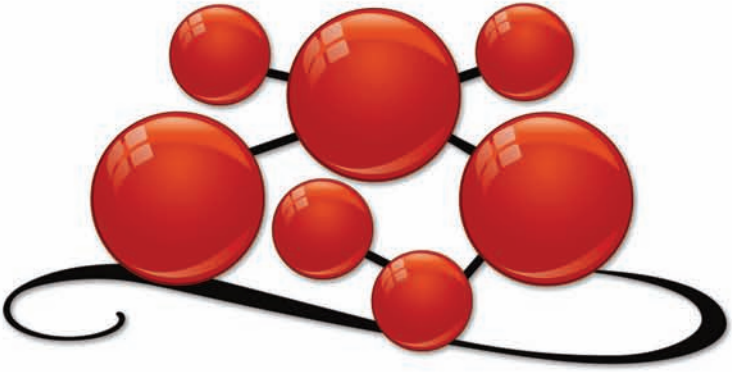

The 17th International Conference on Miniaturized Systems for Chemistry and Life Sciences

µTAS 2013

FREIBURG-BLACK FOREST GERMANY

27-31 OCTOBER 2013

TECHNICAL PROGRAM

Conference Chair:

Roland Zengerle

HSG-IMIT & IMTEK - University of Freiburg, GERMANY

Vice-Chairs:

Andreas Manz

KIST-Europe, GERMANY

Petra Schwille

Max Planck Institute of Biochemistry, GERMANY

Holger Becker

microfluidic ChipShop, GERMANY

Sponsored by:

CBMS microTEC Südwest HSG-IMIT

CONFERENCE AT A GLANCE

COLOR TRACKS		
Orange Track 1: Micro- & Nanoengineering	Blue Track 2: MicroTAS for Biotechnology	Green Track 3: MicroTAS for Biomedicine & Clinical Applications

SUNDAY 27 October

13:00 - 17:00	WORKSHOP & SHORT COURSES
17:00 - 19:00	CONFERENCE REGISTRATION & CHECK-IN
17:00 - 19:00	WELCOME RECEPTION

MONDAY 28 October

08:30 - 08:45	OPENING REMARKS		
08:45 - 09:30	PLENARY PRESENTATION I Antoine M. van Oijen, *University of Groningen, THE NETHERLANDS*		
	Rothaus Arena / Halle 4	K 6-9	Halle 1
09:45 - 10:45	Session 1A1 Tools for Single Molecule Manipulation	Session 1B1 Chemical & Electrochemical Sensing	Session 1C1 Circulating Tumor Cells
10:45 - 11:15	BREAK & EXHIBIT INSPECTION		
11:15 - 12:15	Session 1A2 Single Molecule Characterization	Session 1B2 Particle Processing	Session 1C2 Screening Platforms
12:15 - 13:15	LUNCH		
13:15 - 14:00	PLENARY PRESENTATION II Stephen C. Jacobson, *Indiana University, USA*		
14:00 - 16:00	EXHIBITOR LIVE LAB 1 - LabSmith, Inc.		
14:00 - 15:30	EXHIBITOR INDUSTRIAL STAGE		
14:00 - 16:00	POSTER SESSION 1		
16:00 - 16:30	BREAK & EXHIBIT INSPECTION		
16:30 - 17:15	PLENARY PRESENTATION III Michael Reth, *University of Freiburg, GERMANY*		
17:30 - 18:30	Session 1A3 Fiber & Particle Manufacturing	Session 1B3 Cell Separation & Capture	Session 1C3 Flow Control

TUESDAY 29 October

08:30 - 08:45	ANNOUNCEMENTS		
08:45 - 09:30	PLENARY PRESENTATION IV Aydogan Ozcan, *University of California, Los Angeles, USA*		
09:30 - 11:30	EXHIBITOR LIVE LAB 2 - PASCA		
09:45 - 10:45	Session 2A1 Electrokinetic Transport	Session 2B1 Biomolecular Detection 1	Session 2C1 Point-of-Care Immunodiagnostics 1
10:45 - 11:15	BREAK & EXHIBIT INSPECTION		
11:15 - 12:15	Session 2A2 Particle Manufacturing & Encoding	Session 2B2 Biomolecular Detection 2	Session 2C2 Point-of-Care Immunodiagnostics 2
12:15 - 13:15	LUNCH		
13:15 - 13:35	Analytical Chemistry Young Innovator Award		
13:35 - 13:55	Lab on a Chip / Corning Inc. Pioneers in Miniaturization Prize		
14:00 - 16:00	EXHIBITOR LIVE LAB 3 - Cellix Limited		
14:00 - 16:00	POSTER SESSION 2		
16:00 - 16:30	BREAK & EXHIBIT INSPECTION		
16:30 - 17:15	PLENARY PRESENTATION V Lei Jiang, *Chinese Academy of Sciences, CHINA*		
17:30 - 18:30	Session 2A3 Electrochemical Detection & Imaging	Session 2B3 Immunoassays	

WEDNESDAY 30 October

08:30 - 08:45	ANNOUNCEMENTS		
08:45 - 09:30	PLENARY PRESENTATION VI Shoji Takeuchi, *University of Tokyo, JAPAN*		
09:30 - 11:30	EXHIBITOR LIVE LAB 4 - microfluidic ChipShop GmbH		
09:45 - 10:45	Session 3A1 Point-of-Care Nucleic Acid Analysis	Session 3B1 Protein Processing & Analysis 1	Session 3C1 Blood Processing
10:45 - 11:15	BREAK & EXHIBIT INSPECTION		
11:15 - 12:15	Session 3A2 Single Cell Processing & Analysis 1	Session 3B2 Protein Processing & Analysis 2	Session 3C2 Point-of-Care Bacterial Detection
12:15 - 13:15	LUNCH		
13:15 - 14:00	PLENARY PRESENTATION VII Piotr Garstecki, *Polish Academy of Sciences, POLAND*		
14:00 - 16:00	EXHIBITOR LIVE LAB 5 - cetoni GmbH		
14:00 - 16:00	POSTER SESSION 3		
16:00 - 16:30	BREAK & EXHIBIT INSPECTION		
16:30 - 17:50	Session 3A3 Single Cell Processing & Analysis 2	Session 3B3 Droplets & Plugs	Session 3C3 Tools for Cancer Analysis
19:00 - 23:30	Conference Banquet at the Konzerthaus Freiburg		

THURSDAY 31 October

08:30 - 08:45	ANNOUNCEMENTS		
08:45 - 09:30	PLENARY PRESENTATION VIII Petra S. Dittrich, *ETH Zürich, SWITZERLAND*		
09:45 - 10:45	Session 4A1 Micromixers & Gradient Generators	Session 4B1 Molecular Separation	Session 4C1 Neurobiology
10:45 - 11:15	BREAK & EXHIBIT INSPECTION		
11:15 - 12:35	Session 4A2 Nucleic Acid Processing	Session 4B2 Cell Biology	Session 4C2 Tissue Engineering
12:45 - 13:05	MicroTAS 2014 Announcement		
13:05 - 13:20	Lab on a Chip Widmer & CHEMINAS Young Researcher Poster Awards		
13:20 - 13:35	NIST / Lab on a Chip Art in Science Award		
13:35	CONFERENCE ADJOURNS		

COLOR TRACK PHILOSOPHY

A Track-Centered View to the MicroTAS 2013 Program

When the term "Micro-TAS" (Micro-Total Analysis Systems) was introduced in the early 90's, a novel type of chemistry and biology was prophesized that would make extensive use of miniaturized fluid handling tools. Soon the imagination of tool developers reached beyond "analysis systems" into fields as diverse as molecular biology, materials science, synthetic chemistry, cell biology, and microbiology, to name a few, and it became necessary to coin a new term ("Lab on a Chip"). Meanwhile Micro-TAS and Lab-on-a-Chip entered into adulthood. Several years ago, the majority of abstracts focused on technology developments (microchannel fabrication, droplet generation, microvalve fabrication, etc.). This year, of the 102 oral presentations that were included in the program, less than one third focused on technology development and the rest of the selected orals focused on applications – following the demand of top-tier journals, funding agencies and, ultimately, society.

We divided all the oral presentations into three color-coded "tracks". Each track can be regarded as a broad thematic area so that the attendee can more easily navigate through the conference program and decide which sessions he/she wants to attend. We have produced a Program Schedule (where all the sessions are organized chronologically, so the colors tend to be more scrambled), and a Thematic Program (where all the sessions, with their schedule, are organized by theme).

The oral presentations that focus on technology development are grouped in the **Orange Track 1: Micro- and Nanoengineering**. The Orange Track comprises a total of 9 sessions (in this order in the Program Schedule): Tools for Single-Molecule Manipulation; Single Molecule Characterization; Particle Processing; Fiber and Particle Manufacturing; Flow Control; Electrokinetic Transport; Particle Manufacturing and Encoding; Droplets & Plugs; and Micromixers and Gradient Generators. There are definitely fewer technology-flavored sessions than other years, because of the quality of the rest of the abstracts. We divided the application-focused orals into two tracks. The **Blue Track 2: MicroTAS for Biotechnology** is focused on devices that have a clear "sales pitch" in biotechnology but did not include clinical data (yet). In the Blue Track you can find the following 12 sessions: Chemical and Electrochemical Sensing; Cell Separation and Capture; Biomolecular Detection (1 and 2); Electrochemical Detection and Imaging; Immunoassays; Protein Processing and Analysis (1 and 2); Single Cell Processing and Analysis (1 and 2); Molecular Separation; and Nucleic Acid Processing. The **Green Track 3: MicroTAS for Biomedicine and Clinical Applications** sessions focus on devices that include biological or clinical data, including point-of-care devices. In the Green Track you will find 11 sessions: Circulating Tumor Cells; Screening Platforms; Point-of-Care Immunodiagnostics (1 and 2); Point-of-Care Nucleic Acid Analysis; Blood Processing; Point-of-Care Bacterial Detection; Tools for Cancer Analysis; Neurobiology; Cell Biology; and Tissue Engineering.

Applications are the driving force of our field. Every successful application that hits the news headlines is a collective success of our community in these times of uncertain funding. We hope that this "track-centered" organization will cross-fertilize technologies in laboratories that focus on the same application and will thus help propel the field in a direction of higher public visibility. Last but not least we hope that the track-centered view gives you an additional option to select the sessions of your interest.

TECHNICAL PROGRAM INFORMATION

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

Plenary Speakers: (in order of presentation)

Monday.....08:45 - 09:30	Antoine M. van Oijen, *University of Groningen, THE NETHERLANDS*
Monday.....13:15 - 14:00	Stephen C. Jacobson, *Indiana University, USA*
Monday.....16:30 - 17:15	Michael Reth, *University of Freiburg, GERMANY*
Tuesday .....08:45 - 09:30	Aydogan Ozcan, *University of California, Los Angeles, USA*
Tuesday .....16:30 - 17:15	Lei Jiang, *Chinese Academy of Sciences, CHINA*
Wednesday .....08:45 - 09:30	Shoji Takeuchi, *University of Tokyo, JAPAN*
Wednesday .....13:15 - 14:00	Piotr Garstecki, *Polish Academy of Sciences, POLAND*
Thursday.....08:45 - 09:30	Petra S. Dittrich, *ETH Zürich, SWITZERLAND*

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.

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 = Rothaus Arena / Halle 4 **B** = K 6-9 **C** = Halle 1

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 Halle 2, from 14:00 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. See poster floorplan on pages 28-29.

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.

Poster Number: M.001a

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., **001**) is the poster board position on the floorplan.

The last character (i.e., **a**) shows the category of the poster:

a = Fundamentals in Microfluidics and Nanofluidics
b = Micro- and Nanoengineering
c = Sensors & Actuators, Detection Technologies
d = Novel Functionalities in Integrated Microfluidic Platforms
e = Cells & Liposomes on Chip
f = Organs & Organisms
g = Diagnostics & Analytics
h = Medical Research & Applications
i = Separation Technologies
j = Microreaction Technology & Synthesis
k = Applications to Green & Environmental Technologies
l = MicroTAS for Other Applications

TECHNICAL PROGRAM

SUNDAY 27 October

13:00 - 17:00	WORKSHOP & SHORT COURSES
17:00 - 19:00	CONFERENCE REGISTRATION & CHECK-IN
17:00 - 19:00	WELCOME RECEPTION

MONDAY 28 October

07:00 - 18:00	REGISTRATION
08:30 - 08:45	OPENING REMARKS
08:45 - 09:30	PLENARY PRESENTATION I

Chairs: A. Manz, *KIST Europe GmbH, GERMANY*
P. Schwille, *Max Planck Institute of Biochemistry, GERMANY*

BIOLOGY AT THE NANOSCALE, ONE MOLECULE AT A TIME
Antoine M. van Oijen
University of Groningen, THE NETHERLANDS

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 1A1 - Tools for Single Molecule Manipulation	**Session 1B1 - Chemical and Electrochemical Sensing**	**Session 1C1 - Circulating Tumor Cells**
Session Chairs:		
H. Gardeniers, *University of Twente, THE NETHERLANDS*	K. Hjort, *Uppsala University, SWEDEN*	H. Andersson-Svahn, *KTH - Royal Institute of Technology, SWEDEN*
K. Mawatari, *University of Tokyo, JAPAN*	F.-G. Tseng, *National Tsing Hua University, TAIWAN*	S. Takeuchi, *University of Tokyo, JAPAN*
09:45 - 10:05		
NANOFLUIDIC DEVICE ARCHITECTURES FOR THE CONTROLLED TRANSPORT AND HIGH THROUGHPUT ANALYSIS OF SINGLE DNA MOLECULES IN NANOCHANNELS L.D. Menard and J.M. Ramsey *University of North Carolina, USA*	**PHASE 1 AND 2 DRUG METABOLITES GENERATED USING A MINIATURIZED ELECTROCHEMICAL CELL WITH AN ATTACHED ESI NEEDLE** F. van den Brink[1], L. Büter[2], M. Odijk[1], W. Olthuis[1], U. Karst[2], and A. van den Berg[1] [1]*MESA+, University of Twente, THE NETHERLANDS and* [2]*University of Münster, GERMANY*	**PARALLELIZED MICROFLUIDIC IMMUNOCAPTURE OF CIRCULATING PANCREATIC CELLS FOR GENETIC ANALYSIS AND EARLY DETECTION OF PANCREATIC CARCINOGENESIS** F.I. Thege[1], S.M. Santana[1], T.B. Lannin[1], S. Tsai[2], T.N. Saha[2,3], M.E. Godla[1], E.D. Pratt[1], A.D. Rhim[2,3], and B.J. Kirby[1] [1]*Cornell University, USA,* [2]*University of Pennsylvania, USA, and* [3]*University of Michigan, USA*
10:05 - 10:25		
WHAT DO PHOTONS DO TO FLUORESCENTLY STAINED DNA IN CONFINEMENT? J.P. Beech[1], L. Nyberg[2], J. Fritzsche[2], F. Westerlund[2], and J.O. Tegenfeldt[1] [1]*Lund University, SWEDEN and* [2]*Chalmers University, SWEDEN*	**SELF-POWERED MOBILE SENSOR FOR IN-PIPE POTABLE WATER QUALITY MONITORING** R. Wu[1], W.W.A. Wan Salim[1], S. Malhotra[1], A. Brovont[1], J.H. Park[1], S.D. Pekarek[1], M.K. Banks[2], and D.M. Porterfield[1,3] [1]*Purdue University, USA,* [2]*Texas A&M University, USA, and* [3]*NASA Life and Physical Sciences, USA*	**HIGH THROUGHPUT CIRCULATING TUMOR CELL ISOLATION USING TRAPEZOIDAL INERTIAL MICROFLUIDICS** G. Guan[1,2], M.E. Warkiani[1], K.B. Luan[2], C.T. Lim[1,2], P.C.Y. Chen[1,2], and J. Han[1,3] [1]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,* [2]*National University of Singapore, SINGAPORE, and* [3]*Massachusetts Institute of Technology, USA*

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 1A1 - Tools for Single Molecule Manipulation	**Session 1B1 - Chemical and Electrochemical Sensing**	**Session 1C1 - Circulating Tumor Cells**
10:25 - 10:45		
MICROFLUIDIC PARALLEL STRETCHING AND STAMPING OF SINGLE DNA MOLECULES FOR SUPER RESOLUTION MICROSCOPE IMAGING H. Yasaki[1], D. Onoshima[1], T. Yasui[1], T. Naito[2], N. Kaji[1], and Y. Baba[1,3] [1]*Nagoya University, JAPAN,* [2]*Kyoto University, JAPAN, and* [3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*	**TIME CAPSULE: A DIFFUSION-REACTION BASED PASSIVE SENSING SYSTEM WITH TIMING AND RECORDING FUNCTIONS** Y. Chen and S.K.Y. Tang *Stanford University, USA*	**TUNEABLE "NANOSHEARING": AN INNOVATIVE MECHANISM FOR THE ACCURATE AND SPECIFIC CAPTURE OF RARE CANCER CELLS** M.J.A. Shiddiky, R. Vaidyanathan, S. Rauf, Z. Tay, and M. Trau *University of Queensland, AUSTRALIA*
10:45 - 11:15	**BREAK AND EXHIBIT INSPECTION**	
Session 1A2 - Single Molecule Characterization	**Session 1B2 - Particle Processing**	**Session 1C2 - Screening Platforms**

Session Chairs:

J. Eijkel, *University of Twente, THE NETHERLANDS*	S. Hardt, *Technical University of Darmstadt, GERMANY*	Y.-K. Cho, *Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA*
O. Niwa, *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*	J.-K. Park, *Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA*	M. Meier, *University of Freiburg - IMTEK, GERMANY*

11:15 - 11:35		
DNA METHYLATION MAPPING IN NANOSLIT DEVICES AT A SINGLE MOLECULE LEVEL M. Mizutani[1], T. Yasui[1], N. Kaji[1], S. Rahong[2], T. Yanagida[2], M. Kanai[2], K. Nagashima[2], T. Kawai[2], and Y. Baba[1,3] [1]*Nagoya University, JAPAN,* [2]*Osaka University, JAPAN, and* [3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*	**MICROFABRICATED MAGNETIC POTENTIAL WELL ARRAYS AND MECHATRONIC SYSTEM FOR JOYSTICK-BASED MASSIVELY PARALLEL MANIPULATION OF MAGNETIC PARTICLES** C. Murray, J. Kong, P. Tseng, and D. Di Carlo *University of California, Los Angeles, USA*	**MICRODEVICE TO ASSESS THE EFFECT OF LINEAR WNT-3A GRADIENT ON COLONIC CRYPTS** A.A. Ahmad[1,2], Y. Wang[1], P.K. Shah[1,2], C.E. Sims[1], S.T. Magness[1], and N.L. Allbritton[1,2] [1]*University of North Carolina, USA and* [2]*North Carolina State University, USA*
11:35 - 11:55		
SINGLE-STRANDED DNA DETECTION VIA CHEMICALLY MODIFIED ALAMETHICIN NANOPORE AT SINGLE MOLECULE LEVEL R. Kawano[1], D. Noshiro[2], T. Osaki[1,3], K. Kamiya[1], K. Asami[2], S. Futaki[2], and S. Takeuchi[1,3] [1]*Kanagawa Academy of Science and Technology (KAST), JAPAN,* [2]*Kyoto University, JAPAN, and* [3]*University of Tokyo, JAPAN*	**TWO-DIMENSIONAL ACOUSTOPHORESIS IN SQUARE MICROCHANNEL ENABLES SUB-MICROMETER PARTICLE FOCUSING** M. Nordin[1], P. Augustsson[1], P.B. Muller[2], and H. Bruus[2], and T. Laurell[1] [1]*Lund University, SWEDEN and* [2]*Technical University of Denmark, DENMARK*	**SHORT-RANGE PARACRINE INTERACTIONS REVEALED IN A COMPARTMENTALIZED CO-CULTURE SCREENING PLATFORM** K.H. Spencer and E.E. Hui *University of California, Irvine, USA*

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 1A2 - Single Molecule Characterization	**Session 1B2 - Particle Processing**	**Session 1C2 - Screening Platforms**
11:55 - 12:15		
SINGLE MOLECULE HYDRODYNAMIC SEPARATION FOR ULTRASENSITIVE AND QUANTITATIVE DNA SIZE SEPARATIONS S.M. Friedrich, K.J. Liu, and T.H. Wang *Johns Hopkins University, USA*	**DEVELOPMENT OF MICROFLUIDIC DEVICES WITH THE POLYETHYLENE GLYCOL-LIPID-MODIFIED ADSORPTION SURFACE FOR HIGH-THROUGHPUT ISOLATION OF EXOSOMES FROM HUMAN SERUM** M. Kobayashi[1], M. Sasaki[1], N. Kosaka[2], T. Ochiya[2], T. Akagi[1], and T. Ichiki[1] [1] *University of Tokyo, JAPAN and* [2] *National Cancer Research Institute, JAPAN*	**A MICROPATTERNED HUMAN EMBRYONIC STEM CELL MODEL FOR IN VITRO HUMAN DEVELOPMENTAL TOXICITY TESTING** Y.-C. Toh[1], J. Xing[1,2], S. Xu[2,3], and H. Yu[1,2,3] [1] *Institute of Bioengineering and Nanotechnology, SINGAPORE,* [2] *Mechanobiology Institute, SINGAPORE,* [3] *National University of Singapore, SINGAPORE, and* [4] *Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE*

12:15 - 13:15 — **LUNCH**

13:15 - 14:00 — **PLENARY PRESENTATION II**

Chairs: H. Becker, *microfluidic ChipShop GmbH, GERMANY*
A. Manz, *KIST Europe GmbH, GERMANY*

STUDYING INDIVIDUAL VIRUSES AND BACTERIA WITH NANOFLUIDICS
Stephen C. Jacobson
Indiana University, USA

14:00 - 16:00 — **EXHIBITOR LIVE LAB 1 - LabSmith, Inc.**

AUTOMATE YOUR EXPERIMENT WITH THE LABPACKAGE MICRO/NANOFLUIDIC WORKSTATION
Yolanda Fintschenko, Ph.D., *Director of Sales, Marketing and New Technologies*
LabSmith, Inc., USA

14:00 - 15:30 — **EXHIBITOR INDUSTRIAL STAGE**

14:00 **INSTANTANEOUS STOP FLOW APPLICATIONS IN MICROFLUIDIC / NANOFLUIDIC DEVICE**
Elveflow Microfluidic Innovation Center
Adrien Plecis, *Chief Scientific Officer*

14:15 **MULTI-CHANNELS FLOW-RATE CONTROL BASED ON PRESSURE ACTUATION**
Fluigent SA
Anne Le Nel, *R&D Manager*

14:30 **SILICON PRECISION IN POLYMER MOLDING - FROM CD MANUFACTURER TO MARKET LEADER IN THE INDUSTRIALIZATION OF SMART POLYMER PARTS**
Sony DADC
Christoph Mauracher, *Senior Vice President*

14:45 **NEW TECHNOLOGIES FOR MICROFLUIDICS AND MEMS APPLICATIONS**
Micronit Microfluidics B.V.
Mark Olde Riekerink (PhD), *Senior R&D Project Manager*
Monica Brivio (PhD), *Senior R&D Project Manager*
Marko Blom (PhD), *R&D Project Manager, CTO*

15:00 **SOLVING MICRO REACTION TEMPERATURE CONTROL: ADVANTAGES OF A MODULAR SYSTEM APPROACH TO HEATING AND COOLING**
cetoni GmbH
Franz M. Schaper

15:15 **THE MICROFLUIDIC TOOLBOX – MODULAR APPROACHES FOR INTEGRATED MICROFLUIDICS**
microfluidic ChipShop GmbH
Holger Becker, CSO

14:00 - 16:00 **POSTER SESSION 1** - *See floorplan on pages 28-29*

Fundamentals in Microfluidics and Nanofluidics

Wetting, Capillarity, Priming

M.001a **IS THERMOCAPILLARY ENOUGH FOR DROPLET ACTUATION?**
A. Davanlou, R. Shabani, H.J. Cho, and R. Kumar
University of Central Florida, USA

Electrokinetic Phenomena

M.002a **DUAL FUNCTION MICROFLUIDIC PUMP AND PARTICLE FILTER USING TRAVELING-WAVE ELECTROOSMOSIS AND DIELECTROPHORESIS**
Y.-L. Sung[1], S.-C. Lin[1], W.-Y. Chuang[1], Y.-C. Tung[2], and C.-T. Lin[1]
[1]*National Taiwan University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

M.003a **PDMS VALVES AS TUNABLE NANOCHANNELS FOR CONCENTRATION POLARIZATION**
J. Quist, S.J. Trietsch, P. Vulto, and T. Hankemeier
Leiden University, THE NETHERLANDS

Droplets & Plugs, Multiphase Systems

M.004a **A SINGLE PARTICLE ENCAPSULATION WITHIN DROPLET IN ARRAY- BASED MICROFLUIDIC PLATFORM**
H. Lee, L. Xu and K.W. Oh
University of Buffalo, State University of New York, USA

M.005a **BUBBLE PINCH-OFF AND BREAKUP DUE TO INSTABILITY IN MICRO-JETTTING**
S. Xiong[1], T. Tandiono[2], C.D. Ohl[1], and A.Q. Liu[1]
[1]*Nanyang Technological University, SINGAPORE and*
[2]*Institute of High Performance Computing, A*STAR, SINGAPORE*

M.006a **FORMATION OF PRESSURE DRIVEN PARALLEL AQU/ORG TWO PHASE FLOW IN EXTENDED-NANO SPACE BY A FIB-BASED PARTIAL HYDROPHOBIC MODIFICATION METHOD**
T. Ugajin, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

M.007a **MASS TRANSPORT IN EMULSION STUDIED IN A ONE-DIMENSIONAL MICROARRAY**
P. Gruner[1], B. Semin[2], J. Lim[1], and J.C. Baret[1]
[1]*Max-Planck-Institute for Dynamics and Self-Organization, GERMANY and*
[2]*Laboratoire de Physique Statistique, FRANCE*

M.008a **ON-DEMAND CONTROL OF PH IN MICROFLUIDIC DROPLETS**
H.B. Zhou[1,2] and S.H. Yao[1]
[1]*Hong Kong University of Science & Technology, CHINA and*
[2]*Chinese Academy of Science, CHINA*

M.009a **PRODUCTION OF MONODISPERSE BULK EMULSIONS IN A BEAKER USING A NOVEL MICROFLUIDIC DEVICE**
R. Dangla and C.N. Baroud
Ecole Polytechnique, FRANCE

M.010a **TUNABLE FABRICATION OF MICROFLUIDIC EMULSIONS BY SPINODAL DECOMPOSITION**
S.K. Yap[1], A.Z.M. Badruddoza[1], and S.A. Khan[1,2]
[1]*National University of Singapore, SINGAPORE and*
[2]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE*

Optofluidics

M.011a **DISTINCTIVE LIGHTWAVE COUPLING IN OPTOFLUIDIC PARALLEL WAVEGUIDES FOR SINGLE MOLECULE SORTING**
L.K. Chin, Y. Yang, L. Lei, and A.Q. Liu
Nanyang Technological University, SINGAPORE

M.012a **LOCALIZED SURFACE PLASMON RESONANCE (LSPR) OPTOFLUIDIC BIOSENSOR FOR LABEL-FREE CELLULAR IMMUNOPHENOTYPING**
B.-R. Oh[1], N.-T. Huang[1], W. Chen[1], J. Seo[2], J. Fu[1], and K. Kurabayashi[1]
[1]*University of Michigan, USA and* [2]*Hongik University, SOUTH KOREA*

M.013a **OPTICAL MANIPULATION OF MICROPARTICLES IN OPTOFLUIDIC WAVEGUIDES**
Y.Z. Shi[1], Y. Yang[2], and A.Q. Liu[1,2]
[1] *Xi'an Jiao Tong University, CHINA and* [2] *Nanyang Technological University, SINGAPORE*

Magnetofluidics (Magnetic Particles & Related Phenomena)

M.014a **MANIPULATION OF MAGNETIC PARTICLES IN µ-FLUIDIC VOLUMES**
Y. Gao[1,2], A. van Reenen[1,2], M.A. Hulsen[1], A.M. de Jong[1], M.W.J. Prins[1], and J.M.J. den Toonder[1]
[1] *Eindhoven University of Technology, THE NETHERLANDS and*
[2] *Philips Research, THE NETHERLANDS*

Acoustic Phenomena (BULK & Surface Based)

M.015a **CONTROL OF BLOOD'S RHEOLOGICAL PROPERTIES USING SURFACE ACOUSTIC WAVES**
M.A. Khalid, J. Reboud, R. Wilson, and J.M. Cooper
University of Glasgow, UK

Nanofluidic Phenomena (Nanochannels, -Tubes & -Pores)

M.016a **A PARTICLE TRACKING VELOCIMETRY FOR EXTENDED NANOCHANNEL FLOWS USING EVANESCENT WAVE ILLUMINATION**
Y. Kazoe, K. Iseki, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

M.017a **MOLECULAR CAPTURE IN EXTENDED NANOCHANNELS FOR FEMTO LITER SCALE IMMUNOASSAY**
K. Shirai[1], K. Mawatari[1,2], and T. Kitamori[1,2]
[1] *University of Tokyo and* [2] *Japan Science and Technology Agency (JST), JAPAN*

M.018a **SIZE-BASED PROTEIN FRACTIONATION IN NANOFLUIDIC CHANNEL ARRAYS**
A.T. Woolley, S. Kumar, J. Xuan, M.L. Lee, H.D. Tolley, and A.R. Hawkins
Brigham Young University, USA

Others

M.019a **ON-CHIP ELECTROPORATION DEVICE FOR DIRECT INTRODUCTION OF PLASMIDS INTO CELL NUCLEUS AND OBSERVATION OF CELL REPROGRAMMING PROCESS**
K.O. Okeyo[1], Y. Hayashi[1], O. Kurosawa[1], H. Oana[1], H. Kotera[2], and M. Washizu[1]
[1] *University of Tokyo, JAPAN and* [2] *Kyoto University, JAPAN*

Micro- and Nanoengineering

Micro- & Nanofabrication/ -Patterning/ -Integration

M.020b **A FLOW-THROUGH MICROARRAY OF PREFORMED POROUS POLYMER MONOLITHS IN A THERMOPLASTIC MICROFLUIDIC CHIP**
E.L. Kendall, E. Wienhold, O. Rahmanian, and D.L. DeVoe
University of Maryland, College Park, USA

M.021b **ARBITRARY NANOPATTERNING INSIDE NANOCHANNELS BY INTEGRATION OF TOP-DOWN AND BOTTOM-UP APPROACHES FOR SINGLE MOLECULE ANALYSIS**
N. Matsumoto and Y. Xu
Osaka Prefecture University, JAPAN

M.022b **EFFECT OF AFFINITY BETWEEN THE STAMP AND INK MOLECULES ON MICRO CONTACT PRINTING**
T. Inaba, T. Jean, and N. Miki
Keio University, JAPAN

M.023b **FLUID FLOW THROUGH CARBON NANOTUBE FOREST MICROCHANNELS**
K.B. Teichert[1] and A.J. Hart[1,2]
[1] *University of Michigan, USA and* [2] *Massachusetts Institute of Technology, USA*

M.024b **MICRO- AND NANOSTRUCTURED MICROFLUIDIC CHIP FOR SPECIFIC PROTEIN IMMOBILIZATION**
N.E. Steidle[1], T. Hahn[2], C. Bader[1], M. Schneider[1], R. Ahrens[1], M. Worgull[1], and A.E. Guber[1]
[1] *Karlsruhe Institute of Technology, GERMANY and*
[2] *Bürkert Fluid Control Systems GmbH, GERMANY*

M.025b

ONE-STEP MICROARRAY FABRICATION OF UV-PHOTOPRINTABLE IONOGELS FOR BIOMOLECULE IMMOBILIZATION ON NON-MODIFIED COP AND COC MICROFLUIDIC CHIPS

M. Tijero[1,2], F. Benito-López[1], R. Díez-Ahedo[1,3], L. Basabe-Desmonts[1,4], and V. Castro-López[1]
[1] *CIC microGUNE, SPAIN,* [2] *IK4-IKERLAN, SPAIN,* [3] *IK4-TEKNIKER, SPAIN, and* [4] *IKERBASQUE, SPAIN*

M.026b

RAPID FABRICATION OF OSTE+ MICROFLUIDIC DEVICES WITH LITHOGRAPHICALLY DEFINED HYDROPHOBIC/HYDROPHILIC PATTERNS AND BIOCOMPATIBLE CHIP SEALING

X. Zhou, F. Calborg, N. Sandström, A. Haleem, A. Vastesson, F. Saharil, W. van der Wijngaart, and T. Haraldsson
Royal Institute of Technology (KTH), SWEDEN

M.027b

SELF-ROLLED POLY(DIMETHYL SILOXANE) MICROCAPILLARIES WITH ENGINEERED INNER SURFACE: NEW FUNCTIONAL ELEMENTS OF MICROFLUIDIC DEVICES

L.P.C. Gomez[1], P. Bollgruen[2], A. Egunov[3], D. Mager[2], F. Malloggi[4], J.G. Korvink[2], and V. Luchnikov[3]
[1] *Universidad Nacional de Colombia Bogota, COLOMBIA,* [2] *University of Freiburg, GERMANY,* [3] *Institut de Science des Matériaux de Mulhouse, FRANCE, and* [4] *CEA/CNRS, FRANCE*

M.028b

THREE-DIMENSIONAL FABRICATION OF LONG AND HETEROGENEOUS MICROSTRUCTURES USING VERTICAL CONTINUOUS FLOW LITHOGRAPHY

S. Habasaki[1], S. Yoshida[1], W.C. Lee[1,2], and S. Takeuchi[1,2]
[1] *University of Tokyo, JAPAN and* [2] *Japan Science and Technology Agency (JST), JAPAN*

Novel/Smart/Responsive Materials

M.029b

BIOCOMPATIBILITY OF OSTE POLYMERS STUDIED BY CELL GROWTH EXPERIMENTS

C. Errando-Herranz[1,2], A. Vastesson[1,3], M. Zelenina[1], G. Pardon[1], G. Bergström[3], W. van der Wijngaart[1], T. Haraldsson[1], H. Brismar[1], and K.B. Gylfason[1]
[1] *Royal Institute of Technology (KTH), SWEDEN,*
[2] *Universidad Politécnica de Valencia, SPAIN, and*
[3] *Linköping University, SWEDEN*

M.030b

MAGNETOPHORETIC MANIPULATION IN MICROSYSTEM USING I-PDMS MICROSTRUCTURES

R. Gelszinnis, M. Faivre, J. Degouttes, N. Terrier, R. Ferrigno, and A.-L. Deman
Université de Lyon, FRANCE

M.031b

PHOTO-CLEAVABLE CROSSLINKER CAPABLE OF PREPARING PHOTODEGRADABLE HYDROGEL BY A TWO COMPONENT REACTION FOR HYDROGEL MICRO PATTERNING

F. Yanagawa, S. Sugiura, T. Takagi, K. Sumaru, and T. Kanamori
National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

M.032b

SYNTHESIS OF JANUS MICROHYDROGELS WITH ANISOTROPIC THERMO-RESPONSIVENESS AND ORGANOPHILIC/HYDROPHILC LOADING CAPABILITY

K.D. Seo, J. Doh, D. Choi, M. La, and D.S. Kim
Pohang University of Science and Technology (POSTECH), SOUTH KOREA

Surface Modification

M.033b

LOCAL SURFACE MODIFICATION AT THE MICROSCALE ENABLED BY LIQUID DIELECTROPHORESIS

R. Renaudot[1], T. Nguyen[1], Y. Fouillet[1], L. Jalabert[2], M. Kumemura[2], D. Collard[2], H. Fujita[2], and V. Agache[1]
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M.034b

SUPERHYDROPHILIC TRAP-BASED SELF-PATTERNING OF LIQUID ON CO2 LASER TREATED GLASS SURFACE

K. Xu and J.P. Landers
University of Virginia, USA

Molecular Systems & Nanochemistry

M.035b

MICROTUBULE MANIPULATION BY AN ELECTRIC FIELD IN A FUSED SILICA CHANNEL

T. Nakahara[1], N. Isozaki[1], S. Ando[1], N.K. Kamisetty[1], H. Shintaku[1], H. Kotera[1], and R. Yokokawa[1,2]
[1] *Kyoto University, JAPAN and* [2] *Japan Science and Technology Agency (JST), JAPAN*

Nanobiotechnology

M.036b **CHRISTMAS-TREE NANOWIRE CHIPS FOR DNA SEPARATION**
S. Rahong[1], T. Yasui[2], T. Yanagida[1], M. Kanai[1], K. Nagashima[1], A. Klamchuen[1,3], M. Gang[1], H. Yong[1], F. Zhuge[1], N. Kaji[2], Y. Baba[2,4], and T. Kawai[1]
[1]*Osaka University, JAPAN,* [2]*Nagoya University, JAPAN,* [3]*NANOTEC, THAILAND and* [4]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

M.037b **HIGHLY SENSITIVE DETECTION OF DNA WITH HNA DEFINED SILICON NANOWIRE FET**
L. Dong and X.M. Yu
Peking University, CHINA

M.038b **SENSITIVE AND FAST DNA QUANTIFICATION OF DNA ON FILTER PAPER VIA NANOPARTICLE AGGREGATION**
Q. Liu, D.L. Green, and J.P. Landers
University of Virginia, USA

Nanoassembly

M.039b **SELF-ASSEMBLED NANOWIRES ON GRAPHENE IN MICROFLUIDIC CHANNELS**
W.C. Lee[1,2], J. Park[3], K. Kim[4,5], A. Zettl[4,5], D.A. Weitz[3], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN,* [2]*Japan Science and Technology Agency (JST), JAPAN,* [3]*Harvard University, USA,* [4]*University of California, Berkeley, USA, and* [5]*Lawrence Berkeley National Laboratory, USA*

Sensors & Actuators, Detection Technologies

Micropumps, -Valves, -Dispensers

M.040c **A MICROFLUIDICS BASED 3D BIOPRINTER WITH ON-THE-FLY MULTIMATERIAL SWITCHING CAPABILITY**
S.T. Beyer, T. Mohamed, and K. Walus
University of British Columbia, CANADA

M.041c **RATE-SWITCHABLE AND PRECISELY-TIMED OSMOTIC PUMPING ON A CHIP**
P.-J. Peng, J.-J. Wang, and Y.-C. Su
National Tsing Hua University, TAIWAN

M.042c **VALVELESS FLUID ACTUATION: LIEBAU'S PRINCIPLE FULLY INTEGRATED ON THE MICROFLUIDIC SCALE**
L. Bogunovic[1], S. Gerkens[1], M. Viefhues[1], J. Regtmeier[1], R. Eichhorn[2,3], and D. Anselmetti[1]
[1]*Bielefeld University, GERMANY,* [2]*Royal Institute of Technology (KTH), SWEDEN, and* [3]*Stockholm University, SWEDEN*

Physical Sensors

M.043c **A NOVEL CAPACITIVE DEW-POINT SENSING APPROACH BASED ON WATER-ACTUATED SWELLING OF A SENSING POLYMER MONOLAYER**
V. Kondrashov, J.-N. Schönberg, and J. Rühe
University of Freiburg - IMTEK, GERMANY

M.044c **RESOLUTION ENHANCEMENT OF SUSPENDED MICROCHANNEL RESONATORS BY MASS CORRELATION ANALYSIS**
M.M. Modena, Y. Wang, and T.P. Burg
Max Planck Institute for Biophyisical Chemistry, GERMANY

Biosensors

M.045c **A CAPILLARY-DRIVEN MICROFLUIDIC DEVICE FOR RAPID DNA DETECTION WITH EXTREMELY LOW SAMPLE CONSUMPTION**
C. Huang, B.J. Jones, M. Bivragh, K. Jans, L. Lagae, and P. Peumans
imec, BELGIUM

M.046c **A NEW DISCRIMINATION METHOD OF TARGET BIOMOLECULES WITH MINIATURIZED SENSOR ARRAY UTILIZING LIPOSOME ENCAPSULATING FLUORESCENT MOLECULES WITH TIME COURSE ANALYSIS**
K. Takada[1], T. Fujimoto[1], T. Shimanouchi[2], M. Fukuzawa[1], K. Yamashita[1], H. Umakoshi[3], and M. Noda[1]
[1]*Kyoto Institute of Technology, JAPAN,* [2]*Okayama University, JAPAN, and* [3]*Osaka University, JAPAN*

M.047c **AC-ELECTROOSMOSIS-ASSISTED HIGH-DENSITY SIMULTANEOUS ASSEMBLY OF SERS NANOPARTICLES AND BIOMOLECULES FOR RAPID BIO-DETECTION**
C.W. Lee[1] and F.-G. Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

M.048c **AN INTEGRATED MICROSYSTEM FOR BACTERIAL BIOFILM DETECTION AND TREATMENT**
Y.W. Kim, M.T. Meyer, A. Berkovich, A.A. Iliadis, W.E. Bentley, and R. Ghodssi
University of Maryland, College Park, USA

M.049c **CANCER SENSORS BASED ON GRAPHENE AND GRAPHENE COMPOSITES**
B. Zhang, and T. Cui
University of Minnesota, USA

M.050c **DEVELOPMENT OF LABEL-FREE BIOSENSOR BASED ON APTAMER-MODIFIED SI NANOWIRE FIELD EFFECT TRANSISTOR (FET) USING TOP-DOWN APPROACH AND SOL-GEL METHOD**
J.H. Lee[1], J.H. Roh[2], K.S. Shin[2], D.S. Lee[2], J.A. Lee[3], S.Y. Kim[4], and Y.H. Cho[1,5]
[1]*Seoul National University of Science & Technology, SOUTH KOREA,*
[2]*Korea Electronics Technology Institute, SOUTH KOREA,* [3]*PCL Inc, SOUTH KOREA,*
[4]*Dongguk University, SOUTH KOREA, and*
[5]*Seoul Techno Park Microsystems Packaging Support Center, SOUTH KOREA*

M.051c **DYNAMIC MAGNETIC PARTICLE ACTUATION FOR RAPID BIOSENSING**
A. van Reenen[1], Y. Gao[1], A.M. de Jong[1], M.A. Hulsen[1], J.M.J. den Toonder[1], and M.W.J. Prins[1,2]
[1]*Eindhoven University of Technology, THE NETHERLANDS and*
[2]*Philips Research, THE NETHERLANDS*

M.052c **IMMOBILIZATION OF BIOLOGICAL ACTIVE MOLECULES ON CHEMICALLY INERT POLYMER CHIPS FOR BIO-ANALYTICAL DETECTION**
N. Hlawatsch, M. Krumbholz, J. Rommel, H. Becker, and C. Gärtner
Microfluidic ChipShop GmbH, GERMANY

M.053c **MEASURING BINDING INTERACTIONS OF NEURITE-EXTENSION PROMOTING ANTIBODIES TO SUPPORTED LIPID MEMBRANES USING A MULTICHANNEL MICROFLUIDIC PLASMONIC NANOHOLE ARRAY BIOSENSOR**
L. Jordan[1], X. Xu[2], N.J. Wittenberg[1], A.E. Warrington[2], A. Denic[2], B. Wootla[2], D. Yoo[1], J. Watzlawik[2], M. Rodriguez[2], and S.-H. Oh[1]
[1]*University of Minnesota, USA and* [2]*Mayo Clinic College of Medicine, USA*

M.054c **MONOLITH IMMUNO-SPOTTING MULTIPLEX IMMUNOSENSORS IN A MICROFLUIDIC DEVICE**
O. Rahmanian and D.L. DeVoe
University of Maryland, College Park, USA

M.055c **NANO-CEC CHIP WITH EFFECTIVE SEQUENTIAL ELECTRICAL CONCENTRATION FOR HIGH SENSITIVE CONTINUOUS ANALYSIS OF BIOCHEMICALS RELEASED BY SINGLE CELLS**
P.-J. Wang, R.-G. Wu, F.-G. Tseng, and Y.-L. Wang
National Tsing Hua University, TAIWAN

M.056c **OXYGEN CONSUMPTION MONITORING OF SINGLE ZEBRAFISH EMBRYONIC DEVELOPMENT WITHIN A MICROWELL DEVICE BASED ON PHASE-BASED PHOSPHORESCENCE LIFETIME DETECTION**
S.H. Huang and K.S. Huang
National Taiwan Ocean University, TAIWAN

M.057c **RAPID, LOW-COST DETECTION OF PATHOGENIC BACTERIA FOR POINT-OF-CARE DIAGNOSTICS**
G. Ongo, V. Laforte, and D. Juncker
McGill University, CANADA

M.058c **SUB-SECOND DETERMINATION OF BIOGENIC PROTEIN POLYMERIZATION ACTIVITY USING FLOW INDUCED REFRACTIVE INDEX "VALLEY"**
S. Inoue, K. Hayashi, Y. Iwasaki, T. Horiuchi, N. Matsuura, and Y. Sato
Nippon Telegraph and Telephone Corporation, JAPAN

Chemical & Electrochemical Sensors

M.059c **DEVELOPMENT OF ON-CHIP SOLID PHASE EXTRACTION (SPE) WITH PRECISE FLOW-CONTROL BY MICROPUMP FOR HIGHLY SENSITIVE LIQUID ELECTRODE PLASMA**
D.V. Khoai[1], T. Yamamoto[2], Y. Ukita[1], and Y. Takamura[1]
[1]*Japan Advanced Institute of Science and Technology (JAIST), JAPAN and*
[2]*Micro Emission Ltd., JAPAN*

M.060c **A PORTABLE LAB-ON-A-CHIP INSTRUMENT BASED ON MICROCHIP ELECTROPHORESIS WITH CONTACTLESS CONDUCTIVITY DETECTOR WITH REPLACEABLE DETECTION CELL FOR ORNAMENTAL FISH FARMS APPLICATION**
K. Ansari[1], J.Y.S. Ying[1], P.C. Hauser[2], and N.F. de Rooij[3]
[1]*Agency for Science, Technology and Research (A*STAR), SINGAPORE,*
[2]*Universität Basel, SWITZERLAND, and* [3]*Université de Neuchâtel, SWITZERLAND*

M.061c **NANOPARTICLES-BASED ELECTROCHEMICAL BIOSENSOR FOR SINGLE BACTERIUM DETECTION BY REDOX SIGNAL AMPLIFICATION**
C.S. Lu[1], P.C. Wen[1], H.Y. Chang[1], and F.G. Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Research Center for Applied Sciences, TAIWAN*

M.062c **ENZYME FREE GLUCOSE SENSOR BASED ON MICRO-NANO DUALPOROUS GOLD MODIFIED SCREEN PRINTED CARBON ELECTRODE**
X.V. Nguyen[1,2], M. Chikae[1], Y. Ukita[1], and Y. Takamura[1]
[1]*Japan Advanced Institute of Science and Technology (JAIST), JAPAN and*
[2]*Vietnam National University of Science, VIETNAM*

M.063c **IMPROVED SURFACE ACOUSTIC WAVE SENSOR FOR LOW CONCENTRATION AMMONIA/METHANE MIXTURE GASES DETECTION**
H.C. Hao, M.C. Chiang, S.C. Liu, C.Y. Hsiao, C.M. Yang, K.T. Tang, and D.J. Yao
National Tsing Hua University, TAIWAN

M.064c **MICROFLUIDIC DROPLET-BASED AMPEROMETRIC SENSOR FOR IMMOBILIZATION-FREE ENZYME INHIBITION ASSAY**
S. Gu[1], Y. Lu[1], Y. Ding[1], L. Li[1], F. Zhang[1], and Q. Wu[2]
[1]*Shanghai University, CHINA and* [2]*Tongji University, CHINA*

M.065c **ULTRASENSITIVE HYDRODYNAMIC ELECTROCHEMISTRY USING SOUND WAVE DRIVEN MICROSTREAMING**
E. Kaplan, J. Reboud, A. Glidle, and J.M. Cooper
University of Glasgow, UK

Visualization & Imaging Technologies

M.066c **IN SITU NON-INVASIVE ELECTROCHEMICAL MONITORING OF MICROTISSUE DIFFERENTIATION IN MICROWELL ARRAYS**
A. Sridhar, A. van den Berg, and S. Le Gac
MESA+, University of Twente, THE NETHERLANDS

M.067c **ON-CHIP FLUORESCENCE MICROSCOPY FOR WIDE FIELD-OF-VIEW HIGH-THROUGHPUT PHYNOTYPE SCREENING OF CAENORHABDITIS ELEGANS**
C. Han, S. Pang, M. Kato, P. Sternberg, and C. Yang
California Institute of Technology, USA

M.068c **USE OF A PARYLENE-C BONDING LAYER FLUORESCENCE AS REFERENCE FOR ON-CHIP IMAGING AND DETECTION APPLICATIONS**
D.G. Dupouy, A.T. Ciftlik, and M.A.M. Gijs
École Polytechnique Féderale de Lausanne (EPFL), SWITZERLAND

Optical Detection

M.069c **A SINGLE LIVING BACTERIUM'S REFRACTIVE INDEX MEASUREMENT BY USING OPTOFLUIDIC IMMERSION REFRACTOMETRY**
Y. Liu[1], L.K. Chin[1], W. Ser[1], T.C. Ayi[2], W.M. Ho[2], P.H. Yap[2], Y. Leprince-Wang[3], and T. Bourouina[3]
[1]*Nanyang Technological University, SINGAPORE,*
[2]*DSO National Laboratories, SINGAPORE, and* [3]*University of Paris Est, FRANCE*

M.070c **DEVELOPMENT OF NOVEL MICRO OPTICAL DIFFUSION SENSOR USING COMB-DRIVEN MICRO FRESNEL MIRROR**
Y. Matoba, Y. Taguchi, and Y. Nagasaka
Keio University, JAPAN

M.071c **FLATBED SCANNER-BASED DETECTION FOR CAPILLARY-ASSEMBLED MICROCHIP**
S. Kubo, T.G. Henares, S.-I. Funano, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

M.072c **MAGNETO-OPTICAL DETECTION OF MAGNETIC NANOBEADS IN A MICROFLUIDIC CHANNEL**
M. Donolato[1,2], P. Vavassori[3], and M.F. Hansen[2]
[1]*CIC nanoGUNE, SPAIN,* [2]*Danmarks Tekniske Universitet (DTU), DENMARK, and* [3]*IKERBASQUE, SPAIN*

M.073c **OPTICAL SENSING AND ANALYSIS SYSTEM BASED ON POROUS LAYERS**
A. Kovacs[1], A. Malisauskaite[1], A. Ivanov[1], U. Mescheder[1], and R. Wittig[2]
[1]*Furtwangen University, GERMANY and* [2]*University Ulm, GERMANY*

Mass Spectrometric Detection

M.074c **COUPLING MICROFLUIDIC DROPLET ARRAY WITH ELECTROSPRAY IONIZATION MASS SPECTROMETRY WITH A "PHOENIX" SAMPLING PROBE FOR HIGH-THROUGHPUT AND LABEL FREE SCREENING OF ENZYME INHIBITORS**
D.-Q. Jin, Y. Zhu, and Q. Fang
Zhejiang University, CHINA

Novel Functionalities in Integrated Microfluidic Platforms

Platforms Based on Capillary Forces (Paper Based Microfluidics, Lateral Flow Tests)

M.075d **A DISPOSABLE CHIP ENABLING METERING IN DRIED BLOOD SPOT SAMPLING**
G. Lenk[1], A. Pohanka[2], G. Stemme[1], O. Beck[2], and N. Roxhed[1]
[1]*Royal Institute of Technology (KTH), SWEDEN and* [2]*Karolinska University Hospital, SWEDEN*

M.076d **FABCHIPS: A WEAVING-BASED FABRIC PLATFORM FOR AFFORDABLE MICROFLUIDIC CHIP MANUFACTURE**
D. Dendukuri, P. Bhandari, T. Choudhary, S. Sridharan, and S.V. Shalini
Achira Labs Ltd., INDIA

M.077d **FAST PROTOTYPING OF PAPER-BASED MICROFLUIDIC BY CONTACT STAMPING**
V.F. Curto[1], N. Lopez-Ruiz[2], L.F. Capitan-Vallvey[2], A.J. Palma[2], F. Benito-Lopez[3], and D. Diamond[1]
[1]*Dublin City University, IRELAND,* [2]*University of Granada, SPAIN, and* [3]*CIC microGUNE, SPAIN*

M.078d **REAL-TIME FLOW MEASUREMENT IN PAPER-BASED MICROFLUIDICS**
J.-R. Han, K. Abi-Samra, C. Bathany, and Y.-K. Cho
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

Microfluidic Large Scale Integration

M.079d **PROXIMITY LIGATION ASSAY FOR HIGH CONTENT PROFILING OF CELL SIGNALING PATHWAYS ON A MICROFLUIDIC CHIP**
M. Blazek, R. Zengerle, and M. Meier
University of Freiburg - IMTEK, GERMANY

Digital Microfluidics on Surfaces

M.080d **DIGITAL MICROFLUIDIC FEMTOLITER DROPLET PRINTING: A VERSATILE TOOL FOR SINGLE-MOLECULE DETECTION OF NUCLEIC ACIDS AND PROTEINS**
D. Witters, F. Toffalini, R. Puers, and J. Lammertyn
University of Leuven, BELGIUM

Segmented Flow & Droplet Based Microfluidics in Channels

M.081d **A HIGH THROUGHPUT DROPLET-BASED MICROFLUIDIC BARCODE GENERATOR**
Y. Ding, S. Stavrakis, X. Casadevall i Solvas, and A.J. deMello
ETH Zürich, SWITZERLAND

M.082d **A NOVEL MICROFLUIDIC DROPLET MANIPULATION METHOD FOR FABRICATION OF REVERSE-PHASE TWO LAYER LAYER-BY-LAYER PROTEIN MICROCAPSULES**
C. Kantak[1], S. Beyer[1,2], and D. Trau[1]
[1]*National University of Singapore, SINGAPORE and*
[2]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE*

M.083d **AGITATION PROGRAMMABLE PICOLITER DROPLET ARRAYS FOR HTS OF RECOMBINANT ESCHERICHIA COLI**
J.W. Lim, M. Jia, S.K. Lee, and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

M.084d **NOVEL MIXING METHOD FOR CROSS LINKER INTRODUCTION INTO DROPLET EMULSIONS**
K.J. Land[1,2], M.M. Mbanjwa[2], and J.G. Korvink[2]
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M.085d **TUNABLE STANDING SURFACE ACOUSTIC WAVE (SSAW)-BASED MULTICHANNEL DROPLET SORTER**
S. Li, X. Ding, F. Guo, Y. Chen, C.E. Cameron, and T.J. Huang
Pennsylvania State University, USA

Centrifugal Microfluidics

M.086d **CENTRIFUGE-BASED SINGLE CELL ENCAPSULATION IN HYDROGEL MICROBEADS FROM ULTRA LOW VOLUME OF SAMPLES**
K. Inamori[1], H. Onoe[1,2], M. Takinoue[3], and S. Takeuchi[1,2]
[1] *University of Tokyo, JAPAN,* [2] *Japan Science and Technology Agency (JST), JAPAN, and*
[3] *Tokyo Institute of Technology, JAPAN*

M.087d **IMBIBITION-MODULATED EVENT-TRIGGERING OF CENTRIFUGO-PNEUMATIC CASCADING FOR MULTI-STAGE DILUTION SERIES**
D.J. Kinahan, S.M. Kearney, M.T. Glynn, and J. Ducrée
Dublin City University, IRELAND

M.088d **MICROFLUIDIC APP FEATURING NESTED PCR FOR FORENSIC SCREENING ASSAY ON OFF-THE-SHELF THERMOCYCLER**
M. Keller[1], J. Naue[2], P. Papireddy Vinayaka[3], O. Strohmeier[1], D. Mark[1], U. Schmidt[2], R. Zengerle[3], and F. von Stetten[1]
[1] *Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,*
[2] *Universitätsklinikum Freiburg, GERMANY, and* [3] *University of Freiburg - IMTEK, GERMANY*

M.089d **OLED-INDUCED FLUORESCENCE DETECTION SYSTEM FOR COMPACT DISK-TYPE MICROFLUIDIC DEVICE**
K. Morioka[1], A. Hemmi[2], H. Zeng[1], K. Uchiyama[1], and H. Nakajima[1]
[1] *Tokyo Metropolitan University, JAPAN and* [2] *Mebius Advanced Technology Ltd., JAPAN*

Electrokinetic Microfluidics

M.090d **MICROFLUIDIC FREE-FLOW ELECTROPHORETIC SEPARATION OF PROTEINS USING ELECTRICALLY SWITCHABLE PH ACTUATORS AND 3D EMBEDDED SALT BRIDGES**
L.J. Cheng
Oregon State University, USA

Other & Novel Microfluidic Platforms

M.091d **A SELF-CONTAINED, USER-FRIENDLY, PROGRAMMABLE CELL STIMULATION PLATFORM**
A.K. Au[1], S. Gibbs[1], A. Scott[1], L.F. Horowitz[1], E. Vinckenbosch[1,2], B. Otis[1], and A. Folch[1]
[1] *University of Washington, USA and*
[2] *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

M.092d **DEVELOPMENT OF MICROFLUIDIC DEVICE WITH MOVABLE ELECTRODE FOR ELECTRICAL IMPEDANCE MEASUREMENT ON THE ACTIVELY COMPRESSED SINGLE CELL**
J.Y. Kim[1,2] and Y.E. Yoo[1,2]
[1] *Korea Institute of Machinery & Materials (KIMM), SOUTH KOREA and*
[2] *University of Science & Technology, SOUTH KOREA*

M.093d **ENCAPSULATING BEADS/CELLS IN UNIFORM-SIZED DROPLETS ON A MICROFLUIDIC CHIP UTILIZING HYDROPHILIC MODIFICATION OF A SURFACE**
C.J. Huang, H.H. Chan, and J.T. Yang
National Taiwan University, TAIWAN

M.094d **MINIATURIZED OPTO-FLUIDIC SYSTEM FOR ON-THE-FLOW ANALYTE CHARACTERIZATION BASED ON SPATIAL MODULATION TECHNIQUE**
P. Kiesel, J. Martini, M. Recht, M. Bern, and N. Johnson
PARC - a Xerox Company, USA

M.095d **ONE-STEP SOLID PHASE-BASED ON-CHIP SAMPLE PREPARATION AND INTEGRATION WITH FLOW-THROUGH POLYMERASE CHAIN REACTION**
K.T.L. Trinh, H.H. Tran, Y. Zhang, J. Wu, and N.Y. Lee
Gachon University, SOUTH KOREA

M.096d **SUPERHYDROPHOBIC, PASSIVE MICROVALVES WITH CONTROLLABLE OPENING PRESSURE, AND APPLICATIONS IN FLOW CONTROL**
K. Ellinas, A. Tserepi, and E. Gogolides
NCSR Demokritos, GREECE

M.097d **VARIATION OF CELLS IN CONTROLLED OXYGEN TENSION BY MICRO-FLUIDIC DEVICE**
S. Ji[1], D. An[1], E. Lee[2], K. Lee[1], and J. Kim[1]
[1]*Dankook University, SOUTH KOREA and* [2]*Seoul National University, SOUTH KOREA*

Cells & Liposomes on Chip

Cell Capture, Counting, & Sorting

M.098e **HIGH EFFICIENCY SINGLE CELL CAPTURE CHIP UTILIZING HERRINGBONE VORTICES FOR SMALL SAMPLE ANALYSIS**
Y.-H. Cheng, Y.-C. Chen, P. Ingram, and E. Yoon
University of Michigan, USA

M.099e **SLANTED LATTICE-SHAPED MICROCHANNEL NETWORKS FOR CONTINUOUS SORTING OF MICROPARTICLES AND CELLS**
W. Seko, M. Yamada, and M. Seki
Chiba University, JAPAN

M.100e **MICROARRAY PLATFORM FOR THE ISOLATION OF VIABLE NON-ADHERENT CELLS**
P.J. Attayek[1,2], Y. Wang[1], B.G. Vincent[1], P.M. Armistead[1], C.E. Sims[1], and N.L. Allbritton[1,2]
[1]*University of North Carolina, USA and* [2]*North Carolina State University, USA*

M.101e **SHALLOW ANTIBODY-COATED MICROCHANNEL BASED SELECTIVE CELL CAPTURE AND ANALYSIS**
Y. Tanaka[1], K. Jang[2], J. Wakabayashi[2], R. Ishii[3], K. Sato[3], K. Mawatari[2], M. Nilsson[4], and T. Kitamori[2]
[1]*Institute of Physical and Chemical Research (RIKEN), JAPAN,* [2]*University of Tokyo, JAPAN,* [3]*Japan Women's University, JAPAN, and* [4]*Uppsala University, SWEDEN*

Circulating Tumor Cells

M.102e **ENRICHMENT OF PROSTATE CANCER CELLS FROM BLOOD CELLS WITH A HYBRID DIELECTROPHORESIS AND IMMUNOCAPTURE MICROFLUIDIC SYSTEM**
C. Huang[1], J.P. Smith[1], H. Liu[2], N.H. Bander[2], and B.J. Kirby[1]
[1]*Cornell University, USA and* [2]*Weill Medical College of Cornell University, USA*

M.103e **MICROFLUIDIC DETECTION OF CIRCULATING TUMOR CELLS (CTC) USING SIDE FILTRATION-BASED CAPTURE**
S.W. Lee[1,2], J.Y. Kang[1], H.I. Jung[2], and K.A. Hyun[2]
[1]*Korea Institute of Science and Technology (KIST), SOUTH KOREA and* [2]*Yonsei University, SOUTH KOREA*

M.104e **DEVELOPMENT OF SPECIFIC APTAMERS WITH DIFFERENT HISTO-LOGICAL CLASSIFIED OVARIAN CANCER CELLS BY UTILIZING ON-CHIP OVCA CELL-SELEX**
L.-Y. Hung[1], C.-H. Wang[1], K.-F. Hsu[2], C.-Y. Chou[2], and G.-B. Lee[1]
[1]*National Tsing Hua University, TAIWAN and* [2]*National Cheng Kung University, TAIWAN*

Single Cell Analysis

M.105e **A NEW INDEX OF CELL FATIGUE UNDER RECIPROCATIVE STRESS TEST**
K. Kuroda[1], W. Fukui[1], M. Kaneko[1], S. Sakuma[1], and F. Arai[2]
[1]*Osaka University, JAPAN and* [2]*Nagoya University, JAPAN*

M.106e **CELL STRETCHING MICRODEVICE FOR EVALUATING CELLULAR BIOMECHANICS BASED ON IN-SITU CELLULAR RESPONSE OBSERVATION**
Y. Nakashima[1], R. Monji[2], K. Sato[3], and K. Minami[2]
[1]*Kumamoto University, JAPAN,* [2]*Yamaguchi University, JAPAN, and* [3]*University of Tokushima, JAPAN*

M.107e **ELECTROACTIVE MICROWELL ARRAY TOWARDS SINGLE CIRCULATING TUMOR CELL ANALYSIS**
M. Kobayashi[1,2], S.H. Kim[1,2], S. Kaneda[1,2], and T. Fujii[1,2]
[1]*University of Tokyo and* [2]*Japan Science and Technology Agency (JST), JAPAN*

M.108e **MEASUREMENT OF DRUG ACCUMULATION IN SINGLE ACUTE MYELOID LEUKEMIA (AML) PATIENT CELLS USING A MICROFLUIDIC DIELECTROPHORESIS (DEP) CHIP**
A. Khamenehfar[1], Y. Chen[1], D.E. Hogge[2], and P.C.H. Li[1]
[1]*Simon Fraser University, CANADA and* [2]*BC Cancer Agency, CANADA*

M.109e **MULTIPARAMETER HIGH-THROUGHPUT MECHANICAL PHENOTYPING**
M. Masaeli[1,2], H.T.K. Tse[1,2,3], D.R. Gossett[1,2,3], D. Gupta[1,2], and D. Di Carlo[1,2]
[1]University of California, Los Angeles, USA, [2]California NanoSystems Institute, USA and [3]CytoVale, Inc., USA

M.110e **OPTICALLY-CONTROLLED SELECTIVE TRANSFECTION OF PARTICLE SENSOR USING MULTILAYERED LIPOSOME CONTAINING PHOTOCHROMIC CHEMICAL INTO A CELL NUCLEUS**
H. Maruyama, T. Masuda, and F. Arai
Nagoya University, JAPAN

M.111e **SINGLE CELL OSCILLATORY PLATFORM FOR EXTRACELLULAR STIMULATION (SCOPES) OVER A LARGE TEMPORAL DYNAMIC RANGE**
L. Chingozha, M. Zhan, C. Zhu, and H. Lu
Georgia Institute of Technology, USA

M.112e **SPATIAL RESOLUTION OF EXOCYTOSIS ACROSS A SINGLE CELL BY A MICROWELL-BASED INDIVIDUALLY ADDRESSABLE THIN FILM ULTRA-MICROELECTRODE ARRAY**
J. Wang[1,2], R. Trouillon[1], J. Dunevall[2], and A.G. Ewing[1,2]
[1]University of Gothenburg, SWEDEN and [2]Chalmers University of Technology, SWEDEN

Liposomes/Vesicles

M.113e **CONTROLLED FUSION OF GIANT UNILAMELLAR VESICLES USING VIRAL FUSOGENIC PEPTIDES**
E. Boenzli, M. Hadorn, and P.S. Dittrich
Swiss Federal Institute of Technology, SWITZERLAND

M.114e **QCM DETECTION OF GPCR-LIGAND BINDING USING CELL-DERIVED LIPOSOMES**
M. Yamanaka, S. Sueda, and T. Yasuda
Kyushu Institute of Technology, JAPAN

Stem Cells

M.115e **LARGE-AREA OPEN-WELL OXYGEN LANDSCAPES VIA MICROFLUIDIC NETWORKS FOR BIOLOGICAL ANALYSIS**
M.L. Rexius, Z. Wang, S.C. Oppegard, J. Cheng, J. Rehman, and D.T. Eddington
University of Illinois, Chicago, USA

Cell-Surface Interaction

M.116e **AN ELECTRICAL POTENTIAL DRIVEN SURFACE MOLECULAR GRADIENT TECHNIQUE FOR CELL BEHAVIOR STUDIES**
S.-L. Chung, Y.-Y. Huang, C.-T. Lin, and P.-L. Kuo
National Taiwan University, TAIWAN

M.117e **MECHANICAL CELL CONTACT SYSTEM BY A PARYLENE RAIL FILTER FOR STUDY OF CELL-CELL INTERACTION MEDIATED BY CONNEXIN GAP JUNCTION**
Y. Abe[1,3], K. Kamiya[1], T. Osaki[1,2], R. Kawano[1], K. Akiyoshi[4], N. Miki[1,3], and S. Takeuchi[1,2]
[1]Kanagawa Academy of Science and Technology, JAPAN, [2]University of Tokyo, JAPAN, [3]Keio University, JAPAN, and [4]Kyoto University, JAPAN

Cell-Culturing & Perfusion (2D & 3D)

M.118e **3D FIBER-SHAPED CULTURE SYSTEM PROMOTES DIFFERENTIATION OF MULTIPOTENT DFAT CELLS INTO SMOOTH MUSCLE-LIKE CELLS**
A.Y. Hsiao[1], T. Okitsu[1,2], H. Onoe[1,2], M. Kiyosawa[2], H. Teramae[3], S. Iwanaga[2], S. Miura[2], T. Kazama[4], T. Matsumoto[4], and S. Takeuchi[1,2]
[1]University of Tokyo, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN, [3]Shumei University, JAPAN, and [4]Nihon University School of Medicine, JAPAN

M.119e **AMPLIFIED MICROELECTRODE RECORDINGS OF NEURON CLUSTERS IN A THREE DIMENSIONAL CELL CULTURE CHIP**
M. Son[1], I. Choi[1], S. Chung[2], and J.Y. Kang[1]
[1]Korea Institute of Science and Technology (KIST), SOUTH KOREA and [2]Korea University, SOUTH KOREA

M.120e **GEOMETRIC CONTROL AND CHEMICAL RESPONSE OF CELLULAR CLUSTERS USING FREE-STANDING MESHED HYDROGEL**
C.Y. Bae, M.-K. Min, H. Kim, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

M.121e **MICROFLUIDIC CULTURE OF PRIMARY NEURONS WITH ON-CHIP HYPOXIC CONDITIONING**
A. Takano[1], S. Inomata[1], M. Tanaka[1], and N. Futai[2]
[1] *Tokyo Denki University, JAPAN and* [2] *Shibaura Institute of Technology, JAPAN*

M.122e **ON-CHIP TRAPPING AND VIABILITY ASSESSMENT OF SUBMICROLITER PRIMARY TISSUES FOR PERSONALIZED TREATMENT OF OVARIAN CANCER**
M. Astolfi[1,3,4], S. Fartoumi[1], S. Kataria[5], M.-H. Faille[1], W. Sanger[1], O. Morin[1], B. Péant[3,4], J. Kendall-Dupont[3,4], D. Provencher[2,3,4], A.-M. Mes-Masson[2,3,4], and T. Gervais[1]
[1] *Polytechnique Montréal, CANADA,* [2] *Université de Montréal, CANADA,*
[3] *Centre hospitalier de l'Université de Montréal, CANADA,*
[4] *Institut du cancer de Montréal, CANADA, and* [5] *Indian Institute of Technology Delhi, INDIA*

M.123e **STRETCHABLE PROTEIN-BASED GELS FOR 2.5 D AND 3D MECHANOTRANSDUCTION STUDIES**
C.S. Simmons[1,2], M.A. Burkhardt[3], V. Vogel[3], and B.L. Pruitt[1]
[1] *Stanford University, USA,* [2] *University of Florida, USA, and* [3] *ETH Zürich, SWITZERLAND*

Inter- & Intracellular Signaling, Cell Migration

M.124e **ARCHITECTURE-DEPENDENT COLLECTIVE CALCIUM SIGNALING IN MICROENGINEERED AND SELF-ORGANIZED ENDOTHELIAL CELL NETWORKS**
J. Sun and P.K. Wong
University of Arizona, USA

M.125e **MICRO MAGNET CHIPS TO STUDY NANOPARTICLE FORCE-INDUCED NEURAL CELL MIGRATION**
A. Kunze, P. Tseng, C. Murray, A. Caputo, F.E. Schweizer, and D. Di Carlo
University of California, Los Angeles, USA

M.126e **THE ANGIOGENIC SPROUTING OF ENDOTHELIAL CELLS IN THREE-DIMENSIONAL COLLAGEN GEL MATRIX**
H.E. Jeong[1], H.-R. Seo[2], H.J. Joo[2], and S. Chung[1]
[1] *Korea University, SOUTH KOREA and* [2] *Korea University Medical College, SOUTH KOREA*

Others

M.127e **ENGINEERING MOUNTAIN FOLDS IN CELL ORIGAMI**
D. Serien and S. Takeuchi
University of Tokyo, JAPAN

M.128e **ROOM TEMPERATURE UNIFORM AND HIGH THROUGHPUT AGAROSE GEL MICRO DROPLET GENERATION FOR SINGLE CELL ANALYSIS**
T. Hirose, Y. Hoshino, D.H. Yoon, T. Mori, T. Sekiguchi, H. Takeyama, and S. Shoji
Waseda University, JAPAN

Organs & Organisms

Organs on Chip

M.129f **BODY-ON-A-CHIP: ON-CHIP HEART RECEIVING METABOLITES FROM ON-CHIP LIVER**
A. Williamson, U. Fernekorn, S. Singh, and A. Schober
Technische Universität Ilmenau, GERMANY

M.130f **LIVE HUMAN UPPER AIRWAY ON CHIP FOR IN VITRO TESTING OF GASEOUS FORMALDEHYDE TOXICITY VIA AIRWAY DELIVERY**
W. Wang[1], Y. Yan[2], C.W. Li[2], D.Y. Wang[2], H.M. Xia[1], and Z.P. Wang[1]
[1] *Singapore Institute of Manufacturing Technology, SINGAPORE and*
[2] *National University of Singapore, SINGAPORE*

M.131f **THREE DIMENSIONAL (3-D) CELL-LOCATION ALIGNMENT USING CELL SHEET ENGINEERING FOR TISSUE CONSTRUCTION**
H. Ota, N. Tanaka, K. Fukumori, S. Sekiya, J. Kobayashi, Y. Akiyama, M. Yamato, and T. Okano
Tokyo Women's Medical University, JAPAN

Organisms on Chip (C. elegans, Zebrafish, Arabidopsis, etc.)

M.132f **GLASS-CAPILLARY-ACCESSIBLE DYNAMIC MICROARRAY FOR MICROINJECTION OF ZEBRAFISH EMBRYOS**
S. Miura[1,2], T. Teshima[1], F. Tomoike[1], and S. Takeuchi[1,2]
[1] *University of Tokyo, JAPAN and* [2] *Japan Science and Technology Agency (JST), JAPAN*

Alternatives to Animal Testing

M.133f **DEVELOPMENT OF A MICROFLUIDIC CARDIOVASCULAR SYSTEM FOR EVALUATION OF RENAL CLEARANCE AND CELL CULTURE**
Y. Sakuta, K. Tsunoda, and K. Sato
Gunma University, JAPAN

Diagnostics & Analytics

Sample Preparation (Whole Blood, Saliva, Cells, Tissue, Food, etc.)

M.134g **A WORLD-TO-DIGITAL MICROFLUIDIC INTERFACE FOR TOTAL RNA EXTRACTION FROM BLOOD SAMPLES**
M.J. Jebrail, S. Vellucci, A. Sinha, R.F. Renzi, S.S. Branada, and K.D. Patel
Sandia National Laboratory, USA

M.135g **CHARACTERIZATION OF MICROFLUIDIC COMPONENTS FOR LOW-COST POINT-OF-CARE DEVICES**
S. Hugo[1], K. Land[1], and H. Becker[2]
[1] *Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA, and*
[2] *microfluidic ChipShop, GERMANY*

M.136g **OPTIMIZATION AND CHARACTERIZATION OF DIELECTROPHORETIC SAMPLE PREPARATION SYSTEM FOR MULTIPLEX PCR SLIPCHIP**
D. Cai and W. Du
Renmin University of China, CHINA

Nucleic Acid Analysis (e.g. Digital PCR, Next Generation Sequencing)

M.137g **DEVELOPMENT OF A DEVICE PLATFORM FOR PREDICTIVE AND PROGNOSTIC POINT-OF-CARE TESTING USING THE EXAMPLE OF PATHOGEN IDENTIFICATION**
R. Götzen[2], F. Scherag[1], G. Sulz[3], M. Schmidt[4], M. Panning[1], H. Attig[5], T. Brandstetter[2], and J. Rühe[2]
[1] *University of Freiburg, GERMANY,*
[2] *microTEC Gesellschaft für Mikrotechnologie mbH, GERMANY,*
[3] *Fraunhofer Institute for Physical Measurement Technique IPM, GERMANY,*
[4] *Micropelt GmbH, GERMANY, and* [5] *QIAGEN GmbH, GERMANY*

M.138g **DIRECT DETECTION OF PLASMID-MEDIATED ANTIBIOTIC RESISTANCE IN BLOODSTREAM INFECTION BY PCR USING WIRE-GUIDED DROPLET MANIPULATION (WDM)**
D.K. Harshman, R. Reyes, and J.-Y. Yoon
University of Arizona, USA

M.139g **IDENTIFYING BACTERIA USING DNA BINDING MAPS**
G. Emilsson[1], A. Nilsson[2], L.K. Nyberg[1], C. Noble[2], L. Svensson Stadler[3], E.R.B. Moore[3], T. Ambjörnsson[2], J. Tegenfeldt[2], and F. Westerlund[1]
[1] *Chalmers University of Technology, SWEDEN,* [2] *Lund University, SWEDEN, and*
[3] *University of Gothenburg, SWEDEN*

M.140g **MICROCHIP-BASED RAPID IDENTIFICATION OF BACILLUS ANTHRACIS IN PORTABLE GEL ELECTROPHORESIS DEVICE**
W. Kubicki and R. Walczak
Wroclaw University of Technology, POLAND

M.141g **SINGLE DNA MOLECULE EXTRACTION FROM SINGLE BACTERIUM USING NANOWIRE STRUCTURES**
K. Ootsuka[1], T. Yasui[1], N. Kaji[1], S. Rahong[2], T. Yanagida[2], M. Kanai[2], K. Nagashima[2], T. Kawai[2], and Y. Baba[1,3]
[1] *Nagoya University, JAPAN,* [2] *Osaka University, JAPAN, and*
[3] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

M.142g **VIRUS PURIFICATION, RNA EXTRACTION, AND TARGETED GENOME CAPTURE IN ONE CHIP**
M. Niimi[1], T. Masuda[1], K. Kaihatsu[2], N. Kato[2], and F. Arai[1]
[1] *Nagoya University, JAPAN and* [2] *Osaka University, JAPAN*

Protein Analysis & Characterization (e.g. Proteomics)

M.143g **LOW-COST, HIGH LIQUID VOLUME SILICON QUILL PINS FOR ROBUST AND REPRODUCIBLE PRINTING OF ANTIBODY MICROARRAYS**
V. Laforte, A. Olanrewaju, and D. Juncker
McGill University, CANADA

M.144g **MULTIPLE PROTEINS DETECTION DIRECTLY FROM CLINICAL URINE SAMPLE USING AN INTEGRATED CHIP**
R.G. Wu, Z.P. Wang, and D.Y.P. Seah
Singapore Institute of Manufacturing Technology, SINGAPORE

Clinical Chemistry

M.145g **A DIGITAL MICROFLUIDIC PLATFORM FOR AUTOMATED IMMUNOASSAYS OPTIMIZED USING "DESIGN OF EXPERIMENTS" (DOE) METHODS**
K. Choi[1], A.H.C. Ng[1], R. Fobel[1], D.A. Chang-Yen[2], L.E. Yarnell[2], E.L. Pearson[2], C.M. Oleksak[2], A.T. Fischer[2], R.P. Luoma[2], J.M. Robinson[2], and A.R. Wheeler[1]
[1]*University of Toronto, CANADA and* [2]*Abbott Diagnostics, USA*

M.146g **AUTOMATIC PH CHANGING SYSTEM FOR SENSITIVITY IMPROVEMENT OF ELISA ON LAB-ON-PAPER**
A. Apilux[1,2,3], Y. Ukita[1], M. Chikae[1], O. Chailapakul[3], and Y. Takamura[1]
[1]*Japan Advanced Institute of Science and Technology, JAPAN,*
[2]*Mahidol University, THAILAND, and* [3]*Chulalongkorn University, THAILAND*

M.147g **SINGLE-STEP ENZYNE IMMUNOASSAY USING LIPOPHILIC FLUORESCENT SUBSTRATE FOR CAPILLARY-ASSEMBLED MICROCHIP**
M. Sugahara, S.-I. Funano, T.G. Henares, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

Drug Development

M.148g **QUANTITATIVE ANALYSIS OF MULTIPLE ANTIBODY-LIGAND INTERACTIONS IN A MICROCHIP USING FLUORESCENCE POLARIZATION ANISOTROPY**
K. Eyer, T. Robinson, P. Kuhn, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Others

M.149g **MOVING THE SOLID PHASE: A STATIONARY MICROFLUIDICS PLATFORM TECHNOLOGY FOR CARTRIDGE BASED SANDWICH IMMUNOASSAYS**
R. Gottheil[1], N. Baur[1], H. Becker[2], A. Geiger[1], V. Hummel[3], A. Normann[3], A. Haage[3], G. Link[1], D. Maier[1], N. Schneiderhan-Marra[1], and M. Stelzle[1]
[1]*NMI Natural and Medical Sciences Institute, GERMANY,*
[2]*microfluidic ChipShop GmbH, GERMANY, and* [3]*Mediagnost GmbH, GERMANY*

Medical Research & Applications

Cancer Research

M.150h **A 96-WELL, PLATE-BASED MICROFLUIDIC DEVICE FOR MULTIPLEXED CHEMOSENSITIVITY TESTING OF INTACT TISSUES**
T. Chang, A.M. Mikheev, R.J. Monnat, Jr., R.C. Rostomily, and A. Folch
University of Washington, USA

M.151h **FLUORESCENCE IN SITU HYBRIDIZATION (FISH) MICROFLUIDIC PLATFORM FOR DETECTION OF HER-2 OVER-EXPRESSION IN CANCER CELLS**
K.-J. Kao[1], C.-H. Tai[2], W.-Y. Luo[1], T.-S. Yeh[3], and G.-B. Lee[1]
[1]*National Tsing Hua University, TAIWAN,* [2]*National Cheng Kung University, TAIWAN, and* [3]*Chang Gung University College of Medicine, TAIWAN*

M.152h **PATTERNED MULTICELLULAR SPHEROIDS IN 3D MATRIX FOR TUMOR INVASION AND VASCULOGENIC MIMICRY IN GLIOMA CELLS**
X. Zhang, J. Ma, and J. Qin
Chinese Academy of Sciences, CHINA

M.153h **THREE-DIMENSIONAL MICROVESSEL ARRAY FOR TUMOR ANGIOGENESIS ASSAY**
W. Park, H. Lee, H. Ryu, S. Kim, and N.L. Jeon
Seoul National University, SOUTH KOREA

Personalized Medicine

M.154h **OPTICAL DETECTION OF *KRAS* POINT MUTATIONS VIA HYBRIDIZATION-INDUCED AGGREGATION (HIA) OF MAGNETIC MICROBEADS FOR THE DEVELOPMENT OF A POINT-OF-CARE GENOTYPING**
H.S. Sloane, B.C. Strachan, J.C. Lee, D.C. Miranian, K.A. Kelly, and J.P. Landers
University of Virginia, USA

Drug Delivery Systems

M.155h **HIGH PRODUCTION RATES OF STABLE DRUG-LOADABLE MICROBUBBLES TOWARD TARGETED, TRIGGERED DRUG DELIVERY**
S.A. Peyman[1], R. Abou-Saleh[1], N. Ingram[2], G. Marston[2], P.L. Coletta[2], and S.D. Evans[1]
[1]*University of Leeds, UK and* [2]*St. James's Hospital, UK*

M.156h **MICROFLUIDIC-DIRECTED SYNTHESIS OF NANOSCALE LIPOSOMES FOR TRANSDERMAL DRUG DELIVERY**
R.R. Hood[1], E.L. Kendall[1], W.N. Vreeland[2], Z. Quezado[3], M. Junqueira[3], J.C. Finkel[3], and D.L. DeVoe[1]
[1]*University of Maryland, College Park, USA,*
[2]*National Institute of Standards and Technology, USA, and*
[3]*Children's National Medical Center, USA*

M.157h **TOWARDS AN IMPLANTABLE PULSED MODE ELECTROLYTIC DRUG DELIVERY SYSTEM**
Y. Yi, U. Buttner, and I.G. Foulds
King Abdullah University of Science and Technology (KAUST), SAUDI ARABIA

Regenerative Medicine & Tissue Engineering

M.158h **FORMATION OF VASCULAR STRUCTURES INSIDE CELL SPHEROIDS BY EMPLOYING HYDROGEL MICROCHAMBERS AND SACRIFICIAL FIBERS**
K. Yamakoshi, M. Yamada, and M. Seki
Chiba University, JAPAN

M.159h **ORGANIC-INORGANIC HYBRID HYDROGEL MICROBEADS FOR RAPID BONE FORMATION**
S. Iwanaga[1,2], Y. Morimoto[1], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

Assisted Reproductive Technologies

M.160h **MICROFLUIDIC PROTOCOL FOR IN VITRO CULTURE OF HUMAN EMBRYOS**
Z. Hao[1], D.C. Kieslinger[2], C. Vergouw[2], H. Kostelijk[2], C.B. Lambalk[2], and S. Le Gac[1]
[1]*MESA+, University of Twente, THE NETHERLANDS and*
[2]*VU University Medical Center, THE NETHERLANDS*

Implantable and Surgical Microdevices

M.161h **DEVELOPMENT OF A STRETCHABLE, PENETRATING ELECTRODE ARRAY FOR MEASURING INTRAMUSCULAR ELECTROMYOGRAPHIC ACTIVITY**
G.S. Guvanasen[1], R.J. Aguilar[2], L. Guo[3], C. Karnati[2], S. Rajaraman[2], T.R. Nichols[1], and S.P. DeWeerth[1,4]
[1]*Georgia Institute of Technology, USA,* [2]*Axion BioSystems, Inc., USA,*
[3]*Massachusetts Institute of Technology, USA, and* [4]*Emory University, USA*

Devices for Better Quality-of-Life (QOL)

M.162h **DEVELOPMENT OF A BLOOD TESTING DEVICE BASED ON LOCALIZED SURFACE PLASMON RESONANCE**
H. Kanamori, F. Takada, Y. Sasaki, M. Yamanaka, and T. Yasuda
Kyushu Institute of Technology, JAPAN

Neurobiology/Neuroscience

M.163h **3D IN VITRO MODEL OF NEURAL STEM CELL-VASCULAR NICHE**
Y. Shin[1], S. Han[1], K. Yang[2], S.-W. Cho[2], and S. Chung[1]
[1]*Korea University, SOUTH KOREA and* [2]*Yonsei University, SOUTH KOREA*

Others

M.164h **RAPID AND HIGH THROUGHPUT ANTIMICROBIAL SUSCEPTIBILITY TEST USING MORPHOLOGICAL ANALYSIS OF SINGLE CELLS WITH MICROFLUIDIC CHANNEL IN 96 WELL PLATFORM**
J. Choi[1,3], Y.-G. Jung[2], E.K. Kim[1,2,3], M. Lee[2], J. Yoo[2], and S. Kwon[1]
[1]*Seoul National University, SOUTH KOREA,* [2]*QuantaMatrix Inc., SOUTH KOREA, and*
[3]*Inter-university Semiconductor Research Center (ISRC), SOUTH KOREA*

Separation Technologies

Electrophoretic Separations

M.165i **DEVELOPMENT OF ELECTROSPRAY IONIZATION INTERFACE-INTEGRATED MICROCHIP FOR MASS SPECTROMETRIC DETECTION IN ELECTROPHORESIS**
M. Oketani[1], T. Kawai[2], T. Naito[1], K. Sueyoshi[3], T. Kubo[1], F. Kitagawa[4], and K. Otsuka[1]
[1]*Kyoto University, JAPAN,* [2]*University of Illinois, USA,*
[3]*Osaka Prefecture University, JAPAN, and* [4]*Hirosaki University, JAPAN*

M.166i **DUAL-COLOR MICROFLUIDIC IMMUNOASSAYS FOR MONITORING RELEASE OF MULTIPLE PEPTIDES FROM ISLETS OF LANGERHANS**
L. Yi, A.R. Lomasney, and M.G. Roper
Florida State University, USA

M.167i **FAST DNA SIEVING THROUGH SELF-ENCLOSED SUBMICRON GLASS CAPILLARY SEGMENTS**
Z. Cao and L. Yobas
Hong Kong University of Science and Technology, HONG KONG

M.168i **ICE GRAIN BOUNDARY ELECTROPHORESIS**
A. Inagawa and T. Okada
Tokyo Institute of Technology, JAPAN

M.169i **MECHANISM OF DNA TRAPPING IN NANOPOROUS STRUCTURE**
Y. Zhou[1] and D.J. Harrison[1,2]
[1]*University of Alberta, CANADA and* [2]*National Institute for Nanotechnology, CANADA*

Chromatographic Separations

M.170i **A NOVEL STATIONARY PHASE FOR LIGHT ALKANES SEPARATION IN MICROFABRICATED SILICON GAS CHROMATOGRAPHY COLUMNS**
D. Lefebvre[1], F. Ricoul[1], B. Charleux[2], and C. Thieuleux[2]
[1]*Commissariat à l'énergie atomique (CEA), FRANCE and* [2]*Universite de Lyon, FRANCE*

M.171i **ONE-MINUTE SEPARATION OF BIOLOGICAL COMPOUNDS USING PILLAR ARRAY COLUMN WITH LOW DISPERSION AND LOW PRESSURE-DROP TURNS**
M. Isokawa[1], K. Takatsuki[2], K. Shih[2], M. Kono[2], Y. Song[1], T. Sekiguchi[2], J. Mizuno[2], T. Funatsu[1], S. Shoji[2], and M. Tsunoda[1]
[1]*University of Tokyo, JAPAN and* [2]*Waseda University, JAPAN*

Particle Separations

M.172i **FABRICATION OF MULTI-LEVEL MICROCHANNELS BY USING GREY-SCALE PHOTOLITHOGRAPHY FOR SEPARATION AND EXTRACTION OF MICROPARTICLES**
Y. Nam, M. Kim, and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

M.173i **INERTIAL MICROFLUIDIC BAND-PASS SEPARATIONS**
X. Wang, J. Zhou and I. Papautsky
University of Cincinnati, USA

Others

M.174i **CHIP-BASED DNA SEPARATION IN FREE SOLUTION BY INERTIAL HYDRODYNAMIC FORCES**
J.-K. Wu, S. Friedrich, K.J. Liu, and T.-H. Wang
Johns Hopkins University, USA

Microreaction Technology & Synthesis

Microreactors & Micromixers

M.175j **ICE-CONFINED LIQUID PHASE MICROREACTOR ACCELERATING REACTIONS THEREIN**
K. Anzo and T. Okada
Tokyo Institute of Technology, JAPAN

M.176j **MICROREACTOR FOR CONTINUOUS CELL-FREE PROTEIN SYNTHESIS USING CROSS-FLOW FILTRATION**
H. Koch, M.S. Jaeger, and C. Duschl
Fraunhofer Institute for Biomedical Engineering (IBMT), GERMANY

Filtering & Separation

M.177j **BLOOD PLASMA SEPARATOR USING MICRO PILLERS ARRANGED LIKE A LABYRINTH**
H. Tsutsui, H. Miyagawa, and M. Yano
Osaka Institute of Technology, JAPAN

Chemical Synthesis

M.178j **A VERSATILE TECHNIQUE FOR HETEROGENOUS CATALYTIC MICROCHEMISTRY: TOXIC/EXPENSIVE METAL COMPLEX IMMOBILIZATION ON MICROREACTOR CHANNEL**
K.C. Basavaraju, and D.-P. Kim
Pohang University of Science and Technology (POSTECH), SOUTH KOREA

M.179j **GAS-LIQUID MICROFLUIDIC REACTORS FOR THE OXIDATIVE HOMOCOUPLING OF PHENYLACETYLENE**
I. Lignos, K.S. Elvira, R.C.R. Wootton, and A.J. deMello
ETH Zürich, SWITZERLAND

M.180j **NON-INTRUSIVE MEASUREMENT OF CHEMICAL SPECIFICITY WITH MICRO RESOLUTION USING CARS MICROSCOPY**
T. Noguchi, R. Kuriyama, K. Ozawa, and Y. Sato
Keio University, JAPAN

Particle Synthesis

M.181j **PLASMONIC DESIGN BY MICROFLUIDICS: SIZE-TUNED GOLD CUBES AND SILVER PRISMS OBTAINED BY SEGMENTED FLOW SYNTHESIS**
A. Knauer, R. Roell, and J.M. Koehler
Technische Universität Ilmenau, GERMANY

Applications to Green & Environmental Technologies

Fuel Cells

M.182k **HIGH EFFICIENT DIRECT METHANOL FUEL CELL BY INSTANT MICRO-FUEL-DROPLETS SUPPLY**
C.L. Lu[1], T.-W. Liu[1], W. Ling[2], Y.-C. Su[1], S.-H. Liang[2], C.-H. Tai[2], and F.-G. Tseng[1,3]
[1]*National Tsing Hua University, TAIWAN,*
[2]*Industrial Technology Research Institute, TAIWAN, and*
[3]*Academia Sinica, TAIWAN*

Water/ Air/ Soil Management

M.183k **THERMALLY-TARGETED ADSORPTION AND ENRICHMENT IN MICROSCALE HYDROTHERMAL PORE ENVIRONMENTS**
A. Priye, Y.A. Hassan, and V.M. Ugaz
Texas A&M University, USA

Other Energy/Power Devices

M.184k **SOLAR LIGHT DRIVEN MICRO FUEL (H2/O2) GENERATION DEVICE BASED ON THE MICROFLUIDIC CHIP**
Y. Pihosh[1,2], Y. Kajita[1], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

MicroTAS for Other Applications

Synthetic Biology

M.185l **PROTEIN EXPRESSION INSIDE OIL-FREE GIANT VESICLES BY USING PULSED JET FLOW METHOD**
K. Kamiya[1], R. Kawano[1], T. Osaki[1], and S. Takeuchi[2]
[1]*Kanagawa Academy of Science and Technology (KAST), JAPAN and*
[2]*University of Tokyo, JAPAN*

Bioinspired, Biomimetic & Biohybrid Devices

M.186l **ANTAGONISTIC LIVING MUSCLE ACTUATOR**
Y. Morimoto[1], H. Onoe[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

M.187l **IN-AIR OPERABLE BIOHYBRID MICROMANIPULATOR POWERED BY INSECT HEART MUSCLE TISSUE**
Y. Akiyama, K. Funakoshi, and K. Morishima
Osaka University, JAPAN

Bioprocess Technology

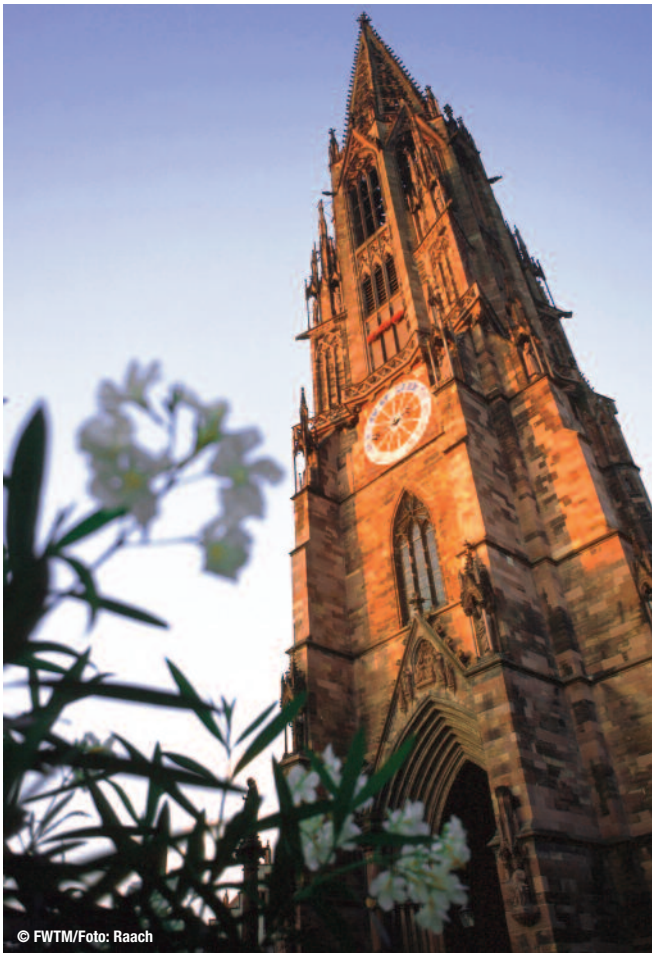
M.188I **DEVELOPMENT OF A MICROFLUIDIC PLATFORM FOR THE ON-LINE STUDY OF FLOCCULATION GROWTH KINETICS**
A.N. Pallipurath Radhakrishnan, B. O'Sullivan, D.G. Bracewell, and N. Szita
University College London, UK

M.189I **POTENTIAL OF SINUSOIDAL GRADIENTS FOR DOSE RESPONSE ASSAYS IN DROPLET-BASED MICROFLUIDICS**
M. Kielpinski[1], T. Vasold[1], P. Horbert[1], K. Martin[2], G. Mayer[1], and T. Henkel[1]
[1]*Institute of Photonic Technology (IPHT), GERMANY and*
[2]*Hans-Knöll-Institute (HKI), GERMANY*

Food & Nutrition

M.190I **AUTOMATIC FOOD-PATHOGEN DETECTION ON A CENTRIFUGAL MICROFLUIDIC CARTRIDGE IN A COMMERCIALLY AVAILABLE PCR THERMOCYCLER**
M.C. Weil[1], W. Hauser[2], D. Kosse[1], O. Strohmeier[1,3], F. von Stetten[1,3], R. Zengerle[1,3], and D. Mark[1]
[1]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,*
[2]*Institut für Produktqualität, GERMANY, and* [3]*University of Freiburg - IMTEK, GERMANY*

16:00 - 16:30 **BREAK AND EXHIBIT INSPECTION**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16:30 - 17:15 **PLENARY PRESENTATION III**

Chairs: P. Schwille, *Max Planck Institute of Biochemistry, GERMANY*
R. Zengerle, *HSG-IMIT & University of Freiburg - IMTEK, GERMANY*

THE BIOSS NANOSCALE EXPLORER PROGRAM (BiNEP)
Michael Reth
University of Freiburg, GERMANY

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 1A3 - Fiber and Particle Manufacturing	**Session 1B3 - Cell Separation and Capture**	**Session 1C3 - Flow Control**
Session Chairs:		
D. DeVoe, *University of Maryland, USA*	H. Fan, *University of Florida, USA*	D. Eddington, *University of Illinois, Chicago, USA*
H. Morgan, *University of Southampton, UK*	S. Verpoorte, *University of Groningen, THE NETHERLANDS*	J. Lötters, *University of Twente, THE NETHERLANDS*
17:30 - 17:50		
RAPID FORMATION OF ANISOTROPIC NON-SPHERICAL HYDROGEL MICROPARTICLES WITH COMPLEX STRUCTURES USING A TABLETOP CENTRIFUGE-BASED MICROFLUIDIC DEVICE M. Hayakawa[1], H. Onoe[2], K.H. Nagai[2], and M. Takinoue[1,3] [1]*Tokyo Institute of Technology, JAPAN,* [2]*University of Tokyo, JAPAN, and* [3]*Japan Science and Technology Agency (JST), JAPAN*	**EVOLUTION OF SECONDARY DEAN VORTICES IN SPIRAL MICROCHANNELS FOR CELL SEPARATIONS** N. Nivedita[1], P. Ligrani[2], and I. Papautsky[1] [1]*University of Cincinnati, USA and* [2]*Saint Louis University, USA*	**FLOCK-BASED MICROFLUIDIC DEVICES WITH FLOW CONTROL, REAGENT INTEGRATION AND MULTIPLEXING FOR SIMPLE ASSAYS** M. Hitzbleck and E. Delamarche *IBM Research-Zurich, SWITZERLAND*
17:50 - 18:10		
MICROFLUIDIC SYNTHESIS OF HYBRID MICROFIBER ENCAPSULATED WITH ENCODED MICROSPHERES Y. Yu, H. Wen, and J. Qin *Chinese Academy of Sciences, CHINA*	**MULTIPLEX GPCR INTERNALIZATION ASSAY USING REVERSE TRANSDUCTION ON ADENOVIRAL VECTOR IMMOBILIZED MICROPARTICLES** S. Han[1], H.J. Bae[1], W. Park[2], and S. Kwon[1] [1]*Seoul National University, SOUTH KOREA and* [2]*Kyung Hee University, SOUTH KOREA*	**MICROFLUIDIC SOLUTION ISOLATED PUMPING (μSIP)** J. Liu[1,2], D. Mitra[1], J.R. Waldeisen[1], R.H. Henrikson[1], Y. Park[1], S. Li[2], and L.P. Lee[1] [1]*University of California, Berkeley, USA and* [2]*Harbin Institute of Technology, CHINA*
18:10 - 18:30		
MOLDED BIOCOMPATIBLE AND DISPOSABLE PDMS/SU-8 INKJET DISPENSER A. Bsoul, S. Beyer, A. Ahmadi, B. Stoeber, E. Cretu, and K. Walus *University of British Columbia, CANADA*	**HIGH-THROUGHPUT SPERM SORTING BY SPERM FLOWING UPSTREAM IN A DUAL GRADIENT FLOW FIELD** Y.-N. Lin[1], P.-C. Chen[1], R.-G. Wu[1], L.-C. Pan[2], and F.-G. Tseng[1] [1]*National Tsing Hua University, TAIWAN and* [2]*Taipei Medical University, TAIWAN*	**LASER ABLATION BASED FAST PROTOTYPING OF FLUIDIC DIODE AND FINGER-DRIVEN MICRODEVICE FOR PRECISE METERING AND DELIVERY OF MULTI-SOURCE LIQUID REAGENTS** K. Xu[1], M.R. Begley[2], and J.P. Landers[1] [1]*University of Virginia, USA and* [2]*University of California, Santa Barbara, USA*

TUESDAY 29 October

08:30 - 08:45 ANNOUNCEMENTS

08:45 - 09:30 PLENARY PRESENTATION IV

Chairs: H. Becker, *microfluidic ChipShop GmbH, GERMANY*
R. Zengerle, *HSG-IMIT & University of Freiburg - IMTEK, GERMANY*

COMPUTATIONAL IMAGING, SENSING AND DIAGNOSTICS
Aydogan Ozcan
University of California, Los Angeles, USA

09:30 - 11:30 EXHIBITOR LIVE LAB 2 - PASCA

THE PASCA SINGLE CELL MANIPULATOR: AUTOMATED PRINTING OF INDIVIDUAL LIVING CELLS FOR A VARIETY OF DOWNSTREAM ANALYSIS TECHNIQUES
Jonas Schoendube, *MSc, R&D Engineer* and Andre Gross, *Dipl. Ing., R&D Engineer*
PASCA., GERMANY

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 2A1 - Electrokinetic Transport	Session 2B1 - Biomolecular Detection 1	Session 2C1 - Point-of-Care Immunodiagnostics 1

Session Chairs:

T. Fujii, *University of Tokyo, JAPAN*	M. Köhler, *Technical University of Ilmenau, GERMANY*	P. Dittrich, *ETH Zurich, SWITZERLAND*
W. van der Wijngaart, *KTH - Royal Institute of Technology, SWEDEN*	G. Urban, *University of Freiburg - IMTEK, GERMANY*	D. Juncker, *McGill University, CANADA*

09:45 - 10:05

HIGH-THROUGHPUT SALT/BIO-AGENT REMOVAL BY ION CONCENTRATION POLARIZATION FOR WATER DESALINATION, PURIFICATION, AND MONITORING
R. Kwak[1,2], V.S. Pham[1], B.J. Kim[1], L. Chen[3], and J. Han[1,3]
[1] *Massachusetts Institute of Technology, USA,* [2] *Korea Institute of Science and Technology (KIST), SOUTH KOREA,* [3] *Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE*

MEGAHERTZ-GENERATED FEMTOLITER MICROFLUIDIC DROPLETS FOR SINGLE-MOLECULE-COUNTING IMMUNOASSAYS
J.-U. Shim[1,2,3], R.T. Ranasinghe[2], F. Hollfelder[2], W.T.S. Huck[4], D. Klenerman[2], C. Abell[2], and J. Cooper[3]
[1] *University of Leeds, UK,* [2] *University of Cambridge, UK,* [3] *University of Glasgow, UK, and* [4] *Radboud University Nijmegen, THE NETHERLANDS*

A HANDHELD MAGNETIC SENSING PLATFORM FOR ANTIGEN AND NUCLEIC ACID DETECTION
A. Pai[1], A. Khachaturian[1], S. Chapman[1], A. Hu[1], H. Wang[1,2], and A. Hajimiri[1]
[1] *California Institute of Technology, USA and* [2] *Georgia Institute of Technology, USA*

10:05 - 10:25

NANOFLUIDIC CRYSTAL SENSING AT NORMAL PHYSIOLOGICAL CONDITION BY COUPLING ION CONCENTRATION POLARIZATION
W. Ouyang, J. Sang, Y. Shi, W. Wang, M. Chu, Y. Wang, H. Li, H.A. Zhang, W. Wu, and Z. Li
Peking University, CHINA

SIMPLE AND HIGHLY-SENSITIVE ENZYME ACTIVITY ASSAY MICRODEVICE BASED ON THE COMBINATION OF REAGENT-RELEASE HYDROGEL AND CAPILLARY ARRAY
N. Agura, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

A FLUOROGENIC HETEROGENOUS IMMUNOASSAY FOR CARDIAC MUSCLE TROPONIN cTNI ON A DIGITAL MICROFLUIDIC DEVICE
M.-N. Tsaloglou, and H. Morgan
University of Southampton, UK

10:25 - 10:45

NANOPORES WITH ASYMMETRIC SPACING FOR RESISTIVE-PULSE SENSING OF VIRUS PARTICLES
Z.D. Harms, D.G. Haywood, A.R. Kneller, L. Selzer, A. Zlotnick, and S.C. Jacobson
Indiana University, USA

NOVEL DETECTION OF NON-ABSORBING MOLECULES BY OPTICAL NEAR-FIELD INDUCED THERMAL LENS MICROSCOPY
T.H.H. Le, K. Mawatari, H. Shimizu, T. Yatsui, T. Kawazoe, M. Naruse, M. Ohtsu, and T. Kitamori
University of Tokyo, JAPAN

AN INTEGRATED MICROFLUIDIC SYSTEM FOR RAPID HBA1C MEASUREMENT
C.-C. Wu[1], K.-W. Chang[1], H.-I. Lin[2], S.-C. Shiesh[2], and G.-B. Lee[1]
[1] *National Tsing Hua University, TAIWAN and* [2] *National Cheng Kung University, TAIWAN*

10:45 - 11:15 Break and Exhibit Inspection

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 2A2 - Particle Manufacturing and Encoding	**Session 2B2 - Biomolecular Detection 2**	**Session 2C2 - Point-of-Care Immunodiagnostics 2**
Session Chairs:		
H. Bruus, *Technical University of Denmark, DENMARK*	E. Delamarche, *IBM, SWITZERLAND*	N. Pamme, *University of Hull, UK*
S. Pennathur, *University of California, Santa Barbara, USA*	H. Hisamoto, *Osaka Prefecture University, JAPAN*	H. Wu, *Hong Kong University of Science and Technology, CHINA*
11:15 - 11:35		
COMPLEX 3D SHAPED PARTICLE FABRICATION VIA INERTIAL FLOW DEFORMATION AND UV POLYMERIZATION A.J. Chung[1,2], C.-Y. Wu[1], D.E. Go[1], J.C. Oka[1], O.H. Paydar[1], R. Candler[1], and D. Di Carlo[1] [1]*University of California, Los Angeles, USA and* [2]*Rensselaer Polytechnic Institute, USA*	**OIL-ISOLATED HYDROGEL MICROSTRUCTURES FOR SENSITIVE BIOASSAYS ON-CHIP** R.L. Srinivas, S.D. Johnson, and P.S. Doyle *Massachusetts Institute of Technology, USA*	**A PDMS / PAPER HYBRID MICROFLUIDIC DEVICE INTEGRATED WITH GRAPHENE OXIDE-BASED NANO-BIOSENSORS FOR MULTIPLEXED PATHOGEN DETECTION** X.J. Li, P. Zuo and D.C. Dominguez *University of Texas, USA*
11:35 - 11:55		
STOCHASTIC BARCODING FOR SINGLE-CELL TRACKING M. Castellarnau, G.L. Szeto, D.J. Irvine, J.C. Love, and J. Voldman *Massachusetts Institute of Technology, USA*	**IMMOBILIZATION OF ANTIBODIES ON SOLID-STATE SURFACES WITH CONTROLLED ORIENTATION USING ELECTRIC FIELD** M. Javanmard[1], S. Emaminejad[1,2], C. Gupta[2], S. Chang[2], R.W. Davis[1], and R.T. Howe[2] [1]*Stanford Genome Technology Center, USA and* [2]*Stanford University, USA*	**PAPER MICROFLUIDICS GOES DIGITAL** R. Fobel, A.E. Kirby, and A.R. Wheeler *University of Toronto, CANADA*
11:55 - 12:15		
A UNIVERSAL PARTICLE ENCODING ARCHITECTURE J. Lee, P.W. Bisso, R.L. Srinivas, J.J. Kim, A.J. Swiston, and P.S. Doyle *Massachusetts Institute of Technology, USA*	**MAGNETIC BEAD-ROLLING FOR ULTRASENSITIVE SURFACE-BASED IMMUNOASSAYS** M. Cornaglia, H.C. Tekin, T. Lehnert, and M.A.M. Gijs *École Polytechnique Féderale de Lausanne (EPFL), SWITZERLAND*	**IN SITU COCAINE DETECTION IN HUMAN SWEAT USING INTEGRATED DIAGNOSTIC SKINPATCHES AND HAND HELD FLUORESCENCE READER** R. Walczak[1], J. Krüger[2], S. Moynihan[2], and D. Flavin[2] [1]*Wrocław University of Technology, POLAND and* [2]*Biosenisa Ltd., IRELAND*

12:15 - 13:15 LUNCH

13:15 - 13:35 Analytical Chemistry Young Innovator Award

13:35 - 13:55 Lab-on-a-Chip / Corning Inc. Pioneers in Miniaturization Prize

14:00 - 16:00 EXHIBITOR LIVE LAB 3 - Cellix Limited

MICROFLUIDIC PUMPING SOLUTIONS FOR DROPLET GENERATION, CELL AND PARTICLE STUDIES, STEM CELL CULTURE
Dmitry Kashanin
Cellix Limited, IRELAND

14:00 - 16:00 **POSTER SESSION 2** - *See floorplan on pages 28-29*

Fundamentals in Microfluidics and Nanofluidics

Wetting, Capillarity, Priming

T.001a **NEW MATHEMATICAL MODEL FOR ELECTROSTATIC STABILITY OF THE CASSIE STATE ON MEMS-BASED PILLARED SURFACE**
K.-Y. Song, K. Morimoto, and Y. Suzuki
University of Tokyo, JAPAN

Electrokinetic Phenomena

T.002a **DYNAMICS OF SURFACE CHARGES AND WATER SPLITTING IN MICROCHANNELS CONTAINING NANOPOROUS ION-SELECTIVE MEMBRANES**
C.P. Nielsen and H. Bruus
Technical University of Denmark, DENMARK

T.003a **FACILE MICROFLUIDIC BASED METHOD TO DETERMINE EQUILIBRIUM CONSTANTS (KD) OF REACTING BIOMOLECULES**
T.M. Wynne and S. Pennathur
University of California, Santa Barbara, USA

Droplets & Plugs, Multiphase Systems

T.004a **A SURFACE DISPLAYING TECHNOLOGY FOR EFFICIENT APTAMER SELECTION BASED ON HIGHLY PARALLEL SINGLE-MOLECULE EMULSION PCR**
Z. Zhu, Y. Song, C. Li, W. Zhang, Z. Guan, and C.J. Yang
Xiamen University, CHINA

T.005a **CHARACTERIZATION OF MICROBUBBLES OF MULTIPLE GASES IN MICROFLUIDIC CHANNELS**
A. Bulbul[1], A.S. Basu[2], and H. Kim[1]
[1]*University of Utah, USA and* [2]*Wayne State University, USA*

T.006a **HIGH THROUGHPUT NANODROPLET GENERATION BY USING SPONTANEOUS EMULSIFICATION**
M. Fukuyama[1,2] and A. Hibara[2]
[1]*University of Tokyo, JAPAN and* [2]*Tokyo Institute of Technology, JAPAN*

T.007a **MICRO AQUIFORM REACTION-CONTROL CAPSULE – USING TERNARY DROPLET COLLISION TO MODULATE THE CHEMICAL REACTION**
S.-I. Yeh, H.-J. Sheen, and J.-T. Yang
National Taiwan University, TAIWAN

T.008a **PARTICLE ORDERING USING DEAN FORCE-BASED INERTIAL MICROFLUIDICS**
A. Rane, X. Casadevall i Solvas, and A. deMello
ETH Zürich, SWITZERLAND

T.009a **SIMPLE GENE TESTING METHOD USING AN AUTOMATED NUCLEIC ACID PURIFICATION DEVICE AND A MICRO CHAMBER ARRAY**
A. Yamaguchi[1,2], F. Takagi[1], K. Kobayashi[2], T. Honda[3], and Y. Saito[1]
[1]*Seiko Epson Corporation, JAPAN,* [2]*Shinshu University, JAPAN, and* [3]*Shinshu University Hospital, JAPAN*

T.010a **WIDE RANGE DYNAMIC VOLUME RATIO AND SIZE CONTROL OF MICRODROPLETS USING ACTIVE DROPLET DIVISION DEVICE**
J. Ito, D.H. Yoon, T. Sekiguchi, and S. Shoji
Waseda University, JAPAN

Optofluidics

T.011a **FUNCTIONALIZATION OF EMBEDDED THIOL-ENE WAVEGUIDES FOR EVANESCENT WAVE-INDUCED FLUORESCENCE DETECTION IN A MICROFLUIDIC DEVICE**
N.A. Feidenhans'l, T.G. Jensen, J.P. Lafleur, and J.P. Kutter
Technical University of Denmark, DENMARK

T.012a **MANIPULATION OF MICROPARTICLES AND BIOLOGICAL CELLS USING LIGHT-INDUCED MARANGONI FLOW**
S.N. Varanakkottu, S.D. George, T. Baier, S. Hardt, M. Ewald, and M. Biesalski
Technische Universität Darmstadt, GERMANY

T.013a **SINGLE-LAYER MICROFLUIDIC "DISC" DIODES VIA OPTOFLUIDIC LITHOGRAPHY FOR ULTRA-LOW REYNOLDS NUMBER APPLICATIONS**
R.D. Sochol, C.J. Deeble, V. Shen, M. Nakamura, B.J. Hightower, T.A. Brubaker, K.Y. Lee, S. Gao, M. Kim, K.T. Wolf, K. Iwai, C.C. Glick, L.P.Lee, and L. Lin
University of California, Berkeley, USA

Magnetofluidics (Magnetic Particles & Related Phenomena)

T.014a **ON-CHIP FORMATION AND FUSION OF SPHEROIDS BY LABEL-FREE MAGNETIC CELL MANIPULATION**
N. Sho, K. Morishima, and Y. Akiyama
Osaka Univsersity, JAPAN

Acoustic Phenomena (BULK & Surface Based)

T.015a **DECOUPLING OF ACOUSTIC AND FLUIDIC BOUNDARIES IN ACOUSTOPHORESIS**
I. Leibacher, S. Schatzer, and J. Dual
ETH Zürich, SWITZERLAND

Nanofluidic Phenomena (Nanochannels, -Tubes & -Pores)

T.016a **DEVELOPMENT OF HEAT-DRIVEN NANOFLUIDIC PUMP**
Y. Hiramatsu[1], C. Wang[1,2], H. Shimizu[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*

T.017a **PRESSURE-ASSISTED SELECTIVE ELECTROPRECONCENTRATION IN A STRAIGHT NANOCHANNEL**
A.-C. Louër[1], A. Plecis[2], A. Pallandre[3], and A.-M. Haghiri-Gosnet[1]
[1]*CNRS, FRANCE,* [2]*Elvesys, FRANCE, and* [3]*Université Paris Sud, FRANCE*

Modeling/Numerical Simulation with Experimental Proof

T.018a **DNA FOCUSING IN NANOFLUIDIC CHANNELS**
W.L. Hsu[1], M.A. Startsev[2], D.W. Inglis[2], E.M. Goldys[2], M.R. Davidson[1], and D.J.E. Harvie[1]
[1]*University of Melbourne, AUSTRALIA and* [2]*Macquarie University, AUSTRALIA*

Others

T.019a **OPTICAL COHERENCE TOMOGRAPHY FOR DIMENSIONAL METROLOGY OF LAB-ON-A-CHIP DEVICES**
D.R. Reyes, M. Halter, and J. Hwang
National Institute of Standards and Technology (NIST), USA

Micro- and Nanoengineering

Micro- & Nanofabrication/ -Patterning/ -Integration

T.020b **A LOW-COST, POWER-FREE PDMS MICROFLUIDIC SPOTTER FOR MICROARRAY PRINTING**
T. Tang, G. Li, C. Jia, and J. Zhao
Chinese Academy of Sciences, CHINA

T.021b **CREATING MICROMETER-SCALE BRANCH-LIKE PATTERNS THROUGH NANOPILLAR-GUIDED CRYSTALLIZATION**
Y.-R. Hsu, E.-C. Chang, C.-C. Fu, C.-M. Cheng, and C.-C. Chen
National Tsing Hua University, TAIWAN

T.022b **ENZYMATIC REACTION-BASED FABRICATION PROCESSES OF MULTILAYER MICROFLUIDIC DEVICES MADE OF GELATIN HYDROGEL**
Y. Yajima, E. Yamada, C. Yukita, M. Iwase, M. Yamada, and M. Seki
Chiba University, JAPAN

T.023b **FOCAL MICROFLUIDIC DELIVERY OF SOLUBLE SIGNALS TO THE BASAL SIDE OF MICROPATTERNED CELLS**
J. Cheng, C.G. Sip, P.R. Lindstedt, and A. Folch
University of Washington, USA

T.024b **MICROFLUIDIC FLOW REACTORS WITH INTEGRATED MICRO-HEATERS AND FLUORESCENT TEMPERATURE SENSORS FOR REACTION MONITORING**
C. Höra[1], Z. Shu[2], E. Beckert[2], S. Nagl[1], and D. Belder[1]
[1]*Leipzig University, GERMANY and*
[2]*Fraunhofer-Institut für Angewandte Optik und Feinmechanik (IOF), GERMANY*

T.025b **OUT OF CLEANROOM, SELF-ASSEMBLED MAGNETIC ARTIFICIAL CILIA**
Y. Wang[1,2], Y. Gao[1], H.M. Wyss[1], P.D. Anderson[1], and J.M.J. den Toonder[1]
[1] *Eindhoven University of Technology, THE NETHERLANDS and*
[2] *Dutch Polymer Institute (DPI), THE NETHERLANDS*

T.026b **RAPID PROTOTYPING OF SELF ALIGNED 3D MICROFLUIDIC STRUCTURES**
J. Elizalde, M. Antoñana, L. Matthys, F. Laouenan, and J.M. Ruano-López
CIC microGUNE, SPAIN and IK4-IKERLAN, SPAIN

T.027b **SLURRY PACKING PLACEMENT OF MEMS MICROPARTS ASSISTED WITH GEL MICROCAPSULE**
K. Araki[1], R. Ohashi[1], H. Honma[1], N. Misawa[1], K. Takahashi[1], K. Sawada[1], M. Ishida[1], and Y. Murakami[1,2]
[1] *Toyohashi University of Technology, JAPAN and*
[2] *Japan Science and Technology Agency (JST), JAPAN*

Bonding, Sealing & Interfacing Technologies

T.028b **HETEROGENEOUS INTEGRATION OF SILICON FLUIDIC COMPONENTS IN POLYMER CHIPS**
M.M. Mielnik, T.R. Tofteberg, and E. Andreassen
SINTEF ICT, NORWAY

Novel/Smart/Responsive Materials

T.029b **CONTINUOUS FORMATION OF HOMOGENEOUS AND HETEROGENEOUS HYDROGEL TUBES**
A. McAllister and A. Günther
University of Toronto, CANADA

T.030b **MICROCAPSULES WITH MAGNETIC NANOPARTICLE-BASED SHELL AND AQUEOUS CORE VIA SELECTIVE POLYMERIZATION FOR THERAPEUTIC DELIVERY APPLICATIONS**
F.N. Pirmoradi, K. Iwai, K.Y. Lee, T.A. Brubaker, and L. Lin
University of California, Berkeley, USA

Surface Modification

T.031b **A CHEMICALLY-SENSITIVE NANOWIRE SENSOR ARRAY FOR SENSING OF H_2O_2 AND pH IN PHYSIOLOGICAL SOLUTIONS**
V. Krivitsky, L.C. Hsiung, V. Naddaka, Y.K. Conroy, L. Burstein, H. Peretz-Soroka, and F. Patolsky
Tel Aviv University, ISRAEL

T.032b **ANTITHROMBOGENICITY OF NANO POROUS POLYETHERSULFONE MEMBRANE COATED WITH FLUORINATED DIAMOND-LIKE CARBON**
I. Sanada[1], H. Ito[1], G.S. Prihandana[1], M. Noborisaka[1], N. Miki[1], T. Suzuki[1], and Y. Kanno[2]
[1] *Keio University, JAPAN and* [2] *Tokyo Medical University, JAPAN*

Molecular Systems & Nanochemistry

T.033b **MANIPULATION OF MICROTUBLES MOTILITY USING ELECTRICAL FILED ON KINESIN/DYNEIN COATED SURFACES**
N.K. Kamisetty[1], J. Ikuta[1], H. Shintaku[1], H. Kotera[1], and R. Yokokawa[1,2]
[1] *Kyoto University, JAPAN and* [2] *Japan Science and Technology Agency (JST), JAPAN*

T.034b **MULTICHANNEL LINEAR-ARRAY MICROBIOSENSOR USING APTAMER MODIFIED GRAPHENE OXIDE: IMPROVED SENSITIVITY BY MOLECULAR DESIGN**
Y. Ueno, K. Furukawa, K. Matsuo, S. Inoue, K. Hayashi, H. Hibino, and Y. Sato
NTT Corporation, JAPAN

Nanobiotechnology

T.035b **DNA TRANSLOCATION DYNAMICS THROUGH SHORT NANOCHANNELS UNDER ASYMMETRIC PULSED ELECTRIC FIELD**
C. Gupta, W.-C. Liao, D. Gallego-Perez, C.E. Castro, and L.J. Lee
Ohio State University, USA

T.036b **MICROFLUIDIC SINGLE-MOLECULE NUCLEASE DIGESTION REVEALS RATE-ENHANCING OFF-AND-ON MOLECULAR ENCOUNTERING FUNCTION FOR SITE-SPECIFIC DNA BREAK**
D. Onoshima[1], N. Kaji[1], M. Tokeshi[2], and Y. Baba[1,3]
[1] *Nagoya University, JAPAN and* [2] *Hokkaido University, JAPAN, and*
[3] *National Institute of Advanced Industrial Science and Technology (AIST)*

Nanoassembly

T.037b **MECHANISM OF DNA COMBING THROUGH RECEDING MENISCUS ASSEMBLY ON MICROSTRUCTURED SUBSTRATE**
B. Charlot[1], F. Bardin[1,2], N. Sanchez[3], P. Roux[3], S. Teixeira[3], and E. Schwob[4]
[1]*Université Montpellier, FRANCE,* [2]*Université de Nîmes, FRANCE,*
[3]*SANOFI, FRANCE, and* [4]*IGMM CNRS, FRANCE*

Sensors & Actuators, Detection Technologies

Micropumps, -Valves, -Dispensers

T.038c **A HIGHLY INTEGRATED DOSING SYSTEM FOR DRUG DELIVERY APPLICATIONS**
F. Thoma, F. Goldschmidtböing, H. Feth, E. Möller, and P. Woias
University of Freiburg - IMTEK, GERMANY

T.039c **ELECTROSTATICALLY DRIVEN VALVELESS PERISTALTIC GAS MICROPUMP WITH MULTIPLE ELECTRODES**
K.S. Lee[1], B. Kim[2], and M.A. Shannon[1]
[1]*University of Illinois, Urbana-Champaign, USA and*
[2]*Catholic University of Daegu, SOUTH KOREA*

T.040c **THERMOREVERSIBLE MODULAR MICROFLUIDIC VALVES USING EMISE IONOGEL**
F. Benito-Lopez[1], M. Antoñana[1], D. Diamond[2], and V. Castro-López[1]
[1]*CIC microGUNE, SPAIN and* [2]*Dublin City University, IRELAND*

Physical Sensors

T.041c **A CMOS MEMS CAPACITIVE DIFFERENTIAL FLOW SENSOR FOR RESPIRATORY MONITORING**
W.-J. Chen, S.-H. Liao, and M.-S. Lu
National Tsing Hua University, TAIWAN

T.042c **DIRECT DIFFERENTIAL MICRO CORIOLIS MASS FLOW SENSOR TO DETECT THE EFFICIENCY OF A PRECONCENTRATOR SYSTEM**
J. Groenesteijn[1], H. Zhang[1], R.M. Tiggelaar[1], T.S.J. Lammerink[1], J.C. Lötters[2], J.G.E. Gardeniers[1], and R.J. Wiegerink[1]
[1]*MESA+, University of Twente, THE NETHERLANDS and*
[2]*Bronkhorst High-Tech BV, THE NETHERLANDS*

T.043c **SIMULTANEOUS FLUORESCENCE AND IMPEDANCE MICRO CYTOMETER – A MODULAR SYSTEM**
D. Spencer, G. Elliott, and H. Morgan
University of Southampton, UK

Biosensors

T.044c **A MEMBRANE-BASED SEMIQUANTITATIVE OPTICAL IMMUNOSENSOR WITHOUT TRANSDUCING APPARATUS**
Y.H. Jang, Y.D. Han, B.H. Min, and H.C. Yoon
Ajou University, SOUTH KOREA

T.045c **A NOVEL ELECTRICAL NEEDLE WITH MICROELECTRODES FOR REAL-TIME IMPEDANCE MEASUREMENT OF BIOTISSUES**
G. Kang, S. Seo, J. Yun, and J.H. Lee
Gwangju Institute of Science and Technology (GIST), REPUBLIC OF KOREA

T.046c **ULTRA DIELECTROPHORESIS: ELECTROTHERMAL ANALYSIS AND ITS APPLICATIONS IN MICROFLUIDIC SAMPLE PREPARATION AND PROTEOMICS**
S. Emaminejad, M. Javanmard, C. Gupta, R.W. Dutton, R.W. Davis, and R.T. Howe
Stanford University, USA

T.047c **APTAMER-FUNCTIONALIZED MICROTUBULE FOR CONTINUOUS AND SELECTIVE CAPTURING AND FILTERING USING A NANOPOROUS HYDROGEL MEMBRANE**
M. Kim and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

T.048c **CELL TYPE CLASSIFICATION BASED ON SPECIFIC MEMBRANE CAPACITANCE AND CYTOPLASM CONDUCTIVITY USING MICROFLUIDIC DEVICES**
Y. Zhao[1], D. Chen[1], Y. Luo[1], S. Huang[2], H. Lee[2], M. Wu[2], R. Long[3], J. Wang[1], and J. Chen[1]
[1]*Chinese Academy of Sciences, CHINA,* [2]*Chang Gung University, TAIWAN, and*
[3]*University of Alberta, CANADA*

T.049c **DEVELOPMENT OF NOVEL LABEL-FREE ENZYME ACTIVITY ASSAY USING NANOIMPRINTED PHOTONIC CRYSTAL FOR UROKINASE ACTIVITY MEASUREMENT**
W. Hashimoto, T. Endo, K. Sueyoshi, and H. Hisamoto
Osaka Prefecture University, JAPAN

T.050c **FABRICATION OF INTEGRATED MICROPATTERN SENSOR CHIP FOR ANALYSIS OF CELL ADHESION DYNAMICS**
C.-H. Lee, N. Matsui, and M. Takai
University of Tokyo, JAPAN

T.051c **KINETIC AND THERMODYNAMIC ANALYSES OF DNA HYBRIDIZATION REVEAL THE MECHANISM OF GOLD NANOPARTICLE-ASSISTED SINGLE BASE-PAIR DISCRIMINATION IN THE NANOBIOARRAY CHIP**
A. Sedighi and P.C.H. Li
Simon Fraser University, CANADA

T.052c **METABOLITE ANALYTICS WITH AN INTEGRATED PROTEIN SENSOR ON A MICROFLUIDIC CHIP**
S. Ketterer, D. Hoevermann, W. Weber, and M. Meier
University of Freiburg - IMTEK, GERMANY

T.053c **MULTI-MARKER SCREENING USING NODE-PORE SENSING**
K.R. Balakrishnan and L.L. Sohn
University of California, Berkeley, USA

T.054c **NANOFLUIDIC CRYSTAL IN A PARYLENE C CONFINED SPACE FOR HIGH-CONSISTENT BIOSENSING**
B.J. Wang, H. Sun, R. Zhang, W. Wang, M. Chu, Y. Wang, H. Li, H.A. Zhang, W. Wu, and Z. Li
Peking University, CHINA

T.055c **RAPID AIRBORNE PATHOGENS DETECTION SYSTEM USING DISPOSABLE IMPACTION CARTRIDGE**
K. Takenaka[1], S. Togashi[1], and R. Miyake[2]
[1]*Hitachi, Ltd., JAPAN and* [2]*University of Tokyo, JAPAN*

T.056c **REAL-TIME BIOSENSOR SYSTEM FOR BIOPHYSICAL MONITORING OF BIRDS**
A. Gumus, S. Lee, K. Karlsson, R. Gabrielson, D.W. Winkler, and D. Erickson
Cornell University, USA

T.057c **VOLUMETRIC IMPEDANCE BASED FLOW-THROUGH IMMUNOSENSOR USING AN INTEGRATED ELECTRODE ARRAY AND SILVER ENHANCMENT**
M.S. Wiederoder and D.L. DeVoe
University of Maryland, College Park, USA

Chemical & Electrochemical Sensors

T.058c **PEDOT-CNT COMPOSITE MICRO-ELECTRODES FOR SENSITIVE DETECTION OF NEUROTRANSMITTERS**
R. Samba[1], W. Schuhmann[2], S. Epple[1], I. Matychin[1], L. Kiesel[1], and M. Stelzle[1]
[1]*NMI Natural and Medical Sciences Institute, GERMANY, and*
[2]*Ruhr Universität Bochum, GERMANY*

T.059c **A NOVEL SPIROPYRAN-CONDUCTING POLYMER BIOSENSOR CHIP WITH ELECTROCHEMICAL AND PHOTOCHEMICAL SENSING PROPERTIES**
M. Zanoni[1], R. Gorkin, III[2], D.L. Officer[2], K. Wagner[2], S. Gambhir[2], G.G. Wallace[2], and D. Diamond[1]
[1]*Dublin City University, IRELAND and* [2]*University of Wollongong, AUSTRALIA*

T.060c **LAB-ON-A-CHIP FOR ELECTROCHEMICAL MAGNETO-IMMUNOASSAY FOR ALZHEIMER'S BIOMARKER DETECTION**
M. Medina-Sánchez[1], S. Miserere[1], E. Morales-Narváez[1,2], and A. Merkoçi[1,3]
[1]*Autonomous University of Barcelona, SPAIN,*
[2]*Polytechnic University of Catalonia, SPAIN, and*
[3]*Catalan Institute for Research and Advanced Studies (ICREA), SPAIN*

T.061c **MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICE FOR FLUORESCENCE DETECTION OF LACTOFERRIN IN TEAR FLUID**
K. Yamada, S. Takaki, K. Suzuki, and D. Citterio
Keio University, JAPAN

T.062c **POLYMERIZATION OF BIOLOGICAL MOLECULES IN A MICROCHANNEL GENERATES BOTH HIGH AND LOW-REFRACTIVE INDEX INGREDIENTS**
K. Hayashi, S. Inoue, T. Horiuchi, Y. Iwasaki, N. Matsuura, and Y. Sato
Nippon Telegraph and Telephone Corporation, JAPAN

T.063c **USB-TYPE POINT-OF-CARE SENSOR FOR STRIPPING ANALYSIS OF TRACE METALS**
W. Kang[1], X. Pei[1], A. Bange[2], E. Haynes[1], W.R. Heineman[1], and I. Papautsky[1]
[1]*University of Cincinnati, USA and* [2]*Xavier University, USA*

Visualization & Imaging Technologies

T.064c **MEASUREMENT OF THREE DIMENSIONAL FLOW STRUCTURE DURING MICRODROPLET FORMATION USING PHASE-LOCKED MULTICOLOR CONFOCAL MICRO-PIV**
M. Oishi, H. Kinoshita, T. Fujii, and M. Oshima
University of Tokyo, JAPAN

T.065c **RAMAN IMAGING TECHNIQUE FOR NON-INTRUSIVE VISUALIZATION OF SCALAR DISTRIBUTION IN MICROFLUIDICS**
R. Kuriyama, A. Ito, T. Noguchi, K. Ozawa, and Y. Sato
Keio University, JAPAN

Optical Detection

T.066c **A 40-MHZ FREQUENCY MULTIPLEXED ELECTRONIC SYSTEM FOR MULTICOLOR DROPLET FLOW CYTOMETRY**
K.M. Dadesh, and A.S. Basu
Wayne State University, USA

T.067c **CARS MICROSCOPIC MEASUREMENT OF MULTIPLE ION CONCENTRATION IN A CHEMICAL REACTION**
T. Noguchi, R. Kuriyama, K. Ozawa, and Y. Sato
Keio University, JAPAN

T.068c **DEVELOPMENT OF UV EXCITATION DIFFERENTIAL INTERFERENCE CONTRAST THERMAL LENS MICROSCOPE TOWARD COUNTING OF PROTEIN MOLECULES**
Y. Asano[1], H. Shimizu[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*

T.069c **FLUORESCENCE IMAGING OF MOLECULAR TRANSPORTATION THROUGH MEMBRANE PROTEINS USING LIPID BILAYERS ON MICRO-DROPLETS**
T. Tonooka[1], K. Sato[1], R. Kawano[2], T. Osaki[1,2], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and*
[2]*Kanagawa Academy of Science and Technology (KAST), JAPAN*

T.070c **MICRO/NANO SURFACE TENSION MEASUREMENT BY 2D-CAPILLARY WAVE RESONANCE**
M. Chung[1,2], C. Pigot[1], and A. Hibara[2]
[1]*University of Tokyo, JAPAN and* [2]*Tokyo Institute of Technology, JAPAN*

T.071c **PLASTICIZED PVC-BASED PHOTONIC CRYSTAL FOR ION SENSING APPLICATION**
S. Aki, T. Endo, K. Sueyoshi, and H. Hisamoto
Osaka Prefecture University, JAPAN

Mass Spectrometric Detection

T.072c **INTERFACING DROPLET MICROFLUIDICS WITH INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY**
P.E. Verboket, O. Borovinskaya, D. Günther, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Novel Functionalities in Integrated Microfluidic Platforms

Platforms Based on Capillary Forces (Paper Based Microfluidics, Lateral Flow Tests)

T.073d **FABRICATION OF LAMINATED PAPER-BASED ANALYTICAL DEVICES (LPAD) FOR COTININE DETECTION**
Z.H. Fan[1], C.L. Cassano[1], and W. Liu[1,2]
[1]*University of Florida, USA and* [2]*Shaanxi Normal University, CHINA*

T.074d **PLASMONIC NANOPARTICLE DEPOSITION ON A MICROPILLAR ARRAY AS A 3D NANOSENSOR**
C. Huang, H. Jans, N. Verellen, M. Bivragh, and L. Lagae
imec, BELGIUM

T.075d **SLICED THREAD COMPOSITE FOR LOW-COST MULTIPLEXED IMMUNOASSAY**
J. Kim, S. Bae, S. Song, and S. Kwon
Seoul National University, SOUTH KOREA

Microfluidic Large Scale Integration

T.076d **ROBUST LAYOUT TECHNIQUES DECREASE VOLUME INJECTION AND CAPACITIVE MISMATCH DUE TO ALIGNMENT ERRORS**
F. Yu, M.A. Horowitz, and S.R. Quake
Stanford University, USA

Digital Microfluidics on Surfaces

T.077d **PARTIALLY FILLED ELECTRODES FOR DIGITAL MICROFLUIDIC DEVICES**
D.G. Pyne[1], W.M. Salman[2], M. Abdelgawad[2], and Y. Sun[1]
[1] *University of Toronto, CANADA and* [2] *Assiut University, EGYPT*

Segmented Flow & Droplet Based Microfluidics in Channels

T.078d **A HIGH-THROUGHPUT MICROFLUIDIC SYSTEM FOR THE SIMULTANEOUS FORMATION OF DROPLET-INTERFACE-BILAYER ARRAYS**
B. Schlicht and M. Zagnoni
University of Strathclyde, UK

T.079d **DROPLET ARRAY FOR MINIATURIZING MICROTITER PLATE PLATFORM**
S.H. Jin[1], H.-H. Jeong[1], Y.M. Noh[1], S.-H. Lee[2], and C.-S. Lee[1]
[1] *Chungnam National University, SOUTH KOREA and*
[2] *Korea Institute of Science and Technology (KIST), SOUTH KOREA*

T.080d **ELECTROSTATIC POTENTIAL WELLS FOR MANIPULATIONS OF DROPS IN MICROCHANNELS**
R. de Ruiter, A.M. Pit, V. Martins de Oliveira, D. Wijnperlé, M.H.G. Duits, H.T.M. van den Ende, and F. Mugele
University of Twente, THE NETHERLANDS

T.081d **ON-DEMAND PHOTOTHERMAL PATTERNING OF PATHWAY FOR PICOLITER DROPLET**
M. Muto and M. Motosuke
Tokyo University of Science, JAPAN

Centrifugal Microfluidics

T.082d **A NOVEL FULLY AUTOMATED CENTRIFUGAL MICROFLUIDIC PLATFORM WITH MASSIVE VOLUME CAPABILITY TO ISOLATE CIRCULATING TUMOR CELLS**
M.S. Kim[1], H.-S. Moon[1], S.S. Kim[2], J.-M. Park[1], and N. Huh[1]
[1] *Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA and*
[2] *Samsung Electronics, SOUTH KOREA*

T.083d **DEVELOPMENT OF A ROTATABLE REAGENT CARTRIDGE FOR HIGH-PERFORMANCE MICROVALVE SYSTEM ON A CENTRIFUGAL MICROFLUIDIC DEVICE**
T. Kawai, N. Naruishi, H. Nagai, Y. Tanaka, Y. Hagihara, and Y. Yoshida
National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T.084d **INTEGRATION OF CENTRIFUGO-MAGNETOPHORESIS AND BRIGHT-FIELD BASED T-CELL ENUMERATION FOR HIV DIAGNOSTICS IN RESOURCE-POOR SETTINGS**
M. Glynn, D. Kirby, R. Burger, and J. Ducrée
Dublin City University, IRELAND

T.085d **MIXING BY ON-CHIP GENERATED GAS BUBBLES FOR ASSAY AUTOMATION IN STANDARD LABORATORY CENTRIFUGES**
J. Liebeskind[1], A. Kloke[1], A.R. Fiebach[1], F. von Stetten[1,2], R. Zengerle[1,2,3], and N. Paust[1,2]
[1] *Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,*
[2] *University of Freiburg – IMTEK, GERMANY, and* [3] *University of Freiburg – BIOSS, GERMANY*

Electrokinetic Microfluidics

T.086d **DIELECTROPHORESIS-BASED 3D CELL ROTATION THROUGH INTEGRATION OF BOTTOM AND VERTICAL ELECTRODES**
P. Benhal[1], J.G. Chase[1], P. Gaynor[1], B. Oback[2], and W.H. Wang[3]
[1] *University of Canterbury, NEW ZEALAND,*
[2] *AgResearch Ruakura Research Centre, NEW ZEALAND, and*
[3] *Tsinghua University, CHINA*

T.087d **SIMPLE AND RAPID IMMUNOASSAY USING MICRO ISOELECTRIC FOCUSING DEVICE AND REAGENT RELEASE HYDROGELS**
Y. Fujii, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

Other & Novel Microfluidic Platforms

T.088d **CELL VIBRO-DEFORMABILITY**
S. Sakuma[1], K. Kuroda[1], F. Arai[2], and M. Kaneko[1]
[1]*Osaka University, JAPAN and* [2]*Nagoya University, JAPAN*

T.089d **DIELECTROPHORETIC TRAPPING OF BEADS IN COMPACT CAPILLARY-DRIVEN SYSTEMS WITH MULTIWALL ELECTRODES**
Y. Temiz, G.V. Kaigala, and E. Delamarche
IBM Research GmbH, SWITZERLAND

T.090d **EXTRUDED MICROFLUIDIC IMMUNOASSAYS**
A.I. Ferreira[1], A.P. Castanheira[2], R.G. Chahin[3], M.R. Mackley[3], A.D. Edwards[4], and N.M. Reis[1]
[1]*Loughborough University, UK,* [2]*Capillary Film Technology Ltd, UK,*
[3]*University of Cambridge, UK, and* [4]*Reading University, UK*

T.091d **MULTIPLEXED ELECTRICAL IMPEDANCE SPECTROSCOPY FOR CONTINUOUS MONITORING OF MICROTISSUES IN A GRAVITY-DRIVEN FLOW**
J.-Y. Kim, S. Bürgel, A. Hierlemann, and O. Frey
ETH Zürich, SWITZERLAND

T.092d **pH MANIPULATING IN MICROFLUDIC CHIPS BASED ON PALLADIUM FILM PROTON PUMP**
D. Zhang, D. Hu, Z. Luo, B. Mao, and Y. Zhou
Xiamen University, CHINA

T.093d **THREE DIMENSIONAL HYDRODYNAMIC FLOW AND PARTICLE FOCUSING THROUGH FOUR VORTICES DEAN FLOW**
B.H. Ha, K.S. Lee, J.H. Jung, G. Destgeer, and H.J. Sung
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

Cells & Liposomes on Chip

Cell Capture, Counting, & Sorting

T.094e **SINGLE LAYERED "MICROFLUIDIC DRIFTING" BASED 3D HYDRODYNAMIC FOCUSING REACHING SUBMICROMETER PRECISION**
A.A. Nawaz[1], X. Mao[1], P. Li[1], J. Rufo[1], L. Wang[2], and T.J. Huang[1]
[1]*Pennsylvania State University, USA and* [2]*Ascent Bio-Nano Technologies Inc., USA*

T.095e **ASSEMBLY OF CELL-LADEN MICROGELS BY AN OPTICALLY CONTROLLED BUBBLE MANIPULATOR**
W. Hu, Q. Fan and A.T. Ohta
University of Hawaii, USA

T.096e **CONTINUOUS AND LABEL-FREE MICROFLUIDIC CELL SEPARATION**
T.M. Geislinger, B. Eggart, S. Braunmüller, L. Schmid, and T. Franke
University of Augsburg, GERMANY

T.097e **A MICROFLUIDIC DEVICE FOR BLOOD CELL SORTING AND MORPHOLOGY ANALYSIS**
V. Liu[1], M. Patel [2], and A. Lee[2]
[1]*Flintridge Preparatory School, USA and* [2]*Univiversity of California, Irvine, USA*

T.098e **MICROFLUIDIC CELL SORTER AIDED DIRECTED EVOLUTION OF AN IMPROVED FLUORESCENT PROTEIN-BASED CALCIUM INDICATOR**
Y. Zhao, H. Hoi, R.E. Campbell, and D.J. Harrison
University of Alberta, CANADA

T.099e **CELL CULTURE AND FRACTIONATION ON A MICROFLUIDIC CHIP WITH PROGRAMMABLE MODULES OF TEMPERATURE AND CARBON DIOXIDE**
Y.-H. Yu, I.-F. Yu, J. Yu, and J.-T. Yang
National Taiwan University, TAIWAN

Circulating Tumor Cells

T.100e **A LABEL-FREE SIZE-BASED MICRO COULTER COUNTER SYSTEM FOR CIRCULATING RARE TUMOR CELLS**
H. Choi[1], C.S. Jeon[1], H.K. Kim[2], T.D. Chung[2], and H.C. Kim[2]
[1]*Seoul National University, SOUTH KOREA and* [2]*National Cancer Center, SOUTH KOREA*

T.101e **FOLIC ACID COUPLED POLY(L-LYSINE)-GRAFT-(POLY(2-METHYL-2-OXAZOLINE) (FA-C-PLL-G-PMOXA): A NOVEL COPOLYMER FOR SPECIFIC TARGETING TO FOLATE RECEPTOR-POSITIVE TUMOR CELLS**
Y. Chen, W. Cao, W. Wen, I.-M. Hsing, and H. Wu
Hong Kong University of Science & Technology, HONG KONG SAR, CHINA

T.102e **MICROFLUIDIC VORTEX TECHNOLOGY FOR PURE CIRCULATING TUMOR CELL CONCENTRATION FROM PATIENT BLOOD**
J. Che[1], E. Sollier[1,2], D.E. Go[1,2], N. Kummer[3], M. Rettig[3], J. Goldman[3], N. Nickols[3], S. McCloskey[3], R.P. Kulkarni[3], and D. Di Carlo[1]
[1]*University of California, Los Angeles, USA,* [2]*Vortex Biosciences, USA, and* [3]*University of California, Los Angeles Medical Center, USA*

T.103e **SCREENING OF CIRCULATING TUMOR CELLS IN TUMOR-BEARING MOUSE BLOOD BY A DETERMINISTIC LATERAL DISPLACEMENT MICRO FLUIDIC DEVICE**
H. Okano, K. Suyama, S. Ariyasu, T. Suzuki, R. Abe, S. Aoki, and M. Hayase
Tokyo University of Science, JAPAN

Single Cell Analysis

T.104e **AUTOMATED HIGH-THROUGHPUT MICROSYSTEM FOR TUNABLE TEMPORAL STIMULATION AND ANALYSIS OF NON-ADHERENT CELLS**
L. He, A. Kniss, M.L. Kemp, and H. Lu
Georgia Institute of Technology, USA

T.105e **DEVELOPMENT OF VOLUME INTERFACE BETWEEN CELL AND ANALYSIS METHOD UTILIZING THE AIR-LIQUID TWO-PHASE FLOW FOR SINGLE CELL ANALYSIS**
M. Kumagai[1], K. Jang[1], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

T.106e **INTEGRATED MICROFLUIDIC DEVICE FOR COUPLED PROTEIN EXPRESSION AND DRUG RESPONSE ON INDIVIDUAL CANCER CELLS**
G. Amselem[1], R. Tomasi[1], R. Frøhlich[2], Y.-P. Ho[2], B.R. Knudsen[2], and C.N. Baroud[1]
[1]*Ecole Polytechnique, FRANCE and* [2]*Aahrus University, DENMARK*

T.107e **MEASUREMENT OF ELECTROPORATION INDUCED CHANGES IN THE DIELECTRIC RESPONSE OF SINGLE CELLS**
E. Salimi, K. Braasch, V. Jung, M. Butler, D.J. Thomson, and G.E. Bridges
University of Manitoba, CANADA

T.108e **NANO-INTENSIFIED ELECTRIC FIELD FOR MULTI-LOCALIZED SINGLE CELL ELECTROPORATION**
T.S. Santra[1], P.-C. Wang[1], and F.-G. Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

T.109e **PROTEIN IDENTIFICATION AND QUANTIFICATION FOR SINGLE CELL ANALYSIS BY COUPLING A MICROFLUIDIC PLATFORM WITH MALDI-TOF**
M. Yang, T.-C. Chao, R. Nelson, and A. Ros
Arizona State University, USA

T.110e **SINGLE CELL PUNCTURE WITH OPTICALLY MANIPULATED HYBRID NANOROBOT**
T. Hayakawa and F. Arai
Nagoya University, JAPAN

T.111e **TOWARDS QUANTITATIVE ANALYSIS OF SINGLE E.COLI LYSATES**
S. Stratz, K. Eyer, F. Kurth, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Liposomes/Vesicles

T.112e **MANIPULATION OF LIPOSOME-BASED BIOREACTOR FEATURING ADDING, MIXING AND ALIQUOTING FEMTOLITER VOLUMES**
H. Shiomi[1], S. Tsuda[2,3], H. Suzuki[3,4], and T. Yomo[1,3]
[1]*Osaka University, JAPAN,* [2]*University of Glasgow, UK,*
[3]*Japan Science and Technology Agency (JST), JAPAN, and* [4]*Chuo University, JAPAN*

T.113e **REORGANIZATION OF LIPID DOMAINS IN MODEL MEMBRANES UNDER DEFORMATION**
T. Robinson, P. Kuhn, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Stem Cells

T.114e **HUMAN INDUCED PLURIPOTENT STEM (iPS) CELLS-DERIVED NEURAL STEM CELL BUNDLE COVERED WITH GROWTH FACTOR-ENCAPSULATED AMPHIPHILIC CHITOSAN**
M. Kato-Negsihi[1,2], H. Onoe[1,2], S. Iwanaga[1,2], Y. Kobayashi[3], M. Nakamura[3], H. Okano[3], and S. Takeuchi[1,2]
[1]*University of Tokyo, JAPAN,* [2]*Japan Science and Technology Agency (JST), JAPAN and* [3]*Keio University, JAPAN*

Cell-Surface Interaction

T.115e **CELL ADHESION CONTROL INITIATE CELL SHEET FORMATION IN A MEDIUM SUSPENSION**
K.O. Okeyo[1], N. Omasa[1], O. Kurosawa[1], H. Oana[1], H. Kotera[2], and M. Washizu[1]
[1]*University of Tokyo, JAPAN and* [2]*Kyoto University, JAPAN*

T.116e **MICROFABRICATED PLATFORM FOR THE APPLICATION OF GRADIENT BIAXIAL STRAIN TO CELLS**
M.G. Simon, M. Winkler, T. Vu, T. Gartner, J.V. Jester, and A.P. Lee
University of California, Irvine, USA

Cell-Culturing & Perfusion (2D & 3D)

T.117e **A MICROFLUIDIC PLATFORM TO GENERATE A ROBUST GAS-LIQUID INTERFACE FOR ORGANOTYPIC SLICE CULTURE OVER A LONG PERIOD**
G.N. Kanda[1,2], H. Moriguchi[2], R.G. Yamada[2], Y. Tanaka[1,2], and H.R. Ueda[1,2,3]
[1]*Osaka University, JAPAN,* [2]*RIKEN, JAPAN, and* [3]*University of Tokyo, JAPAN*

T.118e **A MICRODEVICE TO SCREEN BIOMOLECULE TRANSPORT ACROSS THE PULMONARY EPITHELIAL BARRIER**
L. Bol[1], J.-C. Galas[2], H. Hillaireau[1], I. Le Potier[1], A.-M. Haghiri-Gosnet[2], E. Fattal[1], and M. Taverna[1]
[1]*Université Paris Sud, FRANCE and* [2]*CNRS, FRANCE*

T.119e **HIGH DENSITY HYDROGEL ARRAYS FOR 3D CELL COLONIES WITH DYNAMICALLY CONTROLLED EXTERNAL STIMULI**
R. Tomasi, G. Amselem, and C.N. Baroud
Ecole Polytechnique, FRANCE

T.120e **MICROFLUIDIC PERFUSION CULTURE OF HUMAN INDUCED PLURIPOTENT STEM CELL IN MICROCHAMBER ARRAY CHIP**
R. Yoshimitsu[1], K. Hattori[1], S. Sugiura[2], Y. Kondo[1], T. Satoh[2], A. Kurisaki[2], M. Asashima[2], K. Ohnuma[1], and T. Kanamori[1]
[1]*Nagaoka University of Technology, JAPAN and*
[2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

Inter- & Intracellular Signaling, Cell Migration

T.121e **A MICROFLUIDIC INVASION ASSAY FOR GLIOMA-INITIATING CELLS IN THREE-DIMENSIONAL CULTURE**
S. Fujioka, S. Oltea, H. Saya, and R. Sudo
Keio University, JAPAN

T.122e **COLLECTIVE MIGRATION OF SMALL-SIZED MULTI-CELLULAR CLUSTERS STUDIED BY DYNAMIC CELL MICRO-PATTERNING BASED ON A CELL-FRIENDLY PHOTORESIST**
J.-C. Choi, H.-R. Jung, and J. Doh
Pohang University of Science and Technology (POSTECH), SOUTH KOREA

T.123e **NUMERIC MODELING OF CELL-CELL SIGNALING IN MICROFLUIDICS TOWARDS IN VITRO MODELS OF INTESTINAL FLORA**
X.L. Luo[1], G.W. Rubloff[2], and W.E. Bentley[2]
[1]*Catholic University of America, USA and* [2]*University of Maryland, USA*

Microfluidics for Cryopreservation

T.124e **THERMOPLASTIC BURST VALVES ENABLING ON-CHIP CRYOPRESERVATION AND REAGENT PACKAGING**
O. Rahmanian[1], C.-F. Chen[2], and D.L. DeVoe[1]
[1]*University of Maryland, College Park, USA and* [2]*National Chung Hsing University, TAIWAN*

Others

T.125e **MULTIPARAMETRIC TUMOR CELL CULTURE MONITORING WITH A NOVEL MICROSENSOR SYSTEM**
A. Weltin[1], K. Slotwinski[1], J. Kieninger[1], I. Moser[2], G. Jobst[2], R. Ehret[3], and G.A. Urban[1]
[1]*University of Freiburg - IMTEK, GERMANY,* [2]*Jobst Technologies GmbH, GERMANY, and* [3]*Bionas GmbH, GERMANY*

T.126e **ROTATION OF CELLS AND CELL CLUSTERS IN CULTURE MEDIA FOR OPTICAL COMPUTED TOMOGRAPHY**
H. Wang, M. Stanley, I.S. Elango, R.M. Shetty, W. Teller, A. Shabilla, P. Limsirichai, H. Zhu, J. Houkal, D. Smith, S.-H. Chao, L. Kelbauskas, R.H. Johnson, and D.R. Meldrum
Arizona State University, USA

Organs & Organisms

Organs on Chip

T.127f **DEVELOPMENT OF AN EX-VIVO LYMPHATIC VASCULAR MODEL**
M. Sato[1], N. Sasaki[2], K. Sato[3], S. Hirakawa[4], and K. Sato[1]
[1]*Japan Women's University, JAPAN,* [2]*Toyo University, JAPAN,* [3]*Gunma University, JAPAN, and* [4]*Hamamatsu University School of Medicine, JAPAN*

T.128f **MICROFLUIDIC SYSTEM FOR MIMICKING INTERACTIONS BETWEEN PANCREAS AND PERIPHERAL TISSUES**
R. Dhumpa, T.M. Truong, X. Wang, and M.G. Roper
Florida State University, USA

T.129f **THREE-DIMENSIONAL MICROVESSEL ARRAY FOR VASCULAR PERMEABILITY ASSAY**
H. Lee, S. Kim, M. Chung, and N.L. Jeon
Seoul National University, SOUTH KOREA

Organisms on Chip (C. elegans, Zebrafish, Arabidopsis, etc.)

T.130f **OCEAN ON A CHIP: MICROFLUIDICS AS A GATEWAY TO FUNCTIONAL MARINE ECOLOGY**
N. Ramanathan, O. Simakov, C.A. Merten, and D. Arendt
European Molecular Biology Laboratory (EMBL), GERMANY

Diagnostics & Analytics

Sample Preparation (Whole Blood, Saliva, Cells, Tissue, Food, etc.)

T.131g **A MICROFLUIDIC SAMPLE PREPARATION DEVICE FOR PRE-CONCENTRATION AND CELL LYSIS USING A NANOPOROUS MEMBRANE**
M.S. Islam, K. Kuryllo, P.R. Selvaganapathy, Y. Li, and M.J. Deen
McMaster University, CANADA

T.132g **ACOUSTIC TRAPPING FOR BACTEREMIA DIAGNOSIS WITH MALDI-MS**
B. Hammarström[1], B. Nilson[2], T. Laurell[1,3], J. Nilsson[1], and S. Ekström[1]
[1]*Lund University, SWEDEN,* [2]*Labmedicin Skåne, SWEDEN, and* [3]*Dongguk University, SOUTH KOREA*

T.133g **HIGH-EFFICIENCY CELL ENRICHMENT USING STANDING SURFACE ACOUSTIC WAVE**
Y. Chen, S. Li, Y. Gu, P. Li, X. Ding, and T.J. Huang
Pennsylvania State University, USA

T.134g **PAPER MICROFLUIDIC EXTRACTION OF BACTERIAL AND VIRAL NUCLEIC ACID FROM FIELD AND CLINICAL SAMPLES TOWARDS A DIRECT MICROTAS APPARATUS**
C.F. Fronczek, T.S. Park, and J.-Y. Yoon
University of Arizona, USA

Nucleic Acid Analysis (e.g. Digital PCR, Next Generation Sequencing)

T.135g **CONTROL OF DNA TRANSLOCATION VELOCITIES FOR NANOPORE-BASED DNA SEQUENCING**
X. Sun[1], T. Yasui[1], S. Rahong[2], T. Yanagida[2], N. Kaji[1], M. Kanai[2], K. Nagashima[2], T. Kawai[2], and Y. Baba[1,3]
[1]*Nagoya University, JAPAN,* [2]*Osaka University, JAPAN, and* [3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T.136g **BEAD-BASED MELTING ANALYSIS IN TEMPERATURE-GRADIENT MICROCHANNELS FOR SINGLE NUCLEOTIDE POLYMORPHISMS DETECTION**
K.C. Li, S.T. Ding, E.C. Lin, L. Wang, Y.M. Chang, and Y.W. Lu
National Taiwan University, TAIWAN

T.137g **LABEL-FREE DETECTION AND QUANTIFICATION OF REAL-TIME DNA AMPLIFICATION USING ONE-DIMENSIONAL PHOTONIC CRYSTAL**
T. Yasui[1], K. Ogawa[1], N. Kaji[1], M. Nilsson[2], M. Tokeshi[1,3], Y. Horiike[4], and Y. Baba[1,5]
[1]*Nagoya University, JAPAN,* [2]*Stockholm University, SWEDEN,* [3]*Hokkaido University, JAPAN,* [4]*National Institute for Materials Science, JAPAN, and* [5]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T.138g **MULTIPLEX LIGATION-DEPENDENT PROBE AMPLIFICATION (MLPA) ON-CHIP**
S. Peeters[1], B. Jones[1], O. Ibrahim[1,3], R. Wiederkehr[1], L. Zhang[1], H. Tanaka[4], T. Matsuno[4], I. Yamashita[4], B. Majeed[1], T. Stakenborg[1], P. Fiorini[1], and L. Lagae[1]
[1]*imec, BELGIUM,* [2]*Alexandria University, EGYPT,* [3]*Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA, and* [4]*Panasonic Corporation, JAPAN*

T.139g **SINGLE-MOLECULE COUNTING WITH MICROFLUIDICS, DIGITAL ISOTHERMAL AMPLIFICATION, AND A MOBILE PHONE IS MORE ROBUST THAN KINETIC BASED REAL-TIME QUANTIFICATION**
D.A. Selck, M.A. Karymov, B. Sun, and R.F. Ismagilov
California Institute of Technology, USA

Protein Analysis & Characterization (e.g. Proteomics)

T.140g **COST-EFFECTIVE MULTIPLEXED IMMUNOASSAYS USING SILVER PRECIPITATION AND A DESKTOP SCANNER**
G. Zhou, S. Bergeron, and D. Juncker
McGill University and McGill Genome Innovation Centre, CANADA

T.141g **MICROFLUIDIC DEVICES TO MAP PROTEIN PHASE DIAGRAMS AND NUCLEATION KINETICS FOR IN SITU X-RAY DIFFRACTION OF PROTEIN CRYSTALS**
M. Heymann, A. Opathalage, M. Ludwig, and S. Fraden
Brandeis University, USA

T.142g **MULTIPLEX ANALYSIS OF CARBOHYDRATE/PROTEIN COMPLEX FOR NEUROBLASTOMA CELLS**
F. Pastorino[1] and G. Simone[2]
[1]*Istituto G. Gaslini, ITALY and* [2]*University of Napoli, ITALY*

Clinical Chemistry

T.143g **A RAPIDLY RECONFIGURABLE, UNIVERSAL POINT-OF-CARE TEST PLATFORM**
J. Kai[1], A. Puntambekar[1], S.H. Lee[1], J. Han[1], and C.H. Ahn[1,2]
[1]*Siloam Biosciences Inc., USA and* [2]*University of Cincinnati, USA*

T.144g **CHARACTERIZATION OF SHORT INCUBATION TIME EFFECTS ON CHROMOGEN SIGNAL OBTAINED BY HER2-EXPRESSING BREAST CARCINOMAS USING MICROFLUIDIC IMMUNOHISTOCHEMISTRY**
A.T. Ciftlik[1], H.-A. Lehr[1,2], and M.A.M. Gijs[1]
[1]*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*
[2]*Universitaire Vaudois (CHUV), and Universite de Lausanne, SWITZERLAND*

T.145g **SINGLE-STEP, MULTI-PARAMETER MONITORING OF LIVER FUNCTION ON A PORTABLE CENTRIFUGAL ANALYZER**
C.E. Nwankire, M. Czugala, R. Burger, D. Diamond, and J. Ducrée
Dublin City University, IRELAND

Others

T.146g **A MICROFLUIDIC ARCHITECTURE FOR EFFICIENT REAGENT INTEGRATION, REAGENT RELEASE, AND ANALYTE DETECTION IN LIMITED SAMPLE VOLUME**
B. Eker, M. Hitzbleck, R.D. Lovchik, Y. Temiz, and E. Delamarche
IBM Research GmbH, SWITZERLAND

T.147g **PHASEGUIDE ASSISTED LIQUID LAMINATION FOR MAGNETIC BEAD-BASED ASSAYS**
C. Phurimsak[1], E. Yildirim[2,3], S.J. Trietsch[2,4], T. Hankemeier[2], M.D. Tarn[1], N. Pamme[1], and P. Vulto[2,4]
[1]*University of Hull, UK,* [2]*University of Leiden, THE NETHERLANDS,* [3]*Cankaya University, TURKEY, and* [4]*MIMETAS VB, THE NETHERLANDS*

Medical Research & Applications

Cancer Research

T.148h

CIRCULATING TUMOR CELL (CTC) ENRICHMENT: ULTRA HIGH THROUGHPUT PROCESSING OF CLINICALLY RELEVANT BLOOD VOLUMES USING A MULTIPLEXED SPIRAL BIOCHIP

M.E. Warkiani[1], B.L. Khoo[1,2], D.S.W. Tan[3], A.A.S. Bhagat[4], W.T. Lim[3], J. Han[1,5], and C.T. Lim[1,2,4]
[1]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,*
[2]*National University of Singapore, SINGAPORE,*
[3]*National Cancer Centre Singapore, SINGAPORE,*
[4]*ClearbridgeBioMedics Pte Ltd., SINGAPORE, and*
[5]*Massachusetts Institute of Technology, USA*

T.149h

MICROFLUIDIC LIPOSOMES TARGETING HYPOXIA INDUCED TUMOR PROGRESSION

A.U. Andar[1], R.R. Hood[2], W.N. Vreeland[3], A. Yang[1], P. Shapiro[1], D.L. DeVoe[2], and P.W. Swaan[1]
[1]*University of Maryland, Baltimore, USA,* [2]*University of Maryland, College Park, USA, and*
[3]*National Institute of Standards and Technology (NIST), USA*

T.150h

REAL TIME BIO MECHANICAL CHARACTERIZATION OF DNA DAMAGE UNDER THERAPEUTIC RADIATION BEAMS

G. Perret[1,3], T. Lacornerie[2], M. Kumemura[1], N. Lafitte[1], H. Guillou[1], L. Jalabert[1], E. Lartigau[2], T. Fujii[1], F. Cleri[3], H. Fujita[1], and D. Collard[1,4]
[1]*University of Tokyo, JAPAN,* [2]*University of Lille 2, FRANCE, and* [3]*University of Lille 1, FRANCE,*

Personalized Medicine

T.151h

DEVELOPMENT OF 3RD GENERATION IMMUNO-PILLAR DEVICE FOR HIGH SENSITIVE DETECTION OF DISEASE MARKERS

N. Nishiwaki[1], T. Kasama[2], A. Ishida[1], H. Tani[1], Y. Baba[2,3], and M. Tokeshi[1,2]
[1]*Hokkaido University, JAPAN,* [2]*Nagoya University, JAPAN, and*
[3]*The Priority Research Project, JAPAN*

T.152h

TOWARDS PERSONALIZED MENTAL HEALTHCARE: AN ELECTROCHEMICALLY-AMPLIFIED BIOSENSOR FOR CLOZAPINE ANTIPSYCHOTIC TREATMENT MONITORING

H. Ben-Yoav[1], T.E. Winkler[1], S.E. Chocron[1], G.R. Costa[1], S.M. Restaino[1], N. Woolsey[1], E. Kim[1], D.L. Kelly[2], G.P. Payne[1], and R. Ghodssi[1]
[1]*University of Maryland, College Park, USA and*
[2]*University of Maryland School of Medicine, USA*

Drug Delivery Systems

T.153h

HIGH THROUGHPUT PURIFICATION DEVICES FOR *IN VIVO* APPLICATIONS OF GENE–DELIVERY MULTIFUNCTIONAL ENVELOPE-TYPE NANODEVICES

N. Kaji[1], D. Shigenaka[1], M. Ukawa[2], M. Tokeshi[2], H. Akita[2], H. Harashima[2], and Y. Baba[1,3]
[1]*Nagoya University, JAPAN,* [2]*Hokkaido University, JAPAN, and*
[3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T.154h

MULTIPHASE-LADEN GAS-LIQUID INTERFACE INJECTION FOR THE VERSATILE GENE TRANSFER

H. Kuriki[1], S. Takasawa[2], M. Iwabuchi[1], K. Ohsumi[1], T. Suzuki[1], T. Higashiyama[1], S. Sakuma[3], F. Arai[1], and Y. Yamanishi[2]
[1]*Nagoya University, JAPAN,* [2]*Shibaura Institute of Technology, JAPAN, and*
[3]*Osaka University, JAPAN*

Regenerative Medicine & Tissue Engineering

T.155h

CONTINUOUS MANUFACTURING OF ROBUST LIVING FIBERS THAT WITHSTAND COMMON TEXTILE PROCESSING FOR TISSUE ENGINEERING APPLICATIONS

M. Akbari[1,2,3], A. Tamayol[1,2,3], V. Laforte[1], N. Annabi[2,3], A. Khademhosseini[2,3], and D. Juncker[1]
[1]*McGill University, CANADA,*
[2]*Harvard-MIT Division of Health Sciences and Technology, USA, and*
[3]*Brigham and Women's Hospital, Harvard Medical School, USA*

T.156h

***IN SITU* CROSSLINKABLE HYDROGEL FOR RAPID ENGINEERING OF VASCULAR-LIKE STRUCTURES BY USING ELECTROCHEMICAL DETACHMENT OF CELLS**

T. Kageyama[1,2], T. Kakegawa[1,2], T. Osaki[1,2], T. Ito[3], T. Nittami[2], and J. Fukuda[2]
[1]*University of Tsukuba, JAPAN,* [2]*Yokohama National University, JAPAN, and*
[3]*University of Tokyo, JAPAN*

T.157h **PANCREATIC BETA-CELL-LADEN CONTACT LENS BASED ON TETRA-PEG FOR DIABETES TREATMENT**
Y.J. Heo, S. Iwanaga, and S. Takeuchi
University of Tokyo, JAPAN and Japan Science and Technology Agency (JST), JAPAN

Implantable and Surgical Microdevices

T.158h **MECHANICAL INTERACTION BETWEEN SINGLE-SHAFT SILICON MICROELECTRODES AND RAT DURA MATER**
Z. Fekete, A. Németh, G. Márton, I. Ulbert, P. Fürjes, and A. Pongrácz
Hungarian Academy of Sciences, HUNGARY

Devices for Better Quality-of-Life (QOL)

T.159h **AN ARTIFICIAL LUNG BASED ON GAS EXCHANGE AND BLOOD FLOW OPTIMIZATIONS**
T. Rieper[1], P. Čvančara[1], S. Gast[2], B. Wehrstein[2], A.N. Maurer[2], C. Mueller[1], and H. Reinecke[1]
[1]*University of Freiburg - IMTEK, GERMANY and* [2]*Novalung GmbH, GERMANY*

T.160h **SIMULTANEOUS PROBING OF SINGLE ERYTHROCYTE BIOCHEMICAL AND MECHANICAL PROPERTIES FOR EFFICIENT BLOOD TRANSFUSION**
S. Huang, H.W. Hou, and J. Han
Massachusetts Institute of Technology, USA

Neurobiology/Neuroscience

T.161h **STUDYING AXON PATHFINDING IN CONTROLLED MICROFLUIDIC ENVIRONMENTS**
S. Moorjani, N. Bhattacharjee, and A. Folch
University of Washington, USA

Separation Technologies

Electrophoretic Separations

T.162i **CAPILLARY ISOELECTRIC FOCUSING ON SLIPCHIP**
S. Wang and W. Du
Renmin University of China, CHINA

T.163i **DEVELOPMENT OF MICROFLUIDIC BLOTTING DEVICES USING ALGINATE HYDROGEL**
Y. Fukushima[1], T. Naito[1], K. Sueyoshi[2], T. Kubo[1], and K. Otsuka[1]
[1]*Kyoto University, JAPAN and* [2]*Osaka Prefecture University, JAPAN*

T.164i **EFFECT OF INTERMITTENT AND HIGH FIELD ON TRAPPING OF MEGABASE-SIZED DNA UNDER ASYMMETRIC PULSED FIELD IN NANOPOROUS STRUCTURES ON CHIP**
H. Sheng[1] and D.J. Harrison[1,2]
[1]*University of Alberta, CANADA and* [2]*National Research Council, CANADA*

T.165i **HIGH-SPEED MICRO-RNA ISOLATION FROM DNA FRAGMENTS BY NANOPILLER ARRAY CHIP**
Q. Wu[1], T. Yasui[1], S. Rahong[2], T. Yanagida[2], M. Kanai[2], N. Kaji[1], M. Tokeshi[3], K. Nagashima[1], T. Kawai[1], and Y. Baba[1,4]
[1]*Nagoya University, JAPAN,* [2]*Osaka University, JAPAN,* [3]*Hokkaido University, JAPAN, and* [4]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T.166i **INTEGRATION OF FLUORESCENT PH SENSORS IN MICROFLUIDIC FREE-FLOW ISOELECTRIC FOCUSING PLATFORMS USING AUTOMATED INKJET PRINTING**
C. Herzog[1], E. Beckert[2], and S. Nagl[1]
[1]*Leipzig University, GERMANY and*
[2]*Fraunhofer-Institut für Angewandte Optik und Feinmechanik (IOF), GERMANY*

T.167i **RATCHET NANOFILTRATION OF DNA**
J.D.P. Thomas[1], D.W. Olson[1], M.N. Joswiak[1,2], S.-G. Park[3], and K.D. Dorfman[1]
[1]*University of Minnesota, USA,* [2]*University of California, Santa Barbara, USA, and* [3]*Korea Institute of Materials Science (KIMS), SOUTH KOREA*

Chromatographic Separations

T.168i **ATTOLITER CHROMATOGRAPHY AND DETECTION FOR NONFLUORESCENT BIOMOLECULES TOWARD SINGLE CELL ANALYSIS**
H. Shimizu[1,2], A. Smirnova[1,2], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo and* [2]*Japan Science and Technology Agency (JST), JAPAN*

T.169i **TEMPERATURE OPTIMIZED DNA CHROMATOGRAPHY IN A VAPOR PHASE FUNCTIONALIZED SILICON MICROPILLAR ARRAY CHIP**
L. Zhang[1,2], P. Fiorini[1], B. Majeed[1], L. Lagae[1,2], C. Van Hoof[1,2], B. Jones[1], and W. De Malsche[3]
[1]*imec, BELGIUM,* [2]*Katholieke Universiteit Leuven, BELGIUM, and* [3]*Vrije Universiteit Brussel, BELGIUM*

Particle Separations

T.170i **CONTINUOUS CONCENTRATOR FOR NANOPARTICLE BASED ON CASCADE AC ELECTROOSMOTIC FLOW**
K. Yamasaki and M. Motosuke
Tokyo University of Science, JAPAN

T.171i **COMBINED DENSITY AND SIZE-BASED SORTING IN DETERMINISTIC LATERAL DISPLACEMENT DEVICES**
S.H. Holm, J.P. Beech, and J.O. Tegenfeldt
Lund University, SWEDEN

Microreaction Technology & Synthesis

Microreactors & Micromixers

T.172j **ACOUSTOFLUIDIC MICROMIXER USING ACOUSTICALLY OSCILLATED SHARP-EDGES**
P.H. Huang[1], Y. Xie[1], D. Ahmed[1], N. Nama[1], Y. Chao[1], C.Y. Chan[1], L. Wang[2], and T.J. Huang[1]
[1]*Pennsylvania State University, USA and* [2]*Ascent Bio-Nano Technologies Inc., USA*

T.173j **INVESTIGATION OF BURSTING OF HEATED DROPLETS FOR CHEMISTRY APPLICATIONS IN DIGITAL MICROFLUIDICS**
G.J. Shah[1,2], A. Saucedo[2], and R.M. van Dam[2]
[1]*Sofie Biosciences, USA and* [2]*University of California, Los Angeles, USA*

T.174j **REACTION CONTROL BY STIRRING-INDUCED, DISCRETE, RECURSIVE FUSION AND DIVISION OF FEMTOLITER COMPARTMENTS IN EMULSION**
T. Ichii[1], G. Tanahashi[2], H. Suzuki[1,3], and T. Yomo[1,3]
[1]*Japan Science and Technology Agency (JST), JAPAN,* [2]*Osaka University, JAPAN, and* [3]*Chuo University, JAPAN*

Filtering & Separation

T.175j **GUIDING OF LIQUIDS VIA PATTERNED SURFACE COATINGS TO FACILITATE SOLID-PHASE EXTRACTION IN TWO-PHASE FLOW**
M. Rendl, T. Brandstetter, and J. Rühe
University of Freiburg - IMTEK, GERMANY

Chemical Synthesis

T.176j **CELL-FREE PROTEIN SYNTHESIS IN VERTICALLY-ORIENTED MICROREACTOR ARRAY DEVICES**
K. Jackson and Z.H. Fan
University of Florida, USA

T.177j **HIGH THROUGHPUT SYNTHESIS OF OLIGONUCLEOTIDE UTILIZING INKJET PRINTER AND MICRO-REACTOR ARRAY FILLED WITH ROBUST OPAL**
H. Li[1], Y. Huang[1], H.Q. Yu[1], Y. Ma[1], C.Y. Tang[2], Z.W. Wei[3], Z.C. Liang[1], W. Wang[1], Z.J. Yang[1], and Z.H. Li[1]
[1]*Peking University, CHINA,* [2]*Multimedia University, MALAYSIA, and* [3]*National Center for Nanoscience and Technology, CHINA*

Particle Synthesis

T.178j **CENTRIFUGE-BASED STEPWISE CHEMICAL LOADING DISC FOR HIGH-THROUGHPUT GOLD NANOPARTICLE SYNTHESIS**
B.H. Park, J.H. Jung, S.J. Oh, D.C. Lee, and T.S. Seo
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

T.179j **MICROFLUIDIC PREPARATION OF BIOCATALYTIC PROTEIN MICROSPHERES UTILISING ON-CHIP CROSS-LINKING METHOD**
M.B. Mbanjwa[1], H. Chen[2], and K. Land[1]
[1]*Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA and* [2]*University of the Witwatersrand, SOUTH AFRICA*

Applications to Green & Environmental Technologies

Fuel Cells

T.180k **PAPER-BASED MICROFLUIDIC FUEL CELLS**
J.P. Esquivel[1], F.J. del Campo[1], J.L. Gómez de la Fuente[3], S. Rojas[3], and N. Sabaté[1]
[1]*IMB-CNM (CSIC), SPAIN and* [2]*University of Washington, USA, and*
[3]*Spanish Council for Scientific Research (CSIC), SPAIN*

Other Energy/Power Devices

T.181k **A LOW-TEMPERATURE POM MICRO METHANOL REFORMER WITH HIGH FUEL CONVERSION RATE AND HYDROGEN PRODUCTION YIELD**
H.-S. Wang, Y.-C. Su, Y.-J. Huang, and F.-G. Tseng
National Tsing Hua University, TAIWAN

T.182k **STREAMING CURRENT OF A ROTARY ATOMIZER FOR ENERGY HARVESTING**
T. Nguyen, H. de Boer, T. Tran, A. van den Berg, and J.C.T. Eijkel
MESA+, University of Twente, THE NETHERLANDS

MicroTAS for Other Applications

Synthetic Biology

T.183l **SOFTWARE AUTOMATED GENOMIC ENGINEERING (SAGE) ENABLED BY ELECTROWETTING-ON-DIELECTRIC DIGITAL MICROFLUIDICS**
M. Sandahl[1], S. Punnamaraju[1], A. Madison[2], J. Harrington[1], M. Royal[2], R. Fair[2], A. Eckhardt[1], A. Sudarsan[1], and M. Pollack[1]
[1]*Advanced Liquid Logic, Inc., USA and* [2]*Duke University, USA*

Bioinspired, Biomimetic & Biohybrid Devices

T.184l **CIRCULAR HYDROGEL PATTERN FOR CELL ALIGNMENT UNDER UNIFORM STRAIN STIMULATION**
H.Y. Hsieh[1,2,3], T.W. Huang[2], G. Camci-Unal[3,4], F.G. Tseng[2,5], S.K. Fan[1], and A. Khademhosseini[3,4,6]
[1]*National Taiwan University, TAIWAN,* [2]*National Tsing Hua University, TAIWAN,*
[3]*Brigham and Women's Hospital, Harvard Medical School, USA,*
[4]*Massachusetts Institute of Technology, USA,* [5]*Academia Sinica, TAIWAN, and*
[6]*Harvard University, USA*

T.185l **STUDY OF MOLECULAR TRANSPORT THROUGH SPECIFIC LIQUID IN BIO-MIMETIC EXTENDED NANOSPACES**
Y. Kazoe, L. Li, H. Chinen, H. Kizoe, T. Saruko, T. Yamashita, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

Bioprocess Technology

T.186l **DROPLET BASED DIRECTED EVOLUTION OF YEAST CELL FACTORIES DOUBLES PRODUCTION OF INDUSTRIAL ENZYMES**
S.L. Sjostrom[1], Y. Bai[1], M. Huang[2], J. Nielsen[1,2,3], H.N. Joensson[1], and H. Andersson Svahn[1]
[1]*Royal Institute of Technology (KTH), SWEDEN,* [2]*Chalmers University of Technology, SWEDEN, and* [3]*Technical University of Denmark, DENMARK*

T.187l **SIMPLE MICROFLUIDICS FOR COMPLEX ORGANISMS: A MICROFLUIDIC CHIP SYSTEM FOR GROWTH AND MORPHOGENESIS STUDIES OF FILAMENTOUS FUNGI**
A. Grünberger, K. Schmitz, C. Probst, W. Wiechert, S. Noack, and D. Kohlheyer
Forschungszentrum Jülich GmbH, GERMANY

Food & Nutrition

T.188l **CENTRIFUGAL LABTUBE FOR FULLY AUTOMATED DNA EXTRACTION & LAMP AMPLIFICATION BASED ON AN INTEGRATED, LOW-COST HEATING SYSTEM**
M.M. Hoehl[1], M. Weißert[2], N. Paust[3,4], R. Zengerle[3,4], A.H. Slocum[1], and J. Steigert[2]
[1]*Massachusetts Institute of Technology, USA,* [2]*Robert Bosch GmbH, GERMANY,*
[3]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, and*
[4]*University of Freiburg - IMTEK, GERMANY*

16:00 - 16:30 **BREAK AND EXHIBIT INSPECTION**

16:30 - 17:15 | **PLENARY PRESENTATION V**

Chairs: J. Qin, *Dalian Institute of Chemical Physics, CHINA*
R. Zengerle, *HSG-IMIT & University of Freiburg - IMTEK, GERMANY*

BIO-INSPIRED, SMART, MULTISCALE INTERFACIAL MATERIALS WITH SUPER-WETTABILITY
Lei Jiang
Chinese Academy of Sciences, CHINA

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 2A3 - Electrochemical Detection and Imaging	**Session 2B3 - Immunoassays**	**NO SESSION DURING THIS TIME**

Session Chairs:

C. Henry, *Colorado State University, USA*	A. Llobera, *Institute of Microelectronics Barcelona, SPAIN*
J. Kutter, *University of Copenhagen, DENMARK*	S.K. Vashist, *HSG-IMIT, GERMANY*

17:30 - 17:50

DENSIFIED ELECTROCHEMICAL SENSOR BASED ON VERTICALLY SEPARATED ELECTRODE ARRAY FOR ELECTROCHEMICAL IMAGING
K. Ino, Y. Kanno, K. Komaki, H. Shiku, and T. Matsue
Tohoku University, JAPAN

SELF-ASSEMBLED MELAMINE MICROLENS ARRAYS FOR IMMUNOFLUORESCENCE ENHANCEMENT
H. Yang, H.C. Tekin, A. Sayah, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

17:50 - 18:10

PAPER-BASED MICROFLUIDIC ELECTROCHEMICAL IMMUNODEVICES INTEGRATED WITH NANOBIOPROBES ON GRAPHENE FILM FOR ULTRASENSITIVE DETECTION OF CANCER BIOMARKERS
Y. Wu[1], P. Xue[1], K.M. Hui[2], and Y. Kang[1]
[1]*Nanyang Technological University, SINGAPORE and* [2]*National Cancer Center, SINGAPORE*

SEQUENCE-SELECTIVE DNA METHYLATION ANALYSIS INDUCED BY BULGE SPECIFIC IMMUNO-RECOGNITION ON A SURFACE PLASMON RESONANCE FLUIDIC CHIP
R. Kurita, H. Yanagisawa, K. Yoshioka, and O. Niwa
National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

18:10 - 18:30

NON-FARADAIC ELECTROCHEMICAL DETECTION OF PATHOGENIC DNA AMPLIFIED BY TARGET DRIVEN SELF ASSEMBLY ON A CMOS PLATFORM
K. Jayant, M.R. Hartman, E.J. Rice, D. Luo, and E.C. Kan
Cornell University, USA

ENHANCEMENT OF IMMUNOREACTION ON MICROARRAY-INTEGRATED OPTOELECTROFLUIDIC ASSAY SYSTEM
D. Han, H.J. Gi, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

WEDNESDAY 30 October

08:30 - 08:45 ANNOUNCEMENTS

08:45 - 09:30 PLENARY PRESENTATION VI

Chairs: T. Fujii, *University of Tokyo, JAPAN*
J. Kutter, *University of Copenhagen, DENMARK*

MICROFLUIDIC FABRICATION OF CELL AND TISSUE ARCHITECTURE
Shoji Takeuchi
University of Tokyo, Kanagawa Academy of Science and Technilogy, and Japan Science and Technology Agency (JST), JAPAN)

09:30 - 11:30 EXHIBITOR LIVE LAB 4 - microfluidic ChipShop GmbH

THE MICROFLUIDIC TOOLBOX - A MODULAR SYSTEM FOR MICROFLUIDICS R&D AND TRAINING
Holger Becker, *CSO*
microfluidic ChipShop GmbH, GERMANY

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 3A1 - Point-of-Care Nucleic Acid Analysis	Session 3B1 - Protein Processing and Analysis 1	Session 3C1 - Blood Processing

Session Chairs:

K.S. Drese, *Institut für Mikrotechnik Mainz GmbH, GERMANY*	N. Kaji, *Nagoya University, JAPAN*	J. Ducrée, *Dublin City University, IRELAND*
A. Wheeler, *University of Toronto, CANADA*	D. Mark, *HSG-IMIT, GERMANY, GERMANY*	J. Landers, *University of Virginia, USA*

09:45 - 10:05

LOW-COST BACTERIAL DETECTION SYSTEM FOR FOOD SAFETY BASED ON AUTOMATED DNA EXTRACTION, AMPLIFICATION AND READOUT
M. Hoehl[1,2], E. Schulte Bocholt[2], N. Karippai[2], R. Zengerle[3,4], J. Steigert[2], and A. Slocum[1]
[1] *Massachusetts Institute of Technology, USA,* [2] *Robert Bosch GmbH, GERMANY,* [3] *Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, and* [4] *University of Freiburg - IMTEK, GERMANY*

PROBING PHYSICAL PROPERTIES OF DNA-PROTEIN COMPLEXES USING NANOFLUIDIC CHANNELS
K. Frykholm[1], M. Alizadehheidari[1], L. Fornander[1], J. Fritzsche[1], J. Wigenius[1], P. Beuning[2], M. Modesti[3], F. Persson[4], and F. Westerlund[1]
[1] *Chalmers University of Technology, SWEDEN,* [2] *Northeastern University, USA,* [3] *Universite Aix-Marseille, FRANCE, and* [4] *Uppsala University, SWEDEN*

ACOUSTOPHORESIS SEPARATION OF BACTERIA FROM BLOOD CELLS FOR RAPID SEPSIS DIAGNOSTICS
P.D. Ohlsson, K. Petersson, P. Augustsson, and T. Laurell
Lund University, SWEDEN

10:05 - 10:25

DEVELOPMENT OF THE POCT-ORIENTED PCR DEVICE DRIVEN BY CENTRIFUGATION ASSISTED THERMAL CONVECTION
M. Saito, Y. Kiriyama, K. Yamanaka, and E. Tamiya
Osaka University, JAPAN

HIGH THROUGHPUT FORMATION OF SUB-MILLION LIPID MEMBRANE ARRAYS FOR MEASURING MEMBRANE PROTEIN ACTIVITIES
R. Watanabe[1,2], D. Fujita[3], K.V. Tabata[1,2], L. Yamauchi[1], N. Soga[1], S.H. Kim[1], H. Suga[1], and H. Noji[1,2]
[1] *University of Tokyo, JAPAN,* [2] *Japan Science and Technology Agency (JST), JAPAN, and* [3] *Pohang University of Science and Technology, SOUTH KOREA*

ONE-STEP DIGITAL PLASMA SEPARATION FOR MOLECULAR DIAGNOSTICS
E.-C. Yeh, and L.P. Lee
University of California, Berkeley, USA

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 3A1 - Point-of-Care Nucleic Acid Analysis	**Session 3B1 - Protein Processing and Analysis 1**	**Session 3C1 - Blood Processing**
10:25 - 10:45		
SAMPLE-PRETREATMENT OF INFLUENZA A VIRUS BASED ON THE MICROBEAD INCORPORATED CENTRIFUGAL MICRODEVICE J.H. Jung, B.H. Park, S.J. Oh, and T.S. Seo *Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA*	**PROTEIN CRYSTALLIZATION INDUCED BY ELECRICALLY DRIVEN BUBBLE KNIFE** H. Kuriki[1], S. Takasawa[2], S. Sakuma[3], K. Shinmura[3], G. Kurisu[3], F. Arai[1], and Y. Yamanishi[2] [1]*Nagoya University, JAPAN,* [2]*Shibaura Institute of Technology, JAPAN, and* [3]*Osaka University, JAPAN*	**NO-DIALYSATE MICRO HEMODIALYSIS SYSTEM** H. Ito[1], G.S. Prihandana[1], I. Sanada[1], M. Hayashi[1], Y. Kanno[2], and N. Miki[1] [1]*Keio University, JAPAN and* [2]*Tokyo Medical University, JAPAN*
10:45 - 11:15	**BREAK AND EXHIBIT INSPECTION**	
SESSION ROOM: Rothaus Arena / Halle 4	**SESSION ROOM: K 6-9**	**SESSION ROOM: Halle 1**
Session 3A2 - Single Cell Processing and Analysis 1	**Session 3B2 - Protein Processing and Analysis 2**	**Session 3C2 - Point-of-Care Bacterial Detection**

Session Chairs:

S. Jacobson, *Indiana University, USA*	J.W. Hong, *Auburn University, USA*	V. Lee, *National Tsing Hua University, TAIWAN*
C.T. Lim, *National University of Singapore (NUS), SINGAPORE*	X. Zhang, *University of Southampton, UK*	V. Taly, *Université Paris Descartes, FRANCE*
11:15 - 11:35		
CYTOPLASMIC TRANSFER BETWEEN ADHERED CELLS BY CELL FUSION THROUGH MICROSLIT K.-I. Wada, E. Kondo, K. Hosokawa, Y. Ito, and M. Maeda *Institute of Physical and Chemical Research (RIKEN), JAPAN*	**SINGLE CELL WESTERN BLOTTING** A.J. Hughes, D.P. Spelke, Z. Xu, D.V. Schaffer, and A.E. Herr *University of California, Berkeley, USA*	**SMARTPHONE DETECTION OF *ESCHERICHIA COLI* FROM WASTEWATER UTILIZING PAPER MICROFLUIDICS** T.S. Park, D.K. Harshman, C.F. Fronczek, and J.-Y. Yoon *University of Arizona, USA*
11:35 - 11:55		
MICROFLUIDIC ELECTRO-SONOPORATION BY SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND ACOUSTIC FIELD H. Wang[1,2], W. Longsine-Parker[1], C. Koo[1], J. Kim[2], B.J. Kim[3], A. Jayaraman[1], and A. Han[1] [1]*Texas A&M University, USA,* [2]*Dankook University Graduate School, SOUTH KOREA, and* [3]*University of Tokyo, JAPAN*	**HIGH-THROUGHPUT MICRODROPLET-BASED ANALYSIS OF POST-TRANSLATIONAL PROTEIN MODIFICATIONS USING MASS SPECTROMETRY** S.K. Küster, M. Pabst, R. Zenobi, and P.S. Dittrich *ETH Zürich, SWITZERLAND*	**A SIMPLE INTEGRATED DIAGNOSTIC PLATFORM FOR DNA TESTING OF CHLAMYDIA TRACHOMATIS INFECTION** D.J. Shin, L. Chen, and T.H. Wang *Johns Hopkins University, USA*
11:55 - 12:15		
ELECTROACTIVE MICROWELL ARRAY FOR QUANTITATIVE MEASUREMENT OF INTRACELLULAR ATP AT THE SINGLE-CELL LEVEL S.H. Kim[1,2], T. Fujii[1,2], and D. Fourmy[3] [1]*University of Tokyo, JAPAN,* [2]*Japan Science and Technology Agency (JST), JAPAN, and* [3]*CNRS, FRANCE*	**DETERMINISTIC PROTEIN EXTRACTION FROM DROPLETS USING INTERFACIAL DRAG AND TENSIOPHORESIS** G.K. Kurup and A.S. Basu *Wayne State University, USA*	**MICROFLUIDIC PLATFORM FOR RAPID ANTIBIOTIC SUSCEPTIBILITY TESTING OF POLYMICROBIAL COMMUNITIES** R. Mohan, C. Sanpitakseree, E. Sevgen, A.V. Desai, C.M. Schroeder, and P.J.A. Kenis *University of Illinois, Urbana-Champaign, USA*

12:15 - 13:15	**LUNCH**
13:15 - 14:00	**PLENARY PRESENTATION VII** **Chairs:** H. Becker, *microfluidic ChipShop GmbH, GERMANY* R. Zengerle, *HSG-IMIT & University of Freiburg - IMTEK, GERMANY* **AUTOMATED DROPLET MICROFLUIDICS** Piotr Garstecki *Polish Academy of Sciences, POLAND*
14:00 - 16:00	**EXHIBITOR LIVE LAB 5 - cetoni GmbH** **neMESYS, Qmix, AND BEYOND - PARTICLE SEPARATION & CONTINUOUS FLOW USING A MODULAR MICROFLUIDIC ACTUATION SYSTEM** Franz M. Schaper *cetoni GmbH, GERMANY*

14:00 - 16:00 **POSTER SESSION 3** - *See floorplan on pages 28-29*

Fundamentals in Microfluidics and Nanofluidics

Electrokinetic Phenomena

W.001a **DIELECTROPHORETIC SORTING OF MICROPARTICLES AND LYMPHOCYTES USING RAIL-TYPE ELECTRODES**
K. Tatsumi[1], H. Shintani[1], Y. Katsumoto[2], and K. Nakabe[1]
[1]*Kyoto University, JAPAN and* [2]*Sony Corporation, JAPAN*

W.002a **SELF-ROTATION AND ELECTROKINETIC PROPERTIES OF CELLS IN A NON-ROTATIONAL AC ELECTRIC FIELD**
C. Benoit[1], T. Honegger[2], and D. Peyrade[1]
[1]*LTM-CNRS, FRANCE and* [2]*Massachusetts Institute of Technology, USA*

Droplets & Plugs, Multiphase Systems

W.003a **A HIGHLY PARALLEL MICROFLUIDIC DROPLET METHOD FOR SINGLE ENZYME MOLECULE DETECTION**
Z. Guan, Z. Zhu and C.J. Yang
Xiamen University, CHINA

W.004a **ACTIVE SEQUENTIAL MERGING OF TWO REAGENTS ISOLATED IN MICRO DROPLETS IN MULTIPLE RATIOS**
A. Jamshaid, D.H. Yoon, T. Sekiguchi, and S. Shoji
Waseda University, JAPAN

W.005a **CONTINUOUS MICROFLUIDIC ASSEMBLY OF ANISOTROPIC MICROPARTICLE DIMERS**
A.X. Lu, K. Jiang, S.R. Raghavan, and D.L. Devoe
University of Maryland, College Park, USA

W.006a **HIGH THROUGHPUT SINGLE CANCER CELL ENCAPSULATION AND SELF SORTING FOR PROTEASE ASSAY BY USING JETTING MICROFLUIDICS**
T. Jing[1,2], R. Ramji[1], M.E. Warkiani[2], C.T. Lim[1,2], J. Han[2,3], and C.-H. Chen[1,4]
[1]*National University of Singapore, SINGAPORE,*
[2]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,*
[3]*Massachusetts Institute of Technology, USA, and*
[4]*Singapore Institute for Neurotechnology (SiNAPSE), SINGAPORE*

W.007a **NON-INVASIVE CHARACTERIZATION OF DISSOLVED OXYGEN DYNAMICS IN WATER-IN-OIL DROPLET MICROFLUIDICS - TOWARDS 3D MICRO TUMOR SPHEROIDS FOR HIGH THROUGHPUT CANCER DRUG SCREENING**
J.B. Erhardt[1,2], V. Nock[1], J. Kieninger[2], and G.A. Urban[2]
[1]*University of Canterbury, NEW ZEALAND and* [2]*University of Freiburg - IMTEK, GERMANY*

W.008a **PRECISE NANOLITER DROPLET GENERATION AND VOLUME CONTROL IN ELECTROWETTING MICROCHANNELS**
Y. Liu, A. Banerjee, and I. Papautsky
University of Cincinnati, USA

W.009a **SIZE BASED DROPLET SORTING WITH WIDE TUNING RANGE USING TENSIOPHORESIS**
G.K. Kurup, and A.S. Basu
Wayne State University, USA

Optofluidics

W.010a **A NOVEL PARALLEL NANOMIXER FOR HIGH-THROUGHPUT SINGLE-MOLECULE FLUORESCENCE DETECTION**
K. Mathwig[1], S. Schlautmann[1], S.G. Lemay[1], and J. Hohlbein[2]
[1]*MESA+, University of Twente, THE NETHERLANDS and*
[2]*Wageningen University, THE NETHERLANDS*

W.011a **LABEL-FREE OPTOFLUIDIC BIOMOLECULAR SENSING USING A PHOTONIC CRYSTAL NANOTWEEZER: THE WIGGLE ASSAY**
P. Kang[1], Y.-F. Chen[2], and D. Erickson[1]
[1]*Cornell University, USA and* [2]*National Cheng Kung University, TAIWAN*

W.012a **NEGATIVE PHOTOTAXIS BEHAVIOR OF ORGANIC DROPLETS IN CHANNELS**
L. Florea[1], K. Wagner[2], P. Wagner[2], D.L. Officer[2], G.W. Wallace[2],
F. Benito-Lopez[1,3], and D. Diamond[1]
[1]*Dublin City University, IRELAND,* [2]*University of Wollongong, AUSTRALIA, and*
[3]*CIC microGUNE, SPAIN*

Magnetofluidics (Magnetic Particles & Related Phenomena)

W.013a **MAGNETIC FLUIDIZED BED IN MICROFLUIDICS: HYDRODYNAMIC CHARACTERIZATION AND VALIDATION TO IMMUNOCAPTURE**
S. Tabnaoui[1], I. Pereiro[1], M. Fermigier[2], S. Descroix[1], J.L. Viovy[1], and L. Malaquin[1]
[1]*Institut Curie, FRANCE and* [2]*PMMH-ESPCI, FRANCE*

Acoustic Phenomena (BULK & Surface Based)

W.014a **ACOUSTIC CONTROL OF LIQUIDS IN MICROCHANNELS**
S. Deshmukh[1,2], P. Augustsson[1], Z. Brzozka[2], and T. Laurell[1,3]
[1]*Lund University, SWEDEN,* [2]*Warsaw University of Technology, POLAND, and* [3]*Dongguk University, SOUTH KOREA*

W.015a **MAGNITUDE AND VARIANCE OF ACOUSTIC ENERGY DENSITY IN MICROCHANNEL ACOUSTOPHORESIS: COMPARISON BETWEEN SINGLE-FREQUENCY AND FREQUENCY-MODULATED ACTUATION**
I. Iranmanesh[1], R. Barnkob[2], H. Bruus[2], and M. Wiklund[1]
[1]*Royal Institute of Technology (KTH), SWEDEN and*
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Nanofluidic Phenomena (Nanochannels, -Tubes & -Pores)

W.016a **LABEL-FREE NANOFLUIDIC PRECONCENTRATION WITH MULTI-OPERATIONAL MODES BY LOOP CURRENTS MONITORING FOR BIOLOGICAL APPLICATION**
P.-S. Chung, Y.-L. Liu, K.-P. Liao, Y.-J. Fan, K.-B. Sung, H.-J. Sheen, and W.-C. Tian
National Taiwan University, TAIWAN

W.017a **RAPID MONITORING LOW ABUNDANCE PROSTATE SPECIFIC ANTIGEN BY PROTEIN NANOCONSTRICTION MOLECULAR DAM**
K.-T. Liao[1,2], N.S. Swami[2], and C.-F. Chou[1]
[1]*Academia Sinica, TAIWAN,* [2]*University of Virginia, USA,*
[3]*National Institute of Standards and Technology (NIST), USA, and*
[4]*University of Maryland, College Park, USA*

Micro- and Nanoengineering

Micro- & Nanofabrication/ -Patterning/ -Integration

W.018b **A FLEXIBLE METHOD FOR RAPID-PROTOTYPING OF PDMS MICROFLUIDIC CHIPS USING DIRECT-WRITING FOR GENERATION OF POLYMER-MASTER-STRUCTURES**
L. Gutzweiler[1], F. Stumpf[2], L. Riegger[1], P. Koltay[1], R. Zengerle[1], and L. Tanguy[2]
[1]*University of Freiburg - IMTEK, GERMANY and*
[2]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*

W.019b **A MANUFACTURABLE PLATFORM FOR IN VITRO ELECTROPHYSIOLOGICAL STUDIES UNDER MECHANICAL STIMULATION**
S. Khoshfetrat Pakazad[1], A. Savov[1], and R. Dekker[1,2]
[1]*Delft University of Technology, THE NETHERLANDS and*
[2]*Philips Research Eindhoven, THE NETHERLANDS*

W.020b **DIRECT CHEMICAL-COMPUTER INTERFACE FOR LIVING CELL ANALYSIS**
T. Hoshino, A. Wagatsuma, and K. Mabuchi
University of Tokyo, JAPAN

W.021b **FABRICATION OF GOLD-NANOPARTICLE ARRAYS USING PHOTOLITHOGRAPHY AND THERMAL DEWETTING**
L. de Vreede, K. Göeken, R. Gill, A. van den Berg, and J. Eijkel
MESA+, University of Twente, THE NETHERLANDS

W.022b **NOVEL NANOPLASMONIC-ENHANCED D2PA MICROFLUIDIC IMMUNOASSAY WITH 2.8 NG/ML (66 PM) SENSITIVITY IN 100 NL SAMPLE VOLUME AND 4 MINUTES TOTAL ASSAY TIME**
S.Y. Chou, R. Peng, L. Zhou, and Q. Zhang
Princeton University, USA

W.023b **MULTIDIRECTIONAL TILTED UV LITHOGRAPHY: A KEY FABRICATION METHOD OF POLYMERIC MICROFLUIDIC DEVICE**
S.J. Lee[1], B.I. Kim[1], K.G. Lee[2], T.J. Lee[1], and B.G. Choi[2]
[1]*National Nanofab Center, SOUTH KOREA and* [2]*University of Michigan, USA*

W.024b **PARYLENE C-MEDIATED-PDMS: AN APPROACH FOR FUNCTIONALIZATION OF PDMS MICROFLUIDIC DEVICES**
L. Zhang[1], H. Sun[1], Y. Wu[1], W. Wang[1], D. Li[2], H.A. Zhang[1], W. Wu[1] and, Z. Li[1]
[1]*Peking University, CHINA and* [2]*Tianjin University, CHINA*

W.025b **SCALEABLE BLM ARRAYS FOR PARALLEL ION CHANNEL RECORDING**
S.C. Saha[1], F. Thei[2], M.R.R. de Planque[1], and H. Morgan[1]
[1]*University of Southampton, UK and* [2]*University of Bologna, ITALY*

W.026b **MICRO-SCALE DROPLET CONTACT METHOD BY MECHANICAL MOTION: REPRODUCIBLE AND ROBUST LIPID BILAYER FORMATION**
L.N.S. Zaleha[1,2], R. Kawano[1], H. Yasuga[1,2], K. Kamiya[1], T. Osaki[1,3], N. Miki[1,2], and S. Takeuchi[1,3]
[1]*Kanagawa Academy of Science and Technology, JAPAN,* [2]*Keio University, JAPAN, and* [3]*University of Tokyo, JAPAN*

Bonding, Sealing & Interfacing Technologies

W.027b **MICROFLUIDIC TRANSWELL INSERTS FOR GENERATION OF TISSUE CULTURE-FRIENDLY GRADIENTS IN WELL PLATES**
C.G. Sip and A. Folch
University of Washington, USA

Novel/Smart/Responsive Materials

W.028b **ENGINEERING SUPERLYOPHOBIC SURFACES ON CURABLE MATERIALS BASED ON FACILE AND INEXPENSIVE MICROFABRICATION**
L. Yuan[1], W. Zhang[1], Z. Tang[1], T. Wu[2], L. Zhang[3], and L. Luan[4]
[1]*Sun Yat-sen University, CHINA,* [2]*Chinese Academy of Sciences, CHINA,* [3]*Tsinghua University, CHINA, and* [4]*Kuang-Chi Institute of Advanced Technology, CHINA*

W.029b **MICROFLUIDIC FORMATION OF STIMULUS RESPONSIVE SOFT MATERIALS**
H. Chen and A. Guenther
University of Toronto, CANADA

W.030b **SIMPLE AND SMART MICROFLUIDIC GEL ACTUATOR**
K. Ito[1], S. Sakuma[2], Y. Yokoyama[3], and F. Arai[1]
[1]*Nagoya University, JAPAN,* [2]*Osaka University, JAPAN, and* [3]*Toyama Industrial Technology Center, JAPAN*

Surface Modification

W.031b **MASKED PLASMA OXIDATION METHOD AS A SIMPLE MICROPATTERNING OF EXTRACELLULAR MATRIX IN A CLOSED MICROCHAMBER ARRAY**
K. Hattori[1], R. Yoshimitsu[2], S. Sugiura[1], A. Maruyama[2], K. Ohnuma[2], and T. Kanamori[1]
[1]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and* [2]*Nagaoka University of Technology, JAPAN*

W.032b **POLYHEMA SOFT LITHOGRAPY FOR SELECTIVE CELL SEEDING, MIGRATION BLOCKING, AND HIGH-THROUGHPUT SUSPENSION CELL CULTURE**
P.N. Ingram, Y.-C. Chen, and E. Yoon
University of Michigan, USA

Molecular Systems & Nanochemistry

W.033b **MICROTUBULE GLIDING AT THE BOUNDARY OF KINESIN AND DYNEIN PATTERNED SURFACE**
J. Ikuta[1], N.K. Kamisetty[2], H. Shintaku[1], H. Kotera[1], and R. Yokokawa[1,2]
[1]*Kyoto University, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

Nanobiotechnology

W.034b **PAPER WITHDRAWN**

W.035b **FABRICATION OF PLANAR MICROFLUIDIC DEVICE FOR ARTIFICIAL DARWINIAN SELECTION TECHNOLOGY**
S. Sato[1,2], T. Fukuda[1], T. Hirai[1,2], S. Ueno[1,2], M. Biyani[1,2], T. Akagi[1,2], and T. Ichiki[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

W.036b **PROTEIN-DNA CONJUGATE ARRAY CHIP FOR ON-CHIP DIRECTED EVOLUTION**
S. Ueno[1,2], R. Kobayashi[1], M. Biyani[1,2], and T. Ichiki[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

Nanoassembly

W.037b **NANOWIRE FORMATION USING SPECIFIC METALLIZATION OF DOUBLE-STRANDED DNA**
T. Himuro, R. Araki, H. Ikedo, S. Sato, S. Takenaka, and T. Yasuda
Kyushu Institute of Technology, JAPAN

Sensors & Actuators, Detection Technologies

Micropumps, -Valves, -Dispensers

W.038c **A MICRO CONTROL VALVE WITH INTEGRATED CAPACITIVE SENSING FOR AMBULANT BLOOD PRESSURE WAVEFORM MONITORING**
M.S. Groen[1], R.A. Brookhuis[1], M.J. van Houwelingen[2], D.M. Brouwer[1,3], J.C. Lotters[1,4], and R.J. Wiegerink[1]
[1]*MESA+, University of Twente, THE NETHERLANDS,*
[2]*Finapres Medical Systems B.V., THE NETHERLANDS,*
[3]*DEMCON Advanced Mechatronics B.V., THE NETHERLANDS, and*
[4]*Bronkhorst High-Tech B.V., THE NETHERLANDS*

W.039c **ON-CHIP PUMP SYSTEM FOR HIGH-PRESSURE MICROFLUIDIC APPLICATIONS**
S. Ogden, S. Knaust, A.P. Dahlin, K. Hjort, and R. Bodén
Uppsala University, SWEDEN

W.040c **TOTALLY GLASS-BASED MICROCHIPS WITH VALVES AND PUMPS USING FLEXIBILITY OF ULTRA THIN GLASS**
Y. Tanaka
Institute of Physical and Chemical Research (RIKEN), JAPAN

Physical Sensors

W.041c **A NEW MICROWAVE BIO-MICROSENSOR WITH MINUTE DROPLET OF LIPOSOME SUSPENSION AND TARGET BIOMOLECULES USING S-PARAMETER METHOD FOR DIELECTRIC DISPERSION ANALYSIS**
K. Takada, K. Yamashita, and M. Noda
Kyoto Institute of Technology, JAPAN

W.042c **NOVEL THERMAL MICROSENSOR METHOD FOR ONLINE MONITORING OF IN-VITRO BIOFILM FORMATION**
O. Behrmann, D.F. Reyes Romero, G. Dame, and G.A. Urban
University of Freiburg - IMTEK, GERMANY

Biosensors

W.043c **HIGH-DENSITY 3D NANOSTRUCTURED PILLAR ARRAYS OF SURFACE ENHANCED RAMAN SCATTERING (SERS) BIOSENSOR FOR SINGLE BACTERIA DETECTION BY LOCAL ELECTROKINETIC TRAPPING**
J.-K.Wu[1], C.-W. Lee[1], T.-F. Kuo[1], H.-Y. Chang[1], and F.-G. Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

W.044c **A NEW CONCEPT FOR A HIGHLY INTEGRATED AND FLEXIBLE BIOSENSOR SYSTEM USING AN ARRAY OF SURFACE ACOUSTIC WAVE (SAW) SENSORS**
F. Gruhl, R. Tjahyawati, J. Krattenmacher, and M. Rapp,
Karlsruhe Institute of Technology, GERMANY

W.045c **A NOVEL OPTICAL BIOSENSOR WITH INTERNAL REFERENCING**
R. Gupta, and N.J. Goddard
University of Manchester, UK

W.046c **AN OPTICAL BIOSENSING PLATFORM USING COMMON ELECTRONICS COMPONENTS ONLY**
Y.D. Han, Y.H. Jang, and H.C. Yoon
Ajou University, SOUTH KOREA

W.047c **BIOFUNCTIONALIZED LAB-ON-A-CHIP WITH DUAL READOUT**
B. Ibarlucea[1], X. Munoz-Berbel[1], P. Ortiz[1], S. Büttgenbach[2], C. Fernández-Sánchez[1], and A. Llobera[1]
[1]*Institut de Microelectronica de Barcelona, IMB-CNM (CSIC), SPAIN and*
[2]*Technische Universität Braunschweig, GERMANY*

W.048c **CHARACTERIZATION OF APTAMER-BASED BIOSENSOR ON A CHIP WITH SINGLE EXPERIMENTS**
M. Hamon, J. Dai, J. Wower, and J.W. Hong
Auburn University, USA

W.049c **DIELECTRIC ANALYSIS OF CHANGES IN ELECTRIC PROPERTIES OF DOXORUBICIN RESISTANT K562 LEUKEMIC CELLS THROUGH ELECTROROTATION WITH 3-D ELECTRODES**
G. Bahrieh, M. Erdem, E. Özgur, U. Gündüz, and H. Külah
Middle East Technical University (METU), TURKEY

W.050c **HYDROGEL-BASED IMAGING SENSOR FOR THE ASSAY OF EXERCISE-DEPENDENT METABOLIC REGULATION IN SKELETAL MUSCLE CELLS**
K. Nagamine, K. Okamoto, H. Kaji, M. Kanzaki, and M. Nishizawa
Tohoku University, JAPAN

W.051c **LABEL-FREE CHARACTERIZATION OF AMYLOID GROWTH BY SUSPENDED MICROCHANNEL RESONATORS**
Y. Wang, M.M. Modena, and T.P. Burg
Max Planck Institute for Biophysical Chemistry, GERMANY

W.052c **MICROFLUIDIC INTEGRATION OF PLASMONIC APPLICATIONS FOR HIGHLY SENSITIVE BIOANALYSIS**
C.Y. Xiao[1,3], Z. Cao[2], Z.F. Huang[1], Z. Xu[3], J.X. Fu1, and L. Yobas[2]
[1]*Hong Kong Baptist University, HONG KONG,*
[2]*Hong Kong University of Science and Technology, HONG KONG, and*
[3]*Beijing Jiaotong University, CHINA*

W.053c **MULTI-TARGET TOXIC DETECTIONS BASED ON PIEZORESISTIVE MICROCANTILEVERS**
R. Zhao, J. Zhang, J. Yang, Y. Wen, and X. Yu
Peking University, CHINA

W.054c **NOISE-IMMUNE SILICON NANOWIRE/CMOS HYBRID BIOSENSOR USING TOP-DOWN APPROACH**
J. Lee[1], S. Hwang[1], B. Choi[1], S. Choi[1], J.H. Lee[2], B.-G. Park[2], D.M. Kim[1], S.-J. Choi[1], and D.H. Kim[1]
[1]*Kookmin University, SOUTH KOREA and* [2]*Seoul National University, SOUTH KOREA*

W.055c **RAPID AND AUTOMATED FORMATION OF SUSPENDED LIPID BILAYER ARRAYS FOR PARALLEL ION CHANNEL AND PROTEIN NANOPORE RECORDING**
G. Baaken[1,2], E. Zaitseva[1,2], S. Petersen[1,2], J.M. del Rio Martinez[1], and J.C. Behrends[1]
[1]*University of Freiburg, GERMANY and* [2]*Ionera Technologies GmbH i.G., GERMANY*

W.056c **SINGLE NUCLEOTIDE POLYMORPHISM (SNP) DETECTION ON A MAGNETORESISTIVE SENSOR**
G. Rizzi, F.W. Østerberg, M. Dufva, and M.F. Hansen
Danmarks Tekniske Universitet (DTU), DENMARK

Chemical & Electrochemical Sensors

W.057c **A MICROMACHINED MICROPRECONCENTRATOR DESIGN BASED ON QUANTITATIVE SIMULATION STUDY FOR VOLATILE ORGANIC COMPOUNDS GAS SENSING**
N. Kakita[1], H. Miyashita[1], S. Kishida[1], J.-O. Lee[2], and S.-S. Lee[1]
[1]*Tottori University, JAPAN and*
[2]*Korea Research Institute of Chemical Technology, SOUTH KOREA*

W.058c **A VOC SENSOR BASED ON MICROMECHANICAL CANTILEVER FUNCTIONALIZED WITH ZNO NANORODS**
N. Kilinc[1], O. Cakmak[1], A. Kosemen[2,3], E. Ermek[1], S. Ozturk[2], Y. Yerli[2], Z.Z. Ozturk[2], and H. Urey[1]
[1]*Koc University, TURKEY,* [2]*Gebze Institute of Technology, TURKEY, and*
[3]*Mus Alparslan University, TURKEY*

W.059c **DIFFUSION COEFFICIENT MEASUREMENT BASED ON DIFFUSION-INDUCED FOCUSING IN OPTOFLUIDIC WAVEGUIDE**
H.T. Zhao, Y. Yang, L.K. Chin, and A.Q. Liu
Nanyang Technological University, SINGAPORE

W.060c **FOUR ELECTRODE 3D CONTACTLESS CONDUCTIVITY DETECTOR FOR MICROFLUIDIC APPLICATIONS**
K. Maciejewska (Blaszczyk), K. Zukowski, M. Balcerzak, D. Kapica, J. Janiszewska, M. Chudy, Z. Brzozka, and A. Dybko
Warsaw University of Technology, POLAND

W.061c **MAGNETIC SENSOR PARTICLES: A NEW TOOL FOR THE DETERMINATION OF OXYGEN IN MICROFLUIDICS**
B. Ungerböck, J. Ehgartner, S. Fellinger, P. Sulzer, and T. Mayr
Graz University of Technology, AUSTRIA

W.062c **NANOFLUIDIC CRYSTAL BASED LEAD SENSOR WITH DETECTION OF PICO-MOLAR**
R. Zhang[1], J. Sang[1], J. Huang[1,2], W. Wang[1,2], M. Chu[1], Y. Wang[1], H. Li[1], H.A. Zhang[1,2], W. Wu[1,2], and Z. Li1,[2]
[1]*Peking University, CHINA and*
[2]*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA*

W.063c **SINGLE-STEP CASPASE-3 INHIBITOR ASSAY BY USING COMBINABLE PDMS CAPILLARY (CPC) SENSOR ARRAY**
T. Ishimoto, K. Jigawa, T.G. Henares, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

Visualization & Imaging Technologies

W.064c **FUNCTIONALIZED PARTICLE IMAGE VELOCIMETRY FOR SIMULTANEOUS MEASUREMENTS IN MICRO/NANOCHANNEL FLOWS**
Y. Kazoe, K. Yamamoto, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

W.065c **MICRO/NANO XCT FOR COMPLEX MULTILAYER MICROFLUIDIC DEVICE METROLOGY**
A. Iles[1,2], D. Bernard[3], and D. Sideris[1]
[1]*Genetic Microdevices Ltd., UK,* [2]*University of Hull, UK, and* [3]*Nordson DAGE Ltd, UK*

W.066c **REAL-TIME IMAGE-BASED SORTING OF PICOLITER DROPLETS**
E. Zang, M. Tovar, S. Brandes, M.T. Figge, and M. Roth
Hans-Knöll-Institute, GERMANY

Optical Detection

W.067c **TRACE HEAVY METAL ANALYSIS USING WHISPERING GALLERY MODE SENSING**
S. Panich, K.A. Wilson, and J.B. Edel
Imperial College London, UK

W.068c **COMBINATION OF MULTI LEDS LIGHT SOURCE AND LIGHT ABSORPTION CELL DESIGNED FOR COLORIMETRIC ANALYSIS OF BLOOD PLASMA**
H. Matsui[1], F. Hagihara[2], T. Wada[2], and S. Konishi[1]
[1]*Ritsumeikan University, JAPAN and* [2]*Kyokko Electric Co., Ltd., JAPAN*

W.069c **FABRICATION OF HYDROGEL-BASED TWO-DIMENSIONAL PHOTONIC CRYSTAL FOR OPTICAL SENSOR APPLICATION**
T. Araki, T. Endo, K. Sueyoshi, and H. Hisamoto
Osaka Prefecture University, JAPAN

W.070c **LENSLESS CMOS-BASED IMAGING DEVICE FOR FLUORESCENT FEMTOLITER DROPLET ARRAY COUNTING**
K. Sasagawa[1,3], S.H. Kim[1,2], K. Miyazawa[1], H. Takehara[1], T. Noda[1,3], T. Tokuda[1,3], R. Iino[2,3], H. Noji[2,3], and J. Ohta[1,3]
[1]*Nara Institute of Science and Techonology, JAPAN,* [2]*University of Tokyo, JAPAN, and* [3]*Japan Science and Technology Agency (JST), JAPAN*

W.071c **NEAR-FIELD ILLUMINATION METHOD FOR THE SPECTROSCOPIC MEASUREMENT IN EXTENDED-NANO SPACE**
R. Ohta, K. Mawatari, Y. Kazoe, Y. Pihosh, and T. Kitamori
University of Tokyo, JAPAN

W.072c **RAPID λ BACTERIOPHAGE DETECTION VIA CO-CULTURE OF HOST CELL ESCHERICHIA COLI BY DROPLET OPTOFLUIDIC SYSTEM**
J.Q. Yu, W. Huang, L.K. Chin, L. Lei, Y.J. Zheng, W. Ser, and A.Q. Liu
Nanyang Technological University, SINGAPORE

Others

W.073c **CONTROLLING PARTICLE POSITION USING A NANOPORE TRAPPING METHOD**
Y. Maeda, M. Tsutsui, K. Doi, S. Kawano, T. Kawai, and M. Taniguchi
Osaka University, JAPAN

Novel Functionalities in Integrated Microfluidic Platforms

Platforms Based on Capillary Forces (Paper Based Microfluidics, Lateral Flow Tests)

W.074d **ENHANCEMENT OF CAPILLARY CONDENSATION IN EXTENDED NANOSPACE FOR HIGH-PERFORMANCE MICRO HEAT PIPE DEVICE**
K. Kasai[1], C. Wang[1,2], H. Shimizu[1,2], Y. Kazoe[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*

W.075d **FABRICATION OF THREE-DIMENSIONAL MICROFLUIDIC CHANNELS IN A SINGLE LAYER OF CELLULOSE PAPER**
X. Li and X.Y. Liu
McGill University, CANADA

W.076d **PORTABLE AND SELF-POWERED PAPER-BASED ELECTROPHORETIC MICROFLUIDIC DEVICES**
S.-S. Chen, Y.-C. Liao, and J.-T. Yang
National Taiwan University, TAIWAN

Microfluidic Large Scale Integration

W.077d **A MICROFLUIDIC BASED FUNCTIONAL HIGH THROUGHPUT SCREEN TO DEVELOP 'PATHOGENICITY LANDSCAPES' OF INDWELLING DEVICE-RELATED PATHOGENS**
W.M. Weaver, V. Milisavljevic, R. Damoiseaux, J.F. Miller, and D. Di Carlo
University of California, Los Angeles, USA

Digital Microfluidics on Surfaces

W.078d **CORRELATION OF RAYLEIGH-SAW STREAMING AND THERMAL EFFECT FOR PREDICTION OF HEAT TRANSFER MECHANISM(S) WITHIN MICRODROPLET**
D. Beyssen, T. Roux-Marchand, I. Perry, and F. Sarry
Université de Lorraine, FRANCE

W.079d **PLANARIZATION OF THE SURFACE OF ELECTROWETTING ON DIELECTRIC DEVICE FOR DROPLET SPEED IMPROVEMENT**
C. Lee[1], H.C. Kim[1], and H. Chun[2]
[1]*Seoul National University, SOUTH KOREA and* [2]*Korea University, SOUTH KOREA*

Segmented Flow & Droplet Based Microfluidics in Channels

W.080d **A MULTIPLEXED MICROFLUIDIC DROPLET PLATFORM FOR MATRIX METALLOPROTEINASE SCREENING**
T.D. Rane, H.C. Zec, and T.-H. Wang
Johns Hopkins University, USA

W.081d **A SIMPLE SYSTEM FOR IN-DROPLET INCUBATION AND QUANTIFICATION OF AGGLUTINATION ASSAYS**
D. Castro, R. Kodzius, and I.G. Foulds
King Abdullah University of Science and Technology (KAUST), SAUDI ARABIA

W.082d **MANIPULATION OF MICROMETRIC DROPLETS**
M. Leman, A.D. Griffiths, and P. Tabeling
Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE

W.083d **ON-DEMAND PICOLITER-SCALE DROPLET GENERATION USING SURFACE ACOUSTIC WAVES**
D.J. Collins, T. Alan, K. Helmerson, and A. Neild
Monash University, AUSTRALIA

Centrifugal Microfluidics

W.084d **AN INTEGRATED LAB-ON-A-CHIP SYSTEM WITH DNA EXTRACTION, PRE- AND MAIN PCR AMPLIFICATION FOR AUTOMATED DETECTION OF LOW CONCENTRATED PATHOGENS**
G. Czilwik[1], O. Strohmeier[1], I. Schwarz[1], N. Paust[1], S. Zehnle[1], F. von Stetten[1,2], R. Zengerle[1,2,3], and D. Mark[1]
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W.085d **EFFICIENT LEUKOCYTE ISOLATION BY DENSITY-GRADIENT CENTRIFUGATION VIA DUAL-CHAMBER PNEUMATIC SIPHONING**
D.J. Kinahan, S.M. Kearney, and J. Ducree
Dublin City University, IRELAND

W.086d **INTEGRATION OF PINWHEEL ASSAY ON A CD-LIKE MICROCHIP FOR DNA QUANTITATION**
Y. Ouyang, J. Li, and J.P. Landers
University of Virginia, USA

W.087d **MODIFIED DVD-DRIVE AS AN INTEGRATED MICROFLUIDIC SYSTEM FOR PRECIPITATE-BASED DETECTION OF LAMP ASSAY**
M. Amasia, S. Zelenin, H. Ramachandraiah, P. Asalapuram, and A. Russom
Royal Institute of Technology (KTH), SWEDEN

Electrokinetic Microfluidics

W.088d **ELECTROKINETIC CONCENTRATION ON A MICROFLUIDIC CHIP USING POLYELECTROLYTIC GEL PLUGS FOR SMALL MOLECULE DETECTION**
D. Han[1], Y.-R. Kim[2], J. Kim[3], and T.D. Chung[1]
[1]*Seoul National University, SOUTH KOREA,* [2]*University of Warwick, UK, and* [3]*Kyung Hee University, SOUTH KOREA*

Other & Novel Microfluidic Platforms

W.089d **3D PRINTED MICROFLUIDIC DEVICES FOR RECONFIGURABLE ANALYSIS SYSTEM**
K. Aritome[1], W.P. Bula[1], K. Sakamoto[2], Y. Murakami[3], and R. Miyake[4]
[1]*Hiroshima University, JAPAN,* [2]*Kyushu Institute of Technology, JAPAN,* [3]*Toyohashi University of Technology, JAPAN, and* [4]*University of Tokyo, JAPAN*

W.090d **COMPACT MICROFLUIDIC PROBE SYSTEM WITH SELF-ALIGNED MOUNTED HEADS FOR DIRECT USE ON INVERTED MICROSCOPES**
J.F. Cors, R.D. Lovchik, E. Delamarche, and G.V. Kaigala
IBM Research GmbH, SWITZERLAND

W.091d **DISPOSABLE LABTUBE CARTRIDGES FOR AUTOMATED PROTEIN PURIFICATION IN STANDARD LAB CENTRIFUGES**
A. Kloke[1], S. Niekrawietz[1], A.R. Fiebach[1], J. Bernhardt[1], R. Kneusel[2], K. Schemel[2], J. Ritzel[2], F. von Stetten[1], R. Zengerle[1], and N. Paust[1]
[1]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY and* [2]*Diarect AG, GERMANY*

W.092d **INTERFACING PICOLITER DROPLET MICROFLUIDICS WITH ADDRESSABLE µL-COMPARTMENTS USING FACS**
E. Weibull, Y. Bai, H.N. Joensson, and H. Andersson-Svahn
Royal Institute of Technology (KTH), SWEDEN

W.093d **ON-CHIP ENUCLEATION OF OOCYTE USING UNTETHERED MICRO-ROBOT WITH GRIPPING MECHANISM**
A. Ichikawa[1], S. Sakuma[2], T. Shoda[3], F. Arai[3], and S. Akagi[4]
[1]*Meijo University, JAPAN,* [2]*Osaka University, JAPAN,* [3]*Nagoya University, JAPAN, and* [4]*NARO Institute of Livestock and Grassland Science, JAPAN*

W.094d **Ph SHIFT IN FROZEN ELECTROLYTE CAUSED BY IMBALANCE OF IONIC DISTRIBUTION BETWEEN ICE AND LIQUID PHASES**
H. Watanabe and T. Okada
Tokyo Institute of Technology, JAPAN

W.095d **TOWARDS POINT-OF-CARE DIAGNOSTICS: A MICROFLUIDIC SAMPLE PREPARATION CHIP FOR CONCENTRATION OF BACTERIA AND RNA EXTRACTION**
H. Hubbe, S. Hakenberg, G. Dame, and G.A. Urban
University of Freiburg - IMTEK, GERMANY

Cells & Liposomes on Chip

Cell Capture, Counting, & Sorting

W.096e **A CELL-BASED SENSOR OF FLUID SHEAR STRESS FOR MICROFLUIDICS**
S. Varma, H. Wei Hou, J. Han, and J. Voldman
Massachusetts Institute of Technology, USA

W.097e **BRIDGING THE GAP: TOWARDS MICROFLUIDIC SINGLE CELL ANALYSIS OF IN VIVO STIMULATED CELLS**
F. Kurth, R.E. Wilson, A.J. Trüssel, D.J. Webster, R. Müller, and P.S. Dittrich
ETH Zürich, SWITZERLAND

W.098e **CONTINUOUS FLOW CELL SEPARATION USING MICROFLUIDIC RATCHETS**
C. Jin[1], S.M. McFaul[1], and H. Ma[1,2]
[1]*University of British Columbia, CANADA and* [2]*Vancouver General Hospital, CANADA*

W.099e **LABEL-FREE CELL SEPARATION BASED ON SIZE AND DEFORMABILITY USING MICROFLUIDIC RESETTABLE CELL TRAPS**
W. Beattie[1], X. Qin[1], and H. Ma[1,2]
[1]*University of British Columbia, CANADA and* [2]*Vancouver General Hospital, CANADA*

W.100e **PIEZOELECTRIC INKJET-BASED SINGLE-CELLS PRINTING BY IMAGE PROCESSING FOR HIGH EFFICIENCY AND AUTOMATIC CELL PRINTING**
R. The[1], S. Yamaguchi[2], A. Ueno[2], Y. Akiyama[1], and K. Morishima[1]
[1]*Osaka University, JAPAN and* [2]*Microjet Corporation, JAPAN*

W.101e **STANDING SURFACE ACOUSTIC WAVE BASED ON-CHIP, SHEATHLESS FLOW CYTOMETER**
Y. Chen[1], A.A. Nawaz[1], Y. Zhao[1], L. Wang[2], and T.J. Huang[1]
[1]*Pennsylvania State University, USA and* [2]*Ascent Bio-Nano Technologies Inc., USA*

Circulating Tumor Cells

W.102e **CELL LAYOUTER: LABEL-FREE CELL ISOLATION AND ASPIRATION SYSTEM OF CIRCULATING TUMOR CELLS**
T. Masuda[1], Y. Sun[1], M. Niimi[1], A. Yusa[2], H. Nakanishi[3], and F. Arai[1]
[1]*Nagoya University, JAPAN,* [2]*Aichi Science and Technology Foundation, JAPAN, and* [3]*Aichi Cancer Center Research Institute, JAPAN*

W.103e **NOVEL MICROFLUIDIC PLATFORMS FOR THE INTERROGATION OF PATIENT-DERIVED CTCs AND TUMOR-DERIVED MICROVESICLES**
S.M. Santana, M.A. Antonyak, C. Fischbach-Teschl, R.A. Cerione, and B.J. Kirby
Cornell University, USA

W.104e **ULTRA-HIGH PURITY CAPTURE OF CIRCULATING TUMOR CELLS AND GENE MUTATIONS DETECTION**
J. Autebert, B. Coudert, J. Champ, F.C. Bidard, J.Y. Pierga, S. Descroix,
L. Malaquin, and J.L. Viovy
Institut Curie, FRANCE

Single Cell Analysis

W.105e **CELL ORDERING USING PINCH FLOW MICROCHANNEL FOR SINGLE CELL KINASE ASSAY**
R. Ramji[1], A.A.S. Bhagat[2], C.T. Lim[1], and C.-H. Chen[1,3]
[1]*National University of Singapore, SINGAPORE,*
[2]*ClearBridge Biomedics Pte. Ltd., SINGAPORE, and*
[3]*Singapore Institute for Neurotechnology (SiNAPSE), SINGAPORE*

W.106e **DYNAMIC BEHAVIOR ANALYSIS OF SINGLE CELLS USING DROPLET MICROFLUIDICS**
M.A. Khorshidi[1], P.K. Periyannan Rajeswari[1], C. Wahlby[2], H.N. Joensson[1],
and H. Andersson Svahn[1]
[1]*Royal Institute of Technology (KTH), SWEDEN and* [2]*Uppsala University, SWEDEN*

W.107e **LAB-ON-A-CHIP SPECTROPHOTOMETRIC "FIELD OF QUALITY" ASSESSMENT OF DOG OOCYTES**
P. Śniadek[1], R. Walczak[1], J. Dziuban[1], M. Woźna[2], M. Rybska[2],
D. Bukowska[2], and J. Jaskowski[2]
[1]*Wroclaw University of Technology, POLAND and*
[2]*Poznan University of Life Sciences, POLAND*

W.108e **MICROFLUIDIC SENSOR USING RESONANCE FREQUENCY MODULATION FOR CHARACTERIZATION OF SINGLE CELLS**
N. Haandbæk[1], O. With[1], S.C. Bürgel[1], F. Heer[2], and A. Hierlemann[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*Zurich Instruments AG, SWITZERLAND*

W.109e **OOCYTE MECHANICAL CHARACTERIZATION BY ROBOT INTEGRATED MICROFLUIDIC CHIP FOR HIGH-THROUGHPUT QUALITY EVALUATION**
S. Sakuma[1] and F. Arai[2]
[1]*Osaka University, JAPAN and* [2]*Nagoya University, JAPAN*

W.110e **REAL-TIME SECRETION ANALYSIS REVEALED CORRELATION OF IL-β RELEASE AND LOSS OF CELL MEMBRANE INTEGRITY**
Y. Shirasaki[1], M. Yamagishi[1], K. Izawa[2], K. Nakagawa[2], A. Nakahara[3], N. Suzuki[1],
J. Mizuno[3], T. Sekiguchi[3], T. Heike[2], R. Nishikomori[2], S. Shoji[3], and O. Ohara[1]
[1]*Institute of Physical and Chemical Research (RIKEN), JAPAN,* [2]*Kyoto University, JAPAN, and* [3]*Waseda University, JAPAN*

W.111e **SINGLE CELL TRACKING OF *SYNECHOCYSTIS* GROWTH IN A MICROFLUIDIC CULTURE DEVICE USING A PROBABILISTIC AUTOMATED IMAGE ANALYSIS TECHNIQUE**
F. Yu, K. Song, M.A. Horowitz, and S.R. Quake
Stanford University, USA

Liposomes/Vesicles

W.112e **ACTIVE DRUG LOADING OF MICROFLUIDIC-SYNTHESIZED LIPOSOMES**
R.R. Hood[1], W.N. Vreeland[2], and D.L. DeVoe[1]
[1]*University of Maryland, College Park, USA and*
[2]*National Institute of Standards and Technology (NIST), USA*

W.113e **ON THE DYNAMICS OF GIANT UNILAMELLAR VESICLES UNDER FLOW – TOWARDS A MODEL FOR SHEAR STRESS TRANSDUCTION ON CELLS**
B. Sebastian and P.S. Dittrich
ETH Zürich, SWITZERLAND

W.114e **UNIFORM-SIZED PROTEOLIPOSOME FORMATION BY USING ELECTROSPRAY FOR MICROSCOPIC MEMBRANE PROTEIN ASSAYS**
T. Osaki[1,2], K. Kamiya[1], R. Kawano[1], R. Iino[2,3], H. Noji[2,3], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science and Technology, JAPAN,* [2]*University of Tokyo, JAPAN, and* [3]*Japan Science and Technology Agency (JST), JAPAN*

Stem Cells

W.115e **CULTIVATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS WITH CONTROLLED AGGREGATE SIZE AND GEOMETRICAL ARRANGEMENT BY INVERTING MICROWELL ARRAY CHIP**
T. Satoh[1], S. Sugiura[1], K. Sumaru[1], S. Ozaki[2], S. Gomi[2], T. Kurakazu[2], Y. Oshima[2], and T. Kanamori[1]
[1]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and* [2]*Tokyo Electron Limited, JAPAN*

Cell-Surface Interaction

W.116e **CELL-SURFACE AFFINITY OF THE REFERENCE SURFACE IS KEY TO OBSERVE SPECIFIC CELL RESPONSES TO SUBSTRATE-BOUND CUES**
S.G. Ricoult, G.H. Thompson-Steckel, J.P. Correia, T.E. Kennedy, and D. Juncker
McGill University, CANADA

W.117e **MICROSTRUCTURED THERMORESPONSIVE POLYMER COATINGS AS A PROMISING TOOL FOR CONTROLLING NEURITE OUTGROWTH IN ARTIFICIAL NEURONAL NETWORKS**
M. Kirschbaum, G. Boerner, K. Uhlig, and C. Duschl
Fraunhofer IBMT, GERMANY

Cell-Culturing & Perfusion (2D & 3D)

W.118e **ALGINATE ENCAPSULATION OF CELL-LADEN BEADS FOR MICROFLUIDIC TUMOR SPHEROID CULTURE**
C. Bayly, L. Yu, and K.C. Cheung
University of British Columbia, CANADA

W.119e **COMPARATIVE MICROFLUIDIC CULTURING OF IMMOBILIZED SINGLE CELLS WITH ON-SITE FLUORESCENT-PROTEIN INDUCTION**
Z. Zhu, O. Frey, D. Ottoz, F. Rudolf, and A. Hierlemann
ETH Zürich, SWITZERLAND

W.120e **MATRIGEL-ALGINATE CORE-SHELL BEADS FOR CONTROLLED TUMOR SPHEROID FORMATION**
L. Yu, C. Bayly, and K. Cheung
University of British Columbia, CANADA

W.121e **MONO-, CO- AND MIXED CULTURE OF CELLS IN THE MICROSYSTEM FOR PHOTODYNAMIC THERAPY PROCEDURES**
E. Jastrzebska, N. Bajkowska, K. Zukowski, M. Chudy, A. Dybko, and Z. Brzozka
Warsaw University of Technology, POLAND

W.122e **RECONSTRUCTION OF CAPILLARY NETWORKS IN HUVEC-MSC COCULTURE CULTURED IN STATIC/FLOW CONDITIONS IN A MICROFLUIDIC PLATFORM**
K. Tanimura, K. Yamamoto, and R. Sudo
Keio University, JAPAN

Inter- & Intracellular Signaling, Cell Migration

W.123e **A PDMS-SEALED HYDROGEL DEVICE FOR RAPID AND ACCUARATE GENERATION OF VARIOUS CONCENTRATION GRADIENTS**
M. Kim, M. Jia and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

W.124e **IN-SITU MONITORING TO MECHANOSTRESS RESPONSES USING MICROFLUIDIC DEVICE**
Y. Nakashima[1], Y. Yang[2], and K. Minami[2]
[1]*Kumamoto University, JAPAN and* [2]*Yamaguchi University, JAPAN*

W.125e **ON-CHIP IMMUNOELECTROPHORESIS FOR EVALUATING SURFACE PROTEINS OF EXOSOMES AT SINGLE-PARTICLE LEVEL FOR DIAGNOSTIC APPLICATION**
T. Akagi[1], K. Kato[1], N. Hanamura[1], N. Kosaka[2], T. Ochiya[2], and T. Ichiki[1]
[1] *University of Tokyo, JAPAN and* [2] *National Institute Cancer Center, JAPAN*

Others

W.126e **DIRECT ELECTROPORATION OF ADHERENT CELLS BY HYDROGEL-BASED MICROELECTRODES**
M. Nishizawa[1] and K. Nagamine[2]
[1] *Tohoku University, JAPAN and* [2] *Japan Science and Technology Agency (JST), JAPAN*

W.127e **PARALLEL cDNA SYNTHESIS FROM THOUSANDS OF INDIVIDUALLY ENCAPSULATED CANCER CELLS – TOWARDS LARGE SCALE SINGLE CELL GENE EXPRESSION ANALYSIS**
L.M. Soderberg, H.N. Joensson, and H. Andersson Svahn
Royal Institute of Technology (KTH), SWEDEN

W.128e **TIME-LAPSE SCREENING BY PARALLELIZED LENSFREE IMAGING**
V. Haguet[1,2,3], P. Obeïd,[1,2,3], R. Griffin[1,2,3,4], D. Freida[1,2,3], L. Guyon[1,2,3], and X. Gidrol[1,2,3]
[1] *Commissariat à l'énergie atomique (CEA), FRANCE,* [2] *INSERM, FRANCE,*
[3] *University Grenoble-Alpes, FRANCE, and* [4] *CNRS, FRANCE*

Organs & Organisms

Organs on Chip

W.129f **HUMAN SPLENON-ON-A-CHIP: DESIGN AND VALIDATION OF A MICROFLUIDIC MODEL RESEMBLING THE INTERSTITIAL SLITS AND THE FAST AND SLOW MICROCIRCULATIONS**
L.G. Rigat-Brugarolas[1], M. Bernabeu[2], A. Elizalde[2], M. de Niz[2], L. Martin-Jaular[2], C. Fernandez-Becerra[2], A. Homs-Corbera[1], H.A. del Portillo[2], and J. Samitier[1]
[1] *Institute for Bioengineering of Catalonia (IBEC), SPAIN,* [2] *Centro de Investigación Biomédica en Red de Bioingeniería, Biomateriales y Nanomedicina, SPAIN,*
[3] *Barcelona Centre for International Health Research (CRESIB), SPAIN,*
[4] *Barcelona University, SPAIN, and*
[5] *Institució Catalana de Recerca i Estudis Avançats (ICREA), SPAIN*

W.130f **ON-CHIP ABSORPTION AND METABOLISM MODEL FOR PHARMACOKINETIC STUDIES**
H. Kimura[1], T. Ikeda[2], Y. Sakai[2], and T. Fujii[2]
[1] *Tokai University, JAPAN and* [2] *University of Tokyo, JAPAN*

Organisms on Chip (C. elegans, Zebrafish, Arabidopsis, etc.)

W.131f **ELECTROPHYSIOLOGICAL ANALYSIS OF NEMATODE LARVAE WITH AN INTEGRATED MICROFLUIDIC PLATFORM**
C. Hu, V. O'Connor, L. Holden-Dye, and H. Morgan
University of Southampton, UK

W.132f **ON-CHIP CHEMOTAXIS ASSAY OF PLANT-PARASITIC NEMATODE TOWARDS INCREASING GLOBAL CROP PRODUCTIVITY**
H. Hida[1,4], H. Nishiyama[2], S. Sawa[2], T. Higashiyama[1,3], and H. Arata[1]
[1] *Japan Science and Technology Agency (JST), JAPAN,* [2] *Kumamoto University, JAPAN,*
[3] *Nagoya University, JAPAN, and* [4] *Kobe University, JAPAN*

Diagnostics & Analytics

Sample Preparation (Whole Blood, Saliva, Cells, Tissue, Food, etc.)

W.133g **A NUCLEIC ACID EXTRACTION MEMBRANE FOR POINT OF CARE DEVICES**
R.E. Mackay, N. Garg, P. Craw, J.C. Ahern, and W. Balachandran
Brunel University, UK

W.134g **AUTOMATED WHOLE BLOOD PROCESSING WITH A PORTABLE MICROFLUIDIC DEVICE FOR POINT-OF-CARE DIAGNOSIS**
H. Li, H. Jayamohan, C. Lambert, S. Mohanty, and B.K. Gale
University of Utah, USA

W.135g **MICROFLUIDIC IMMUNOPHENOTYPING ASSAY PLATFORM FOR IMMUNOMONITORING OF SUBPOPULATIONS OF IMMUNE CELLS**
W. Chen, N. Huang, B. Oh, T.T. Cornell, T.P. Shanley, K. Kurabayashi, and J. Fu
University of Michigan, USA

W.136g **PORTABLE DIGITAL MICROFLUIDIC/MASS SPECTROMETRY METHOD FOR QUANTIFICATION OF DRUGS OF ABUSE IN URINE**
N.M. Lafrenière[1], A.E. Kirby[1], B. Seale[1], E. Gritzan[1], J.T. Shelley[2], P.I. Hendricks[2], R.G. Cooks[2], and A.R. Wheeler[1]
[1] *University of Toronto, CANADA and* [2] *Purdue University, USA*

Nucleic Acid Analysis (e.g. Digital PCR, Next Generation Sequencing)

W.137g **DETECTION OF OIL-UTILIZING MICROORGANISMS BY NUCLEIC ACID SEQUENCE-BASED AMPLIFICATION IN A TOTAL ANALYSIS LAB-ON-A-CHIP DEVICE**
B.K. Honsvall[1,2], A. Ezkerra[3,4], A. Gulliksen[5], T. Dong[1], and F. Karlsen[1,5]
[1] *Vestfold University College, NORWAY,* [2] *Trilobite Microsystems AS, NORWAY,* [3] *CIC MicroGUNE, SPAIN* [4] *IK4-Ikerlan, SPAIN, and* [5] *NorChip AS, NORWAY*

W.138g **FOIL-BASED DNA MELTING CURVE ANALYSIS PLATFORM FOR LOW-COST POINT-OF-CARE MOLECULAR DIAGNOSTICS**
A. Ohlander[1], S. Bauer[1], H. Ramachandraiah[2], A. Russom[2], and K. Bock[1,3]
[1] *Fraunhofer Research Institution for Modular Solid State Technologies EMFT, GERMANY,* [2] *KTH Royal Institute of Technology, SWEDEN, and* [3] *Technical University Berlin, GERMANY*

W.139g **LEVERAGING PEPTIDE NUCLEIC ACID PROBES AND ISOTACHOPHORESIS FOR ON-CHIP HIGH SENSITIVITY DETECTION OF DNA**
N. Ostromohov, O. Schwartz, and M. Bercovici
Technion – Israel Institute of Technology, ISRAEL

W.140g **ON-CHIP MULTIPLEX PCR AMPLIFICATION DIRECTLY FROM WHOLE BLOOD**
R.S. Wiederkehr[1,2], B. Jones[1], S. Peeters[1], T. Stakenborg[1], O. Ibrahim[3,4], P. Fiorini[1], H. Tanaka[5], I. Yamashita[5], T. Matsuno[5], and L. Lagae[1,2]
[1] *imec, BELGIUM,* [2] *Katholieke Universiteit Leuven, BELGIUM,* [3] *Alexandria University, Alexandria, EGYPT,* [4] *Consortium Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA, and* [5] *Panasonic Corporation, JAPAN*

W.141g **THERMALLY-MULTIPLEXED MICROFLUIDIC PCR**
C.R. Phaneuf[1], N. Pak[1], D.C. Saunders[1], E. Popler[2], N. Nagpal[1], R. Jerris[3], A. Shane[2], and C.R. Forest[1]
[1] *Georgia Institute of Technology, USA,* [2] *Emory University, USA, and* [3] *Children's Healthcare of Atlanta, USA*

Protein Analysis & Characterization (e.g. Proteomics)

W.142g **INTEGRATED MICROFLUIDIC FEMTOLITER ARRAY FOR QUANTITATIVE ELISA AT THE ATTOMOLAR LEVEL**
Y. Zeng and T. Wang
University of Kansas, USA

W.143g **MICROFLUIDICS TO ISOLATE UNTAGGED PROTEINS FROM CELL EXTRACTS FOR VISUAL ANALYSIS BY ELECTRON MICROSCOPY**
D. Giss, S. Kemmerling, V. Dandey, H. Stahlberg, and T. Braun
University of Basel, SWITZERLAND

W.144g **TOWARDS A HIGH-THROUGHPUT, DROPLET-BASED VIRAL-FUSION ASSAY WITH SINGLE-PARTICLE SENSITIVITY**
S. Mashaghi and A.M. van Oijen
University of Groningen, THE NETHERLANDS

Clinical Chemistry

W.145g **AN OPTICAL LAB-ON-A-CHIP SYSTEM BASED ON SPR SENSOR FOR CONTINUOUS GLUCOSE MONITORING**
D. Li, H. Yu, J. Wu, D. Yang, and K. Xu
Tianjin University, CHINA

W.146g **QUANTITATIVE DETERMINATION OF BRANCHED-CHAIN AMINO ACIDS IN HUMAN PLASMA USING PRESSURE-DRIVEN LIQUID CHROMATOGRAPHY WITH PILLAR ARRAY COLUMNS**
Y. Song[1], K. Takatsuki[2], M. Isokawa[1], T. Sekiguchi[2], J. Mizuno[2], T. Funatsu[1], S. Shoji[2], and M. Tsunoda[1]
[1] *University of Tokyo, JAPAN and* [2] *Waseda University, JAPAN*

Drug Development

W.147g **ELECTRICAL IMPEDANCE SPECTROSCOPY FOR LABEL-FREE, CONTINUOUS MONITORING OF DRUG IMPACT ON 3D TISSUE SPHEROIDS**
S.C. Bürgel, J.Y. Kim, A. Hierlemann, and O. Frey
ETH Zürich, SWITZERLAND

Others

W.148g **KINETIC MEASUREMENTS USING THE FREQUENCY RESPONSE OF INTERACTING BIOMOLECULES SUBJECTED TO A THERMAL MODULATION**
K. Bournine, X. Zhao, and C. Gosse
CNRS, FRANCE

W.149g **RAPID AND HIGH SENSITIVITY MALARIA DIAGNOSIS: A MICROFLUIDICS APPROACH**
T.F. Kong[1,2], W.K. Peng[1], H.W. Hou[4], Marcos[2], N.T. Nguyen[1,2,3], and J. Han[1,4]
[1]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,*
[2]*Nanyang Technological University, SINGAPORE,* [3]*Griffith University, AUSTRALIA, and*
[4]*Massachusetts Institute of Technology, USA*

Medical Research & Applications

Cancer Research

W.150h **DETECTION AND QUANTIFICATION OF MINORITY KRAS SUBCLONES IN TUMORS USING DROPLET-BASED MICROFLUIDICS: CLINICAL IMPLICATION**
D. Pekin[1,2], C. Normand[1], S. Kotsopoulos[3], X. Li[3], L. Benhaim[1], O. Bouché[4], T. Lecomte[5], D. Le Corre[1], T. Hor[1], Z. El Harrak[1], P. Nizard[1], D. Link[3], J.B. Hutchison[3], P. Laurent-Puig[1], and V. Taly[1]
[1]*University Paris Descartes, FRANCE,* [2]*Université de Strasbourg, FRANCE,*
[3]*Raindance Technologies, USA,* [4]*Centre Hospitalier Universitaire de Reims, FRANCE, and*
[5]*Université de Tours, FRANCE*

W.151h **INVESTIGATION OF ENDOTHELIAL GROWTH USING A POLYCARBONATE BASED MICROFLUIDIC CHIP AS ARTIFICIAL BLOOD CAPILLARY VESSEL WITH INTEGRATED IMPEDANCE SENSORS FOR APPLICATION IN CANCER RESEARCH**
T. Rajabi[1], V. Huck[2], R. Ahrens[1], Ch. Bassing[1], J. Fauser[1], S.W. Schneider[2], and A.E. Guber[1]
[1]*Karlsruhe Institute of Technology, GERMANY and* [2]*Heidelberg University, GERMANY*

W.152h **STREAMLINING CELL BIOLOGY WORKFLOWS: INTEGRATING SUSPENSION CULTURE, CELL LYSIS, PROTEIN EXTRACTION AND NUCLEIC ACID EXTRACTION**
T.E. de Groot, B.P. Casavant, K.S. Veserat, L.N. Strotman, S.M. Berry, and D.J. Beebe
University of Wisconsin, USA

Personalized Medicine

W.153h **MULTIPLEX DETECTION OF KRAS POINT MUTATIONS FROM TUMOR CELL DNA ON A CENTRIFUGAL MICROFLUIDIC CARTRIDGE (GENESLICE) FOR CHOICE OF PERSONALIZED CANCER THERAPY**
O. Strohmeier[1,2], S. Laßmann[3,4,5,6], B. Riedel[3,6], M. Werner[3,5,6], D. Mark[1], R. Zengerle[1,2,4], and F. von Stetten[1,2]
[1]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,*
[2]*University of Freiburg - IMTEK, GERMANY,*
[3]*University Medical Center Freiburg, GERMANY,*
[4]*University of Freiburg - BIOSS, GERMANY,*
[5]*Comprehensive Cancer Center Freiburg, GERMANY, and*
[6]*German Cancer Consortium (DKTK) and German Cancer Research Center (DKFZ), GERMANY*

Drug Delivery Systems

W.154h **CHARACTERIZATION OF NANOPARTICLE PERMEABILITY ON A MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE**
N. Sasaki[1], M. Tatanou[2], Y. Anraku[3], A. Kishimura[4], K. Kataoka[3], and K. Sato[2]
[1]*Toyo University, JAPAN,* [2]*Japan Women's University, JAPAN,*
[3]*University of Tokyo, JAPAN, and* [4]*Kyushu University, JAPAN*

W.155h **MICROFLUIDIC DEVICE FOR MICROINJECTION OF CAENORHABDITIS ELEGANS**
R. Ghaemi, J. Tong, P.R. Selvaganapathy, and B.P. Gupta
McMaster University, CANADA

W.156h **SINGLE-STEP DRUG CRYSTALLIZATION AND FORMULATION - 'DESIGNER' PHARMACEUTICALS ENABLED BY MICROFLUIDICS**
R.A.L. Leon[1], W.Y. Wan[1], A.Z.M. Badruddoza[1], T.A. Hatton[2,3], and S.A. Khan[1,2]
[1]*National University of Singapore, SINGAPORE,*
[2]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE and*
[3]*Massachusetts Institute of Technology, USA*

Regenerative Medicine & Tissue Engineering

W.157h **ENGINEERING OF THREE-DIMENSIONAL LIVER MICRO-TISSUE CONTAINING SINUSOIDAL ULTRASTRUCTURE THROUGH HETEROTYPIC CELL-CELL INTERACTIONS**
D.Y. No, S.A. Lee, and S.H. Lee
Korea University, SOUTH KOREA

W.158h **MATHEMATICAL MODELING FOR THE SELF-ORGANIZATION OF CELLS**
N. Kojima[1], Y. Ogata[2], S. Nakaoka[3], and Y. Sakai[1]
[1] *Yokohama City University, JAPAN,* [2] *University of Tokyo, JAPAN, and* [3] *Riken Yokohama Institute, JAPAN*

W.159h **SKIN PRINTER: MICROFLUIDIC APPROACH FOR SKIN REGENERATION AND WOUND DRESSINGS**
L. Leng[1], S. Amini-Nik[1,2], Q. Ba[1], M. Jeschke[1,2], and A. Günther[1]
[1] *University of Toronto, CANADA and* [2] *Sunnybrook Health Sciences Centre, CANADA*

Implantable and Surgical Microdevices

W.160h **LONG-TERM IMPLANTATION OF PRIMARY ISLET CELL-ENCAPSULATING HYDROGEL MICROFIBERS IN DIABETIC MICE**
H. Onoe[1,2], T. Okitsu[1,2], A. Itou[1,2], and S. Takeuchi[1,2]
[1] *University of Tokyo and* [2] *Japan Science and Technology Agency (JST), JAPAN*

Devices for Better Quality-of-Life (QOL)

W.161h **AUTONOMOUS IMPLANTABLE DEVICE WITH APPLICATION IN LATE-PHASE HEMORRHAGIC SHOCK PREVENTION**
V. Oncescu, S. Lee, A. Gumus, K. Karlsson, and D. Erickson
Cornell University, USA

W.162h **SKIN-EMITTED ACETONE DETECTION TOWARD SELF-MONITORING OF FAT METABOLISMS**
Y. Yamada[1], S. Hiyama[1], T. Toyooka[1], H. Onoe[2], and S. Takeuchi[2]
[1] *NTT DOCOMO, Inc., JAPAN and* [2] *University of Tokyo, JAPAN*

Others

W.163h **A NOVEL MICROFLUIDIC "CELL-BASED" BLOOD DIALYSIS PLATFORM FOR MURINE MODEL OF SEPSIS**
H.W. Hou[1], M.P. Vera[2], B.D. Levy[2], R.M. Baron[2], and J. Han[1]
[1] *Massachusetts Institute of Technology, USA and*
[2] *Brigham and Women's Hospital, and Harvard Medical School, USA*

Separation Technologies

Electrophoretic Separations

W.164i **CHARACTERIZATION OF SIALYLATED GLYCANS BY COVALENT DERIVATIZATION AND MICROCHIP ELECTROPHORESIS**
I. Mitra, C.M. Snyder, W.R. Alley, M.V. Novotny, and S.C. Jacobson
Indiana University, USA

W.165i **DROPLET-BASED COMPARTMENTALIZATION AFTER ISOELECTRIC FOCUSING IN A SLIPCHIP**
Y. Zhao[1], F. Pereira[2], A. de Mello[2], H. Morgan[1], and X. Niu[1]
[1] *University of Southampton, UK, and* [2] *ETH Zürich, SWITZERLAND*

W.166i **ELECTROOSMOTICALLY ACTUATED ON-CHIP SOLID-PHASE EXTRACTION WITH MICROCHIP ELECTRPHORESISELECTROSPRAY IONIZATION MASS SPECTROMETRY**
N. Nordman[1], B. Barrios-Lopez[1], S. Laurén[2], P. Suvanto[2], T. Kotiaho[1], S. Franssila[2], R. Kostiainen[1], and T. Sikanen[1]
[1] *University of Helsinki, FINLAND and* [2] *Aalto University, FINLAND*

W.167i **HYDRODYNAMIC CONTROL FOR NON-BIASED INJECTION AND SIMULTANEOUS COMPLEMENTARY ANALYSIS**
A.J. Gaudry, M.C. Breadmore, and R.M. Guijt
University of Tasmania, AUSTRALIA

W.168i **MEASURING THE EFFECT OF CRYSTALLINE ORDER ON DNA ELECTROPHORESIS IN COLLOIDAL CRYSTALS**
S.B. King and K.D. Dorfman
University of Minnesota, USA

W.169i **TUNING THE MOBILITY OF FLUORESCENT, DNA-TEMPLATED, SILVER NANOCLUSTERS FOR ELECTROPHORETIC SEPARATIONS IN MICROCHANNELS**
J.T. Del Bonis-O'Donnell, D. Fygenson, and S. Pennathur
University of California, Santa Barbara, USA

Chromatographic Separations

W.170i **DEVELOPMENT OF MILLION PLATES LIQUID CHROMATOGRAPHY USING EXTENDED-NANO CHANNEL**
Y. Liu[1,2], H. Shimizu[1,2], A. Smirnova[1,2], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo and* [2]*Japan Science and Technology Agency (JST), JAPAN*

Particle Separations

W.171i **A LOW-POWER AND SMALL-VOLUME PARTICLE SEPARATION DEVICE BASED ON CIRCULAR TRAVELLING-WAVE ELECTROOSMOSIS**
S.-C. Lin[1], Y.-L. Sung[1], Y.-C. Tung[2], and C.-T. Lin[1]
[1]*National Taiwan University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

W.172i **HAND-HELD BLOOD SEPARATION MICROFLUIDIC CHIP**
L. Xu, H. Lee, and K.W. Oh
University of Buffalo, State University of New York, USA

W.173i **LOW CONCENTRATION OIL SEPARATION AND DETECTION FROM ENVIRONMENTAL WATER SAMPLES THROUGH ACOUSTOPHORESIS**
H. Wang[1], S. Kim[1], C. Koo[1], Y. Cho[2], Y.-J. Kim[1], and A. Han[1]
[1]*Texas A&M University, USA and*
[2]*Seoul National University of Science and Technology, SOUTH KOREA*

Microreaction Technology & Synthesis

Microreactors & Micromixers

W.174j **AN ULTRA-LOW CONSUMPTION PLATFORM FOR MEASURING FAST CHEMICAL REACTIONS**
E. Fradet, P. Abbyad, and C.N. Baroud
Ecole Polytechnique, FRANCE

W.175j **LOGIC OPERATION IN DNA NANO DEVICE: ELECTRICAL INPUT/OUTPUT THROUGH BIOLOGICAL NANOPORES**
K. Inoue[1,3], R. Kawano[1], H. Yasuga[1,3], M. Takinoue[4], T. Osaki[1,2], K. Kamiya[1], N. Miki[1,3], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science and Technology, JAPAN,* [2]*University of Tokyo, JAPAN,* [3]*Keio University, JAPAN, and* [4]*Tokyo Institute of Technology, JAPAN*

W.176j **TRANSPARENT P(VDF-TRFE) TRANSDUCER-BASED ACOUSTIC STREAMING FOR MICROFLUIDIC APPLICATIONS**
V.F. Cardoso, L. Rebouta, S. Lanceros-Méndez, and G. Minas
University of Minho, PORTUGAL

Filtering & Separation

W.177j **NANOWIRE DEVICES FOR EXOSOMAL MICRORNA EXTRACTION**
S. Ito[1], T. Yasui[1], H. Yong[2], T. Yanagida[2], S. Rahong[2], M. Kanai[2], K. Nagashima[2], H. Yukawa[1], N. Kaji[1], T. Kawai[2], and Y. Baba[1,3]
[1]*Nagoya University, JAPAN,* [2]*Osaka University, JAPAN, and*
[3]*National Institute of Advanced Industrial Science and Technology, (AIST), JAPAN*

Chemical Synthesis

W.178j **COPPER COMPLEXATION OF MACROCYCLIC MOLECULES: TOWARDS ON-CHIP RADIOMETALLIC LABELLING OF PET RADIOTRACERS**
M.D. Tarn, B. Lu, R. Smith, B.P. Burke, S.J. Archibald, and N. Pamme
University of Hull, UK

W.179j **MULTI-PASS NANOCRYSTAL PROCESSOR**
M. Abolhasani, Y. Hassan, E. Kumacheva, G. Scholes, and A. Günther
University of Toronto, CANADA

Particle Synthesis

W.180j **POLYPLEX SYNTHESIS BY "MICROFLUIDIC DRIFTING" BASED THREE-DIMENSIONAL HYDRODYNAMIC FOCUSING METHOD**
M. Lu[1], Y.-P. Ho[2,3], C.L. Grigsby[2], A.A. Nawaz[1], P.-H. Huang[1], K.W. Leong[2], and T.J. Huang[1]
[1]*Pennsylvania State University, USA,* [2]*Duke University, USA, and*
[3]*Interdisciplinary Nanoscience Center (iNANO), DENMARK*

Applications to Green & Environmental Technologies

Fuel Cells

W.181k **DEVELOPMENT OF A MICRO FUEL CELL DEVICE BASED ON THE MICROFLUIDIC CHIP**
Y. Pihosh[1,2], H. Chinen[1], K. Mawatari[1,2], and T. Kitamori[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

Water/Air/Soil Management

W.182k **LOW-COST PAPER MICROFLUIDICS FOR ECOTOXICOLOGICAL ANALYSIS**
J. Petr, P. Svobodová, L. Vojtková, A. Suchomelová, A. Přibylka, and R. Knob
Palacký University, Olomouc, CZECH REPUBLIC

Other Energy/Power Devices

W.183k **GATE CONTROLLED HIGH EFFICIENCY BALLISTIC ENERGY CONVERSION SYSTEM**
Y. Xie, D. Bos, H. de Boer, A. van den Berg, and J.C.T. Eijkel
MESA+, University of Twente, THE NETHERLANDS

MicroTAS for Other Applications

Synthetic Biology

W.184l **PATTERNING AND FUNCTIONALIZATION OF THERMOPLASTIC MICROCHIP FOR AUTOMATED HIGH-THROUGHPUT MICROARRAY GENE SYNTHESIS**
S. Ma, I.A. Saaem, and J. Tian
Duke University, USA

Integrative Biology, Systems Biology

W.185l **FATE MANIPULATION OF PC-12 CELL USING MICROFLUIDIC DEVICE**
H. Ryu[1], M. Chung[1], S.S. Lee[2], N.L. Jeon[1], and O. Pertz[3]
[1]*Seoul National University, SOUTH KOREA,* [2]*ETH Zürich, SWITZERLAND, and*
[3]*University of Basel, SWITZERLAND*

Bioinspired, Biomimetic & Biohybrid Devices

W.186l **DROPLET-BOX: A PLATFORM FOR BIOLOGICAL-NANOPORE-BASED LOGICAL OPERATION USING LIPID-COATED DROPLET NETWORK**
H. Yasuga[1,3], R. Kawano[1], M. Takinoue[4], Y. Tsuji[1], T. Osaki[1,2], K. Kamiya[1], N. Miki[1,3], and S. Takeuchi[1,2]
[1]*Kanagawa Academy of Science and Technology, JAPAN,*
[2]*University of Tokyo, JAPAN,* [3]*Keio University, JAPAN, and*
[4]*Tokyo Institute of Technology, JAPAN*

W.187l **NATURAL LEAF REPLICAS TO STUDY CELL CONTACT GUIDANCE**
L. MacQueen, Z. Gong, B. Chen, J. Liu, H. Liu, C. Simmons, and Y. Sun
University of Toronto, CANADA

Bioprocess Technology

W.188l **MICROALGAL CULTURE, LIPID PRODUCTION AND EXTRACTION USING AN INTEGRATED MICROFLUIDIC SYSTEM**
H.S. Lim, J.Y.H. Kim, H.S. Kwak, and S.J. Sim
Korea University, SOUTH KOREA

Food & Nutrition

W.189l **AUTOMATED ON-SITE DETECTION OF ORGANOPHOSPHOROUS PESTICIDES IN REAL FOOD SAMPLES**
L. Drechsel[1], M. Schulz[1], F. von Stetten[1,2], R. Zengerle[1,2,3], and N. Paust[1,2]
[1]*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,*
[2]*University of Freiburg – IMTEK, GERMANY, and* [3]*University of Freiburg – BIOSS, GERMANY*

16:00 - 16:30 **BREAK AND EXHIBIT INSPECTION**

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 3A3 - Single Cell Processing and Analysis 2	**Session 3B3 - Droplets & Plugs**	**Session 3C3 - Tools for Cancer Analysis**
Session Chairs:		
S. Ekström, *Lund University, SWEDEN* H. Ma, *University of British Columbia, CANADA*	P. Garstecki, *Polish Academy of Sciences, POLAND* M. Yamada, *Chiba University, JAPAN*	T. Franke, *University of Augsburg, GERMANY* M. Takai, *University of Tokyo, JAPAN*
16:30 - 16:50		
TOWARDS A MICROFLUIDIC SINGLE-CELL IMMUNE CHIP M. Junkin, A. Kaestli, and S. Tay *ETH Zürich, SWITZERLAND*	**SHAKEN, AND STIRRED** M. Abolhasani, A. Oskooei, E. Kumacheva, and A. Günther *University of Toronto, CANADA*	**MICROENGINEERED HYDROGEL FIBERS FOR EVALUATING CANCER CELL INVASION UNDER 3D COCULTURE CONDITIONS** Y. Kitagawa, M. Yamada, and M. Seki *Chiba University, JAPAN*
16:50 - 17:10		
OPTICAL CELL PICKING IN PHOTODEGRADABLE HYDROGELS BASED ON CELLULAR MORPHOLOGY IN 3D CULTURE ENVIRONMENT M. Tamura[1], F. Yanagawa[2], S. Sugiura[2], T. Takagi[2], K. Sumaru[2], H. Matsui[1], and T. Kanamori[2] [1]*University of Tsukuba, JAPAN and* [2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*	**DROPLET INCUBATION CHAMBER ARRAY: JOURNEY OF DROPLETS ON A CHIP** H.S. Rho, and H. Gardeniers *MESA+, University of Twente, THE NETHERLANDS*	**CANCER CELL-SPECIFIC OLIGOPEPTIDE SELECTED BY MICROFLUIDIC SYSTEM FROM A PHAGE DISPLAY LIBRARY FOR OVARIAN CANCER DIAGNOSIS** C.H. Wang[1], C.-H. Weng[2], Y.-J. Che[1], K. Wang[3], and G.-B. Lee[1] [1]*National Tsing Hua University, TAIWAN,* [2]*National Cheng Kung University, TAIWAN, and* [3]*Academia Sinica, TAIWAN*
17:10 - 17:30		
CIRCUMFERENTIAL MOLECULAR DELIVERY INTO SINGLE CELLS VIA CELL-ROLLING MEDIATED ELECTROPORATION IN MICROFLUIDIC CHANNELS M. Zheng, J.W. Shan, H. Lin, D.I. Shreiber, and J.D. Zahn *Rutgers, USA*	**AUTOSIZING, CLOSED-LOOP DROP GENERATOR USING MORPHOMETRIC IMAGE FEEDBACK** R. Kebriaei and A.S. Basu *Wayne State University, USA*	**UNDERSTANDING TUMOR HETEROGENEITY AS AN ENCOURAGER FOR CANCER METASTASIS (IN VITRO MODEL OF TUMOR HETEROGENEITY)** Y. Shin and S. Chung *Korea University, SOUTH KOREA*
17:30 - 17:50		
LIPID SCREENING IN SINGLE MICROALGAE USING HYDROGEL MICROCAPSULE ARRAYS D.-H. Lee, J.-I. Han, and J.-K. Park *Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA*	**CHARACTERIZATION OF DYE LEAKAGE IN MICROFLUIDIC DROPLETS** Y. Chen, M. Pan and S.K.Y. Tang *Stanford University, USA*	**MULTIPLEX REAL-TIME MONITORING OF CELLULAR METABOLIC ACTIVITY USING A REDOX-REACTIVE NANOWIRE BIOSENSOR** L.C. Hsiung, V. Krivitsky, V. Naddaka, Y.K. Conroy, H. Peretz-Soroka, and F. Patolsky *Tel Aviv University, ISRAEL*
19:00 - 23:30	**Conference Banquet at the Konzerthaus Freiburg**	

THURSDAY 31 October

08:30 - 08:45 ANNOUNCEMENTS

08:45 - 09:30 PLENARY PRESENTATION VIII

Chairs: A. Manz, *KIST Europe GmbH, GERMANY*
P. Schwille, *Max Planck Institute of Biochemistry, GERMANY*

FROM SINGLE CELLS TO ARTIFICIAL CELLS: HOW MICROFLUIDICS CAN CONTRIBUTE TO A BETTER UNDERSTANDING OF CELLULAR PROCESSES
Petra S. Dittrich
ETH Zürich, SWITZERLAND

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 4A1 - Micromixers and Gradient Generators	**Session 4B1 - Molecular Separation**	**Session 4C1 - Neurobiology**

Session Chairs:

V. Ugaz, *Texas A&M University, USA*	A. Hibara, *Tokyo Institute of Technology, JAPAN*	S. Franssila, *Aalto University, FINLAND*
F. von Stetten, *HSG-IMIT, Europe, GERMANY*	A. Singh, *Sandia National Laboratory, USA*	H. Lu, *Georgia Institute of Technology, USA*

09:45 - 10:05

COAXIAL TURBULENT JET MIXER FOR CONTROLLED SYNTHESIS OF NANOPARTICLES
J.-M. Lim[1], L.M. Gilson[1], S. Chopra[1], R.S. Langer[1], O.C. Farokhzad[2], and R. Karnik[1]
[1]*Massachusetts Institute of Technology, USA and* [2]*Brigham and Women's Hospital-Harvard Medical School, USA*

DEVELOPMENT OF SUBSECOND TIME-SCALE LIQUID-LIQUID EXTRACTION PROCESSES UTILIZING MONODISPERSE MICROFLUIDIC DROPLETS
S. Kakegawa, M. Yamada, M. Mizuno, N. Nakajima, and M. Seki
Chiba University, JAPAN

CONTACTLESS THREE-DIMENSIONAL GUIDANCE OF AXONAL GROWTH
T. Honegger, M. Thielen, and J. Voldman
Massachusetts Institute of Technology, USA

10:05 - 10:25

TUNABLE MICROFLUIDIC GRADIENT GENERATOR VIA ACOUSTICALLY OSCILLATED SHARP EDGES
P.H. Huang[1], C.Y. Chan[1], D. Ahmed[1], Y. Xie[1], L. Wang[2], and T.J. Huang[1]
[1]*Pennsylvania State University, USA and* [2]*Ascent Bio-Nano Technologies Inc., USA*

ULTRA HIGH FLEXIBLE UV-VIS RADIATION SOURCE AND NOVEL DETECTION SCHEMES FOR SPECTROPHOTOMETRIC HPLC DETECTION
K. Kraiczek[1], R. Bonjour[2], Y. Salvadé[2], and R. Zengerle[3,4]
[1]*Agilent Technologies, GERMANY,* [2]*University of Applied Sciences, SWITZERLAND, and* [3]*University of Freiburg - IMTEK, GERMANY*

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

10:25 - 10:45

PARTICLE SEPARATION, CHEMICAL GRADIENT CONTROL AND MICROMIXING VIA FOCUSED TRAVELLING SURFACE ACOUSTIC WAVES (F-TSAW)
G. Destgeer[1], S. Im[1], J.H. Jung[1], B.H. Ha[1], H.W. Kang[1], K.H. Lee[1], M.A. Ansari[1], A. Alazzam[2], and H.J. Sung[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA and* [2]*Khalifa University of Science, Technology & Research (KUSTAR), UAE*

CUSTOMIZED HPLC IN GLASS CHIPS
S. Thürmann, and D. Belder
Universität Leipzig, GERMANY

ANALYSIS OF AXON GUIDANCE IN SINGLE NEURONS USING A LARGE ARRAY OF MICROFLUIDIC GRADIENT GENERATORS
N. Bhattacharjee, and A. Folch
University of Washington, USA

10:45 - 11:15 BREAK AND EXHIBIT INSPECTION

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 4A2 - Nucleic Acid Processing	**Session 4B2 - Cell Biology**	**Session 4C2 - Tissue Engineering**

Session Chairs:

G. Dernick, *F. Hoffmann-La Roche AG, SWITZERLAND*	T.J. Huang, *Pennsylvania State University, USA*	A. Folch, *University of Washington, USA*
D.P. Kim, *Pohang University of Science & Technology, KOREA*	J. Qin, *Dalian Institute of Chemical Physics, CHINA*	K. Sato, *Gunma University, JAPAN*

11:15 - 11:35

ISOTHERMAL AMPLIFICATION OF DNA ON TIPS OF SILICON NANOTWEEZERS AND ITS ELECTRICAL AND MECHANICAL CHARACTERIZTION
M. Kumemura[1], S.L. Karsten[2], N. Lafitte[1], H. Guillou[3], L. Jalabert[1], H. Fujita[1], and D. Collard[1]
[1]*University of Tokyo, JAPAN,* [2]*NeuroInDx. Inc., USA, and* [3]*CNRS and University Joseph Fourier, FRANCE*

HYDROGEL DROPLET PLATFORM FOR HIGH-THROUGHPUT, HIGH-RESOLUTION IMAGING AND SORTING OF EARLY LARVAL CAENORHABDITIS ELEGANS
G. Aubry, M. Zhan, and H. Lu
Georgia Institute of Technology, USA

HANGING MICROFLUIDICS: A HIGHLY VERSATILE PLATFORM FOR PRODUCTION AND CULTIVATION OF 3D SPHERICAL MICROTISSUES
O. Frey, P.M. Misun, and A. Hierlemann
ETH Zürich, SWITZERLAND

11:35 - 11:55

NON-INVASIVE HANDLING OF CHROMATIN FIBERS ISOLATED FROM INDIVIDUAL CELLS IN A MICROCHANNEL UTILIZING AN OPTICALLY DRIVEN MICROTOOL –TOWARD DIRECT EPIGENETIC ANALYSIS BY MICROSCOPY–
H. Oana[1], K. Nishikawa[1], H. Matsuhara[2], A. Yamamoto[2], T.G. Yamamoto[3], T. Haraguchi[3], Y. Hiraoka[4], and M. Washizu[1]
[1]*University of Tokyo, JAPAN,* [2]*Shizuoka University, JAPAN,* [3]*National Institute of Information and Communications Technology (NICT), JAPAN, and* [4]*Osaka University, JAPAN*

NEUTROPHILS MIGRATE LONGER DISTANCES IN MOVING MICROFLUIDIC CONCENTRATION GRADIENTS COMPARED TO STATIC ONES
M.A. Qasaimeh, M. Astolfi, M. Pyzik, S. Vidal, and D. Juncker
McGill University, CANADA

MICROFLUIDIC TISSUE: A BIODEGRADABLE SCAFFOLD WITH BUILT-IN VASCULATURE FOR CARDIAC TISSUE VASCULARIZATION AND SURGICAL VASCULAR ANASTOMOSIS
B. Zhang[1], M. Montgomery[1], A. Pahnke[1], L. Reis[1], S.S. Nunes[1,2], and M. Radisic[1]
[1]*University of Toronto, CANADA and* [2]*University Health Network, CANADA*

11:55 - 12:15

DRY SAMPLE PRESERVATION USING A SLIPCHIP
S. Begolo[1], F. Shen[2], and R.F. Ismagilov[1]
[1]*California Institute of Technology, USA and* [2]*Slipchip LLC, USA*

DISPOSABLE MICROFLUIDIC CHIP WITH INTEGRATED LIGHT SHEET ILLUMINATION ENABLES DIAGNOSTICS BASED ON MEMBRANE VESICLES
H. Deschout[1], K. Raemdonck[1], S. Stremersch[1], P. Maoddi[2], G. Mernier[2], P. Renaud[2], S. Jiguet[2], A. Hendrix[3], M. Bracke[3], R. Van den Broecke[3], M. Röding[4], M. Rudemo[4], J. Demeester[1], S. De Smedt[1], F. Strubbe[1], K. Neyts[1], and K. Braeckmans[1]
[1]*Ghent University, BELGIUM,* [2]*Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND,* [3]*Ghent University Hospital, BELGIUM, and* [4]*Chalmers University of Technology, SWEDEN*

CURVATURE-INDUCED SPONTANEOUS DETACHMENT OF VASCULAR SMOOTH MUSCLE CELL SHEETS: TOWARDS VASCULAR SELF ASSEMBLY IN MICROCHANNELS
T. Yamashita[1], P. Kollmannsberger[2], K. Mawatari[1,3], V. Vogel[2], and T. Kitamori[1,3]
[1]*University of Tokyo, JAPAN,* [2]*ETH Zürich, SWITZERLAND, and* [3]*Japan Science and Technology Agency (JST), JAPAN*

SESSION ROOM: Rothaus Arena / Halle 4	SESSION ROOM: K 6-9	SESSION ROOM: Halle 1
Session 4A2 - Nucleic Acid Processing	**Session 4B2 - Cell Biology**	**Session 4C2 - Tissue Engineering**
12:15 - 12:35		
MICROFLUIDICS TO EXPLORE SPATIAL BEHAVIOR OF SYNTHETIC BIOCHEMICAL NETWORKS A. Estévez-Torres[1], L. Mzali[1], A. Kalley[1], A. Zadorin[1], Y. Rondelez[2], and J.-C. Galas[1] [1]*LPN-CNRS, FRANCE and* [2]*University of Tokyo, JAPAN*	**PULSED STIMULATION VIA MICROFLUIDICS REVEALS SHORT AND LONG-TERM MEMORIES IN MAST CELLS** Y. Liu[1], W.S. Hlavacek[3], B.R. Schudel[1], A. Mahajan[3], C.H. Hayden[1], D.S. Lidke[2], B.W. Wilson[2], and A.K. Singh[1] [1]*Sandia National Laboratory, USA,* [2]*Los Alamos National Laboratory, USA, and* [3]*University of New Mexico, USA*	**MICROFLUIDIC PERFUSION CULTIVATION SYSTEM FOR A MULTILAYER STRUCTURED TUBULAR TISSUES** Y. Yamagishi[1], T. Masuda[1], N. Takei[1], M. Matsusaki[2], M. Akashi[2], and F. Arai[1] [1]*Nagoya University, JAPAN and* [2]*Osaka University, JAPAN*

12:45 - 13:05	**MicroTAS 2014 Announcement**
13:05 - 13:20	**Lab on a Chip Widmer Poster Award**
	CHEMINAS Young Researcher Poster Awards
13:20 - 13:35	**NIST / Lab on a Chip Art in Science Award**
13:35	**CONFERENCE ADJOURNS**


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