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:
**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

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<tr>
<td>13:00 - 17:00</td>
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### MONDAY 28 October

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<tr>
<td>08:30 - 08:45</td>
<td>OPENING REMARKS</td>
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<tr>
<td>08:45 - 09:30</td>
<td>PLENARY PRESENTATION I</td>
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<tr>
<td></td>
<td>Antoine M. van Oijen, University of Groningen, THE NETHERLANDS</td>
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<tr>
<td>09:45 - 10:45</td>
<td>Rothaus Arena / Halle 4</td>
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<tr>
<td></td>
<td>Session 1A1 Tools for Single Molecule Manipulation</td>
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<tr>
<td></td>
<td>Session 1B1 Chemical &amp; Electrochemical Sensing</td>
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<tr>
<td></td>
<td>Session 1C1 Circulating Tumor Cells</td>
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<tr>
<td>10:45 - 11:15</td>
<td>BREAK &amp; EXHIBIT INSPECTION</td>
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<tr>
<td>11:15 - 12:15</td>
<td>Session 1A2 Single Molecule Characterization</td>
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<tr>
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<td>Session 1B2 Particle Processing</td>
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<td>Session 1C2 Screening Platforms</td>
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<tr>
<td>12:15 - 13:15</td>
<td>LUNCH</td>
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<tr>
<td>13:15 - 14:00</td>
<td>PLENARY PRESENTATION II</td>
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<td></td>
<td>Stephen C. Jacobson, Indiana University, USA</td>
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<tr>
<td>14:00 - 16:00</td>
<td>EXHIBITOR LIVE LAB 1 - LabSmith, Inc.</td>
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<tr>
<td>14:00 - 15:30</td>
<td>EXHIBITOR INDUSTRIAL STAGE</td>
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<tr>
<td>14:00 - 16:00</td>
<td>POSTER SESSION 1</td>
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<tr>
<td>16:00 - 16:30</td>
<td>BREAK &amp; EXHIBIT INSPECTION</td>
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<tr>
<td>16:30 - 17:15</td>
<td>PLENARY PRESENTATION III</td>
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<td>Michael Reth, University of Freiburg, GERMANY</td>
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<tr>
<td>17:30 - 18:30</td>
<td>Session 1A3 Fiber &amp; Particle Manufacturing</td>
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<td></td>
<td>Session 1B3 Cell Separation &amp; Capture</td>
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<td>Session 1C3 Flow Control</td>
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### TUESDAY 29 October

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<tr>
<td>08:30 - 08:45</td>
<td>ANNOUNCEMENTS</td>
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<tr>
<td>08:45 - 09:30</td>
<td>PLENARY PRESENTATION IV</td>
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<td>Aydogan Ozcan, University of California, Los Angeles, USA</td>
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<tr>
<td>09:30 - 11:30</td>
<td>EXHIBITOR LIVE LAB 2 - PASCA</td>
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<tr>
<td>09:45 - 10:45</td>
<td>Session 2A1 Electrokineic Transport</td>
</tr>
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<td>Session 2B1 Biomolecular Detection 1</td>
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<tr>
<td></td>
<td>Session 2C1 Point-of-Care Immunodiagnostics 1</td>
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<tr>
<td>10:45 - 11:15</td>
<td>BREAK &amp; EXHIBIT INSPECTION</td>
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<tr>
<td>11:15 - 12:15</td>
<td>Session 2A2 Particle Manufacturing &amp; Encoding</td>
</tr>
<tr>
<td></td>
<td>Session 2B2 Biomolecular Detection 2</td>
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<tr>
<td></td>
<td>Session 2C2 Point-of-Care Immunodiagnostics 2</td>
</tr>
<tr>
<td>12:15 - 13:15</td>
<td>LUNCH</td>
</tr>
<tr>
<td>13:15 - 13:35</td>
<td>Analytical Chemistry Young Innovator Award</td>
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<tr>
<td>14:00 - 16:00</td>
<td>EXHIBITOR LIVE LAB 3 - Cellix Limited</td>
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<tr>
<td>14:00 - 16:00</td>
<td>POSTER SESSION 2</td>
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<tr>
<td>16:00 - 16:30</td>
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<tr>
<td>16:30 - 17:15</td>
<td>PLENARY PRESENTATION V</td>
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<tr>
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<td>Lei Jiang, Chinese Academy of Sciences, CHINA</td>
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<tr>
<td>17:30 - 18:30</td>
<td>Session 2A3 Electrochemical Detection &amp; Imaging</td>
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<td></td>
<td>Session 2B3 Immunoassays</td>
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MTAS13 Program AAG:Layout 1  10/7/13 10:57 PM Page 1
When the term “Micro-TAS” (Micro-Total Analysis Systems) was introduced in the early 90’s, a novel type of chemistry and biology was prophesied 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 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 your "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.
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

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**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 1A1 - Tools for Single Molecule Manipulation
- H. Gardeneria, University of Twente, THE NETHERLANDS
- K. Hjort, Uppsala University, SWEDEN
- F.-G. Tseng, National Tsing Hua University, TAIWAN
- S. Takeuchi, University of Tokyo, JAPAN

#### Session 1B1 - Chemical and Electrochemical Sensing
- H. Andersson-Svahn, KTH - Royal Institute of Technology, SWEDEN

#### Session 1C1 - Circulating Tumor Cells
- 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 Brink1, L. Büter2, M. Odijk1, W. Olthuis1, U. Karst2, and A. van den Berg1
  - 1MESA+ University of Twente, THE NETHERLANDS and 2University of Münster, GERMANY

### SESSION ROOM: K 6-9

**PHASE 1 AND 2 DRUG METABOLITES GENERATED USING A MINIATURIZED ELECTROCHEMICAL CELL WITH AN ATTACHED ESI NEEDLE**
F. van den Brink1, L. Büter2, M. Odijk1, W. Olthuis1, U. Karst2, and A. van den Berg1
1MESA+, University of Twente, THE NETHERLANDS and 2University of Münster, GERMANY

### SESSION ROOM: Halle 1

#### Session Chairs:
- H. Gardeniers, University of Twente, THE NETHERLANDS
- K. Hjort, Uppsala University, SWEDEN
- F.-G. Tseng, National Tsing Hua University, TAIWAN
- S. Takeuchi, University of Tokyo, JAPAN

#### Session 181 - Chemical and Electrochemical Sensing
- K. Hjort, Uppsala University, SWEDEN

#### Session 1C1 - Circulating Tumor Cells
- PARALLELIZED MICROFLUIDIC IMMUNCAPTURE OF CIRCULATING PANCREATIC CELLS FOR GENETIC ANALYSIS AND EARLY DETECTION OF PANCREATIC CARCINOGENESIS
  - F. Thege1, S.M. Santana1, T.B. Lannin1, S. Tsai2, T.N. Saha2,3, M.E. Godla1, E.D. Pratt1, A.D. Rhim2,3, and B.J. Kirby1
  - 1Cornell University, USA, 2University of Pennsylvania, USA, and 3University of Michigan, USA

### WORKSHOP & SHORT COURSES

**PARALLELIZED MICROFLUIDIC IMMUNCAPTURE OF CIRCULATING PANCREATIC CELLS FOR GENETIC ANALYSIS AND EARLY DETECTION OF PANCREATIC CARCINOGENESIS**

**HIGH THROUGHPUT CIRCULATING TUMOR CELL ISOLATION USING TRAPEZOIDAL INERTIAL MICROFLUIDICS**

**WHAT DO PHOTONS DO TO FLUORESCENTLY STAINED DNA IN CONFINEMENT?**
J.P. Beech1, L. Nyberg2, J. Fritzsche2, F. Westerlund2, and J.O. Tegenfeldt1
1Lund University, SWEDEN and 2Chalmers University, SWEDEN

**SELF-POWERED MOBILE SENSOR FOR IN-PIPE POTABLE WATER QUALITY MONITORING**
R. Wu1, W.W.A. Wan Salim1, S. Malhotra1, A. Brovont2, J.H. Park3, S.D. Pekarek4, M.K. Banks2, and D.M. Porterfield3
1Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE, 2Singapore, SINGAPORE, and 3Massachusetts Institute of Technology, USA

**HIGH THROUGHPUT CIRCULATING TUMOR CELL ISOLATION USING TRAPEZOIDAL INERTIAL MICROFLUIDICS**
G. Guan1,2, M.E. Workman1, K.B. Luan2, C.T. Lim1,2, P.C.Y. Chen1,2, and J. Han1,2
1Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE, 2National University of Singapore, SINGAPORE, and 3Massachusetts Institute of Technology, USA

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**PHASE 1 AND 2 DRUG METABOLITES GENERATED USING A MINIATURIZED ELECTROCHEMICAL CELL WITH AN ATTACHED ESI NEEDLE**
F. van den Brink1, L. Büter2, M. Odijk1, W. Olthuis1, U. Karst2, and A. van den Berg1
1MESA+, University of Twente, THE NETHERLANDS and 2University of Münster, GERMANY

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1Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE, 2National University of Singapore, SINGAPORE, and 3Massachusetts Institute of Technology, USA
MICROFLUIDIC PARALLEL STRETCHING AND STAMPING OF SINGLE DNA MOLECULES FOR SUPER RESOLUTION MICROSCOPE IMAGING
H. Yasaki1, D. Onoshima1, T. Yasui1, T. Naito2, N. Kaji1, and Y. Baba1,3
1Nagoya University, JAPAN, 2Kyoto University, JAPAN, and 3National 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

DNA METHYLATION MAPPING IN NANOSLIT DEVICES AT A SINGLE MOLECULE LEVEL
M. Mizutani1, T. Yasui1, N. Kaji1, S. Rahong2, T. Yanagida2, M. Kanai2, K. Nagashima2, T. Kawai2, and Y. Baba1,3
1Nagoya University, JAPAN, 2Osaka University, JAPAN, and 3University of Tokyo, 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. Ahmad1,2, Y. Wang1, P.K. Shah1,2, C.E. Sims1, S.T. Magness1, and N.L. Allbritton1,2
1University of North Carolina, USA and 2North Carolina State University, USA

SINGLE-STRANDED DNA DETECTION VIA CHEMICALLY MODIFIED ALAMETHICIN NANOPORRE AT SINGLE MOLECULE LEVEL
R. Kawano1, D. Noshiro2, T. Osaki1,3, K. Kamiya1, K. Asami2, S. Futaki2, and S. Takeuchi1,3
1Kanagawa Academy of Science and Technology (KAST), JAPAN, 2Kyoto University, JAPAN, and 3University of Tokyo, JAPAN

TWO-DIMENSIONAL ACOUSTOPHORESIS IN SQUARE MICROCHANNEL ENABLES SUB-MICROMETER PARTICLE FOCUSING
M. Nordin1, P. Augustsson1, P.B. Muller2, and H. Brüden1
1Lund University, SWEDEN and 2Technical 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 1A2 - Single Molecule Characterization
S. Herdt, University of Twente, THE NETHERLANDS
J.-K. Park, Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA
J. Eijkel, University of Twente, THE NETHERLANDS
O. Niwa, National Institute of Advanced Industrial Science and Technology (AIST), JAPAN
Y. H. Cho, Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA
M. Meier, Technical University of Darmstadt, GERMANY

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

11:15 - 11:35
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. Kobayashi1, M. Sasaki1, N. Kosaka2, T. Ochiya3, T. Akagi1, and T. Ichiki1
1University of Tokyo, JAPAN and 2National Cancer Research Institute, JAPAN

A MICROPATTERNED HUMAN EMBRYONIC STEM CELL MODEL FOR IN VITRO HUMAN DEVELOPMENTAL TOXICITY TESTING
Y.-C. Toh1, J. Xing1,2, S. Xu3,4, and H. Yu1,2,3
1Institute of Bioengineering and Nanotechnology, SINGAPORE; 2Mechanochemistry Institute, SINGAPORE; 3National University of Singapore, SINGAPORE, and 4Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE

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

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

EXHIBITOR LIVE LAB 1 - LabSmith, Inc.
INSTANTANEOUS STOP FLOW APPLICATIONS IN MICROFLUIDIC / NANOFLUIDIC DEVICE
Elveflow Microfluidic Innovation Center
Adrien Precis, Chief Scientific Officer

MULTI-CHANNELS FLOW-RATE CONTROL BASED ON PRESSURE ACTUATION
Fluent SA
Anne Le Nel, R&D Manager

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

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

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

THE MICROFLUIDIC TOOLBOX – MODULAR APPROACHES FOR INTEGRATED MICROFLUIDICS
microfluidic ChipShop GmbH
Holger Becker, CSO
M.001a IS THERMOCAPILLARY ENOUGH FOR DROPLET ACTUATION?
A. Davanlou, R. Shabani, H.J. Cho, and R. Kumar
University of Central Florida, USA

M.002a DUAL FUNCTION MICROFLUIDIC PUMP AND PARTICLE FILTER USING TRAVELING-WAVE ELECTROOSMOSIS AND DIELECTROPHORESIS
Y.-L. Sung1, S.-C. Lin1, W.-Y. Chuang2, Y.-C. Tung3, and C.-T. Lin4
1National Taiwan University, TAIWAN and 2Academia Sinica, TAIWAN

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

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-JETTNG
S. Xieng1, T. Tandiono2, C.D. Oh1, and A.G. Liu2
1Nanyang Technological University, SINGAPORE and 2Institute 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
U. Ugajin, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

M.007a MASS TRANSPORT IN EMULSION STUDIED IN A ONE-DIMENSIONAL MICROARRAY
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1Max-Planck-Institute for Dynamics and Self-Organization, GERMANY and 2Laboratoire de Physique Statistique, FRANCE

M.008a ON-DEMAND CONTROL OF pH IN MICROFLUIDIC DROPLETS
H.B. Zhou1,2 and S.H. Yao2
1Hong Kong University of Science & Technology, CHINA and 2Chinese Academy of Science, CHINA

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

M.010a TUNABLE FABRICATION OF MICROFLUIDIC EMULSIONS BY SPINODAL DECOMPOSITION
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1National University of Singapore, SINGAPORE and 2Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE

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

M.012a LOCALIZED SURFACE PLASMON RESONANCE (LSPR) OPTOFLUIDIC BIOSensor FOR LABEL-FREE CELLULAR IMMUNOPHENOTYPING
B.-R. Oh1, N.-T. Huang1, W. Chen1, J. Seo2, J. Fu2, and K. Kurabayashi1
1University of Michigan, USA and 2Hongik University, SOUTH KOREA
M.013a  OPTICAL MANIPULATION OF MICROPARTICLES IN OPTOFLOWIC WAVEGUIDES
Y.Z. Shi1, Y. Yang2, and A.Q. Liu2
1Kian Jin Tong University, CHINA and 2Nanyang Technological University, SINGAPORE

M.014a  MANIPULATION OF MAGNETIC PARTICLES IN µ-FLUIDIC VOLUMES
Y. Gao1,2, A. van Reenen1,2, M.A. Hulsen1, A.M. de Jong1, M.W.J. Prins1, and J.M.J. den Toonder1
1Eindhoven University of Technology, THE NETHERLANDS and 2Philips Research, THE NETHERLANDS

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

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 FEUETO LITER SCALE IMMUNOASSAY
K. Shirai1,2, K. Mawatari1,2, and T. Kitamori1,2
1University of Tokyo and 2Japan Science and Technology Agency (JST), JAPAN

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

M.019a  ON-CHIP ELECTROPORATION DEVICE FOR DIRECT INTRODUCTION OF PLASMIDS INTO CELL NUCLEUS AND OBSERVATION OF CELL REPROGRAMMING PROCESS
K.O. Okeyo1, Y. Hayashi1, O. Kurosawa1, H. Oana1, H. Koter1sa, and M. Washizu1
1University of Tokyo, JAPAN and 2Kyoto University, JAPAN

M.020b  A FLOW-THROUGH MICROARRAY OF PREFORMED POROUS POLYMER MONOLITHS IN A THERMOPLASTIC NANOFLUIDIC 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 NANOCHANNELS
K.B. Teichert1 and A.J. Hart1,2
1University of Michigan, USA and 2Massachusetts Institute of Technology, USA

M.024b  MICRO- AND NANOSTRUCTURED MICROFLUIDIC CHIP FOR SPECIFIC PROTEIN IMMOBILIZATION
N.E. Stei1, T. Hahn2, C. Bader1, M. Schneider1, R. Ahrens1, M. Worjull1, and A.E. Guber2
1Karlsruhe Institute of Technology, GERMANY and 2Bürkert Fluid Control Systems GmbH, GERMANY
ONE-STEP MICROARRAY FABRICATION OF UV-PHOTOPRINTABLE IONOGELS FOR BIOMOLECULE IMMOBILIZATION ON NON-MODIFIED COP AND COC MICROFLUIDIC CHIPS

1CIC microGUNE, SPAIN, 2IK4-IKERLAN, SPAIN, 3IK4-TEKNIKER, SPAIN, and 4IKERBASQUE, SPAIN

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

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

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

1Universidad Nacional de Colombia Bogota, COLOMBIA, 2Institut de Science des Matériaux de Mulhouse, FRANCE, and 4CEA/CNRS, FRANCE

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

S. Habasaki, S. Yoshida, W.C. Lee,1,2, and S. Takeuchi1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

BIOCOMPATIBILITY OF OSTE POLYMERS STUDIED BY CELL GROWTH EXPERIMENTS

1Royal Institute of Technology (KTH), SWEDEN, 2Universidad Politécnica de Valencia, SPAIN, and 3Linköping University, SWEDEN

MAGNETOPHORETIC MANIPULATION IN MICROSYSTEM USING 1-PDMS MICROSTRUCTURES

Université de Lyon, FRANCE

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

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

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

LOCAL SURFACE MODIFICATION AT THE MICROSCALE ENABLED BY LIQUID DIELECTROPHORESIS

R. Renaudot, T. Nguyen, Y. Fouillet, L. Jalabert, M. Kumemura, D. Collard, H. Fujita, and V. Agache
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SUPERNHYDROPHILIC TRAP-BASED SELF-PATTERNING OF LIQUID ON CO2 LASER TREATED GLASS SURFACE

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

MICROTUBULE MANIPULATION BY AN ELECTRIC FIELD IN A FUSED SILICA CHANNEL

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

Surface Modification

Molecular Systems & Nanochemistry

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Nanobiotechnology

M.043b  CHRISTMAS-TREE NANOWIRE CHIPS FOR DNA SEPARATION
S. Rahong1, T. Yasui2, T. Yanagida1, M. Kamai1, K. Nagashima1, A. Klarmun1,2, M. Gang1, H. Yong1, F. Zhuge1, N. Kaji1, Y. Baba1,4, and T. Kawai1
1Osaka University, JAPAN, 2Nagoya University, JAPAN, 3NANOTEC, THAILAND and 4National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

M.047b  HIGHLY SENSITIVE DETECTION OF DNA WITH HNA DEFINED SILICON NANOWIRE FET
L. Dong and X.M. Yu
Peking University, CHINA

M.048b  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

Nanooassembly

M.049b  SELF-ASSEMBLED NANOWIRES ON GRAPHENE IN MICROFLUIDIC CHANNELS
W.C. Lee1, J. Park1, K. Kim2, A. Zettl2, D.A. Weitz1, and S. Takeuchi1,2
1University of Tokyo, JAPAN, 2Japan Science and Technology Agency (JST), JAPAN, 3Harvard University, USA, 4University of California, Berkeley, USA, and 5Lawrence Berkeley National Laboratory, USA

Sensors & Actuators, Detection Technologies

Micropumps, -Valves, -Dispensers

M.050b  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.051b  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

Physical Sensors

M.052b  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.053b  RESOLUTION ENHANCEMENT OF SUSPENDED MICROCHANNEL RESONATORS BY MASS CORRELATION ANALYSIS
M.054c  A NEW DISCRIMINATION METHOD OF TARGET BIOMOLECULES WITH MINIATURIZED SENSOR ARRAY UTILIZING LIPOSOME ENCAPSULATING FLUORESCENT MOLECULES WITH TIME COURSE ANALYSIS
K. Takada1, T. Fujimoto1, T. Shimanouchi2, M. Fukuzawa1, K. Yamashita1, H. Uraoku1, and M. Noda1
1Kyoto Institute of Technology, JAPAN, 2Okayama University, JAPAN, and 3Osaka University, JAPAN

Biosensors

M.055c  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.056c  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
M.047c  AC-ELECTROOSMOSIS-ASSISTED HIGH-DENSITY SIMULTANEOUS ASSEMBLY OF SERS NANOPARTICLES AND BIOMOLECULES FOR RAPID BIO-DETECTION
C.W. Lee1 and F.-G. Tseng2,3
1National Tsing Hua University, TAIWAN and 2Academia 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. Lee1, J.H. Roh2, K.S. Shin1, D.S. Lee1, J.A. Lee2, S.Y. Kim2, and Y.H. Cho1,3
1Seoul National University of Science & Technology, SOUTH KOREA,
2Korea Electronics Technology Institute, SOUTH KOREA, 3PCL Inc, SOUTH KOREA,
4Dongguk University, SOUTH KOREA, and 5Seoul Tekno Park Microsystems Packaging Support Center, SOUTH KOREA

M.051c  DYNAMIC MAGNETIC PARTICLE ACTUATION FOR RAPID BIOSENSING
A. van Reenen1, Y. Gao1, A.M. de Jong1, M.A. Hulsen1, J.M.J. den Toonder1, and M.W.J. Prins2,3
1Eindhoven University of Technology, THE NETHERLANDS and 2Philips Research, THE NETHERLANDS

M.052c  IMMOBILIZATION OF BIOLOGICAL ACTIVE MOLECULES ON CHEMICALLY INERT POLYMER CHIPS FOR BIO-ANALYTICAL DETECTION
N. Hiawatsch, M. Krumbhölz, J. Rommel, H. Becker, and C. Gärtnert
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. Jordan1, X. Xu2, N.J. Wittenberg1, A.E. Warrington1, A. Denic2, B. Wootla2, D. Yoo1, J. Watzlawik2, M. Rodriguez2, and S.-H. Oh1
1University of Minnesota, USA and 2Mayo 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 BIOMICRO PROTEIN POLYMERIZATION ACTIVITY USING FLOW INDUCED REFRACTIVE INDEX “VALLEY”
S. Inoue, K. Hayashi, Y. Iwasaki, T. Horiiuchi, N. Matsuura, and Y. Sato
Nippon Telegraph and Telephone Corporation, JAPAN
The 17th International Conference on Miniaturized Systems for Chemistry and Life Sciences
27-31 October 2013
Freiburg, Germany

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. Khoai1, T. Yamamoto2, Y. Ukita1, and Y. Takamura1
1Japan Advanced Institute of Science and Technology (JAIST), JAPAN and
2Micro 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. Ansari1, J.Y.S. Ying1, P.C. Hauser2, and N.F. de Rooij3
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2Universität Basel, SWITZERLAND, and
3Université de Neuchâtel, SWITZERLAND

M.061c NANOPIRLE-BASED ELECTROCHEMICAL BIOSENSOR FOR SINGLE BACTERIUM DETECTION BY REDOX SIGNAL AMPLIFICATION
C.S. Lu1, P.C. Wen1, H.Y. Chang1, and F.G. Tseng1,2
1National Tsing Hua University, TAIWAN and
2Research Center for Applied Sciences, TAIWAN

M.062c ENZYME FREE GLUCOSE SENSOR BASED ON MICRO-NANO DUALPOROUS GOLD MODIFIED SCREEN PRINTED CARBON ELECTRODE
X.V. Nguyen1,2, M. Chikae1, Y. Ukita1, and Y. Takamura1
1Japan Advanced Institute of Science and Technology (JAIST), JAPAN and
2Vietnam National University of Science, VIETNAM

M.063c IMPROVED SURFACE ACOUSTIC WAVE SENSOR FOR LOW CONCENTRATION AMMONIA/METHANE MIXTURE GASES DETECTION
National Tsing Hua University, TAIWAN

M.064c MICROFLUIDIC DROPLET-BASED AMPEROMETRIC SENSOR FOR IMMobilIZATION-FREE ENZYME INHIBITION ASSAY
S. Gu1, Y. Lu1, Y. Ding1, L. Li1, F. Zhang1, and G. Wu1
1Shanghai University, CHINA and
2Tongji University, CHINA

M.065c ULTRASENSITIVE HYDRODYNAMIC ELECTROCHEMISTRY USING SOUND WAVE DRIVEN MICROSTREAMING
E. Kaplan, J. Reboud, A. Giolli, 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 PHOTOTYPE 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 Fédérale de Lausanne (EPFL), SWITZERLAND

Optical Detection

M.069c A SINGLE LIVING BACTERIUM'S REFRACTIVE INDEX MEASUREMENT BY USING OPTOFLOIDIC IMMERSION REFRACTROMETHRY
Y. Liu1, L.K. Chin1, W. Sen1, T.C. Ay1, W.M. Ho2, P.H. Yap2, Y. Leprince-Wang3, and T. Bourouina3
1Nanyang Technological University, SINGAPORE,
2DSO National Laboratories, SINGAPORE, and
3University 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. Nagasaki
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. Hisamori
Osaka Prefecture University, JAPAN

M.072c MAGNETO-OPTICAL DETECTION OF MAGNETIC NANOBEBDS IN A MICROFLUIDIC CHANNEL
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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. Kovaci1, A. Malisauskaite1, A. Ivanov1, U. Mescheder1, and R. Wittig2
1 Furtwangen University, GERMANY and 2 University Ulm, GERMANY

M.074c COUPLING MICROFLUIDIC DROPLET ARRAY WITH ELECTROSINGRANIZATION 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

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

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

M.081d A HIGH THROUGHPUT DROPLET-BASED MICROFLUIDIC BARCODE GENERATOR
Y. Ding, S. Stavrikis, 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
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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

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. Lenk1, A. Pohanka2, G. Stemme1, G. Beck1, and N. Roxhed1
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. Curti1, N. Lopez-Ruiz1, L.F. Capitan-Valleley2, A.J. Patma2, F. Benito-Lopez1, and D. Diamond1
1 Dublin City University, IRELAND, 2University 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. Stavrikis, 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. Kantak1,2, S. Beyer1,2, and D. Trau1
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.090d NOVEL MIXING METHOD FOR CROSS LINKER INTRODUCTION INTO DROPLET EMULSIONS
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M.095d NOVEL MIXING METHOD FOR CROSS LINKER INTRODUCTION INTO DROPLET EMULSIONS
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M.084d NOVEL MIXING METHOD FOR CROSS LINKER INTRODUCTION INTO DROPLET EMULSIONS
K. J. Land1,2, M. M. Mbanjwa2, and J. G. Korvink2
1 Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA and
2 University of Freiburg - IMTEK, GERMANY

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. Inamori1, H. Ozoe1, M. Takinoue1, and S. Takeuchi1,2
1 University of Tokyo, JAPAN, 1Japan Science and Technology Agency (JST), JAPAN, and
2 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. Ducree
Dublin City University, IRELAND

M.088d MICROFLUIDIC APP FEATURING NESTED PCR FOR FORENSIC SCREENING ASSAY ON OFF-THE-SHELF THERMOCYCLER
M. Keller1, J. Naue1, P. Papireddy Vinayaka1, O. Strohmeier1, D. Mark1, U. Schmidt1, R. Zengerle1, and F. von Stetten1
1 Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,
2 Universitätstülenium Freiburg, GERMANY, and 3 University of Freiburg - IMTEK, GERMANY

M.089d OLED-INDUCED FLUORESCENCE DETECTION SYSTEM FOR COMPACT DISK-TYPE MICROFLUIDIC DEVICE
K. Morisaka1, A. Hemmi1, H. Zeng1, K. Uchiyama1, and H. Nakajima1
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

M.092d DEVELOPMENT OF MICROFLUIDIC DEVICE WITH MOVABLE ELECTRODE FOR ELECTRICAL IMPEDANCE MEASUREMENT ON THE ACTIVELY COMPRESSED SINGLE CELL
J.Y. Kim1,2, and Y.E. Yoo1,2
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

Other & Novel Microfluidic Platforms

M.091d A SELF-CONTAINED, USER-FRIENDLY, PROGRAMMABLE CELL STIMULATION PLATFORM
A.K. Au1,2, S. Gibbs1, A. Scott1, L.F. Horowitz1, E. Vinckenbosch1,2, B. Otis1, and A. Folch1
1 University of Washington, USA and 2 École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

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2 University of Science & Technology, SOUTH KOREA

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K.T.L. Trinh, H.H. Tran, Y. Zhang, J. Wu, and N.Y. Lee
Gachon University, SOUTH KOREA
SUPERHYDROPHOBIC, PASSIVE MICROVALVES WITH CONTROLLABLE OPENING PRESSURE, AND APPLICATIONS IN FLOW CONTROL
K. Ellinas, A. Tserepi, and E. Gogolides
NCSR Demokritos, GREECE

VARIATION OF CELLS IN CONTROLLED OXYGEN TENSION BY MICRO-FLUIDIC DEVICE
S. Ji1, D. An1, E. Lee2, K. Lee1, and J. Kim1
1 Dankook University, SOUTH KOREA and 2 Seoul National University, SOUTH KOREA

M.096d
M.097d

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

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

MICROARRAY PLATFORM FOR THE ISOLATION OF VIABLE NON-ADHERENT CELLS
P.J. Attayek1,2, Y. Wang1, B.G. Vincent1, P.M. Armstrong1, C.E. Sims1, and N.L. Albritten1,2
1 University of North Carolina, USA and 2 North Carolina State University, USA

SHALLOW ANTIBODY-COATED MICROCHANNEL BASED SELECTIVE CELL CAPTURE AND ANALYSIS
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

ENRICHMENT OF PROSTATE CANCER CELLS FROM BLOOD CELLS WITH A HYBRID DIELECTROPHORESIS AND IMMUNOCAPTURE MICROFLUIDIC SYSTEM
C. Huang1, J.P. Smith1, H. Liu2, N.H. Bander2, and B.J. Kirby1
1 Cornell University, USA and 2 Weill Medical College of Cornell University, USA

MICROFLUIDIC DETECTION OF CIRCULATING TUMOR CELLS (CTC) USING SIDE FILTRATION-BASED CAPTURE
S.W. Lee1,2, J.Y. Kang1, H.I. Jung2, and K.A. Hyun1
1 Korea Institute of Science and Technology (KIST), SOUTH KOREA and 2 Yonsei University, SOUTH KOREA

DEVELOPMENT OF SPECIFIC APTAMERS WITH DIFFERENT HISTO-LOGICAL CLASSIFIED OVARIAN CANCER CELLS BY UTILIZING ON-CHIP OVCA CELL-SELEX
L.-Y. Hung1, C.-H. Wang1, K.-F. Hsu2, C.-Y. Chou2, and G.-B. Lee1
1 National Tsing Hua University, TAIWAN and 2 National Cheng Kung University, TAIWAN

CELL STRETCHING MICRODEVICE FOR EVALUATING CELLULAR BIOMECHANICS BASED ON IN-SITU CELLULAR RESPONSE OBSERVATION
Y. Nakashima1, R. Monji2, K. Sato2, and K. Misumi1
1 Kumamoto University, JAPAN, 2 Yamaguchi University, JAPAN, and 3 University of Tokushima, JAPAN

ELECTROACTIVE MICROWELL ARRAY TOWARDS SINGLE CIRCULATING TUMOR CELL ANALYSIS
M. Kobayashi1,2, S.H. Kim1,2, S. Kaneda1,2, and T. Fuji1,2
1 University of Tokyo and 2 Japan Science and Technology Agency (JST), JAPAN

MEASUREMENT OF DRUG ACCUMULATION IN SINGLE ACUTE MYELOID LEUKEMIA (AML) PATIENT CELLS USING A MICROFLUIDIC DIELECTROPHORESIS (DEP) CHIP
A. Khamenehfar1, Y. Chen1, D.E. Hogge2, and P.C.H. Li3
1 Simon Fraser University, CANADA and 2 BC Cancer Agency, CANADA

Cell Capture, Counting, & Sorting

M.098e
M.099e
M.100e
M.101e

Circulating Tumor Cells

M.102e
M.103e
M.104e

Single Cell Analysis

M.105e
M.106e
M.107e
M.108e
| M.109e | MULTIPARAMETER HIGH-THROUGHPUT MECHANICAL PHENOTYPING | M. Masaeli1,2, H.T.K. Tse1,2, D.R. Gossett1,2, D. Gupta1,2, and D. Di Carlo1,2 |
|        |                                                   | 1University of California, Los Angeles, USA, 2California NanoSystems Institute, USA and 3CytoVate, Inc., USA |
| M.110e | OPTICALLY-CONTROLLED SELECTIVE TRANSEFCTION OF PARTICLE SENSOR USING MULTILAYERED LIPOSOME CONTAINING PHOTOCRIMIC 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. Chingscha, 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. Wang1,2, R. Trouillon1, J. Dunevall2, and A.G. Ewing1,2 |
|        |                                                   | 1University of Gothenburg, SWEDEN and 2Chalmers University of Technology, SWEDEN |
| Liposomes/Vesicles |
| M.113e | CONTROLLED FUSION OF GIANT UNILAMELLAR VESICLES USING VIRAL FUOSGENIC 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 |
|        |                                                   | 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. Abe1,2, K. Kamiya1, T. Osaki1,2, R. Kawano1, K. Akiyoshi4, N. Miki1,3, and S. Takeuchi1,2 |
|        |                                                   | 1Kanagawa Academy of Science and Technology, JAPAN, 2University of Tokyo, JAPAN, 3Keio University, JAPAN, and 4Kyoto 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. Hsiao1, T. Okitsu1,2, H. Onoe1,2, M. Kiyosawa1, S. Iwanaga2, S. Miura2, T. Kazama1, T. Matsumoto1, and S. Takeuchi1,2 |
|        |                                                   | 1University of Tokyo, JAPAN, 2Japanese Science and Technology Agency (JST), JAPAN, 3Shumei University, JAPAN, and 4Nihon University School of Medicine, JAPAN |
| M.119e | AMPLIFIED MICROELECTRODE RECORDINGS OF NEURON CLUSTERS IN A THREE DIMENSIONAL CELL CULTURE CHIP | M. Son1, J. Choi1, S. Chung2, and J.Y. Kang1 |
|        |                                                   | 1Korea Institute of Science and Technology (KIST), SOUTH KOREA and 2Korea University, SOUTH KOREA |
| M.120e | GEOMETRIC CONTROL AND CHEMICAL RESPONSE OF CELLULAR CLUSTERS USING FREE-STANDING MESHE 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. Takano1, S. Inomata1, M. Tanaka1, and N. Futai2
1Tokyo Denki University, JAPAN and 2Shibaura Institute of Technology, JAPAN

M.122e ON-CHIP TRAPPING AND VIABILITY ASSESSMENT OF SUBMICROLITER PRIMARY TISSUES FOR PERSONALIZED TREATMENT OF OVARIAN CANCER
M. Astolfi1,3,4, S. Fartoumi1, S. Kataria5, M.-H. Faille1, W. Sanger1, O. Morin1, B. Péant1,4, J. Kendall-Dupont3,4, D. Provencher2,3,4, A.-M. Mes-Masson1,3,4, and T. Gervais1
1Polytechnique Montréal, CANADA, 2Université de Montréal, CANADA, 3Centre hospitalier de l’Université de Montréal, CANADA, 4Institut du cancer de Montréal, CANADA, and 5Indian Institute of Technology Delhi, INDIA

M.123e STRETCHABLE PROTEIN-BASED GELS FOR 2.5 D AND 3D MECHANOTRANSDUCTION STUDIES
C.S. Simmons1,2, M.A. Burkhardt3, V. Vogel3, and B.L. Pruitt1
1Stanford University, USA, 2University of Florida, USA, and 3ETH Zürich, SWITZERLAND

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. Taeng, 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. Jeong1, H.-R. Seo1, H.J. Joo1, and S. Chung1
1Korea University, SOUTH KOREA and 2Korea University Medical College, SOUTH KOREA

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
Waseda University, JAPAN

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. Wang1, Y. Yan1, C.W. Li2, D.Y. Wang1, H.M. Xia1, and Z.P. Wang1
1Singapore Institute of Manufacturing Technology, SINGAPORE and 2National 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

M.132f GLASS-CAPILLARY-ACCESSIBLE DYNAMIC MICROARRAY FOR MICRONEJECTION OF ZEBRAFISH EMBRYOS
S. Miura1,2, T. Teshima1, P. Tomoike1, and S. Takeuchi1
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

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

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A. Kunze, P. Taeng, 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. Jeong1, H.-R. Seo1, H.J. Joo1, and S. Chung1
1Korea University, SOUTH KOREA and 2Korea University Medical College, SOUTH KOREA

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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
Waseda University, JAPAN

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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. Wang1, Y. Yan1, C.W. Li2, D.Y. Wang1, H.M. Xia1, and Z.P. Wang1
1Singapore Institute of Manufacturing Technology, SINGAPORE and 2National University of Singapore, SINGAPORE

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Organs & Organisms

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A. Williamson, U. Fernekorn, S. Singh, and A. Schober
Technische Universität Ilmenau, GERMANY

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1Singapore Institute of Manufacturing Technology, SINGAPORE and 2National University of Singapore, SINGAPORE

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1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

Others

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A. Williamson, U. Fernekorn, S. Singh, and A. Schober
Technische Universität Ilmenau, GERMANY

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W. Wang1, Y. Yan1, C.W. Li2, D.Y. Wang1, H.M. Xia1, and Z.P. Wang1
1Singapore Institute of Manufacturing Technology, SINGAPORE and 2National University of Singapore, SINGAPORE

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Organs on Chip

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1Singapore Institute of Manufacturing Technology, SINGAPORE and 2National University of Singapore, SINGAPORE

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S. Miura1,2, T. Teshima1, P. Tomoike1, and S. Takeuchi1
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

Organs on Chip (C. elegans, Zebrafish, Arabidopsis, etc.)
DEVELOPMENT OF A MICROFLUIDIC CARDIOVASCULAR SYSTEM FOR EVALUATION OF RENAL CLEARANCE AND CELL CULTURE
Y. Sakuta, K. Tsunoda, and K. Sato
Gunma University, JAPAN

A WORLD-TO-DIGITAL MICROFLUIDIC INTERFACE FOR TOTAL RNA EXTRACTION FROM BLOOD SAMPLES
Sandia National Laboratory, USA

CHARACTERIZATION OF MICROFLUIDIC COMPONENTS FOR LOW-COST POINT-OF-CARE DEVICES
S. Hugo1, K. Land1, and H. Becker2
1Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA, and 2microfluidic ChipShop, GERMANY

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

DEVELOPMENT OF A DEVICE PLATFORM FOR PREDICTIVE AND PROGNOSTIC POINT-OF-CARE TESTING USING THE EXAMPLE OF PATHOGEN IDENTIFICATION
R. Götzen2, F. Scheraq1, G. Sutz2, M. Schmidt3, M. Penning1, H. Attig1, T. Brandstetter1, and J. Rühe4
1University of Freiburg, GERMANY, 2microTEC Gesellschaft für Mikrotechnologie mbH, GERMANY, 3Fraunhofer Institute for Physical Measurement Technique IPM, GERMANY, 4Micropelt GmbH, GERMANY, and 5QIAGEN GmbH, GERMANY

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

IDENTIFYING BACTERIA USING DNA BINDING MAPS
1Chalmers University of Technology, SWEDEN, 2Lund University, SWEDEN, and 3University of Gothenburg, SWEDEN

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

SINGLE DNA MOLECULE EXTRACTION FROM SINGLE BACTERIUM USING NANOWIRE STRUCTURES
K. Ootsuka1, Y. Yasui1, N. Kaji1, S. Rahong1, T. Yanagida1, M. Kana1, K. Nagashima1, T. Kawai2, and Y. Baba1,2
1Nagoya University, JAPAN, 2Osaka University, JAPAN, and 3National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

VIRUS PURIFICATION, RNA EXTRACTION, AND TARGETED GENOME CAPTURE IN ONE CHIP
M. Niimi1, T. Masuda1, K. Kaihatsu1, N. Kato1, and F. Arai1
1Nagoya University, JAPAN and 2Osaka University, JAPAN

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

A DIGITAL MICROFLUIDIC PLATFORM FOR AUTOMATED IMMUNOASSAYS OPTIMIZED USING “DESIGN OF EXPERIMENTS” (DOE) METHODS
K. Choi1, A.H.C. Ng1, R. Fobel1, D.A. Chang-Yen2, L.E. Yarmell2, E.L. Pearson2, C.M. Oleksak2, A.T. Fischer2, R.P. Lusma2, J.M. Robinson1, and A.R. Wheeler1
1 University of Toronto, CANADA and 2 Abbott Diagnostics, USA

AUTOMATIC pH CHANGING SYSTEM FOR SENSITIVITY IMPROVEMENT OF ELISA ON LAB-ON-PAPER
A. Apilux1,2,3, Y. Ukita1, M. Chikae1, O. Chailapakul4, and Y. Takamura5
1 Japan Advanced Institute of Science and Technology, JAPAN, 2 Mahidol University, THAILAND, and 3 Chulalongkorn University, THAILAND

SINGLE-STEP ENZYME 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

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

MOVING THE SOLID PHASE: A STATIONARY MICROFLUIDICS PLATFORM TECHNOLOGY FOR CARTRIDGE BASED SANDWICH IMMUNOASSAYS
R. Gottheil1, N. Baur1, H. Becker1, A. Geiger2, V. Hammer2, A. Normann2, A. Haage2, G. Link1, D. Maier1, N. Schneiderhan-Marra2, and M. Stelzle1
1 NMI Natural and Medical Sciences Institute, GERMANY, 2 microfluidic ChipShop GmbH, GERMANY, and 3 Mediagnost GmbH, GERMANY

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

FLUORESCENCE IN SITU HYBRIDIZATION (FISH) MICROFLUIDIC PLATFORM FOR DETECTION OF HER-2 OVER-EXPRESSION IN CANCER CELLS
K.-J. Kao1, C.-H. Tai2, W.-Y. Luo1, T.-S. Yeh3, and G.-B. Lee1
1 National Tsing Hua University, TAIWAN, 2 National Cheng Kung University, TAIWAN, and 3 Chang Gung University College of Medicine, TAIWAN

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

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

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. Slineo, B.C. Strachan, J.C. Lee, D.C. Miranian, K.A. Kelly, and J.P. Landers
University of Virginia, USA
M.155h HIGH PRODUCTION RATES OF STABLE DRUG-LOADABLE MICROBUBBLES TOWARD TARGETED, TRIGGERED DRUG DELIVERY
S.A. Peyman1, R. Abou-Saleh1, N. Ingram1, G. Marston1, P.L. Coletta2, and S.D. Evans1
1University of Leeds, UK and 2St. James’s Hospital, UK

M.156h MICROFLUIDIC-DIRECTED SYNTHESIS OF NANOSCALE LIPOSOMES FOR TRANSDERMAL DRUG DELIVERY
R.R. Hood1, E.L. Kendall1, W.N. Vreeland1, Z. Quezado3, M. Junqueira2, J.C. Finkel3, and D.L. DeVoe1
1University of Maryland, College Park, USA, 2National Institute of Standards and Technology, USA, and 3Children’s National Medical Center, USA

M.157h TOWARDS AN IMPLANTABLE PULSED MODE ELECTROLYTIC DRUG DELIVERY SYSTEM
Y. Yi1, U. Buttner1, and I.G. Foulds1
King Abdullah University of Science and Technology (KAUST), SAUDI ARABIA

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. Iwanaga1,2, Y. Morimoto1, and S. Takeuchi1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

M.160h MICROFLUIDIC PROTOCOL FOR IN VITRO CULTURE OF HUMAN EMBRYOS
Z. Hao1, D.C. Kieslinger2, C. Vergouw2, H. Kostelijik2, C.B. Lambalk2, and S. Le Gac1
1MESA+, University of Twente, THE NETHERLANDS and 2VU University Medical Center, THE NETHERLANDS

M.161h DEVELOPMENT OF A STRETCHABLE, PENETRATING ELECTRODE ARRAY FOR MEASURING INTRAMUSCULAR ELECTROMYOGRAPHIC ACTIVITY
G.S. Guvanasen3, R.J. Aguilar5, L. Guo3, C. Karnati2, S. Rajaraman6, T.R. Nichols1, and S.P. DeWeerth1,4,6
1Georgia Institute of Technology, USA, 2Axion BioSystems, Inc., USA, 3Massachusetts Institute of Technology, USA, and 4Emory University, USA

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

M.163h 3D IN VITRO MODEL OF NEURAL STEM CELL-VASCULAR NICHE
Y. Shin1, S. Han1, K. Yang1, S.-W. Cho2, and S. Chung1
1Korea University, SOUTH KOREA and 2Yonsei University, SOUTH KOREA

M.164h RAPID AND HIGH THROUGHPUT ANTIMICROBIAL SUSCEPTIBILITY TEST USING MORPHOLOGICAL ANALYSIS OF SINGLE CELLS WITH MICROFLUIDIC CHANNEL IN 96 WELL PLATFORM
J. Choi2, Y.-G. Jung1, E.K. Kim2,3, M. Lee1, J. Yoo1, and S. Kwon1
1Seoul National University, SOUTH KOREA, 2Quantamatrix Inc., SOUTH KOREA, and 3Inter-university Semiconductor Research Center (ISR), SOUTH KOREA
Electrophoretic Separations

**M.165i** DEVELOPMENT OF ELECTROSPRAY IONIZATION INTERFACE-INTEGRATED MICROCIP FOR MASS SPECTROMETRIC DETECTION IN ELECTROPHORESIS  
M. Oketani1, T. Kawarai1, T. Naito1, K. Sueyoshi1, T. Kubo1, F. Kitagawa1, and K. Otsuka1  
1Kyoto University, JAPAN, 2University of Illinois, USA, 3Osaka Prefecture University, JAPAN, and 4Hokkaido 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. Zhou1 and D.J. Harrison1,2  
1University of Alberta, CANADA and 2National Institute for Nanotechnology, CANADA

**M.170i** A NOVEL STATIONARY PHASE FOR LIGHT ALKANES SEPARATION IN MICROFABRICATED SILICON GAS CHROMATOGRAPHY COLUMNS  
D. Lefebvre1, F. Ricoul1, B. Charleux2, and C. Thieuleux2  
1Commissariat à l’énergie atomique (CEA), FRANCE and 2Université de Lyon, FRANCE

**M.171i** ONE-MINUTE SEPARATION OF BIOLOGICAL COMPOUNDS USING PILLAR ARRAY COLUMN WITH LOW DISPERSION AND LOW PRESSURE-DROP TURNS  
M. Isokawa1, K. Takatsuki2, K. Shih1, M. Kono2, Y. Song1, T. Sekiguchi1, J. Mizuno1, T. Funatsu1, S. Shoji1, and M. Tsunoda1  
1University of Tokyo, JAPAN and 2Waseda University, JAPAN

**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

**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

**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
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 HETEROGENEOUS 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. Uzawa, and Y. Satō  
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. Lu¹, T.-W. Liu¹, W. Ling¹, Y.-C. Su¹, S.-H. Liang², C.-H. Tai², and F.-G. Tseng¹ ²  
¹National Tsing Hua University, TAIWAN, ²Industrial Technology Research Institute, TAIWAN

Water/ Air/ Soil Management

M.183k  THERMALLY-TARGETED ADSORPTION AND ENRICHMENT IN MICROSCALE HYDROTHERMAL PORE ENVIRONMENTS  
A. Piyet, Y.A. Hassan, and V.M. U Gut  
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. Pihosh¹ ², Y. Kajita¹, K. Mawatari¹ ², and T. Kitamori¹ ²  
¹University of Tokyo, JAPAN and ²Japan 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. Kamiya¹, R. Kawano¹, T. Osaki¹, and S. Takeuchi²  
¹Kanagawa Academy of Science and Technology (KAST), JAPAN and ²University of Tokyo, JAPAN

Bioinspired, Biomimetic & Biohybrid Devices

M.186l  ANTAGONISTIC LIVING MUSCLE ACTUATOR  
Y. Morimoto¹ ², H. Onoe³ ², and S. Takeuchi²  
¹University of Tokyo, JAPAN and ²Japan 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
M.188l 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.189l POTENTIAL OF SINUSOIDAL GRADIENTS FOR DOSE RESPONSE ASSAYS IN DROPLET-BASED MICROFLUIDICS
M. Kielpinski1, T. Vasold1, P. Horbert1, K. Martin2, G. Mayer1, and T. Henkel1
1Institute of Photonic Technology (IPHT), GERMANY and
2Hans-Knöll-Institute (HKI), GERMANY

M.190l AUTOMATIC FOOD-PATHOGEN DETECTION ON A CENTRIFUGAL MICROFLUIDIC CARTRIDGE IN A COMMERCIALLY AVAILABLE PCR THERMOCYCLER
M.C. Weil1, W. Hauser2, D. Kosse1, O. Strohmeier1,3, F. von Stetten1,3, R. Zengerle1,3, and D. Mark1
1Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,
2Institut für Produktqualität, GERMANY, and 3University of Freiburg - IMTEK, GERMANY

16:00 - 16:30 BREAK AND EXHIBIT INSPECTION
RAPID FORMATION OF ANISOTROPIC NON-SPHERICAL HYDROGEL MICROPARTICLES WITH COMPLEX STRUCTURES USING A TABLETOP CENTRIFUGE-BASED MICROFLUIDIC DEVICE

M. Hayakawa1, H. Onoe2, K.H. Nagai2, and M. Takinoue1,3
1 Tokyo Institute of Technology, JAPAN, 2 University of Tokyo, JAPAN, and 3 Japan Science and Technology Agency (JST), JAPAN

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. Edgington, University of Illinois, Chicago, USA
S. Verpoorte, University of Groningen, THE NETHERLANDS
J. Lütters, University of Twente, THE NETHERLANDS

RAPID FORMATION OF ANISOTROPIC NON-SPHERICAL HYDROGEL MICROPARTICLES WITH COMPLEX STRUCTURES USING A TABLETOP CENTRIFUGE-BASED MICROFLUIDIC DEVICE

M. Hayakawa1, H. Onoe2, K.H. Nagai2, and M. Takinoue1,3
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. Nivedita1, P. Ligrani2, and I. Papautsky1
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

MICROFLUIDIC SYNTHESIS OF HYBRID MICROFIBER ENCAPSULATED WITH ENCODED MICROSферES

Y. Yu, H. Wen, and J. Qin
Chinese Academy of Sciences, CHINA

MULTIPLEX GPCR INTERNALIZATION ASSAY USING REVERSE TRANSDUCTION ON ADENOVRAL VECTOR IMMOBILIZED MICROPARTICLES

S. Han1, H.J. Bae2, W. Park2, and S. Kwon1
1 Seoul National University, SOUTH KOREA and 2 Kyung Hee University, SOUTH KOREA

MICROFLUIDIC SOLUTION ISOLATED PUMPING (µSIP)

J. Liu1,2, D. Mitra1, J.R. Waldeisen1, R.H. Henrikson1, Y. Park1, S. Li2, and L.P. Lee1
1 University of California, Berkeley, USA and 2 Harbin Institute of Technology, CHINA

MOLECULAR HYBRID MICROFIBER DEVICES WITH A COMPLEX STRUCTURE USING A TABLETOP CENTRIFUGE-BASED MICROFLUIDIC DEVICE

M. Hayakawa1, H. Onoe2, K.H. Nagai2, and M. Takinoue1,3
1 Tokyo Institute of Technology, JAPAN, 2 University of Tokyo, JAPAN, and 3 Japan Science and Technology Agency (JST), JAPAN

HIGH-THROUGHPUT SPERM SORTING BY SPERM FLOWING

K. Xu1, M.R. Begley2, and J.P. Landers1
1 University of Virginia, USA and 2 University of California, Santa Barbara, USA

LASER ABLATION BASED FAST PROTOTYPING OF FLUIDIC DIODE AND FINGER-DRIVEN MICRODEVICE FOR PRECISE METERING AND DELIVERY OF MULTI-SOURCE LIQUID REAGENTS

K. Xu, M.R. Begley2, and J.P. Landers1
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

08:30 - 09:30
HIGH-THROUGHPUT SALT/BIO-AGENT REMOVAL BY ION CONCENTRATION POLARIZATION FOR WATER DESALINATION, PURIFICATION, AND MONITORING
R. Kwak1,2, V.S. Pham1, B.J. Kim1, L. Chen3, and J. Han1,3
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. Shim1,2,3, R.T. Ranasinghe2, F. Hollfelder2, W.T.S. Huck4, D. Klenerman2, C. Abell2, and J. Cooper3
1 University of Leeds, UK,
2 University of Cambridge, UK,
3 University of Glasgow, UK,
4 Radboud University Nijmegen, THE NETHERLANDS

A HANDHELD MAGNETIC SENSING PLATFORM FOR ANTIGEN AND NUCLEIC ACID DETECTION
A. Pai1, A. Khachaturian1, S. Chapman1, A. Hu1, H. Wang1,2, and A. Hajimiri1
1 California Institute of Technology, USA and
2 Georgia Institute of Technology, USA

09:45 - 10:05
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

10:05 - 10:25
NANOPORES WITH ASYMMETRIC SPACING FOR RESISTIVE-PULSE SENSING OF VIRUS PARTICLES
Indiana University, USA

NOVEL DETECTION OF NON-ABSORBING MOLECULES BY OPTICAL NEAR-FIELD INDUCED THERMAL LENS MICROSCOPY
University of Tokyo, JAPAN

AN INTEGRATED MICROFLUIDIC SYSTEM FOR RAPID HBATIC MEASUREMENT
C.-C. Wu1, K.-W. Chang1, H.-I. Lin2, S.-C. Shiesh2, and G.-B. Lee3
1 National Tsing Hua University, TAIWAN and 2 National Cheng Kung University, TAIWAN

09:45 - 10:05
SESSION ROOM: Rothaus Arena / Halle 4
SESSION ROOM: K 8-9
SESSION ROOM: Halle 1

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

10:05 - 10:25
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

10:25 - 10:45
NANOPOROS WITH ASYMMETRIC SPACING FOR RESISTIVE-PULSE SENSING OF VIRUS PARTICLES
Indiana University, USA

NOVEL DETECTION OF NON-ABSORBING MOLECULES BY OPTICAL NEAR-FIELD INDUCED THERMAL LENS MICROSCOPY
University of Tokyo, JAPAN

AN INTEGRATED MICROFLUIDIC SYSTEM FOR RAPID HBATIC MEASUREMENT
C.-C. Wu1, K.-W. Chang1, H.-I. Lin2, S.-C. Shiesh2, and G.-B. Lee3
1 National Tsing Hua University, TAIWAN and 2 National Cheng Kung University, TAIWAN

10:25 - 10:45
SESSION ROOM: Rothaus Arena / Halle 4
SESSION ROOM: K 8-9
SESSION ROOM: Halle 1
### 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-BIOSERNS FOR MULTIPLEXED PATHOGEN DETECTION

X.J. Li, P. Zuo and D.C. Dominguez

University of Texas, USA

### 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\(^1\), S. Chang\(^2\), R.W. Davis\(^1\), and R.T. Howe\(^2\)

\(^1\)Stanford Genome Technology Center, USA and \(^2\)Stanford University, USA

### A UNIVERSAL PARTICLE ENCODING ARCHITECTURE


Massachusetts Institute of Technology, USA

### MAGNETIC BEAD-ROLLING FOR ULTRASENSITIVE SURFACE-BASED IMMUNOASSAYS

M. Cornaglia, T. Lehnert, and M.A.M. Gijs

École Polytechnique Fédérale 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\(^2\)

\(^1\)Wroclaw University of Technology, POLAND and \(^2\)Biosenisa Ltd., IRELAND

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### Session Chairs:

- H. Bruus, Technical University of Denmark, DENMARK
- E. Delamarche, IBM, SWITZERLAND
- N. Pamme, University of Hull, UK
- H. Hisamoto, Osaka Prefecture University, JAPAN
- H. Wu, Hong Kong University of Science and Technology, CHINA

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### Break and Exhibit Inspection

#### Session 2A2 - Particle Manufacturing and Encoding

- **H. Bruus**, Technical University of Denmark, DENMARK
- **S. Pennathur**, University of California, Santa Barbara, USA

#### Session 2B2 - Biomolecular Detection 2

- **E. Delamarche**, IBM, SWITZERLAND
- **H. Hisamoto**, Osaka Prefecture University, JAPAN

#### Session 2C2 - Point-of-Care Immunodiagnostics 2

- **N. Pamme**, University of Hull, UK
- **H. Wu**, Hong Kong University of Science and Technology, CHINA

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### 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\(^1\)
  - **University of California, Los Angeles, USA and 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-BIOSERNS FOR MULTIPLEXED PATHOGEN DETECTION**
  - X.J. Li, P. Zuo and D.C. Dominguez
  - **University of Texas, USA**

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### 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\(^1\), S. Chang\(^2\), R.W. Davis\(^1\), and R.T. Howe\(^2\)
  - **Stanford Genome Technology Center, USA and Stanford University, USA**

- **PAPER MICROFLUIDICS GOES DIGITAL**
  - R. Fobel, A.E. Kirby, and A.R. Wheeler
  - **University of Toronto, CANADA**

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### 11:55 - 12:15

- **A UNIVERSAL PARTICLE ENCODING ARCHITECTURE**
  - **Massachusetts Institute of Technology, USA**

- **MAGNETIC BEAD-ROLLING FOR ULTRASENSITIVE SURFACE-BASED IMMUNOASSAYS**
  - M. Cornaglia, T. Lehnert, and M.A.M. Gijs
  - **Ecole Polytechnique Fédérale 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\(^2\)
  - **Wroclaw University of Technology, POLAND and Biosenisa Ltd., IRELAND**

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### 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
### Fundamentals in Microfluidics and Nanofluidics

#### Wetting, Capillarity, Priming

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<th>T.001a</th>
<th>NEW MATHEMATICAL MODEL FOR ELECTROSTATIC STABILITY OF THE CASSIE STATE ON MEMS-BASED PILLARED SURFACE</th>
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<td>K.-Y. Song, K. Morimoto, and Y. Suzuki</td>
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#### Electrokinetic Phenomena

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<td>A. Bulbul1, A.S. Basu2, and H. Kim1</td>
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<td>1. University of Utah, USA and 2. Wayne State University, USA</td>
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<td>M. Fukuyama1,2 and A. Hibara2</td>
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<th>T.007a</th>
<th>MICRO AQUIFORM REACTION-CONTROL CAPSULE – USING TERNARY DROPLET COLLISION TO MODULATE THE CHEMICAL REACTION</th>
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<th>T.009a</th>
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<td>A. Yamaguchi1,2, F. Takagi3, K. Kobayashi4, T. Honda1, and Y. Saito5</td>
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<td>1. Seiko Epson Corporation, JAPAN, 2. Shinshu University, JAPAN, and 3. Shinshu University Hospital, JAPAN</td>
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| T.010a | WIDE RANGE DYNAMIC VOLUME RATIO AND SIZE CONTROL OF MICRDROPLETS USING ACTIVE DROPLET DIVISION DEVICE | |
|--------|--------------------------------------------------------------------------------------------------------|
|        | Waseda University, JAPAN                                                                               |

#### Droplets & Plugs, Multiphase Systems

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<th>T.012a</th>
<th>MANIPULATION OF MICROPARTICLES AND BIOLOGICAL CELLS USING LIGHT-INDUCED MARANGONI FLOW</th>
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<td>Technische Universität Darmstadt, GERMANY</td>
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**14:00 - 16:00**

**POSTER SESSION 2** - See floorplan on pages 28-29
T.013a  SINGLE-LAYER MICROFLUIDIC “DISC” DIODES VIA OPTOFLUIDIC LITHOGRAPHY FOR ULTRA-LOW REYNOLDS NUMBER APPLICATIONS  
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. Sno, K. Morishima, and Y. Akiyama  
Osaka University, 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 NANOFLO uid PUMP  
Y. Hiramatsu1, C. Wang1,2, H. Shimizu1,2, K. Mawatari1,2, and T. Kitamori1,2  
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

T.017a  PRESSURE-ASSISTED SELECTIVE ELECTROPRECONCENTRATION IN A STRAIGHT NANOCANAL  
A.-C. Louër1, A. Plecis2, A. Pallandre3, and A.-M. Haghiri-Gosnet1  
1CNRS, FRANCE, 2Evesys, FRANCE, and 3Université Paris Sud, FRANCE

Modeling/ Numerical Simulation with Experimental Proof

T.018a  DNA FOCUSING IN NANOFLO uidIC CHANNELS  
W.L. Hsu1, M.A. Startsev2, D.W. Inglis2, E.M. Goldys2, M.R. Davidson1, and D.J.E. Harvie1  
1University of Melbourne, AUSTRALIA and 2Macquarie 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 Nanoeengineering

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. Yazima, 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.C. Sip, R.T. 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. Höra1, Z. Shu2, E. Beckert2, S. Nagl2, and D. Belder2  
1Leipzig University, GERMANY and 2Fraunhofer-Institut für Angewandte Optik und Feinmechanik (IOF), GERMANY
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<td>OUT OF CLEANROOM, SELF-ASSEMBLED MAGNETIC ARTIFICIAL CILIA</td>
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<td>1Eindhoven University of Technology, THE NETHERLANDS and 2Dutch Polymer Institute (DPI), THE NETHERLANDS</td>
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<td>RAPID PROTOTYPING OF SELF ALIGNED 3D MICROFLUIDIC STRUCTURES</td>
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<td>1Toyohashi University of Technology, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN</td>
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<td>HETEROGENEOUS INTEGRATION OF SILICON FLUIDIC COMPONENTS IN POLYMER CHIPS</td>
<td>M.M. Mielnik, T.R. Tofteberg, and E. Andreassen</td>
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<td>University of California, Berkeley, USA</td>
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<td>I. Sanada1, H. Ito1, G.S. Prihandana1, M. Noborisaka1, N. Miki1, T. Suzuki1, and Y. Kanno2</td>
<td>1Keio University, JAPAN and 2Tokyo Medical University, JAPAN</td>
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<td>1Kyoto University, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN</td>
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<td>D. Onoshima1, N. Kaji1, M. Tokeshi2, and Y. Baba1,3</td>
<td>1Nagoya University, JAPAN and 2Hokkaido University, JAPAN, and 3National Institute of Advanced Industrial Science and Technology (AIST)</td>
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T.037b MECHANISM OF DNA COMBING THROUGH RECEDING MENISCUS ASSEMBLY ON MICROSTRUCTURED SUBSTRATE
B. Charlot1, F. Bardin1, N. Sanchez2, P. Teixeira3, and E. Schwob4
1Université Montpellier, FRANCE, 2Université de Nîmes, FRANCE, 3SANOPI, FRANCE, and 4IOMM CNRS, FRANCE

Sensors & Actuators, Detection Technologies

Micropumps, -Valves, -Dispensers
T.038c A HIGHLY INTEGRATED DOSING SYSTEM FOR DRUG DELIVERY APPLICATIONS
F. Thoma, F. GoldschmidtBoing, H. Feith, E. Müller, and P. Woias
University of Freiburg - IMTEK, GERMANY

T.039c ELECTROSTATICALLY DRIVEN VALVELESS PERISTALTIC GAS MICROPUMP WITH MULTIPLE ELECTRODES
K.S. Lee1, B. Kim1, and M.A. Shannon1
1University of Illinois, Urbana-Champaign, USA and 2Catholic University of Daegu, SOUTH KOREA

T.040c THERMOREVERSIBLE MODULAR MICROFLUIDIC VALVES USING EMISE IONOGEL
F. Benito-Lopez1, M. Antoñana1, D. Diamond1, and V. Castro-Lopez1
1CIC microGUNE, SPAIN and 2Dublin 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. Groenestaljin1, H. Zhang1, R.M. Tiggelaar1, T.S.J. Lammerink1, J.C. Lötters1, J.G.E. Gardeniers1, and R.J. Wiegerink1
1MESA+, University of Twente, THE NETHERLANDS and 2Bronkhorst 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

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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 DILECTROPHORESIS: ELECTROTHERMAL ANALYSIS AND ITS APPLICATIONS IN MICROFLUIDIC SAMPLE PREPARATION AND PROTEOMICS
Stanford University, USA

T.047c APTAMER-FUNCTIONALIZED MICROSPHERE FOR CONTINUOUS AND SELECTIVE CAPTURING AND FILTERING USING A NONPOROUS 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. Zhao1, D. Chen1, Y. Luo1, S. Huang2, H. Lee1, M. Wu1, R. Long1, J. Wang1, and J. Chen1
1Chinese Academy of Sciences, CHINA, 2Chang Gung University, TAIWAN, and 3University of Alberta, CANADA
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W. Hashimoto, T. Endo, K. Sueyoshi, and H. Hisamoto
Osaka Prefecture University, JAPAN

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

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

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S. Ketterer, D. Hoevermann, W. Weber, and M. Meier
University of Freiburg - IMTEK, GERMANY

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K.R. Balakrishnan and L.L. Sohn
University of California, Berkeley, USA

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

RAPID AIRBORNE PATHOGENS DETECTION SYSTEM USING DISPOSABLE IMPACTION CARTRIDGE
K. Takenaka1, S. Togashi2, and R. Miyake2
1Hitachi, Ltd., JAPAN and 2University of Tokyo, JAPAN

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

VOLUMETRIC IMPEDANCE BASED FLOW-THROUGH IMMUNOSensor USING AN INTEGRATED ELECTRODE ARRAY AND SILVER ENHANCEMENT
M.S. Wiederoder and D.L. DeVoe
University of Maryland, College Park, USA

PEDOT-CNT COMPOSITE MICRO-ELECTRODES FOR SENSITIVE DETECTION OF NEUROTRANSMITTERS
R. Samba1, W. Schuhmann2, S. Epple1, I. Matychin1, L. Kiesel1, and M. Stelzle1
1NMI Natural and Medical Sciences Institute, GERMANY, and 2Ruhr Universität Bochum, GERMANY

A NOVEL SPIROPYRAN-CONDUCTING POLYMER BIOSENSOR CHIP WITH ELECTROCHEMICAL AND PHOTOCHEMICAL SENSING PROPERTIES
M. Zanoni1, R. Gorkin, III2, D.L. Officer2, K. Wagner2, S. Gambhir2, G.G. Wallace2, and D. Diamond1
1Dublin City University, IRELAND and 2University of Wollongong, AUSTRALIA

LAB-ON-A-CHIP FOR ELECTROCHEMICAL MAGNETO-IMMUNOASSAY FOR ALZHEIMER’S BIOMARKER DETECTION
M. Medina-Sánchez1, S. Miserere3, E. Morales-Narváez2,3, and A. Merkoçi1,3
1Autonomous University of Barcelona, SPAIN, 2Polytechnic University of Catalonia, SPAIN, and 3Catalan Institute for Research and Advanced Studies (ICREA), SPAIN

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
Nippon Telegraph and Telephone Corporation, JAPAN

T.063c USB-TYPE POINT-OF-CARE SENSOR FOR STRIPPING ANALYSIS OF TRACE METALS
W. Kang1, X. Pei1, A. Bang1, E. Haynes1, W.R. Heineman1, and I. Papautsky1
1 University of Cincinnati, USA and 2 Xavier University, USA

T.064c MEASUREMENT OF THREE DIMENSIONAL FLOW STRUCTURE DURING MICRODROPLET FORMATION USING PHASE-LOCKED MULTICOLOR CONFOCAL MICRO-PIV
M. Oishi, H. Kinoshita, T. Fuji, 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

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1 University of Tokyo, JAPAN and 2 Japan Science and Technology Agency (JST), JAPAN

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1 University of Tokyo, JAPAN and 2 Kanagawa Academy of Science and Technology (KAST), JAPAN

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1 University of Tokyo, JAPAN and 2 Tokyo Institute of Technology, JAPAN

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1 University of Florida, USA and 2 Shaanxi Normal University, CHINA

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1Chungnam National University, SOUTH KOREA and 2Korea Institute of Science and Technology (KIST), SOUTH KOREA

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M.S. Kim1, H.-S. Moon1, S.S. Kim2, J.-M. Park1, and N. Huh1
1Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA and 2Samsung Electronics, SOUTH KOREA

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1Institute for Micromachining and Information Technology (ASG-IMIT), GERMANY, 2University of Freiburg – IMTEK, GERMANY, and 3University of Freiburg – BIOSS, GERMANY

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¹Osaka University, JAPAN and ²Nagoya University, JAPAN

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¹Pennsylvania State University, USA and ²Ascent Bio-Nano Technologies Inc., USA

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¹Flintridge Preparatory School, USA and ²University of California, Irvine, USA

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1Seoul National University, SOUTH KOREA and 2National Cancer Center, SOUTH KOREA

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1University of California, Los Angeles, USA, 2Vortex Biosciences, USA, and 3University of California, Los Angeles Medical Center, USA

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1Osaka University, JAPAN, 2RIKEN, JAPAN, and 3University of Tokyo, JAPAN

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1University of Maryland, College Park, USA and 2National Chung Hsing University, TAIWAN
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<td>1Nagoya University, JAPAN; 2Osaka University, JAPAN; and</td>
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1Nagoya University, JAPAN, 2Stockholm University, SWEDEN, 3Hokkaido University, JAPAN,
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1Siloam Biosciences Inc., USA and 2University of Cincinnati, USA

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1Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,
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1University of Maryland, Baltimore, USA, 2University of Maryland, College Park, USA, and
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1University of Tokyo, JAPAN, 2University of Lille 2, FRANCE, and 3University of Lille 1, FRANCE

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1University of Maryland, College Park, USA and 2University of Maryland School of Medicine, USA

HIGH THROUGHPUT PURIFICATION DEVICES FOR IN VIVO APPLICATIONS OF GENE–DELIVERY MULTIFUNCTIONAL ENVELOPE-TYPE NANODEVICES
M. Kaji1, D. Shigenaka1, M. Ukawa1, H. Akita1, H. Harashima2, and Y. Baba1,3
1Hokkaido University, JAPAN, 2Nagoya University, JAPAN, and 3National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

MUTIPHASE-LADEN GAS-LIQUID INTERFACE INJECTION FOR THE VERSATILE GENE TRANSFER
H. Kuriki1, S. Takasawa1, M. Iwabuchi1, K. Ohsumi1, T. Suzuki1, T. Higashiyama1, S. Sakuma1, F. Arai1, and Y. Yamanishi2
1Nagoya University, JAPAN, 2Shibaura Institute of Technology, JAPAN, and 3Osaka University, JAPAN

CONTINUOUS MANUFACTURING OF ROBUST LIVING FIBERS THAT WITHSTAND COMMON TEXTILE PROCESSING FOR TISSUE ENGINEERING APPLICATIONS
M. Akbari1,2,3, A. Tamayol1,2,3, V. Laforte1, N. Annabi2,3, A. Khademhosseini2,3, and D. Juncker1
1McGill University, CANADA, 2Harvard-MIT Division of Health Sciences and Technology, USA, and 3Brigham and Women’s Hospital, Harvard Medical School, USA

IN SITU CROSSLINKABLE HYDROGEL FOR RAPID ENGINEERING OF VASCULAR-LIKE STRUCTURES BY USING ELECTROCHEMICAL DETACHMENT OF CELLS
T. Kageyama1, T. Kakegawa2, T. Osaki1, T. Ito3, T. Nittami2, and J. Fukuda2
1University of Tsukuba, JAPAN, 2Shibaura Institute of Technology, JAPAN, and 3University of Tokyo, JAPAN

Cancer Research

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CIRCUITING TUMOR CELL (CTC) ENRICHMENT: ULTRA HIGH THROUGHPUT PROCESSING OF CLINICALLY RELEVANT BLOOD VOLUMES USING A MULTIPLEXED SPIRAL BIOCHIP
M.E. Warkiani1, B.L. Kho0, D.S.W. Tan1, A.A.S. Bhagat4, W.T. Lim4, J. Han1,2, and C.T. Lim3,4
1Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,
2National University of Singapore, SINGAPORE,
3National Cancer Centre Singapore, SINGAPORE,
4ClearbridgeBioMedics Pte Ltd., SINGAPORE, and
5Massachusetts Institute of Technology, USA

MICROFLUIDIC LIPOSOMES TARGETING HYPOXIA INDUCED TUMOR PROGRESSION
A.U. Andar1, R.R. Hood1, W.N. Vreeland1, A. Yang1, P. Shapiro2, D.L. DeVoe3, and P.W. Swaan1
1University of Maryland, Baltimore, USA, 2University of Maryland, College Park, USA, and
3National Institute of Standards and Technology (NIST), USA

REAL TIME BIO MECHANICAL CHARACTERIZATION OF DNA DAMAGE UNDER THERAPEUTIC RADIATION BEAMS
G. Perret1, T. Lacomerie1, M. Kumemura1, N. Lafitte1, H. Guillou1, L. Jalabert1, E. Lartigau2, T. Fujii1, F. Cleri1, H. Fujita1, and D. Collard1
1University of Tokyo, JAPAN, 2University of Lille 2, FRANCE, and 3University of Lille 1, FRANCE

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N. Nishiwaki1, T. Kasama2, A. Ishida1, H. Tani1, Y. Baba2,3, and M. Tokeshi1,2
1Hokkaido University, JAPAN, 2Nagoya University, JAPAN, and 3The Priority Research Project, JAPAN

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H. Ben-Yoav1, T.E. Winkler1, S.E. Chocron1, G.R. Costa1, S.M. Restaino1, N. Woolsey1, E. Kim1, D.L. Kelly2, G.P. Payne1, and R. Ghodssi1
1University of Maryland, College Park, USA and 2University of Maryland School of Medicine, USA

DRUG DELIVERY SYSTEMS

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HIGH THROUGHPUT PURIFICATION DEVICES FOR IN VIVO APPLICATIONS OF GENE–DELIVERY MULTIFUNCTIONAL ENVELOPE-TYPE NANODEVICES
M. Kaji1, D. Shigenaka1, M. Ukawa1, H. Akita1, H. Harashima2, and Y. Baba1,3
1Hokkaido University, JAPAN, 2Nagoya University, JAPAN, and 3National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T.154h

MUTIPHASE-LADEN GAS-LIQUID INTERFACE INJECTION FOR THE VERSATILE GENE TRANSFER
H. Kuriki1, S. Takasawa1, M. Iwabuchi1, K. Ohsumi1, T. Suzuki1, T. Higashiyama1, S. Sakuma1, F. Arai1, and Y. Yamanishi2
1Nagoya University, JAPAN, 2Shibaura Institute of Technology, JAPAN, and 3Osaka University, JAPAN

REGENERATIVE MEDICINE & TISSUE ENGINEERING

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CONTINUOUS MANUFACTURING OF ROBUST LIVING FIBERS THAT WITHSTAND COMMON TEXTILE PROCESSING FOR TISSUE ENGINEERING APPLICATIONS
M. Akbari1,2,3, A. Tamayol1,2,3, V. Laforte1, N. Annabi2,3, A. Khademhosseini2,3, and D. Juncker1
1McGill University, CANADA, 2Harvard-MIT Division of Health Sciences and Technology, USA, and 3Brigham and Women’s Hospital, Harvard Medical School, USA

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IN SITU CROSSLINKABLE HYDROGEL FOR RAPID ENGINEERING OF VASCULAR-LIKE STRUCTURES BY USING ELECTROCHEMICAL DETACHMENT OF CELLS
T. Kageyama1, T. Kakegawa2, T. Osaki1, T. Ito3, T. Nittami2, and J. Fukuda2
1University of Tsukuba, JAPAN, 2Shibaura Institute of Technology, JAPAN, and 3University of Tokyo, JAPAN
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Hungarian Academy of Sciences, HUNGARY

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T. Rieper¹, P. Čvančara¹, S. Gast², B. Wehrstein², A.N. Maurer², C. Mueller², and H. Reinecke¹
¹University of Freiburg - IMTEK, GERMANY and ²Novalung GmbH, GERMANY

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S. Huang, H.W. Hou, and J.J. Han
Massachusetts Institute of Technology, USA

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S. Wang and W. Du
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Y. Fukushima¹, T. Naito¹, K. Sueyoshi¹, T. Kubo¹, and K. Otsuka¹
¹Kyoto University, JAPAN and ²Osaka Prefecture University, JAPAN

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H. Sheng¹ and D.J. Harrison¹,²
¹University of Alberta, CANADA and ²National Research Council, CANADA

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¹Nagoya University, JAPAN, ²Osaka University, JAPAN, ³Hokkaido University, JAPAN, and ⁴National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

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C. Herzog¹, E. Becker¹, and S. Nagi¹
¹Leipzig University, GERMANY and ²Fraunhofer-Institut für Angewandte Optik und Feinmechanik (IOF), GERMANY

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J.D.P. Thomas¹, D.W. Olson¹, M.N. Joswiak¹,², S.-G. Park³, and K.D. Dorfman¹
¹University of Minnesota, USA, ²University of California, Santa Barbara, USA, and ³Korea Institute of Materials Science (KIMS), SOUTH KOREA

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H. Shimizu¹,², A. Smirnova¹,², K. Mawatari¹,², and T. Kitaori¹,²
¹University of Tokyo and ²Japan Science and Technology Agency (JST), JAPAN
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<td>Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA and University of the Witwatersrand, SOUTH AFRICA</td>
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Particle Separations

Microreaction Technology & Synthesis

Microreactors & Micromixers

Filtering & Separation

Chemical Synthesis

Particle Synthesis
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#### Fuel Cells

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</tr>
<tr>
<td>1Advanced Liquid Logic, Inc., USA and 2Duke University, USA</td>
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<tr>
<td>1National Taiwan University, TAIWAN, 2National Tsing Hua University, TAIWAN, 3Brigham and Women’s Hospital, Harvard Medical School, USA, 4Massachusetts Institute of Technology, USA, 5Academia Sinica, TAIWAN, and 6Harvard University, USA</td>
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<td>1Royal Institute of Technology (KTH), SWEDEN, 2Chalmers University of Technology, SWEDEN, and 3Technical University of Denmark, DENMARK</td>
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<tr>
<td>1Massachusetts Institute of Technology, USA, 2Robert Bosch GmbH, GERMANY, 3Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, and 4University of Freiburg - IMTEK, GERMANY</td>
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#### 16:00 - 16:30

**BREAK AND EXHIBIT INSPECTION**
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

PAPER-BASED MICROFLUIDIC ELECTROCHEMICAL IMMUNEDEVICES INTEGRATED WITH NANOBIOPROBES ON GRAPHENE FILM FOR ULTRASENSITIVE DETECTION OF CANCER BIOMARKERS
Y. Wu1, P. Xue1, K.M. Hui2, and Y. Kang1
1Nanyang Technological University, SINGAPORE and 2National 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

NON-FARADAIC ELECTROCHEMICAL DETECTION OF PATHOGENIC DNA AMPLIFIED BY TARGET DRIVEN SELF ASSEMBLY ON A CMOS PLATFORM
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 Technology, 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 3A1 - Point-of-Care Nucleic Acid Analysis

**SESSION ROOM: Rothaus Arena / Halle 4**

1. **09:45 - 10:05**
   - 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

2. **10:05 - 10:25**
   - High Throughput Formation of Sub-Million Lipid Membrane Arrays for Measuring Membrane Protein Activities  
R. Watanabe1,2, D. Fujita2, K.V. Tabata1, I. Yamauchi3, N. Soga3, S.H. Kim1, H. Sugai1, and H. Noji1,2  
1. University of Tokyo, JAPAN  
2. Japan Science and Technology Agency (JST), JAPAN  
3. Pohang University of Science and Technology, SOUTH KOREA

### Session 3B1 - Protein Processing and Analysis 1

**SESSION ROOM: K 6-9**

1. **09:45 - 10:05**
   - Low-Cost Bacterial Detection System for Food Safety Based on Automated DNA Extraction, Amplification and Readout  
M. Hoebl1,2, E. Schulte Bocholt2, N. Karippai2, R. Zengerle3,4, J. Steigert2, and A. Slocum1  
1. Massachusetts Institute of Technology, USA  
2. Robert Bosch GmbH, GERMANY  
3. Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY  
4. University of Freiburg - IMTEK, GERMANY

2. **10:05 - 10:25**
   - Probing Physical Properties of DNA-Protein Complexes Using Nanofluidic Channels  
K. Frykholm1, M. Alizadeheidari1, L. Fornander1, J. Wigenius1, P. Beuning2, M. Modesti3,4, F. Persson2, and F. Westerlund1  
1. Chalmers University of Technology, SWEDEN  
2. Northeastern University, USA  
3. Universite Aix-Marseille, FRANCE  
4. Uppsala University, SWEDEN

### Session 3C1 - Blood Processing

**SESSION ROOM: Halle 1**

1. **09:45 - 10:05**
   - 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

2. **10:05 - 10:25**
   - Acoustophoresis Separation of Bacteria from Blood Cells for Rapid SEPSIS Diagnostics  
P.D. Ohlsson, K. Petersson, P. Augustsson, and T. Laurell  
Lund University, SWEDEN

**Session Chairs:**

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

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**10:55 - 12:05**

**SESSION ROOMS:**

- Session Chairs:
SAMPLE-PRETREATMENT OF INFLUENZA A VIRUS BASED ON THE MICROBEAD INCORPORATED CENTRIFUGAL MICRODEVICE
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

NO-DIALYSATE MICROHEMODIALYSIS SYSTEM
H. Ito1, G.S. Prihandana1, I. Sanada1, M. Hayashi2, Y. Kanno2, and N. Miki
1Keio University, JAPAN and 2Tokyo Medical University, JAPAN

PROTEIN CRYSTALLIZATION INDUCED BY ELECTRICALLY DRIVEN BUBBLE KNIFE
H. Kuriki1, S. Takasawa2, S. Sakuma3, K. Shimura2, G. Kurisu2, F. Arai1, and Y. Yamanishi2
1Nagoya University, JAPAN, 2Shibaura Institute of Technology, JAPAN, and 3Osaka University, JAPAN

SESSION ROOM:
K 6-9

BREAK AND EXHIBIT INSPECTION

MICROFLUIDIC ELECTRO-SONOPORATION BY SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND ACOUSTIC FIELD
H. Wang1,2, W. Longsine-Parker1, C. Koo1,2, J. Kim3, B.J. Kim3, A. Jayaraman1, and A. Han1
1Texas A&M University, USA, 2Dankook University Graduate School, SOUTH KOREA, and 3University of Tokyo, JAPAN

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

SESSION ROOM:
K 6-9

SESSION ROOM:
Halle 1

SESSION ROOM:
Halle 1

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

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. Sevgan, A.V. Desai, C.M. Schroeder, and P.J.A. Kenis
University of Illinois, Urbana-Champaign, USA

ELECTROACTIVE MICROWELL ARRAY FOR QUANTITATIVE MEASUREMENT OF INTRACELLULAR ATP AT THE SINGLE-CELL LEVEL S.H. Kim1*, T. Fujii1*, and D. Fourny1*
1University of Tokyo, JAPAN, 2Japan Science and Technology Agency (JST), JAPAN, and 3CNRS, FRANCE

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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
C.T. Lim, National University of Singapore (NUS), SINGAPORE
J.W. Hong, Auburn University, USA
X. Zhang, University of Southampton, UK
V. Lee, National Tsing Hua University, TAIWAN
V. Taly, Université Paris Descartes, FRANCE

10:45 - 11:15

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Rothaus Arena / Halle 4

SESSION ROOM:
Rothaus Arena / Halle 4

CYTOPLASMIC TRANSFER BETWEEN ADHERED CELLS BY CELL FUSION THROUGH MICROSLOT
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

SESSION ROOM:
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SESSION ROOM:
Halle 1

MICROFLUIDIC ELECTROS-ONOPORATION BY SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND ACOUSTIC FIELD
H. Wang1*, W. Longsine-Parker1, C. Koo1, J. Kim3, B.J. Kim3, A. Jayaraman1, and A. Han1
1Texas A&M University, USA, 2Dankook University Graduate School, SOUTH KOREA, and 3University 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

10:25 - 10:45

BREAK AND EXHIBIT INSPECTION
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

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
DIELECTROPHORETIC SORTING OF MICROPARTICLES AND LYMPHOCYTES USING RAIL-TYPE ELECTRODES
K. Tatsumi1, H. Shintani1, Y. Katsumoto2, and K. Nakabe1
1Kyoto University, JAPAN and 2Sony Corporation, JAPAN

SELF-ROTATION AND ELECTROKINETIC PROPERTIES OF CELLS IN A NON-ROTATIONAL AC ELECTRIC FIELD
C. Benoit1, T. Honegger2, and D. Peyrade1
1LTM-CNRS, FRANCE and 2Massachusetts Institute of Technology, USA

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

ACTIVE SEQUENTIAL MERGING OF TWO REAGENTS ISOLATED IN MICRO DROPLETS IN MULTIPLE RATIOS
Waseda University, JAPAN

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

HIGH THROUGHPUT SINGLE CANCER CELL ENCAPSULATION AND SELF SORTING FOR PROTEASE ASSAY BY USING JETTING MICROFLUIDICS
T. Jing1,2, R. Ramji1, M.E. Warkiani1, C.T. Lim1,2, J. Han1,2, and C.-H. Chen1,3,4
1National University of Singapore, SINGAPORE; 2Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE; 3Massachusetts Institute of Technology, USA; and 4Singapore Institute for Neurotechnology (SINAPSE), SINGAPORE

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. Erhardt1,2, V. Nock1, J. Kieninger2, and G.A. Urban2
1University of Canterbury, NEW ZEALAND and 2University of Freiburg - IMTEK, GERMANY

PRECISE NANOFLUID GENERATION AND VOLUME CONTROL IN ELECTROWETTING MICROCHANNELS
Y. Liu, A. Banerjee, and I. Papautsky
University of Cincinnati, USA

SIZE BASED DROPLET SORTING WITH WIDE TUNING RANGE USING TENSIOPHORESIS
G.K. Kunup, and A.S. Bass
Wayne State University, USA

A NOVEL PARALLEL NANOMIXER FOR HIGH-THROUGHPUT SINGLE-MOLECULE FLUORESCENCE DETECTION
K. Mathwig1, S. Schlautmann1, S.G. Lemay1, and J. Hohlbein2
1MESA+, University of Twente, THE NETHERLANDS and 2Wageningen University, THE NETHERLANDS

LABEL-FREE OPTOFLUIDIC BIOMEMBRANE SENSING USING A PHOTONIC CRYSTAL NANOTWEEZER: THE WIGGLE ASSAY
P. Kang1, Y.-F. Chen2, and D. Erickson1
1Cornell University, USA and 2National Cheng Kung University, TAIWAN

NEGATIVE PHOTOTAXIS BEHAVIOR OF ORGANIC DROPLETS IN CHANNELS
L. Florea1, K. Wagner2, P. Wagner2, D.L. Officer2, G.W. Wallace2, F. Benito-Lopez1,3, and D. Diamond1
1Dublin City University, IRELAND; 2University of Wollongong, AUSTRALIA; and 3CIC microGUNE, SPAIN

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<td>1Institut Curie, FRANCE and 2PMMH-ESPO, FRANCE</td>
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<td>1Lund University, SWEDEN, 2Warsaw University of Technology, POLAND, and 3Dongguk University, SOUTH KOREA</td>
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<td>I. Iranmanesh1, R. Barmkob2, H. Bruus1, and M. Wiklund1</td>
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<td>1Royal Institute of Technology (KTH), SWEDEN and 2Danmarks Tekniske Universitet (DTU), DENMARK</td>
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<td>K.-T. Liao1,2, N.S. Swami2, and C.-F. Chou1</td>
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<td>L. Gutzweiler1, F. Stumpf2, L. Riegger1, P. Koltay1, R. Zengerle1, and L. Tanguy2</td>
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<td>1University of Freiburg - IMTEK, GERMANY and 2Institute for Micromachining and Information Technology (hSG-IMIT), GERMANY</td>
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<td>DIRECT CHEMICAL-COMPUTER INTERFACE FOR LIVING CELL ANALYSIS</td>
<td>T. Hoshino, A. Wagatsuma, and K. Mabuchi</td>
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<td>1National Nanofab Center, SOUTH KOREA and 2University of Michigan, USA</td>
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University of Washington, USA

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1Sun Yat-sen University, CHINA, 2Chinese Academy of Sciences, CHINA,
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H. Chen and A. Guenther
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SIMPLE AND SMART MICROFLUIDIC GEL ACTUATOR
K. Ito1, S. Sakuma2, Y. Yokoyama3, and F. Arai1
1Nagoya University, JAPAN, 2Osaka University, JAPAN, and 3Toyama Industrial Technology Center, JAPAN

MASKED PLASMA OXIDATION METHOD AS A SIMPLE MICROPATTERNING OF EXTRACELLULAR MATRIX IN A CLOSED MICROCHAMBER ARRAY
K. Hattori1, R. Yoshimitsu2, S. Sugiru1, A. Maruyama2, K. Ohnuma2, and T. Kanamori1
1National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and 2Nagaoka University of Technology, JAPAN

MICROTUBULE GLIDING AT THE BOUNDARY OF KINESIN AND DYNEIN PATTERNED SURFACE
J. Ikuta1, N.K. Kamisetty2, H. Shintaku1, H. Koterai1, and R. Yokokawa1,2
1Kyoto University, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

PROTEIN-DNA CONJUGATE ARRAY CHIP FOR ON-CHIP DIRECTED EVOLUTION
S. Ueno1, R. Kobayashi2, M. Biyani1, and T. Ichiki1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

PAPER WITHDRAWN

FABRICATION OF PLANAR MICROFLUIDIC DEVICE FOR ARTIFICIAL DARWINIAN SELECTION TECHNOLOGY
S. Sato1, S. Fukuda1, T. Hirai1, S. Ueno1, M. Biyani1, T. Akagi1,2, and T. Ichiki1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

PROTEIN-DNA CONJUGATE ARRAY CHIP FOR ON-CHIP DIRECTED EVOLUTION
S. Ueno1, R. Kobayashi2, M. Biyani1, and T. Ichiki1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

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<td>Y. Tanaka</td>
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G. Bahrieh, M. Erdem, E. Özgür, U. Gündüz, and H. Külah
Middle East Technical University (METU), TURKEY

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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. Xiao1,2, Z. Cao1, Z.F. Huang1, Z. Xu1, J.X. Fu1, and L. Yobas2
1 Hong Kong Baptist University, HONG KONG, and 2Hong Kong University of Science and Technology, HONG KONG, and Beijing Jiaotong University, CHINA

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

W.054c NOISE-IMMUNE SILICON NANOWIRE/CMOS HYBRID BIOSENSOR USING TOP-DOWN APPROACH
J. Lee1, S. Hwanj1, B. Choi1, S. Choi1, J.H. Lee2, B.-G. Park2, D.M. Kim1, S.-J. Choi1, and D.H. Kim1
1 Kookmin University, SOUTH KOREA and 2Seoul National University, SOUTH KOREA

W.055c RAPID AND AUTOMATED FORMATION OF SUSPENDED LIPID BILAYER ARRAYS FOR PARALLEL ION CHANNEL AND PROTEIN NANOPORE RECORDING
G. Baaken1,2, E. Zaitseva1,2, S. Petersen1, J.M. del Rio Martinez1, and J.C. Behrends1
1 University of Freiburg, GERMANY and 2Ionera 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

W.057c A MICROMACHINED MICROPRECONCENTRATOR DESIGN BASED ON QUANTITATIVE SIMULATION STUDY FOR VOLATILE ORGANIC COMPOUNDS GAS SENSING
N. Kakita1, H. Miyashita1, S. Kishida1, J.-O. Lee2, and S.-S. Lee1
1 Tottori University, JAPAN and 2Korea Research Institute of Chemical Technology, SOUTH KOREA

W.058c A VOC SENSOR BASED ON MICROMECHANICAL CANTILEVER FUNCTIONALIZED WITH ZNO NANORODS
N. Kilinc1, O. Cakmak1, A. Kosemen2,3, E. Ermek1, S. Oztuk1, Y. Yerli1, and H. Urey1
1 Koc University, TURKEY, 2Gebze Institute of Technology, TURKEY, and 3Mus Alparslan University, TURKEY

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H.T. Zhao, Y. Yang, L.K. Chin, and A.Q. Liu
Nanyang Technological University, SINGAPORE

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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
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Y. Kazoe, K. Yamamoto, K. Masawata, and T. Kitamori
University of Tokyo, JAPAN

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A. Iles1,2, D. Bernard3, and D. Sideris1
1Genetic Microdevices Ltd., UK, 2University of Hull, UK, and 3Nordson 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

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S. Panich, K.A. Wilson, and J.B. Edel
Imperial College London, UK

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H. Matsui1, F. Hagihara2, T. Wada1, and S. Konishi1
1Ritsumeikan University, JAPAN and 2Kyokko Electric Co., Ltd., JAPAN

W.059c FABRICATION OF HYDROGEL-BASED TWO-DIMENSIONAL PHOTONIC CRYSTAL FOR OPTICAL SENSOR APPLICATION
T. Araki, T. Endo, K. Suyeshi, and H. Hisamotio
Osaka Prefecture University, JAPAN

W.070c 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.071c RAPID λ BACTERIOPHAGE DETECTION VIA CO-CULTURE OF HOST CELL ESCHERICHIA COLI BY DROPLET OPTOFUIDIC 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
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. Kasai1, C. Wang2, H. Shiizu2, Y. Kazoe1, K. Mawatari2, and T. Kitamori1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN
W.075d FABRICATION OF THREE-DIMENSIONAL MICROFLUIDIC CHANNELS IN A SINGLE LAYER OF CELLULOSE PAPER
X. Li and Y.X. 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

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

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. Lee¹, H.C. Kim¹, and H. Chun²
¹Seoul National University, SOUTH KOREA and ²Korea University, SOUTH KOREA

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. Neilid
Monash University, AUSTRALIA

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. Calwik¹, O. Strohmeyer¹, I. Schwarz¹, N. Paust¹, S. Zehnle¹, F. von Stetten¹,², R. Zengerle¹,², and D. Mark¹
¹Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, ²University of Freiburg – IMTEK, GERMANY, and ³University of Freiburg – BIOSS, GERMANY

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. Guayang, 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. Armasia, S. Zelenit, H. Ramachandraiah, P. Asalapuram, and A. Russom
Royal Institute of Technology (KTH), SWEDEN
W.088d  ELECTROKINETIC CONCENTRATION ON A MICROFLUIDIC CHIP USING POLYELECTROLYTIC GEL PLUGS FOR SMALL MOLECULE DETECTION
D. Han1, Y.-R. Kim2, J. Kim3, and T.D. Chung1
1Seoul National University, SOUTH KOREA, 2University of Warwick, UK, and
3Kyung Hee University, SOUTH KOREA

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. Kloke1, S. Niekraszewitz2, A.R. Fiebach1, J. Bernhardt1, R. Kneusel2, K. Schemel2, J. Ritzel2, F. von Stetten1, R. Zengerle1, and N. Paust1
1Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY and
2Diarect AG, GERMANY

W.092d  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.093d  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.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

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. Jin1, S.M. McFaul1, and H. Ma2
1University of British Columbia, CANADA and 2Vancouver General Hospital, CANADA

W.099e  PIEZOELECTRIC INKJET-BASED SINGLE-CELLS PRINTING BY IMAGE PROCESSING FOR HIGH EFFICIENCY AND AUTOMATIC CELL PRINTING
R. The1, S. Yamaguchi2, A. Ueno2, Y. Akiyama1, and K. Morishima1
1Osaka University, JAPAN and 2Microjet Corporation, JAPAN

W.100e  LABEL-FREE CELL SEPARATION BASED ON SIZE AND DEFORMABILITY USING MICROFLUIDIC RESETTABLE CELL TRAPS
W. Beattie1, X. Qin1, and H. Ma1,2
1University of British Columbia, CANADA and 2Vancouver General Hospital, CANADA
W.101e  STANDING SURFACE ACOUSTIC WAVE BASED ON-CHIP, SHEATHLESS FLOW CYTOMETER  
Y. Chen1, A.A. Navaz1, Y. Zhao1, L. Wang1, and T.J. Huang1  
1Pennsylvania State University, USA and 2Ascent Bio-Nano Technologies Inc., USA  

W.102e  CELL LAYOUTER: LABEL-FREE CELL ISOLATION AND ASPIRATION SYSTEM OF CIRCULATING TUMOR CELLS  
T. Masuda1, Y. Sun1, M. Nii1, A. Yusa1, H. Nakanishi1, and F. Arai2  
1Nagoya University, JAPAN, 2Aichi Science and Technology Foundation, JAPAN, and 3Aichi Cancer Center Research Institute, JAPAN  

W.104e  ULTRA-HIGH PURITY CAPTURE OF CIRCULATING TUMOR CELLS AND GENE MUTATIONS DETECTION  
Institut Curie, FRANCE  

W.105e  CELL ORDERING USING PINCH FLOW MICROCHANNEL FOR SINGLE CELL KINASE ASSAY  
R. Ramji1, A.A.S. Bhagat2, C.T. Lim1, and C.-H. Chen1,2  
1National University of Singapore, SINGAPORE, 2ClearBridge Biomedics Pte. Ltd., SINGAPORE, and 3Singapore Institute for Neurotechnology (SIAPSE), SINGAPORE  

W.106e  DYNAMIC BEHAVIOR ANALYSIS OF SINGLE CELLS USING DROPLET MICROFLUIDICS  
M.A. Khoshidi1, P.K. Periyannan Rajeswari1, C. Wahbly2, H.N. Joensson1, and H. Andersson Svahn1  
1Royal Institute of Technology (KTH), SWEDEN and 2Uppsala University, SWEDEN  

W.107e  LAB-ON-A-CHIP SPECTROPHOTOMETRIC “FIELD OF QUALITY” ASSESSMENT OF DOG OOCYTES  
P. Śniadek1, R. Walczak1, D. Juziuban1, M. Woźna2, M. Rybska2, D. Bukowska1, and J. Jaskowski1  
1Wrocław University of Technology, POLAND and 2Poznan University of Life Sciences, POLAND  

W.108e  MICROFLUIDIC SENSOR USING RESONANCE FREQUENCY MODULATION FOR CHARACTERIZATION OF SINGLE CELLS  
N. Haandbæk1, O. With1, S.C. Bürgel1, F. Heer2, and A. Hierlemann1  
1ETH Zürich, SWITZERLAND and 2Zurich Instruments AG, SWITZERLAND  

W.109e  OOCYTE MECHANICAL CHARACTERIZATION BY ROBOT INTEGRATED MICROFLUIDIC CHIP FOR HIGH-THROUGHPUT QUALITY EVALUATION  
S. Sakuma1 and F. Arai2  
1Osaka University, JAPAN and 2Nagoya University, JAPAN  

W.110e  REAL-TIME SECRETION ANALYSIS REVEALED CORRELATION OF IL-β RELEASE AND LOSS OF CELL MEMBRANE INTEGRITY  
Y. Shirasaki1, M. Yamagishi1, K. Izawa2, K. Nakagawa2, A. Nakahara2, N. Suzuki2, J. Mizuno1, T. Sekiguchi1, T. Heike1, R. Nishikomori3, S. Shoji3, and O. Ohara1  
1Institute of Physical and Chemical Research (RIKEN), JAPAN, 2Kyoto University, JAPAN, and 3Waseda 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  

W.112e  ACTIVE DRUG LOADING OF MICROFLUIDIC-SYNTHESIZED LIPOSOMES  
R.R. Hood1, W.N. Vreeland2, and D.L. DeVoe3  
1University of Maryland, College Park, USA and 2National Institute of Standards and Technology (NIST), USA  

The 17th International Conference on Miniaturized Systems for Chemistry and Life Sciences  
27-31 October 2013  
Freiburg, Germany  

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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

UNIFORM-SIZED PROTEOLIPOSOME FORMATION BY USING ELECTROSpray FOR MICROSCOPIC MEMBRANE PROTEIN ASSAYS
T. Osaki1,2, K. Kamiya1, R. Kawano1, R. Iino1,2, H. Noji2,3, and S. Takeuchi1,2
1Kanagawa Academy of Science and Technology, JAPAN, 2University of Tokyo, JAPAN, and 3Japan Science and Technology Agency (JST), JAPAN

CULTIVATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS WITH CONTROLLED AGGREGATE SIZE AND GEOMETRICAL ARRANGEMENT BY INVERTING MICROWELL ARRAY CHIP
T. Satoh1,2, S. Sugihara1, K. Sumaru1, S. Ozaki2, S. Gomi2, T. Kurakazu2, Y. Oshima2, and T. Kanamori1
1National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and 2Tokyo Electron Limited, JAPAN

CELL-SURFACE AFFINITY OF THE REFERENCE SURFACE IS KEY TO OBSERVE SPECIFIC CELL RESPONSES TO SUBSTRATE-BOUND CUES
McGill University, CANADA

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

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

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

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

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

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

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

IN-SITU MONITORING TO MECHANOSTRESS RESPONSES USING MICROFLUIDIC DEVICE
Y. Nakashima1,2, Y. Yang2, and K. Minami2
1Kumamoto University, JAPAN and 2Yamaguchi University, JAPAN
W.125e  ON-CHIP IMMUNOELECTROPHORESIS FOR EVALUATING SURFACE PROTEINS OF EXOSOMES AT SINGLE-PARTICLE LEVEL FOR DIAGNOSTIC APPLICATION
T. Akagi1, K. Kato2, N. Hanamura1, N. Kosaka3, T. Ochiya3, and T. Ichiki3
1University of Tokyo, JAPAN and 2National Institute Cancer Center, JAPAN

W.126e  DIRECT ELECTROPORATION OF ADHERENT CELLS BY HYDROGEL-BASED MICROELECTRODES
M. Nishizawa1 and K. Nagamine2
1Tohoku University, JAPAN and 2Japan 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. Haguet1,2,3, P. Obeïd,1,2,3, R. Griffin1,2,3, D. Freida1,2,3, L. Guyon1,2,3, and X. Gidrol1,2,3
1Commissariat à l’énergie atomique (CEA), FRANCE, 2INSERM, FRANCE, 3University Grenoble-Alpes, FRANCE, and 4CNRS, FRANCE

1Institute for Bioengineering of Catalonia (IBEC), SPAIN, 2Centro de Investigación Biomédica en Red de Biobioingeniería, Biomateriales y Nanomedicina, SPAN, 3Barcelona Centre for International Health Research (CRESIB), SPAN, 4Barcelona University, SPAN, and 5Institució Catalana de Recerca i Estudis Avançats (ICREA), SPAN

W.130f  ON-CHIP ABSORPTION AND METABOLISM MODEL FOR PHARMACOKINETIC STUDIES
H. Kimura1,4, H. Nishiyama2, S. Sawa2, T. Higashiyama1,3, and H. Arata1
1Japan Science and Technology Agency (JST), JAPAN, 2Kumamoto University, JAPAN, 3Nagoya University, JAPAN, and 4Kobe University, JAPAN

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. Hida1,2, H. Nishiyama1, S. Sawa1, T. Higashiyama2,3, and H. Arata1
1Japan Science and Technology Agency (JST), JAPAN, 2Kumamoto University, JAPAN, 3Nagoya University, JAPAN, and 4Kobe University, JAPAN

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

Organs & Organisms

1Institute for Bioengineering of Catalonia (IBEC), SPAIN, 2Centro de Investigación Biomédica en Red de Biobioingeniería, Biomateriales y Nanomedicina, SPAN, 3Barcelona Centre for International Health Research (CRESIB), SPAN, 4Barcelona University, SPAN, and 5Institució Catalana de Recerca i Estudis Avançats (ICREA), SPAN

W.130f  ON-CHIP ABSORPTION AND METABOLISM MODEL FOR PHARMACOKINETIC STUDIES
H. Kimura1,4, H. Nishiyama2, S. Sawa2, T. Higashiyama1,3, and H. Arata1
1Japan Science and Technology Agency (JST), JAPAN, 2Kumamoto University, JAPAN, 3Nagoya University, JAPAN, and 4Kobe University, JAPAN

W.131f  ELECTROPHYSIOLOGICAL ANALYSIS OF NEMATODE LARVAE WITH AN INTEGRATED MICROFLUIDIC PLATFORM
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H. Hida1,2, H. Nishiyama1, S. Sawa1, T. Higashiyama2,3, and H. Arata1
1Japan Science and Technology Agency (JST), JAPAN, 2Kumamoto University, JAPAN, 3Nagoya University, JAPAN, and 4Kobe University, JAPAN

Sample Preparation (Whole Blood, Saliva, Cells, Tissue, Food, etc.)
W.136g PORTABLE DIGITAL MICROFLUIDIC/MASS SPECTROMETRY METHOD FOR QUANTIFICATION OF DRUGS OF ABUSE IN URINE
N.M. Lafrenière1, A.E. Kirby1, B. Seale1, E. Gritzan1, J.T. Shelley2, P.I. Hendricks2, R.G. Cooks2, and A.R. Wheeler2
1University of Toronto, CANADA and 2Purdue University, USA

W.137g DETECTION OF OIL-UTILIZING MICROORGANISMS BY NUCLEIC ACID SEQUENCE-BASED AMPLIFICATION IN A TOTAL ANALYSIS LAB-ON-A-CHIP DEVICE
B.K. Honsvall1,2, A. Ezkerra3,4, A. Gulliksen5, T. Dong1, and F. Karlsen1,5
1Vestfold University College, NORWAY, 2Trilobite Microsystems AS, NORWAY, 3CIC MicroGUNE, SPAIN, 4IK4-Ikerlan, SPAIN, and 5NorChip AS, NORWAY

W.138g FOIL-BASED DNA MELTING CURVE ANALYSIS PLATFORM FOR LOW-COST POINT-OF-CARE MOLECULAR DIAGNOSTICS
A. Ohlander1, S. Bauer1, H. Ramachandraiah2, A. Russom1, and K. Bock1,3
1Fraunhofer Research Institution for Modular Solid State Technologies EMFT, GERMANY, 2KTH Royal Institute of Technology, SWEDEN, and 3Technical 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 MULTIPLY PCR AMPLIFICATION DIRECTLY FROM WHOLE BLOOD
R.S. Wiederkehr1,2, B. Jones1, S. Peeters1, T. Stakenborg1, O. Ibrahim1,3, P. Fiorini1, H. Tanake1, I. Yamashita1, T. Matsuno1,2, and L. Laga1
1imec, BELGIUM, 2Katholieke Universiteit Leuven, BELGIUM, 3Alexandria University, Alexandria, EGYPT, 4Consortium Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA, and 5Panasonic Corporation, JAPAN

W.141g THERMALLY-MULTIPLEXED MICROFLUIDIC PCR
C.R. Phaneuf1, N. Pak1, D.C. Saunders1, E. Popler2, N. Nagpal1, R. Jerris3, A. Shane2, and C.R. Forest1
1Georgia Institute of Technology, USA, 2Emory University, USA, and 3Children’s Healthcare of Atlanta, USA

Clinical Chemistry

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

Drug Development

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. Song1, K. Takatsuki2, M. Isokawa1, T. Sekiguchi1, J. Mizuno1, T. Funatsu1, S. Shoji1, and M. Tsunoda1
1University of Tokyo, JAPAN and 2Waseda University, JAPAN

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

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

W.136g PORTABLE DIGITAL MICROFLUIDIC/MASS SPECTROMETRY METHOD FOR QUANTIFICATION OF DRUGS OF ABUSE IN URINE
N.M. Lafrenière1, A.E. Kirby1, B. Seale1, E. Gritzan1, J.T. Shelley2, P.I. Hendricks2, R.G. Cooks2, and A.R. Wheeler2
1University of Toronto, CANADA and 2Purdue University, USA

W.137g DETECTION OF OIL-UTILIZING MICROORGANISMS BY NUCLEIC ACID SEQUENCE-BASED AMPLIFICATION IN A TOTAL ANALYSIS LAB-ON-A-CHIP DEVICE
B.K. Honsvall1,2, A. Ezkerra3,4, A. Gulliksen5, T. Dong1, and F. Karlsen1,5
1Vestfold University College, NORWAY, 2Trilobite Microsystems AS, NORWAY, 3CIC MicroGUNE, SPAIN, 4IK4-Ikerlan, SPAIN, and 5NorChip AS, NORWAY

W.138g FOIL-BASED DNA MELTING CURVE ANALYSIS PLATFORM FOR LOW-COST POINT-OF-CARE MOLECULAR DIAGNOSTICS
A. Ohlander1, S. Bauer1, H. Ramachandraiah2, A. Russom1, and K. Bock1,3
1Fraunhofer Research Institution for Modular Solid State Technologies EMFT, GERMANY, 2KTH Royal Institute of Technology, SWEDEN, and 3Technical 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 MULTIPLY PCR AMPLIFICATION DIRECTLY FROM WHOLE BLOOD
R.S. Wiederkehr1,2, B. Jones1, S. Peeters1, T. Stakenborg1, O. Ibrahim1,3, P. Fiorini1, H. Tanake1, I. Yamashita1, T. Matsuno1,2, and L. Laga1
1imec, BELGIUM, 2Katholieke Universiteit Leuven, BELGIUM, 3Alexandria University, Alexandria, EGYPT, 4Consortium Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA, and 5Panasonic Corporation, JAPAN

W.141g THERMALLY-MULTIPLEXED MICROFLUIDIC PCR
C.R. Phaneuf1, N. Pak1, D.C. Saunders1, E. Popler2, N. Nagpal1, R. Jerris3, A. Shane2, and C.R. Forest1
1Georgia Institute of Technology, USA, 2Emory University, USA, and 3Children’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

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. Song1, K. Takatsuki2, M. Isokawa1, T. Sekiguchi1, J. Mizuno1, T. Funatsu1, S. Shoji1, and M. Tsunoda1
1University of Tokyo, JAPAN and 2Waseda University, JAPAN

W.147g ELECTRICAL IMPEDANCE SPECTROSCOPY FOR LABEL-FREE, CONTINUOUS MONITORING OF DRUG IMPACT ON 3D TISSUE SPHEROIDS
S.C. Bürgel, J.X. Kim, A. Hierlemann, and O. Frey
ETH Zürich, SWITZERLAND
KINETIC MEASUREMENTS USING THE FREQUENCY RESPONSE OF INTERACTING BIOMOLECULES SUBJECTED TO A THERMAL MODULATION
K. Boumine, X. Zhao, and C. Gosse
CNRS, FRANCE

RAPID AND HIGH SENSITIVITY MALARIA DIAGNOSIS: A MICROFLUIDICS APPROACH
T.F. Kong1,2, W.K. Peng1, H.W. Hou3, Marcos4, N.T. Nguyen1,2, and J. Han1,4
1Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE, 2Nanyang Technological University, SINGAPORE, 3Griffith University, AUSTRALIA, and 4Massachusetts Institute of Technology, USA

DETECTION AND QUANTIFICATION OF MINORITY KRAS SUBCLONES IN TUMORS USING DROPLET-BASED MICROFLUIDICS: CLINICAL IMPLICATION
D. Pekin1,2, C. Normand1, S. Kotsopoulos2, X. Li3, L. Benhaim4, O. Bouché5, T. Lecomte6, D. Le Corre7, T. Hor1, Z. El Harrak8, P. Nizard9, D. Link10, J.B. Hutchinson11, P. Laurent-Puig12, and V. Taly13
1Université Paris Descartes, FRANCE, 2Université de Strasbourg, FRANCE, 3Raindance Technologies, USA, 4Centre Hospitalier Universitaire de Reims, FRANCE, and 5Université de Tours, FRANCE

DETECTION AND QUANTIFICATION OF MINORITY KRAS SUBCLONES IN TUMORS USING DROPLET-BASED MICROFLUIDICS: CLINICAL IMPLICATION
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1Université Paris Descartes, FRANCE, 2Université de Strasbourg, FRANCE, 3Raindance Technologies, USA, 4Centre Hospitalier Universitaire de Reims, FRANCE, and 5Université de Tours, FRANCE

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T. Rajabi1, V. Huck2, R. Ahrens3, Ch. Bussing4, J. Fauser5, S.W. Schneider6, and A.E. Guber7
1Karlsruhe Institute of Technology, GERMANY and 2Heidelberg University, GERMANY

STREAMLINING CELL BIOLOGY WORKFLOWS: INTEGRATING SUSPENSION CULTURE, CELL LYSIS, PROTEIN EXTRACTION AND NUCLEIC ACID EXTRACTION
T.E. de Groot1, B.P. Casavant, K.S. Veserat, L.N. Strotman, S.M. Berry, and D.J. Beebe
University of Wisconsin, USA

CHARACTERIZATION OF NANOPARTICLE PERMEABILITY ON A MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE
1Toyo University, JAPAN, 2Japan Women’s University, JAPAN, 3University of Tokyo, JAPAN, and 4Kyushu University, JAPAN

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

SINGLE-STEP DRUG CRYSTALLIZATION AND FORMULATION - ‘DESIGNER’ PHARMACEUTICALS ENABLED BY MICROFLUIDICS
R.A.L. Leon1, W.Y. Wan1, A.Z.M. Bedruddoza2, T.A. Hatton1,2, and S.A. Khan1,2
1National University of Singapore, SINGAPORE, and 2Massachusetts Institute of Technology, USA
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

MATHEMATICAL MODELING FOR THE SELF-ORGANIZATION OF CELLS
N. Kojima1, Y. Ogata2, S. Nakaoka3, and Y. Sakai1
1Yokohama City University, JAPAN, 2University of Tokyo, JAPAN, and 3Riken Yokohama Institute, JAPAN

SKIN PRINTER: MICROFLUIDIC APPROACH FOR SKIN REGENERATION AND WOUND DRESSINGS
L. Leng1, S. Amini-Nik1,2, Q. Ba1, M. Jeschke1,2, and A. Guntner1
1University of Toronto, CANADA and 2Sunnybrook Health Sciences Centre, CANADA

LONG-TERM IMPLANTATION OF PRIMARY ISLET CELL-ENCAPSULATING HYDROGEL MICROFIBERS IN DIABETIC MICE
H. Onoe1,2, T. Okitsu1,2, A. Itou1,2, and S. Takeuchi1,2
1University of Tokyo and 2Japan Science and Technology Agency (JST), JAPAN

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

SKIN-EMITTED ACETONE DETECTION TOWARD SELF-MONITORING OF FAT METABOLISMS
Y. Yamada1, S. Hiyama1, T. Toyooka1, H. Onoe1, and S. Takeuchi2
1NTT DOCOMO, Inc., JAPAN and 2University of Tokyo, JAPAN

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Indiana University, USA

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Y. Zhao1, F. Pereira2, A. de Mello2, B.D. Levy2, R.M. Baron2, and J. Han1
1Massachusetts Institute of Technology, USA and 2Brigham and Women's Hospital, and Harvard Medical School, USA

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N. Nordman1, B. Barrios-Lopez1, S. Laurén2, P. Suvanto2, T. Kotiaho1, S. Franssila1, R. Kostiainen1, and T. Sikanen1
1University of Helsinki, FINLAND and 2Aalto University, FINLAND

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

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S.B. King and K.D. Dorfman
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J.T. Del Bonis-O’Donnell, D. Fygenson, and S. Pennathur  
University of California, Santa Barbara, USA

DEVELOPMENT OF MILLION PLATES LIQUID CHROMATOGRAPHY USING EXTENDED-NANO CHANNEL  
Y. Liu1,2, H. Shimizu1,2, A. Smirnova1,2, K. Mawatari1,2, and T. Kitamori1,2  
1University of Tokyo and 2Japan Science and Technology Agency (JST), JAPAN

A LOW-POWER AND SMALL-VOLUME PARTICLE SEPARATION DEVICE BASED ON CIRCULAR TRAVELLING-WAVE ELECTROOSMOSIS  
S.-C. Lin1, Y.-L. Sung1, Y.-C. Tung1, and C.-T. Lin1  
1National Taiwan University, TAIWAN and 2Academia Sinica, TAIWAN

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

LOW CONCENTRATION OIL SEPARATION AND DETECTION FROM ENVIRONMENTAL WATER SAMPLES THROUGH ACOUSTOPHORESIS  
H. Wang1, S. Kim1, C. Koo2, Y. Cha1, Y.-J. Kim1, and A. Han1  
1Texas A&M University, USA and 2Seoul National University of Science and Technology, SOUTH KOREA

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

LOGIC OPERATION IN DNA NANO DEVICE: ELECTRICAL INPUT/OUTPUT THROUGH BIOLOGICAL NANOPORES  
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1Kanagawa Academy of Science and Technology, JAPAN, 2University of Tokyo, JAPAN, and 3Keio University, JAPAN

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V.F. Cardoso, L. Rebouta, S. Lanceros-Méndez, and G. Minas  
University of Minho, PORTUGAL

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1Nagoya University, JAPAN, 2Osaka University, JAPAN, and 3National Institute of Advanced Industrial Science and Technology, (AIST), JAPAN

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

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M. Afsharzad, Y. Hassan, E. Kumacheva, G. Scholes, and A. Günther  
University of Toronto, CANADA
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<td>W.180j</td>
<td>POLYPLEX SYNTHESIS BY &quot;MICROFLUIDIC DRIFTING&quot; BASED THREE-DIMENSIONAL HYDRODYNAMIC FOCUSING METHOD</td>
<td>M. Lu1, Y.-P. Ho2,3, C.L. Grigsby4, A.A. Nawaz5, P.-H. Huang1, K.W. Leong1, and T.J. Huang1</td>
<td>Pennsylvania State University, USA, 1Duke University, USA, and Interdisciplinary Nanoscience Center (iNANO), DENMARK</td>
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### Applications to Green & Environmental Technologies

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<td>University of Tokyo, JAPAN and 1Japan Science and Technology Agency (JST), JAPAN</td>
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#### Water/Air/Soil Management

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<td>J. Petr, P. Svobodová, L. Vojtková, A. Suchomelová, A. Přibylka, and R. Knob</td>
<td>Palacký University, Olomouc, CZECH REPUBLIC</td>
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<td>GATE CONTROLLED HIGH EFFICIENCY BALLISTIC ENERGY CONVERSION SYSTEM</td>
<td>Y. Xie, D. Bos, H. de Boer, A. van den Berg, and J.C.T. Eijkel</td>
<td>MESA+, University of Twente, THE NETHERLANDS</td>
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### MicroTAS for Other Applications

#### Synthetic Biology

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<td>W.184l</td>
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<td>S. Ma, I.A. Saaem, and J. Tian</td>
<td>Duke University, USA</td>
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<td>W.185l</td>
<td>FATE MANIPULATION OF PC-12 CELL USING MICROFLUIDIC DEVICE</td>
<td>H. Ryu1, M. Chung1, S.S. Lee2, N.L. Jeon1, and O. Pertz1</td>
<td>1Seoul National University, SOUTH KOREA, 2ETH Zürich, SWITZERLAND, and 3University of Basel, SWITZERLAND</td>
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#### Bioinspired, Biomimetic & Biohybrid Devices

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<td>W.186l</td>
<td>DROPLET-BOX: A PLATFORM FOR BIOLOGICAL-NANOPORE-BASED LOGICAL OPERATION USING LIPID-COATED DROPLET NETWORK</td>
<td>H. Yasuga1, 2, R. Kawano1, M. Takinour1, Y. Tsuji1, T. Osaki1, 2, K. Kamiya1, N. Miki1, 2, and S. Takeuchi1, 2</td>
<td>Kanagawa Academy of Science and Technology, JAPAN, University of Tokyo, JAPAN, Keio University, JAPAN, and Tokyo Institute of Technology, JAPAN</td>
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<td>W.187l</td>
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<td>University of Toronto, CANADA</td>
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<td>W.188l</td>
<td>MICROALGAL CULTURE, LIPID PRODUCTION AND EXTRACTION USING AN INTEGRATED MICROFLUIDIC SYSTEM</td>
<td>H.S. Lim, J.Y.H. Kim, H.S. Kwak, and S.J. Sim</td>
<td>Korea University, SOUTH KOREA</td>
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### Food & Nutrition

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<td>W.189l</td>
<td>AUTOMATED ON-SITE DETECTION OF ORGANOPHOSPHOROUS PESTICIDES IN REAL FOOD SAMPLES</td>
<td>L. Drechsel1, M. Schulz2, F. von Stetten1, 2, R. Zengerle1, 2, and N. Pautz1, 2</td>
<td>1Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, 2University of Freiburg – IMTEK, GERMANY, and 3University of Freiburg – BIOSS, GERMANY</td>
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#### MicroTAS for Other Applications

16:00 - 16:30 **BREAK AND EXHIBIT INSPECTION**
SESSION ROOM: Rothaus Arena / Halle 4  
Session 3A3 - Single Cell Processing and Analysis 2

Session Chairs:

S. Ekström, Lund University, SWEDEN  
H. Ma, University of British Columbia, CANADA  
M. Yamada, Chiba University, JAPAN

TOWARDS A MICROFLUIDIC SINGLE-CELL IMMUNE CHIP  
M. Junkin, A. Kaestli, and S. Tay  
ETH Zürich, SWITZERLAND

SHAKEN, AND STIRRED  
M. Abolhasani, A. Oskooei, R. Kumacheva, and A. Günther  
University of Toronto, CANADA

16:30 - 16:50

OPTICAL CELL PICKING IN PHOTODEGRADABLE HYDROGELS BASED ON CELLULAR MORPHOLOGY IN 3D CULTURE ENVIRONMENT  
M. Tamura1, F. Yanagawa2, S. Sugiura2, T. Takagi2, K. Sumaru2, H. Matsui1, and T. Kanamori2  
1University of Tsukuba, JAPAN and 2National 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

16:50 - 17:10

CIRCUMFERENTIAL MOLECULAR DELIVERY INTO SINGLE CELLS VIA CELL-ROLLING MEDIATED ELECTROPORATION IN MICROFLUIDIC CHANNELS  
M. Zheng, J.W. Shan, H. Lin, D.J. Shreiber, and J.D. Zahn  
Rutgers, 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

17:10 - 17:30

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

MULTIPLEX REAL-TIME MONITORING OF CELLULAR METABOLIC ACTIVITY USING A REDOX-REACTIVE NANOWIRE BIOSENSOR  
L.C. Haung, V. Krivitsky, V. Naddaka, Y.K. Conroy, H. Peretz-Soroka, and F. Patolsky  
Tel Aviv University, ISRAEL

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CHARACTERIZATION OF DYE LEAKAGE IN MICROFLUIDIC DROPLETS  
Y. Chen, M. Pan and S.K.Y. Tang  
Stanford University, USA

19:00 - 23:30  
Conference Banquet at the Konzerthaus Freiburg
### THURSDAY 31 October

**SESSION ROOM:** Rothaus Arena / Halle 4  
**SESSION ROOM:** K 6-9  
**SESSION ROOM:** Halle 1

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<td><strong>PLENARY PRESENTATION VIII</strong></td>
<td>A. Hira, Tokyo Institute of Technology, JAPAN</td>
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<td>S. Franssila, Aalto University, FINLAND</td>
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<td>J. M. Lim, L.M. Gilson, S. Chopra, R.S. Langer, O.C. Farokhzad, and R. Karnik</td>
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<td><em>Massachusetts Institute of Technology, USA and</em> <em>Bingham and Women’s Hospital-Harvard Medical School, USA</em></td>
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<td>DEVELOPMENT OF SUBSECOND TIME-SCALE LIQUID-LIQUID EXTRACTION PROCESSES</td>
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<td><em>Chiba University, JAPAN</em></td>
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<td>CUSTOMIZED HPLC IN GLASS CHIPS</td>
<td>S. Thürmann, and D. Belder</td>
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<td>ANALYSIS OF AXON GUIDANCE IN SINGLE NEURONS USING A LARGE ARRAY OF</td>
<td>N. Bhattacharjee, and A. Folch</td>
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<td>MICROFLUIDIC GRADIENT GENERATORS</td>
<td><em>University of Washington, USA</em></td>
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<td>10:25 - 10:45</td>
<td><strong>ANNOUNCEMENTS</strong></td>
<td>V. Ugaz, Texas A&amp;M University, USA</td>
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<td>F. von Stetten, HSG-AMT, Europe, GERMANY</td>
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<td>A. Hira, Tokyo Institute of Technology, JAPAN</td>
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<td>S. Franssila, Aalto University, FINLAND</td>
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<td>H. Lu, Georgia Institute of Technology, USA</td>
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<td>10:45 - 11:15</td>
<td><strong>BREAK AND EXHIBIT INSPECTION</strong></td>
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**Session Chairs:**

- **V. Ugoz**, Texas A&M University, USA
- **F. von Stetten**, HSG-AMT, Europe, GERMANY
- **A. Hira**, Tokyo Institute of Technology, JAPAN
- **S. Franssila**, Aalto University, FINLAND
- **H. Lu**, Georgia Institute of Technology, USA

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**Plenary Presentation VIII**

**Chair:** A. Manz, KIST Europe GmbH, GERMANY

**From Single Cells to Artificial Cells: How Microfluidics Can Contribute to a Better Understanding of Cellular Processes**

Petra S. Dittrich

EHT Zürich, SWITZERLAND
ISOTHERMAL AMPLIFICATION OF DNA ON TIPS OF SILICON NANOTWEEZERS AND ITS ELECTRICAL AND MECHANICAL CHARACTERIZATION
M. Kumemura1, S.L. Karsten2, N. Lafitte1, H. Guillou3, L. Jalabert1, H. Fujita1, and D. Collard1
1University of Tokyo, JAPAN, 2NeuroInDx. Inc., USA, and 3CNRS 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 MUCROSITIES
O. Frey, P.M. Misun, and A. Hierlemann
ETH Zürich, SWITZERLAND

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. Oana1, K. Nishikawa1, H. Matsuhara2, A. Yamamoto2, T.G. Yamamoto3, T. Haraguchi3, Y. Hiraoka4, and M. Washizu1
1University of Tokyo, JAPAN, 2Shizuoka University, JAPAN, 3National Institute of Information and Communications Technology (NICT), JAPAN, and 4Osaka 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. Zhang1, M. Montgomery1, A. Pahnke1, L. Reis1, S.S. Nunes1, and M. Radisic1
1University of Toronto, CANADA and 2University Health Network, CANADA

DRY SAMPLE PRESERVATION USING A SLIPCHIP
S. Begolo1, F. Shen2, and R.F. Ismagilov1
1California Institute of Technology, USA and 2Slipchip LLC, USA

DISPOSABLE MICROFLUIDIC CHIP WITH INTEGRATED LIGHT SHEET ILLUMINATION ENABLES DIAGNOSTICS BASED ON MEMBRANE VESICLES
H. Deschout1, K. Raemdonck1, S. Stremersch1, A. Hendrix3, M. Bracke3, R. Van den Broecke3, M. Röding4, M. Rudemo4, J. Demeester1, S. De Smedt1, F. Strubbe1, K. Neyts1, and K. Braeckmans1
1Ghent University, BELGIUM, 2Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND, 3Ghent University Hospital, BELGIUM, and 4Chalmers University of Technology, SWEDEN

CURVATURE-INDUCED SPONTANEOUS DETACHMENT OF VASCULAR SMOOTH MUSCLE CELL SHEETS: TOWARDS VASCULAR SELF ASSEMBLY IN MICROCHANNELS
T. Yamashita1, P. Kollmannsberger2, K. Mawatari1,3, V. Vogel2, and T. Kitamori1,3
1University of Tokyo, JAPAN, 2ETH Zürich, SWITZERLAND, and 3Japan Science and Technology Agency (JST), JAPAN

SESSION ROOM: Rothaus Arena / Halle 4
Session 4A2 - Nucleic Acid Processing
G. Demenic, F. Hoffmann-La Roche AG, SWITZERLAND

SESSION ROOM: K 6-9
Session 4B2 - Cell Biology
T.J. Huang, Pennsylvania State University, USA

SESSION ROOM: Halle 1
Session 4C2 - Tissue Engineering
A. Felch, University of Washington, USA

Session Chairs:

11:15 - 11:35
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1University of Toronto, CANADA and 2University Health Network, CANADA

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1University of Tokyo, JAPAN, 2ETH Zürich, SWITZERLAND, and 3Japan Science and Technology Agency (JST), JAPAN
### 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\(^1\)

1LPN-CNRS, FRANCE and 2University 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\(^1\), and A.K. Singh\(^1\)

1Sandia National Laboratory, USA, 2Los Alamos National Laboratory, USA, and 3University of New Mexico, USA

### MICROFLUIDIC PERFUSION CULTIVATION SYSTEM FOR A MULTILAYER STRUCTURED TUBULAR TISSUES
Y. Yamagishi\(^1\), T. Masuda\(^1\), M. Matsusaki\(^2\), M. Akashi\(^2\), and F. Arai\(^1\)

1Nagoya University, JAPAN and 2Osaka University, JAPAN

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

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<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>12:45 - 13:05</td>
<td>MicroTAS 2014 Announcement</td>
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<td>13:05 - 13:20</td>
<td>Lab on a Chip Widmer Poster Award</td>
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<td>13:20 - 13:35</td>
<td>CHEMINAS Young Researcher Poster Awards</td>
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<td>13:35</td>
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