. Onoe[1,2], R. Gojo[1,2], T. Teshima[1], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

M15D
EFFECTS OF MECHANICAL STRAIN ON INTRACELLULAR CALCIUM EXPRESSION IN CELL
T.K. Kim[1] and O.C. Jeong[2]
[1]*PCI, Inc., SOUTH KOREA and* [2]*Inje University, SOUTH KOREA*

M16D
GAP-CONTROLLED AND SELF-ASEMBLED MICRO WET-CELL FOR CELL INCUBATION AND ANALYSIS IN EM
T.-W. Huang[1], S.-Y. Liu[1], S.-H. Fu[1], H.-Y. Hsieh[1], F.-R. Chen[1], and F.-G. Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

M17D
INTEGRATED MICROEDDY SYSTEM FOR SINGEL CELL TRAPPING, COUNTING AND SENSING
V.H. Lieu, T.A. House, J.T. Crawford, and D.T. Schwartz
University of Washington, USA

M18D
LAB-ON-A-CHIP FOR THE MAGNETIC ISOLATION AND ANALYSIS OF CIRCULATING TUMOR CELLS
C. Liu[1], T. Stakenborg[1], O. Henry[2], C. O'Sullivan[2], E. Borgen[3], C. Schirmer[3], N. Laddach[4], T. Roeser[5], D. Latta[5], M. Ritzi-Lehnert[5], C. Fermer[6], J. van de Flierdt[7], S. Hauch[7], and L. Lagae[1]
[1]*IMEC, BELGIUM,* [2]*Universitat Rovira I Virgili, SPAIN,*
[3]*Oslo University Hospital, NORWAY,* [4]*MRC-Holland, THE NETHERLANDS,*
[5]*Institut für Mikrotechnik Mainz GmbH, GERMANY,*
[6]*Fujirebio Diagnostics, SWEDEN, and* [7]*AdnaGen, GERMANY*

M19D
MEASUREMENT OF ENDOTHELIAL INTERCELLULAR FORCE RESPONSE TO HEMODYNAMIC SHEARS
L.H. Ting and N.J. Sniadecki
University of Washington, USA

M20D
MICROFLUDIC CHIP WITH THREE-DIMENSIONAL HYDRODYNAMIC FOCUSING FOR HIGH-THROUGHPUT SINGLE-CELL ANALYSIS WITH CONTINUOUS CELL INTRODUCTION AND RAPID DYNAMIC LYSIS
X.F. Yin, C.X. Xu, and M. Wang
Zhejiang University, CHINA

M21D
MICROFLUIDIC SYTUDY ON ECM-DEPENDENT THREE DIMESIONAL MORPHOGENESIS OF BREAST ADENOCARCINOMA CELLS
Y. Shin[1], S. Han[1], H. Kim[1], J.-H. Kim[1], R.D. Kamm[2], and S. Chung[1]
[1]*Korea University, SOUTH KOREA and*
[2]*Massachusetts Institute of Technology, USA*

M22D
NEUROMUSCULAR SYNAPTOGENESIS IN AN OPEN CHAMBER MICROFLUIDIC DEVICE
J. Cheng, T. Chang, N. Bhattacharjee, and A. Folch
University of Washington, USA

M23D
RAPID FORMATION OF SIZE-CONTROLLED 3-DIMENSIONAL HETERO-SPHEROID USING MICRO-ROTATIONAL FLOW
T. Kodama, H. Ota, and N. Miki
Keio University, JAPAN

M24D
SINGLE-CELL REAL-TIME PCR: DIRECT PROCESS FROM CELLS TO DATA
X. Shi, L.-I Lin, S.-Y. Chen, W. Gao, S.-H. Chao, W. Zhang, and D.R. Meldrum
Arizona State University, USA

Integrated Micro- and Nanotechnologies
Forensics

M25D
PCR AMPLIFICATION OF STR LOCI USING AN INFRARED LASER SOURCE
K.A. Hagan[1], J.V. Norris[1], B.E. Root[1], O.N. Scott[1], R. Lovaglio[1], M. Egan[2], P. Trost[2], J.M. Bienvenue[2], and J.P. Landers[1]
[1]*ZyGEM-Microlab Diagnostics, USA and* [2]*Lockheed Martin, USA*

Integrated Micro- and Nanotechnologies
Others

M26D
MICROFLUIDIC PROBE FOR ADVANCED STAINING OF HUMAN TISSUE SECTIONS
R.D. Lovchik, G.V. Kaigala, M. Georgiadis, and E. Delamarche
IBM Research GmbH, SWITZERLAND

Nanotechnologies
Nanofluidics

M1E
A NEW METHOD OF UV-PATTERNABLE HYDROPHOBIZATION OF MICRO- AND NANOFLUIDIC NETWORKS
R. Arayanarakool, L. Shui, A. van den Berg, and J.C.T. Eijkel
MESA+, University of Twente, THE NETHERLANDS

M2E
DNA ENTROPOPHORESIS: A BALANCE OF ENTROPY AND DIFFUSION IN COMPLEX NANOCONFINEMENT
S.M. Stavis, J. Geist, M. Gaitan, L.E. Locascio, and E.A. Strychalski
National Institute of Standards and Technology (NIST), USA

M3E
INFLUENCE OF SURFACE CHARGE AND ION CONCENTRATION ON CURRENT RECTIFICATION IN CONICAL NANOPORES
B.W. Hildenbrand, K. Zhou, L. Kohler, and S.C. Jacobson
Indiana University, USA

M4E
MULTISTEP MIXING, REACTION AND DETECTION SYSTEM IN AN EXTENDED-NANO FLUIDIC NETWORK
Y. Tanaka[1,2], H.T. Ngo[1], Y. Kazoe[1], H. Shimizu[1], K. Mawatari[1], and T. Kitamori[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Institute of Physical and Chemical Research (RIKEN), JAPAN*

M5E
TRANSISTOR-LIKE BEHAVIOR IN COUPLED NANOFLUIDIC FUNNELS
J.M. Perry and S.C. Jacobson
Indiana University, USA

Nanotechnologies
Nanoengineering

M6E
MICROFLUIDIC CONNECTIONS TO HOLLOW NANOWIRES
F. Yadegari[1], H. Persson[1], M. Lard[1], J.P. Beech[1], C. Niman[1], L. Samuelson[1], H. Linke[1], and J.O. Tegenfeldt[1,2]
[1]*Lund University, SWEDEN and* [2]*University of Gothenburg, SWEDEN*

M7E
REAL-TIME SENSING OF MOLECULE BINDING ON DNA WITH SILICON NANOTWEEZERS
N. Lafitte[1], M. Kumemura[1], L. Jalabert[1], D. Collard[1], and H. Fujita[2]
[1]*LIMMS-CNRS/IIS, JAPAN and* [2]*University of Tokyo, JAPAN*

Nanotechnologies
Nanobiotechnology

M8E
A MOTOR PROTEIN-BASED ENZYMATIC DETECTION SYSTEM
M.C. Tarhan[1], R. Yokokawa[2,3], L. Jalabert[1], D. Collard[1], and H. Fujita[1]
[1]*University of Tokyo, JAPAN,*
[2]*Japan Science and Technology Agency (JST), JAPAN, and*
[3]*Kyoto University, JAPAN*

M9E
IMMOBILIZATION AND LYSIS OF NANOLIPOSOMES IN MICROFLUIDICS BY PHOTOPATTERNING OF BIOCOMPATIBLE ANCHOR FOR MEMBRANE
T. Akagi, M. Sasaki, S. Mohri, K. Kato, and T. Ichiki
University of Tokyo, JAPAN

M10E
MINING DISEASE INFORMATION IN LOW MOLECULAR WEIGHT PEPTIDES BASED ON NANOPOROUS SILICON MICRO-FLAKE
J. Tan, W.-J. Zhao, J.-K. Yu, S. Ma, and J.-M. Wu
Zhejiang University, CHINA

M11E
NANOGAP ELECTRICAL DETECTION OF SINGLE MOLECULES TRANSLOCATING THROUGH A NANOCHANNEL WITH TRANSVERSE NANOELECTRODES AND FUNNELS POPULATED WITH AN ARRAY OF NANOPILLARS
F.I. Uba[1,2], J. Wu[1], S. Park[1], D. Moldovan[1], B. Novak[2], H. Shin[2], D.K. Park[2], Y.K. Cho[2], T. Kim[2], and S.A. Soper[1,2]
[1]*Louisiana State University, USA and*
[2]*Ulsan National Institute of Science and Technology, SOUTH KOREA*

M12E
SIZE-SPECIFIC SEPARATION OF BIO-MOLECULES USING POROUS ALUMINA MEMBRANE
Y. Choi, M. Cha, P. Purwar, and J. Lee
Seoul National University, SOUTH KOREA

Nanotechnologies
Nanoassembly

M13E
DROPLET SELF-ASSEMBLING BY BUBBLE MANIPULATION USING NANOFLUIDIC CHIP
S. Xiong[1], L. Shui[2], and A.Q. Liu[1]
[1]*Nanyang Technological University, SINGAPORE and*
[2]*MESA+, University of Twente, THE NETHERLANDS*

Nanotechnologies
Nanostructured Materials

M14E
FABRICATION AND REALIZATION OF OPTICAL NEAR-FIELD INDUCED VISIBLE RESPONSE PHOTOCATALYTIC REACTION ON NANOROD TiO2 FOR MICRO FUEL CELL
T.H.H. Le, Y. Pihosh, K. Mawatari, K. Kitamura, T. Yatsui, T. Kawazoe, M. Naruse, M. Ohtsu, and T. Kitamori
University of Tokyo, JAPAN

M15E
LONG VANADIUM PENTOXIDE/POLYANILINE COMPOSITE TAPE WITH ALIGNED INTERNAL MORPHOLOGY
D. Kiriya, H. Onoe, and S. Takeuchi
University of Tokyo, JAPAN and Japan Science and Technology Agency (JST), JAPAN

M16E
HIGH-THROUGHPUT FABRICATION OF PLASMONIC NANOHOLE ARRAY SENSORS FOR LABEL-FREE KINETIC BIOSENSING
H. Im[1], S.H. Lee[1], N.J. Wittenberg[1], T.W. Johnson[1], N.C. Lindquist[1], P. Nagpal[2], D.J. Norris[3], and S.-H. Oh[1]
[1]*University of Minnesota, USA,*
[2]*Los Alamos National Laboratory, USA, and*
[3]*ETH Zürich, SWITZERLAND*

Nanotechnologies
Others

M17E
REACTION ANALYSIS IN EXTENDED-NANO SPACE BY A NOVEL NMR CHIP AND ENHANCEMENT OF DIELS-ALDER REACTIVITY OF CYLOPENTADIENE
S. Yoshioka, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

MEMS & NEMS Technologies
Micro- & Nanomachining

M1F
DATA-DRIVEN 3D INKJET PRINTING OF HYDROGEL MICROFLUIDICS
K. Pataky, A. Negro, T. Braschler, Ph. Renaud, M. Lutolf, and J. Brugger
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

M2F
OROGENIC MICROFABRICATION – LITHOGRAPHY-FREE PATTERNING OF THERMOPLASTIC MICROFLUDICS
C.-F. Chen, O. Rahmanian, and D.L. DeVoe
University of Maryland, USA

MEMS & NEMS Technologies
Microfluidic Components/Packaging

M3F
A LARGE SCALE THERMAL MICROFLUIDIC VALVE PLATFORM
C. Neumann, A. Voigt, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY

M4F
A SINGLE-MASK SELF-ALIGNED FABRICATION PROCESS FOR ELECTRODE-EMBEDDED MICROCHANNELS
S.H. Song, T. Maleki, and B. Ziaie
Purdue University, USA

M5F
CELL LYSIS BY LOW POWER FOCUSED ACOUSTIC TRANSDUCER AND INVESTIGATION OF ACOUSTIC INTENSITY THRESHOLD FOR CYTOLYSIS OF VARIOUS CELL LINES
L. Wang, Y.-J. Li, A. Lin, S.-J. Chen, M. Gross, and E.S. Kim
University of Southern California, USA

M6F
MINIATURE STICK-PACKAGING – AN INDUSTRIAL TECHNOLOGY FOR PRE-STORAGE AND RELEASE OF REAGENTS IN LAB-ON-A-CHIP SYSTEMS
T. van Oordt[1], Y. Barb[1], R. Zengerle[2], and F. von Stetten[1]
[1]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY and* [2]*University of Freiburg, GERMANY*

MEMS & NEMS Technologies
Integration Strategies

M7F
BRAIN INJURY SCREENING DIAGNOSTICS FOR EMERGENCY MEDICINE: QUANTITATION OF CEREBROSPINAL FLUID SPECIFIC PROTEINS IN HUMAN NASAL DISCHARGE
A.A. Apori and A.E. Herr
University of California, Berkeley, USA

M8F
PARYLENE TO SILICON-NITRIDE BONDING FOR EASY POST-INTEGRATION OF HIGH-PRESSURE MICROFLUIDICS TO CMOS DEVICES
A.T. Ciftlik, M. Ettori, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

MEMS & NEMS Technologies
New Chip Materials

M9F
DESIGN OF RE-WRITABLE AND SHAPE-MEMORY MICROCHIP MATERIALS WITH DYNAMICALLY TUNABLE MICROCHANNEL GEOMETRY NEAR BIOLOGICAL TEMPERATURE
M. Ebara, K. Uto, N. Idota, J.M. Hoffman, and T. Aoyagi
National Institute for Materials Science, JAPAN

M10F
HYDROGEL REACTIVE MICROBONDING (HRMB) METHOD FOR THE USE OF TETRA-PEG GEL AS A STRUCTURAL MATERIAL FOR MICROFLUIDIC DEVICES
H. Takehara, A. Nagaoka, J. Noguchi, T. Akagi, T. Sakai, U. Chung, H. Kasai, and T. Ichiki
University of Tokyo, JAPAN

M11F
OPTIMIZATION AND EVALUATION OF POLYETHYLENE GLYCOL DIACRYLATE AS A NONADSORPTIVE POLYMERIC MATERIAL FOR MICROFLUIDICS
C.I. Rogers, J.V. Pagaduan, G.P. Nordin, and A.T. Woolley
Brigham Young University, USA

MEMS & NEMS Technologies
Surface Modification

M12F
CHEMICAL-LESS CELL PATTERNING VIA ELECTRICALLY ALTERED ITO SURFACE
J. Chang and L. Lin
University of California, Berkeley, USA

M13F
DIRECTING FUNCTIONAL CHEMISTRIES ON MICROPATTERNED CONDUCTING POLYMERS FOR ALL-POLYMER CELL ANALYSIS MICROSYSTEMS
J.U. Lind[1], A.E. Daugaard[1], T.L. Andresen[1], C. Acikgöz[2], M. Textor[2], and N.B. Larsen[1]
[1]*Technical University of Denmark (DTU), DENMARK and*
[2]*ETH Zürich, SWITZERLAND*

M14F
GETTING THE GROOVE INTO SILICONE – LET LIGHT DO THE JOB
T. Scharnweber[1], R.K. Truckenmüller[2], A. Welle[1], and S. Giselbrecht[1]
[1]*Karlsruhe Institute of Technology (KIT), GERMANY and*
[2]*University of Twente, THE NETHERLANDS*

M15F
SUPERHYDROPHOBIC PERFLUOROPOLYMER MICRO- AND NANOSTRUCTURES BY EMBOSSING
P. Suvanto, V. Jokinen, and S. Franssila
Aalto University, FINLAND

MEMS & NEMS Technologies
Others

M16F
CHARACTERIZING ELASTIC AND VISCOELASTIC PROPERTIES OF YOUNG AND AGED MOUSE OOCYTES USING A PDMS MICRODEVICE
X. Liu[1], J. Shi[2], Z. Zong[2], R. Fernandes[3], R.F. Casper[3], A. Jurisicova[3], K.-T. Wan[2], and Y. Sun[3]
[1]*McGill University, USA,* [2]*Northeastern University, USA, and*
[3]*University of Toronto, CANADA*

M17F
MICROFLUIDIC TRANSPORT AND SENSING OF FUNCTIONALIZED SUPERPARAMAGNETIC BEADS WITH INTEGRATED SPIN-VALVES
W.R. Altman[1], J. Moreland[2], S.E. Russek[2], B.W. Han[1], and V.M. Bright[1]
[1]*University of Colorado, USA and*
[2]*National Institute of Standards and Technology (NIST), USA*

Bench-to-Bedside
Point-of-Care Testing

M1G
A DISPOSABLE MICROFLUIDIC CHIP FOR DETECTION OF INFLUENZA TYPE A IN CLINICAL SPECIMENS INTEGRATING RNA ISOLATION, REVERSE TRANSCRIPTION, AND CONTINUOUS FLOW PCR
M. Mahalanabis[1], Q. Cao[1], J. Chang[1], C.A. Odell[2], N. Pollock[3], P. Mitchell[2], J. Feldman[2], and C.M. Klapperich[1]
[1]*Boston University, USA,* [2]*Boston Medical Center, USA, and*
[3]*Beth Israel Deaconess Medical Center, USA*

M2G
A MICROFABRICATED DIELECTRIC AFFINITY SENSOR FOR CONTINUOUS GLUCOSE MONITORING
X. Huang[1], S. Li[2], E.N. Davis[2], R. Peltzman[2], Q. Wang[2], and Q. Lin[1]
[1]*Columbia University, USA and* [2]*University of South Carolina, USA*

M3G
A SELF-REFERENCING PAPER T-SENSOR FOR ANALYTE DETECTION
J.L. Osborn, L. Marshall, C. Holstein, C. Ball, B. Lutz, E. Fu, and P. Yager
University of Washington, USA

M4G
BIOCHEMICAL SENSOR TUBING FOR POINT-OF-CARE MONITORING OF INTRAVENOUS DRUG INFUSION AND URINARY METABOLITES
C.J. Choi, H.Y. Wu, S. George, J. Weyhenmeyer, and B.T. Cunningham
University of Illinois, Urbana-Champaign, USA

M5G
FIELD-PORTABLE REFLECTION AND TRANSMISSION MICROSCOPE FOR TELEMEDICINE APPLICATIONS
G. Biener, A. Greenbaum, S.O. Isikman, K. Lee, D. Tseng, and A. Ozcan
University of California, Los Angeles, USA

M6G
FLOW-VALVE DIAGNOSTICS FOR SIMPLE, POINT-OF-CARE ANALYTE QUANTITATION
D. Chatterjee, S. Subedi, D.S. Mansfield, and A.T. Woolley
Brigham Young University, USA

M7G
HIGHLY SENSITIVE MICRORNA DETECTION USING GOLD-NANO-PARTICLES ON POWER-FREE MICROFLUIDIC CHIP: TOWARDS POINT-OF-CARE EARLY-STAGE CANCER DIAGNOSIS
H. Arata[1], H. Komatsu[1,2], A. Han[1], K. Hosokawa[1], and M. Maeda[1,2]
[1]*RIKEN Advanced Science Institute, JAPAN and* [2]*University of Tokyo, JAPAN*

M8G
INVESTIGATION OF MOLECULAR TRANSPORT ACROSS SMALL BLOOD VESSELS IN A MICROFLUIDIC FORMAT
S. Pinto, Z. Abdi Dezfooli, S. Yasotharan, S.-S. Bolz and A. Günther
University of Toronto, CANADA

M9G
MICROFILTRATION DEVICE FOR CONTINUOUS, LABEL-FREE BACTERIA SEPARATION FROM WHOLE BLOOD FOR SEPSIS TREATMENT
K. Aran[1], M. Morales[1], L.A. Sasso[1], J. Lo[1], J. Zheng[1], I. Johnson[1], N. Kamdar[1], A. Ündar[2], and J.D. Zahn[1]
[1]*Rutgers University, USA and* [2]*Penn State College of Medicine, USA*

M10G
NOVEL SAMPLE PROCESSING MODULES FOR ENHANCED PAPER-BASED DIAGNOSTICS
J.L. Osborn, B. Lutz, E. Fu, and P. Yager
University of Washington, USA

M11G
PORTABLE DNA DETECTION SYSTEM BASED ON ULTRAFAST SEGMENT-FLOW AND FLUORESCENCE DETECTION
H. Nagai[1], Y. Fuchiwaki[1], K. Yamanaka[2], M. Saito[2], and E. Tamiya[2]
[1]*National Institute of Advanced Science and Technology, JAPAN and*
[2]*Osaka University, JAPAN*

M12G
REAL-TIME PCR BASED FOOD PATHOGEN DETECTION ON A CENTRIFUGAL MICROFLUIDIC FOIL DISK INCLUDING POSITIVE- AND NO-TEMPLATE-CONTROLS
O. Strohmeier[1], N. Marquart[1], D. Mark[2], G. Roth[1,2], R. Zengerle[1,2], and F. von Stetten[1,2]
[1]*University of Freiburg - IMTEK, GERMANY and*
[2]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*

M13G
SUCTION-TYPE MICROFLUIDIC IMMUNOMAGNETIC BEAD-BASED SYSTEM FOR RAPID DETECTION OF INFLUENZA INFECTION
T.-B. Huang[1], L.-Y. Hung[2], Y.-C. Tsai[1], C.-S. Yeh[1], H.-Y. Lei[1], and G.-B. Lee[2]
[1]*National Cheng Kung University, TAIWAN and*
[2]*National Tsing Hua University, TAIWAN*

M14G
TWO-DIMENSIONAL PAPER1 NETWORKS: MULTI-STEP FLUIDIC PROGRAMMING USING A FLUID SOURCE WELL & SHAPED PAPER
B. Lutz, P. Trinh, C. Ball, E.S. Fu, and P. Yager
University of Washington, USA

Bench-to-Bedside
Cell Sorting

M15G
A NOVEL DEVICE FOR CONTINUOUS FLOW MAGNETIC TRAPPING AND SORTING OF HUMAN CELLS USING FLAT MICRO-PATTERNED NdFeB FILMS
O. Osman[1], C.Vézy[1], J. Pivetal[1], M. Frénea-Robin[2], N. Haddour[1], F. Buret[1], L.F. Zanini[3,4], G. Reyne[4], N.M. Dempsey[3], and F. Dumas-Bouchiat[3]
[1]*Ecole Centrale Lyon, FRANCE,* [2]*Université Claude Bernard Lyon, FRANCE,*
[3]*CNRS/UJF, FRANCE, and* [4]*CNRS/INPG, FRANCE*

M16G
BACTERIA ISOLATION FROM WHOLE BLOOD FOR SEPSIS DIAGNOSTICS
S. Zelenin[1], H. Ramachandraiah[2], J. Hansson[2], S. Ardabili[2], H. Brismar[1,2], and A. Russom[2]
[1]*Karolinska Institutet, SWEDEN and*
[2]*KTH Royal Institute of Technology (KTH), SWEDEN*

M17G
CIRCULATING TUMOR CELL RELEASE BY USE OF NOVEL IMMUNOCAPTURE CHEMISTRY IN GEDI MICRODEVICES
E.D. Pratt[1], S.M. Santana[1], J.P. Gleghorn[1], H. Liu[2], N.H. Bander[2], D.M. Nanus[2], P. Giannakakou[2], and B.J. Kirby[1]
[1]*Cornell University, USA and* [2]*Weill Cornell Medical College, USA*

M18G
DEAN FLOW FRACTIONATION (DFF) ISOLATION OF CIRCULATING TUMOR CELLS (CTCs) FROM BLOOD
A.A.S. Bhagat[1], H.W. Hou[1,2], L.D. Li[3], C.T. Lim[1,2,4], and J. Han[1,3]
[1]*Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE,* [2]*National University of Singapore, SINGAPORE,*
[3]*Massachusetts Institute of Technology, USA, and*
[4]*Mechanobiology Institute, SINGAPORE*

M19G
MULTIPLE DEPTHS IN A DETERMINISTIC LATERAL DISPLACEMENT DEVICE FOR FIELD-DIAGNOSIS OF SLEEPING-SICKNESS
S.H. Holm[1], J.P. Beech[1], M.P. Barrett[2], and J.O. Tegenfeldt[1,3]
[1]*Lund University, SWEDEN,* [2]*University of Glasgow, UK, and*
[3]*University of Gothenburg, SWEDEN*

M20G
MICROFLUIDIC DEVICES FOR RAPID LABEL-FREE SEPARATION OF CELLS
S. Bose[1], M. Hanewich-Hollatz[1], C.-H. Lee[1], J.M. Karp[2], and R. Karnik[1]
[1]*Massachusetts Institute of Technology, USA and*
[2]*Brigham & Women's Hospital, USA*

M21G
SELECTIVE SEPARATION AND ISOLATION OF PARTICLES/CELLS OF SIMILAR SIZES USING DIELECTROPHORESIS
Y.J. Lo, U. Lei, and P.C. Yang
National Taiwan University, TAIWAN

M22G
TOWARDS CHROMATOGRAPHIC CELL SEPARATION USING DYNAMIC MICROSTRUCTURES
W. Beattie, T. Gerhardt, S. Woo, and H. Ma
University of British Columbia, CANADA

Bench-to-Bedside
Cell Analysis

M23G
ARRAYED CAPTURE, ASSAYING AND BINARY COUNTING OF CELLS IN A STOPPED-FLOW SEDIMENTATION MODE
R. Burger[1], G. Kijanka[1], O. Sheils[2], J. O'Leary[2], and J. Ducrée[1]
[1]*Dublin City University, IRELAND and* [2]*Trinity College Dublin, IRELAND*

M24G
MICROFLUIDIC SYSTEM FOR MULTICHANNEL OPTICAL MEASUREMENT OF SHEAR-INDUCED PLATELET THROMBOSIS IN UNFRACTIONATED BLOOD
M. Li[1], D.N. Ku[1], J.D. Ackerman[2], and C.R. Forest[1]
[1]*Georgia Institute of Technology, USA and*
[2]*Emory University School of Medicine, USA*

M25G
RAPID LYSIS OF ERYTHROCYTES UNDER HYDRODYNAMIC FOCUSING REVEALS CELL BIOMECHANICS
Y. Zhan[1], D.N. Loufakis[2], N. Bao[2], and C. Lu[2]
[1]*Purdue University, USA and* [2]*Virginia Tech, USA*

Bench-to-Bedside
Genomics

M26G
DEVELOPMENT OF DISPOSABLE MULTICHAMBERED MICROCHIP FOR PCR VIA NON-CONTACT IR MEDIATED THERMAL CONTROL
Y. Ouyang, B.L. Poe, and J.P. Landers
University of Virginia, USA

Bench-to-Bedside
Others

M27G
DEVELOPMENT OF MICROFLUIDIC OXYGENATORS AS LUNG ASSISTING DEVICES FOR PRETERM INFANTS
W.-I. Wu, N. Rochow, G. Fusch, R. Kusdaya, A. Choi, P.R. Selvaganapathy, and C. Fusch
McMaster University, CANADA

Imaging & Detection Technologies
Flow Visualization

M1H
INVESTIGATION OF FLOW-INDUCED DYNAMIC MOTION OF RED BLOOD CELLS USING TARGET TRACKING CONFOCAL MICRO-PIV SYSTEM
M. Oishi, K. Utsubo, H. Kinoshita, T. Fujii, and M. Oshima
University of Tokyo, JAPAN

Imaging & Detection Technologies
Optical

M2H
A CHEAP 2D FLUORESCENCE DETECTION SYSTEM FOR µM-SIZED BEADS ON-CHIP
L.I. Segerink, M.J. Koster, A.J. Sprenkels, I. Vermes, and A. van den Berg
MESA+, University of Twente, THE NETHERLANDS

M3H
CHROMATOGRAPHIC SEPARATION OF NONFLUORESCENT MOLECULES USING EXTENDED-NANO CHANNEL AND DIFFERENTIAL INTERFERENCE CONTRAST THERMAL LENS MICROSCOPE
H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

M4H
COMPLEMENTARY TEMPLATED POSITIVE AND INVERSE SUB-MICRON PYRAMIDS ARRAY FOR SURFACE ENHANCED RAMAN SPECTROSCOPY
Z. Xu, H.-Y. Wu, S.U. Ali, J. Jiang, B.T. Cunningham, and G.L. Liu
University of Illinois, Urbana-Champaign, USA

M5H
LABEL-FREE BIOSENSING USING CASCADED SILICON-ON-INSULATOR MICRO-RACETRACK RESONATORS INTEGRATED WITH PDMS MICROFLUIDIC CHANNELS
J. Flueckiger, S.M. Grist, E. Ouellet, L. Chrostowski, and K.C. Cheung
University of British Columbia, CANADA

M6H
MICROFABRICATED ATMOSPHERIC RF MICROPLASMA DEVICES FOR GAS SPECTROSCOPY
W. Yuan, K.N. Chappanda, and M. Tabib-Azar
University of Utah, USA

M7H
NANOIMPRINTED FLEXIBLE PHOTONIC CRYSTAL FOR SINGLE-STEP LABEL-FREE BIOSENSOR
T. Endo[1], N. Okuda[2], S. Tanaka[2], and H. Hisamoto[1]
[1]*Osaka Prefecture University, JAPAN and* [2]*SCIVAX Corporation, JAPAN*

M8H
PORTABLE MULTI-COLOR FLUORESCENT DETECTION FOR POINT-OF-CARE
L. Shen[1], M. Ratterman[1], D. Klotzkin[2], and I. Papautsky[1]
[1]*University of Cincinnati, USA and* [2]*Binghamton University, USA*

M9H
WEARABLE MICRO-FLUIDIC pH SWEAT SENSING DEVICE BASED ON COLORIMETRIC IMAGING TECHNIQUES
V.F. Curto, C. Fay, S. Coyle, R. Byrne, D. Diamond, and F. Benito-Lopez
Dublin City University, IRELAND

Imaging & Detection Technologies
Electrochemical

M10H
MEASURING RAPID BINDING KINETICS BY MICRO ION-SELECTIVE ELECTRODES IN DROPLET-BASED MICROFLUIDIC DEVICES
H. Feng, Z.Han, Y.Y. Chang, S.W.N. Au, and B. Zheng
Chinese University of Hong Kong, CHINA

M11H
NANOGRATING Si BIO-FETs FOR SENSITIVE DETECTION OF PROTEIN IN SERUM
S. Regonda[1], K. Trivedi[1], R. Tian[1], L. Spurgin[1], S. Green[2], J. Ding[2], and W. Hu[1]
[1]*University of Texas, Dallas, USA and*
[2]*Baylor University Medical Center, USA*

Imaging & Detection Technologies
Mass Spectrometry

M12H
A MULTIFUNCTIONAL MICROFLUIDIC DROPLET ARRAY SYSTEM WITH ESI-MS DETECTION
Y. Su, Y. Zhu, and Q. Fang
Zhejiang University, CHINA

M13H
FROM CAFFEINE TO PROTEIN: THE DETECTION OF A WIDE RANGE OF MOLECULES BY SURFACE ACOUSTIC WAVE NEBULIZATION (SAWN) MASS SPECTROMETRY
Y. Huang[1], S.H. Yoon[1], J.S. Edgar[1], S. Heron[1], C. Masselon[2], F. Tureček[1], and D.R. Goodlett[1]
[1]*University of Washington, USA and* [2]*CEA Grenoble, FRANCE*

M14H
LASER DESORPTION/IONIZATION MASS SPECTROMETRY USING TUNABLE NANOPOROUS STRUCTURES
R. Singh[1], A.B. Jemere[2], Z. Wang[1], M. Brett[1,2], and J.D. Harrison[1,2]
[1]*University of Alberta, CANADA and* [2]*National Research Council, CANADA*

Imaging & Detection Technologies
Optofluidics

M15H
AN OPTICAL-CODING METHOD FOR SCATTERING SIGNAL DETECTION IN MICROFLUIDIC CYTOMETERS
T.-F. Wu[1], Z. Mei[2], L. Pion-Tonachini[1], C. Zhao[1], W. Qiao[1], A. Arianpour[1], and Y.-H. Lo[1]
[1]*University of California, San Diego, USA and*
[2]*Beijing Institute of Technology, CHINA*

M16H
MULTI-SPECTRAL FLUORESCENCE MICROSCOPY WITH EMBEDDED LIQUID FILTERS FOR POINT-OF-CARE APPLICATIONS
X. Lou and E. Yoon
University of Michigan, USA

M17H
PHOTORESPONSIVE OPTOFLUIDICS AND LIGHT-INDUCED MICROFLOW
M. Harada[1], M. Fukuyama[2], K. Sato[1], and A. Hibara[2]
[1]*Japan Women's University, JAPAN and* [2]*University of Tokyo, JAPAN*

Imaging & Detection Technologies
Others

M18H
A DNA POTENTIOMETRIC FET SENSOR BASED ON THE DIRECT CHARGE ACCUMULATION
K.-H. Lee, J.-O. Lee, S.-H. Choi, J.-B. Yoon, and G.-H. Cho
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

M19H
DEVELOPMENT OF A ELECTRIC FIELD DISTORTION TACTILE SENSOR
S. Suzuki, Y. Saegusa, and T. Takahashi
Seikei University, JAPAN

M20H
MICROFLUIDIC DEVICES FOR REAL-TIME INFRARED IMAGING OF LIVING CELLS
G. Birarda[1], G. Grenci[2], L. Businaro[3], E. Mitri[2], M. Tormen[2], S. Pacor[4], and L. Vaccari[1]
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M21H
SINGLE CELL DIELECTRIC SPECTROSCOPY IN A MICRO-CHANNEL
Y. Katsumoto[1], S. Omori[1], K. Sato[1], T. Umetsu[1], M.A. Brun[1], H. Soma[1], T. Hayakawa[1], S.M. Lee[1], K. Sakai[1], Y. Hayashi[1], A. Yasuda[1], M. Nagasawa[2], T. Morio[2], and S. Mizutani[2]
[1]*Sony Corporation, JAPAN and*
[2]*Tokyo Medical and Dental University, JAPAN*

Other Applications
Environment

M1I
DEVELOPMENT OF FULLY AUTOMATED MICRO-GAS ANALYZING PROTOTYPE SYSTEM WITH SELF-VALIDATING
S. Hiki, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

M2I
MICRO-OPTO-FLUIDIC-SYSTEM (MOFS) FOR LABEL-FREE DETECTION OF WATERBORNE PATHOGENS IN DRINKING WATER
L. Lei, W. Huang, and A.Q. Liu
Nanyang Technological University, SINGAPORE

Other Applications
Agriculture

M3I
USING A CMOS-BIOMEMS CANTILEVER SENSOR FOR ORCHID VIRUS DETECTION
L.-H. Cheng[1], Y.-C. Chang[1], W.-C. Hu[1], H.-H. Liao[2], H.-H. Tsai[2], Y.-Z. Juang[2], and Y.-W. Lu[1]
[1]*National Taiwan University, TAIWAN and*
[2]*National Chip Implementation Center, TAIWAN*

Other Applications
Separation Science

M4I
A NOVEL CHROMATOGRAPHY FORMAT FOR HIGH EFFICIENCY SEPARATIONS
W. De Malsche[1], J. Op De Beeck[1], S. De Bruyne[1], H. Gardeniers[2], and G. Desmet[1]
[1]*Vrije Universiteit Brussel, BELGIUM and*
[2]*MESA+, University of Twente, THE NETHERLANDS*

M5I
DEVELOPMENT OF A ONE-STEP MICROFLUIDIC WESTERN BLOTTING ANALYSIS SYSTEM
M. Minegishi[1] and K. Sato[2]
[1]*University of Tokyo, JAPAN and* [2]*Gunma University, JAPAN*

M6I
TRAPPING AND FOCUSING OF PARTICLES AND CELLS BASED ON MAGNETIC ATTRACTION AND DIAMAGNETIC REPULSION
M.D. Tarn, A. Peyman, A.I. Rodriguez-Villareal, A. Swinley, and N. Pamme
University of Hull, UK

M7I
INTEGRATION OF A GRADIENT ELUTION SYSTEM FOR PRESSURE-DRIVEN LIQUID CHROMATOGRAPHY WITH MEMS FABRICATED EFFICIENT PILLAR ARRAY COLUMNS
Y. Song[1], M. Noguchi[2], K. Takatsuki[2], T. Sekiguchi[2], S. Shoji[2], T. Funatsu[1], J. Mizuno[2], and M. Tsunoda[1]
[1]*University of Tokyo, JAPAN and* [2]*Waseda University, JAPAN*

M8I
NANOWALL ARRAY CHIPS FOR DNA SEPARATION
T. Yasui[1], N. Kaji[1], R. Ogawa[2], S. Hashioka[2], M. Tokeshi[1], Y. Horiike[2], and Y. Baba[1,3]
[1]*Nagoya University, JAPAN,*
[2]*National Institute for Materials Science, JAPAN, and*
[3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

M9I
SILICON MICROPILLAR ARRAY CHIP FOR ION-PAIR REVERSED-PHASE DNA CHROMATOGRAPHY USING GRADIENT ELUTION MODE
L. Zhang[1,2], H. Gardeniers[3], C. Van Hoof[1,2], G. Desmet[4], and W. De Malsche[4]
[1]*IMEC, BELGIUM,* [2]*Katholieke Universiteit Leuven, BELGIUM,*
[3]*MESA+, University of Twente, THE NETHERLANDS, and*
[4]*Vrije Universiteit Brussel, BELGIUM*

M10I
SYSTEMATIC INVESTIGATION OF INSULATOR-BASED PROTEIN DIELECTROPHORESIS UNDER DC CONDITION
A. Nakano, F. Camacho-Alanis, T.C. Chao, and A. Ros
Arizona State University, USA

M11I
DNA TRAPPING AT THE INTERFACE OF NANOPILLAR AND NANOPILLAR-FREE REGIONS FOR LONG DNA SEPARATION
K. Motoyama[1], T. Yasui[1], N. Kaji[1], Y. Okamoto[1], M. Tokeshi[1], and Y. Baba[1,2]
[1]*Nagoya University, JAPAN and*
[2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

Other Applications
Food & Nutrition

M12I
NUTRICHIP: AN INTEGRATED MICROFLUIDIC SYSTEM FOR IN VITRO INVESTIGATION OF THE IMMUNOMODULATORY FUNCTION OF DAIRY PRODUCTS
Q. Ramadan[1], H. Jafarpoorchekab[1], K. Bolanz[2], F. Schwander[2], C. Egger[2], R. Portmann[2], P. Silacci[2], S. Carrara[1], J. Ramsden[3], G. Vergéres[2], and M.A.M. Gijs[1]
[1]*Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND,* [2]*Agroscope Liebefeld-Posieux Research Station ALP, SWITZERLAND, and* [3]*Collegium Basilea, SWITZERLAND*

Other Applications
Fuel Cells

M13I
DEVELOPMENT OF H2/O2 GENERATION CHIP FOR MICRO FUEL CELL DEVICES
Y. Kajita[1], Y. Pihosh[1,2], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

Ballroom 6E

Session 1A3
DNA Diagnostics/Sample Preparation
CHAIR: R. Zengerle, *University of Freiburg - IMTEK, GERMANY*

16:00 - 16:20

HIGH-THROUGHPUT MICROFLUIDIC RT-QPCR OF SINGLE CELLS
A.K. White[1], M. VanInsberghe[1], O.I. Petriv[1], M. Hamidi[1], D. Sikorski[1], M.A. Marra[2], J.M. Piret[1], S. Aparicio[1], and C.L. Hansen[1]
[1]*University of British Columbia, CANADA and*
[2]*British Columbia Cancer Agency, CANADA*

16:20 - 16:40

CENTRIFUGO-THERMOPNEUMATIC LIQUID ACTUATION FOR MICROFLUIDIC GENOTYPING OF NUCLEIC ACIDS
M. Focke[1], O. Strohmeier[1], P. Reith[1], G. Roth[1], D. Mark[2], R. Zengerle[1], and F. von Stetten[1]
[1]*University of Freiburg - IMTEK, GERMANY and*
[2]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*

16:40 - 17:00

ON-CHIP INTEGRATION OF LYSIS AND NUCLEIC ACID PREPARATION OF MALARIA-INFECTED BLOOD
L.A. Marshall[1], L.L. Wu[2], C.M. Han[1], M. Bachman[2], and J.G. Santiago[1]
[1]*Stanford University, USA and*
[2]*University of California, Irvine, USA*

17:00 - 17:20

MULTIPLEX HIGHLY SENSITIVE DETECTION OF CANCER BIOMARKERS IN BIOLOGICAL SAMPLES
D. Pekin[1], Y. Skhiri[1], J.-C. Baret[1,2], D. Le Corre[3], L. Mazutis[1], C. Ben Salem[1], A. El Abed[3], J.B. Hutchison[4], D.R. Link[4], A. Griffiths[1], P. Laurent-Puig[3], and V. Taly[1,3]
[1]*Université de Strasbourg, FRANCE,*
[2]*Max-Planck-Institute for Dynamics and Self-Organization, GERMANY,*
[3]*University Paris Descartes, FRANCE, and*
[4]*RainDance Technologies, USA*

Ballroom 6D

Session 1B3
Droplets: Modeling, Mixing & Control
CHAIR: A. Wheeler, *University of Toronto, CANADA*

16:00 - 16:20

MODEL-PREDICTIVE STRATEGY FOR EXPLORATION OF CARBON DIOXIDE DISSOLUTION AND MASS TRANSFER
M. Abolhasani, E. Kumacheva, and A. Günther
University of Toronto, CANADA

16:20 - 16:40

SPEED OF DROPLETS IN MICROFLUIDIC CHANNELS
S. Jakiela, P.M. Korczyk, S. Makulska, and P. Garstecki
Polish Academy of Sciences, POLAND

16:40 - 17:00

GUIDING AND DISTRIBUTION OF A TRAIN OF DROPLETS EMPLOYING SIDE FLOWS AND GUIDING TRACKS
B. Ahn, K. Lee, R. Panchapakesan, H. Lee, L. Xu, J. Xu, and K.W. Oh
State University of New York, Buffalo, USA

17:00 - 17:20

STIRRING IMMISCIBLE LIQUIDS IN NANOLITER CAVITIES
S.H.S. Lee, P.Z. Wang, S.K. Yap, and S.A. Khan
National University of Singapore, SINGAPORE

Room 611-614

Session 1C3
Advance Fabrication Techniques at Micro- & Nano-Scale
CHAIR: J.P. Kutter, *Technical University of Denmark, DENMARK*

16:00 - 16:20

A LABEL-FREE PROTEIN SENSOR BASED ON MEMS FABRY-PEROT INTERFEROMETER INTEGRATED WITH SILICON PHOTODIODE
H. Oyama[1], K. Takahashi[1,2], N. Misawa[1], K. Okumura[1], M. Ishida[1], and K. Sawada[1,2]
[1]*Toyohashi University of Technology, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

16:20 - 16:40

HIGH-THROUGHPUT FABRICATION OF ADVANCED 3D MICROFLUIDIC DEVICES IN THERMOPLASTIC ELASTOMER FOR BIOLOGICAL PROBE IMMOBILIZATION
D. Brassard, L. Clime, K. Li, M. Geissler, C. Miville-Godin, E. Roy, and T. Veres
National Research Council, CANADA

16:40 - 17:00

ULTRATHIN, HYPERELASTIC PDMS NANO MEMBRANE: FABRICATION AND CHARACTERIZATION
J.H. Ryoo, G.S. Jeong, E. Kang, and S.H. Lee
Korea University, SOUTH KOREA

17:00 - 17:20

MICROBIALLY-FABRICATED CELLULOSE MICROSTRANDS IN THE CORE OF HYDROGEL FIBERS
K. Hirayama[1], D. Kiriya[1,2], H. Onoe[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

Tuesday, October 4

08:00 - 08:15 **Announcements**

08:15 - 09:00 **Plenary Session III** - Chair: T. Kitamori, *University of Tokyo, JAPAN*

SELF-REPLICATION OF GENETIC INFORMATION IN MICRO-COMPARTMENTS
T. Yomo
Osaka University and Japan Science and Technology Agency (JST), JAPAN

Ballroom 6E	Ballroom 6D	Room 611-614
Session 2A1 **Cell-Based Drug Development** CHAIR: B. Paegel, *The Scripps Research Institute, USA*	**Session 2B1** **Optics** CHAIR: A.Q. Liu, *Nanyang Techological Insitute, SINGAPORE*	**Session 2C1** **DNA Detection via Hybridization** CHAIR: Y. Baba, *Nagoya University, JAPAN* ***Session Benefactor - Life Technologies Corporation***
09:15 - 09:35		
IMAGE-BASED SCREENING OF HIGH-PERFORMING CLONES USING PHOTOACTIVATED CELL SORTING VIA DUAL PHOTOPOYLMERIZED MICROWELL ARRAYS T. Sun and J. Voldman *Massachusetts Institute of Technology, USA*	**MICRODROPLET OPTICAL CAVITY SENSORS** S.K. Tang[1], R. Derda[2], Q. Quan[3], M. Loncar[3], and G.M. Whitesides[3] [1]*Stanford University, USA,* [2]*University of Alberta, CANADA, and* [3]*Harvard University, USA*	**SPECIFIC DNA SEQUENCE DETECTION THROUGH HYBRIDIZATION INDUCED AGGREGATION** B.C. Strachan, J. Lee, R.A. Dudley, D.C. Leslie, and J.P. Landers *University of Virginia, USA*
09:35 - 09:55		
CO-PATHOLOGICAL STATES OF TAU PROTEINS IN A 3D MICROPATTERNED NEURAL CELL CULTURE A. Kunze, R. Meissner, S. Brando, and Ph. Renaud *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*	**MICROFLUIDIC MOLDING OF POLYMERIC MICRO LENSES FROM ALTERNATELY SEGMENTED MULTIPHASE LIQUID STRING** T. Ando, T. Hatsuzawa, and T. Nisisako *Tokyo Institute of Technology, JAPAN*	**EXPEDITIOUS HYBRIDIZATION AND LOCALLY ENHANCED CONCENTRATION OF OLIGONUCLEOTIDES IN A PLUG-BASED MICRODEVICE** W.F. Fang, C.W. Hsu, Y.T. Chen, and J.T. Yang *National Taiwan University, TAIWAN*
09:55 - 10:15		
QUANTITATIVE CNS AXON GROWTH ANALYSIS FOR DRUG SCREENING IN A MICROFLUIDIC NEURON CULTURE PLATFORM J. Park, S. Kim, J. Li, and A. Han *Texas A&M University, USA*	**NULL-METHOD IN IMMERSION REFRACTOMETRY FOR BIOPHYSICAL MEASUREMENT OF CRYPTOSPORIDIUM AND GIARDIA LAMBLIA** L.K. Chin[1], T.C. Ayi[2], P.H. Yap[2], and A.Q. Liu[1] [1]*Nanyang Technological University, SINGAPORE and* [2]*DSO National Laboratories, SINGAPORE*	**RAPID DNA HYBRIDIZATION REACTIONS USING ISOTACHOPHORESIS** M. Bercovici, C.M. Han, J.C. Liao, and J.G. Santiago *Stanford University, USA*

10:15 - 10:45 **Break and Exhibit Inspection**

Ballroom 6E	Ballroom 6D	Room 611-614
Session 2A2 **Micro-Probing Worms & Flies** CHAIR: Z. Brzózka, *Warsaw University of Technology, POLAND*	**Session 2B2** **PCR in Droplets** *CHAIR: D. Chiu, University of Washington, USA*	**Session 2C2** **Controlling Fluidic Circuits** CHAIR: M. Utz, *University of Virginia, USA*
10:45 - 11:05		
AN AUTOMATED MICROFLUIDIC PLATFORM FOR ELECTRICAL STIMULATION OF THE NERVOUS SYSTEM OF C. ELEGANS T.V. Chokshi, D. Bazopoulou, and N. Chronis *University of Michigan, USA*	**A DROPLET-BASED MICROFLUIDIC RANDOM ACCESS MEMORY FOR GENETIC ANALYSIS OF SINGLE CELLS** K. Leung, H. Zahn, T. Leaver, and C. Hansen *University of British Columbia, CANADA*	***INVITED PRESENTATION*** **MICROFLUIDIC WAVEGUIDES FOR FREQUENCY-BASED PUMPING** M. Utz[1] and M.R. Begley[2] [1]*University of Virginia, USA and* [2]*University of California, Santa Barbara, USA*
11:05 - 11:25		
ELECTRICAL SORTING OF CAENORHABDITIS ELEGANS P. Rezai, S. Salam, B.P. Gupta, and P.R. Selvaganapathy *McMaster University, CANADA*	**NANOLITER-SIZED SUPERHEATED BIOREACTOR** P. Neužil[1], W.X. Sun[2], C.C. Wong[3], and B.W. Soon[3] [1]*Korea Institute of Science and Technology (KIST) - Europe, GERMANY,* [2]*Veeco Asia, SINGAPORE, and* [3]*Institute of Microelectronics, SINGAPORE*	**MICROFLUIDIC FINITE STATE MACHINE FOR AUTONOMOUS CONTROL OF INTEGRATED FLUID NETWORKS** T.V. Nguyen, S. Ahrar, P.N. Duncan, and E.E. Hui *University of California, Irvine, USA*
11:25 - 11:45		
A MICROFLUIDIC CHIP FOR IMMOBILIZING AND IN VIVO IMAGING OF DROSOPHILA LARVA M. Ghannad-Rezaie, X. Wang, B. Mishra, C. Collins, and N. Chronis *University of Michigan, USA*	**A NOVEL CONTAMINATION FREE PCR WELL ARRAY DEVICE FOR CLINICAL APPLICATIONS** M. Kanai, T. Nishimoto, K. Ogata, and N. Hanafusa *Shimadzu Corporation, JAPAN*	**IONIC LIQUID ELECTROFLUIDIC PRESSURE SENSORS WITH EMBEDDED ANALOG AND DIGITAL CIRCUITRY FUNCTIONS** C.-Y. Wu and Y.-C. Tung *Academia Sinica, TAIWAN*

11:45 - 13:00 | **Lunch (on own)**

13:00 - 13:45

Awards Ceremony I

Chair: J.P. Kutter, *Technical University of Denmark (DTU), DENMARK*

Lab on a Chip / Corning Inc. Pioneers of Miniaturization Prize
sponsored by *Lab on a Chip (Royal Society of Chemistry) and Corning Inc.*

Analytical Chemistry Young Innovator Award
sponsored by *ACS Publications* and the *Chemical and Biological Microsystems Division (CBMS)*

13:45 - 16:00

Poster Session II ***(refreshments will be served at 15:00)***

Life Science Applications
Genomics & Proteomics

T1A
A HIGH-SPEED HIGH-PERFORMANCE REVERSE TRANSCRIPTION MICROCHIP
H. Lee and K.-H. Han
Inje University, SOUTH KOREA

T2A
A MULTI-CHAMBER PMMA MICRODEVICE FOR SIMULTANEOUS AMPLIFICATION OF UP TO SEVEN INDIVIDUAL SAMPLES USING INFRARED-MEDIATED PCR
J.A. Lounsbury, D.C. Miranian, and J.P. Landers
University of Virginia, USA

T3A
AUTOMATED SAMPLE PREPARATION PLATFORM FOR NEXT GENERATION DNA SEQUENCING USING A DIGITAL MICROFLUIDIC HUB
H. Kim, M.S. Bartsch, R.F. Renzi, J. He, J. Van De Vreugde, M.R. Claudnic, and K.D. Patel
Sandia National Laboratories, USA

T4A
COMPARTMENTALIZED EVOLUTION OF PROTEASES FOR MASS SPECTROMETRY-BASED PROTEOMICS
J. Kostera and B.M. Paegel
Scripps Research Institute, USA

T5A
ELECTROKINETICALLY ACTUATED PROTEIN CRYSTALLIZATION
W. Kim, Y-W. Huang, and V.M. Ugaz
Texas A&M University, USA

T6A
MICROCOMPARTMENTALIZED CELL-FREE PROTEIN SYNTHESIS FROM SINGLE MOLECULE TEMPLATE DNA USING SEMI-PERMEABLE ALGINATE MICROCAPSULES
D. Saeki[1,2], S. Sugiura[3], T. Kanamori[3], S. Sato[1], and S. Ichikawa[1]
[1]*University of Tsukuba, JAPAN,* [2]*Kobe University, JAPAN, and*
[3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T7A
ON-CHIP SYNTHESIS OF MUTANT GFP LIBRARY USING ULTRA-LARGE SELF-ALIGNED DNA-BOUND BEADS MICROARRAY
S. Sato[1,2], M. Biyani[1,3], T. Akagi[1,3], and T. Ichiki[1,3]
[1]*University of Tokyo, JAPAN,*
[2]*Center for Medical Systems Innovation, JAPAN, and*
[3]*Japan Science and Technology Agency (JST), JAPAN*

Life Science Applications
Drug Development

T8A
FAST DETERMINATION OF DISTRIBUTION COEFFICIENTS IN A POLY(DIMETHYLSILOXANE) CHIP
M.J. Lopez-Martinez, P.P.M.F.A. Mulder, P. Born, and E. Verpoorte
University of Groningen, THE NETHERLANDS

T9A
MICROFLUIDIC IN VITRO MODEL FOR QUANTITATIVE STUDY OF STOMACH MUCIN ACID BARRIER FUNCTION
L. Li, O. Lieleg, K.R. Ribbeck, and J. Han
Massachusetts Institute of Technology, USA

T10A
ROBOTS: RAPID ON-BEAD OLIGOMER-TARGET SCREENING
A.K. Price and B.M. Paegel
Scripps Research Institute, USA

Life Science Applications
Cell Culture / Handling / Analysis

T11A
A CELL-BASED LAB-ON-A-CHIP AS AN ALTERNATIVE METHOD FOR TESTING SKIN IRRITATIONS
U. Neubert[1], A. Bogen[1], M. Schimmelpfennig[1], S. Michaelis[2], J. Wegener[2], and K.-H. Feller[1]
[1]*University of Applied Sciences Jena, GERMANY and*
[2]*University of Regensburg, GERMANY*

T12A
A MICROFLUIDIC APPROACH FOR GENERATING STEADY-STATE OXYGEN GRADIENTS IN 3-D MATRICES
S.C. Oppegard and D.T. Eddington
University of Illinois, Chicago, USA

T13A
A NEW IN VIVO-MIMIC ANGIOGENESIS MICROFLUIDIC PLATFORM FOR THE STUDY OF CELL ENCAPSULATION BASED CELL THERAPY
C. Kim[1], M.-C. Kim[1], S. Chung[3], H.H. Asada[1,2], and R.D. Kamm[1,2]
[1]*Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE,* [2]*Massachusetts Institute of Technology, USA, and*
[3]*Korea University, SOUTH KOREA*

T14A
A TRANSWELL™ MICROFLUIDIC GRADIENT GENERATOR FOR CELL CULTURE
C.G. Sip and A. Folch
University of Washington, USA

T15A
ALIGNED FREE-STANDING MUSCLE FIBERS CONNECTED WITH NEURONS
Y. Morimoto[1,2], M. Kato-Negishi[1], H. Onoe[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

T16A
CARCINOMA-NORMAL CELL-CELL INTERACTIONS AFTER PDT PROCEDURES IN THE MICROSYSTEM FOR "MIXED" CELL CULTURE
E. Jedrych, I. Grabowska-Jadach, M. Chudy, A. Dybko, and Z. Brzozka
Warsaw University of Technology, POLAND

T17A
CLASSIFICATION OF CELL TYPES USING MECHANICAL AND ELECTRICAL MEASUREMENT ON SINGLE CELLS
J. Chen, Y. Zheng, Q. Tan, E. Shojaei-Baghini, Y. Zhang, P. Prasad, X.Y. Wu, and Y. Sun
University of Toronto, CANADA

T18A
DEVELOPMENT OF A MICROFLUIDIC HANGING DROPLET PLATFORM FOR 3D CELL CULTURE
M.H. Yang[1], C.C. Chen[1], C.F. Yeh[2], and C.H. Hsu[2]
[1]*National Tsing Hua University, TAIWAN and*
[2]*National Health Research Institute, TAIWAN*

T19A
EFFECT OF TOPOGRAPHIC CUES ON IN VITRO CULTURED TRABECULAR MESHWORK ENDOTHELIAL CELLS
B. Kim, C.J. Roberts, A.M. Mahmoud, P. Weber, and Y. Zhao
Ohio State University, USA

T20A
FABRICATION OF AN OPTIMIZED MICROLITER CULTURE DEVICE WITH INTEGRATED OPTICAL pH MONITORING
P.P.M.F.A. Mulder[1], M.J. Lopez-Martinez[1], S. Demming[2], S. Büttgenbach[2], A. Llobera[3], and E. Verpoorte[1]
[1]*University of Groningen, THE NETHERLANDS,*
[2]*Technische Universität Braunschweig, GERMANY, and*
[3]*IMB-CNM; CSIC, SPAIN*

T21A
GLASS MICROPALLETS FOR ADHERENT CELL ANALYSIS AND RECOVERY
N.M. Gunn, T. Westerhof, G.P. Li, E.L. Nelson, and M. Bachman
University of California, Irvine, USA

T22A
MICROFLUIDIC JET INJECTION FOR DELIVERY OF COMPOUNDS INTO CELLS
A. Adamo, A. Sharei, O. Roushdy, R. Dokov, and K.F. Jensen
Massachusetts Institute of Technology, USA

T23A
INDUCING CELLULAR ALIGNMENT ON MICROPOST ARRAYS VIA BIOPHYSICAL SPATIAL STIMULI
R.D. Sochol, S.-C. Chang, A.T. Higa, M.E. Dueck, L.P. Lee, S. Li, and L. Lin
University of California, Berkeley, USA

T24A
LONG-TIME STRESS LESS CELL CULTURE CHIPS FOR NON-ADHESIVE CELLS
T. Naito[1], N. Kaji[1], Y. Okamoto[1], M. Tokeshi[1], and Y. Baba[1,2]
[1]*Nagoya University, JAPAN and*
[2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T25A
MICROCHANNEL ARRAY FOR LONG TERM MONITORING OF MULTICELLULAR FILAMENTOUS CYANOBACTERIUM WITH CONTROLLED PERFUSION CULTURE
R. Kajiyama[1], J. Ishihara[1], K. Kawai[2], H. Iwasaki[1], and S. Shoji[1]
[1]*Waseda University, JAPAN and* [2]*Osaka University, JAPAN*

T26A
MICROFLUIDIC ASSAY TO STUDY TRANSENDOTHELIAL MIGRATION OF HUMAN LEUKOCYTE
S. Han[1], J.-J. Yan[2], Y. Shin[1], R.D. Kamm[3], Y.-J. Kim[2], and S. Chung[1]
[1]*Korea University, SOUTH KOREA,* [2]*Yonsei University, SOUTH KOREA, and*
[3]*Massachusettes Institute of Technology, USA*

T27A
MICROFLUIDIC PRODUCTION OF YARN-BALL-SHAPE HYDROGEL BEADS AND ITS APPLICATION TO HIGH-DENSITY CELL CULTIVATION
A. Miyama, M. Yamada, S. Sugaya, and M. Seki
Chiba University, JAPAN

T28A
MICROWELL ARRAY PCR CHIP FOR STUDY OF GENETICALLY ENGINEERED MOUSE STEM CELLS
S.R. Beard, W.H. Henley, J.P. Alarie, and J.M. Ramsey
University of North Carolina, USA

T29A
ON-DEMAND GEOMETRIC METERING-BASED MULTI-REAGENT MIXTURE GENERATOR FOR ROBUST HIGH-THROUGHPUT SINGLE CELL ENVIRONMENTAL TOXIN SCREENING
H. Wang, J. Kim, A. Jayaraman, and A. Han
Texas A&M University, USA

T30A
PERFUSION CELL CULTURE REVEALS A PARACRINE OR AUTOCRINE SIGNALLING PATHWAY INVOLVED IN ADIPOSE-DERIVED STEM CELL DIFFERENTIATION INTO ADIPOCYTES
M. Hemmingsen[1], P. Skafte-Pedersen[1], D. Sabourin[1], R.F. Andersen[1], A.L. Sørensen[2], P. Collas[2], and M. Dufva[1]
[1]*Technical University of Denmark (DTU), DENMARK and*
[2]*University of Oslo, NORWAY*

T31A
PULSATILE SHEAR STRESS AND HIGH GLUCOSE CONCENTRATIONS INDUCED CELL DEATH IN ENDOTHELIAL CELLS
J.Q. Yu, L.K. Chin, A.Q. Liu, and Q. Luo
Nanyang Technological University, SINGAPORE

T32A
RAPID CONCENTRATION AND MANIPULATION OF COLLOIDS AND MICROORGANISMS THROUGH DOUBLE LAYER POLARIZATION ELECTROKINETICS
S.J. Williams[1], J.-S. Kwon[2], S.P. Ravindranath[2], J. Irudayaraj[2], and S.T. Wereley[2]
[1]*University of Louisville, USA and* [2]*Purdue University, USA*

T33A
SINGLE CELL ANALYSIS OF THE PROINFLAMMATORY RESPONSES OF MAST CELL BY A REAL TIME SECRETION ASSAY
Y. Shirasaki[1,2], A. Nakahara[2], N. Shimura[1], N. Suzuki[1], M. Yamagishi[1], J. Mizuno[2], S. Shoji[2], and O. Ohara[1,3]
[1]*Institute of Physical and Chemical Research (RIKEN), JAPAN,*
[2]*Waseda University, JAPAN, and*
[3]*KAZUSA DNA Research Institute, JAPAN*

T34A
FORMATION OF ARTICULATED EMBRYOID BODY (art-EB) FOR SPATIALLY CONTROLLED DIFFERENTIATION
J. Kawada[1,2], H. Kimura[1,2], S. Kaneda[1,2], H. Akutsu[2,3], Y. Sakai[1,2], and T. Fujii[1,2]
[1]*University of Tokyo, JAPAN,*
[2]*Japan Science and Technology Agency (JST), JAPAN, and*
[3]*National Research Institute for Child Health and Development, JAPAN*

T35A
THE DISTINCT PAIRING SEQUENCE OF LIVER CELL AND FIBROBLAST ON CELL-CELL FUSION PLATFORM
S.-M. Yang[1], C.-Y. Lin[1], S. Sivashankar[2], S.V. Puttaswamy[2], Y.-T. Lu[1], H.-Y. Chang[3], L. Hsu[1], and C.-H. Liu[3]
[1]*National Chiao Tung University, TAIWAN,*
[2]*National Tsing Hua University, TAIWAN, and*
[3]*Mackay Memorial Hospital, TAIWAN*

T36A
THREE DIMENSIONAL CO-CULTURE OF NEURON AND ASTROCYTE IN A MICRO-FLUIDIC DEVICE
Y.H. Kim[1], Y.E. Kim[1], S. Chung[2], B. Kim[3], T.S. Kim[1], and J.Y. Kang[1]
[1]*Korea Institute of Science and Technology (KIST), SOUTH KOREA,*
[2]*Korea University, SOUTH KOREA, and*
[3]*Korea Aerospace University, SOUTH KOREA*

T37A
TRACKING OF SINGLE BACTERIAL CELLS TO DETERMINE HOLDFAST PRODUCTION TIMES
M.D. Hoffman, L.I. Kacz, D.T. Kysela, P.J.B. Brown, Y.V. Brun, and S.C. Jacobson
Indiana University, USA

T38A
USING MICROFLUIDICS AND MASS SPECTROMETRY TO STUDY PEPTIDE RELEASE IN NEURONS
C.A. Croushore, C.Y. Lee, M. Zhong, and J.V. Sweedler
University of Illinois, Urbana-Champaign, USA

Life Science Applications
Others

T39A
BIOFABRICATION OF PSEUDOCARDIAC TUBLAR TISSUES WITH GEL FIBERS INCLUDING RAT CARDIOMYOCYTES
S. Iwanaga, H. Onoe, and S. Takeuchi
University of Tokyo, JAPAN and
ERATO Takeuchi Biohybrid Innovation Project, JAPAN

T40A
GUIDED FORMATION OF PERFUSABLE BLOOD VESSEL AND VASCULAR FUSION IN A MICROFLUIDIC DEVICE
J.H. Yeon, Q.P. Hu, H.R. Ryu, M.H. Chung, and N.L. Jeon
Seoul National University, SOUTH KOREA

T41A
LOCALIZED INDUCTION OF CORTICAL SPREADING DEPRESSION WAVES IN BRAIN SLICES USING MICROFLUIDIC INJECTION
Y.T. Tang[1], H.E. López-Valdés[1], K.C. Brennan[2], and Y.S. Ju[1]
[1]*University of California, Los Angeles, USA and* [2]*University of Utah, USA*

T42A
MONITORING THE KINETICS OF HEPATOCYTE METABOLISM IN A DYNAMICALLY CHANGING ENVIRONMENT VIA AN AUTOMATED MICROFLUIDIC PLATFORM: MICROFLUIDICS, MICROSCOPY AND IMAGE ANALYSIS
S.S. Lee, H. Schober, S. Pelet, D. Reinhard, W. Krek, and M. Peter
ETH Zürich, SWITZERLAND and Competence Center for Systems Physiology and Metabolic Diseases, SWITZERLAND

T43A
OPTICAL STIMULATION AND IMAGING OF FUNCTIONAL BRAIN CIRCUITRY IN A LAMINAR FLOW CHAMBER
S. Ahrar, T.V. Nguyen, Y. Shi, P.V. Thomas, T. Ikrar, X. Xu, and E.E. Hui
University of California, Irvine, USA

T44A
X-RAY COMPATIBLE MICROFLUIDIC PLATFORMS FOR SCREENING, CRYSTALLIZATION AND DE NOVO STRUCTURE DETERMINATION OF PROTEINS
S. Guha, S.L. Perry, A.S. Pawate, S.K. Nair, and P.J.A. Kenis
University of Illinois, Urbana-Champaign, USA

Microreaction Applications
Flow Chemistry / Synthesis

T1B
DROPLET-BASED BIOGENIC PARAMAGNETIC NANOPARTICLE SYNTHESIS
J.H. Jung, T.J. Park, Y. Piao, S.Y. Lee, and T.S. Seo
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

T2B
MICROFLOW SYSTEMS FOR MECHANISTIC INVESTIGATION OF COMPLEX REACTION SEQUENCES
R.C.R. Wootton[1] and S.D. Brandt[2]
[1]*ETH Zürich, SWITZERLAND and* [2]*Liverpool John Moores University, UK*

Microreaction Applications
In-Line Analysis/Process Control

T3B
A HIGH-THROUGHPUT DRUG-SCREENING SYSTEM TARGETING ABC-TRANSPORTERS: AN APPLICATION OF A MICROFLUIDIC GRADIENT GENERATOR
Y. Abe[1,3], H. Sasaki[1], R. Yamamoto[1,3], T. Osaki[1], R. Kawano[1], K. Kamiya[1], N. Miki[1,3], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science and Technology (KAST), JAPAN,*
[2]*University of Tokyo, JAPAN, and*
[3]*Keio University, JAPAN*

T4B
KINETICS OF PLASMID DNA AND CATIONIC LIPOSOME COMPLEXATION THROUGH IN LINE MICROCHANNEL SAXS MEASUREMENTS
T.A. Balbino[1], L.P. Cavalcanti[2], C.L.P. Oliveira[3], and L.G. de La Torre[1]
[1]*University of Campinas, BRAZIL,*
[2]*Synchrotron Light National Lab, BRAZIL, and*
[3]*University of São Paulo, BRAZIL*

T5B
NON-CONTACT LABEL-FREE DIELECTRIC SPECTROSCOPY OF SINGLE- AND MULTI-PHASE MICROFLUIDIC SYSTEMS
D.J. Rowe, A. Porch, D.A. Barrow, and C.J. Allender
Cardiff University, UK

Microreaction Applications
Others

T6B
FLEXIBLE MICROFLUIDIC DEVICES FOR GAS AND LIQUID APPLICATIONS
P.K. Yuen and M.E. DeRosa
Corning Incorporated, USA

T7B
MINIATURIZED LIQUID-LIQUID EXTRACTION SYSTEM BASED ON CONTROLLED AQUEOUS AND ORGANIC DROPLETS
V. Jokinen[1], T. Sikanen[2], R. Kostiainen[2], and S. Franssila[1]
[1]*Aalto University, FINLAND and* [2]*University of Helsinki, FINLAND*

T8B
SINGLE-MOLECULE PCR IN A PICOWELL ARRAY SIMULTANIOUSLY IMMOBILIZING PCR PRODUCTS TO A PDMS COVERSLIDE
J. Hoffmann[1], M. Trotter[1], F. von Stetten[1,2], R. Zengerle[1,2], and G. Roth[1,2]
[1]*University of Freiburg - IMTEK, GERMANY and*
[2]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*

Microfluidic Fundamentals
Fluid Mechanics & Modeling

T1C
CONTROLLING FLOW IN MICROCHANNELS USING PROGRAMMED PILLARS
H. Amini, M. Masaeli, and D. Di Carlo
University of California, Los Angeles, USA

T2C
IN-SITU SUB-MICROMETER SURFACE FLOW VELOCITY MEASUREMENT
Y. Iwasaki, M. Seyama, T. Miura, T. Horiuchi, and E. Tamechika
NTT Corporation, JAPAN

T3C
MODELING AND EXPERIMENTAL VERIFICATION OF CHANNEL GEOMETRY FOR DELIVERY OF STIMULANT WAVEFORMS TO LARGE VOLUME CHAMBERS FOR CELLULAR SYNCHRONIZATION
M.G. Roper, X. Zhang, R. Dhumpa, and T.M. Truong
Florida State University, USA

T4C
SELECTING 3D CHATOIC FLOW STATES FOR ACCELERATED DNA REPLICATION IN MICRO-SCALE CONVECTIVE PCR
A. Priye, R. Muddu, Y.A. Hassan, and V.M. Ugaz
Texas A&M University, USA

T5C
SYSTEM SIMULATION FOR MICROFLUIDIC DESIGN AUTOMATION OF LAB-ON-A-CHIP DEVICES
N. Gleichmann, P. Horbert, D. Malsch, and T. Henkel
Institute of Photonic Technology (IPHT), GERMANY

Microfluidic Fundamentals
Micro Liquid Handling

T6C
A CAPILLARY-PRESSURE-BASED AIR PUMP FOR NANOLITER LIQUID HANDLING IN MICROFLUIDIC DEVICES
G. Li, Y. Luo, Q. Chen, and J. Zhao
Chinese Academy of Sciences, CHINA

T7C
AUTOMATED MICROFLUIDIC SYSTEM FOR RAPID GENERATION OF LIBRARIES OF NANOLITER DROPLETS
T.S. Kamiński, S. Jakiela, K. Churski, and P. Garstecki
Polish Academy of Sciences, POLAND

T8C
EFFICIENT DEVELOPMENT KIT FOR WELL-TO-CHIP CUSTOMIZATION AND DETECTION OF COLORIMETRIC AND FLUORESCENCE BASED MICROFLUIDIC IMMUNOASSAYS
R. Gorkin[1], R. Burger[1], D. Kurzbuch[1], G.G. Donohoe[2], X. Zhang[1], M. Czugala[1], F.B. Lopez[1], S.O'Driscoll[1], M. Rook[2], C. McDonagh[2], D. Diamond[1], R. O'Kennedy[1,2], and J. Ducrée[1]
[1]*Dublin City University, IRELAND and* [2]*EMD Millipore, USA*

T9C
GENERATING AND DISPENSING CHARGED MICRODROPLETS USING ELECTROHYDRODYNAMIC REPULSION FOR CIRCULAR DROPLET PATTERNING
B. Kim[1], H. Nam[1], S.J. Kim[2], and G. Lim[1]
[1]*Pohang University of Science and Technology (POSTECH), SOUTH KOREA and* [2]*Massachusetts Institute of Technology, USA*

T10C
MICROFLUIDIC AUTOMATIC CONCENTRATION GRADIENT GENERATOR FOR DISOLVED GAS
B.-Y. Xu, X.-N. Yan, J.-J. Xu, and H.-Y. Chen
Nanjing University, CHINA

T11C
PHOTO-ACTUATED DROPLET MICROFLUIDICS
J. Nammoonnoy, M.T. Koesdjojo, R.T. Frederick, and V.T. Remcho
Oregon State University, USA

T12C
PUMPING FLUIDS RADIALLY INWARD ON CENTRIFUGAL MICROFLUIDIC PLATFORMS VIA THERMALLY-ACTUATED MECHANISMS
K. Abi-Samra and M. Madou
University of California, Irvine, USA and
Ulsan National Institute of Science and Technology, SOUTH KOREA

T13C
SINGLE-LAYER MICROFLUIDIC NETWORK-BASED COMBINATORIAL DILUTION FOR A STANDARD SIMPLEX-LATTICE COMBINATORIAL DESIGN
K. Lee[1], C. Kim[2], B. Ahn[1], H. Lee[1], R. Panchapakesan[1], L. Xu[1], J. Xu[1], J.Y. Kang[2], and K.W. Oh[1]
[1]*State University of New York, Buffalo, USA and*
[2]*Korea Institute of Science and Technology (KIST), SOUTH KOREA*

T14C
THE PHASEGUIDE PARADIGM: PRIMING AND EMPTYING OF MONOLITHIC POLYMER CHIPS
S.J. Trietsch[1], W. Rauwé[1], G.A. Urban[2], A. Manz[3], T. Hankemeier[1], H.J. van der Linden[1], and P. Vulto[1]
[1]*Leiden University, THE NETHERLANDS,*
[2]*University of Freiburg - IMTEK, GERMANY, and*
[3]*Korea Institute of Science and Technology (KIST) - Europe, GERMANY*

Microfluidic Fundamentals
Multi-Phase & Digital Microfluidics

T15C
AGAROSE DROPLET MICROFLUIDICS FOR HIGHLY PARALLEL SINGLE MOLECULE EMULSION RT-PCR
G. Jenkins[1,2], H. Zhang[1], Y. Zou[1], X. Leng[1], W. Zhang[1], and C.J. Yang[1]
[1]*Xiamen University, CHINA and* [2]*Imperial College London, UK*

T16C
CONTINUOUS-FLOW IN-DROPLET MAGNETIC PARTICLE SEPARATION IN A DROPLET-BASED MICROFLUIDIC PLATFORM
H. Lee, B. Ahn, K. Lee, and K.W. Oh
State University of New York, Buffalo, USA

T17C
FIREFLIES-ON-A-CHIP
Z. Barikbin[1], Md.T. Rahman[1], P. You[2], J. Berasategi[3], and S.A. Khan[1]
[1]*Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE,* [2]*National University of Singapore, SINGAPORE, and*
[3]*University of the Basque Country, Bilbao, SPAIN*

T18C
INDUCTION HEATING ASSISTED INJECTION MOLDING OF MAGNETIC ALLOY MICROSTRUCTURES FOR DROPLET MANIPULATION
H.H. Tsai, J.J. Wang, R.W. Tsai, and Y.C. Su
National Tsing Hua University, TAIWAN

T19C
MICRODROPLET NMR: PUMPING A PRECIOUS MICROLITER THROUGH METERS WITHOUT LOSS, AND LC-MS+NMR OF COMPLEX SAMPLES
R.A. Kautz[1], R. Gathungu[1], Y. Lin[2], R. Kc[1], and P. Vouros[1]
[1]*Northeastern University, USA and* [2]*Biogen-Idec, USA*

T20C
MICROFLUIDIC PRODUCTION OF IMMUNOLOGICAL MICROBEADS WITH MONODISPERSITY AND MACROPOROSITY
K. Jiang, A. Sposito, J. Liu, S.R. Raghavan, and D.L. DeVoe
University of Maryland, USA

T21C
ON-DEMAND TECHNIQUES FOR HIGH-THROUGHPUT GENERATION OF EMULSIONS AND FOR DESIGN OF MULTIPLE DROPLETS
J. Guzowski, P. Korczyk, S. Jakiela, and P. Garstecki
Polish Academy of Sciences, POLAND

T22C
PRECISE CONTROL OF TRAPPING/RELEASE OF INDIVIDUAL LABEL-FREE DROPLETS IN COMB-SHAPED MICROFLUIDIC CHIP USING MAGNETIC REPULSION
K. Zhang[1], Q.L. Liang[2], Y.M. Wang[2], and G.A. Luo[2]
[1]*East China University of Science and Technology, CHINA and*
[2]*Tsinghua University, CHINA*

T23C
TOWARDS A HIGH-THROUGHPUT ELECTROFUSION PLATFORM USING DROPLETS: CELL DETECTION AND DETERMINISTIC ENCAPSULATION
E.W.M. Kemna, L.I. Segerink, R. Schoeman, F. Wolbers, I. Vermes, and A. van den Berg
MESA+, University of Twente, THE NETHERLANDS

Microfluidic Fundamentals
Multiscale/ Integrative Microfluidics

T24C
FABRICATION AND PERFORMANCE OF PLASMONIC NANO-CAVITY ANTENNA ARRAYS SELF-ALIGNED IN FLUIDIC CHANNELS FOR ENHANCEMENT OF SINGLE DNA MOLECULE DETECTION
C. Wang, W. Zhang, S. Li, and S.Y. Chou
Princeton University, USA

Microfluidic Fundamentals
Others

T25C
A MICROFABRICATION-FREE PROCEDURE TO FABRICATE 3-DIMENSIONAL MICROFLUIDIC DEVICES USING HYDROGEL MOLDS
H. Hirama, H. Moriguchi, and T. Torii
University of Tokyo, JAPAN

T26C
IN SITU OBSERVATION OF ANTIBIOTIC SUSCEPTIBILITY OF BIOFILMS USING MICROFLUIDIC DEVICE
S. Hwang[1], J. Kim[1], A. Park[1], S.H. Lee[1], and C.S. Lee[2]
[1]*Chungnam National University, SOUTH KOREA and*
[2]*Korea Institute of Industrial Technology, SOUTH KOREA*

T27C
SPATIAL AND TEMPORAL CONTROLS FOR REHYDRATION OF DRIED REAGENTS STORED IN A POROUS DEVICE
G.E. Fridley, H. Le, E. Fu, and P. Yager
University of Washington, USA

Integrated Micro- and Nanotechnologies
Genetic Analysis Systems

T1D
AN INTEGRATED MICROCANTILEVER-BASED WIRELESS DNA CHIP FOR HEPATITIS B VIRUS (HBV) DNA DETECTION
C.-W. Huang[1], Y.-J. Huang[1], T.-H. Lin[1], C.-T. Lin[1], J.-K. Lee[1], L.-G. Chen[1], P.-Y. Hsiao[1], B.-R. Wu[1], H.-T. Hsueh[1], B.-J. Kuo[1], H.-H. Tsai[2], H.-H. Liao[2], Y.-Z. Juang[2], and S.-S. Lu[1]
[1]*National Taiwan University, TAIWAN and*
[2]*National Applied Research Laboratories, TAIWAN*

T2D
DNA PURIFICATION IN CONTINUOUS NANOLITER FLOWS USING FLOW-INDUCED ELECTROKINETIC TRAPPING: INFLUENCE OF IONIC STRENGTH AND CHIP CONDITIONING
G.IJ. Salentijn, M. van Dijk, H.J. Geertsema, L.-J.C. Jellema, A.M. Van Oijen, and E. Verpoorte
University of Groningen, THE NETHERLANDS

T3D
HANDLING DNA IN DISPOSABLE MULTILAYER POLYESTER MICROCHIPS
G. Duarte[1], C. Price[2], B. Poe[2], E. Carrilho[3], and J.P. Landers[2]
[1]*Universidade Estadual de Goiás, BRAZIL,*
[2]*University of Virginia, USA, and*
[3]*Universidade de São Paulo, BRAZIL*

T4D
MICROFLUIDIC CHROMATIN IMMUNOPRECIPITATION ASSAY FOR HISTONE MODIFICATION ANALYSIS BASED ON 50 CELLS
T. Geng[1], N. Bao[2], M.D. Litt[3], T.G. Glaros[2], L. Li[2], and C. Lu[2]
[1]*Purdue University, USA,* [2]*Virginia Tech, USA, and* [3]*Ball State University, USA*

T5D
POINT-MUTATION DETECTION OF MITOCHONDRIAL DNA BY USING MICROFLUIDIC SYSTEM
C.-M. Chang[1], L.-F. Chiou[1], D.-B. Shieh[1], and G.-B. Lee[2]
[1]*National Cheng Kung University, TAIWAN and*
[2]*National Tsing Hua University, TAIWAN*

T6D
RT-PCR MICRODEVICE INTEGRATED WITH A ROSGENE STRIP FOR COLORIMETRIC DETECTION OF INFLUENZA H1N1 VIRUS
Y.T. Kim, Y. Chen, J.Y. Choi, and T.S. Seo
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

Integrated Micro- and Nanotechnologies
Proteomic Analysis

T7D
A MICROFLUIDIC PLATFORM FOR AUTOMATED MICROPARTICLE LABEL IMMUNOASSAYS
J. Kim, E.C. Jensen, M. Megens, B. Boser, and R.A. Mathies
University of California, Berkeley, USA

T8D
RECONSTITUTION OF G-PROTEIN COUPLED RECEPTORS (GPCRS) INTO GIANT LIPOSOME ARRAY
K. Kamiya[1], T. Osaki[1], K. Tsumoto[3], R. Kawano[1], H. Sasaki[1], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science and Technology (KAST), JAPAN,*
[2]*University of Tokyo, JAPAN, and*
[3]*Mie University, JAPAN*

Integrated Micro- and Nanotechnologies
Single or Multi-Cell Analysis

T9D
A MECHANOREGULATION APPROACH FOR PROBING SUBSTRATE ELASTICITIES AND GEOMETRIC CONSTRAINTS ON DIFFERENTIATION OF HUMAN NEUROBLASTOMA
K.-H. Nam, E. Mfoumou, and P.K. Wong
University of Arizona, USA

T10D
A MICROFLUIDIC DEVICE FOR HIGHLY PARALLEL ISOLATION AND CHEMICAL ANALYSIS OF SINGLE CELLS
K. Eyer, P. Kuhn, and P.S. Dittrich
ETH Zürich, SWITZERLAND

T11D
A MULTIPLEXED MICROFLUIDIC PLATFORM UTILIZING OPTIMIZED NORMALLY CLOSED VALVES FOR INVESTIGATING MICROBIAL GENE EXPRESSION
R. Mohan, A. Mukherjee, A.V. Desai, J. Lee, C.M. Schroeder, and P.J.A. Kenis
University of Illinois, Urbana-Champaign, USA

T12D
A SIMPLE PUMPFREE HEPG2 LIVER CELLS SPHEROID AMALGAMATION PLATFORM VIA GRAVITY DRIVING FORCE
S.-M. Yang[1], C.-Y. Lin[2], S. Sivashankar[2], S.V. Puttaswamy[2], H.-Y. Chang[2], L. Hsu1, and C.-H. Liu[2]
[1]*National Chiao Tung University, TAIWAN and*
[2]*National Tsing Hua University, TAIWAN*

T13D
ALL-ELECTRONIC DEFORMABILITY CYTOMETRY FOR MARKERLESS IDENTIFICATION OF CANCER CELLS
M. Nikolic-Jaric[1], T. Cabel[1], G.A. Ferrier[1], G.E. Bridges[1], D.J. Thomson[1], C.P. Peltier[2], P. Khan[2], and J.R. Davie[2]
[1]*University of Manitoba, CANADA and*
[2]*Manitoba Institute of Cell Biology, CANADA*

T14D
CONCENTRATION ENHANCED MOBILITY SHIFT ASSAY WITH APPLICATIONS TO APTAMER-BASED BIOMARKER DETECTION AND KINASE PROFILING
L.F. Cheow, A. Sarkar, S. Kolitz, D. Lauffenburger, and J. Han
Massachusetts Institute of Technology, USA

T15D
EXTRACTION AND PURIFICATION OF GENOMIC DNA VIA ENTRAPMENT IN AN ARRAY OF MICROPOSTS
J. Topolancik, D.R. Latulippe, H. Tian, C. Wallin, and H.G. Craighead
Cornell University, USA

T16D
HIGH-THROUGHPUT COMBINATORIAL STUDY OF AXON INITIATION AND GUIDANCE OF SINGLE NEURONS IN RESPONSE TO MICROFLUIDIC BIOCHEMICAL GRADIENTS
N. Bhattacharjee and A. Folch
University of Washington, USA

T17D
INTEGRATION OF SINGLE CELL MANIPULATION, LYSIS, INJECTION AT SUB-PICOLITER SCALE UTLIZING EXTENDED-NANO SPACE FOR SINGLE CELL ANALYSIS
K. Shirai[1], Y. Sugii[1,2], Y. Tanaka[1,2,3], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo, JAPAN,*
[2]*Japan Science and Technology Agency (JST), JAPAN, and*
[3]*Institute of Physical and Chemical Research (RIKEN), JAPAN*

T18D
LATERAL DIELECTROPHORETIC MICROSEPARATORS FOR DETECTING HEMATOLOGICAL DISORDERS
S.-I. Han, S.-M. Lee, Y.-D. Joo, and K.-H. Han
Inje University, SOUTH KOREA

T19D
MEMS COULTER COUNTER FOR DYNAMIC IMPEDANCE MEASUREMENT OF CELLS
Y. Wu, J.D. Benson, and M. Almasri
University of Missouri, USA

T20D
MICROFLUIDIC DEVICE FOR MEASURING THE STIFFNESS OF SINGLE CELLS
Q. Guo and H. Ma
University of British Columbia, CANADA

T21D
MICROHEATER-MEDIATED MECHANICAL SINGLE-CELL LYSIS
S. Wadle[1,2], V. Kondrashov[1,2], H. Hoefemann[2], N. Bakhtina[1,2], N. Wangler[1], and R. Zengerle[1,2]
[1]*University of Freiburg - IMTEK, GERMANY and*
[2]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*

T22D
PLATELET CONTRACTILE FORCE ASSAY USING MICROPOSTS AND THE ROLE OF NONMUSCLE MYOSIN IIA REGULATION
S. Feghhi and N.J. Sniadecki
University of Washington, USA

T23D
SINGLE CELL ANTIMICROBIAL SUSCEPTIBILITY TESTING USING CONFINED MICROCHANNELS AND ELECTROKINETIC LOADING
Y. Lu and P.K. Wong
University of Arizona, USA

T24D
SIZE-INDEPENDENT DEFORMABILITY CYTOMETRY WITH ACTIVE FEEDBACK CONTROL OF MICROFLUIDIC CHANNELS
G. Guan[1,2], A.A. Bhagat[2], W.K. Peng[2], W.C. Lee[1,2], C.J. Ong[1], P.C.Y. Chen[1,2], and J. Han[2,3]
[1]*National University of Singapore, SINGAPORE,*
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[3]*Massachusetts Institute of Technology, USA*

Integrated Micro- and Nanotechnologies
Others

T25D
IMAGING LIPID MICRODOMAINS IN A MICROFLUIDIC BILAYER LIPID MEMBRANE CHIP
C. Shao and D.L. DeVoe
University of Maryland, USA

T26D
PARTIPETTING FOR MULTIPLEXED BIOASSAY IN MICROWELLS
S.E. Chung, S.H. Lee, Y. Song, J. Kim, and S. Kwon
Seoul National University, SOUTH KOREA

Nanotechnologies
Nanofluidics

T1E
DEVELOPMENT OF NONINTRUSIVE MEASUREMENT TECHNIQUE OF FLOW RATE AND PRESSURE DROP FOR EXTENED NANOSPACE CHANNEL FLOWS
S. Kubori, Y. Kazoe, K. Mawatari, Y. Sugii, and T. Kitamori
University of Tokyo, JAPAN

T2E
EFFICIENT CONTROL OF DNA TRANSPORT IN NANOPORE-BASED NANOFLUIDIC TRANSISTORS
K.-H. Paik[1], Y. Liu[1], V. Tabard-Cossa[2], D.E. Huber[1], J. Provine[1], R.T. Howe[1], R.W. Dutton[1], and R.W. Davis[1]
[1]*Stanford University, USA,* [2]*SRI International, USA, and*
[3]*University of Ottawa, CANADA*

T3E
LAPLACE PRESSURE VALVE UTILIZING NANO-IN-NANO STRUCTURE TOWARD ATTOLITER SCALE LIQUID HANDLING
S. Kubota[1], K. Mawatri[1], Y. Xu[2], and T. Kitamori[1]
[1]*University of Tokyo, JAPAN and* [2]*Osaka Prefecture University, JAPAN*

T4E
NANOFLUIDICS FOR SELECTIVE PROTEIN TRAPPING IN BIO-FLUIDS
K.-T. Liao[1], V. Chaurey[1], M. Tsegaye[1], C.-F. Chou[2], and N.S. Swami[1]
[1]*University of Virginia, USA and* [2]*Academia Sinica, TAIWAN*

T5E
TRANSVERSE CONDUCTANCE MEASUREMENTS OF SINGLE DNA MOLECULES
M.E. Woodson, L. Menard, C. Mair, J.P. Alarie, and J.M. Ramsey
University of North Carolina, Chapel Hill, USA

Nanotechnologies
Nanoengineering

T7E
SCALING EFFECT IN BIOMOLECULE DETECTION USING SILICON NANOWIRE BIOSENSORS
X. Yang, W. Frensley, D. Zhou, and W. Hu
University of Texas, Dallas, USA

T7E
SCALING EFFECT IN BIOMOLECULE DETECTION USING SILICON NANOWIRE BIOSENSORS
X. Yang, W. Frensley, D. Zhou, and W. Hu
University of Texas, Dallas, USA

Nanotechnologies
Nanobiotechnology

T8E
ASSEMBLING BACKPACKING BACTERIA FOR DIAGNOSTICS AND THERAPEUTICS
R. Fernandes, T. James, M.C. Zuniga, N.Li, S. Ngan, and D.H. Gracias
Johns Hopkins University, USA

T9E
INFLAMMATORY BIOMARKER SENSING USING RECTANGULAR POLYCRYSTALLINE SILICON NANOWIRES MADE BY DRY ETCHING
M. Lombardini, M.M.A. Hakim, K. Sun, G. Broder, F. Giustiniano, M.R.R. de Planque, P.L. Roach, D.E. Davies, H. Morgan, and P. Ashburn
University of Southampton, UK

T10E
PLASMONIC NANOPORE ARRAYS FOR CHARACTERIZING THE BINDING OF MYELIN GROWTH PROMOTING IGM ANTIBODIES TO SUPPORTED LIPID BILAYERS
N.J. Wittenberg[1], H. Im[1], A.E. Warrington[2], M. Rodriguez[2], and S.-H. Oh[1]
[1]*University of Minnesota, USA and* [2]*Mayo Clinic College of Medicine, USA*

T11E
SINGLE MOLECULE ENZYMATIC KINETICS IN SUBCELLULAR-SIZED NANOSPACES USING PNEUMATIC VALVE-ASSISTED ATTO-LITER CHAMBER ARRAY DEVICES
K. Iijima[1], N. Kaji[1], Y. Okamoro[1], M. Tokeshi[1], and Y. Baba[1,2]
[1]*Nagoya University, JAPAN and*
[2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T12E
SURFACE PLASMON BASED SUBSTRATE FOR ENHANCED FLUORESCENCE LIVE CELL IMAGING
M.R. Gartia, A. Hsiao, M. Sivaguru, Y. Chen, T.-J. Kim, Y. Wang, and G.L. Liu
University of Illinois, Urbana-Champaign, USA

Nanotechnologies
Nanoassembly

T13E
NANOASSEMBLY OF GRAPHENE OXIDE FOR CIRCULATING TUMOR CELL ISOLATION
H.J. Yoon, K. Lee, Z. Zhang, T.M. Pham, and S. Nagrath
University of Michigan, USA

Nanotechnologies
Nanostructured Materials

T14E
NANOWIRE FORMATION USING METALLIZATION OF EXTENDED AND IMMOBILIZED DNA
T. Himuro, H. Ikedo, K. Ohtsuka, S. Takenaka, and T. Yasuda
Kyushu Institute of Technology, JAPAN

T15E
MICROFLUIDICS WITH MONOLITHICALLY INTEGRATED SELF-WETTING AND FLUORESCENCE ENHANCING 3D NANOSTRUCTURED SURFACE
H. Jin, Z. Xu, A. Hsiao, P. Vuttipittayamongkol, and G.L. Liu
University of Illinois, Urbana-Champaign, USA

T16E
REPLICATION OF BIOMIMETIC NANOSURFACES AND THEIR APPLICATION TO CELL DIFFERENTIATION STUDY
K.J. Cha, J.M. Hong, M. Rha, D.-W. Cho, and D.S. Kim
Pohang University of Science and Technology (POSTECH), SOUTH KOREA

MEMS & NEMS Technologies
Micro- & Nanomachining

T1F
A RAPID PROTOTYPING MICROFABRICATION METHOD USING HIGH-TEMPERATURE CASTABLE MATERIAL FOR HIGH-THROUGHPUT MICRO-INJECTION MOLDING
J. Han[1], A. Puntambekar[1], S.H. Lee[1], and C.H. Ahn[2]
[1]*Siloam Biosciences, Inc., USA and* [2]*University of Cincinnati, USA*

T2F
MINIATURIZED CELL MECHANICAL STIMULATOR WITH CONTROLLED STRAIN GRADIENT FOR CELLULAR MECHANOBIOLGICAL STUDY
Q. Wang and Y. Zhao
Ohio State University, USA

T3F
RAPID PROTOTYPING OF MICROFLUIDIC STRUCTURES FROM UV CURABLE PTFE-LIKE POLYMERS: CREATING STRUCTURES IN MASKLESS DIRECT LITHOGRAPHY AND CASTING
A. Waldbaur, M. Dirschka, K. Länge, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY

MEMS & NEMS Technologies
Microfluidic Components/Packaging

T4F
A RAPID-PROTOTYPED ON-CHIP VACUUM GAUGE UTILIZING THE VOLUMETRIC EXPANSION OF TRAPPED AIR IN A SEALED MICROCHAMBER
H.-T. Kim[1], A.T. Evans[2], and H. Kim[1]
[1]*University of Utah, USA and*
[2]*Pacific Northwest National Laboratory, USA*

T5F
ACOUSTICALLY DRIVEN MICROFLUIDIC MICROMOTOR FOR LAB-ON-A-MICRODISC
R.J. Shilton, N.R. Glass, P. Chan, L.Y. Yeo, and J. Friend
Monash University, AUSTRALIA

T6F
CHITOSAN-ALGINATE MICROFIBERS GENERATION ON A MICROFLUIDIC CHIP AND ENCAPSULATION OF HEPG2 CELLS
B.R. Lee[1], K.H. Lee[2], E. Kang[1], and S.H. Lee[1]
[1]*Korea University, SOUTH KOREA and*
[2]*Massachusetts of Institute Technology, USA*

T7F
OPTICAL CONTROLLED MICROFLUIDIC COMPONENTS BY OPTOGENTETIC BIOACTUATOR
T. Hoshino, K. Suzumura, T. Kimura, K. Funakoshi, Y. Akiyama, H. Tsujimura, K. Iwabuchi, and K. Morishima
Tokyo University of Agriculture and Technology, JAPAN

T8F
UNTETHERED MICRO-PIPETTE MANEUVERED IN A CHIP BY OUTER MAGNETIC FIELD
A. Ichikawa[1] and F. Arai[1,2]
[1]*Nagoya University, JAPAN and*
[2]*Seoul National University, SOUTH KOREA*

MEMS & NEMS Technologies
Integration Strategies

T9F
METABOLOMIC NMR ON A CHIP VIA INDUCTIVE COUPLING
H. Ryan[1], S.-H. Song[1], K. Lamson[1], J. Elliot[1], A. Zaß[2], K. Wang[1], J. Korvink[2], M. Reed[1], J.P. Landers[1], and M. Utz[1]
[1]*University of Virginia, USA and* [2]*University of Freiburg – IMTEK, GERMANY*

T10F
SELECTIVE LIPID-PATTERNING FOR HETEROLOGOUS GIANT LIPOSOME ARRAY
T. Osaki[1], K.S. Kuribayashi[2], R. Kawano[1], H. Sasaki[1], K. Kamiya[1], and S. Takeuchi[2]
[1]*Kanagawa Academy of Science and Technology (KAST), JAPAN and* [2]*University of Tokyo, JAPAN*

MEMS & NEMS Technologies
New Chip Materials

T11F
FABRICATION OF POLYURETHANE MICROFLUIDIC CHANNELS AND THEIR SURFACE MODIFICATION FOR BLOOD CONTACTING APPLICATION
W.-I. Wu, K.N. Sask, P.R. Selvaganapathy, and J.L. Brash
McMaster University, CANADA

T12F
LOW TEMPERATURE "CLICK" WAFER BONDING OF OFF-STOICHIOMETRY THIOL-ENE (OSTE) POLYMERS TO SILICON
C.F. Carlborg, F. Saharil, T. Haraldsson, and W. van der Wijngaart
Royal Institute of Technology (KTH), SWEDEN

T13F
PTFE-LIKE/PDMS HYBRIDS: SYNTHESIS OF PHOTOCURABLE, HIGHLY CHEMICALLY RESISTANT POLYMERS AND THEIR APPLICATION IN MICROFLUIDICS
C. Hannig, D. Schild, M. Dirschka, K. Länge, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY

MEMS & NEMS Technologies
Surface Modification

T14F
A SIMPLE AND INEXPENSIVE WET PROCESS FOR THE CONTROLLED SURFACE WRINKLING OF PDMS MATERIAL
C. Provin[1], M. Hamon[2], and T. Fujii[1]
[1]*University of Tokyo, JAPAN and* [2]*Auburn University, USA*

T15F
COMBINABLE PDMS CAPILLARY SENSOR ARRAY FOR MULTIPLE CHEMICAL SENSING: SENSITIVITY ENHANCEMENT AND FACILITATION OF SAMPLE INTRODUCTION BASED ON SURFACE MODIFICATION OF PDMS
Y. Fujii, T.G. Henares, K. Kawamura, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

T16F
DYNAMIC pH SENSING IN MICRO-FLUIDIC DEVICES USING ADAPTIVE COATINGS BASED ON POLYANILINE
L. Florea, E. Lahiff, D. Diamond, and F. Benito-Lopez
Dublin City University, IRELAND

T17F
LONG-LASTING SUPERHYDROPHIILIC PDMS SURFACE BY ATMOSPHERIC-PRESSURE PLASMA POLYMERIZATION
D. Lee, J.-C. Hyun, S.A. Hong, and S. Yang
Gwangju Institute of Science and Technology (GIST), SOUTH KOREA

T18F
SURFACE MODIFICATION OF PHOTORESIST SU-8 FOR LOW AUTOFLUORESCENCE AND BIOANALYTICAL APPLICATIONS
C. Cao[1], S.W. Birtwell[2], J. Høgberg[1], A. Wolff[1], H. Morgan[2], and D. Duong Bang[1]
[1]*Technical University of Denmark (DTU), DENMARK and* [2]*University of Southampton, UK*

MEMS & NEMS Technologies
Others

T19F
ENHANCING EFFICIENCY OF DOUBLE CASTING PROTOTYPING BY THERMAL AGING OF POLY(DIMETHYLSILOXANE)
K. Ziólkowska, K. Żukowski, M. Chudy, A. Dybko, and Z. Brzózka
Warsaw University of Technology, POLAND

Bench-to-Bedside
Point-of-Care Testing

T1G
A CELL PHONE-BASED MICROPHOTOMETRIC SYSTEM FOR RAPID ANTIMICROBIAL RESISTANCE PROFILING AT THE POINT-OF-CARE
M. Kadlec, D. You, and P.-K. Wong
University of Arizona, USA

T2G
A FULLY INTEGRATED MULTIPLEXED IMMUNOASSAY ON A DISC
J. Park, V. Sunkara, T.H. Kim, H. Hwang, and Y.-K. Cho
Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA

T3G
A MICROFLUIDIC CHIP COMBINING DNA EXTRACTION AND REAL-TIME PCR FOR IDENTIFYING BACTERIA IN SALIVA
E.A. Oblath, W.H. Henley, J.P. Alarie, and J.M. Ramsey
University of North Carolina, Chapel Hill, USA

T4G
A TEN-MINUTE HIGH DENSITY LATERAL FLOW PROTEIN MICROARRAY ASSAY
J. Gantelius, T. Bass, A. Gundberg, M. Sundberg, R. Sjöberg, P. Nilsson, and H. Andersson-Svahn
Royal Institute of Technology (KTH), SWEDEN

T5G
DETECTING GENETIC VARIATIONS IN A DROPLET
Y. Zhang, D.J. Shin, and T.-H. Wang
Johns Hopkins University, USA

T6G
A FINGER-POWERED CELL ENCAPSULATION SYSTEM
K. Iwai, A.T. Higa, R.D. Sochol, and L. Lin
University of California, Berkeley, USA

T7G
HIGH FLOW RATE CAPTURE OF CIRCULATING TUMOR CELLS USING A SMALL FOOTPRINT POLYMER DEVICE
T. Park, D.S.-W. Park, and M.C. Murphy
Louisiana State University, USA

T8G
IN-GEL PCR AMPLIFICATION OF HERPES SIMPLEX VIRUS
D.P. Manage[1], J. Lauzon[1], Y.C. Morrissey[1], A.L. Edwards[1], M.J. Gysel[1], A. Atrazhev[1], H.J. Crabtree[1], A.J. Stickel[1], G. Zahariadis[1,2], S.K. Yanow[1,2], and L.M. Pilarski[1]
[1]*University of Alberta, CANADA and*
[2]*Provincial Laboratory for Public Health, CANADA*

T9G
LOW PRESSURE MICROFLUIDIC-BASED DNA FRAGMENTATION
L. Shui, W. Sparreboom, J.G. Bomer, M. Jin, E.T. Carlen, and A. van den Berg
MESA+, University of Twente, THE NETHERLANDS

T10G
ON-CHIP PROTEIN ASSAYS USING MICROBEAD ARRAYS: AN INTEGRATED SYSTEM FOR SALIVARY-BASED CLINICAL DIAGNOSTICS
W.H. Henley, P.D. Dennis, E.A. Oblath, J.P. Alarie, and J.M. Ramsey
University of North Carolina, Chapel Hill, USA

T11G
RAPID AND SENSITIVE DETECTION OF CAPSID PROTEIN P24 OF HUMAN IMMUNODEFICIENCY VIRUS TYPE 1 (HIV-1) USING ON-CHIP EUROPIUM (III) NANOPARTICLE-BASED IMMUNOASSAY
J. Liu[1], B. Du[1], S. Tang[1], D.L. DeVoe[2], and I.K. Hewlett[1]
[1]*Food and Drug Administration, USA and* [2]*University of Maryland, USA*

T12G
RAPID, SENSITIVE DETECTION AND QUANTIFICATION OF TOXINS FROM COMPLEX BIOLOGICAL MATRICES
C.-Y. Koh, U.Y. Schaff, A.K. Singh, and G.J. Sommer
Sandia National Laboratories, USA

T13G
RESONANT FLUIDIC CIRCUITS FOR SOUND-CONTROLLED POINT-OF-CARE DIAGNOSTICS
R. Phillips, R. Shah, Y. Browning, P. Yager, and B. Lutz
University of Washington, USA

T14G
THE DEVELOPMENT OF A POINT OF CARE CREATININE MEASUREMENT USING DISPOSABLE READY TO USE MICROCHIP CAPILLARY ELECTROPHORESIS
M. Muñoz[1], J. Eijkel[3], A. Floris[2], S. Staal[3], Á. Ríos[1], and A. van den Berg[3]
[1]*University of Castilla la Mancha, SPAIN,*
[2]*Medimate BV, THE NETHERLANDS, and*
[3]*MESA+, University of Twente, THE NETHERLANDS*

T15G
ULTRA-FAST IMMUNOASSAY WITH 3D STRUCTURED MICROFIBER DEVICE
T. Fukushima and M. Takai
University of Tokyo, JAPAN

Bench-to-Bedside
Cell Sorting

T16G
AN ELECTRODYNMIC PRECONCENTRATOR FOR APPLICATION OF LAB-ON-A-CHIP
H.K. Seo, Y.H. Choi, D.H. Kang, K.T. Kim, H.R. Ahn, H.O. Kim, and Y.J. Kim
Yonsei University, SOUTH KOREA

T17G
BEDSIDE CANCER CELL COLLECTOR USING SIZE-DEPENDENT CELL FILTRATION IN MICROFLUIDIC CHIP
T. Masuda[1], M. Niimi[1], H. Nakanishi[2], Y. Yamanishi[1], and F. Arai[1,3]
[1]*Nagoya University, JAPAN,* [2]*Aichi Cancer Center, JAPAN, and*
[3]*Seoul National University, SOUTH KOREA*

T18G
CONTINUOUS SEPARATION OF BREAST CANCER CELLS FROM BLOOD USING MULTI-STAGE MULTI-ORIFICE FLOW FRACTIONATION (MS-MOFF)
H.S. Moon[1], K. Kwon[2], T.S. Sim[1], J.C. Park[1], J.G. Lee[1], and H.Y. Jung[2]
[1]*Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA and*
[2]*Yonsei University, SOUTH KOREA*

T19G
DEVELOPMENT OF DAMAGELESS BIOSAFETY FLUORESCENCE ACTIVATED CELL SORTER USING ELECTRIC LEAK FREE ELECTROOSMOSIS PUMP
T. Yamamori[1], Y. Ukita[1], M. Kobayashi[2], and Y. Takamura[1]
[1]*Japan Advanced Institute Science Technology (JAIST), JAPAN and*
[2]*On-Chip Biotechnologies Co., Ltd., JAPAN*

T20G
LABEL-FREE ISOLATION OF INTESTINAL PROGENITOR CELLS FROM NATIVE RAT TISSUE USING MICROFLUIDIC DEVICES
S.H. Kevlahan, R.L. Carrier, and S.K. Murthy
Northeastern University, USA

T21G
PATTERNING OF ALTERNATING PROTEINS INSIDE A MICROFLUIDIC CHANNEL FOR ENHANCED TUMOR CELL ISOLATION
C.A. Launiere, M.M. Gaskill, J.H. Myung, S. Hong, and D.T. Eddington
University of Illinois, Chicago, USA

T22G
SORTING HUMAN PROSTATE EPITHELIAL (HPET) CELLS IN AN INERTIAL MICROFLUIDIC DEVICE
N. Nivedita, P. Giridhar, S. Kasper, and I. Papautsky
University of Cincinnati, USA

T23G
TOWARDS THE DEVELOPMENT OF A MICROFLUIDIC DEVICE FOR THE SEPARATION AND ISOLATION OF CIRCULATING TUMOR CELLS FROM WHOLE BLOOD USING ACOUSTOPHORESIS
D.A. Nelson, B. Fuller, F.J. Lara, and J.P. Landers
University of Virginia, USA

Bench-to-Bedside
Cell Analysis

T24G
CHARACTERIZATION OF CELL PHENOTYPE USING DYNAMIC VISION SENSOR AND IMPEDANCE SPECTROSCOPE
N. Haandbæk[1], K. Mathwig[2], R. Streichan[1], N. Goedecke[1], S.C. Bürgel[1], F. Heer[1], and A. Hierlemann[1]
[1]*ETH Zürich, SWITZERLAND and*
[2]*MESA+, University of Twente, THE NETHERLANDS*

T25G
PHENOTYPE-DEPENDENT AND INDEPENDENT INERTIAL FOCUSING
S.C. Hur, M. Masaeli, and D. Di Carlo
University of California, Los Angeles, USA

T26G
STANDING SURFACE ACOUSTIC WAVE (SSAW) BASED THREE-DIMENSIONAL (3D) PARTICLE FOCUSING
J. Shi, S. Yazdi, S.-C. Lin, X. Ding, and T.J. Huang
Pennsylvania State University, USA

Bench-to-Bedside
Others

T27G
A MICRO BLOOD SAMPLING SYSTEM FOR CATHETERIZED NEONATES AND PEDIATRICS IN INTENSIVE CARE UNIT (ICU)
W. Jung and C.H. Ahn
University of Cincinnati, USA

T28G
IMPLANTABLE HYDROGEL MICROFIBER ENCAPSULATING PANCREATIC BETA-CELLS FOR DIABETES TREATMENT
S. Sugimoto[1], Y.J. Heo[1], H. Onoe[1,2], T. Okitsu[1,2], H. Kotera[2,3], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN,*
[2]*Japan Science and Technology Agency (JST), JAPAN, and*
[3]*Kyoto University, JAPAN*

Imaging & Detection Technologies
Flow Visualization

T1H
DEVELOPMENT OF A VISUALIZATION TECHNIQUE OF PROTON CONCENTRATION IN EXTENDED NANOSPACE CHANNEL USING STIMULATED EMISSION DEPLETION MICROSCOPY
Y. Kazoe, K. Mawatari, Y. Sugii, and T. Kitamori
University of Tokyo, JAPAN

T2H
SENSING THE FLOW: ADAPTIVE COATINGS BASED ON POLYANILINE FOR DIRECT OBSERVATION OF MIXING PROCESSES IN MICRO-FLUIDIC SYSTEMS
L. Florea, E. Lahiff, D. Diamond, and F. Benito-Lopez
Dublin City University, IRELAND

Imaging & Detection Technologies
Optical

T3H
A DOUBLET MICROLENS ARRAY FOR IMAGING OF BIOLOGICAL MICRON-SIZE OBJECTS
A. Tripathi and N. Chronis
University of Michigan, USA

T4H
CMOS-BASED LUMINESCENT CO2 SENSOR
M. Ratterman[1], L. Shen[1], D. Klotzkin[2], A. Bhattacharya[1], and I. Papautsky[1]
[1]*University of Cincinnati, USA and*
[2]*Binghamton University, USA*

T5H
DIFFERENTIATION OF MICRO SPHERES BY NARROW ANGLE SCATTERED LIGHT DETECTION ON LOW COST PMMA MICRO FLOW CYTOMETER CHIP
R. Zmijan[1], D.C. Spencer[1], M.C. Mowlem[2], and H. Morgan[1]
[1]*University of Southampton, UK and*
[2]*National Oceanography Centre Southampton, UK*

T6H
LENSFREE SUPER-RESOLUTION MICROSCOPY USING WETTING FILMS
O. Mudanyali, W. Bishara, and A. Ozcan
University of California, Los Angeles, USA

T7H
MULTICOLOR LIF DETECTION IN A SINGLE OPTICAL WINDOW USING PHASE-SENSITIVE MULTIPLEXING
K.M. Dadesh and A.S. Basu
Wayne State University, USA

T8H
LIGHT TRANSMISSION AND INTERFEROMETRY IN LIQUID-LIQUID WAVEGUIDE FOR PHOTOCATALYTIC APPLICATIONS
Y. Yang[1], G.P. Wang[2], and A.Q. Liu[1]
[1]*Nanyang Technological University, SINGAPORE and*
[2]*Wuhan University, CHINA*

T9H
TRAPPING OF PROTEIN IN NANOSLOT NANOLASER SENSOR
S. Kita[1,2], S. Otsuka[1,2], T. Endo[3], Y. Nishijima[4], H. Misawa[3], and T. Baba[1,2]
[1]*Yokohama National University, JAPAN,*
[2]*Japan Science and Technology Agency (JST), JAPAN,*
[3]*Tokyo Institute of Technology, JAPAN, and*
[4]*Hokkaido University, JAPAN*

Imaging & Detection Technologies
Electrochemical

T10H
ADDRESSABLE ELECTRODE ARRAY DEVICE INCORPORATED WITH IDA ELECTRODES FOR BIOLOGICAL ANALYSES
K. Ino, T. Nishijo, W. Saito, H. Shiku, and T. Matsue
Tohoku University, JAPAN

T11H
MICROFLUIDIC SENSOR FOR ULTRA HIGH REDOX CYCLING AMPLIFICATION FOR HIGHLY SELECTIVE ELECTROCHEMICAL MEASUREMENTS
M. Odijk, M. Straver, W. Olthuis, and A. van den Berg
MESA+, University of Twente, THE NETHERLANDS

T12H
PARALLEL RECOGNITION OF SINGLE-STRANDED DNA USING A BIOLOGICAL NANOPORE ARRAY
Y. Tsuji[1,3], R. Kawano[1], T. Osaki[1], H. Sasaki[1], N. Miki[1,3], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science and Technology (KAST), JAPAN,*
[2]*University of Tokyo, JAPAN, and* [3]*Keio University, JAPAN*

Imaging & Detection Technologies
Mass Spectrometry

T13H
DIGITAL MICROFLUIDIC CHIPS FOR AUTOMATED HYDROGEN DEUTERIUM EXCHANGE (HDX) MS ANALYSIS
L. Zhao[1], C.M. Ryan[1], K. Liu[1,2], K.F. Faull[1], J. Whitelegge[1], and C.K.-F. Shen[1]
[1]*University of California, Los Angeles, USA and*
[2]*Wuhan Textile University, CHINA*

T14H
IMPROVED WASHING IN IMMUNO-MALDI MS BY ACOUSTIC TRAPPING
B. Hammarström, J. Nilsson, T. Laurell, and S. Ekström
Lund University, SWEDEN

T15H
NON-COVALENT ANTIBODY IMMOBILIZATION ON POROUS SILICON COMBINED WITH MINIATURIZED SPE FOR ARRAY BASED IMMUNO-MALDI ASSAYS
H. Yan[1], A. Ahmad-Tajudin[1,3], M. Bengtsson[1], S. Xiao[3], T. Laurell[1,2], and S. Ekström[1]
[1]*Lund University, SWEDEN,* [2]*Dongguk University, SOUTH KOREA, and*
[3]*Nanjing University, CHINA*

Imaging & Detection Technologies
Optofluidics

T16H
HIGH RESOLUTION REVERSIBLE COLOR IMAGES ON PHOTONIC CRYSTAL SUBSTRATES
P. Kang[1], S.O. Ogunbo[2], and D. Erickson[1]
[1]*Cornell University, USA and*
[2]*University of Maryland, Baltimore County, USA*

T17H
NANO-LIQUID/LIQUID WAVEGUIDE COUPLING BY EVANESCENT TUNNELING EFFECT FOR BIOMOLECULE IMAGING APPLICATIONS
Y. Yang[1], A.Q. Liu[1], and D.P. Tsai[2]
[1]*Nanyang Technological University, SINGAPORE and*
[2]*National Taiwan University, TAIWAN*

T18H
SANDWICH IMMUNOASSAYS BASED ON THE CHANGE OF OPTOELECTROFLUIDIC PARTICLE MOBILITY
D. Han[1], H. Hwang[2], Y.-K. Cho[2], and J.-K. Park[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA and*
[2]*Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA*

Imaging & Detection Technologies
Others

T19H
A MICROREACTOR TO IMAGE CRISTALLIZATION KINETICS BY X-RAY MICROSCOPY
A. Vecchiola[1], M. Moskura[1], P. Haltebourg[1], P. Guenoun[1], J. Daillant[1], A. Madouri[2], A. Gianoncelli[3], B. Kaulich[3], C. Gosse[2], and C. Chevallard[1]
[1]*LIONS, CEA, FRANCE,* [2]*LPN-CNRS, FRANCE, and*
[3]*Elettra Sincrotrone Trieste, ITALY*

T20H
IMPEDANCE-BASED DROPLET VOLUME AND CONCENTRATION MEASUREMENT IN DIGITAL MICROFLUIDICS
G.J. Shah, S. Sadeghi, H. Ding, S. Chen, and R.M. van Dam
University of California, Los Angeles, USA

T21H
MICROFLUIDICALLY CRYO-COOLED INDUCTIVELY COUPLED SPIRAL MICROCOILS FOR MR MICROSCOPY
C. Koo, R. Godley, M.P. McDougall, S.M. Wright, and A. Han
Texas A&M University, USA

T22H
SINGLE CHIP PROBE FOR HIGH RESOLUTION MAGIC ANGLE COIL SPINNING NMR OF BIOLOGICAL SAMPLES
V. Badilita[1], B. Fassbender[2], K. Kratt[1], R. Meier[1], D. Sakellariou[2], J.G. Korvink[1], and U. Wallrabe[1]
[1]*University of Freiburg - IMTEK, GERMANY and* [2]*CEA Saclay, FRANCE*

Other Applications
Environment

T1I
GOLD NANOPARTICLE-BASED MICROFLUIDIC SENSOR FOR MERCURY DETECTION
J.P. Lafleur, T. Glasdam Jensen, and J.P. Kutter
Technical University of Denmark (DTU), DENMARK

T2I
SEA WATER DESALINATION BY MANIPULATING ELECTRICAL DOUBLE LAYER OVERLAP INSIDE ELECTROSTATICLY CHARGED AAO NANOCHANNELS
C.-J. Chang[1], Y.-S. Huang[1], S.-M. Lin[1], Y.-L. Chueh[1], and F.-G. Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

Other Applications
Separation Science

T3I
A DROPLET-BASED MICROFLUIDIC SOLVENT MICROEXTRACTION SYSTEM FOR THE DETERMINATION OF LANTHANIDE AND ACTINIDE LIQUID-LIQUID EXTRACTION KINETICS
K.P. Nichols[1], R.R. Pompano[2], L. Li[2], A.V. Gelis[1], and R.F. Ismagilov[2]
[1]*Argonne National Laboratory, USA and* [2]*University of Chicago, USA*

T4I
ACOUSTIC DEVICE FOR SELECTIVE PLATELET EXTRACTION FROM WHOLE BLOOD
J. Nam, H. Lim, D. Kim, and S. Shin
Korea University, SOUTH KOREA

T5I
DEVELOPMENT OF MICROFLUIDIC AQUEOUS TWO-PHASE SYSTEM FOR CONTINUOUS PARTITIONING OF E. coli STRAINS
P.K. Periyannan Rajeswari, H. Ramachandraiah, J. Hansson, S. Ardabili, A. Veide, and A. Russom
Royal Institute of Technology (KTH), SWEDEN

T6I
EFFECT OF PARTICLE SHAPE ON INERTIAL FOCUSING
E. Sollier[1], M. Masaeli[1], H. Amini[1], K. Camacho[2], N. Doshi[2], S. Mitragotri[2], and D. Di Carlo[1]
[1]*University of California, Los Angeles, USA,*
[2]*University of California, Santa Barbara, USA*

T7I
LAB-ON-A-CHIP IN SUPERCONDUCTING MAGNETS - A TOOL FOR PARTICLE SEPARATIONS AND BUBBLE MANIPULATION VIA DIAMAGNETIC REPULSION
M. Vojtíšek[1], M.D. Tarn[1], N. Hirota[2], and N. Pamme[1]
[1]*University of Hull, UK and* [2]*National Institute for Materials Science, JAPAN*

T8I
MICROSCALE PHOTOLYTIC ELUENT GENERATION FOR CHROMATOGRAPHY
O.G. Potter, M.E. Thomas, E.F. Hilder, and M.C. Breadmore
University of Tasmania, AUSTRALIA

T9I
RAPID BIOMOLECULE ANALYSIS USING TWO-DIMENSIONAL ELECTROPHORESIS-ELECTROSPRAY IONIZATION MICROCHIP
N. Nordman[1], T. Sikanen[1], S. Aura[2], T. Kotiaho[1], S. Franssila[2], and R. Kostiainen[1]
[1]*University of Helsinki, FINLAND and* [2]*Aalto University, FINLAND*

T10I
TILTED-BRANCH HYDRODYNAMIC FILTRATION FOR LENGTH-DEPENDENT SORTING OF ROD-LIKE PARTICLES
A. Tamura, S. Sugaya, M. Yamada, and M. Seki
Chiba University, JAPAN

Other Applications
Food & Nutrition

T11I
MODELING AND VALIDATION OF ACOUSTOPHORESIS DESIGNS FOR HIGH VOLUME THROUGHPUT SEPARATION OF MILK LIPIDS
B.Y. Guélat[1], A. Homsy[1], S. Pennathur[2], and N.F. de Rooij[1]
[1]*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and*
[2]*University of California, Santa Barbara, USA*

Other Applications
Fuel Cells

T12I
EFFECT OF MICROSCALE SURFACE GEOMETRY OF ELECTRODES ON PERFORMANCE OF MICROBIAL FUEL CELLS
T. Kano[1], E. Suito[1], and N. Miki[1,3]
[1]*Keio University, JAPAN and* [2]*NEDO BEANS Project, JAPAN*

Ballroom 6E

Session 2A3
Cellular Response & Morphology
CHAIR: M. Begley, *University of California, Santa Barbara, USA*

16:00 - 16:20

DRUG SCREENING LOBULE-MIMETIC LIVER CHIP FOR STUDYING INTERLEUKIN 8 RESPONSE IN K. PNEUMONIA INFECTED HEPATOCYTES
Y.-J. Chu[1], Z.-C. Wang[1], S.-M. Yang[1], H.-L. Peng[2], and C.-H. Liu[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*National Chiao Tung University, TAIWAN*

16:20 - 16:40

CELL MORPHOLOGY AND DEFORMABILITY IN DETERMINISTIC LATERAL DISPLACEMENT DEVICES
J.P. Beech[1], K. Adolfsson[1], S.H. Holm[1], and J.O. Tegenfeldt[1,2]
[1]*Lund University, SWEDEN and*
[2]*University of Gothenburg, SWEDEN*

16:40 - 17:00

MECHANISM FOR CELL SEPARATION BASED ON SIZE AND DEFORMABILITY USING MICROFLUIDIC RATCHETS
S.M. McFaul, B.K. Lin, and H. Ma
University of British Columbia, CANADA

Ballroom 6D

Session 2B3
Fundamental Developments
CHAIR: N. Pamme, *The University of Hull, UK*

16:00 - 16:20

MICRO- pH CONTROL BY BREAKING WATER AND ITS APPLICATIONS
L.-J. Cheng and H.-C. Chang
University of Notre Dame, USA

16:20 - 16:40

NUMERICAL MODEL FOR MICROPARTICLE AND LYMPHOCYTE MOTIONS IN DIELECTROPHORETIC MANIPULATION DEVICE
K. Tatsumi[1], K. Imajou[1], H. Shintani[1], Y. Katsumoto[2], and K. Nakabe[1]
[1]*Kyoto University, JAPAN and*
[2]*Sony Corporation, JAPAN*

16:40 - 17:00

TENSIOPHORESIS: MIGRATION AND SORTING OF DROPLETS IN AN INTERFACIAL TENSION GRADIENT
G.K. Kurup and A.S. Basu
Wayne State University, USA

Room 611-614

Session 2C3
Protein Biomarkers
CHAIR: A. Herr, *University of California, Berkeley, USA*

16:00 - 16:20

THE NEXT GENERATION MICROPLATE USING POWER OF MICROFLUIDICS FOR FEMTOGRAM/ML LEVEL SENSITIVITY
J. Kai[1], N. Santiago[1], A. Puntambekar[1], S.H. Lee[1], D.W. Sehy[1], R. Schultheis[1], J. Han[1], and C.H. Ahn[1,2]
[1]*Siloam Biosciences, USA and*
[2]*University of Cincinnati, USA*

16:20 - 16:40

HYDROGEL DISCS ON DIGITAL MICROFLUIDIC DEVICES FOR PROTEOMIC APPLICATIONS
V.N. Luk, L.K. Fiddes, A.H.C. Ng, E. Kumacheva, and A.R. Wheeler
University of Toronto, CANADA

16:40 - 17:00

MICROFLUIDIC DEVICE FOR ANALYSIS OF PROTEIN BIOMARKERS USING MAGNETIC BEAD SURFACE COVERAGE DETECTION
H.C. Tekin, C. Scherz, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

Wednesday, October 5

08:00 - 08:15 **Announcement of the 2012 Conference**

08:15 - 09:00 **Plenary Session IV** - Chair: J. Voldman, *Massachusetts Institute of Technology, USA*

ACOUSTOPHORESIS - A SOUND APPROACH TO CHIP BASED CELL HANDLING
T. Laurell
Lund University, SWEDEN and Dongguk University, SOUTH KOREA

Ballroom 6E	Ballroom 6D	Room 611-614
Session 3A1 **Microscale Tissue Models** CHAIR: S. Lunte, *University of Kansas, USA*	**Session 3B1** **Integrated *Sample-to-Result* Systems** CHAIR: T. Fujii, *University of Tokyo, JAPAN*	**Session 3C1** **Bilayers/Vesicles/Liposomes** CHAIR: S. Shoji, *Waseda University, USA*
09:15 - 09:35		
A HIGH THROUGHPUT MICROFLUIDIC DEVICE FOR GENERATING MULTIPLE HUMAN MICROTISSUES WITH PERFUSED CAPILLARIES Y.-H. Hsu, M.L. Moya, C.C.W. Hughes, S.C. George, and A.P. Lee *University of California, Irvine, USA*	**8-PLEX SAMPLE-IN-ANSWER-OUT CARTRIDGE FOR PATHOGEN DETECTION** H. Becker, N. Hlawatsch, R. Klemm, and C. Gärtner *microfluidic ChipShop GmbH, GERMANY*	**INTEGRATED MICROFLUIDIC PLATFORM FOR BILAYER STUDIES AND EXPERIMENTATION ON SINGLE PORE-FORMING SPECIES** V.C. Stimberg, A. van den Berg, and S. Le Gac *MESA+, University of Twente, THE NETHERLANDS*
09:35 - 09:55		
FORMATION OF COMPLEX HEPATIC ORGANOIDS USING MICROFABRICATED ANISOTROPIC HYDROGEL FIBERS M. Yamada[1], R. Utoh[2], K. Ohashi[1], M. Yamato[1], T. Okano[1], and M. Seki[2] [1]*Chiba University, JAPAN and* [2]*Tokyo Women's Medical University, JAPAN*	**AN INTEGRATED MICROFLUIDIC PROBE FOR CONCENTRATION-ENHANCED SELECTIVE SINGLE CELL KINASE ACTIVITY MEASUREMENT** A. Sarkar, S. Kolitz, L.F. Cheow, D. Lauffenburger, and J. Han *Massachusetts Institute of Technology, USA*	**MICROFLUIDIC PLATFORMS FOR ON-CHIP FORMULATION AND SMALL-ANGLE X-RAY ANALYSIS OF THE PHASE BEHAVIOR OF LIPID/WATER MIXTURES** D.S. Khvostichenko[1], S.L. Perry[1], E. Kondrashkina[2], S. Guha[1], K. Brister[2], and P.J.A. Kenis[1] [1]*University of Illinois, Urbana-Champaign, USA and* [2]*Northwestern University, USA*
09:55 - 10:15		
A MULTI-LAYERED MICROFLUIDIC DEVICE FOR IN VITRO BLOOD-BRAIN BARRIER PERMEABILITY STUDIES R. Booth and H. Kim *University of Utah, USA*	**AUTOMATED SYSTEM FOR HIGH-THROUGHPUT SCREENS FROM MICROLITER SAMPLES** K. Churski[1], T. Kamiński[1], S. Jakiela[1], Ł. Szultka[2], W. Barańska-Rybak[2], W. Kamysz[2], and P. Garstecki[1] [1]*Polish Academy of Sciences, POLAND and* [2]*Medical University of Gdańsk, POLAND*	**FORMATION, IMMOBILIZATION AND LOCAL MANIPULATION OF TUBULAR LIPID MEMBRANE STRUCTURES** A. Cavegn and P.S. Dittrich *ETH Zürich, SWITZERLAND*

10:15 - 10:45 **Break and Exhibit Inspection**

Ballroom 6E	Ballroom 6D	Room 611-614
Session 3A2 **Cell Manipulation, Capture & Analysis** CHAIR: S. Takeuchi, *University of Tokyo, JAPAN*	**Session 3B2** **Energy & the Environment** CHAIR: C. Henry, *Colorado State University, USA*	**Session 3C2** **Robots & Microscopy** CHAIR: P. Yang, *Fudan University, CHINA*
10:45 - 11:05		
SINGLE CELL MIGRATION CHIP USING HYDRODYNAMIC CELL POSITIONING Y.-C. Chen, X. Lou, P. Ingram, and E. Yoon *University of Michigan, USA*	**NOVEL OPTICAL SENSING SYSTEM BASED ON WIRELESS PAIRED EMITTER DETECTOR DEVICE FOR LAB ON A DISC WATER QUALITY ANALYSIS** M. Czugala, R. Gorkin, T. Phelan, J. Ducrée, D. Diamond, and F. Benito-Lopez *Dublin City University, IRELAND*	**ULTRA-HIGH-SPEED ROBOT HAND AND EYE FOR INVESTIGATION OF MICROORGANISMS IN A CHIP** T. Kawahara[1], M. Sugita[1], M. Hagiwara[1], Y. Yamanishi[1,2], and F. Arai[1,3] [1]*Nagoya University, JAPAN,* [2]*Japan Science and Technology Agency (JST), JAPAN, and* [3]*Seoul National University, SOUTH KOREA*
11:05 - 11:25		
A MICROFLUIDIC DEVICE FOR HIGHLY EFFICIENT PROCESSING OF YEAST CULTURE K. Mogi and T. Fujii *University of Tokyo, JAPAN*	**DEVELOPMENT OF A HANDHELD OPTOFLUIDIC IMMUNOSENSOR TO TRACK THE TRANSPORT AND DISTRIBUTION OF H1N1/2009 VIRUS IN A MOCK CLASSROOM** H.-J. Kwon, S.V. Angus, D.J. You, C.C. Stemple, and J.-Y. Yoon *University of Arizona, USA*	**COMPACT AND COST-EFFECTIVE LENSLESS TOMOGRAPHIC ON-CHIP MICROSCOPE** S.O. Isikman, W. Bishara, U. Sikora, O. Yaglidere, J. Yeah, and A. Ozcan *University of California, Los Angeles, USA*
11:25 - 11:45		
HIGH-THROUGHPUT CELLULAR SAMPLE PREPARATION VIA ULTRAFAST SOLUTION EXCHANGE D.R. Gossett, H.T.K. Tse, J. Dudani, and D. Di Carlo *University of California, Los Angeles, USA*	**MICROFLUIDIC MICROBIAL FUEL CELL ARRAY FOR MULTIPLEXED LONG-TERM PARALLEL ANALYSIS OF MICROBIAL ACTIVITIES** H. Hou, L. Li, P. de Figueiredo, and A. Han *Texas A&M University, USA*	**LIVE CELL IMAGING USING PHOTONIC CRYSTAL NANOLASER ARRAY** H. Abe, M. Narimatsu, S. Kita, A. Tomitaka, Y. Takemura, and T. Baba *Yokohama National University, JAPAN*

11:45 - 13:00 | **Lunch (on own)**

13:00 - 13:45 **Plenary Session V** - Chair: D.J. Harrison, *University of Alberta, CANADA*

CENTRIFUGAL MICROFLUIDICS
Y.-K. Cho - *Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA*

13:45 - 16:00 **Poster Session III** *(refreshments will be served at 15:00)*

Life Science Applications
Genomics & Proteomics

W1A
A MICROFLUIDIC DEVICE FOR DETECTION OF SINGLE NUCLEOTIDE POLYMORPHISMS BY ALLELE SPECIFIC SINGLE BASE EXTENSION
J. Zhu, C. Qiu, M. Palla, T.H. Nguyen, J. Ju, and Q. Lin
Columbia University, USA

W2A
A SELF-DISPENSING MICROFLUIDIC CHIP WITH THE OSMOTIC DEWATERING METHOD FOR NANOVOLUME CHEMISTRY AND PROTEIN CRYSTALLIZATION
Y. Luo, Q. Chen, G. Li, and J. Zhao
Chinese Academy of Sciences, CHINA

W3A
CHIP BASED ASSEMBLY OF VESICULAR BIO-SENSORS USING QUANTUM DOTS AS BIO-PROBES
R. Prakash and K.V.I.S. Kaler
University of Calgary, CANADA

W4A
CONTINUOUS MICROFLUIDIC DNA AND PROTEIN TRAPPING AND CONCENTRATION BY BALANCING TRANSVERSE ELECTROKINETIC FORCES
M.C. Morales, H. Lin, and J.D. Zahn
Rutgers University, USA

W5A
FAST MEASUREMENT OF PROTEIN-LIGAND KINETICS USING DUAL SLOPE SPR MICROCHIPS
T. Ghosh and C. Mastrangelo
University of Utah, USA

W6A
MOLECULAR SCREENING ON A CHIP BY DNA-DISPLAYED PROTEIN MICROARRAY
M. Biyani[1,2], R. Kobayashi[1], S. Sato[1], and T. Ichiki[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W7A
PURIFICATION OF miRNA FROM WHOLE BLOOD BY CHEMICAL LYSIS AND PHASE SEPARATION IN A CENTRIFUGO-PNEUMATIC MICROHOMOGENIZER
A.V. Linares[1], R. Gorkin III[1], B. Glynn[2], N. Godino[1], N. Miller[2], M. Kerin[2], T. Barry[2], T. Smith[2], and J. Ducrée[2]
[1]*Dublin City University, IRELAND and* [2]*National University of Ireland, IRELAND*

Life Science Applications
Drug Development

W8A
GRADIENT HYDROGELS FOR HIGH THROUGHPUT DRUG SCREENING
S. Ostrovidov[1], N. Annabi[2], F. Dehghani[3], A. Seidi[4], M. Ramalingam[5], H. Kaji[2], and A. Khademhosseini[2]
[1]*Tohoku University, JAPAN,*
[2]*Massachusetts Institute of Technology, USA,*
[3]*University of Sydney, AUSTRALIA,*
[4]*Okinawa Institute of Science and Technology, JAPAN, and*
[5]*University of Strasbourg, FRANCE*

W9A
MINIATURIZED FLUID ARRAY DEVICE FOR HIGH-THROUGHPUT DRUG SCREENING
R. Khnouf[1], D. Olivero[2], S. Jin[2], and Z.H. Fan[2]
[1]*Jordan University of Science and Technology, JORDAN and*
[2]*University of Florida, USA*

Life Science Applications
Cell Culture/ Handling/ Analysis

W10A
96 PILLAR-WELL PLATE FOR 3D CELL CULTURE
D.W. Lee[1], S.H. Yi[1], S.H. Jeong[1], B.S. Ku[1], J. Kim[2], and M.-Y. Lee[3]
[1]*Samsung Electro-Mechanics Co., Ltd., SOUTH KOREA,*
[2]*Sungkyunkwan University, SOUTH KOREA, and*
[3]*Solidus Biosciences, Inc. USA*

W11A
A HYBRID ELECTROKINETIC PROCESSOR FOR ISOLATING EXFOLIATED CANCER CELLS AND CIRCULATING TUMOR CELLS IN PHYSIOLOGICAL SAMPLES
J. Gao[1], R. Riahi[2], M.L.Y. Sin[2], and P.K. Wong[2]
[1]*Shandong Polytechnic University, CHINA and* [2]*University of Arizona, USA*

W12A
A MICROFLUIDIC DEVICE TO MIMIC THE BONE MARROW MICROENVIRONMENT: REAL-TIME OBSERVATION OF THE LEUKEMIC CELL BEHAVIOR
T. Munaka[1], M. Kanai[1], H. Abe[1], E. Ashihara[2], S. Kimura[3], and T. Maekawa[4]
[1]*Shimadzu Corporation, JAPAN,* [2]*Kyoto Prefectural University of Medicine, JAPAN,*
[3]*Saga University, JAPAN, and* [4]*Kyoto University Hospital, JAPAN*

W13A
A NEW UNDERSTANDING OF CELL MOTILITY ENABLED BY A MICROFLUIDIC IN VITRO MODEL
K.A. Wilson, A.R.M. Lewalle, M. Fritzsche, T. Duke, and G.T. Charras
University College London, UK

W14A
ACCELERATION OF THE EMERGENCE OF BACTERIAL ANTIBIOTIC RESISTANCE
Q. Zhang, D. Liao, and R.H Austin
Princeton University, USA

W15A
CHARACTERIZATION OF ADHESION PROTEINS FOR CELL MECHANOTRANSDUCTION ASSAYS
E. Martin, C. Chung, and B. Pruitt
Stanford University, USA

W16A
CONTINUOUS AND LABEL-FREE TOXICITY SCREENING OF HUMAN HEPATOCYTES ON CHIP REVEALS FREQUENCY-DEPENDENT IMPEDANCE PROFILES
R. Meissner, B. Eker, and Ph. Renaud
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

W17A
DIFFERENTIATION INDUCTION OF NEURONAL STEM CELLS IN 3D FIBER-SHAPED MICROENVIRONMENT
H. Onoe[1,2], M. Kato-Negishi[1], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W18A
EVALUATING THE EFFECTS OF FLUID FLOW PATTERNS ON S1P1 AND S1P2 RECEPTORS
R. Estrada, G. Giridharan, and P. Sethu
University of Louisville, USA

W19A
FORMING OF 3D NEURONAL PATHWAY BY NEURONAL BLOCK ASSEMBLY
M. Kato-Negishi[1], H. Onoe[1,2], Y. Morimoto[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W20A
HEPATOCYTE CO-CULTURE IN ALGINATE HYDROGEL FOR ANTI-CANCER DRUG ANAYSIS
L.K. Chin, K.Q. Luo, and A.Q. Liu
Nanyang Technological University, SINGAPORE

W21A
HUMAN KIDNEY PROXIMAL TUBULE-ON-A-CHIP FOR DRUG TRANSPORTER STUDIES AND NEPHROTOXICITY ASSESSMENT
K.-J. Jang[1], G.A. Hamilton[1], L. McPartlin[1], A. Bahinski[1], H.N. Kim[2], K.-Y. Suh[2], and D.E. Ingber[1,3]
[1]*Harvard University, USA,* [2]*Seoul National University, SOUTH KOREA, and*
[3]*Children's Hospital, Harvard Medical School and Harvard School of Engineering and Applied Sciences, USA*

W22A
INVESTIGATING NEUROPROTECTIVE EFFECTS OF PRIMARY GLIAL CELLS USING OVERFLOW MICROFLUIDIC NETWORKS
F. Bianco[1], N. Tonna[1], R.D. Lovchik[2], R. Morini[3,4], A. Ruiz[3,4], R. Mastrangelo[1], E. Delamarche[2], and M. Matteoli[3,4]
[1]*Neuro-Zone s.r.l., ITALY,* [2]*IBM Research GmbH, SWITZERLAND,*
[3]*Fondazione Filarete, ITALY, and* [4]*University of Milano, ITALY*

W23A
MASSIVELY PARALLEL MICROFLUIDIC CELL-PAIRING PLATFORM FOR THE STATISTICAL STUDY OF IMMUNOLOGICAL CELL-CELL INTERACTIONS
M.M. Hoehl, S.K. Dougan, H.L. Ploegh, and J. Voldman
Massachusetts Institute of Technology, USA

W24A
MICROFLUIDIC ANALYSIS OF NEURODEGENERATIVE IMPACT EVOKED BY LOCAL STIMULATION-TRIGGERED APOPTOTIC INFORMATION
Y. Edagawa[1], T. Watanabe[1], M. Fujii[1], K. Kawai[2], and S. Shoji[1]
[1]*Waseda Institute for Advanced Study, JAPAN and* [2]*Osaka University, JAPAN*

W25A
MICROFLUIDIC JET INJECTION FOR DELIVERY OF COMPOUNDS INTO CELLS
A. Adamo, A. Sharei, O. Roushdy, R. Dokov, and K.F. Jensen
Massachusetts Institute of Technology, USA

W26A
MICROFLUIDIC PROTOCOL FOR PRE-IMPLANTATION CULTURE OF SINGLE MAMMALIAN EMBRYOS: TOWARDS AN OPTIMAL CULTURE PROTOCOL
T.C. Esteves[1], F. van Rossem[2], M. Bioani[1], A. van den Berg[2], and S. Le Gac[2]
[1]*Max Planck Institute for Molecular Biomedicine, GERMANY and*
[2]*MESA+, University of Twente, THE NETHERLANDS*

W27A
ON-CHIP PERVAPORATION-FREE CONTROL OF GAS PARTIAL PRESSURES
P.C. Thomas[1], L.E. Locascio[1], S.R. Raghavan[2], and S.P. Forry[1]
[1]*National Institute of Standards and Technology (NIST), USA and*
[2]*University of Maryland, USA*

W28A
OPTICAL FEEDBACK CONTROL/ANALYSIS OF PHOTOREACTIVE EUGLENA CELLS SWIMMING IN MICRO-AQUARIUMS
K. Ozasa[1], J. Lee[2], S. Song[2], M. Hara[1], and M. Maeda[1]
[1]*Institute of Physical and Chemical Research (RIKEN), JAPAN and*
[2]*Hanyang University, SOUTH KOREA*

W29A
POLARIZED HEPATOCYTE CULTURE USING 3D PATTERNED COLLAGEN GEL FOR ANALYSIS OF BILIARY METABOLITES
H. Matsui[1], M. Sekijima[2], T. Fujii[3], S. Takeuchi[3], and Y. Sakai[3]
[1]*BEANS Laboratory, JAPAN,*
[2]*Mitsubishi Chemical Medience Co. Ltd., JAPAN, and*
[3]*University of Tokyo, JAPAN*

W30A
QUANTITATIVE ANALYSIS OF THE INTERACTIONS BETWEEN 3D HEPATOCYTE TISSUES AND CAPILLARY NETWORKS IN A MICROFLUIDIC PLATFORM
T. Tsuji[1], S. Chung[2], R. Kamm[3], M. Ikeda[1], K. Tanishita[1], and R. Sudo[1]
[1]*Keio University, JAPAN,* [2]*Korea University, SOUTH KOREA, and*
[3]*Massachusetts Institute of Technology, USA*

W31A
REAL TIME MONITORING OF CELLULAR DYNAMICS USING A MICROFLUIDIC CELL CULTURE SYSTEM WITH INTEGRATED ELECTRODE ARRAY AND POTENTIOSTAT
K. Zor[1,2], M. Vergani[3], A. Heiskanen[2], E. Landini[4], M. Carminati[3], V. Coman[2], I. Vedarethinam[2], P. Skafte-Pedersen[2], M. Skolimowski[2], A. Martinez Serrano[5], M. Kokaia[1], T. Ramos Moreno[5], A. Ghio[4], W.E. Svendsen[2], M. Dimaki[2], Z. Keresztes[6], M. Adamovski[7], U. Wollenberger[7], D. Sabourin[2], G. Ferrari[3], R. Raiteri[4], M. Sampietro[3], M. Dufva[2], and J. Emnéus[2]
[1]*Lund University, SWEDEN,* [2]*Technical University of Denmark (DTU), DENMARK,*
[3]*Politecnico of Milano, ITALY,* [4]*University of Genova, ITALY,*
[5]*University of Autonomous of Madrid, SPAIN,*
[6]*Hungarian Academy of Sciences, HUNGARY, and*
[7]*University of Potsdam, GERMANY*

W32A
SINGLE-CELL MICROCENTRIFUGATION WITH MONITORED SUPERNATANT REPLACEMENT IN A MICROWELL BASED DEVICE
A. Faenza[1], M. Bocchi[2], L. Rambelli[1], L. Giulianelli[1], E. Franchi[1], and R. Guerrieri[1]
[1]*University of Bologna, ITALY and* [2]*MindSeeds Laboratories, ITALY*

W33A
SPHEROID CELL CULTURE ON PDMS HYDROPHOBIC SURFACES AND INTEGRATION INTO MICROFLUIDIC DEVICES
P. Ingram, M. Im, S. McDermott, M. Wicha, and E. Yoon
University of Michigan, USA

W34A
THE RESPONSE OF YEAST CELLS TO A CHANGE IN THE DIRECTION OF A PHEROMONE GRADIENT IN A MICROFLUIDIC DEVICE
M.-E. Brett, R. DeFlorio, D. Stone, and D. Eddington
University of Illinois, Chicago, USA

W35A
THREE DIMENSIONAL TISSUE BASED DIGITAL MICROFLUIDIC SCREENING PLATFORM
S.M. George and H. Moon
University of Texas, Arlington, USA

W36A
ULTRAHIGH SPEED CELL MANIPULATION BY ROBOT ON A CHIP: A LEVITATED STRUCTURE WITH THREE-DIMENSIONALLY PATTERNED SURFACE
M. Hagiwara[1], T. Kawahara[1], T. Masuda[1], T. Iijima[2], Y. Yamanishi[1,3], and F. Arai[1,4]
[1]*Nagoya University, JAPAN,* [2]*Muroran Institute of Technology, JAPAN,*
[3]*Japan Science and Technology Agency (JST), JAPAN, and*
[4]*Seoul National University, SOUTH KOREA*

Life Science Applications
Others

W37A
A SIMPLE PDMS-BASED SUCTION DEVICE FOR STABILIZING IN VIVO REAL-TIME FLUORESCENCE IMAGING OF TRANSPLANTED CELLS IN LIVE ANIMALS
K. Shimizu[1,2], Y. Higuchi[1,3], Y. Kozu[1], M. Hashida[1], and S. Konishi[1,2]
[1]*Kyoto University, JAPAN,* [2]*Ritsumeikan University, JAPAN, and*
[3]*Japan Science and Technology Agency (JST), JAPAN*

W38A
DESIGNER BIOFILMS: CONTROLLING BIOFILM FORMATION AND DISPERSAL USING A SYNTHETIC QUORUM SENSING CIRCUIT IN MICROFLUIDIC DEVICES
M. Hegde, J. Kim, S.H. Hong, T.K. Wood, and A. Jayaraman
Texas A&M University, USA

W39A
HIGH-THROUGHPUT CELLULAR-RESOLUTION FOR IN VIVO VERTEBRATE SCREENING
C. Pardo-Martin[1,2], T.-Y. Chang[1], A. Allalou[3], C. Whälby[3,4], and M.F. Yanik[1,4]
[1]*Massachusetts Institute of Technology, USA,* [2]*Harvard University, USA,*
[3]*Uppsala University, SWEDEN, and* [4]*Broad Institute, USA*

W40A
LONG-TERM BRAIN SLICE CULTURING IN A MICROFLUIDIC PLATFORM
I. Vedarethinam[1], N. Avaliani[2], J. Tønnesen[2], J. Hansen[3], D. Sabourin[1], M. Dimaki[1], M. Kokaia[2], M. Dufva[1], W.E. Svendsen[1], J. Emnéus[1], and A. Heiskanen[1]
[1]*Technical University of Denmark (DTU), DENMARK,*
[2]*Lund University, SWEDEN, and* [3]*Aquaporin A/S, DENMARK*

W41A
ON-CHIP BEADS MANIPULATION FOR IMMUNOASSAY
T. Ishikawa[1,2], J.-S. Lee[1], and R. Miyake[1,2]
[1]*Hiroshima University, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W42A
PULSE WIDTH MODULATION OF LIQUID FLOWS: TOWARDS DYNAMIC CONTROL OF CELL MICROENVIRONMENTS
M. Unger[1], S.S. Lee[1,2], M. Peter[1,2], and H. Koeppl[1,2]
[1]*ETH Zürich, SWITZERLAND and*
[2]*Competence Center for Systems Physiology and Metabolic Diseases, SWITZERLAND*

Microreaction Applications
Flow Chemistry / Synthesis

W1B
A MICROFLUIDIC TOOLBOX FOR THE DEVELOPMENT OF MULTI-STEP BIOCATALYTIC PROCESSES
J. Lawrence[1], H. Al-Bahrani[1], B. O'Sullivan[1], R. Wohlgemuth[2], H.C. Hailes[1], and N. Szita[1]
[1]*University College London, UK and* [2]*Sigma-Aldrich, UK*

W2B
FLOW LITHOGRAPHY IN GAS IMPERMEABLE CHANNELS
K.W. Bong, J.J. Xu, J.H. Kim, S.C. Chapin, M.S. Strano, K.K. Gleason, and P.S. Doyle
Massachusetts Institute of Technology, USA

W3B
MICROREACTOR-BASED SYSTEM FOR RADIOLABELING OF BIOMOLECULES WITH METALLIC RADIOISOTOPES
A.V. Desai[1], D. Zeng[2], T.D. Wheeler[1], D. Ranganathan[2], D.E. Reichert[2], and P.J.A. Kenis[1]
[1]*University of Illinois, Urbana-Champaign, USA and*
[2]*Washington University School of Medicine, St. Louis, USA*

Microreaction Applications
In-Line Analysis/Process Control

W4B
HIGH FIDELITY MICROCHANNEL TEMPERATURE CONTROL TO FACILITATE CF-PCR OF DIFFICULT DNA TARGETS
A. Harandi and T. Farquhar
University of Maryland, Baltimore County, USA

W5B
MICROFLUIDIC DEVICE WITH INTEGRATED FLOW CONTROL ELEMENTS FOR CHEMILUMINESCENCE-BASED MN DETECTION IN DEEP-SEA ENVIRONMENTS
C. Provin[1], T. Fukuba[1], H. Kinoshita[1], K. Okamura[2], and T. Fujii[1]
[1]*University of Tokyo, JAPAN and* [2]*Kochi University, JAPAN*

Microreaction Applications
Integrated Synthesis & Work-up

W6B
COMPARTMENTALIZED MULTI-STEP MICROSCALE BIOCHEMICAL REACTION IN SUSPENSION OF AGAROSE MICROBEADS
T. Yamamoto[1], D. Saeki[1,2], S. Sugiura[3], T. Kanamori[3], S. Sato[1], and S. Ichkawa[1]
[1]*University of Tsukuba, JAPAN,* [2]*Kobe University, JAPAN, and*
[3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

Microreaction Applications
Others

W7B
FORMATION OF POLYMER VESICLES FROM MICRODROPLETS OF POLYION COMPLEX AND EXAMINATION OF THEIR PHYSICOCHEMICAL PROPERTIES IN MICROFLUIDIC CHAMBER
H. Oana, M. Morinaga, A. Kishimura, M. Gel, K. Kataoka, and M. Washizu
University of Tokyo, JAPAN

W8B
RAPID FABRICATION OF A BIOMIMETIC ORGANIC/INORGANIC MULTI-LAYERED COMPOSITE BY MULTIPLE-FOLDING OF A SINGLE-LAYERED COMPOSITE
M. Hori[1], D. Kiriya[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W9B
STUDY OF HYPERGOLIC PROPELLANTS USING MICRO-REACTORS
P. Saksena, S. Tadigadapa, and R.A. Yetter
Pennsylvania State University, USA

Microfluidic Fundamentals
Fluid Mechanics & Modeling

W1C
CONTROLLING THE SHAPE OF A HYDRODYNAMICALLY FOCUSED STREAM
M. Nasir and F. Ligler
Naval Research Laboratory (NRL), USA

W2C
INERTIAL MICROFLUIDIC STUDY OF INTERPARTICLE-INDUCED DEFOCUSING AND STEPWISE EXPANSION CHANNELS THAT REDUCE DEFOCUSING
W. Lee[1,2], H. Amini[1], and D. Di Carlo[1]
[1]*University of California, Los Angeles, USA,*
[2]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA*

W3C
ON-CHIP WESTERN BLOTTING: IN-SITU RENATURATION OF SDS-PROTEIN COMPLEXES UNIFIES SODIUM DODECYL SULFATE (SDS) SIZING & BLOTTING IN ONE MICRODEVICE
C. Hou and A.E. Herr
University of California, Berkeley, USA

W4C
SIMULATION, DESIGN, AND CHARACTERIZATION OF MICROEDDY HYDRODYNAMIC TWEEZERS
T.A. House, V.H. Lieu, J. Chen, B.R. Lutz, and D.T. Schwartz
University of Washington, USA

Microfluidic Fundamentals
Micro Liquid Handling

W5C
A DIELECTROPHORESIS MICROPUMP FOR ON-CHIP PARTICLES TRAPPING AND BLOOD DRIVING IN A VIRTUAL CHANNEL
Y.-C. Yeh, I.-P. Lu, and S.-K. Fan
National Chiao Tung University, TAIWAN

W6C
CONTROLLING ACOUSTIC STREAMING IN A MULTI-WELL MICROPLATE FOR IMPROVING LIVE CELL ASSAYS
M. Ohlin, A.E. Christakou, T. Frisk, B. Önfelt, and M. Wiklund
Royal Institute of Technology (KTH), SWEDEN

W7C
FABRICATION OF TITANIA MICROSPHERES USING ALGINATE MICRODROPLETS ON AN OIL/HYDROGEL INTERFACE
K. Aketagawa, H. Hirama, H. Moriguchi, and T. Torii
University of Tokyo, JAPAN

W8C
GIANT UNILAMELLAR VESICLES AS A PLATFORM OF LIQUID HANDLING IN FEMTOLITER VOLUMES
H. Terasawa[1], H. Suzuki[1,2], K. Nishimura[1], T. Matsuura[1,2], and T. Yomo[1,2]
[1]*Osaka University, JAPAN and* [2]*Japan Science and Technology Agency (JST)*

W9C
MODULAR CONTROL SYSTEM FOR REAL-TIME ON-CHIP GENERATION AND ROUTING OF TEMPORAL CONCENTRATION GRADIENTS IN MICROFLUIDIC CHIPS
A.J. Conde[1], D. Sabourin[2], P. Skafte-Pedersen[2], and M. Dufva[2]
[1]*Universidad Nacional de Tucumán, ARGENTINA and*
[2]*Technical University of Denmark (DTU), DENMARK*

W10C
FABRICATION OF FLEXIBLE DRUG DELIVERY CHANNEL EMBEDDED LCP BASED HYBRID NEURAL PROSTHESIS
J. Byun, H. Ryu, K.S. Min, S.J. Kim, and N.L. Jeon
Seoul National University, SOUTH KOREA

W11C
QUANTIFICATION OF THE MIX AND CATCH EFFICIENCY BY MICROPARTICLES FOR BIOSENSING WITH SINGLE-MOLECULE RESOLUTION
A. van Reenen[1], A.M. de Jong[1], and M.W.J. Prins[1,2]
[1]*Eindhoven University of Technology, THE NETHERLANDS and*
[2]*Philips Research, THE NETHERLANDS*

W12C
STREAM FORMATION IN HYDROGELS: MICRORIVERS ON A CHIP
V. Bazargan and B. Stoeber
University of British Columbia, CANADA

W13C
UNCONVENTIONAL DROPLETS MANIPULATIONS ON SUPERHYDROPHOBIC-PATTERNED SURFACE MICROFLUIDICS
S. Xing, R.S. Harake, and T. Pan
University of California, Davis, USA

Microfluidic Fundamentals
Multi-Phase & Digital Microfluidics

W14C
ARRAYING AND SHUFFLING TRIPLE MICROBEADS WITH DYNAMIC MICROARRAY DEVICE
T. Tonooka[1], T. Teshima[1], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W15C
DROPLET SYNCHRONIZATION OF TWO PARALLEL TRAINS OF DROPLETS USING A LADDER-LIKE CHANNEL NETWORK
B. Ahn, K. Lee, H. Lee, R. Panchapakesan, L. Xu, J. Xu, and K.W. Oh
State University of New York, Buffalo, USA

W16C
HIGH ASPECT RATIO INERTIAL MICROFLUIDIC FOCUSING FOR PASSIVE SIZE-SELECTIVE SORTING AND ENRICHMENT
N. Fletcher, A.E. Reece, and J.S. Oakey
University of Wyoming, USA

W17C
INTEGRATED TOP-DOWN/BOTTOM-UP MASS SPECTROMETRY OF PROTEINS USING A DROPLET MICROFLUIDIC PLATFORM
A.A. Stokes[1], C.L. Mackay[2], D. Gruber[2], Y. Li[2], D.J. Clarke[2], A.J. Walton[2], and P. Langridge-Smith[2]
[1]*Harvard University, USA and* [2]*University of Edinburgh, UK*

W18C
MICRODROPS ON MESH FOR THE EFFICIENT FORMATION OF A CELL-BASED SCREENING ARRAY
E. Um and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

W19C
MICROFLUIDIC PRODUCTION OF MONODISPERSE SILICONE MICROPARTICLES FOR OXYGEN-SENSING
K. Jiang[1], P. Thomas[1], S. Forry[2], D.L. DeVoe[1], and S.R. Raghavan[1]
[1]*University of Maryland, USA and*
[2]*National Institute of Standards and Technology (NIST), USA*

W20C
ONE-STEP SYNTHESIS OF SPHERICAL/NONSPHERICAL POLYMERIC PARTICLES USING NON-EQUILIBRIUM MICROFLUIDIC DROPLETS
Y. Suzuki, M. Yamada, K. Sasamori, T. Taniguchi, and M. Seki
Chiba University, JAPAN

W21C
SPIDER-INSPIRED MICROFLUIDIC CHANNEL FOR TUNABLE PHYSICOCHEMICAL ENCODING OF MATERIAL COMPOSITION AND TOPOGRAPHY IN CONTINUOUS MICROFIBERS
E. Kang, Y.Y. Choi, and S.H. Lee
Korea University, SOUTH KOREA

W22C
TUNABLE MONODISPERSE FEMTOLITER DROPLET ARRAY USING 3D MICROFLUIDIC TRAPS
T. Wu[1,3], H. Suzuki[2,3], T. Yomo[2,3], R. Xiang[1], X. Gui[1], and Z. Tang[1]
[1]*Sun Yat-sen University, CHINA,*
[2]*Japan Science and Technology Agency (JST), JAPAN, and*
[3]*Osaka University, JAPAN*

Microfluidic Fundamentals
Multiscale/ Integrative Microfluidics

W23C
CAPILLARY ELECTROPHORESIS IN VIRTUAL MICROCHANNEL BASED ON DIELECTROPHORESIS
C.-Y. Huang, S.-K. Fan, and W. Hsu
National Chiao Tung University, TAIWAN

W24C
FULL INTEGRATION AND AUTOMATION OF IMMUNOASSAY PROTOCOLS BY ROTATIONALLY ACTUATED DISSOLVABLE FILM VALVES
C. Nwankire[1], R. Gorkin[2], J. Siegrist[1], J. Gaughran[2], D.-S. Chan[1], and J. Ducrée[1,2]
[1]*National Centre for Sensor Research, IRELAND and*
[2]*Dublin City University, IRELAND*

W25C
FULLY INTEGRATED CENTRIFUGAL MICROFLUIDIC PLATFORM FOR ELECTROCHEMICAL BIOMARKER DETECTION
T.H. Kim[1], V. Sunkara[1], K. Abi-Samra[2], M. Amasia[2], S.J. Oh[1], N. Kim[3], J. Kim[3], H. Kim[3], M. Madou[2], and Y.K. Cho[1]
[1]*Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA,*
[2]*University of California, Irvine, USA, and* [3]*Samsung Electronics, SOUTH KOREA*

Microfluidic Fundamentals
Others

W26C
MICROFLUIDIC DEVICE FOR DETECTION OF CHEMICALS IN AQUEOUS MIXTURES USING SURFACE ENHANCED RAMAN SPECTROSCOPY
C. Andreou, M.R. Hoonejani, M.R. Barmi, B. Piorek, M. Moskovits, and C.D. Meinhart
University of California, Santa Barbara, USA

Integrated Micro- and Nanotechnologies
Genetic Analysis Systems

W1D
5-METHYL CYTOSINE PROFILING ON SINGLE DNA MOLECULES CONFINED TO NANOCHANNELS
S.F. Lim, A. Karpusenko, and R. Riehn
North Carolina State University, USA

W2D
AN INTEGRATED MICROFLUIDIC PLATFORM FOR RAPID DETECTION AND SUBTYPING OF INFLUENZA VIRUS
C.-H. Tai[1], C.-H. Wang[2], S.-Y. Yang[2], C.-C. Lin[1], and G.-B. Lee[2]
[1]*National Cheng Kung University, TAIWAN and*
[2]*National Tsing Hua University, TAIWAN*

W3D
DROPLET-BASED POLYMERASE CHAIN REACTION (PCR) USING INFRARED-MEDIATED HEATING SYSTEM
K. Oh, D.A. Nelson, and J.P. Landers
University of Virginia, USA

W4D
LABEL-FREE DETECTION OF DNA AMPLIFICATION IN DROPLETS USING ELECTRICAL IMPEDANCE
M.G. Simon, R. Lin, J. Lopez-Prieto, and A.P. Lee
University of California, Irvine, USA

W5D
MICROFLUIDIC DEVICES TO ELUCIDATE HUMAN GENE PARTICIPATION INFECTION OF RIFT VALLEY FEVER VIRUS
B.R. Schudel, O.A. Negrete, B. Harmon, B.W. Pruitt, and A.K. Singh
Sandia National Laboratories, USA

W6D
RAPID, INDEPENDENTLY CONTROLLED POLYMERASE CHAIN REACTION VIA MULTIPLEXED LASER RADIATION
C.R. Phaneuf, N. Pak, D.C. Saunders, and C.R. Forest
Georgia Institute of Technology, USA

Integrated Micro- and Nanotechnologies
Proteomic Analysis

W7D
A SYRINGE-VACUUM DRIVEN MICROFLUIDIC CHIP INTEGRATED WITH BEADS-BASED ELISA FOR EARLY DETECTION OF BLADDER CANCER
Y.-J. Chen, Y.-H. Lin, C.-S. Lai, Y.-T. Chen, J.-S. Yu, and Y.-S. Chang
Chang Gung University, TAIWAN

W8D
INTEGRATED MULTI-TIP PHOTOCATALYTIC NANOREACTOR ELECTROSPRAY CHIP FOR PHOSPHOPEPTIDE ENRICHMENT AND OXIDATION
M. Ruokolainen[1], T. Sikanen[1], L. Sainiemi[1], T. Nissilä[1], R.A. Ketola[1], S. Franssila[2], R. Kostiainen[1], and T. Kotiaho[1]
[1]*University of Helsinki, FINLAND and*[2]*Aalto University, FINLAND*

W9D
THE NANOMECHANICAL RESPONSE OF PROTEIN BEHAVIOR VIA DIRECT ELECTRICAL SIGNALS USING PIEZOELECTRIC MICROCANTILEVERS
J.H. Lee[1], K.S. Hwang[2], D.S. Yoon[3], J.Y. Kang[1], S.K. Kim[1], and T.S. Kim[1]
[1]*Kwangwoon University, SOUTH KOREA,*
[2]*Korea Institute of Science and Technology (KIST), SOUTH KOREA, and*
[3]*Yonsei University, SOUTH KOREA*

Integrated Micro- and Nanotechnologies
Single or Multi-Cell Analysis

W10D
A MICROFLUIDIC DEVICE FOR SORTING CANCER CELLS BASED ON CELL MOTILITY
W. Tai[2], C.F. Yeh[1], C.C. Wu[2], and C.H. Hsu[1]
[1]*National Health Research Institutes, TAIWAN and*
[2]*National Chung Hsing University, TAIWAN*

W11D
A PAIRED MICROFLAP ARRAY FOR SINGLE CELL INTERACTION ANALYSIS
T. Teshima[1], K. Kuribayashi-Shigetomi[1,2], H. Onoe[1,2], T. Tonooka[1], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W12D
ACOUSTIC TRAPPING OF BACTERIA AND NANOPARTICLES IN DISPOSABLE GLASS CAPILLARIES USING SEED PARTICLES
B. Hammarström, T. Laurell, and J. Nilsson
Lund University, SWEDEN

W13D
BATCH CULTIVATION OF BACTERIAL CELLS IN NANOLITER REACTOR ARRAY
J. Dai[1], S.H. Yoon[2], H.Y. Sim[1],T.K. Oh[2,3], J.F. Kim[2,3,4,5], and J.W. Hong[1]
[1]*Auburn University, USA,*
[2]*Korea Research Institute of Bioscience & Biotechnology, SOUTH KOREA,*
[3]*21C Frontier Microbial Genomics and Applications Center, SOUTH KOREA,*
[4]*University of Science and Technology, SOUTH KOREA, and*
[5]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA*

W14D
DETECTION OF BREAST CANCER CELLS IN TRI-CULTURE USING IMPEDANCE SPECTROSCOPY
V. Srinivasaraghavan, J. Strobl, and M. Agah
Virginia Tech University, USA

W15D
FLUORESCENCE BASED ON-CHIP CELL ANALYSIS APPLYING STANDARD VIABILITY KITS
E. Weber[1,2], M. Rosenauer[1], W. Buchegger[1], P.D.E.M. Verhaert[2], and M.J. Vellekoop[1]
[1]*Vienna University of Technology, AUSTRIA and*
[2]*Delft University of Technology, THE NETHERLANDS*

W16D
INTEGRATED FLUIDIC SYSTEM FOR GROWTH AND FLUORESCENCE IMAGING OF MULTICELLULAR ORGANISMS IN NANOSATELLITE APPLICATIONS
M.X. Tan, M. Piccini, and A.J. Ricco
NASA Ames Research Center, USA

W17D
INVERTED OPEN MICROWELLS FOR ANALYSIS AND FUNCTIONAL SORTING OF SINGLE LIVE CELLS
M. Bocchi[1], L. Rambelli[2], E. Duqi[2], A. Faenza[2], L. Giulianelli[2], N. Lopez[2], N. Pecorari[2], and R. Guerrieri[2]
[1]*Mindseeds Laboratories, ITALY and* [2]*University of Bologna, ITALY*

W18D
LIVE CELL IMAGING AND AUTOMATED LINEAGE TRACKING OF YEAST IN A HIGH-THROUGHPUT MICROFLUIDIC DEVICE
M. Ricicova[1], M. Hamidi[1], A. Quiring[1], A. Niemisto[2,3], I. Shmulevich[2], and C.L. Hansen[1,2]
[1]*University of British Columbia, CANADA,*
[2]*Institute for Systems Biology, USA, and*
[3]*Tampere University of Technology, FINLAND*

W19D
MICROCHIP ELECTROPHORESIS DEVICES FOR THE DETECTION OF NITRIC OXIDE: COMPARISON OF BULK CELL AND SINGLE CELL ANALYSIS
S.M. Lunte[1], D.B. Gunasekara[1], E.C. Metto[2], M.K. Hulvey[1], E.R. Mainz[1], G. Caruso[1,3], J.A. Fracassi Da Silva[1,4], D.T. Jensen[1], A.H. Culbertson[2], R.J. Grigsby[1], and C.T. Culbertson[2]
[1]*University of Kansas, USA,* [2]*Kansas State University, USA,*
[3]*University of Catenia, ITALY, and* [4]*State University of Campinas, BRAZIL*

W20D
MICROFLUIDIC IMPEDANCE SPECTROSCOPY SCANNER FOR SPHERICAL MICROTISSUES
Z. Schumacher[1,2], O. Frey[1], and A. Hierlemann[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*University of Basel, SWITZERLAND*

W21D
MICROPOST-BASED FUNCTIONAL ASSAY OF ADULT HEART CELLS: DOES MECHANOSENSING LIMIT FORCE PRODUCTION?
R.E. Taylor, A. Ribeiro, G. Fajardo, H. Razavi, D. Bernstein, and B.L. Pruitt
Stanford University, USA

W22D
QUANTITATIVE ANALYSIS OF SINGLE-CELL CLONAL EXPANSION AND CELL SENESCENCE BY USING MICROWELL CELL ARRAY
T. Chang, W. Tang, R.J. Monnat, and A. Folch
University of Washington, USA

W23D
SINGLE CELL TRAPPING AND ANALYSIS OF PROKARYOTIC PRODUCTION STRAINS IN SUB-µm FLUIDIC STRUCTURES
A. Gruenberger, C. Probst, S. Binder, R. Ziaee, L.. Eggeling, W. Wiechert, and D. Kohlheyer
Forschungszentrum Juelich GmbH, GERMANY

W24D
THE ROLE OF CELL MEMBRANE STRAIN IN SONOPORATION CHARACTERISED BY MICROFLUIDIC-BASED SINGLE-CELL ANALYSIS
N. Bose[1], D. Carugo[2], T.K. Maiti[1], X. Zhang[2], and S. Chakraborty[1]
[1]*Indian Institute of Technology Kharagpm, INDIA and*
[2]*University of Southampton, UK*

Integrated Micro- and Nanotechnologies
Others

W25D
MICROFABRICATED QLISA BIOSENSORS WITH AN EMBEDDED MIXING ELEMENT
P. Clark, C. Yu, E. Papazoglou, and H. Noh
Drexel University, USA

W26D
SINGLE NEURAL CELLS ON MOBILE MICROPLATES FOR PRECISE NEURAL NETWORK ASSEMBLY
S. Yoshida[1], T. Teshima[1], K. Kuribayashi-Shigetomi[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

Nanotechnologies
Nanofluidics

W1E
DEVELOPMENT OF POLYMER-MODIFICATION METHOD FOR CREATION OF FUNCTIONAL EXTENDED NANOSPACE
J. Katagiri[1], T. Yamamoto[1], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W2E
ELECTROCAVITATION IN NANOCHANNELS
K.G.H. Janssen[1], J.C.T. Eijkel[2], N.R. Tas[2], L.J. de Vreede[2], T. Hankemeier[1], and H.J. van der Linden[1]
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[2]*MESA+, University of Twente, THE NETHERLANDS*

W3E
MEANDERING NANOCHANNELS FOR IMAGING OF ULTRA-LONG DNA MOLECULES
C. Freitag[1], J. Fritzsche[1], F. Persson[1], K.U. Mir[2], and J.O. Tegenfeldt[1,3]
[1]*University of Gothenburg, SWEDEN,* [2]*University of Oxford, UK, and*
[3]*Lund University, SWEDEN*

W4E
SINGLE MOLECULE DYNAMICS OF DNA DURING ELECTROKINETIC TRANSPORT THROUGH NANOFLUIDIC CHANNELS
L.D. Menard, J.S. Zhou, M.E. Woodson, C.E. Mair, J.P. Alarie, and J.M. Ramsey
University of North Carolina, USA

Nanotechnologies
Nanoengineering

W5E
OVER 20 FOLD FLUORESCENCE ENHANCEMENT OF YOYO-1 LABELED DNA USING NEW 3D CAVITY NANOSCALE PLASMONIC ANTENNA ARRAY
R.M. Peng, C. Wang, W.H. Zhang, L.C. Zhou, and S.Y. Chou
Princeton University, USA

W6E
SIZE CONTROLLABLE SUB-NANOSTRUCTURES ON FLUORESCENT POLYSTYRENE BEADS BY PLASMA ETCHING FOR 3D PARTICLE TRACKING AND RAMAN SENSING IN LIVING CELL
H.-Y. Hsieh[1], J.-L. Xiao[2,3], C.-H. Lee[2,3], P.-C. Wang[1], and F.-G. Tseng[1,3]
[1]*National Tsing Hua University, TAIWAN,*
[2]*National Yang-Ming University, TAIWAN, and*
[3]*Academia Sinica, TAIWAN*

Nanotechnologies
Nanobiotechnology

W7E
BIOMEMBRANE-GATED CARBON NANOTUBE TRANSISTOR AS A SENSING PLATFORM
T.-S. Lim, D. Jain, and P.J. Burke
University of California, Irvine, USA

W8E
MICROFLUIDIC ACTIVE SORTING OF DNA MOLECULES LABELED WITH SINGLE QUANTUM DOTS USING FLOW SWITCHING BY A HYDROGEL SOL-GEL TRANSITION
M. Haneoka[1], Y. Shirasaki[2], H. Sugino[1], T. Sekiguchi[3], D.H. Yoon[3], R. Iizuka[1], S. Shoji[3], and T. Funatsu[1]
[1]*University of Tokyo, JAPAN,*
[2]*Institute of Physical and Chemical Research (RIKEN), JAPAN, and*
[3]*Waseda University, JAPAN*

W9E
PRECISE EVALUATION OF ELECTROPHORETIC MOBILITY DISTRIBUTION OF NANOLIPOSOMES USING MICROCAPILLARY ELECTROPHORESIS CHIPS WITH SENSITIVE FLUORESCENT IMAGING
K. Kato, M. Koido, T. Akagi, and T. Ichiki
University of Tokyo, JAPAN

W10E
SINGLE QUANTUM DOT-BASED MULTIPLEXED POINT MUTATION DETECTION BY GAP LIGASE CHAIN REACTION
Y. Song, Y. Zhang, and T.-H. Wang
Johns Hopkins University, USA

Nanotechnologies
Nanoassembly

W11E
A ZERO-POWER, HIGH-THROUGHPUT MICRO, NANOPARTICLE PRINTING VIA GRAVITY-DRIVEN FORMATION OF PICOLITER-SCALE DROPLETS
S. Choi, A. Jamshidi, T.J. Seok, T.I. Zohdi, M.C. Wu, and A.P. Pisano
University of California, Berkeley, USA

Nanotechnologies
Nanostructured Materials

W12E
ARRAYS OF METALLIC NANOPILLARS IN HOLES FOR PLASMONIC DEVICES
K. Nakamoto[1], R. Kurita[2], and O. Niwa[2]
[1]*University of Tsukuba, JAPAN and*
[2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

W13E
IN-SITU SYNTHESIZED AND PATTERNED NANOWIRE ARRAYS IN MICROFLUIDIC CHANNEL FOR PARTICLE TRAPPING AND CELL LYSIS APPLICATIONS
J. Kim[1], J.W. Hong[1], Z. Li[2], J.H. Shin[1], and I. Park[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA and* [2]*Hewlett Packard Laboratory, USA*

W14E
MICROREACTOR ARRAY FOR LOCALIZED SYNTHESIS OF FUNCTIONAL MATERIALS IN PICOLITER VOLUMES
B.Z. Cvetković, J. Puigmartí-Luis, and P.S. Dittrich
ETH Zürich, SWITZERLAND

W15E
SHRINK-INDUCED SUPERHYDROPHOBIC SURFACES
L.R. Freschauf, J. McLane, H. Sharma, and M. Khine
University of California, Irvine, USA

MEMS & NEMS Technologies
Micro- & Nanomachining

W1F
ATTACHABLE/DETACHABLE OXYGEN SENSOR MICROARRAY SHEET FOR IN SITU MEASUREMENT OF CULTIVATED CELL'S OXYGEN CONSUMPTION
M. Kojima[1], H. Takehara[1], T. Akagi[1], H. Shiono[2], and T. Ichiki[1]
[1]*University of Tokyo, JAPAN and* [2]*Nikon Instruments Inc, JAPAN*

W2F
NANOFABRICATION OF POLYMERIC APERTURE ARRAY FOR LOCALIZED ILLUMINATION BEYOND DIFFRACTION LIMIT
T. Ono[1,2,3], R. Iizuka[1,3], T. Akagi[1,3], T. Funatsu[1,3], and T. Ichiki[1,3]
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[2]*Japan Society for the Promotion of Science, JAPAN, and*
[3]*Japan Science and Technology Agency (JST), JAPAN*

W3F
SELF-HEALING MICROFLUIDIC WIRES FOR ULTRA-RELIABLE FLEXIBLE MICROSYSTEMS
R. Surapaneni, K. Park, Y. Xie, and C. Mastrangelo
University of Utah, USA

MEMS & NEMS Technologies
Microfluidic Components/Packaging

W4F
A SEQUENTIAL-DOSAGE, FLUOROCARBON-ACTUATED MICROPUMP
M. Ochoa, C. Mousoulis, and B. Ziaie
Purdue University, USA

W5F
BLOOD PLASMA SEPARATOR USING MICRO PILLARS ARRANGED LIKE A LABYRINTH
H. Tsutsui and T. Kawano
Osaka Institute of Technology, JAPAN

W6F
ELECTROSTATIC MICROVALVES FOR INTEGRATED MICROCHEMICAL SYSTEMS
J.D. Tice[1], A.V. Desai[1], T.A. Bassett[1], C.A. Apblett[2], and P.J.A. Kenis[1]
[1]*University of Illinois, Urbana-Champaign, USA and*
[2]*Sandia National Laboratories, USA*

W7F
PHYSICAL AND BIOCHEMICAL INVESTIGATION OF AN ACTIVE MAGNETIC MICROCOLUMN SELF-ASSEMBLED IN A MICROCHANNEL
S. Tabnaoui[1], A. Ali-Cherif[1], V. Taniga[1], A. Le Nel[2], L. Malaquin[1], and J.-L. Viovy[1]
[1]*Institut Curie, FRANCE and* [2]*Fluigent, FRANCE*

MEMS & NEMS Technologies
Integration Strategies

W8F
A PRINTED CIRCUIT BOARD BASED MICROFLUIDIC SYSTEM FOR POINT-OF-CARE DIAGNOSTICS APPLICATIONS
L.L. Wu[1], L.A. Marshall[2], S. Babikian[1], C.M. Han[2], J.G. Santiago[2], and M. Bachman[1]
[1]*University of California, Irvine, USA and* [2]*Stanford University, USA*

W9F
MICROFLUIDIC INTEGRATION OF PARALLEL LIQUID CHROMATOGRAPHY
J. Huft and C.L. Hansen
University of British Columbia, CANADA

MEMS & NEMS Technologies
New Chip Materials

W10F
COMPARISON OF RAPID PROTOTYPING POLYMERS FOR HIGH PRESSURE INJECTIONS
E. Sollier, C. Murray, P. Maoddi, and D. Di Carlo
University of California, Los Angeles, USA and

W11F
GREEN MICROFLUIDICS MADE OF CORN PROTEIN
A. Hsiao, J. Luecha, J. Kokini, and G.L. Liu
University of Illinois, Urbana-Champaign, USA

W12F
NON-ABSORBING, CLEAR, FLEXIBLE, AND CASTABLE POLYURETHANE FOR FABRICATION OF MICROFLUIDIC DEVICES
K. Domansky, D.C. Leslie, J.P. Fraser, G.A. Hamilton, A. Bahinski, and D.E. Ingber
Harvard University, USA

W13F
REPLICA MOLDING AND BONDING OF MICROSTRUCTURED HYDROGEL PLATES FOR TISSUE ENGINEERING APPLICATIONS
E. Yamada, M. Yamada, M. Iwase, S. Sugaya, and M. Seki
Chiba University, JAPAN

MEMS & NEMS Technologies
Surface Modification

W14F
A SIMPLE IN SITU MICROFLUIDIC PROCEDURE TO CREATE MULTIVALENT BIOFUNCTIONALIZED SURFACES
G. Perozziello[1], G. Simone[2], M. Francardi[4], R. La Rocca[1,3], N. Malara[2], P. Candeloro[1], E. Carbone[1,5], E. Di Fabrizio[1,3], and A. Manz[1]
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[2]*Korea Institute of Science and Technology (KIST) - Europe, GERMANY,*
[3]*Italian Institute of Technology IIT of Genova, ITALY,*
[4]*International School for Advanced Studies (SISSA), ITALY, and*
[5]*Karolinska Institutet, SWEDEN*

W15F
ENABLING DNA-MICROARRAYS IN POLYMERIC LAB-ON-A-CHIP SUBSTRATES FOR MULTIPLEXED TARGET ANALYSIS VIA SOLID-PHASE PCR
J. Hoffmann[1], S. Hin[1], F. von Stetten[1,2], R. Zengerle[1,2], and G. Roth[1,2]
[1]*University of Freiburg, GERMANY and*
[2]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*

W16F
SPONTANEOUS FAST MOTION OF WATER DROPLET ON NANOTEXTURED AND CURVED GLASS SURFACES
Y.C. Chuang[1], H.S. Hsieh[1], Q.S. Zheng[2], Y.C. Lin[3], and F.G. Tseng[1,4]
[1]*National Tsing Hua University, TAIWAN,* [2]*Tsinghua University, CHINA,*
[3]*National Cheng Kung University, TAIWAN, and* [4]*Academia Sinica, TAIWAN*

MEMS & NEMS Technologies
Others

W17F
CELL SHEET FREE ACTUATOR FOR A BIO-MICROPUMP USING PREVIOUSLY FROZEN CARDIOMYOCYTES
Y. Tanaka[1,2,3], Y. Yanagisawa[1], and T. Kitamori[1,3]
[1]*University of Tokyo, JAPAN,*
[2]*Institute of Physical and Chemical Research (RIKEN), JAPAN, and*
[3]*Japan Science and Technology Agency (JST), JAPAN*

W18F
FLOWER-SHAPED MICROMOTORS DRIVEN BY GLIDING BACTERIA
T. Sawada[1], Y. Hiratsuka[2], M. Miyata[3], and S. Maruo[1]
[1]*Yokohama National University, JAPAN,*
[2]*Japan Advanced Institute of Science and Technology, JAPAN, and*
[3]*Osaka City University, JAPAN*

Bench-to-Bedside
Point-of-Care Testing

W1G
A DISPOSABLE DNA AMPLIFICATION PLATFORM FOR THE DETECTION OF CLOSTRIDIUM DIFFICILE INFECTED STOOL SPECIMENS
S. Huang[1], J. Do[1], M. Mahalanabis[1], A. Fan[1], L. Jepeal[1], S. Singh[1,2], and C. Klapperich[1]
[1]*Boston University, USA and* [2]*VA Boston, USA*

W2G
A FULLY-AUTOMATED SURFACE ACOUSTIC WAVE IMMUNOSENSING SYSTEM FOR THE DETECTION OF CARDIAC MARKERS IN WHOLE BLOOD
Y.-S. Choi, J.P. Do, H.J. Lee, S.S. Lee, J. Lee, Y.H. Lee, S.K. Kim, J.N. Lee, K.Y. Han, and J.C. Park
Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA

W3G
AN INTEGRATED MICROFLUIDIC DEVICE FOR QUANTITATIVE MEASUREMENT OF HEPATOCELLULAR CARCINOMA (HCC) BIOMARKERS IN WHOLE BLOOD SAMPLES
C. Li, S. Yang, and R.-L. Chien
Wako Pure Chemical Industries, USA

W4G
ENGINEERING A POINT-OF-CARE VIRAL CONCENTRATION DEVICE FOR RAPID MOLECULAR DIAGNOSTICS OF INFLUENZA IN HUMAN RESPIRATORY SPECIMENS
J.Y. Zhang[1], M. Mahalanabis[1], L. Liu[1], J. Chang[2], J. Do[3], and C.M. Klapperich[1]
[1]*Boston University, USA,*
[2]*Center for Disease Control and Prevention, USA, and*
[3]*Samsung Electronics, SOUTH KOREA*

W5G
GELIFICATION - A SIMPLE AND EFFICIENT METHOD FOR ON-CHIP STORAGE OF REAGENTS: TOWARDS LAB-ON-A-CHIP SYSTEMS FOR POINT-OF-CARE DIAGNOSTICS
J. Høgberg[1], T. Christine[2], C. Cao[1], L. Florian[3], M. Agirregabiria[3], L.G. Monsalve[3], A. Goiriena[3], S. Rodriguez[4], A. Wolff[1], D.D. Bang[1], and J.M. Ruano-Lopez[3]
[1]*Technical University of Denmark (DTU), DENMARK,* [2]*EVGroup, AUSTRIA,*
[3]*Ikerlan, SPAIN, and* [4]*Biotools B&M Labs, SPAIN*

W6G
HIGH SENSITIVITY MULTIPLEXED IMMUNOCHROMATOGRAPHIC ASSAY ON THREADS
G. Zhou and D. Juncker
McGill University, CANADA and Genome Quebec, CANADA

W7G
IN SITU ELECTROKINETIC STRINGENCY CONTROL FOR MULTIPLEXED ELECTROCHEMICAL PATHOGEN SENSING
T. Liu, M.L.Y. Sin, and P. Wong
University of Arizona, USA

W8G
MICRO TOTAL ANALYSIS SYSTEM BASED ON MAGNETIC NANOPARTICLES FOR ALLERGY DIAGNOSIS
B. Teste, F. Malloggi, F. Kanoufi, A. Varenne, J.M. Siaugue, P. Poncet, and S. Descroix
Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE

W9G
MULTI-LAYERED APTAMER ARRAY INTEGRATED IN MICROFLUIDIC CHIP FOR ON-SITE BLOOD ANALYSIS
S. Inoue, M. Seyama, T. Miura, T. Horiuchi, Y. Iwasaki, J. Takahashi, and E. Tamechika
Nippon Telegraph and Telephone Corporation, JAPAN

W10G
PEG BONDED FLUORESCENT-HYDROGEL FIBERS WITH LESS INFLAMMATION FOR LONG-TERM SUBCUTANEOUS GLUCOSE MONITORING
Y.J. Heo[1], M. Takahashi[2], H. Shibata[3], T. Okitsu[1], T. Kawanishi[3], and S. Takeuchi[1]
[1]*University of Tokyo, JAPAN,* [2]*Life BEANS Center, JAPAN, and* [3]*Terumo Co., JAPAN*

W11G
RAPID BLOOD PLASMA SEPARATION WITH AIR-LIQUID CAVITY ACOUSTIC TRANSDUCERS
A. Doria, M. Patel, and A.P. Lee
University of California, Irvine, USA

W12G
REAGENT INTEGRATORS FOR THE CONTROLLED RELEASE OF PICOGRAMS OF REAGENTS IN SELF-POWERED MICROFLUIDIC CHIPS
M. Hitzbleck, L. Gervais, and E. Delamarche
IBM Research GmbH, SWITZERLAND

W13G
SIMPLIFIED MONOLITHIC FLOW CYTOMETER CHIP WITH THREE-DIMENSIONAL HYDRODYNAMIC FOCUSING AND INTEGRATED FIBER-FREE OPTICS
M. Motosuke[1,2], T.G. Jensen[2], G. Zhuang[2], and J.P. Kutter[2]
[1]*Tokyo University of Science, JAPAN and*
[2]*Technical University of Denmark (DTU), DENMARK*

W14G
TWO-DIMENSIONAL PAPER NETWORK FORMAT FOR AMPLIFIED LATERAL FLOW ASSAYS
E. Fu, T. Liang, S. Ramachandran, B. Lutz, and P. Yager
University of Washington, USA

Bench-to-Bedside
Cell Sorting

W15G
A CTC-MICROSEPARATOR FOR ISOLATION OF CIRCULATING TUMOR CELLS USING LATERAL MAGNETOPHORESIS AND MAGNETIC NANOBEADS
S.-Y. Kim, H.-Y. Lee, S.-I. Han, M.-J. Park, C.-W. Jeon, Y.-D. Joo, I.-H. Choi, and K.-H. Han
Inje University, SOUTH KOREA

W16G
APTAMER-FACILITATED HIGH-EFFICIENCY CANCER CELL SORTING IN A MICROPOST-BASED MICROFLUIDIC DEVICE
W. Sheng, R. Kamath, T. Chen, W. Tan, and Z.H. Fan
University of Florida, USA

W17G
CHARACTERIZATION OF HepG2 CELLS BEHAVIOR IN CRITICAL FREQUENCY DOMAIN ON TiOPc-BASED OPTOELECTRONIC DIELECTROPHORESIS CHIP
S.-M. Yang[1], C.-Y. Lin[2], S. Sivashankar[2], S.V. Pattaswamy[2], S.-Y. Wei[1], T.-M. Yu[1], H.-Y. Chang[2], L. Hsu[1], and C.-H. Liu[2]
[1]*National Chiao Tung University, TAIWAN and*
[2]*National Tsing Hua University, TAIWAN*

W18G
CONTROLLABLE THREE-DIMENSIONAL SHEATH FLOW WITH A WIDE RANGE REYNOLDS NUMBER AND ITS APPLICATION FOR EFFICIENT CELL SORTING
R. Sekine[1], T. Sakurai[2], D.H. Yoon[1], R. Iizuka[2], T. Sekiguchi[1], T. Funatsu[2], and S. Shoji[1]
[1]*Waseda University, JAPAN and* [2]*University of Tokyo, JAPAN*

W19G
EXTRACTION AND ENRICHMENT OF RARE CELLS IN A SIMPLE INERTIAL MICROFLUIDIC DEVICE
J. Zhou, P.J. Giridhar, S. Kasper, and I. Papautsky
University of Cincinnati, USA

W20G
MICROFLUIDIC CELL SEPARATION WITH ANTIBODY MODIFIED EUGLENA BY USING PHOTOTAXIS MEDIATED MIGRATION
Y. Okamoto[1], Y. Nakakita[1], T. Sano[1], J. Morikawa[1], N. Kaji[1], M. Tokeshi[1], and Y. Baba[1,2]
[1]*Nagoya University, JAPAN and*
[2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

W21G
PATHOGEN AND INFLAMMATORY COMPONENTS REMOVAL FROM BLOOD USING CELL MARGINATION
H.W. Hou[1], H.Y. Gan[2], A.A.S. Bhagat[1], L.D. Li[2], C.T. Lim[3], and J. Han[2]
[1]*Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE,* [2]*Massachusetts Institute of Technology, USA, and*
[3]*National University of Singapore, SINGAPORE*

W22G
STRESS-FREE CENTRIFUGO-MAGNETIC 2D-SEPARATION OF CANCER CELLS IN A STOPPED-FLOW MODE
J. Siegrist, R. Burger, D. Kirby, L. Zavattoni, G. Kijanka, and J. Ducrée
Dublin City University, IRELAND

Bench-to-Bedside
Cell Analysis

W23G
A RAPID AND SENSITIVE ANTIGEN CAPTURE TEST FOR THE DETECTION SPECIFIC CELLS ON SHEAR HORIZONTAL SURFACE ACOUSTIC WAVE SENSORS
H.-C. Hao, H.Y. Chang, T.P. Wang, and D.J. Yao,
National Tsing Hua University, TAIWAN

W24G
INTEGRATED MICROSYSTEM AS A TOOL FOR FABRY DISEASE DIAGNOSTICS
R. Kwapiszewski, S. Chmielinski, K. Ziolkowska, M. Chudy, A. Dybko, and Z. Brzozka
Warsaw University of Technology, POLAND

W25G
QUANTITATIVE AND MULTIPLEXED IMMUNOCYTOCHEMISTRY USING A MICROFLUIDIC QUANTUM DOT IMMUNO-STAINING SYSTEM
S. Kwon[1], M.S. Kim[2], E.S. Lee[3], and J.-K. Park[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA,*
[2]*Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA, and*
[3]*Korea University, SOUTH KOREA*

Bench-to-Bedside
Proteomics

W26G
ACTIVITY MEASUREMENTS OF KINASES AND PHOSPHATASES IN CELL LYSATES BY MICROCHIP PHOSPHATE-AFFINITY ELECTROPHORESIS
A. Han, K. Hosokawa, and M. Maeda
Institute of Physical and Chemical Research (RIKEN), JAPAN

Bench-to-Bedside
Others

W27G
CONSTRUCTION OF CELL DENSITY-CONTROLLED 3D HIERARCHIC TISSUES USING CELL BEADS
R. Tanaka[1], Y.T. Matsunaga[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

W28G
USE OF NEGATIVE DIELECTROPHORESIS FOR SELECTIVE ELUTION OF IMMUNO-BOUND PARTICLES
M. Javanmard, S. Emaminejad, R.W. Dutton, and R.W. Davis
Stanford University, USA

Imaging & Detection Technologies
Flow Visualization

W1H
HIGH SPEED 3D-GEOMETRY RECONSTRUCTION OF DROPLET SHAPE EVOLUTION BY ABSORBANCE IMAGING TECHNIQUE
T. Henkel, D. Malsch, M. Kielpinski, and G. Mayer
Institute of Photonic Technology (IPHT), GERMANY

Imaging & Detection Technologies
Optical

W2H
LABEL-FREE DETECTION AND QUANTITATION OF NUCLEIC ACIDS WITH 1μM SUPERPARAMAGNETIC PARTICLES
B.C. Strachan[1], J. Li[1], K. Kehn-Hall[2], and J.P. Landers[1]
[1]*University of Virginia, USA and* [2]*George Mason University, USA*

W3H
A PARTICLE-ENHANCED DOUBLE-STRANDED DNA PROBE FOR RAPID DETECTION OF BACTERIAL 16S rRNA TOWARD URINARY TRACT INFECTION DIAGNOSTICS
R. Riahi[1], J.C. Liao[2], and P.K. Wong[1]
[1]*University of Arizona, USA and* [2]*Stanford University, USA*

W4H
COLOR SUB-PIXEL RESOLVING OPTOFLUIDIC MICROSCOPE AND ITS APPLICATION TO BLOOD CELL IMAGING FOR MALARIA DIAGNOSIS
S.A. Lee[1], R. Leitao[2], G. Zheng[1], S. Yang[1], A. Rodriguez[2], and C. Yang[1]
[1]*California Institute of Technology, USA and*
[2]*New York University School of Medicine, USA*

W5H
LABEL FREE DETECTION OF VIRUS-LIKE PARTICLES
D.S. Dandy, N.S. Lynn, L.C. Kingry, R. Yan, and K.L. Lear
Colorado State University, USA

W6H
LOCAL TEMPERATURE MEASUREMENT AND CONTROL USING FUNCTIONAL GEL-TOOL CONTAINING A QUANTUM DOT BY COLOR ANALYSIS OF FLUORESCENCE SPECTRUM
H. Maruyama[1], T. Masuda[1], and F. Arai[1,2]
[1]*Nagoya University, JAPAN and* [2]*Seoul National University, JAPAN*

W7H
MULTIPLEX PINWHEEL ASSAY: MICRO-SCALE OPTICAL AND LABEL-FREE QUANTITATION OF DNA WITH HIGH THROUGHPUT AND LOW COST
J. Li and J.P. Landers
University of Virginia, USA

W8H
PINWHEEL ASSAY VIA A 'PIPET, AGGREGATE AND BLOT' (PAB) APPROACH ON FILTER PAPER
J. Li, H. Alshammari, B. Ehdaie, K.A. Kelly, and J.P. Landers
University of Virginia, USA

W9H
LABEL-FREE SENSING WITH PHOTONIC CRYSTAL NANOBEAM CAVITIES
Q. Quan[1], I.B. Burgess[1], S.K.Y. Tang[1], D.L. Floyd[1], P.B. Deotare[1], I.W. Frank[1], R. Ilic[2], F. Vollmer[3], and M. Loncar[1]
[1]*Harvard University, USA,* [2]*Cornell University, USA, and*
[3]*Max Plank Institute for Science of Light, GERMANY*

Imaging & Detection Technologies
Electrochemical

W10H
DEVELOPMENT AND CHARACTERIZATION OF ELECTROCHEMICAL CANTILEVER SENSOR FOR BIO/CHMEICAL SENSING APPLICATIONS
X. Quan, L.M. Fisher, A. Boisen, and M. Tenje
Technical University of Denmark (DTU), DENMARK

W11H
MONITORING BIOFILM GROWTH USING A SCALABLE MULTICHANNEL IMPEDIMETRIC BIOSENSOR
K. Sachsenheimer, L. Pires, M. Adamek, T. Schwartz, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY

W12H
SCALABLE MONOLITHIC SUSPENDED CARBON NANOWIRE ARRAY SYSTEMS AS ULTRA SENSITIVE ELECTROCHEMICAL SENSING PLATFORMS
J.-I. Heo[1], M. Madou[2], and H. Shin[1]
[1]*Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA and*
[2]*University of California, Irvine, USA*

Imaging & Detection Technologies
Mass Spectrometry

W13H
DIGITAL MICROFLUIDICS COUPLED TO NANOELECTROSPRAY IONIZATION MASS SPECTROMETRY FOR SUCCINYLACETONE ANALYSIS IN DRIED BLOOD SPOTS
S.C.C. Shih, H. Yang, M.J. Jebrail, R. Fobel, and A.R. Wheeler
University of Toronto, CANADA

W14H
INTACT PROTEIN SEPARATIONS WITH INHERENTLY BIOCOMPATIBLE ORMOCOMP SEPARATION CHIP WITH INTEGRATED ELECTROSPRAY IONIZATION EMITTER
T. Sikanen[1], S. Aura[2], B. Barrios Lopez[1], S. Franssila[2], T. Kotiaho[1], and R. Kostiainen[1]
[1]*University of Helsinki, FINLAND and* [2]*Aalto University, FINLAND*

Imaging & Detection Technologies
Optofluidics

W15H
A BIOINSPIRED 3D ARTIFICIAL COMPOUND EYE WITH FOCUS-TUNABLE SINGLE LENSES
H. Zeng, H. Borteh, and Y. Zhao
Ohio State University, USA

W16H
LIQUID-GAS MICROFLUIDICS AS A MICROSTRUCTURING TOOL FOR OPTICS: CONTROLLED DEFECTS INSIDE SELF-ORGANIZED BUBBLE CRYSTALS
A.E.D. Allouch[1], K. Bournine[1], P. Joseph[1], S. Geoffroy[2], A. Bouchier[1], A. Monmayrant[1], O. Gauthier-Lafaye[1], F. Lozes[1], and A.-M. Gue[1]
[1]*LAAS-CNRS, FRANCE and* [2]*Université de Toulouse, FRANCE*

W17H
OPTO-FLUIDIC TOMOGRAPHY
W. Bishara, S. Isikman, H. Zhu, and A. Ozcan
University of California, Los Angeles, USA

W18H
THIOL-ENE BASED POLYMER WAVEGUIDES FABRICATED BY UV-ASSISTED SOFT LITHOGRAPHY FOR OPTOFLUIDIC APPLICATIONS
G. Zhuang, T.G. Jensen, and J.P. Kutter
Technical University of Denmark (DTU), DENMARK

Imaging & Detection Technologies
Others

W19H
CW-PHOTOACOUSTIC-BASED PROTOCOL FOR THE NON-INVASIVE DETECTION OF AQUEOUS GLUCOSE AT LOW MG/DL CONCENTRATION LEVELS
S. Camou, Y. Ueno, and E. Tamechika
NTT Corporation, JAPAN

W20H
IODINATED HYDROGEL MICROPARTICLES AS X-RAY COMPUTED TOMOGRAPHY CONTRAST AGENTS
C. Wang[1], X. Wang[1], S. Anderson[2], and X. Zhang[1]
[1]Boston University, USA and [2]Boston University Medical Center, USA

W21H
PULSE WIDTH MODULATION USING CODED CORRUGATED MICROFLUIDIC SIDEWALLS FOR LOW SIGNAL-NOISE RATIO SINGLE CELL IMPEDANCE CYTOMETRY
M. Javanmard and R.W. Davis
Stanford University, USA

Other Applications
Environment

W1I
COMPACT GAS-FLOW SENSOR BASED ON ELASTOMERIC TRANSPARENT MICROWIRES
J. Lee and J. Kim
Iowa State University, USA

W2I
LAB ON A BIRD: AUTONOMOUS MICROSYSTEMS FOR IN-VIVO REAL TIME BIOPHYSICAL MONITORING OF BIRDS
A. Gumus, D. Winkler, and D. Erickson
Cornell University, USA

Other Applications
Agriculture

W3I
INTEGRATED MICROFLUIDICS FOR SEROTYPE IDENTIFICATION OF FOOT AND MOUTH DISEASE VIRUS
H. Sant, M. Johnson, and B. Gale
University of Utah, USA

Other Applications
Separation Science

W4I
A NANOFENCE ARRAY FOR DNA ELECTROPHORESIS
S.-G. Park and K.D. Dorfman
University of Minnesota, USA

W5I
COMPLETE POLYMER ELECTROPHORESIS MICROCHIP WITH INTEGRATED HIGH VOLTAGE AND DETECTION ELECTRODES
R.D. Henderson, R.M. Guijt, A. Henderson, T.W. Lewis, E.F. Hilder, P.R. Haddad, and M.C. Breadmore
University of Tasmania, AUSTRALIA

W6I
FRACTIONATION OF MAGNETIC MICROSPHERES FOR MAGNETIC DRUG TARGETING USING DEAN FLOW COMBINED WITH A MAGNETIC OCTUPOLE ON A CHIP
S. Dutz[1,2], M.E. Hayden[3], A. Schaap[1], B. Stoeber[1], and U.O. Häfeli[1]
[1]University of British Columbia, CANADA,
[2]Institute of Photonic Technology (IPHT), GERMANY, and
[3]Simon Fraser University, CANADA

W7I
MICROFRACTIONATION OF CE-SEPARATED COMPOUNDS INTO DROPLETS
P. Sehgal, A. Doshi, and A.S. Basu
Wayne State University, USA

W8I
OVER 50,000-FOLD SAMPLE PRECONCENTRATION EFFICIENCY IN MICROCHIP ELECTRPHORESIS USING A SIMPLE CHANNEL
T. Kawai[1], M. Ueda[1], K. Sueyoshi[1], F. Kitagawa[2], and K. Otsuka[1]
[1]Kyoto University, JAPAN and [2]Hirosaki University, JAPAN

W9I
SIMPLE AND HIGHLY-SENSITIVE ENZYME ACTIVITY ASSAY BASED ON REAGENT-RELEASE CAPILLARY - ISOELECTRIC FOCUSING (RRC-IEF) TOWARDS THE DEVELOPMENT OF MULTI ANALYTE SENSING MICRO DEVICE CAPABLE OF DETECTING BOTH PROTEINS AND ENZYME ACTIVITIES
Y. Nogawa, H. Yokoyama, K. Kawamura, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

W10I
TOWARDS SELECTORFREE SEPARATION OF CHIRAL MOLECULES: ENANTIOSELECTIVE SEPARATION OF MICROPARTICLES IN A MICROFLUIDIC DEVICE
L. Bogunovic[1], R. Eichhorn[2], S. Wegener[1], F.J. Lorenz[1], J. Regtmeier[1], and D. Anselmetti[1]
[1]Bielefeld University, GERMANY and
[2]Nordic Institute of Theoretical Physics (NORDITA), SWEDEN

Other Applications
Fuel Cells

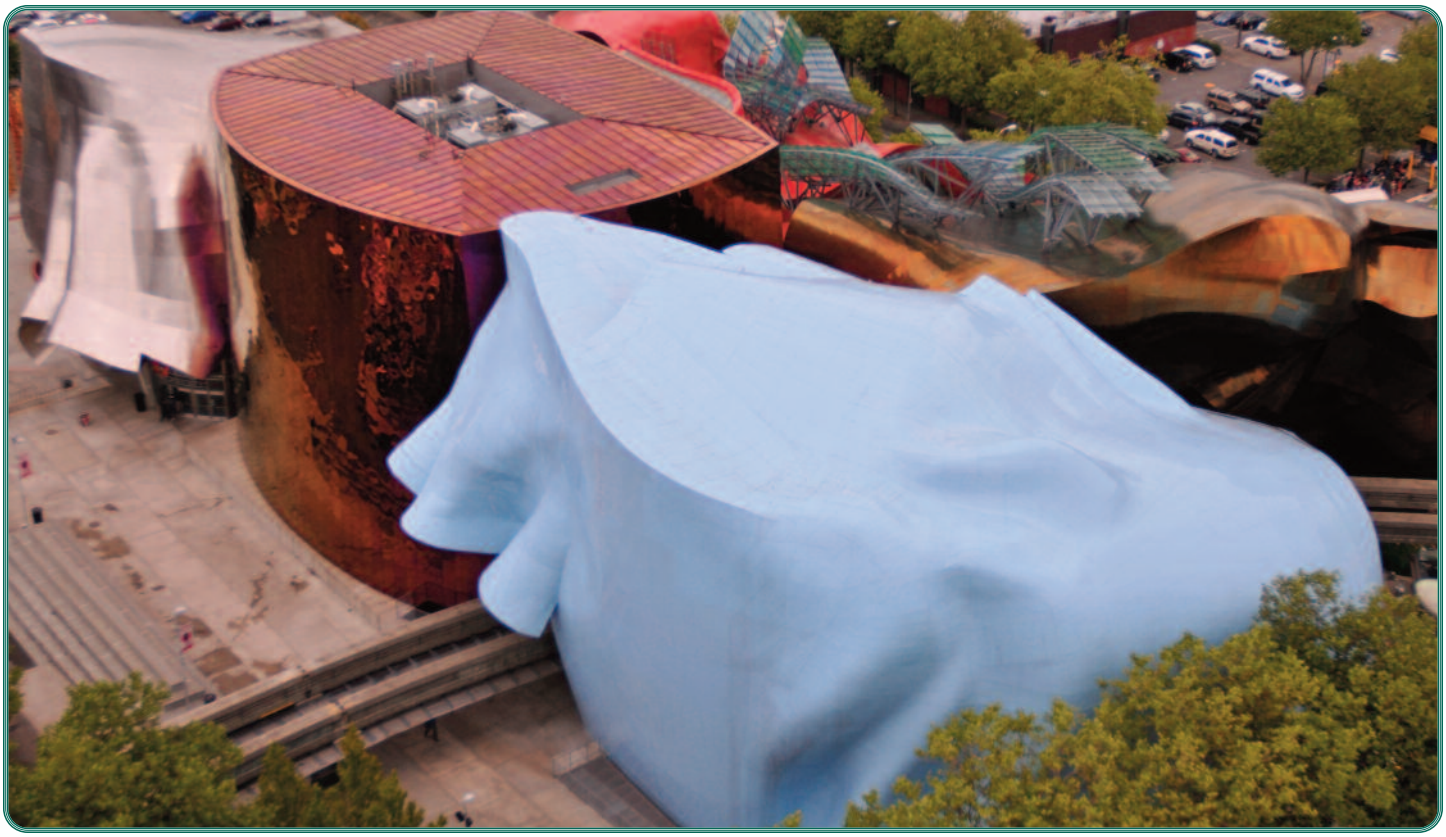
W11I
A NOVEL MICRO FUEL CELL UTILIZING EXTENDED-NANOCHANNELS AS FAST PROTON CONDUCTOR
H. Chinen[1], Y. Pihosh[1], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]University of Tokyo, JAPAN and
[2]Japan Science and Technology Agency (JST), JAPAN

Other Applications
Others

W12I
SAMPLE PREPARATION UNIT FOR ONLINE BIO-PROCESSES MONITORING
C. Wu, F. Bendriaa, M. Harnois, and V. Senez
Université Lille Nord de France, FRANCE and
Institut d'Electronique, de Microélectronique et de Nanotechnologie (IEMN), FRANCE

Ballroom 6E	Ballroom 6D	Room 611-614
Session 3A3 **Cell Sorting** CHAIR: J. Bienvenue, *Lockhead Martin, USA*	**Session 3B3** **Microparticles in Biomedicine** CHAIR: D. Juncker, *McGill University, CANADA*	**Session 3C3** **Nanoscale Particles & Interactions** CHAIR: J.-K. Park, *Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA*
16:00 - 16:20		
MAGNETOPHORESIS-ASSISTED HYDRODYNAMIC FILTRATION SYSTEM FOR CONTINUOUS TWO-DIMENSIONAL CELL SORTING R. Mitamura, K. Toyama, M. Mizuno, M. Yamada, and M. Seki *Chiba University, JAPAN*	**ULTRASENSITIVE MULTIPLEXED QUANTIFICATION OF MICRORNA AND PROTEIN PANELS ON ENCODED GEL MICROPARTICLES** S.C. Chapin[1], D.C. Appleyard[1], D.C. Pregibon[2], and P.S. Doyle[1] [1]*Massachusettts Institute of Technology, USA and* [2]*Firefly BioWorks, Inc., USA*	**2-D MICROMANIPULATION OF SINGLE NANOPARTICLES IN FREE SOLUTION USING A MICROFLUIDIC TRAP** M. Tanyeri and C.M. Schroeder *University of Illinois, Urbana-Champaign, USA*
16:20 - 16:40		
BUBBLE-JET ACTUATED CELL-SORTING H. Hoefemann[1], N. Bakhtina[1], S. Wadle[1], V. Kondrashov[1], N. Wangler[2], and R. Zengerle[2] [1]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY and* [2]*University of Freiburg - IMTEK, GERMANY*	**A MICROFLUIDIC DEVICE FOR THE CHARACTERISATION OF EMBOLISATION WITH MICROSPHERICAL BEADS** D. Carugo[1], L. Capretto[1], S. Willis[2], A. Lewis[2], D. Grey[2], M. Hill[1], and X. Zhang[1] [1]*University of Southampton, UK and* [2]*Biocompatibles UK Ltd, UK*	**INVESTIGATING PHOTODYNAMIC EFFICIENCY OF TUMOR TARGETED NANOPARTICULAR PHOTOSENSITIZER USING MICROFLUIDIC CHIPS** X. Lou, G. Kim, Y.K. Lee, R. Kopelman, and E. Yoon *University of Michigan, USA*
16:40 - 17:00		
CONTINUOUS CELL SORTING BY DETERMINISTIC CELL ROLLING S. Choi[1], J.M. Karp[2], and R. Karnik[1] [1]*Massachusetts Institute of Technology, USA and* [2]*Brigham and Women's Hospital, Harvard-MIT Division of Health Sciences and Technology, and Harvard Stem Cell Institute, USA*	**TRANSFORMATION OF BI-LAYERED HYDROGEL MICROPARTICLES FOR MICROCARRIER** T.S. Shim[1], S.-H. Kim[2], C.-J. Heo[1], H.C. Jeon[1], S.-M. and Yang[1] [1]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA and* [2]*Harvard University, USA*	**MICROFLUIDIC VISUALIZATION OF ENCOUNTER COMPLEX IN ENZYMATIC DIGESTION OF SINGLE DNA MOLECULE BY DUAL MOLECULAR TAGGING** D. Onoshima[1], N. Kaji[1], M. Tokeshi[1], and Y. Baba[1,2] [1]*Nagoya University, JAPAN and* [2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

19:00 - 22:00 | **An Evening at the EMP Museum (music + sci-fi + pop-culture)**



Thursday, October 6

08:30 - 08:45 **Announcements**

08:45 - 09:30 **Plenary Session VI** - Chair: A. Manz, *Korea Institute of Science and Technology (KIST) - Europe, GERMANY*

SYSTEMS BIOLOGY, TRANSFORMATIONAL TECHNOLOGIES AND THE EMERGENCE OF PROACTIVE P4 MEDICINE
L. Hood
Institute for Systems Biology, USA

09:30 - 09:45 **Awards Ceremony II**
Chairs: J. Ducrée, *Dublin City University, IRELAND* and D. Juncker, *McGill University, CANADA*

μTAS Art in Science Award
sponsored by *Lab on a Chip (Royal Society of Chemistry), National Institute of Standards and Technology (NIST),* and *Chemical and Biological Microsystems Society (CBMS)*

Young Researcher Poster Award
sponsored by *The Society for Chemistry and Micro-Nano Systems (CHEMINAS)*

Lab on a Chip Widmer Poster Award
sponsored by *Lab on a Chip (Royal Society of Chemistry)*

Ballroom 6E	Ballroom 6D	Room 611-614
Session 4A1 **Circulating Tumor Cells** CHAIR: B. Kirby, *Cornell University, USA*	**Session 4B1** **Protein Analysis** CHAIR: D. DeVoe, *University of Maryland, USA*	**Session 4C1** **Process Automation & Screening** CHAIR: P. Yager, *University of Washington, USA*
09:45 - 10:05		
HIGH-THROUGHPUT INERTIAL SEPARATION OF CANCER CELLS FROM HUMAN WHOLE BLOOD IN A CONTRACTION–EXPANSION ARRAY MICROCHANNEL M.G. Lee[1], C.Y. Bae[1], S. Choi[1], H.-J. Cho[2], and J.-K. Park[1] [1]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA and* [2]*Konyang University Hospital, SOUTH KOREA*	**PHOTO-CLICKABLE SEPARATION GELS ENABLE TARGETED PROTEOMICS OF CANCER BIOMARKER ISOFORMS: A 'SINGLE CHANNEL, MULTI-STAGE' STRATEGY** A.J. Hughes and A.E. Herr *University of California, Berkeley, USA*	**PARALLEL MICRO-CHEMOSTATS IN AN AUTOMATED DROPLET MICROFLUIDIC SYSTEM** S. Jakiela, T.S. Kamiński, O. Cybulski, and P. Garstecki *Polish Academy of Sciences, POLAND*
10:05 - 10:25		
FUNCTIONAL ASSAYS OF DRUG-TARGET ENGAGEMENT ON CIRCULATING TUMOR CELLS CAPTURED FROM PATIENT BLOOD CORRELATE WITH PATIENT PROGRESSION B.J. Kirby[1], E.D. Pratt[1], S.M. Santana[1], J.P. Smith[1], J.P. Gleghorn[1], M. Jodari[2], G. Gakhar[2], M. Loftus[2], H. Liu[2], N.H. Bander[2], D.M. Nanus[2], and P.A. Giannakakou[2] [1]*Cornell University, USA and* [2]*Weill Cornell Medical College, USA*	**A PLATFORM COMBINING ACTIVABLE MAGNETIC TWEEZERS AND BIPHASIC FLUIDIC PLUGS FOR ULTRA LOW VOLUME AND HIGH THROUGHPUT BIOASSAY** A. Ali-Cherif, S. Begolo, S. Descroix, J.-L. Viovy, and L. Malaquin *Institut Curie, FRANCE*	**AN INTEGRATED MICROFLUIDIC SYSTEM FOR AUTOMATING ON-CHIP SELEX PROCESS TO SCREEN TUMOR CELL-SPECIFIC APTAMERS** C.H. Weng[1], L.Y. Hung[2], G.B. Lee[2], H.-I. Lin[1], I.-S. Hsieh[1], S.-C. Shiesh[1], and Y.-L. Chen[1] [1]*National Cheng Kung University, TAIWAN and* [2]*National Tsing Hua University, TAIWAN*
10:25 - 10:45		
A NOVEL FULLY-AUTOMATED MICROFILTER PLATFORM USING SELECTIVE SIZE AMPLIFICATION OF CIRCULATING TUMOR CELLS M.S. Kim[1], J.-G. Lee[1], T.S. Sim[1], Y.J. Kim[1], J.-M. Park[1,2], S. Baek[1], J.-M. Oh[1], H. Jeong[1], H.J. Lee[1], J.-Y. Lee[1], S.S. Kim[1], S.S. Lee[1], and J.C. Park[1] [1]*Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA and* [2]*Yonsei University, SOUTH KOREA*	**ENHANCING/MULTIPLEXING PROTEASE ASSAY WITH DROPLET BASED MICROFLUIDICS USING BIOMOLECULE CONCENTRATOR** C.H. Chen, A. Sarkar, Y.-A. Song, M.A. Miller, S.J. Kim, L.G. Griffith, D.A. Lauffenburger, and J. Han *Massachusetts Institute of Technology, USA*	**MICROFLUIDIC PLATFORMS FOR SOLID FORM SCREENING OF PHARMACEUTICALS** S. Goyal[1], M.R. Thorson[1], Y. Gong[2], G.G.Z. Zhang[2], and P.J.A. Kenis[1] [1]*University of Illinois, Urbana-Champaign, USA and* [2]*Abbott Laboratories, USA*

10:45 - 11:15 **Break and Exhibit Inspection**

Ballroom 6E

Special Focus Session Session 4A2
Paper Microfluidics
CHAIR: J. Ducrée, *Dublin City University, IRELAND*

11:15 - 11:35

A TWO-DIMENSIONAL PAPER NETWORK FOR COMPREHESIVE DENGUE DETECTION AT THE POINT OF CARE
P. Yager, E. Fu, T. Liang, B. Lutz, and J.L. Osborn
University of Washington, USA

11:35 - 11:55

WAX PRINTED MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICES: PUTTING THEM TO WORK
M.E. Funes-Huacca[1], T. Mazzu[1], R. Borba[1], and E. Carrilho[1,2]
[1]*Universidade de São Paulo, BRAZIL and*
[2]*INCTBio, BRAZIL*

11:55 - 12:15

VOC-FREE INKJET PATTERNING METHOD FOR THE FABRICATION OF "PAPERFLUIDIC" SENSING DEVICES
D. Citterio, K. Maejima, and K. Suzuki
Keio University, JAPAN

Ballroom 6D

Special Focus Session Session 4B2
Forensic Analysis
CHAIR: S. Ekström, *Lund University, SWEDEN*
Session Benefactor - Promega Corporation

11:15 - 11:35

RAPID DNA HUMAN IDENTIFICATION SYSTEM: OPTIMIZATION OF MICROFLUIDIC INTEGRATION
M.D. Estes[1], C. Hurth[1], J. Yang[1], C. Brooks[1], A. Nordquist[1], S. Smith[1], R. Lenigk[1], N. Moran[2], A.J. Hopwood[2], G. Tully[2], and F. Zenhausern[1]
[1]*University of Arizona, USA and*
[2]*Forensic Science Service, UK*

11:35 - 11:55

FORENSIC MICROFLUIDICS OUTSIDE THE DNA BOX
S. Bell
West Virginia University, USA

11:55 - 12:15

A MULTICHANNEL MICRODEVICE FOR PCR AMPLIFICATION AND ELECTROPHORETIC SEPARATION OF DNA
B.E. Root[1], C.R. Reedy[1], K.A. Hagan[1], J.V. Norris[1], M. Egan[1], R. Lovaglio[1], O.N. Scott[1], D.J. South[2], P. Trost[2], D. Albert[2], J.M. Bienvenue[2], and J.P. Landers[1]
[1]*ZyGEM-Microlab Diagnostics, USA and*
[2]*Lockheed Martin, USA*

Room 611-614

Special Focus Session 4C2
Bacterial Detection & Communication
CHAIR: W. van der Wijngaart, *KTH Royal Institute of Technology, SWEDEN*

11:15 - 11:35

A MICROMAGNETIC FLUX CONCENTRATOR DEVICE FOR ISOLATION AND VISUALIZATION OF PATHOGENS
R.M. Cooper[1,2], D. Leslie[1], K. Domansky[1], M. Super[1], C. Yung[1,2], M. Cho[1], S. Workman[1], and D. Ingber[1,2]
[1]*Harvard University, USA and*
[2]*Boston Children's Hospital, USA*

11:35 - 11:55

BACTERIAL CELL-TO-CELL COMMUNICATION ASSAYS IN A MICROFABRICATED CONCENTRATOR ARRAY DEVICE
S. Park[1], X. Hong[2], M. Kim[1], W. Choi[1], and T. Kim[1]
[1]*Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA and*
[2]*University of Science and Technology of China, CHINA*

11:55 - 12:15

A PAPER-BASED ANALYTICAL DEVICE FOR THE COLORIMETRIC DETECTION OF FOODBORNE PATHOGENIC BACTERIA
J.C. Jokerst, J.A. Adkins, B. Bisha, M.M. Mentele, L.D. Goodridge, and C.S. Henry
Colorado State University, USA

12:15 | **Conference Adjourns**

The 16th International Conference on
Miniaturized Systems for Chemistry and Life Sciences

CALL FOR PAPERS and ADVANCE ANNOUNCEMENT

The 16th International Conference on Miniaturized Systems for Chemistry and Life Sciences

μTAS 2012 OKINAWA JAPAN Oct.28-Nov.1

Date : **Oct.28-Nov.1,2012**

Location : **Okinawa Convention Center**
4-3-1 Mashiki, Ginowan City, Okinawa, Japan

Conference Chair : **Teruo Fujii**
IIS, University of Tokyo, JAPAN

The Sixteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS 2012) will be held at the Okinawa Convention Center in Okinawa, Japan from October 28 to November 1, 2012.

μTAS 2012 continues a series of Conferences that are the premier forum for reporting and exchanging research results in microfluidics, microfabrication, nanotechnology, integration, materials and surfaces, analysis and synthesis, and detection technologies for life science and chemistry. The Conference offers plenary talks as well as contributed oral presentations and posters selected from submitted abstracts. Following Tokyo in 2006, Paris in 2007, San Diego in 2008, Jeju in 2009, Groningen in 2010, and Seattle in 2011, we anticipate over 900 international scientists and professionals engaged in research on and in the use of integrated microsystems and nanotechnology for chemistry and life sciences.

IMPORTANT DATES

Abstract Deadline : April 15, 2012
Author Notification : June 20, 2012
Manuscript Deadline : July 23, 2012

TOPICS

Microfluidics and Nanofluidics
- Micro / Nano Liquid Handling
- Micro / Nano Flow Measurement
- Fluid Mechanics / Modelling
- Multi-Phase & Digital Microfluidics
- Multiscale / Integrative Microfluidics

Life Science Applications
- Omics Technologies
- Drug Development / Analysis
- Cell Culture / Handling / Analysis
- Tissue Engineering
- Implantable Devices

Analysis and Synthesis Applications
- Separation Science
- Microreactors
- Flow Chemistry / Synthesis
- In-Line Analysis / Process Control
- Integrated Process Systems

MEMS and NEMS Technologies
- Micro- & Nanofabrication
- Materials and Surface Modification
- Microfluidic Components and Packaging
- New Device Materials
- Integration Technologies

Nanotechnologies
- Nanoengineering
- Molecular Systems
- Nanobiotechnology
- Nanoassembly
- Nanostructured Materials

Imaging and Detection Technologies
- Visualization
- Optical / Optofluidic
- Electrochemical
- Mass Spectrometry

Integrated Sample-to-Answer Systems
- Point-of-Care Testing
- Clinical Diagnostics
- Forensics
- Integrated Analytical Systems

Application to Green Technologies
- Fuel Cells / Solar Cells
- Low Carbon/Emission Technologies
- Water / Air / Soil Management
- Building / Architecture
- Other Energy / Power Devices

Other Applications
- Agriculture/Fishery/Forestry
- Food & Nutrition
- Environmental
- Systems/Synthetic Biology
- Devices for Better Quality-of-Life (QOL)

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