



Preliminary Technical Program

The Executive Committee reserves the right to amend the program if necessary.

Sunday, October 22

08:30 **Workshop Registration**

09:00 - 12:00 **Morning Workshops**

Workshop 1

COMMERCIALIZATION OF MICROFLUIDICS

Holger Becker

microfluidic ChipShop, GERMANY

Workshop 2

LAB-ON-A-CHIP (LOC) TECHNOLOGIES FOR THE ISOLATION OF CIRCULATING MARKERS: APPLICATION IN LIQUID BIOPSIES

Steven Soper

University of Kansas, USA

Workshop 3

3D PRINTING MICROFLUIDIC CHIPS

Michael Breadmore¹, Rosanne Guijt², Nial MacDonald¹, and Greg Nordin³

¹University of Tasmania, AUSTRALIA, ²Deakin University, AUSTRALIA, and

³Brigham Young University, USA

Workshop 4

CARING FOR CELLS IN MICROSYSTEMS: ENSURING CELL-SAFE DEVICE DESIGN AND OPERATION

Joel Voldman, Massachusetts Institute of Technology, USA

Sarvesh Varma, Massachusetts Institute of Technology, USA

Workshop 5

POINT-OF-CARE DIAGNOSTICS AT RESOURCE LIMITED SETTINGS

Aman Russom

KTH Royal Institute of Technology, SWEDEN

Workshop 6

NETWORKED LABS-ON-CHIPS (NLOCS): A PASSIVE DROPLET ROUTING CONCEPT FOR TWO-PHASE FLOW MICROFLUIDICS

Werner Haselmayr, Robert Wille, and Andreas Grimmer

Johannes Kepler University Linz, AUSTRIA

14:00 - 17:00 Afternoon Workshops

Workshop 7

MINIATURIZATION OF BIOMOLECULAR DIAGNOSTICS: HYBRID APPROACHES ACROSS ELECTRONICS, PHOTONICS AND MICROFLUIDICS

Mehdi Javanmard¹, Kaushik Sengupta², Sam Emaminejad³, Jeff Zahn¹, Stephen Chou², Ken Shepard⁴, and Shan Wang⁵

¹*Rutgers University, USA*, ²*Princeton University, USA*, ³*University of California, Los Angeles, USA*, ⁴*Columbia University, USA*, and ⁵*Stanford University, USA*

Workshop 8

INERTIAL MICROFLUIDICS

Jian Zhou and Ian Papautsky

University of Illinois, Chicago

Workshop 9

FUNCTIONAL DROPLETS FOR FEMTOLITER-SCALE SYNTHETIC BIOLOGY

Manish Biyani

Japanese Advanced Institute of Science and Technology (JAIST), JAPAN

Workshop 10

INFLAMMATION RESEARCH ENABLED BY MICROFLUIDICS

Daniel Irimia

Harvard Medical School, USA

Workshop 11

INCORPORATING THE NEEDS OF USERS INTO POINT-OF-CARE DIAGNOSTICS

Jacqueline Linnes¹, Elizabeth Johansen², and Ashok A. Kumar³

¹*Purdue University, USA*, ²*Spark Health Design, USA*, and ³*Jana Care, USA*

17:00 - 19:00 Conference Registration and Check-In

17:00 - 19:00 Wine & Cheese Welcome Reception Westin Savannah Harbor Golf Resort & Spa

Monday, October 23

07:00 **Registration**

08:00 **Opening Remarks**
MicroTAS 2017 Conference Chairs

Plenary Presentation I - Interview

Chatham Ballroom A/B, Second Floor

08:30 **A CONVERSATION WITH GEORGE WHITESIDES**
George Whitesides¹ and Thomas Laurell²
¹Harvard University, USA and ²Lund University, SWEDEN

Plenary Presentation II

Chatham Ballroom A/B, Second Floor

09:30 **NANOBIODEVICES AND AI FOR SOCIETY 5.0: SUPER SMART SOCIETY**
Yoshinobu Baba
Nagoya University, JAPAN

10:15 **Break: Exhibit and Poster Inspection**

Session 1A1 - Disease Diagnostics

Chatham Ballroom A/B, Second Floor

10:45 **MULTIPLEXED CYTOKINE DETECTION FOR IMMUNODIAGNOSTICS USING SILICON PHOTONIC MICRORING RESONATOR ARRAYS**
H.M. Robison^{1,2}, P. Escalante³, E. Valera², C.L. Erskine³, L. Auvil², H.C. Sasieta³, C. Bushell², M. Welge², and R.C. Bailey^{1,2}
¹University of Michigan, USA, ²University of Illinois, Urbana-Champaign, USA, and ³Mayo Clinic, USA

11:05 **AN INTEGRATED ELECTRICAL ENZYME-LINKED IMMUNOSORBENT ASSAY (E²LISA) FOR POINT-OF-CARE DIAGNOSIS OF TUBERCULOSIS USING GLYCAN BIOMARKERS**
A. Sarkar^{1,2}, L.L. Lu¹, J. Han², and G. Alter¹
¹Massachusetts General Hospital, USA and ²Massachusetts Institute of Technology, USA

- 11:25 THE FEVERDISK: MULTIPLEX DETECTION OF FEVER-CAUSING PATHOGENS FOR RAPID DIAGNOSIS OF TROPICAL DISEASES**
S. Hin¹, B. Lopez-Jimena², M. Bakheit³, V. Klein¹, S. Stack⁴, C. Fall⁵, A. Sall⁵, K. Enan⁶, S. Frischmann³, L. Gillies⁴, M. Weidmann², S. Goethel⁷, V. Rusu⁷, O. Strohmeier^{1,8}, N. Paust^{1,8}, R. Zengerle^{1,8}, and K. Mitsakakis^{1,8}
¹University of Freiburg, GERMANY, ²University of Stirling, UK, ³Mast Diagnostica GmbH, GERMANY, ⁴Mast Group Limited, UK, ⁵Institut Pasteur de Dakar, SENEGAL, ⁶Central Laboratory, SUDAN, ⁷MagnaMedics Diagnostics BV, NETHERLANDS, and ⁸Hahn-Schickard, GERMANY

- 11:45 DETECTING PATHOGENS WITH VISCOSITY-BASED MEASUREMENTS**
K.N. Clayton, T.J. Moehling, D.H. Lee, G.D. Berglund, A.J. Witten, S.T. Wereley, J.C. Linnes, and T.L. Kinzer-Ursem
Purdue University, USA

Session 1B1 - DNA Analysis
Chatham Ballroom C, Second Floor

- 10:45 DNA METHYLATION STATUS DETECTION BY MELTING CURVE ANALYSIS IN DROPLET-BASED MICROCHIP**
F.-W. Liu¹, H.-F. Liao¹, S.-P. Lin^{1,2}, and Y.-W. Lu¹
¹National Taiwan University, TAIWAN and ²Academia Sinica, TAIWAN
- 11:05 DEVELOPMENT OF DIGITAL DROPLET PCR (DDPCR) DEVICE DRIVEN BY CENTRIFUGATION MEDIATED BUOYANCY**
T. Mitsumaki, K. Takahashi, M. Saito, W.V. Espulgar, and E. Tamiya
Osaka University, JAPAN
- 11:25 LABEL-FREE QUANTIFICATION OF DNA IN DROPLETS**
G.K. Kurup and A.S. Basu
Wayne State University, USA
- 11:45 PHASE-CHANGING PARTITIONS FOR SIMPLE AUTOMATION OF MULTI-STEP REACTIONS IN A SINGLE-TUBE FORMAT**
J.P. Goertz and I.M. White
University of Maryland, USA

Session 1C1 - Nanoparticle Synthesis
Room 203 - 205

- 10:45 INTEGRATED MICROFLUIDIC CHIP FOR PLASMA SYNTHESIS OF NANOPARTICLES AND ON-SITE DETECTIONS OF Hg²⁺ IONS**
D.-E. Li and C.-H. Lin
National Sun Yat-sen University, TAIWAN

- 11:05** **PARALLELIZED MICROFLUIDICS FOR LARGE-SCALE SYNTHESIS OF MULTICOMPONENT NANOPARTICLES**
M.J. Toth and Y. Kim
Georgia Institute of Technology, USA
- 11:25** **MICROFLUIDIC STUDIES OF BI-PHASIC LIGAND EXCHANGE OF SEMICONDUCTOR NANOCRYSTALS**
M. Abolhasani^{1,2}, Y. Shen¹, C.W. Coley¹, and K.F. Jensen¹
¹*Massachusetts Institute of Technology, USA* and ²*North Carolina State University, USA*
- 11:45** **HIGH-THROUGHPUT, CONTROLLABLE SYNTHESIS OF NANOMATERIALS ENABLED BY A SHARP-EDGE-BASED ACOUSTOFLUIDIC MICROMIXER**
S. Zhao¹, P.-H. Huang¹, M. Wu², N. Nama², and T.J. Huang¹
¹*Duke University, USA* and ²*Pennsylvania State University, USA*
- 12:05 - 13:35** **Lunch**
Exhibit Hall B, First Floor

Session 1A2 - 3D Printing - Fundamentals
Chatham Ballroom A/B, Second Floor

- 13:35** **Keynote Presentation**
MINIATURIZING 3D PRINTED MICROFLUIDICS
G.P. Nordin, H. Gong, and A.T. Wooley
Brigham Young University, USA
- 14:05** **MULTI-MATERIAL 3D PRINTED MICROFLUIDIC CIRCUITRY ELEMENTS**
J.D. Hubbard, C. Manny, A. Montgomery, B. Freeman, A. Boyle, and R.D. Sochol
University of Maryland, USA
- 14:25** **THREE-DIMENSIONAL PRINTING OF TRANSPARENT FUSED SILICA MICROFLUIDIC CHIPS**
F. Kotz, K. Arnold, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY

Session 1B2 - Antibiotic Resistance
Chatham Ballroom C, Second Floor

- 13:35** **Keynote Presentation**
ALL-IN-ONE DROPLET MICROFLUIDIC CHIPS FOR BIOMOLECULAR ASSAYS
T.-H.J. Wang
Johns Hopkins University, USA

14:05 UNRAVELING BACTERIAL NETWORKS AND THEIR ANTIMICROBIAL SUSCEPTIBILITY ON SILICON MICROARCHITECTURES USING INTRINSIC PHASE-SHIFT SPECTROSCOPY

H. Leonard¹, Y. Haimov¹, L. Holtzman¹, S. Halachmi², O. Nativ², and E. Segal¹

¹*Technion - Israel Institute of Technology, ISRAEL and*

²*Bnai Zion Medical Center, ISRAEL*

14:25 DIRECT AND RAPID ANTIMICROBIAL SUSCEPTIBILITY TESTING FOR EXPEDITE TREATMENT OF BLOOD STREAM INFECTION

H.Y. Jeong¹, J. Choi², G.Y. Lee¹, S. Han², T. Lim^{1,2}, S. Han², B. Jin², H. Kim², S. Song², S. Park², E.-G. Kim², D.Y. Kim², T.S. Kim³, and S. Kwon^{1,2,3}

¹*Seoul National University, KOREA, ²Quantamatrix Inc., KOREA, and*

³*Seoul National University Hospital, KOREA*

Session 1C2 - Nanowire Synthesis

Room 203 - 205

13:35 Keynote Presentation

SERPENTINE SI NANOWIRE BIOSENSOR FOR DIGITAL SENSING OF SINGLE VIRUS

P. Zang¹, Y. Liang¹, H. Wang¹, J. Tao², X. Zeng², D. Zhou^{1,2}, and W. Hu^{1,2}

¹*University of Texas, Dallas, USA and ²Fudan University, CHINA*

14:05 CROSS-MEMBRANE ELECTRICAL DETECTION OF DNA

M. Guo¹, I. Hernández-Neuta², N. Madaboosi², M. Nilsson², and W. van der Wijngaart¹

¹*KTH Royal Institute of Technology, SWEDEN and ²Stockholm University, SWEDEN*

14:25 CONTROLLED FORMATION OF SPIDER SILK NANOWIRES, SURFACE COATINGS, AND SHEETS

L. Gustafsson, R. Jansson, M. Hedhammar, and W. van der Wijngaart

KTH Royal Institute of Technology, SWEDEN

14:45 - 16:45 Poster Session 1

Exhibit Hall A, First Floor

Poster presentations are listed by topic category with their assigned number starting on page 27.

14:45 - 16:45 Exhibitor Industrial Stage 1

River Concourse, First Floor

Session 1A3 - C. Elegans

Chatham Ballroom A/B, Second Floor

- 16:45** **MICROFLUIDIC-BASED *IN VIVO* IMAGING PLATFORMS FOR MECHANOSENSATION IN *C. ELEGANS* LARVAE**
Y. Cho, S.-A. Lee, D.N. Oakland, and H. Lu
Georgia Institute of Technology, USA
- 17:05** **A MICROFLUIDIC PLATFORM FOR AUTOMATED PHENOTYPING DURING FULL LIFESPAN OF *CAENORHABDITIS ELEGANS* AT HIGH-THROUGHPUT**
H.B. Atakan, M. Cornaglia, L. Mouchiroud, J. Auwerx, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- 17:25** **DYNAMIC MULTICHEMICAL STIMULATION FOR ANALYZING CHEMOSENSORY CIRCUITS IN *C. ELEGANS***
T. Rouse¹, G. Aubry¹, M. Zimmer², and H. Lu¹
¹*Georgia Institute of Technology, USA and*
²*Research Institute of Molecular Pathology, AUSTRIA*

Session 1B3 - Electrokinetic Separations

Chatham Ballroom C, Second Floor

- 16:45** **ELECTROPHORETIC CYTOMETRY REVEALS HETEROGENEITY IN CYTOSKELETAL MOLECULAR STATES OF CANCER CELLS**
J. Vlassakis and A.E. Herr
University of California, Berkeley, USA
- 17:05** **ORTHOGONAL, HIGH-PERFORMANCE FRACTIONATION OF POLYMER MICROPARTICLES IN MICROFLUIDIC CHANNELS USING FLOW-INDUCED ELECTROKINETIC TRAPPING**
S. Fernández-Poza, P.P.M.F.A. Mulder, and E. Verpoorte
University of Groningen, NETHERLANDS
- 17:25** **CONTINUOUS EXTRACTION DEPLETION ZONE ISOTACHOPHORESIS (Edz-ITP)**
V.A. Papadimitriou, L.I. Segerink, A. van den Berg, and J.C.T. Eijkel
University of Twente, NETHERLANDS

Session 1C3 - Angiogenesis

Room 203 - 205

- 16:45** **RADIATION EFFECT ON 3D MICRO VASCULAR NETWORK IN *IN VITRO* MICROFLUIDIC CHIP**
D.-H. Choi¹, K. -H. Na¹, H. Kim¹, Y. -H. Jung¹, C. -H. Kim², and S. Chung¹
¹*Korea University, KOREA and*
²*Korea Institute of Radiological and Medical Sciences, KOREA*
- 17:05** **PROBING THE EFFECT OF HDL-MIMETIC NANOPARTICLES ON ANGIOGENESIS USING MICROENGINEERED VASCULATURE MIMICRY**
J. Ahn^{1,2}, Y. Sei¹, N.L. Jeon², and Y. Kim¹
¹*Georgia Institute of Technology, USA and* ²*Seoul National University, KOREA*
- 17:25** **ANGIOGENESIS ON CHIP (AoC): STRUCTURAL ANALOGIES FOR FLUID MECHANICAL DETERMINANTS OF ENDOTHELIAL SPROUTING**
K.K. Rangharajan, E. Akbari, G.B. Spsychalski, J.W. Song, and S. Prakash
Ohio State University, USA
- 17:45** **Adjourn for the Day**

Tuesday, October 24

07:55 **Registration**

08:25 **Announcements**

Plenary Presentation III

Chatham Ballroom A/B, Second Floor

08:30 **MICROFLUIDICS FOR DISEASE DIAGNOSIS AND MEDICAL WEARABLE SENSING APPLICATIONS**

Chwee Teck Lim

National University of Singapore, SINGAPORE

09:15 **Transition**

Session 2A1 - 3D Printing - Applications

Chatham Ballroom A/B, Second Floor

09:30 **3D PRINTED ROLL-TO-ROLL MASKLESS LITHOGRAPHY SYSTEM WITH WATER-SOLUBLE SUBSTRATE FOR SUPPLYING A MANAGEABLE MICROSTRUCTURE**

K. Kim and W. Park

Kyung Hee University, KOREA

09:50 **ISOTHERMAL TITRATION CALORIMETRY IN A MINIATURIZED 3D-PRINTED PLATFORM**

Y. Jia¹, C. Su^{1,2}, M. He², and Q. Lin¹

¹Columbia University, USA and ²Xi'an Jiaotong University, CHINA

10:10 **DOMINO CAPILLARIC CIRCUITS: 3D-PRINTED CAPILLARY MICROFLUIDICS FOR SCALABLE, SEQUENTIAL, AND SIMULTANEOUS LIQUID DELIVERY**

A. Olanrewaju, M. Yafia, M. Beaugrand, F. Possel, and D. Juncker

McGill University, CANADA

Session 2B1 - Cancer Analysis
Chatham Ballroom C, Second Floor

- 09:30** **3D NANOSTRUCTURING OF MICROFLUIDIC DEVICES BY ENGINEERED COLLOIDAL SELF-ASSEMBLY AFFORDS SENSITIVE IMMUNOSENSING OF EXOSOMAL BIOMARKERS**
P. Zhang¹, M. He², Y. Shang¹, and Y. Zeng¹
¹University of Kansas, USA and ²Kansas State University, USA
- 09:50** **INDUCTIVE ELECTRIC FIELDS DIRECTIONALLY HINDER EGF-GRADIENT PROMOTED BREAST CANCER MOTILITY IN BIOMIMETIC MICROTRACKS**
A.A. Garg, T.H. Jones, S. Bushman, J. Shuman, J. Enders, V. Subramaniam, and J.W. Song
Ohio State University, USA
- 10:10** **A REFINED TAXONOMY FOR UNDERSTANDING CANCER DRUG RESISTANCE: RESOLVING TRUNCATED ISOFORMS IN SINGLE ESTROGEN RECEPTOR POSITIVE (ER+) BREAST CANCER CELLS**
J.J. Kim, C.-C. Kang, and A.E. Herr
University of California, Berkeley, USA

Session 2C1 - Droplets & Digital Microfluidics
Room 203 - 205

- 09:30** **HIGH-EFFICIENCY SINGLE CELL ENCAPSULATION AND SIZE-SELECTIVE SORTING OF CELLS IN FEMTO-LITER DROPLETS**
G.K. Kurup and A.P. Lee
University of California, Irvine, USA
- 09:50** **DROPLET FREQUENCY SENSOR (DFS): A BIOMOLECULAR DETECTOR BASED ON SURFACTANT RETARDATION**
R. Kebriaei and A.S. Basu
Wayne State University, USA
- 10:10** **ON-CHIP CHARACTERIZATION OF RESISTIVE FORCES IN DIGITAL MICROFLUIDICS**
R. Fobel, I. Swyer, and A.R. Wheeler
University of Toronto, CANADA
- 10:30** **Break: Exhibit and Poster Inspection**

MicroTAS 2017 Shark Tank Competition

Chatham Ballroom A/B, Second Floor

11:00

Judges

Allen Northrup, Ph.D.

Founder of Cepheid and Microfluidic Systems, USA

Fiona Adair, Ph.D.

Vice President Strategy & Innovations, Beckman Coulter Diagnostics, USA

Richard Fair, Ph.D.

Founder of Advanced Liquid Logic and Lord-Chandran Professor of Electrical and Computer Engineering, Duke University, USA

12:30 - 13:30 Lunch

Session 2A2 - Neuroscience

Chatham Ballroom A/B, Second Floor

13:30

Keynote Presentation

A GEOMETRICAL APPROACH OF AXO-DENDRITIC POLARITY AND NEURONAL CONNECTIVITY

C. Villard

Institut Curie, FRANCE

14:00

HIGHLY SENSITIVE MEASUREMENT OF TAU PROTEIN WITH ELECTROCHEMICAL IMPEDANCE SENSOR TOWARDS THE DIAGNOSIS OF NEURODEGENERATIVE DISEASE

M. Park, K.-S. Shin, J. Ji, and J.Y. Kang

Korea Institute of Science and Technology (KIST), KOREA

14:20

AN INTEGRATED MICROELECTRODE ARRAY AND MICROFLUIDIC PLATFORM FOR STIMULATING AND RECORDING OF RECONSTRUCTED NEURONAL NETWORKS

E. Moutaux^{1,2}, B. Charlot^{3,4}, F. Bardin^{3,5}, F. Saudou^{1,2}, and M. Cazorla^{1,2}

¹Université Grenoble, Alpes, FRANCE, ²INSERM, FRANCE, ³CNRS, FRANCE,

⁴Université de Montpellier, FRANCE, and ⁵Université de Nîmes, FRANCE

14:40

SYSTEMS INTEGRATION OF CELLULAR AND MOLECULAR SENSING TOWARDS POINT-OF-CARE TREATMENT MONITORING IN SCHIZOPHRENIA

T.E. Winkler¹, E. Kim¹, M. Kang¹, G.F. Payne¹, D.L. Kelly², and R. Ghodssi¹

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

Session 2B2 - Sensing/Sensors
Chatham Ballroom C, Second Floor

- 13:30** **Keynote Presentation**
LOW-COST DISPOSABLE POINT-OF-CARE DEVICES BASED ON POROUS MATERIALS FOR RAPID DETECTION OF PATHOGENS
P. Yager¹, K. Abe¹, C.E. Anderson¹, D. Baker¹, Y. Belousov², J. Bishop¹, J.R. Buser¹, S.A. Byrnes¹, G. Domingo³, E. Fu¹, R.P. Gallagher¹, E.K. Heiniger¹, C.A. Holstein¹, S. Huang¹, P. Kauffman¹, E.C. Kline¹, P. D. Ladd¹, L.K. Lafleur¹, B.R. Lutz¹, W. Mahoney³, S. Kumar¹, N. Scarr², L. Stewart¹, E.-M. Strauch¹, B. Toley¹, N.M.J. Vermeulen³ and X. Zhang¹
¹University of Washington, USA, ²ELITechGroup Molecular Diagnostics, USA, and ³PATH, Seattle, WA, USA
- 14:00** **A THREAD-BASED WEARABLE NANOBIOSENSOR**
C. Zhao¹, X. Li^{1,2}, T. Li¹, Q. Wu¹, and X. Liu¹
¹McGill University, CANADA and ²Stanford University, USA
- 14:20** **HETEROGENEOUS CELL-LADEN HYDROGEL ARRAY FOR PORTABLE ODORANT SENSOR**
Y. Hirata, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN
- 14:40** **PLASMONICS-NANOFLUIDICS HYBRID METAMATERIAL ABSORBERS: FABRICATION & APPLICATIONS IN INFRARED ABSORPTION SPECTROSCOPY**
T.H.H. Le¹ and T. Tanaka^{1,2}
¹Tokyo Institute of Technology, JAPAN and ²Institute of Physical and Chemical Research (RIKEN), JAPAN

Session 2C2 - Droplet Microfluidic Fundamentals
Room 203 - 205

- 13:30** **Keynote Presentation**
DROPLET MICROFLUIDICS FOR CIRCULATING TUMOR CELL ANALYSIS
C. Yang
Xiamen University, CHINA
- 14:00** **DROPLET PLATFORM FOR INTEGRATION OF DETERMINISTIC PARTICLE SEPARATION IN A MULTI-STAGE MODULAR AND RECONFIGURABLE CARTRIDGE**
E. Pariset, F. Revol-Cavalier, F. Boizot, C. Pudda, A. Thuaire, F. Navarro, B. Icard, and V. Agache
University Grenoble, FRANCE

14:20 DROPLET BREAKUP AT A CO-FLOWING FLUID-FLUID INTERFACE IN A MICROCHANNEL
K.S. Jayaprakash and A.K. Sen
Indian Institute of Technology, Madras, INDIA

14:40 BINARY ADDRESSABLE DROPLET-ON-DEMAND ARRAY FOR COMBINATORIAL DROPLET GENERATION
E. Werner¹, T. Dawes², and E. Hui¹
¹University of California, Irvine, USA and ²Genentech, USA

15:00 - 17:00 Poster Session 2

Exhibit Hall A, First Floor

Poster presentations are listed by topic category with their assigned number starting on page 27.

15:00- 17:00 Exhibitor Industrial Stage 2
River Concourse, First Floor

Session 2A3 - Single Cell Analysis I

Chatham Ballroom A/B, Second Floor

17:00 DIRECT OBSERVATION-BASED ANALYSIS OF COMPACTION STABILITY OF INDIVIDUAL CHROMOSOMES ISOLATED FROM SINGLE MAMMALIAN CELLS
H. Oana¹, T. Takahashi¹, K.O. Okeyo², J. Ueda³, and M. Washizu¹
¹University of Tokyo, JAPAN, ²Kyoto University, JAPAN, and ³Asahikawa Medical University, JAPAN

17:20 LABEL-FREE SCREENING AND IDENTIFICATION OF SINGLE CANCER CELLS IN BLOOD USING FLUORESCENCE LIFETIME IMAGING MICROSCOPY
D.-H. Lee, X. Li, N. Ma, M.A. Digman, and A.P. Lee
University of California, Irvine, USA

17:40 ADDRESSABLE ELECTROACTIVE MICROWELL ARRAY CAPABLE OF DETERMINISTIC COMBINATORIAL TRAPPING OF SINGLE CELLS
S.H. Kim¹, T. Mitsunaka², Y. Fujimoto², K. Iizuka², and T. Fujii¹
¹University of Tokyo, JAPAN and ²SHARP, JAPAN

Session 2B3 - Paper Microfluidics
Chatham Ballroom C, Second Floor

- 17:00** **PRE-CONCENTRATION BY LIQUID INTAKE BY PAPER (P-CLIP): A NEW TECHNIQUE FOR LARGE VOLUMES AND DIGITAL MICROFLUIDICS**
D.G. Rackus, R.P.S. de Campos, C. Chan, M.M. Karcz, B. Seale, T. Narahari, C. Dixon, M.D. Chamberlain, and A.R. Wheeler
University of Toronto, CANADA
- 17:20** **A FOLDABLE PAPER-BASED DEVICE FOR THE ANGLE-BASED SEMI-QUANTITATIVE ANALYSIS OF NERVE AGENT SIMULANT**
S. Lee, J. Park, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- 17:40** **3D-PAPER-BASED MULTIPLEXED NUCLEIC ACID AMPLIFICATION ASSAY**
P. Garneret¹, L. Magro¹, B. Jacquelin², E. Coz¹, F. Monti¹, A. Kwasiborski², J. Vanhomwegen², J.C. Manuguerra², P. Lafaye², and P. Tabeling¹
¹*École Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE and*
²*Institut Pasteur, FRANCE*

Session 2C3 - Bacteria Analysis & Diagnostics
Room 203 - 205

- 17:00** **SEPSIS DIAGNOSIS FROM WHOLE BLOOD BASED ON NEUTROPHIL MOTILITY SIGNATURES IN A MICROFLUIDIC ASSAY**
F. Ellett, J. Jorgensen, A.L. Marand, Y.M. Liu, M.M. Martinez, V. Stein, K.L. Butler, J. Lee, and D. Irimia
Massachusetts General Hospital, USA
- 17:20** **FLEXIBLE IMPEDANCE SENSOR FOR IN SITU SENSING OF CATHETER BIOFILMS**
R.C. Huiszoon, P.R. Rajasekaran, S. Subramanian, W.E. Bentley, and R. Ghodssi
University of Maryland, USA
- 17:40** **PCR-FREE, TWO-COLOR DIGITAL DETECTION OF UROPATHOGENIC BACTERIA IN URINE SAMPLES**
A.M. Kaushik¹, K.E. Mach², K. Hsieh¹, C. Tang¹, L. Chen¹, J.C. Liao², and T.-H. Wang¹
¹*Johns Hopkins University, USA and* ²*Stanford University, USA*
- 18:00** **Adjourn for the Day**

Wednesday, October 25

07:30 Registration

08:00 Announcements

Plenary Presentation IV

Chatham Ballroom A/B, Second Floor

08:05 POINT-OF-CARE DIAGNOSTICS TO IMPROVE NEWBORN AND MATERNAL HEALTH IN LOW-RESOURCE SETTINGS
Rebecca Richards-Kortum¹, P. Keahey¹, B. Hunt¹, C. Smith¹, and K. Schmeler²
¹Rice University, USA and ²MD Anderson Cancer Center, USA

08:50 **Analytical Chemistry - Young Innovator Award**
ACOUSTIC TWEEZERS: MANIPULATING PARTICLES, CELLS, ORGANISMS, AND FLUIDS USING SURFACE ACOUSTIC WAVES
Tony Jun Hung
Duke University, USA

09:10 **Dolomite and Lab on a Chip - Pioneers in Miniaturization Lectureship Prize and Presentation**
A PIONEER'S TRAIL: FROM SAVANNAH TO TORONTO TO KAKUMA AND BEYOND
Aaron R. Wheeler
University of Toronto, CANADA

09:30 **Break: Exhibit and Poster Inspection**

Session 3A1 - Single Cell Analysis II

Chatham Ballroom A/B, Second Floor

10:00 **NANOPOTS: NANOWELL-BASED SAMPLE PREPARATION ENABLES DEEP PROTEOME PROFILING OF SINGLE HUMAN ISLETS**
Y. Zhu¹, P.D. Piehowski¹, R. Zhao¹, Y. Shen¹, R.J. Moore¹, J. Chen², C.E. Mathews², W.-J. Qian¹, R.D. Smith¹, and R.T. Kelly¹
¹Pacific Northwest National Laboratory, USA and ²University of Florida, USA

- 10:20** **WHOLE TUMOR SCREENING WITH SINGLE CELL MULTIPLEXED PROTEOLYTIC ASSAY THROUGH CONTINUOUS FLOW MICROFLUIDICS**
 E.X. Ng¹, G. Sun¹, S.-C. Wei¹, and M.A. Miller², and C.-H. Chen¹
¹*National University of Singapore, SINGAPORE* and
²*Massachusetts General Hospital, USA*
- 10:40** **A HIGH-THROUGHPUT SINGLE-CELL ASSAY PLATFORM TO ANALYZE RESPONSES OF TUMORS TO THERAPEUTIC COMBINATIONS**
 J. Choi, H. Kim, Y.R. Nam, A. Atajanov, and S. Yang
Gwangju Institute of Science and Technology (GIST), KOREA
- 11:00** **A MICROFLUIDIC CHIP ENABLING SINGLE CELL ANALYSIS OF TUMOR-STROMAL INTERCELLULAR COMMUNICATION**
 J. Kim¹, H.E. Karakas², J. Park³, J.M. Oh³, Y. Choi^{1,3}, V. Sunkara¹, Y.-S. Park^{1,3},
 D. Gozuacik², and Y.-K. Cho^{1,3}
¹*Ulsan National Institute of Science & Technology (UNIST), KOREA*,
²*Sabancı University, TURKEY*, and ³*Institute for Basic Science (IBS), KOREA*

Session 3B1 - Brain-on-a-Chip

Chatham Ballroom C, Second Floor

- 10:00** **MECHANICALLY GUIDED EMERGENT PATTERNING OF NEUROECTODERM TISSUE USING HUMAN PLURIPOTENT STEM CELLS**
 X. Xue¹, Y. Sun^{1,2}, A. Resto-Irizarry¹, K.M.A. Yong¹, Y. Zheng¹,
 S. Weng¹, Y. Shao¹, and J. Fu¹
¹*University of Michigan, USA* and ²*University of Massachusetts, USA*
- 10:20** **MODELLING HUMAN ROSTRO-CAUDAL NEURAL PATTERNING WITH A MICROFLUIDIC MORPHOGENIC GRADIENT**
 M. Isaksson¹, P. Rifes^{1,2}, T. Laurell¹, and A. Kirkeby^{1,2}
¹*Lund University, SWEDEN* and ²*University of Copenhagen, DENMARK*
- 10:40** **A MICROFLUIDIC BLOOD-BRAIN BARRIER PLATFORM COMPRISED OF INTACT AND PERFUSABLE CAPILLARIES AND ASTROCYTES**
 S. Bang, S.-R. Lee, J. Ko, K. Son, D. Tahk, J. Ahn, C. Im, and N.L. Jeon
Seoul National University, KOREA
- 11:00** **BEC-ON-A CHIP: A PHYSIOLOGICAL MICROFLUIDIC SYSTEM INCORPORATING BRAIN ENDOTHELIAL CELL (BEC)**
 S. Jeong¹, S. Kim¹, J. Buonocore¹, J. Park², J. Welsh¹, J. Li¹, and A. Han¹
¹*Texas A&M University, USA* and
²*Southern University of Science and Technology, CHINA*

Session 3C1 - Droplet-Based Assays

Room 203 - 205

- 10:00 FEMTOMOLE-SCALE HIGH THROUGHPUT SCREENING OF PROTEIN LIGANDS USING MICROFLUIDIC DROPLET-BASED THERMAL SHIFT ASSAY TECHNIQUE**
W.-W. Liu¹, Y. Zhu^{1,2}, and Q. Fang¹
¹Zhejiang University, CHINA and ²Pacific Northwest National Laboratory, USA
- 10:20 OPTIMIZING THE VIOLACEIN BIOSYNTHETIC PATHWAY USING DROPLET MICROFLUIDICS**
P.C. Gach^{1,2}, M. Raje^{1,2}, K. Iwai^{1,2}, N. Kaplan¹, S. Nath¹, S. Deutsch¹,
J.D. Keasling¹, N.J. Hillson¹, P.D. Adams¹, and A.K. Singh^{1,2}
¹Sandia National Laboratories, USA and ²University of California Berkeley, USA
- 10:40 FORMATION OF DROPLET INTERFACE BILAYERS EQUIPPED WITH OPEN WATER SURFACE FOR ODORANT DETECTION USING OLFACTORY RECEPTORS**
N. Misawa¹, S. Fujii¹, K. Kamiya¹, T. Osaki^{1,2}, A. Ozoe³,
Y. Takahashi³, and S. Takeuchi^{1,2}
¹Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN, ²University of Tokyo, JAPAN, and ³Sumitomo Chemical Company, JAPAN
- 11:00 FORMATION OF DNA MICRO-SKELETON STRUCTURES IN WATER-IN-OIL MICRODROPLETS**
M. Morita¹, S.M. Nomura², S. Murata², M. Yanagisawa³, and M. Takinoue¹
¹Tokyo Institute of Technology, JAPAN, ²Tohoku University, JAPAN, and ³Tokyo University of Agriculture and Technology, JAPAN
- 11:20 - 12:20 Lunch**
- 11:45 - 12:20 Hochuen – Portable Microfluidic Device Finalist Presentations**

Plenary Presentation V

Chatham Ballroom A/B, Second Floor

- 12:20 CAPILLARY-DRIVEN MICROFLUIDICS FOR MOBILE HEALTH: OPPORTUNITIES AND CHALLENGES**
Y. Temiz, O. Gökçe, Y. Arango, R.D. Lovchik, C. Mercandetti,
and **Emmanuel Delamarche**
IBM Research - Zürich, SWITZERLAND
- 13:05 MicroTAS 2018 Announcement**
- 13:15 Transition**

Session 3A2 - Cell Analysis & Manipulation

Chatham Ballroom A/B, Second Floor

- 13:25** **Keynote Presentation**
A MICROFLUIDIC GUILLOTINE FOR SINGLE-CELL WOUND REPAIR STUDIES
S.K.Y. Tang
Stanford University, USA
- 13:55** **INERTIAL MICROFLUIDIC CELL HYDROPORATOR (iMCH) FOR HIGH-THROUGHPUT & SINGLE-STEP INTRACELLULAR MOLECULE DELIVERY**
Y. Deng¹, M. Rada², M. Kizer¹, X. Wang¹, D.-J. Cheon², and A.J. Chung¹
¹Rensselaer Polytechnic Institute (RPI), USA and ²Albany Medical College, USA
- 14:15** **MICROFLUIDIC HIGH-THROUGHPUT CELL PAIRING AND RETRIEVAL FOR STUDYING BREAST CANCER-MSC ENGULFMENT**
Y.-C. Chen^{1,2}, M.E. Gonzalez², A.B. Hizioglu¹, X. Zhao¹, R. Brien¹, Y.-H. Cheng¹, Z. Zhang¹, C.G. Klee², and E. Yoon¹
¹University of Michigan, USA and ²University of Michigan Medical School, USA

Session 3B2 - Engineered Cell Systems

Chatham Ballroom C, Second Floor

- 13:25** **Keynote Presentation**
ENGINEERED MICROSYSTEMS FOR INVESTIGATING NEURONAL NETWORK RESPONSE TO AXON DAMAGE
A.M. Taylor
University of North Carolina, Chapel Hill, USA
- 13:55** **ENGINEERING 3D LIVER LOBULE TISSUES CONTAINING MONOCYTES WITH MULTIPLE HYDROGELS ON ELECTROMICROFLUIDIC PLATFORM**
K.-L. Ho, J.-H. Lee, S.-C. Hsieh, and S.-K. Fan
National Taiwan University, TAIWAN
- 14:15** **BASEMENT MEMBRANE-MIMETIC MICROENGINEERED ECM FILMS FOR CELL CO-CULTURE ON FRONT-BACK SURFACES**
H. Iwadate, N. Kimura, R. Hashimoto, Y. Yajima, R. Utoh, M. Yamada, and M. Seki
Chiba University, JAPAN

Session 3C2 - Plant Analytics

Room 203 - 205

- 13:25** **Keynote Presentation**
HIGH-THROUGHPUT PHENOTYPING OF MORPHOLOGICAL TRAITS AND NUTRIENT UPTAKE OF PLANTS USING MICROFLUIDIC DEVICES
L. Dong
Iowa State University, USA
- 13:55** **A MINIATURIZED MICROFLUIDIC ASSAY FOR SINGLE PLANT CELL PROTEIN QUANTITATION**
T.G. Mickleburgh, A. Salehi-Reyhani, A.J. Magness, W.D. Joyce, O. Ces, and D.R. Klug
Imperial College London, UK
- 14:15** **METHODS FOR PHYSICAL CHARACTERIZATION OF GROWING PLANT ROOTS**
H. Hida¹, K. Ozoe¹, D. Iguro¹, I. Kanno¹, and M. Nogaguchi²
¹*Kobe University, JAPAN* and ²*Nagoya University, JAPAN*
- 14:35 - 16:35** **Poster Session 3**
Exhibit Hall A, First Floor
Poster presentations are listed by topic category with their assigned number starting on page 27.

Session 3A3 - Cancer Diagnostics

Chatham Ballroom A/B, Second Floor

- 16:35** **LECTIN CHIP FOR INDIVIDUALLY ISOLATING OF PANCREATIC CIRCULATING TUMOR CELLS**
T. Masuda¹, H. Tateno², W. Lei¹, I. Arifin¹, and F. Arai²
¹*Nagoya University, JAPAN* and
²*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*
- 16:55** **LOW-INPUT FLUIDIZED-BED ENABLED CHIP-SEQ DEVICE WITH PARALLEL UNITS FOR ANALYSIS OF HISTONE MODIFICATIONS**
T.W. Murphy, S. Ma, and C. Lu
Virginia Polytechnic Institute and State University, USA
- 17:15** **MICRORNA ASSAYS FROM RAW CELLS IN ISOLATED MICROWELL ARRAYS**
A.M. Tentori¹, J.J. Kim¹, W.C. Zhang², F.J. Slack², and P.S. Doyle¹
¹*Massachusetts Institute of Technology, USA* and ²*Harvard Medical School, USA*

Session 3B3 - Sample Prep for Cell Isolation

Chatham Ballroom C, Second Floor

- 16:35 HIGH LIPID-PRODUCING MICROALGAL MUTANT SCREENING THROUGH LATERAL DIELECTROPHORESIS**
H.S. Kim^{1,2}, S.-I. Han¹, and A. Han¹
¹Texas A&M University, USA and ²Korea Institute of Machinery and Materials, KOREA
- 16:55 HIGH THROUGHPUT ISOLATION OF INTACT BACTERIA FROM WHOLE BLOOD USING INTEGRATED POROUS SILICA MONOLITH BRICKS**
J.Y. Han and D.L. DeVoe
University of Maryland, USA
- 17:15 HIGHLY EFFICIENT RARE CANCER CELLS ISOLATION AND CONCENTRATION BY COMBINING LABEL-FREE ISOLATION AND DIELECTROPHORETIC CONCENTRATION IN A MICROFLUIDIC STEP-CHANNEL**
S.H. Kim¹, H. Ito², M. Kozuka², H. Takagi², M. Hirai², and T. Fujii¹
¹University of Tokyo, JAPAN and ²ARKRAY, Inc., JAPAN

Session 3C3 - Fluorescence Assays

Room 203 - 205

- 16:35 AUTOMATED MICROFLUIDIC FOR THE ANALYSIS OF CIRCULATING MULTIPLE MYELOMA CELLS (CMMCs) USING “FISH” ANALYSIS**
K.M. W-Ratnayake¹, M.L. Hupert², M.A. Witek¹, C. Kong¹, M. Hu²,
J.W. Kamande⁵, M.A. Lindell⁵, S. Vaidyanathan¹, P.M. Vorhees⁵,
A. Goodwin³, K. August^{3,4}, and S.A. Soper^{1,2,3}
¹University of Kansas, USA, ²Biofluidica, Inc., USA, ³University of Kansas Medical Center, USA, ⁴University of Missouri, Kansas City, USA, and ⁵University of North Carolina, Chapel Hill, USA,
- 16:55 AUTOMATED PLATFORM FOR YEAST CULTIVATION AND ANALYSIS OF SECRETED PHYTASE IN NANOLITER DROPLET ARRAYS**
D. Hümmer¹, C. Bärtschi¹, R. Steinhoff¹, J. Förster², L.M. Blank², R. Zenobi¹,
and P.S. Dittrich¹
¹ETH Zürich, SWITZERLAND and ²RWTH Aachen, GERMANY
- 17:15 REAL-TIME ATP MONITORING IN HUMAN SERUM BY AN NANOFLUIDIC DEVICE INTEGRATED WITH AN APTAMER SENSOR**
D.-T. Phan, L. Jin, S. Wustoni, and C.-H. Chen
National University of Singapore, SINGAPORE
- 17:35 Adjourn for the Day**

18:30 - 21:30 Wednesday Evening Dinner Cruise on the Georgia Queen

MicroTAS 2017 welcomes you aboard the largest and grandest riverboat of its kind in the United States. Featuring three grand ballrooms, the Georgia Queen invites attendees to remember a time when paddleboat travel was the epitome of elegance. Join friends and colleagues on a two-hour dinner cruise, and enjoy the amazing sights and sounds of the historic city of Savannah.

Thursday, October 26

08:00 Registration

Session 4A1 - Cell Mechanics I

Chatham Ballroom A/B, Second Floor

08:30 **WHERE CELLS GO: DEVELOPING MECHANOCHEMICAL HYBRID MODEL OF COLLECTIVE CELL MIGRATION TOWARD DIRECTING COMPLEX TISSUE FORMATION**

M. Marumoto, Y. Shiraishi, and M. Hagiwara
Osaka Prefecture University, JAPAN

08:50 **MICROFLUIDIC RHEOLOGY TO CHARACTERIZE VISCOELASTIC PROPERTIES OF MALIGNANT AND NON-MALIGNANT EPITHELIAL CELLS**

J. Kim and L.L. Sohn
University of California, Berkeley, USA

09:10 **LABEL-FREE SIZE AND CELL DEFORMABILITY CONTRAST METHOD FOR SENSITIVE IMMUNE CELL CHARACTERISATION**

K.K. Zeming¹, R. Vernekar², T. Krueger², C.-H. Chen^{1,3}, and J. Han^{1,4}
¹*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,*
²*University of Edinburgh, UK,* ³*National University of Singapore, SINGAPORE, and*
⁴*Massachusetts Institute of Technology, USA*

Session 4B1 - Sampling & Sample Prep

Chatham Ballroom C, Second Floor

08:30 **LAB-ON-A-DISC FOR FULLY AUTOMATED ISOLATION OF CELL-FREE DNA FROM WHOLE BLOOD OF CANCER PATIENTS**

C.-J. Kim^{1,2}, J. Park², V. Sunkara¹, T.-H. Kim², and Y.-K. Cho^{1,2}
¹*Ulsan National Institute of Science & Technology (UNIST), KOREA, and*
²*Institute for Basic Science (IBS), KOREA*

08:50 **AUTOMATED SAMPLE PREPARATION FOR NUCLEOSOME POSITIONING ANALYSIS USING DROPLET MICROFLUIDICS**

Y. Xu¹, J.-H. Lee², Y. Zhao³, Z. Li³, T. Ordog², and R.C. Bailey¹
¹*University of Michigan, USA,* ²*Mayo Clinic, Rochester, USA, and*
³*Mayo Clinic, Jacksonville, USA*

- 09:10** **MINIATURIZED HYBRID PUSH-PULL PERFUSION PROBE FOR SAMPLING WITH HIGH SPATIAL AND TEMPORAL RESOLUTION**
F. van den Brink¹, A. Asthana¹, J. Bomer¹, E.A. Tolner², A. van den Maagdenberg², and M. Odijk¹
*¹University of Twente, NETHERLANDS and
²Leiden University Medical Hospital, NETHERLANDS*

Session 4C1 - Nanopore Diagnostics

Room 203 - 205

- 08:30** **MAGNETIC NANOPORE ISOLATION OF EXOSOMES FOR THE EARLY DIAGNOSIS OF PANCREATIC CANCER**
J. Ko, N. Bhagwat, S.S. Yee, N. Ortiz, A. Sahnoud, T. Black, N.M. Aiello, L. McKenzie, M. O'Hara, C. Redlinger, J. Romeo, E.L. Carpenter, B.Z. Stanger, and D. Issadore
University of Pennsylvania, USA
- 08:50** **MICRORNA PATTERN RECOGNITION FOR BILE DUCT CANCER USING PROGRAMMABLE DNA AND BIOLOGICAL NANOPORE**
M. Hiratani and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN
- 09:10** **SINGLE MOLECULE KINETIC PROFILING OF POLYMERASES ON A NANOPORE ARRAY**
M. Palla^{1,2}, S. Punthambaker¹, P.B. Stranges¹, F. Vigneault², J. Nivala¹, A. Trans³, A. Ayer³, S. Sun³, J. Pollard³, A. Qwan³, C.W. Fuller³, and G.M. Church¹
*¹Harvard Medical School, USA, ²Harvard University, USA, and
³Roche Sequencing Solutions, USA*

09:30 **Transition**

Session 4A2 - Cell Mechanics II

Chatham Ballroom A/B, Second Floor

- 09:40** **DEFORMABILITY BASED SEPARATION OF PANCREATIC ISLETS FROM EXOCRINE ACINAR TISSUE FOR TRANSPLANT APPLICATIONS**
W. Varhue¹, L. Langman², M. Kelly-Goss², K.L. Brayman², S. Peirce-Cottler², and N.S. Swami¹
¹University of Virginia, USA and ²School of Medicine University of Virginia, USA
- 10:00** **MULTIPARAMETER CELL-TRACKING INTRINSIC CYTOMETRY FOR THE CHARACTERIZATION OF SINGLE CELLS**
N. Apichitsopa, A. Jaffe, and J. Voldman
Massachusetts Institute of Technology, USA

- 10:20** **MICROFLUIDIC SINGLE-CELL ASSAY FOR EVALUATION OF NEUTROPHIL ACTIVE DEFORMABILITY DURING CHEMOTAXIS**
X. Wang, E. Jodoin, J. Jorgensen, and D. Irimia
Massachusetts General Hospital, Harvard Medical School, Shriners Burns Hospital, USA

Session 4B2 - Portable Diagnostics
Chatham Ballroom C, Second Floor

- 09:40** **A MOBILE PHONE-OPERATED NUCLEIC ACID DIAGNOSTIC PLATFORM FOR DETECTION OF URINARY TRACT INFECTION (UTI)**
D.J. Shin¹, L. Chen¹, C. Li^{1,2}, A. Trick¹, and T.-H. Wang¹
¹Johns Hopkins University, USA and ²China Agricultural University, USA
- 10:00** **A PORTABLE DEVICE FOR RAPID INFLUENZA A (H1N1) DIAGNOSIS**
Y.-D. Ma, S.-T. Chou, Y.-M. Lee, Y.-Y. Lai, K.-H. Li, W.-B. Li, Y.-H. Chen, Z.-D. Lin, T.-M. Lee, P.-C. Huang, H.-P. Ma, and G.-B. Lee
National Tsing Hua University, TAIWAN
- 10:20** **A NEW MOBILE HEALTHCARE SYSTEM USING SMARTPHONE AND LAB-ON-A-CHIP FOR ON-SITE DIAGNOSTICS OF MALARIA**
S. Ghosh, K. Aggarwal, and C.H. Ahn
University of Cincinnati, USA

Session 4C2 - Drug Screening
Room 203 - 205

- 09:40** **PERSONALIZED DRUG TESTING OF TUMOR SAMPLES USING A MICROFLUIDIC PLATFORM**
A.D. Rodríguez¹, L. Horowitz¹, M. Rumaner¹, V.K. Gadi¹, R. Monnat¹, R. Rostomily², and A. Folch¹
¹University of Washington, USA and ²Houston Methodist, USA
- 10:00** **A ONE-STEP PIPETTING PLATFORM FOR LARGE-SCALE SEQUENTIAL DRUG COMBINATION ASSAY WITH A NETWORK-BASED APPROACH TO CANCER RESEARCH**
S.D. Kim, S.W. Song, D.Y. Oh, Y. Lee, and S. Kwon
Seoul National University, KOREA
- 10:20** **MONITORING THE RESPONSE OF SINGLE MCF-7 CELLS TO ANTICANCER PEPTIDES ON A MICROFLUIDIC CHIP**
L. Armbrecht, G. Gabernet, F. Kurth, J.A. Hiss, G. Schneider, and P.S. Dittrich
ETH Zürich, SWITZERLAND

10:40 Break: Exhibit and Poster Inspection

Plenary Presentation VI

Chatham Ballroom A/B, Second Floor

11:15 ENGINEERING MICROBUBBLES FOR PRECISION MEDICINE

Michel Versluis

University of Twente, NETHERLANDS

12:00 CHEMINAS – Young Researcher Poster Awards

12:10 Lab on a Chip - Widmer Poster Award

12:20 NIST and Lab on a Chip - Art in Science Award

12:30 Dolomite and Lab on a Chip - Video Award

12:40 Hochuen - Portable Microfluidic Device Awards

12:50 Closing Remarks - Conference Adjourns

Poster Presentations

M – Monday, October 23 (14:45 - 16:45) T – Tuesday, October 24 (15:00 - 17:00)

W – Wednesday, October 25 (14:25 - 16:30)

Classification Chart

(last character of poster number)

a	Fundamentals in Microfluidics and Nanofluidics
b	Micro- and Nanoengineering
c	Sensors & Actuators, and Detection Technologies
d	Integrated Microfluidic Platforms
e	Cell & Vesicle Analysis and Manipulation
f	Cells, Organisms, and Organs on Chip
g	Diagnostics, Therapeutics, and Translational Medicine
h	Separations and Reactions
i	Other Applications for Microfluidics
j	Microfluidics in Biology
k	Late News

a - Fundamentals in Microfluidics and Nanofluidics

Acoustofluidics

- M001a** **ACOUSTOFLUIDIC WAVEGUIDES FOR SUBWAVELENGTH LOCALIZED ACOUSTIC FIELD CONTROL AND MICROPARTICLES MANIPULATION**
S. Yang¹, Y. Bian², F. Guo², M. Wu², Z. Tian¹, P.-H. Huang¹, and T.J. Huang¹
¹Duke University, USA and ²Pennsylvania State University, USA
- T001a** **INVESTIGATION ON ACOUSTIC STREAMING PATTERNS IN SHARP-EDGE-BASED DEVICES: EFFECTS OF SHARP-EDGE LOCATION**
P.H. Huang¹, M. Darmawan², N. Nama², and T.J. Huang¹
¹Duke University, USA and ²Pennsylvania State University, USA

- W001a** **STAIRCASE ECHO-CHANNEL ACOUSTOFLUIDIC DEVICE FOR CELL POSITION CONTROL**
S. Yigit¹, S.-I. Han¹, Y.-H. Cho², and A. Han¹
¹*Texas A&M University, USA and*
²*Seoul National University of Science & Technology, KOREA*

a - Fundamentals in Microfluidics and Nanofluidics

Electrokinetics

- M002a** **ENHANCED ELECTROKINETIC PARTICLE FOCUSING IN BUFFERS OF REDUCED CONCENTRATIONS**
Z. Liu^{1,2}, D. Li¹, and X. Xuan¹
¹*Clemson University, USA and* ²*Dalian Maritime University, CHINA*
- T002a** **GENERATION OF LABILE HEPATITIS B VIRUS CAPSIDS ASSEMBLED WITH GUANIDINE HYDROCHLORIDE AND OBSERVED BY RESISTIVE-PULSE SENSING**
M. Zhang, L.S. Lee, A. Zlotnick, and S.C. Jacobson
Indiana University, USA

a - Fundamentals in Microfluidics and Nanofluidics

Mixing

- M003a** **DESIGN OF A PUMPLESS CHAOTIC MIXING DEVICE DRIVEN BY THE VIBRATION-INDUCED FLOW**
K. Kaneko¹, T. Osawa², Y. Kametani², Y. Hasegawa², and H. Suzuki¹
¹*Chuo University, JAPAN and* ²*University of Tokyo, JAPAN*
- T003a** **INVESTIGATION AND OPTIMIZATION OF A SHARP-EDGE-BASED ACOUSTOFLUIDIC MICROMIXER**
S. Zhao, P.-H. Huang, S. Yang, P. Zhang, and T.J. Huang
Duke University, USA
- W002a** **ACTIVE PNEUMATIC MICROBALLOON MIXING ON CENTRIFUGAL MICROFLUIDIC PLATFORMS**
M.M. Aeinehvand¹, A. Palermo², L.K. Weber², F.F. Loeffler³, A.E. Carvajal¹, D. Mager², J.G. Korvink², M. Madou⁴, and S.O. Martínez-Chapa¹
¹*Tecnológico de Monterrey, MEXICO,* ²*Karlsruhe Institute of Technology (KIT), GERMANY,* ³*Max Planck Institute of Colloids and Interfaces, GERMANY, and* ⁴*University of California, Irvine, USA*

a - Fundamentals in Microfluidics and Nanofluidics

Nanochannel/Nanopores

- M004a** **DEFOCUSING NANO PARTICLE IMAGE VELOCIMETRY FOR NANOCANNEL FLOWS**
K. Shibata, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- M005a** **NANOCANNELS WITH INTEGRATED ELECTRODES AND COMPLEX IONS CHANGE ELECTRIC DOUBLE LAYER STRUCTURE**
K.-H. Chou¹, C. McCallum¹, S. Mackenzie¹, D. Gillespie², and S. Pennathur¹
¹*University of California, Santa Barbara, USA and*
²*Rush University Medical Center, USA*
- M006a** **PORE SIZE DEPENDENCE OF DNA TRANSLOCATION THROUGH POLYMER NANOPORES FABRICATED BY NANOIMPRINT LITHOGRAPHY**
J. Choi and S. Park
Louisiana State University, USA
- M007a** **STABLE CONDITION OF PARALLEL AQ/ORG TWO PHASE FLOW IN NANOCANNEL**
H. Sano, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- T004a** **DIFFUSIOPHORESIS OF GOLD IN SILICA DRIVEN BY THE NANOMETRIC INTERFACIAL LAYER**
C. Tregouet, H. Le The, M. Odijk, J. Snoeijer, J. Eijkel, D. Lohse, and A. van den Berg
University of Twente, NETHERLANDS
- T005a** **NANOFLUIDIC MEMRISTOR: BY ORGANIC ELECTROLYTE SOLUTIONS IN SINGLE CONICAL NANOPORES**
J. Li¹, J. Xue², G. Du³, and Y. Xie¹
¹*Northwestern Polytechnical University, CHINA,* ²*Peking University, CHINA, and*
³*Chinese Academy of Sciences, CHINA*
- T006a** **PROTON TRANSFER MECHANISM IN EXTENDED-NANO SPACE: PROTON DIFFUSION OF D₂O AND H₂O**
K. Isogai, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

- T007a** **STRUCTURAL ANALYSIS OF WATER CONFINED IN NANOCANNEL: MEASUREMENT OF RADIAL DISTRIBUTION FUNCTION AND HYDROGEN BOND STRUCTURE**
H. Koreeda¹, K. Mawatari¹, K. Ohara², S. Kohara³, T. Yamaguchi⁴, K. Yoshida⁴, and T. Kitamori¹
¹University of Tokyo, JAPAN, ²Japan Synchrotron Radiation Research Institute (JASRI), JAPAN, ³National Institute for Materials Science (NIMS), JAPAN, and ⁴Fukuoka University, JAPAN
- W003a** **CLOGGING OF MODEL PORES WITH BROWNIAN PARTICLES**
O. Liot^{1,2}, P. Bacchin³, P. Duru⁴, P. Joseph¹, and J. Morris⁵
¹University Toulouse, FRANCE, ²Fédération Fermat, FRANCE, ³LGC, FRANCE, ⁴Institut de Mécanique des Fluides de Toulouse, FRANCE, and ⁵City College of New York, USA
- W004a** **EFFECT OF SURFACE ELECTROSTATIC INTERACTION ON SAMPLING BEHAVIOR OF SOLUTE MOLECULES AT MICRO/EXTENDED-NANO INTERFACE**
K. Okamoto, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- W005a** **NANOPORE PROBE: ANALYSIS OF HOFMEISTER EFFECT IN NANOSPACE**
M. Matsushita and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN
- W006a** **SINGLE PARTICLE PING-PONG ACROSS MULTIPLE NANOPORES FOR STUDYING VIRUS CAPSID DISASSEMBLY**
J. Zhou, L.S. Lee, A. Zlotnick, and S.C. Jacobson
Indiana University, USA
- W007a** **TRACKING THE IMPACT OF ANTIVIRAL COMPOUNDS ON VIRUS ASSEMBLY DYNAMICS WITH IN-PLANE MULTIPORE NANOFUIDIC DEVICES**
P. Kondylis, C.J. Schlicksup, A. Zlotnick, and S.C. Jacobson
Indiana University, USA

a - Fundamentals in Microfluidics and Nanofluidics

Others

- M008a** **3D BRANCHING STRUCTURES FOR FLUIDIC PROPORTIONING AND SAMPLE HANDLING**
N.P. Macdonald, S. Currivan, B. Paull, and M.C. Breadmore
University of Tasmania, AUSTRALIA

- M009a** **MEASURING A SLIGHT DIFFERENCE IN STRETCH BETWEEN GC AND AT RICH REGIONS WITHIN THE HUMAN GENOME**
J.G. Reifenger¹, H.-M. Chuang², K.D. Dorfman², and H. Cao¹
¹Bionano Genomics, USA and ²University of Minnesota, USA
- T008a** **HIGH DENSITY HYDROGEN STORAGE IN ULTRA-THIN LIQUID LAYER**
S. Bhattacharya, P. Kundu, S.-Y. Liu, F.-R. Chen, and F.-G. Tseng
National Tsing Hua University, TAIWAN
- T009a** **PRESSURE DEPENDENCY OF VIRTUAL VORTEX GEAR**
T. Takayama, C.-H.D. Tsai, H. Ito, and M. Kaneko
Osaka University, JAPAN
- W008a** **IN-SITU MEASUREMENT OF THERMAL DIFFUSION CONSTANT OF LIQUID USING PHOTOTHERMAL OPTICAL PHASE SHIFT**
T. Sato, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- W009a** **TIME-CONSTANT RATIOS OF INLET-CHANNEL ELEMENTS TO PREVENT BACKFLOW OF CAPILLARITY NETWORK**
Y. Lee and S.-J. Kim
University of Konkuk, KOREA

b - Micro- and Nanoengineering

3D Printing

- M010b** **3D PRINTED CASSETTE EMBEDDED WITH CONDUCTIVE POLYMER ELECTRODES FOR 2D PAPER CHROMATOGRAPHY AND PAPER TEETH SPRAY MASS SPECTROMETRY (PTS-MS) DETECTION OF RESIDUAL PESTICIDES IN AGRICULTURES**
M.-H. Cheng and C.-H. Lin
National Sun Yat-sen University, TAIWAN
- M011b** **3D PRINTING OF MICROFLUIDIC DEVICES IN HIGHLY FLUORINATED PERFLUOROPOLYETHERS (PFPE)**
F. Kotz, D. Helmer, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY
- M012b** **INKJET 3D PRINTED MINIATURE WATER TURBINE AS FLOW METER AND ENERGY HARVESTER FOR WIRELESS SENSOR SYSTEM**
K. Adamski, J. Adamski, J.A. Dziuban, and R. Walczak
Wrocław University of Science and Technology, POLAND

- T010b** **3D PRINTED HIGH QUALITY BECHTOP MICROFLUIDIC DEVICES INTEGRATING SMART MATERIALS AS SENSORS**
 J. Etxebarria-Elezgarai¹, M. García-Hernando¹, L. Basabe-Desmonts^{1,2},
 and F. Benito-Lopez¹
¹University of the Basque Country, SPAIN and ²IKERBASQUE, SPAIN
- T011b** **A BIOCOMPATIBLE PDMS RESIN FOR 3D-PRINTING OF BIOMEDICAL MICRODEVICES**
 N. Bhattacharjee, C. Parra-Cabrera, and A. Folch
University of Washington, USA
- T012b** **SUSPENDED LIQUID SUBTRACTIVE LITHOGRAPHY (SLSL) - 3D PRINTING OF MICROFLUIDIC STRUCTURES DIRECTLY INTO PDMS**
 D. Helmer, A. Voigt, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY
- W010b** **3D PRINTED MEMBRANE-BASED GAS MICROFLOW REGULATOR**
 A. Podwin, K. Adamski, and W. Kubicki
Wroclaw University of Science and Technology, POLAND
- W011b** **HIGH RESOLUTION 3D-PRINTING OF TRANSPARENT PEG-DA MICROFLUIDIC DEVICES**
 A.P. Kuo, N. Bhattacharjee, and A. Folch
University of Washington, USA
- W012b** **SYNERGY OF 3D PRINTING AND INJECTION MOLDING: A NEW PROTOTYPING METHOD FOR RAPID DESIGN OPTIMIZATION AND MANUFACTURING OF MICROFLUIDIC DEVICES**
 E. Vereshchagina¹, E. Andreassen², R.H. Gaarder², and M.M. Mielnik¹
¹SINTEF Digital, NORWAY and ²SINTEF Materials and Chemistry, NORWAY

b - Micro- and Nanoengineering

Assembly

- M013b** **DIRECT BIOACTUATOR FORMATION ON MICROSTRUCTURE BY QUASI-DIAMAGNETIC ASSEMBLY**
 H. Suenaga¹, J. Sugihara¹, M. Horie², and Y. Akiyama¹
¹Shinshu University, JAPAN and ²Kyoto University, JAPAN
- M014b** **SYNTHESIS OF CRYSTALLINE MATERIALS USING MICROFLUIDIC DEVICES: FROM ISOLATION OF OUT-OF-EQUILIBRIUM CRYSTAL STRUCTURES TO DIRECT PRINTING OF CONFORMAL FIBERS OF CRYSTALLINE MATERIALS ON SURFACES**
 A. Abrishamkar¹, R. Mas-Ballesté², A.J. deMello¹, and J. Puigmarti-Luis¹
¹ETH Zürich, SWITZERLAND and ²Universidad Autónoma de Madrid, SPAIN

T013b **GENERATION OF PICOLITER DROPLETS FROM IN SITU ASSEMBLED NANOLITER PLUGS FOR MULTIPLE HIGH THROUGHPUT ASSAYS ON A SINGLE DEVICE**

P. Zhang, A. Kaushik, K. Hsieh, and T.-H. Wang
Johns Hopkins University, USA

T014b **THE SELECTIVE BINDING TECHNIQUE USING HYDROPHILIC/HYDROPHOBIC PATTERNING FOR SELF-ASSEMBLY**

T. Okuyama, T. Okano, and H. Suzuki
Chuo University, JAPAN

W013b **HETEROGENEOUS 3D STRUCTURE BY ASSEMBLY OF FUNCTIONAL ALGINATE GEL MODULE**

A. Yokomizo, H. Oda, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN

b - Micro- and Nanoengineering

Cell and Tissue Culture

M015b **DEVELOPMENT OF A MICROCHANNEL FABRICATION METHOD KEEPING CELL OR MOLECULE PATTERNING FORMED IN AN OPEN SPACE USING LOW/ROOM TEMPERATURE GLASS BONDING**

S. Funano, N. Ota, A. Sato, and Y. Tanaka
Institute of Physical and Chemical Research (RIKEN), JAPAN

M016b **POWDER BLASTING AS A RAPID METHOD FOR FABRICATION OF MICROSYSTEMS FOR CELL-BASED STUDIES**

J. Smejkal, M. Štofik, D. Wróbel, and J. Malý
Jan Evangelista Purkyně University, CZECH REPUBLIC

T015b **MICROWELL-BASED SPHERO-PLATE FOR HIGH-THROUGHPUT SCREENING**

I. Koh, D. Won, and P. Kim
Korea Advanced Institute of Science and Technology (KAIST), KOREA

W014b **BOTTOM-UP TISSUE ENGINEERING BY LIGHT DIRECTED ASSEMBLY OF BUILDING BLOCKS WITH MICROSCALE CONTROL**

N.-D. Dinh, M.N. Hsu, W.N. Lin and C.-H. Chen
National University of Singapore, SINGAPORE

W015b **MULTIFUNCTIONAL MICROFLUIDIC SYSTEM FOR CONTROLLABLE CO-CULTURE, MIGRATION ANALYSIS AND DRUG SCREENING**

K. Tokarska, E. Jastrzębska, M. Chudy, A. Dybko, and Z. Brzózka
Warsaw University of Technology, POLAND

b - Micro- and Nanoengineering

Hydrogels

- M017b** **UNCONVERTED DOUBLE BONDS IN THE HYDROGEL NETWORK SYNTHESIZED VIA FLOW LITHOGRAPHY**
H.J. Moon¹, M. Ku², H. Lee¹, J. Yang², and K.W. Bong¹
¹Korea University, KOREA and ²Yonsei University, KOREA
- T016b** **A MULTI-LAYER, SELF-ALIGNING HYDROGEL MICROMOLDING PROCESS OFFERING A FABRICATION ROUTE TO PERFUSABLE 3D IN-VITRO MICROVASCULATURE**
H. Heidari and H. Taylor
University of California, Berkeley, USA
- W016b** **MICROFLUIDIC ACTUATORS BASED ON TEMPERATURE-RESPONSIVE HYDROGELS**
H. Geisler, M. Leman, B. Chollet, L. d'Eramo, M. Kerdraon, F. Monti, Y. Tran, and P. Tabeling
École Supérieure de Physique et de Chimie Industrielles (ESPCI), PARIS

b - Micro- and Nanoengineering

Microneedles

- M018b** **A REPEATABLE AND RELIABLE FABRICATION METHOD FOR SHARP, HOLLOW SILICON MICRONEEDLES**
H. Kim, L. Theogarajan, and S. Pennathur
University of California, Santa Barbara, USA
- T017b** **A MICROFLUIDIC NEEDLE FOR SAMPLING AND DELIVERY OF CHEMICAL SIGNALS BY SEGMENTED FLOWS**
S. Feng¹, G. Liu¹, L. Jiang¹, Y. Zhu², E.M. Goldys¹, and D.W. Inglis¹
¹Macquarie University, AUSTRALIA and ²RMIT University, AUSTRALIA
- W017b** **FABRICATION OF POROUS POLYLACTIC-CO-GLYCOLIC ACID (PLGA) COATED SUS MICRONEEDLES FOR IMPROVING TRANSDERMAL DRUG DELIVERY**
A. Ullah, C.M. Kim, and G.M. Kim
Kyungpook National University, KOREA

b - Micro- and Nanoengineering

Microparticles

- M019b** **RAPID AND REPRODUCABLE METHOD TO FABRICATE MICRO-SIZED FERROMAGNETIC ROBOTS FOR MICROFLUIDIC APPLICATIONS**
A. Al-Halhouli, H. Al-Aloul, O. Deeb, and W. Al-Faqheri
German Jordanian University, JORDAN
- T018b** **ENHANCED STORAGE CAPACITY OF INFORMATION DNA MICROPARTICLE USING POROUS MATERIAL**
S. Kim¹, H. Kim¹, Y. Choi², H. Bae², S.H. Song¹, S. Kwon², and W. Park¹
¹Kyung Hee University, KOREA and ²Seoul National University, KOREA
- T019b** **SIMPLE EPOXY ENCAPSULATION OF INFORMATION DNA-CONJUGATED MICROPARTICLE FOR LONG-TERM STORAGE**
H. Kim¹, S. Kim¹, Y. Choi², H. Bae², S.H. Song¹, S. Kwon², and W. Park¹
¹Kyung Hee University, KOREA and ²Seoul National University, KOREA
- W018b** **QR-CODED MICROPARTICLE WITH DEGRADABLE DECODE-BLOCKING STRUCTURE FOR TIME-TRACEABILITY**
C. Park, S. Lim, and W. Park
Kyung Hee University, KOREA
- W019b** **SYNTHESIS OF MULTI-STIMULI RESPONSIVE DRUG CARRIERS FOR SELECTIVE MULTIPLE DRUG RELEASE TO TUMOR MICROENVIRONMENTS**
H.U. Kim¹, D.G. Choi², H.J. Lee¹, M.S. Shim², and K.W. Bong¹
¹Korea University, KOREA and ²Incheon National University, KOREA

b - Micro- and Nanoengineering

Nanostructures

- M020b** **3D TISSUE FORMATION BY STACKING DETACHABLE CELL SHEETS FORMED ON NANOFIBER MESH**
B. Lee¹, M.S. Kim¹, S. Kim¹, S. Bang¹, S.-H. Park², and N.L. Jeon¹
¹Seoul National University, KOREA and ²Korea Institute of Industrial Tecnology, KOREA
- M021b** **NANOPORE SENSING DEVICE INTEGRATING NANOPILLAR ARRAY FOR DNA TRANSLOCATION CONTROL**
T. Tanaka, S. Kanetani, K. Arima, and K. Kawai
Osaka University, JAPAN

- M022b** **HIGH-PRECISION FABRICATION OF NANOCHANNELS WITH CONTROLLED CIRCULAR CROSS-SECTION**
Y.-S. Park, J.M. Oh, and Y.-K. Cho
Ulsan National Institute of Science & Technology (UNIST), KOREA
- M023b** **MICROFLUIDIC SYNTHESIS OF MULTIFUNCTIONAL HOLLOW MESOPOROUS SILICA NANOSPHERES**
Y. Nie, N.J. Hao, and J.X.J. Zhang
Dartmouth College, USA
- M024b** **SILVER NANOWIRE SYNTHESIS USING NANOFLUIDIC CHANNEL NETWORKS FABRICATED BY CRACK-PHOTOLITHOGRAPHY FOR NANOSENSOR APPLICATIONS**
D. Ha¹, D.J. Kim², Q. Zhou¹, and T. Kim¹
¹*Ulsan National Institute of Science & Technology (UNIST), KOREA and*
²*Yale University, USA*
- T020b** **A NANO-DUPLEX-IMPRINT TECHNIQUE BASED ON NANOPILLAR STRUCTURE OF NATURAL CICADA WING**
X. Li^{1,2} and A. Manz^{1,2}
¹*Saarland University, GERMANY and*
²*Korea Institute of Science and Technology (KIST) - Europe, GERMANY*
- T021b** **CRACK-PHOTOLITHOGRAPHY-ASSISTED COLLAPSE-FREE AND MASS-TRANSPORT-CONTROLLABLE NANOCHANNEL MICROFABRICATION**
D. Ha¹, D.-J. Kim², J.G. Park¹, and T. Kim¹
¹*Ulsan National Institute of Science & Technology (UNIST), KOREA and*
²*Yale University, USA*
- T022b** **LARGE-AREA FABRICATION OF SUB- μ M PDMS THROUGH-HOLE MEMBRANES**
H. Le-The, M.A. Palma do Carmo, M.W. van der Helm, J.G. Bomber, L.I. Segerink, A. van den Berg, and J.C.T. Eijkel
University of Twente, NETHERLANDS
- T023b** **PHENOTYPIC SCREENING WITH MULTI-ARCHITECTURAL CHIP (MARC) IDENTIFIES UNIQUE TOPOGRAPHIES REGULATING ARTERIAL AND VENOUS ENDOTHELIAL CELL PHENOTYPES**
S. Arora¹, E.K.F. Yim², and Y.C. Toh¹
¹*National University of Singapore, SINGAPORE and* ²*University of Waterloo, CANADA*
- T024b** **SINGLE NANOPARTICLE ENCAPSULATION IN FAST-EVAPORATING MICRO-EMULSION PREVENTS PARTICLE AGGLOMERATION IN NANOCOMPOSITES**
M. Pan, F. Lyu, and S.K.Y. Tang
Stanford University, USA

- W020b** **CAPILLARY-FACILITATED COATING OF CARBON NANOTUBE THIN FILM AS A STRAIN GAUGE FOR BLOOD RETRACTION TEST**
Z. Li, X. Xue, D. Peyer, B. McCracken, K. Ward, and J. Fu
University of Michigan, USA
- W021b** **FINE TUNING SILICA MESOPORES TO CONFORMALLY ENHANCE THE SPECIFIC SURFACE IN PILLAR ARRAY COLUMNS IN THE CONTEXT OF CHROMATOGRAPHY**
S. Futagami¹, T. Hara², H. Ottevaere¹, G.V. Baron¹, G. Desmet¹, and W. De Malsche¹
¹Vrije Universiteit Brussel, BELGIUM and ²Kyushu University, JAPAN
- W022b** **LOCAL MICRO AND NANO PATTERNING OF MICROFLUIDIC DEVICES USING THE SOLID ON LIQUID DEPOSITION PROCESS**
J. Charmet¹, A. Homasy², M. Wood³, J. Covington¹, L. Isa⁴, M. Textor⁴, T.P.J. Knowles³, and H. Keppner²
¹University of Warwick, UK, ²University of Applied Sciences Western Switzerland, SWITZERLAND, ³University of Cambridge, UK, and ⁴ETH Zürich, SWITZERLAND
- W023b** **RAPID FOLDING OF DNA NANOSTRUCTURES IN MICROFLUIDIC CHANNEL**
K. Hara¹, K. Arima¹, O. Tabata², and K. Kawai¹
¹Osaka University, JAPAN and ²Kyoto University, JAPAN
- W024b** **SINGLE-EXOSOME ANALYSIS PLATORM BASED ON NANOARRAY CHIP TECHNOLOGY**
H. Kuramochi¹, S. Yokota¹, S. Tsuchiya², T. Akagi¹, and T. Ichiki¹
¹Univerisity of Tokyo, JAPAN and ²Innovation Center of NanoMedicine, JAPAN

b - Micro- and Nanoengineering

Other Microfabrication

- M025b** **DEVELOPMENT OF AN AUTOMATED LATERAL FLOW IMMUNOASSAY OPTIMIZATION SYSTEM**
D. Gasperino, T. Huynh, and B. Weigl
Intellectual Ventures Laboratory, USA
- M026b** **LAB ON A CHIP LIGHT GENERATION: THE FABRICATION OF FULLY INTEGRATED AND "FLEXIBLE" COHERENT LIGHT SOURCE**
S. Bonfadini^{1,2}, P. Spegni³, F. Simoni³, and L. Criante¹
¹Istituto Italiano di Tecnologia, ITALY, ²Politecnico di Milano, ITALY, and ³Università Politecnica delle Marche, ITALY

- M027b** **SIMPLE METHOD FOR FABRICATION OF HYBRID AND ALL-GLASS MICROFLUIDIC CHIPS USING NEW LOW-TEMPERATURE LAMINATED DRY FILM RESIST**
W. Kubicki, R. Walczak, and J.A. Dziuban
Wroclaw University of Science and Technology, POLAND
- T025b** **FUNDAMENTALS OF INJECTION MOLDING FOR MICROFLUIDIC CELL-BASED ASSAYS**
U.N. Lee¹, E. Berthier¹, X. Su¹, D.J. Guckenberger², A.M. Dostie¹, T. Zhang¹, and A.B. Theberge¹
¹*University of Washington, USA and* ²*Salus Discovery, LLC, USA*
- T026b** **PATTERNING MOLECULAR MOTORS FOR FABRICATION OF STACKED ROTARY ACTUATOR**
K. Minakata¹, Y. Hiratsuka², K. Uesigi¹, and K. Morishima¹
¹*Osaka University, JAPAN and* ²*Japan Advanced Institute of Science and Technology (JAIST), JAPAN*
- T027b** **STUDY ON THE MECHANISM OF DIRECT BONDING OF PLASTICS BY VACUUM ULTRAVIOLET LIGHT LESS THAN 160-NM WAVELENGTH**
Y. Hashimoto¹, K. Mogi², and T. Yamamoto¹
¹*Tokyo Institute of Technology, JAPAN and* ²*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*
- W025b** **INVESTIGATION OF DIRECT LASER WRITING FOR TOPOTAXIS STUDIES**
C. Krueger, S.H. Sturner, H. Palmer, E. Nakas, L. Motabar, F. Aromolaran, and R.D. Socchol
University of Maryland, USA
- W026b** **RESPONSIVE ORIGAMI PLEATS BY HYGROSCOPIC ACTUATIONS WITH ON HIERARCHICAL BUMPS**
J. Bae¹, H. Cho², H. Kang², G. Wu², J. Jollu², S. Yang², and W. Park¹
¹*Kyung Hee University, KOREA and* ²*University of Pennsylvania, USA*

b - Micro- and Nanoengineering

Patterning/Lithography

- T028b** **LOW TEMPERATURE FLOW LITHOGRAPHY**
H. Lee, H.U. Kim, Y.H. Roh, and K.W. Bong
Korea University, KOREA
- T029b** **SELF-SHAPED LIQUID TEMPLATE ON INKJET-PATTERNED SUPERHYDROPHOBIC SUBSTRATE FOR FABRICATION OF FUNCTIONALIZED MICROFLUIDIC SYSTEMS**
X. Lai, B. Lu, H. Wu, Z. Pu, H. Yu, and D. Li
Tianjin University, CHINA

- W027b** **MICROCONTACT PRINTING OF POLYDOPAMINE ARRAY ON HYDROPHOBIC SURFACE FOR SINGLE CELL PATTERNING**
H. Wu, L. Wu, X. Zhou, B. Liu, and B. Zheng
Chinese University of Hong Kong, HONG KONG
- W028b** **TOPOGRAPHICAL AND CHEMICAL PATTERNING OF CELL CULTURE SUBSTRATES**
E. Azuaje-Hualde¹, M.M. de Pancorbo¹, F. Benito-Lopez¹, and L. Basabe-Desmonts^{1,2}
¹*University of the Basque Country, SPAIN* and ²*IKERBASQUE, SPAIN*

b - Micro- and Nanoengineering

PDMS

- M028b** **A UNIVERSAL METHOD TO BOND SILICONES TO POLYMERIC AND METALLIC SUBSTRATES**
R. Ghaemi, M. Dabaghi, R. Attalla, A. Shahid, H.-H. Hsu, and P.R. Selvaganapathy
McMaster University, CANADA
- M029b** **FABRICATION OF POROUS POLYDIMETHYLSILOXANE (PDMS) THIN FILM AT TEMPERATURE BELOW ZERO DEGREE**
X. Ren¹ and M. Noh²
¹*Virginia Polytechnic Institute and State University, USA* and ²*Drexel University, USA*
- M030b** **SIMPLE FABRICATION OF 3D MICRO CONTAINER USING PDMS STENCIL BASED ON SOLVENT EVAPORATION**
C.M. Kim¹, H.B. Lee¹, J.U. Kim¹, Y.L. Cui¹, J.A. Kim², S.K. Yoo², and G.M. Kim¹
¹*Kyungpook National University, KOREA* and
²*Osong Medical Innovation Foundation, KOREA*
- T030b** **DIRECT ETCHING AND IMPLANTED METALIZATION IN SOFT MATTER**
K. Ichikawa¹, Y. Fukuyama², S. Maeda¹, and Y. Yamanishi²
¹*Shibaura Institute of Technology, JAPAN* and ²*Kyushu University, JAPAN*
- T031b** **MICROLENS INTEGRATED WITH BLACK SHADOW MASK USING PDMS THROUGH-HOLE ARRAY**
N. Jin, M. Mizuochi, and M. Seki
Chiba University, JAPAN
- T032b** **STAINLESS STEEL REINFORCED COMPOSITE SILICONE MEMBRANE AND ITS INTEGRATION INTO MICROFLUIDIC OXYGENATORS FOR HIGH PERFORMANCE GAS EXCHANGE**
H. Matharoo, M. Dabaghi, N. Rochow, G. Fusch, J. Brash, C. Fusch, and P.R. Selvaganapathy
McMaster University, CANADA

W029b **FABRICATION OF TRANSPARENT SUPERHYDROPHOBIC PDMS USING THERMAL TREATMENT**
E. Lee¹, K. Seo², M. Kim³, and D.H. Kim¹
¹Korea Advanced Institute of Science and Technology (KAIST), KOREA, ²LG Chem Research Park, KOREA, and ³Korea Institute of Science and Technology (KIST), KOREA

W030b **HIGH STRETCHABLE CONDUCTIVE MICROCHANNEL FABRICATED BY SIMPLE PDMS SOFT LITHOGRAPHY PROCEDURES**
X.-C. Guo and C.-W. Tsao
National Central University, TAIWAN

b - Micro- and Nanoengineering

Sensing/Assays

M031b **CANCER miRNA DETECTION BY HIGHLY SENSITIVE SERS VIA SELF-ASSEMBLY NANO PARTICLE BASED MICRO PERIODIC DOMAIN (SANP-MPD)**
M.P. Koduri¹, A. Kumar¹, V. Goudar¹, and F.G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN

M032b **LASER-MANIPULATED MICROTOOL WITH ENZYME-FUNCTIONALIZED SURFACE FOR ON SITE MOLECULAR PROCESSING**
A. Masuda¹, H. Takao¹, F. Shimokawa¹, and K. Terao^{1,2}
¹Kagawa University, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

M033b **PRECONCENTRATION ENHANCED IMMUNOASSAY FOR PROTEIN SENSING**
Y.-J. Fan¹, C.-Z. Deng², and H.-J. Sheen²
¹Taipei Medical University, TAIWAN and ²National Taipei University, TAIWAN

T033b **ELECTRODE SPATIAL DESIGN FOR A NEW MICROFLUIDICS IMPEDANCE FLOW CYTOMETER**
T.-W. Wu, C.-H. Gao, Y.-Z. Huang, T.-W. Lin, and C.-T. Lin
National Taiwan University, TAIWAN

T034b **LOW COST, COMMERCIALY AVAILABLE PIEZO RING FOR MICROFLUIDICS INTERFACING WITH MASS SPECTROMETRY**
I.-C. Lei and C.-W. Tsao
National Central University, TAIWAN

W031b **A NANO-SANDWICH DEVICE BASED GRAPHENE OXIDESE FOR MONITORING CYTOKINES**
G. Liu^{1,2}, M. Qi¹, and S. Feng²
¹Central China Normal University, CHINA and ²Macquarie University, AUSTRALIA

W032b **IMPROVED ACCURACY IN QUANTIFICATION OF ANALYTE THROUGH DUAL MODALITY MULTISITE SENSING**
S. Sardar, L. Fabris, and M. Javanmard
Rutgers University, USA

W033b **MEASURING INTRINSIC KINETICS OF ENZYMES IMMOBILIZED IN HYDROGELS**
H.D. Neira and A.E. Herr
University of California, Berkeley, USA

c - Sensors & Actuators, and Detection Technologies

Cantilever Sensors

M034c **NANOPARTICLE MODIFIED MICROCANTILEVER SENSOR FOR DETECTION OF EMERGING WATER CONTAMINANTS**
M. Duman and M. Okan
Hacettepe University, TURKEY

T035c **A SELECTIVE DETECTION OF AMYLOID BETA IN HUMAN SERUM BY STRAIN GAUGE CANTILEVER SENSOR IMMOBILIZING LIPOSOME INCORPORATED WITH CHOLESTEROL**
T. Taniguchi¹, Y. Murakami¹, M. Sohgawa², K. Yamashita¹, and M. Noda¹
¹Kyoto Institute of Technology, JAPAN and ²Niigata University, JAPAN

W034c **FULLY POLYMERIC FLEXIBLE PIEZORESISTIVE CANTILEVER IMMUNOSENSOR BASED ON PEDOT/PSS SENSING LAYER**
R. Zhao, H. Guo, J. Tang, Y. Shi, and J. Liu
North University of China, CHINA

c - Sensors & Actuators, and Detection Technologies

Cell Studies

M035c **HIGH-THROUGHPUT, SINGLE CELL ANALYSIS OF PEPTIDE UPTAKE AND DEUBIQUITINATING ENZYME ACTIVITY USING A MICROFLUIDIC DROPLET TRAPPING ARRAY**
N. Safabakhsh, M. Vaithyanathan, S. Charles, R. Elkhanoufi, W. Wortmann III, and A.T. Melvin
Louisiana State University, USA

M036c **MONITORING THE RESPIRATORY ACTIVITY OF MULTICELLULAR TUMOR SPHEROIDS IN AN INTEGRATED MICROFLUIDIC DEVICE**
Y. Abbas, F. van Rossem, J. Bomer, and S. Le Gac
University of Twente, NETHERLANDS

- T036c** **A HIGH-THROUGHPUT AND LABEL-FREE MULTI-OUTLETS CELL COUNTING MICROSYSTEM USING A SINGLE PAIR OF IMPEDANCE SPECTROSCOPY ELECTRODES**
N. Sobahi and A. Han
Texas A&M University, USA
- T037c** **LENSLESS SINGLE CELL CYTOMETER WITH DIELECTROPHORESIS (DEP) DETECTION**
S. Afshar¹, E. Salimi¹, A. Fazelkhah¹, M. Butler², G. Bridges¹, and D. Thomson¹
¹*University of Manitoba, CANADA and*
²*National Institute for Bioprocessing Research and Training (NIBRT), IRELAND*
- W035c** **CELL LYSIS USING INTEGRATED MICROFABRICATED ULTRASONIC HORNS**
P. Hareesh, J.Y. Han, and D. DeVoe
University of Maryland, USA
- W036c** **MICROFLUIDIC APPROACH FOR PROBING BIOLOGICAL EVENTS THAT LEAD TO EXCESSIVE CELL PROLIFERATION**
I.M. Lazar, J. Deng, and N. Smith
Virginia Polytechnic Institute and State University, USA

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- M037c** **A MICROBIAL ELECTROGENICITY-BASED SENSOR FOR GLUCOSE MONITORING IN SALIVA**
M. Mohammadifar and S. Choi
State University of New York, Binghamton, USA
- M038c** **AN ELECTROCHEMICAL DETECTION OF METHYLATED DNA SPIKED IN HUMAN URINE SAMPLE**
S.A. Hong, Y. Yun, Y. Lee, and S. Yang
Gwangju Institute of Science and Technology (GIST), KOREA
- M039c** **BIOSENSOR PLATFORM BASED ON SANDWICH CARBON ELECTRODES ENABLING ENZYMATIC-ELECTROCHEMICAL REDOX CYCLING**
J. Lee, D. Sharma, and H. Shin
Ulsan National Institute of Science & Technology (UNIST), KOREA
- M040c** **ELECTROCHEMICAL APTAMER SENSORS FOR THE DETECTION OF QUORUM SENSING MOLECULES FROM CLINICAL PATHOGENS**
H.J. Sismaet and E.D. Goluch
Northeastern University, USA

- M041c** **GRAPHENE BASED ULTRA SENSITIVE ION SENSOR FOR PHOSPHATE DETECTION**
J. Kim¹, L. Wang², and T. Cui¹
¹University of Minnesota, USA and ²Tsinghua University, USA
- M042c** **INTEGRATED ELECTROCHEMICAL SENSING WITH HIGH SENSITIVITY MASS SPECTROMETRY ANALYSIS ON A SIMPLE AND RAPID NANOSTRUCTURED SILICON PLATFORM**
Z.-M. Guo and C.-W. Tsao
National Central University, TAIWAN
- M043c** **LSI-BASED ELECTROCHEMICAL DEVICE FOR EVALUATION OF RESPIRATORY ACTIVITY OF THREE-DIMENSIONAL CULTURED CELLS**
K. Ino, T. Onodera, and H. Shiku
Tohoku University, JAPAN
- M044c** **PORTABLE LOCK-IN AMPLIFIER-BASED ELECTROCHEMICAL METHOD TO MEASURE AN ARRAY OF 64 SENSORS FOR POINT OF CARE APPLICATIONS**
R. Hrdý³, H. Kynclová², I. Klepáčova^{1,3}, M. Bartošík⁴, and P. Neužil^{1,2}
¹Northwestern Polytechnical University, CHINA, ²Central European Institute of Technology, CZECH REPUBLIC, ³Brno University of Technology, CZECH REPUBLIC, and ⁴Masaryk Memorial Cancer Institute, CZECH REPUBLIC
- M045c** **ULTRA-LOW DETECTION-LIMIT HEAVY METAL ION DETECTION VIA ELECTROCHEMICAL ENHANCED POROUS SILICON PHOTONIC SENSORS**
K.-H. Chih¹, W.-T. Tsai¹, J.-R. Lai¹, M.-H. Nguyen², H.-B. Nguyen³, M.-C. Lee¹, and F.-G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN, ²Academia Sinica, TAIWAN, and ³Center for Microelectronics and Informatics Technology, VIETNAM
- T038c** **A FLEXIBLE GRAPHENE APTAMERIC NANOSENSOR FOR DETECTION OF TNF- α**
Z. Hao^{1,2}, Y. Zhu¹, Y. Li¹, X. Wang¹, X. Zhao², and Q. Lin¹
¹Columbia University, USA and ²Harbin Institute of Technology, CHINA
- T039c** **A RECYCLABLE DEVICE FOR REAL-TIME CYTOKINE MONITORING IN CELL MICROENVIRONMENT**
G. Liu^{1,2} and C. Cao¹
¹Centra China Normal University, CHINA and ²Macquarie University, AUSTRALIA
- T040c** **AN APTAMERIC GRAPHENE NANOSENSOR FOR DIRECT AND SENSITIVE VASOPRESSIN DETECTION**
C. Su^{1,2}, X. Wang¹, M.N. Milosavic¹, M. He², and Q. Lin¹
¹Columbia University, USA and ²Xi'an Jiaotong University, CHINA

- T041c** **INCORPORATION OF THERMOPLASTIC GRAPHITE INTERDIGITATED ELECTRODE ARRAY INTO PAPER-BASED MICROFLUIDIC DEVICES**
C.S. Henry, E. Noviana, R. Channon, M. Nguyen, D. Dandy, and B. Geiss
Colorado State University, USA
- T042c** **ELECTROCHEMICAL IMMUNOSENSOR BASED ON 3D TRIPLE ELECTRODE SYSTEM FOR SENSITIVE DETECTION OF CARDIAC BIOMARKER**
D. Sharma, J. Lee, and H. Shin
Ulsan National Institute of Science & Technology (UNIST), KOREA
- T043c** **HUMAN OLFACTORY RECEPTOR-FUNCTIONALIZED GRAPHENE-FET SENSOR AS HIGH PERFORMANCE BIOELECTRONIC NOSE**
H.S. Song^{1,2} and O.S. Kwon²
¹*Korea Basic Science Institute (KBSI), KOREA and*
²*Korea Research Institute of Bioscience and Biotechnology, KOREA*
- T044c** **INVESTIGATION OF THE SOLID-LIQUID INTERFACE WITH A DUAL PLASMONIC AND ELECTRONIC BIOSENSING PLATFORM**
R.F. Tiefenauer¹, K. Tybrandt², T. Dalgaty¹, and J. Vörös¹
¹*ETH Zürich, SWITZERLAND and* ²*Linköpings University, SWEDEN*
- T045c** **NANOWELL ARRAY IMPEDANCE SENSOR FOR LABEL-FREE QUANTIFICATION OF CYTOKINES IN SERUM AT FEMTOMOLAR LEVEL DETECTION LIMITS**
P. Xie¹, N. Song², W. Shen², M. Allen², and M. Javanmard¹
¹*Rutgers University, USA and* ²*University of Pennsylvania, USA*
- T046c** **REAL-TIME MONITORING OF THE MICRODROPLET SIZE ON 3D PRINTED MICROFLUIDIC DEVICES WITH INTEGRATED CONTACTLESS CONDUCTIVITY DETECTION**
L.C. Duarte, C.L.S. Chagas, L.E.B. Ribeiro, and W.K.T. Coltro
Federal University of Goiás, BRAZIL
- T047c** **μ-ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY FOR IDENTIFYING SPATIAL HETEROGENEITY IN TUMOR BEARING HEPATIC TISSUE**
V. Lochab, E. Alkandry, T.H. Jones, M. Abdel-Rahman, E.W. Martin Jr., C.R. Schmidt, S.R. Abdel-Misih, M. Bloomston, V.V. Subramaniam, and S. Prakash
Ohio State University, USA
- W037c** **A LABEL-FREE SINGLE BREAST CANCER CELL DETECTION USING h-BN SANDWICHED MoS₂ FIELD-EFFECT TRANSISTOR COMBINED WITH PDMS-CONSTRICTION-CHANNEL**
J. Lee, Y. Yoon, H. Yang, Y. An, O. Sul, S.-J. Lee, and S.-B. Lee
Hanyang University, KOREA

- W038c** **A WILD TYPE T4 PHAGE BASED IMPEDIMETRIC WIDE-DYNAMIC-RANGE MICRO ELECTROCHEMICAL SENSOR FOR DETECTION OF VIABLE BACTERIA**
J. Xu, B. Gao, Y. Hua, Q. Chen, Y. Chau, and Y.-K. Lee
Hong Kong University of Science and Technology, HONG KONG
- W039c** **AN ORGANOMETALLIC POLYMER-BASED MICROFLUIDIC PLATFORM FOR REDOX-MEDIATED ELECTROCHEMICAL SENSING**
X. Su¹, A. Harynuk², T.A. Hatton¹, and N. Nazemifard²
¹*Massachusetts Institute of Technology, USA and* ²*University of Alberta, CANADA*
- W040c** **EFFECT OF AGGREGATED AMYLOID BETA ON THE SIGNAL VARIATION OF ELECTROCHEMICAL IMPEDANCE SENSING SYSTEM TOWARDS THE DIAGNOSIS OF ALZHEIMER'S DISEASE**
J. Ji, M. Park, Y. Heo, K.-S. Shin, and J.Y. Kang
Korea Institute of Science and Technology (KIST), KOREA
- W041c** **GELATIN-ENABLED MICROSENSOR (GEM) FOR PANCREATIC PROTEASE MONITORING**
G.E. Banis, L.A. Beardslee, and R. Ghodssi
University of Maryland, USA
- W042c** **HYBRID PAPER-BASED POTENTIOSTAT FOR LOW-COST POINT-OF-NEED DIAGNOSTICS**
P. Bezuidenhout, S. Smith, K. Land, and T. Joubert
University of Pretoria, SOUTH AFRICA
- W043c** **LABEL-FREE DNA QUANTIFICATION BY MULTI-FREQUENCY IMPEDANCE CYTOMETRY AND MACHINE LEARNING ANALYSIS**
J. Sui¹, N. Gandotra², P. Xie¹, Z. Lin¹, C. Scharfe², and M. Javanmard¹
¹*Rutgers University, USA and* ²*Yale University, USA*
- W044c** **OPTIMIZATION OF OPERATION REGIMES FOR EXTENDED-GATE FIELD EFFECT TRANSISTORS (EGFET) INTEGRATED WITH ION SELECTIVE MEMBRANE (ISM) FOR AMPEROMETRIC pH SENSING WITH g_m/I_D THEORY**
B. Gao¹, M. Duan¹, Q. Chen¹, A. Bermak^{1,2}, and Y.-K. Lee¹
¹*Hong Kong University of Science and Technology, HONG KONG and* ²*Hamad Bin Khalifa University, QATAR*
- W045c** **WEARABLE AND STRETCHABLE POROUS REDUCED GRAPHENE OXIDE (RGO)-CNT NETWORK-MODIFIED ELECTROCHEMICAL SENSOR FOR AMMONIUM IN SWEAT**
Y. Hua, S.C.T. Kwok, B. Gao, J. Xu, Y.-K. Lee, and M.M.F. Yuen
Hong Kong University of Science and Technology, HONG KONG

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- M046c** **A "DYED PLASTICIZER" FOR RAPID AND HIGHLY SENSITIVE SENSING BASED ON A PLASTICIZED PVC MEMBRANE FOR CAPILLARY ARRAY-BASED MICROANALYTICAL DEVICES**
T. Mizuta, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN
- M047c** **ELECTRICALLY TRIGGERED CONVECTION FOR MICRO-PARTICLE AGGREGATION**
A. Menachery¹ and M.A. Qasaimeh^{1,2}
¹*New York University, Abu Dhabi, UAE* and ²*New York University, USA*
- T048c** **AN AUTOMATED SYSTEM FOR THE SHAPE OPTIMIZATION OF DOUBLE EMULSION DROPLETS USED IN THE FABRICATION OF INERTIAL FUSION ENERGY TARGET SHELLS**
J. Li, F. Wu, H. Wang, J. Cuenca, X. Yang, and D. Barrow
Cardiff University, UK
- T049c** **GLUCOSE AND OXYGEN SENSITIVE HYDROGEL FOR BIOANALYTES MONITORING**
J. Sawayama and S. Takeuchi
University of Tokyo, JAPAN
- W046c** **3D PRINTED, ALL-ELASTOMER PNEUMATIC ARTIFICIAL MUSCLES FOR MEDICAL APPLICATIONS**
L.-Y. Liu, L.-Y. Liu, and Y.-C. Su
National Tsing Hua University, TAIWAN
- W047c** **E-BEAM PATTERNED GOLD NANOSTRUCTURE MATRIX ON PDMS FOR PLASMOMECHANICAL PRESSURE SENSOR SKIN**
A. Kakati and S. Das
Indian Institute of Technology, Kharagpur, INDIA
- W048c** **HIGH-THROUGHPUT FABRICATION OF NANOCONE SUBSTRATES THROUGH POLYMER INJECTION MOULDING FOR SERS ANALYSIS IN MICROFLUIDIC SYSTEMS**
M. Viehrig¹, M. Matteucci¹, A.H. Thilsted², M.S. Schmidt¹, and A. Boisen¹
¹*Technical University of Denmark, DENMARK* and ²*SpectroInlets, DENMARK*

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Y. Pihosh, Y. Kazoe, H. Takahashi, K. Mawatari, K. Morikawa, and T. Kitamori
University of Tokyo, JAPAN
- M049c** **SIMPLE AND ULTRA SENSITIVE DETECTION METHOD OF NON-FLUORESCENT MOLECULES IN EXTENDED-NANO SPACES UTILIZING LIGHT DIFFRACTION: INVESTIGATION OF SIGNAL GENERATION MECHANISM**
Y. Tsuyama, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- T050c** **DEVELOPMENT OF SINGLE-MOLECULE DETECTION AND TRANSLOCATION CONTROL BY ELECTROPHORESIS OF NANO-FLUID TOWARDS BIOPOLYMER SEQUENCING**
T. Ohshiro, M. Tsutsui, K. Yokota, T. Kawai, and M. Taniguchi
Osaka University, JAPAN
- T051c** **RAPID DISCRIMINATION OF SINGLE-NUCLEOTIDE DIFFERENCES THROUGH SPATIAL ANALYSIS OF A NANOFUIDIC-EMBEDDED BIOSENSOR**
J. Cacheux, M. Brut, A. Bancaud, P. Cordelier, and T. Leïchlé
Université de Toulouse, FRANCE
- W049c** **NANOPORE-BASED SENSOR FOR SEQUENCE-SPECIFIC MICRORNA DETECTION**
Y. Zhang¹, M.F. Czyzyk-Krzeska^{1,2}, L. Esfandiari¹
¹*University of Cincinnati, USA* and ²*Veterans Affairs Research Service, USA*

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- M050c** **CHEMOSENSITIVITY ANALYSIS OF CO-CULTURE TUMOR SPHEROIDS ON CHIP USING HYPERSPECTRAL FLUORESCENCE IMAGING**
A. St-Georges-Robillard, M. Masse, B. Patra, A.M. Orimoto, M. Strupler, A.-M. Mes-Masson, F. Leblond, and T. Gervais
Polytechnique Montreal, CANADA

- M051c LABEL-FREE OPTICAL SENSING OF POLLUTANTS IN REAL WATER SAMPLES WITH A PHANTOM MEMBRANE INTEGRATED INTO A MICROFLUIDIC DEVICE**
J. Saez¹, R. Lanfranco², E. Di Nicoló³, M. Buscaglia², and F. Benito-Lopez¹
¹University of the Basque Country, SPAIN, ²Università degli Studi di Milano, ITALY, and ³Solvay Specialty Polymers, ITALY
- M052c NEAR VIDEO RATE DROPLET TRACKING WITH COMPUTATIONALLY-EFFICIENT IMAGE PROCESSING SOFTWARE**
A. Vedhanayagam and A.S. Basu
Wayne State University, USA
- T052c DETECTION OF CHEMICAL NUTRIENTS IN WATER USING A FLUIDIC MICROPLASMA CHIP WITH ENHANCED OPTICAL COLLECTION EFFICIENCY**
S. Gong, C. Song, D. Qiao, and L. Que
Iowa State University, USA
- T053c MEASUREMENT OF OXYGEN DISTRIBUTION IN THREE-DIMENSIONAL TISSUE USING FLUORESCENCE MICROSENSORS**
H. Maruayma, Y. Akita, S. Omata, T. Masuda, and F. Arai
Nagoya University, JAPAN
- W050c A NANOPAPER DEVICE FOR HIGHLY SENSITIVE AND HOMOGENEOUS SURFACE-ENHANCED RAMAN SPECTROSCOPY**
L. Chen, B. Ying, P. Song, and X. Liu
McGill University, CANADA
- W051c HIGH-THROUGHPUT FLUORESCENCE POLARIZATION MEASUREMENT SYSTEM TOWARDS MOLECULAR INTERACTION ANALYSIS**
O. Wakao¹, K. Sumiyoshi², C. Mizokuchi², M. Maeki¹, A. Ishida¹, H. Tani¹, K. Shigemura², A. Hibara³, and M. Tikeshi¹
¹Hokkaido University, JAPAN, ²Tianma Japan, Ltd., JAPAN, and ³Tohoku University, JAPAN
- W052c MICROANALYTICAL DEVICES TOWARDS INTEGRATED QUALITY CONTROL TESTING OF [¹⁸F]FDG RADIOTRACER**
M.D. Tarn, M.M.N. Esfahani, L. Patinglag, Y.C. Chan, J.X. Buch, C.C. Onyije, P.J. Gawne, D.J.B. Gambin, N.J. Brown, S.J. Archibald, and N. Pamme
University of Hull, UK

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K. Maeno¹, S. Aki¹, K. Satoh², S. Murakami², Y. Sando², Y. Kanaoka², K. Sueyoshi¹,
H. Hisamoto¹, and T. Endo^{1,3}
*¹Osaka Prefecture University, JAPAN, ²Osaka Research Institute of Industrial Science
and Technology, JAPAN, and ³Japan Science and Technology Agency (JST), JAPAN*
- M054c** **ON-GLASSCHIP INTEGRATION OF PHOTONICS FOR PHOTOTHERMAL
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K. Miyake, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- T054c** **A LATERAL FLOW-THROUGH LABEL-FREE BIOSENSOR BASED ON
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Y. Wang, M.A. Ali, L. Dong, and M. Lu
Iowa State University, USA
- T055c** **INORGANIC ANION SENSING USING PHOTONIC CRYSTAL ENCLOSING
THERMORESPONSIVE CORE-SHELL NANOPARTICLES IN A
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K. Saga¹, F.H. Kriel², C. Priest², and T. Tsukahara¹
¹Tokyo Institute of Technology, JAPAN and ²University of South Australia, AUSTRALIA
- T056c** **PHOTOTHERMAL OPTICAL PHASE SHIFT DETECTION DEVICE FOR
MEASUREMENT OF ABSORPTION SPECTRUM IN MICROSPACE**
F. Sugino¹, H. Shimizu¹, M. Sakakura², K. Miura³, K. Mawatari¹, and T. Kitamori¹
*¹University of Tokyo, JAPAN, ²Next Generation Laser Processing Technology Reserch
Association, JAPAN, and ³Kyoto University, JAPAN*
- W053c** **AN ULTRA-SMALL, MULTI-POINT AND MULTI-COLOR PHOTO-
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RANGE**
T. Anazawa¹ and M. Yamazaki²
¹Hitachi, Ltd., JAPAN and ²Hitachi High-Technologies Corporation, JAPAN
- W054c** **LYTIC ENZYME-BASED SELECTIVE DETECTION OF STAPHYLOCOCCUS
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J. Rasson, C. Nannan, J. Mahillon, and L.A. Francis
Université Catholique de Louvain, BELGIUM
- W055c** **PHOTOTHERMAL OPTICAL PHASE SHIFT MICROSCOPY USING RELAY
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S. Takeda, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

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- M055c** **A CAPACITIVE POLYMER MICROTENSIOMETER**
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- M056c** **ASSESSMENT OF PATIENT RESPONSE TO TARGETED CANCER THERAPY USING MULTI-FREQUENCY IMPEDANCE CYTOMETRY AND UNSUPERVISED MACHINE LEARNING**
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Z. Pu, H. Yu, X. Lai, X. Zhang, B. Lu, X. Zhang, C. Sun, and D. Li
Tianjin University, CHINA
- M058c** **FLU VIRUS AEROSOL COLLECTION AND PAPER-BASED VIRAL RNA DETECTION**
X. Jiang¹, M. Pan¹, J. Loeb¹, S.V. Hering², A. Eiguren-Fernandez², J.A. Lednicky¹, C.-W. Wu¹, and Z.H. Fan¹
¹University of Florida, USA and ²Aerosol Dynamics Inc., USA
- M059c** **MICROFLUIDIC DIFFERENTIAL NANOCALORIMETRY SYSTEM FOR MEASUREMENT OF MIXING ENTHALPY AND CELLULAR HEAT**
R. Krenger, R. Trouillon, T. Lehnert, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- M060c** **READY-TO-USE LIPID BILAYER DEVICE FOR SENSOR APPLICATIONS**
T. Osaki¹, S. Fujii¹, K. Kamiya¹, N. Misawa¹, and S. Takeuchi^{1,2}
¹Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and ²University of Tokyo, JAPAN
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A. Schaap, A. Beaton, and M. Mowlem
National Oceanography Centre, UK
- T057c** **A DIFFUSIVE CONCENTRATION GRADIENT GENERATOR WITH A DEFINED EXPONENTIAL DECAY AND ITS APPLICATION TO MAMMALIAN CELL TOXICITY ASSAYS AND ACCELERATED BACTERIAL EVOLUTION OF ANTIBIOTIC RESISTANCE**
J. Atencia
University of Maryland, USA

- T058c** **CARBON DOT-APTAMER COMPLEXES FOR STEROID HORMONE DETECTION**
L.-J. Cheng, Y. Liu, and B. Wu
Oregon State University, USA
- T059c** **HIGHLY SENSITIVE SENSOR BASED ON DECORATED COPPER NANOPARTICLES AND SELF-ASSEMBLED GRAPHENE FOR NITRATE DETECTION**
L. Wang¹, J. Kim², and T. Cui²
¹*Tsinghua University, CHINA* and ²*University of Minnesota, USA*
- T060c** **INCREASED BANDWIDTH IN COLORIMETRIC DETECTION OF EXPLOSIVES THROUGH TINTING AND HUE ANALYSIS**
S.T. Krauss¹, A.Q. Nauman², R.M. Aubrey¹, G. Garner¹, B.E. Root¹, and J.P. Landers¹
¹*University of Virginia, USA* and ²*TeGrex Technologies, USA*
- T061c** **MILLISECOND TIME-RESOLVED SURFACE TENSION MEASUREMENT OF MICROSCALE INTERFACES**
T. Endo^{1,2}, K. Ishikawa², M. Fukuyama^{1,3}, and A. Hibara^{1,2}
¹*Tohoku University, JAPAN*, ²*Tokyo Institute of Technology, JAPAN*, and ³*Japan Science and Technology Agency (JST), JAPAN*
- T062c** **SELF-POWERED SIMPLE CHIP FOR CKD DIAGNOSIS AND MONITORING USING THE POC CREAM SENSOR**
F. Dal Dosso¹, D. Decrop¹, E. Pérez Ruiz¹, D. Daems¹, T. Kokalj^{1,2}, D. Spasic¹, and J. Lammertyn¹
¹*KU Leuven, BELGIUM* and ²*Institute of Metals and Technology, SLOVENIA*
- T063c** **TWO-PHOTON EXCITATION BASED NANOSCOPIC VELOCIMETER USING SMALL NEUTRAL MOLECULAR DYE AS TRACER**
A. Wang, A. Abdalrahman, J. Deng, and G. Wang
University of South Carolina, USA
- W056c** **A MICROFLUIDIC SENSOR USING FREQUENCY DIVISION MULTIPLE ACCESS FOR MULTIPLEXED DETECTION OF CELLS IN MICROFLUIDIC CHANNELS**
N. Wang, R. Liu, M. Boya, and A.F. Sarioglu
Georgia Institute of Technology, USA
- W057c** **DIELECTROPHORESIS-ENABLED DYNAMIC FORMATION OF HIGHER-ORDER NANOSTRUCTURE CONSISTING OF AU-NANOPARTICLES-DECORATED POLYSTYRENE BEADS FOR SERS DETECTION**
A. Yamaguchi, T. Fukuoka, and Y. Utsumi
University of Hyogo, JAPAN

- W058c** **GRAPHENE-BASED INLINE PRESSURE SENSOR INTEGRATED WITH ELASTIC MICROFLUIDIC TUBE**
N. Inoue and H. Onoe
Keio University, JAPAN
- W059c** **MATRIX-FREE BIOMOLECULE ANALYSIS BY A MINIATURIZED ON-CHIP PULSE-HEATING IONIZATION MASS SPECTROMETER**
X. Luo, P. Trong Tue, and Y. Takamura
Japan Advanced Institute of Science Technology (JAIST), JAPAN
- W060c** **RAPID DETECTION OF E. COLI IN WATER BASED ON NANO HOLE PRECONCENTRATE AND NANOFORREST SERS SENSORS**
M. Li¹, H. Mao¹, H. Wang², and C. Huang¹
¹*Chinese Academy of Sciences, CHINA and*
²*National Health and Family Planning Commission (NHFPC), CHINA*
- W061c** **SEQUENTIAL STEREOLITHOGRAPHIC PRINTING OF TWO BIOCOMPATIBLE RESINS FOR BIOMICROFLUIDICS APPLICATIONS**
K. Castro, Y.T. Kim, N. Bhattacharjee, and A. Folch
University of Washington, USA
- W062c** **MICROFLUIDIC DETECTION WITH ACOUSTIC SPECTROSCOPY FOR INSULIN**
C. McIntosh, K. Scida, and S. Pennathur
University of California, Santa Barbara, USA

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Inje University, KOREA
- M063c** **PROGRAMMABLE ACOUSTIC-BASED FLUID PROPULSION**
P.-H. Huang¹, N. Nama², and T.J. Huang¹
¹*Duke University, USA and* ²*Pennsylvania State University, USA*
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S. Azukizawa, F. Tsumori, H. Shinoda, K. Tokumaru, K. Kudo, and K. Shinagawa
Kyushu University, JAPAN

- T065c** **THE SLIDING WALLS: A NEW TOOLBOX FOR MANUALLY-OPERATED MICROFLUIDIC**
 B. Venzac¹, Y. Liu¹, I. Ferrante¹, A. Yamada¹, P. Vargas¹, M. Verhulsel¹, L. Malaquin², J.-L. Viovy¹, and S. Descroix¹
¹Pierre-and-Marie-Curie University, FRANCE and ²LAAS CNRS, FRANCE
- W063c** **FINGERTIP-SIZE PRESSURE SENSOR FOR LUER TAPER OF THREE-WAY STOPCOCK IN LIQUID CIRCUIT**
 K. Takenaka, S. Togashi, A. Kazama, K. Miyajima, and T. Nagano
Hitachi, Ltd., JAPAN
- W064c** **WIRELESS, SMARTPHONE CONTROLLED POTENTIOSTAT INTEGRATED WITH LAB-ON-DISC PLATFORM**
 C.-H. Cheng^{1,3}, K. Zor², J.-H. Wang^{1,3}, K. Sanger², W.-M. Wang^{1,3}, A.M. Capria², A. Boisen², K.-Y. Huang¹, and E.-T. Hwu^{1,3}
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Particles

- M064c** **3D PARTICLE LOCALIZATION IN A MICROFLUIDIC IMPEDANCE CYTOMETER**
 R. Reale¹, A. De Ninno², V. Errico¹, L. Businaro², P. Bisegna¹, and F. Caselli¹
¹University of Rome Tor Vergata, ITALY and ²Italian National Research Council, ITALY
- M065c** **SINGLE STREAM INERTIAL FOCUSING OF PARTICLES IN MICROCHANNELS WITH TRIANGULAR CROSS-SECTION**
 P. Mukherjee and I. Papautsky
University of Illinois, Chicago, USA
- T066c** **ELECTRONICALLY BARCODED PARTICLES FOR MULTIPLEXED MOLECULAR BIOANALYSIS: A STUDY OF THE EFFECT OF THIN FILM DIELECTRIC PERMITTIVITY AND THICKNESS**
 J. Sui, P. Xie, Z. Lin, and M. Javanmard
Rutgers University, USA
- T067c** **SUB-100 MICRON 3D-SHAPED PARTICLES FROM OPTOFLUIDIC FABRICATION WITH ON-THE-FLY PILLAR FABRICATION**
 K.S. Paulsen, B.M. Johnson, and A.J. Chung
Rensselaer Polytechnic Institute (RPI), USA
- W065c** **FLUIDIC-FORCE-BASED NANOPARTICLE CONCENTRATOR CHIP**
 K. Fujita, T. Hayashi, K. Yamamoto, and M. Motosuke
Tokyo University of Science, JAPAN

c - Sensors & Actuators, and Detection Technologies

Pumps & Valves

- M066c** **AN ELECTROLYTIC MICROPUMP FABRICATED ON A PRINTED CIRCUIT BOARD FOR INTEGRATED MICROFLUIDIC SYSTEM**
H. Kim¹, H. Hwang¹, J. Kim², and D. Kim¹
¹Myongji University, KOREA and ²Lab Genomics Inc., KOREA
- M067c** **ENHANCED HYDROSTATIC PRESSURE-DRIVEN PASSIVE MICROPUMP WITH SIPHON-BASED AUTOFILL FUNCTION**
X. Wang¹, D. Zhao², and A.P. Lee²
¹Shanghai Jiao Tong University, CHINA and ²University of California, Irvine, USA
- T068c** **CHIPHOLDER-INTEGRATED 3D-PRINTED PNEUMATIC LOGIC CONTROLLERS FOR MICROFLUIDIC CHIPS**
J. Loessberg-Zahl, J. Vollenbroek, A. van der Meer, J. Eijkel, and A. van den Berg
University of Twente, NETHERLANDS
- T069c** **ZERO-POWER MICROFLUIDIC OSMOTIC PUMPS USING ULTRA-THIN PDMS MEMBRANES**
T. Yue, X. Li, and A.P. Lee
University of California, Irvine, USA
- W066c** **A 3D-PRINTED PUSH-BUTTON FOR CONTROLLING PORTABLE PNEUMATICALLY-POWERED BIOASSAYS**
A. Naderi, Y.T. Kim, and A. Folch
University of Washington, USA
- W067c** **ARRAY OF INDEPENDENT MICROFLUIDIC VALVES DRIVEN BY SHAPE MEMORY POLYMER ACTUATORS USING A SINGLE PNEUMATIC SUPPLY**
N. Besse¹, R.J. Boom², B.J. Hoogenberg², B. Aksoy¹, M. Blom², and H. Shea¹
¹École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and ²Micronit Microtechnologies B.V., NETHERLANDS
- W068c** **MAGNET-PAPER COMPOSITES FOR LOW-COST TWO-WAY VALVES AND OTHER ACTIVE STRUCTURES IN μ PADS**
M. Fratzl¹, B. Chang², S. Oyola-Reynoso², G. Blaire¹, S. Delshadi¹, T. Devillers¹, O. Cugat¹, N.M. Dempsey¹, M. Thuo², and J.-F. Bloch¹
¹University Grenoble, Alpes, FRANCE and ²Iowa State University, USA

d - Integrated Microfluidic Platforms

Bioanalysis & Diagnostics

- M068d** **A MULTI-WELL BASED DETECTION PLATFORM WITH INTEGRATED PDMS CONCENTRATORS FOR RAPID MULTIPLEXED ENZYMATIC ASSAYS**
X. Wei¹ and Y.-A. Song^{1,2}
¹New York University, Abu Dhabi, UAE and ²New York University, USA
- M069d** **CONNECTED, LOW-COST POINT-OF-CARE DIAGNOSTICS FOR RURAL SOUTH AFRICAN CLINICS**
S. Smith^{1,2}, K. Land¹, J.G. Korvink², and D. Mager²
¹Council for Scientific and Industrial Research, SOUTH AFRICA and ²Karlsruhe Institute of Technology (KIT), GERMANY
- M070d** **PORTABLE PATHOGEN ANALYSIS SYSTEM (PPAS) FOR MICROBIAL WATER QUALITY ANALYSIS**
X. Huang¹, H.N. Gowda², X. Wu¹, S.L. Dumas², Y. Zhu¹, X. Lin¹, H. Kido², X. Xie^{1,3}, S. Jiang², M. Madou², and M.R. Hoffmann¹
¹California Institute of Technology, USA, ²University of California, Irvine, USA, and ³Georgia Institute of Technology, USA
- T070d** **A MULTIPLEXED MICROFLUIDIC SINGLE CELL SAMPLE PREPARATION DEVICE FOR TRANSCRIPTOME SEQUENCING**
B. Zhang, A. Sun, and Y. Chen
Chinese Academy of Sciences, CHINA
- T071d** **DUAL-HEIGHT FLUIDIC-CHANNEL-INTEGRATED MICROPORE SENSOR FOR HIGH-THROUGHPUT SINGLE-PARTICLE DETECTIONS**
W. Tonomura, M. Tsutsui, K. Yokota, A. Arima, M. Taniguchi, and T. Kawai
Osaka University, JAPAN
- T072d** **STRETCHABLE MICROFLUIDIC INTEGRATING LINEAR DILUTIONS FOR QUANTITATIVE MULTI-STEP ASSAYS**
C. Parent, N. Verplanck, J.-L. Achard, F. Boizot, M. Cubizolles, and Y. Fouillet
University Grenoble, Alpes, FRANCE
- W069d** **AN AUTO-REGENERATABLE ELECTROCHEMICAL APTASENSOR FOR CONTINUOUS MONITORING OF BIOMOLECULES ENABLED BY ION CONCENTRATION POLARIZATION**
L. Jin¹, D.-T. Phan¹, T. Sun², and C.-H. Chen¹
*¹National University of Singapore, SINGAPORE and ²Agency for Science, Technology and Research (A*STAR), SINGAPORE*

W070d **FABRICATION OF AN INTEGRATED MICROFLUIDIC DEVICE USING MULTIMATERIAL 3D PRINTING FOR POINT-OF-CARE DETECTION OF DRUGS IN BODY FLUIDS**
F. Li¹, N.P. Macdonald¹, P. Smejkal¹, R.M. Guijt², and M.C. Breadmore¹
¹University of Tasmania, AUSTRALIA and ²Deakin University, AUSTRALIA

d - Integrated Microfluidic Platforms

Cell Manipulation & Analysis

M071d **AIR-PLUG ENABLED LOCALIZATION OF SINGLE CELL ENTRAPMENT IN AN ARRAY OF RECTANGULAR MICROWELLS**
P. Sukumar¹, R. Alnemari¹, W. Chen², and M.A. Qasaimeh^{1,2}
¹New York University, Abu Dhabi, UAE and ²New York University, USA

M072d **DIAMAGNETIC PARTICLE SEPARATION AND WASHING IN AN INERTIAL FERROFLUID/WATER CO-FLOW**
Q. Chen^{1,2}, D. Li¹, J. Lin², M. Wang², and X. Xuan¹
¹Clemson University, USA and ²China Agricultural University, CHINA

M073d **HepG2 CELLS PATTERNING BY EWOD ON THIN-FILM-TRANSISTOR ARRAY DEVICES- AN ANALYSIS TO PREVENT CELL DEATH**
F.A. Shaik, G. Cathcart, S. Ihida, A. Tixier-Mita, and H. Toshiyoshi
University of Tokyo, JAPAN

M074d **ON-CHIP CELL SEPARATION BASED ON MECHANICAL CHARACTERISTICS**
K. Nakahara, S. Sakuma, and F. Arai
Nagoya University, JAPAN

T073d **CELL DEPOSITION AND ISOLATION WITH MICROPIPETTE CONTROL OVER LIQUID INTERFACE MOTION IN MICROFLUIDIC CHANNEL**
D. Onoshima¹, H. Yukawa¹, Y. Hattori¹, K. Ishikawa¹, M. Hori¹, and Y. Baba^{1,2}
¹Nagoya University, JAPAN and ²National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T074d **DROPLET BASED CELL SCREENING SYSTEM INTEGRATED WITH CMOS IMAGE SENSOR AND ANDROID-BASED APPLICATION**
M.D. Özkan¹, M.K. Aslan¹, A.C. Atik¹, E. Özgür², E. Yıldırım³, and H. Külah^{1,2}
¹Middle East Technical University, TURKEY, ²Mikro BiyoSistemler Inc., TURKEY, and ³Çankaya University, TURKEY

T075d **INTEGRATED CENTRIFUGAL PLATFORM FOR POINT-OF-CARE CELL SEPARATION**
N. Mehendale and D. Paul
Indian Institute of Technology, Bombay, INDIA

- W071d** **AIR-LIQUID INTERFACE-INDUCED DEFORMABILITY CYTOMETRY**
R.S. Kotesa, G.K. Ananthasuresh, and P. Sen
Indian Institute of Science, INDIA
- W072d** **ALL SURFACE IMAGING METHOD OF OOCYTE BY USING SMALLER VERTICAL ROTATIONAL FLOW**
Y. Yalikul^{1,2}, Y. Aishan^{1,2}, K. Sumiyama¹, and Y. Tanaka^{1,2}
¹*Institute of Physical and Chemical Research (RIKEN), JAPAN* and
²*Osaka University, JAPAN*
- W073d** **INTERGRATED MICROFLUIDIC SPERM SORTING AND OOCYTE INCUBATION SYSTEM FOR IN-VITRO FERTILIZATION ENHANCEMENT**
H. Liu¹, Y.C. Tzeng¹, Y.J. Chen¹, C. Chuan¹, L.C. Pan³, and F.G. Tseng^{1,2}
¹*National Tsing Hua University, TAIWAN*, ²*Academia Sinica, TAIWAN*, and
³*Taipei Medical University, TAIWAN*

d - Integrated Microfluidic Platforms

Centrifugal Systems

- M075d** **DISK-INTEGRATED REPEATED DISPENSING OF 200 NL VOLUMES FOR THE AUTOMATION OF PYROSEQUENCING**
B. Johannsen¹, R. Zengerle^{1,2}, and N. Paust^{1,2}
¹*Hahn-Schickard, GERMANY* and ²*University Freiburg, GERMANY*
- T076d** **CENTRIFUGAL MICROFLUIDIC AUTOMATION OF DILUTION SERIES FOR HIGH DYNAMIC RANGE ASSAYS DEMONSTRATED FOR DECADAL DILUTIONS UP TO 1:100,000**
P. Juelg¹, M. Specht¹, E. Kipf², M. Lehnert², C. Eckert³, S. Wadle^{1,2},
M. Keller^{1,2}, N. Paust^{1,2}, R. Zengerle^{1,2}, and T. Hutzenlaub^{1,2}
¹*Hahn-Schickard, GERMANY*, ²*University Freiburg, GERMANY*, and
³*Charité - Universitaetsmedizin Berlin, GERMANY*
- T077d** **EXTRACTION AND SERS BASED DETECTION OF BACTERIAL METABOLITES IN MIXTURE ON A CENTRIFUGAL MICROFLUIDIC DEVICE**
L. Morelli¹, L. Serioli¹, F.A. Centorbi², M. Matteucci¹, D. Demarchi²,
K. Zór², and A. Boisen¹
¹*Technical University of Denmark, DENMARK* and ²*Politecnico di Torino, ITALY*
- W074d** **CENTRIFUGATION-ENHANCED ENZYME IMMUNOASSAY FOR RAPID BACTERIA DETECTION IN COMMON LABORATORY TUBE**
Y. Fu, H. Miao, and L.L. Sun
Temasek Polytechnic, SINGAPORE

W075d **RAPID BACTERIAL GROWTH USING A MICROFLUIDIC CENTRIFUGAL INCUBATOR SPINSTAND**
A. Perebikovsky¹, Y. Liu¹, C. Halford², G. Monti², A.T. Hwu¹, D.A. Haake²,
and M.J. Madou¹
¹University of California, Irvine, USA and ²University of California, Los Angeles, USA

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Droplets/Fluid Digitalization

- M076d** **A DROP IN THE OCEAN: MONITORING OF WATER CHEMISTRY USING DROPLET MICROFLUIDICS**
G.W.H. Evans, A.M. Nightingale, S.-U. Hassan, and X. Niu
University of Southampton, UK
- M077d** **IMAGE-BASED FEEDBACK AND ANALYSIS SYSTEM FOR DIGITAL MICROFLUIDICS**
P.Q.N. Vo, M.C. Husser, F. Ahmadi, H. Sinha, and S.C.C. Shih
Concordia University, CANADA
- M078d** **COLORED MICROBEAD ENCODING OF PICOLITER DROPLET POPULATIONS FOR BIOTECHNOLOGICAL APPLICATIONS**
O. Shvydkiv¹, C.-M. Svensson¹, L. Mahler^{1,2}, S. Dietrich^{1,2}, T. Weber¹,
M. Choudhary¹, M. Tovar^{1,2}, M.T. Figge¹, and M. Roth¹
¹Hans Knoll Institute, GERMANY and ²Friedrich Schiller University, GERMANY
- M079d** **CONTROLLED ONE CELL-ONE BEAD ENCAPSULATION IN DROPLETS BY LIQUID-LIQUID INTERFACIAL SHEARING**
G.K. Kurup and A.P. Lee
University of California, Irvine, USA
- M080d** **ENCAPSULATED ONE-STEP GENOTYPE-PHENOTYPE COVALENT LINKAGE IN ELECTROSPRAYED FEMTOLITER COMPARTMENTS FOR ON-DEMAND IN-VITRO SELECTION**
K. Sharma¹, K. Nishigaki², Y. Takamura¹, and M. Biyani¹
¹Japan Advanced Institute of Science Technology (JAIST), JAPAN and
²Saitama University, JAPAN
- M081d** **IN SITU DIGITAL PCR BASED ON PUMP-FREE AND HIGH-THROUGHPUT WATER-IN-OIL DROPLET ARRAY**
L. Li and T. Wu
Chinese Academy of Sciences, CHINA

- M082d** **MULTIPLEXED AUTOMATED PARTICLE AND PARTICLE-FREE DROPLET ACTUATION ON A DIFFERENT (SUPER)HYDROPHOBIC SURFACES USING A 3D-PRINTED MICROFLUIDIC DEVICE FOR DNA QUANTITATION**
P. Agrawal, K. Bachus, G. Carriere, P. Grouse, and R. Oleschuk
Queen's University, CANADA
- M083d** **STAGGERED TRAP ARRAYS FOR ROBUST PASSIVE MICROFLUIDIC SAMPLE DIGITIZATION**
A.J. Sposito and D.L. DeVoe
University of Maryland, USA
- M084d** **THE STUDY OF ATMOSPHERIC ICE-NUCLEATING PARTICLES USING MICROFLUIDICALLY GENERATED DROPLETS**
M.D. Tarn, S.N.F. Sikora, G.C.E. Porter, D. O'Sullivan, M. Adams, T.F. Whale, A.D. Harrison, J.-U. Shim, and B.J. Murray
University of Leeds, UK
- T078d** **A DROPLET-BASED MICROFLUIDIC PLATFORM FOR THE STUDY OF THE EFFECT OF OSCILLATION ON THE GROWTH OF E. COLI**
Q.I. Sun^{1,2}, C.-X. Zhao¹, N.-T. Nguyen², and S.H. Tan²
¹University of Queensland, AUSTRALIA and ²Griffith University, AUSTRALIA
- T079d** **AN INTEGRATED MICROFLUIDIC PLATFORM FOR CONTROLLED GENERATION, STORAGE AND MERGING OF MICRODROPLETS**
H. Babahosseini¹, T. Misteli¹, S. Padmanabhan², and D.L. DeVoe²
¹National Cancer Institute, National Institutes of Health, USA and ²University of Maryland, USA
- T080d** **CONTINUOUS GENERATION OF STABLE POLYELECTROLYTE MULTILAYER CAPSULES INSIDE A SNAKES-AND-LADDERS CHIP**
J. Gómez-Pastora^{1,2}, A.Q. Al-Orabi¹, M.D. Tarn¹, E. Bringas², I. Ortiz², V.N. Paunov¹, and N. Pamme¹
¹University of Hull, UK and ²University of Cantabria, SPAIN
- T081d** **DYNAMICS OF A BIOCHEMICAL BISTABLE SWITCH STUDIED WITH A DROPLET MICROFLUIDIC PLATFORM**
S. Okumura^{1,2}, G. Gines², E. Henry¹, Y. Rondelez², T. Fujii¹, and A.J. Genot¹
¹University of Tokyo, JAPAN and ²Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE
- T082d** **GENERATION OF "DROPLET TRAINS" FOR CONTINUOUS AND MULTIPLE SAMPLE OR MULTIPLE STEP ASSAYS IN DROPLET MICROFLUIDICS**
G.W.H. Evans, A.M. Nightingale, S.-U. Hassan, and X. Niu
University of Southampton, UK

- T083d** **MAGNETIC "MECHANICAL HAND": 3D MANIPULATION OF DROPLETS USING A SUPERHYDROPHOBIC ELECTROMAGNET NEEDLE**
C. Yang and G. Li
Chongqing University, CHINA
- T084d** **ON-DEMAND MICROFLUIDIC DROPLET VOLUME CONTROL BY SURFACE ACOUSTIC WAVE**
J. Park, J.H. Jung, G. Destgeer, K. Park, H. Ahmed, R. Ahmad, and H.J. Sung
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- T085d** **THE FORMATION OF DROPLETS BY DENSITY-INDUCED FLOW-FOCUSING IN 3D-PRINTED DEVICE**
Y.-H. Hwang and D.-P. Kim
Pohang University of Science and Technology (POSTECH), KOREA
- W076d** **A MICROFLUIDIC METHOD TO STUDY THE COALESCENCE OF CRUDE OIL DROPS IN WATER - THE EFFECT OF CRUDE OIL AND WATER COMPOSITION**
M. Dudek¹, T. Dumaire², and G. Øye¹
¹*Norwegian University of Science and Technology, NORWAY and*
²*Pierre-and-Marie-Curie University, FRANCE*
- W077d** **FORMATION OF CHAINED ALGINATE HYDROGEL FIBERS WITH θ GLASS TUBE**
K. Nishimura, Y. Morimoto, N. Mori, and S. Takeuchi
University of Tokyo, JAPAN
- W078d** **CONTROLLED DROPLET DISCRETIZATION, RELEASE, TRANSPORT, AND CAPTURE USING MEMBRANE DISPLACEMENT TRAPS**
S. Padmanabhan¹, T. Misteli², and D.L. DeVoe¹
¹*University of Maryland, USA and* ²*National Institutes of Health, USA*
- W079d** **HIGHLY CONTROLLED MATERIAL TRANSFER INTO MICROFLUIDIC DROPLETS FROM AN ACTIVE COLLOIDAL CONTINUOUS PHASE**
T. Gu¹, T.A. Hatton¹, and S.A. Khan²
¹*Massachusetts Institute of Technology, USA and*
²*National University of Singapore, SINGAPORE*
- W080d** **MICROFLUIDIC-BASED MULTICOLOR REFLECTIVE DISPLAY USING WATER/AIR MICRODROPLET TRAINS**
K. Kobayashi and H. Onoe
Keio University, JAPAN
- W081d** **REACTION KINETIC STUDIES BY COMPLIANCE-INDUCED ULTRA MONODISPERSE MICRODROPLETS**
A. Kalantalifard, A. Saateh, P. Beyazkilic, and C. Elbuken
Bilkent University, TURKEY

W082d **THE REDEPLOYMENT OF DROPLETS WITH VARIED CONCENTRATIONS USING DROPLET FISSION AND FUSION IN A 3-D CROSSING MICROCHANNEL**
S.-I. Yeh, H.-W. Lai, T.-M. Wang, and J.-T. Yang
National Taiwan University, TAIWAN

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Other

M085d **A NOVEL ACTIVE METHOD FOR JET LENGTH REDUCTION IN MICROFLUIDIC CO-FLOW DROPLET GENERATION DEVICES**
A.S. Khorrami and P. Rezai
York University, CANADA

T086d **BACKFLOW-ASSISTED SEQUENTIAL INJECTION IN VACUUM-DRIVEN POWER-FREE MICROFLUIDIC DEVICE**
A. Wang, D. Koh, P. Schneider, Y. Zhai, B. Bosinski, and K.W. Oh
State University of New York, Buffalo, USA

T087d **ON-CHIP GLASS MICROLENS FABRICATION USING ULTRA-THIN GLASS SHEET**
Y. Yalikun and Y. Tanaka
Institute of Physical and Chemical Research (RIKEN), JAPAN

W083d **MICROCARRIER ASSISTED SYNTHESIS IN A LONGITUDINAL ACOUSTIC TRAP**
M.M. Binkley, M. Cui, M.Y. Berezin, and J.M. Meacham
Washington University, St. Louis, USA

W084d **PATTERNED MICROFLUIDIC OPEN SURFACE (PMOS) FOR COLLECTION AND MANIPULATION OF PARTICULATE MATTERS IN AIR**
Y. Tian, Y. Chen, H. Li, R. Waldman, H. Hu, and L. Dong
Iowa State University, USA

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Sensors

M086d **FROM FUNCTIONAL STRUCTURE TO PACKAGING: A FULLY-PRINTING FABRICATION OF BIOSENSORS**
F. Zheng¹, Z. Pu², E. He³, D. Li², and Z. Li¹
¹*Peking University, CHINA*, ²*Tianjin University, CHINA*, and ³*Tsinghua University, CHINA*

T088d **A FLEXIBLE CAPACITANCE SENSOR INTEGRATED MICROVALVE ARRAY FOR MONITORING ACTUATION**
Q. Nguyen and J. Kim
Texas Tech University, USA

W085d **MULTI-SPOT LIGHT EXPOSURE SYSTEM FOR PARALLEL MEASUREMENT OF LIGHT-RESPONSE IN ALGAE**
T. Nakamizu, M. Nagara, T. Shibata, and M. Nagai
Toyohashi University of Technology, JAPAN

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System Integration Automation

M087d **A COMPACT AND HIGHLY SCALABLE STORAGE UNIT CELL DESIGNED FOR INTEGRATION WITHIN A MICROFLUIDIC DROPLET RANDOM ACCESS MEMORY (dRAM) PLATFORM**
P. Weerappuli^{1,2}, T. Kojima², S. Takayama², and A.S. Basu¹
¹Wayne State University, USA and ²University of Michigan, USA

M088d **AUTOMATED MICROFLUIDIC PLATFORM FOR HIGH-THROUGHPUT SCREENING OF COLLOIDAL PEROVSKITE NANOCRYSTALS**
R. Epps¹, K. Felton¹, C.W. Coley², and M. Abolhasani¹
¹North Carolina State University, USA and ²Massachusetts Institute of Technology, USA

M089d **DEVELOPMENT OF A LABEL FREE MICROFLUIDIC PLATFORM FOR DIRECTED ENZYME EVOLUTION**
D. Holland-Moritz¹, D. Steyer¹, S. Doonan¹, S. Sun², X. Diefenbach²,
J. Moore², R. Bailey¹, and R. Kennedy¹
¹University of Michigan, USA and ²Merck Research Laboratories, USA

M090d **NOVEL SURFACE SAMPLING TOOL AND TECHNIQUE FOR INTEGRATION INTO COLORIMETRIC DETECTION MICROFLUIDIC DEVICES**
S.T. Krauss¹, V.C. Holt¹, R.M. Aubrey¹, A.Q. Nauman², K. Kroupa³, B.E. Root¹,
and J.P. Landers¹
¹University of Virginia, USA, ²TeGrex Technologies, USA, and ³Department of Defense, USA

M091d **STANDARDIZED AND MODULAR MICROFLUIDIC PLATFORM FOR FAST LAB ON CHIP SYSTEM DEVELOPMENT**
S. Dekker, A. van den Berg, and M. Odijk
University of Twente, NETHERLANDS

- T089d** **THE DEVELOPMENT OF FILM-BASED BIOSENSING CHIP FOR DNA AMPLIFICATION AND ELECTROCHEMICAL DETECTION OF FOOD ILLNESSES PATHOGEN**
Y.M. Park, S.Y. Lim, S.J. Shin, C.H. Kim, S.W. Jeong, S.Y. Shin, N.H. Bae, S.J. Lee, and T.J. Lee
National Nanofab Center (NNFC), KOREA
- T090d** **AUTOMATED SPECIES IDENTIFICATION DEVICE FOR CONSERVATION BIOLOGY**
H.R. Holmes^{1,2}, A.E. Gomez¹, D.A. Baisch^{1,2}, and K.F. Böhringer¹
¹*University of Washington, USA* and ²*Conservation XLabs, USA*
- T091d** **DEVELOPMENT OF A USER-DEFINED LOCAL STIMULATION SLIPCHIP DEVICE**
M.A. Catterton and R.R. Pompano
University of Virginia, USA
- T092d** **SIMULTANIOUS ON-CHIP PUMPING AND MIXING ENABLED BY ACOUSTICALLY OSCILLATING SHARP-EDGES**
H. Bachman, P.-H. Huang, P. Zhang, and T.J. Huang
Duke University, USA
- W086d** **AN INTEGRATED MICROFLUIDIC SYSTEM FOR CONTINUOUS WEARABLE SWEAT SAMPLING AND SENSING: SOLVING ISSUES WITH NL SAMPLE VOLUMES AND SKIN CONTAMINATION**
A. Hauke, N. Twine, P. Simmers, Z. Sonner, R. Norton, and J. Heikenfeld
University of Cincinnati, USA
- W087d** **CONNECTABLE MICROFLUIDIC MODULES AS PLATFORMS FOR COAXIAL MICROFLUIDICS**
Y. Morimoto and S. Takeuchi
University of Tokyo, JAPAN
- W088d** **INTEGRATION OF NANOFLUIDICS WITHIN MICROELECTRONIC CMOS**
H. Meng, J. Kim, A. Atabaki, and R.J. Ram
Massachusetts Institute of Technology, USA
- W089d** **SMARTPHONE INTEGRATED PORTABLE OPTOELECTROWETTING (OEW) DEVICES FOR IN SITU WATER QUALITY DETECTION**
D. Jiang, S. Lee, S. Bae, and S.-Y. Park
National University of Singapore, SINGAPORE

e - Cell & Vesicle Analysis and Manipulation

Cell Culture & Manipulation

- M092e** **A SCALABLE MICROFLUIDIC PIPETTE TIP FOR HIGH-THROUGHPUT GENETIC ENGINEERING**
P.A. Garcia, R.N. McCormack, and C.R. Buie
Massachusetts Institute of Technology, USA
- M093e** **DIELECTROPHORETIC IN-DROPLET CELL CONCENTRATION**
S.-I. Han¹, H.S. Kim², and A. Han¹
¹*Texas A&M University, USA and*
²*Korea Institute of Machinery & Materials (KIMM), KOREA*
- M094e** **LAYER-BY-LAYER SYSTEM BASED ON CELLULOSE NANOFIBRILS FOR CAPTURE AND RELEASE OF CELLS IN MICROFLUIDIC DEVICE**
H. Ramachandraiah, T. Pettersson, and A. Russom
Royal Institute of Technology (KTH), SWEDEN
- M095e** **MODELING THE PRE-INVASIVE BREAST CANCER MICROENVIRONMENT USING HIGH-THROUGHPUT MICROFLUIDIC CELL ENCAPSULATION**
J.J.F. Sleeboom¹, C.M. Sahlgren², and J.M.J. Den Toonder¹
¹*Eindhoven University of Technology, NETHERLANDS and*
²*Åbo Akademi University, FINLAND*
- M096e** **RAPID BIOLOGICAL RISK EVALUATION OF COSMIC RADIATION ON A MICROFLUIDIC CHIP**
T. Tamura¹, A. Nakamura², K. Takahashi², K. Yamada¹, and T. Suzuki^{1,3}
¹*Gunma University, JAPAN,* ²*Ibaraki University, JAPAN, and*
³*Japan Science and Technology Agency (JST), JAPAN*
- T093e** **A HIGH-PERFORMANCE MICROCHEMOSTAT ENABLING REUSAGE AND STORAGE OF WHOLE-CELL MICROBIAL BIOSENSORS FOR ON-SITE HEAVY METAL DETECTION**
J. Bae, J.W. Lim, and T. Kim
Ulsan National Institute of Science & Technology (UNIST), KOREA
- T094e** **CANCER CELL TRAPPING AND MIGRATION IN A MICROFLUIDIC DEVICE FOR ANTI-MIGRATION DRUG SCREENING**
C.L. Hisey¹, O. Mitxelena-Iribarren², M. Martínez-Calderon^{2,3}, S. Arana^{2,3},
M. Mujika^{2,3}, S.M. Olaizola^{2,3}, and D.J. Hansford¹
¹*Ohio State University, USA and* ²*Centro de Estudios e Investigaciones Técnicas, SPAIN*

- T095e** **DOWNSTREAM MICROFLUIDIC COLLAGEN CULTURE CHAMBER FOR ADVANCING MECHANISTIC UNDERSTANDING OF DIELECTROPHORETIC BEHAVIOR IN CELLS**
T.A. Douglas, P. Graybill, N. Alinezhadbalalami, N. Balani, J. Cemazar, E.M. Schmelz, and R.V. Davalos
Virginia Polytechnic Institute and State University, USA
- T096e** **MICROBIAL BATCH CULTIVATIONS INSIDE PICOLITER SIZED GROWTH CHAMBERS**
E. Kaganovitch¹, X. Steurer¹, D. Dogan¹, W. Wiechert^{1,2}, and D. Kohlheyer^{1,2}
¹*Forschungszentrum Jülich GmbH, GERMANY and*
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- T097e** **MONITORING CELL-WALL GROWTH OF INDIVIDUAL BACTERIA WITH FLUORESCENTLY LABELED D-AMINO ACIDS IN AN AUTOMATED MICROFLUIDIC DEVICE**
H.R. Malone, J.D. Baker, J. Schmid, A. Burrage, Y.-P. Hsu, D.B. Kearns, Y.V. Brun, M.S. VanNieuwenhze, and S.C. Jacobson
Indiana University, USA
- T098e** **USING OXYGEN-CONSUMING THERMOSET PLASTICS TO GENERATE HYPOXIC CONDITIONS IN MICROFLUIDIC DEVICES FOR POTENTIAL CELL CULTURE APPLICATIONS**
D. Sticker¹, M. Rothbauer², J. Ehgartner³, C. Steininger⁴, W. Neuhaus⁴, T. Mayr³, T. Haraldsson⁵, J.P. Kutter¹, and P. Ertl²
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³*Graz University of Technology, AUSTRIA,* ⁴*Austrian Institute of Technology GmbH, AUSTRIA,* and ⁵*KTH Royal Institute of Technology, SWEDEN*
- W090e** **A MICROFLUIDIC HANGING-DROP SYSTEM TO STUDY THE SECRETION DYNAMICS OF SINGLE PANCREATIC ISLET MICROTISSUES**
P.M. Misun¹, F. Forschler¹, B. Yesildag², O. Frey^{1,2}, and A. Hierlemann¹
¹*ETH Zürich, SWITZERLAND and* ²*InSphero AG, SWITZERLAND*
- W091e** **CELL MODEL OF MYOCARDIAL HYPOXIA IN *LAB-ON-A-CHIP* SYSTEM**
A. Kobuszewska, E. Jastrzebska, M. Chudy, A. Dybko, and Z. Brzozka
Warsaw University of Technology, POLAND
- W092e** **HIGH-DENSITY PERFUSION CULTURE OF SUSPENDED MAMMALIAN CELLS AND CONTINUOUS REMOVAL OF CELL DEBRIS AND SMALLER NON-VIABLE CELLS USING INERTIAL MICROFLUIDICS**
T. Kwon¹, R. Yao¹, J.-F.P. Hamel¹, and J. Han^{1,2}
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²*Singapore-MIT Alliance for Research and Technology Centre (SMART), SINGAPORE*

W093e **MICROFLUIDIC GRADIENT GENERATORS FOR EVALUATING CELLS IN CLINICALLY-RELEVANT INJECTABLE HYALURONIC ACID HYDROGELS**
S.C. Leshner-Pérez, Y. Zhang, and T. Segura
University of California, Los Angeles, USA

W094e **NUMERICAL SIMULATION FOR CELL RAILING ON 3D SILICON MICROELECTRODES FEATURING SIDEWALL UNDERCUTS**
M.L. Chau, X. Xing, and L. Yobas
Hong Kong University of Science and Technology, HONG KONG

e - Cell & Vesicle Analysis and Manipulation

Cell Mechanics

M097e **CELL MIGRATION THROUGH FLEXIBLE MICRO-CONSTRICTION**
A. Raj and A.K. Sen
Indian Institute of Technology, Madras, INDIA

M098e **MECHANICAL CHARACTERIZATION OF SINGLE CELLS TO DISTINGUISH DIFFERENT BREAST CANCER CELLS**
G. Perret^{1,2}, Y. Takayama², M. Kumemura^{1,2}, S. Meignan³, H. Fujita^{1,2},
C. Lagadec², D. Collard^{1,2}, and M.C. Tarhan²
¹*University of Tokyo, JAPAN*, ²*University of Lille, FRANCE*, and
³*Centre Oscar Lambret, FRANCE*

M099e **STUDY IN-PLANE ELASTICITY OF ALVEOLAR EPITHELIAL CELLS WITH DIFFERENT ONCOGENE EXPRESSION LEVELS USING MICROFLUIDIC DEVICES**
P.-L. Ko¹, T.-A. Lee¹, C.-K. Wang², C.-C. Peng¹, W.-H. Liao¹, and Y.-C. Tung¹
¹*Academia Sinica, TAIWAN* and ²*Tamkang University, TAIWAN*

T099e **INFLUENCE OF FLUID FLOW ON MICROTOPOGRAPHY-GUIDED CELL MIGRATION AND UNDERLYING MECHANOTRANSDUCTION**
K. Kushiro¹, A. Ryo², and M. Takai¹
¹*University of Tokyo, JAPAN* and ²*Yokohama City University, JAPAN*

T100e **MILLISECOND MECHANOPHENOTYPING OF STEM CELLS BY ELECTRICAL DETECTION IN MICROFLUIDIC CONSTRICTIONS**
N. Kaji^{1,2}, S. Ito¹, H. Yasaki¹, T. Yasui^{1,2}, H. Yukawa¹, and Y. Baba^{1,3}
¹*Nagoya University, JAPAN*, ²*Japan Science and Technology Agency (JST), JAPAN*,
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W095e **A MULTIWELL MICROFLUIDIC DEVICE FOR PROBING THE EFFECT OF ANTIBIOTICS ON MYCOBACTERIUM MIGRATION**
H. Li, Y. Liu, and P.K. Wong
Pennsylvania State University, USA

W096e **MECHANICAL CHARACTERIZATION OF ENDOMETRIAL CELLS AS A NON-SURGICAL DIAGNOSTIC TEST FOR ENDOMETRIOSIS**
A. Altayyeb¹, M. Khashbah², A. Esmaeel², M. El-Mokhtar², A. Sharkawy²,
M. Abdelgawad², and E. Othman²
¹Zewail City of Science and Technology, EGYPT and ²Assiut University, EGYPT

W097e **SINGLE CELL DEFORMATION IN SHEAR AND INERTIA DOMINANT FLOW REGIMES**
F.J. Armistead¹, J.G. De Pablo¹, H. Gadêlha², S.A. Peyman¹, and S.D. Evans¹
¹University of Leeds, UK and ²University of York, USA

e - Cell & Vesicle Analysis and Manipulation

Cell Studies

M100e **STUDYING CELL-TO-CELL COMMUNICATION FOR MOTILITY IN BACILLUS SUBTILIS WITH MICROFLUIDIC DEVICES**
Y. Yu, J.D. Baker, J. Zhou, D.B. Kearns, and S.C. Jacobson
Indiana University, USA

T101e **ADDING METABOLISM TO THE EMBRYONIC STEM CELL TEST**
J.A. Boos¹, A. Michlmayr¹, A. Birchler¹, O. Frey², and A. Hierlemann¹
¹ETH Zürich, SWITZERLAND and ²InSphero AG, SWITZERLAND

W098e **MICROFLUIDIC-BASED BLOOD EXCHANGE PLATFORMS FOR UNDERSTANDING THE EFFECT OF CELLULAR COMPONENTS OF THE BLOOD ON AGING**
P. Amiri¹, T. Tran¹, J. Parades², I. Conboy³, and K. Aran¹
¹Keck Graduate Institute, USA, ²Universidad de Navarra, SPAIN, and ³University of California, Berkeley, USA

e - Cell & Vesicle Analysis and Manipulation

Circulating Tumor Cells

M101e **A MICROFLUIDIC PLATFORM INTEGRATED WITH FIELD-EFFECT TRANSISTORS FOR DETECTION OF CIRCULATING TUMOR CELLS**
Y.-H. Chen, A.K. Pulikkathodi, Y.-L. Wang, and G.-B. Lee
National Tsing Hua University, TAIWAN

M102e **AN INTEGRATED MICROFLUIDIC CHIP CAPABLE OF WHOLE BLOOD TREATMENT AND PNEUMATICALLY-MODULATED FILTERING FOR DETECTING CIRCULATING TUMOR CELLS IN CLINICAL SPECIMEN**
Y.-C. Tsai, L.-Y. Hung, F.-G. Tseng, H.-Y. Chang, and G.-B. Lee
National Tsing Hua University, TAIWAN

- M103e** **CAPTURE OF CANCER CELLS USING MAGNETIC FIELD ENHANCED MICROFLUIDIC DEVICES**
J. Zhang, M. Unni, T. George, M. Segal, C. Rinaldi, and Z.H. Fan
University of Florida, USA
- M104e** **DIALYSIS-LIKE TUMOR CELL REMOVAL USING CAPILLARY BUNDLES**
P. Dopico, C. Wang, C.-W. Rinaldi, T.-J. George, M. Segal, and Z.H. Fan
University of Florida, USA
- M105e** **INTERFERENCE-BASED LABEL-FREE ANALYSIS OF FILOPODIA DYNAMICS IN CANCER CELLS OF DIFFERENT METASTATIC POTENTIAL**
J.C. Contreras-Naranjo, A. Jayaraman, and V.M. Ugaz
Texas A&M University, USA
- M106e** **LIVE CIRCULATING TUMOR CELLS SELECTION ON SELF-ASSEMBLED CELL ARRAY (SACA) CHIP BY IN-PARALLEL IMAGE ANALYSIS AND IN-SITU CELL CAPTURE**
S.Y. Wu¹, H.Y. Chu¹, Y.C. Cheng¹, C.H. Chu¹, and F.G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN
- T102e** **A DISPOSABLE MICROSEPARATOR FOR ISOLATING CIRCULATING TUMOR CELLS**
H. Cho¹, J. Kim¹, H.-U. Park¹, H. Kang¹, C.-W. Jeon², and K.-H. Han¹
¹Inje University, KOREA and ²Gospel Hospital, Kosin University, KOREA
- T103e** **AFM COMPATIBLE MICROFLUIDIC PLATFORM FOR MECHANICAL CHARACTERIZATION OF PROSTATE CIRCULATING TUMOR CELLS**
M. Deliorman¹, R. Alnemari¹, F.K. Janahi², and M.A. Qasaimeh^{1,3}
¹New York University, Abu Dhabi, UAE, ²Mohammed Bin Rashid University of Medicine and Health Sciences, UAE, and ³New York University, USA
- T104e** **BIO-FUNCTIONALIZED RECOMBINANT SPIDER SILK MODIFIED MICRODEVICE FOR CAPTURE AND RELEASE OF CIRCULATING TUMOR CELLS FROM PANCREATIC CANCER PATIENTS**
H. Ramachandraiah¹, T. Pettersson¹, R. Heuchel², M. Löhr², M. Hedhammar¹, and A. Russom¹
¹Royal Institute of Technology (KTH), SWEDEN and ²Karolinska University Hospital, SWEDEN
- T105e** **CONTINUOUS CIRCULATING TUMOR CELL ISOLATION AND RETRIEVAL VIA AN ULTRAHIGH FREQUENCY PIEZOELECTRIC NANO-ELECTROMECHANICAL DEVICE**
Y. Yang, W. Cui, M. He, H. Zhang, Y. Wang, W. Pang, and X. Duan
Tianjin University, CHINA

- T106e** **DYNAMIC DEFORMABLE MICROFILTER FOR CAPTURING CIRCULATING TUMOR CELLS**
Y. Nakashima¹, K. Nakatake¹, K. Yasuda², Y. Kitamura¹, M. Iwatsuki¹,
H. Baba¹, T. Ihara¹, and Y. Nakanishi¹
¹Kumamoto University, JAPAN and ²Ogic Technologies Co., Ltd., JAPAN
- T107e** **LABEL-FREE FERROHYDRODYNAMIC CELL SEPARATION OF CIRCULATING TUMOR CELLS**
W. Zhao¹, R. Cheng¹, B.D. Jenkins¹, M.B. Davis¹, S.K. Kavuri², Z. Hao²,
C. Schroeder², and L. Mao¹
¹University of Georgia, USA and ²Augusta University, USA
- T108e** **QUANTIFICATION OF THE EFFECTS OF HIGH SHEAR STRESSES ON SINGLE CIRCULATING TUMOR CELLS USING A MICROFLUIDIC DEVICE**
G.M. Landwehr¹, S.M. Rahman¹, J.H. Pettigrew¹, A.J. Kristof², U.L. Triantafillu³,
Y. Kim³, and A.T. Melvin¹
¹Louisiana State University, USA, ²North Carolina State University, USA, and ³University of Alabama, USA
- W099e** **A HIGH-THROUGHPUT ENTRAPMENT CHIP FOR CIRCULATING TUMOR CELL (CTC-HTECH)**
X. Ren, P. Ghassemi, J.S. Strobl, and M. Agah
Virginia Polytechnic Institute and State University, USA
- W100e** **AN ANTIBODY-COATED, SIZE-BASED MICROFLUIDIC CHIP WITH WAVE-SHAPED ARRAYS FOR ISOLATING CIRCULATING TUMOR CELLS**
H. Chen
Chinese Academy of Sciences, CHINA
- W101e** **BIOCOMPATIBLE AND LABEL-FREE SEPARATION OF CANCER CELLS FROM BLOOD IN FERROFLUIDS**
W. Zhao, R. Cheng, S.H. Lim, J.R. Miller, W. Zhang, W. Tang, J. Xie, and L. Mao
University of Georgia, USA
- W102e** **CONTINUOUS SEPARATION OF CIRCULATING TUMOR CELLS FROM WHOLE BLOOD USING A MICROFLUIDIC DEVICE WITH DIAGONAL WEIR**
Y. Yoon, J. Choi, J. Lee, K.-C. Yoo, O. Sul, S.-J. Lee, and S.-B. Lee
Hanyang University, KOREA
- W103e** **HIGHLY EFFICIENT TRAPPING AND ANALYSIS OF RARE CELLS USING AN ELECTROACTIVE MICROWELL ARRAY WITH BARRIERS**
M. Takeuchi, S.H. Kim, K. Nagasaka, M. Yoshida, Y. Kawata, K. Oda, and T. Fujii
University of Tokyo, JAPAN

W104e **LEUKOCYTE DEPLETION AND SIZE-BASED ENRICHMENT OF CIRCULATING TUMOR CELLS WITH PRESSURE-SENSING MICROFILTRATION SYSTEM**
D. Kuboyama¹, D. Onoshima¹, N. Kihara^{1,2}, H. Tanaka¹, T. Hase¹, H. Yukawa¹, K. Ishikawa¹, H. Odaka², Y. Hasegawa¹, M. Hori¹, and Y. Baba^{1,3}
¹Nagoya University, JAPAN, ²AGC Asahi Glass, JAPAN, and ³National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

W105e **RAPID CIRCULATING TUMOR CELLS STAINING AND IN-PARALLEL DIAGNOSIS BY TWO-IN-ONE 3D-MICRODIALYSIS AND CELL SELF-ASSEMBLING CHIP**
H.-Y. Chu¹, W. Cho¹, C.-P. Lin², J.-K. Jiang², and F.-G. Tseng^{1,3}
¹National Tsing Hua University, TAIWAN, ²Veterans General Hospital, TAIWAN, and ³Academia Sinica, TAIWAN

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Exosomes

M107e **A ZINC OXIDE NANOWIRES DEVICE FOR EXTRACELLULAR VESICLES ISOLATION AND PURIFICATION**
I.A. Thiodorus¹, N. Kaji^{1,2}, T. Yasui^{1,2}, and Y. Baba^{1,2,3}
¹Nagoya University, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN, and ³National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

M108e **EVALUATION OF INDIVIDUAL EXOSOMES OF HUMAN LEUKEMIA CELLS FRACTIONATED BY OPPTIPREP DENSITY GRADIENT ULTRACENTRIFUGATION USING MICROFLUIDIC CHIP-BASED PLATFORM**
R. Okamura¹, T. Akagi¹, and T. Ichiki^{1,2}
¹University of Tokyo, JAPAN and ²Innovation Center of Nano Medicine (iCONM), JAPAN

M109e **ON-CHIP FILTRATION UTILIZING DOUBLE LAYERS OF MEMBRANE FILTERS FOR EXTRACELLULAR VESICLES ISOLATION FROM WHOLE BLOOD**
Y.-S. Chen, H.-L. Cheng, C. Chen, and G.-B. Lee
National Tsing Hua University, TAIWAN

M110e **QUICK IMMUNOASSAY OF AMYLOID BETA (A β) IN EXOSOMES FROM PLASMA USING MAGNETIC MICROPARTICLES IN WATER-OIL DROPLETS FOR THE DIAGNOSIS OF ALZHEIMER'S DISEASE**
Y. Heo^{1,2}, M. Park¹, J.H. Ji¹, K.-S. Shin¹, M.C. Park^{1,3}, K. Shin², and J.Y. Kang¹
¹Korea Institute of Science and Technology (KIST), KOREA, ²Sogang University, KOREA, and ³Intek Plus, KOREA

- T109e** **ANALYSIS OF INDIVIDUAL EXTRACELLULAR VESICLES DOWN TO THIRTY NANOMETER WITH SMALL SAMPLE VOLUME TOWARD EXOSOMAL BIOMARKER APPLICATIONS**
T. Akagi^{1,2}, H. Kishita¹, Y. Suehiro¹, M. Nakakuki¹, R. Okamura¹, and T. Ichiki^{1,2}
¹*University of Tokyo, JAPAN and*
²*Innovation Center of Nano Medicine (iCONM), JAPAN*
- T110e** **MICROFLUIDIC AFFINITY PURIFICATION OF CANCER-SPECIFIC EXTRACELLULAR VESICLES**
J.M. Jackson¹, M.A. Witek¹, S.R. Pullagurla¹, D.S. Park^{1,2}, M.L. Hupert³,
K. Herrera⁴, M.C. Murphy^{1,2}, and S.A. Soper¹
¹*University of Kansas, USA,* ²*Louisiana State University, USA,* ³*Biofluidica, Inc., USA,*
and ⁴*University of North Carolina, Chapel Hill, USA*
- T111e** **ON-CHIP HARVESTING AND PHOTO-RELEASE OF IMMUNOGENIC EXTRACELLULAR VESICLES FOR CANCER IMMUNOTHERAPY**
Z. Zhao², J. Sibbitt², and M. He^{1,2}
¹*Kansas State University, USA and* ²*Terry C. Johnson Cancer Research Center, USA*
- T112e** **RESISTIVE-PULSE SENSING TUMOR-DERIVED EXOSOME DETECTION DEVICE FOR RESOURCE-LIMITED SETTINGS**
T.R. Carey, C.W. Yu, and L.L. Sohn
University of California, Berkeley, USA
- W106e** **DIELECTROPHORETIC ISOLATION OF EXOSOMES FOR STRATIFYING TUMORIGENICITY**
J.H. Moore¹, S.S. Linton², M. Kester¹, and N.S. Swami¹
¹*University of Virginia, USA and* ²*Penn State College of Medicine, USA*
- W107e** **EXTRACELLULAR VESICLES SEPARATION BY ELECTROOSMOTIC FLOW-DRIVEN DETERMINISTIC LATERAL DISPLACEMENT IN NANOPILLAR CHIPS**
N. Kaji^{1,2}, Y. Hattori¹, H. Yasaki¹, T. Yasui^{1,2}, and Y. Baba^{1,3}
¹*Nagoya University, JAPAN,* ²*Japan Science and Technology Agency (JST), JAPAN, and*
³*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*
- W108e** **PROFILING OF N-GLYCANS FROM URINARY EXOSOMES BY MICROCHIP ELECTROPHORESIS AND MASS SPECTROMETRY**
W. Song, G. Zou, X. Zhou, M.V. Novotny, and S.C. Jacobson
Indiana University, USA

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Single Cell Analysis

- M111e** **A MICROTRAP PLATFORM TO INVESTIGATE SINGLE CELL MECHANICS**
Q. Jin¹, G. Pahapale¹, A. Bhatta², A. Dai¹, L. Romer², and D.H. Gracias^{1,2}
¹Johns Hopkins University, USA and ²Johns Hopkins School of Medicine, USA
- M112e** **CHARACTERIZATION OF A FLUIDIC PLATFORM FOR NANOSCALE CELLULAR ELECTROPORATION**
H. Yuan, M.M. Crain, P.S. Soucy, S.J. Williams, and R.S. Keynton
University of Louisville, USA
- M113e** **CONTINUOUS FLOW MICROFLUIDICS FOR ADHERENT SINGLE CELL SECRETOMICS PROFILING IN RESPONSE TO VARIOUS MATRIX STIFFNESS**
M. Wang, H.L. Leo, C.T. Lim, and C.-H. Chen
National University of Singapore, SINGAPORE
- M114e** **DROPLET BASED ASSAY TO MEASURE RADIOACTIVITY WITH SINGLE-CELL RESOLUTION**
T.J. Kim¹, M.E. Gallina¹, A. Sun², M. Shelor³, M. Kim¹, S. Tang¹, P. Abbyad², and G. Pratz¹
¹Stanford University, USA, ²Santa Clara University, USA, and ³University of California, Merced, USA
- M115e** **HIGH-THROUGHPUT CHARACTERIZATION OF SINGLE-CELL SPECIFIC MEMBRANE CAPACITANCE ON A NOVEL CROSS-SHAPED MICROFLUIDIC CHIP**
Y. Zhao, K. Wang, N. Guo, D. Chen, L. Li, B. Fan, M. Li, J. Wang, J. Chen, and C. Huang
Chinese Academy of Sciences, CHINA
- M116e** **LIPOPLEX-MEDIATED EFFICIENT SINGLE-CELL TRANSFECTION VIA DROPLET MICROFLUIDICS**
X. Li¹, S. Liu², and A.P. Lee¹
¹University of California, Irvine, USA and ²Chinese University of Hong Kong, HONG KONG
- M117e** **PRECISE LOCALIZED CHEMICAL STIMULATION USING THE FLUIDFM TO PROBE SPATIO-TEMPORAL DYNAMICS OF NEURAL NETWORKS TOWARDS AN *IN VITRO* STROKE MODEL**
G. Thompson-Steckel, M.J. Aebersold, H. Dermutz, I. Luchtefeld, J.F. Saenz Cogollo, S.-C. Lin, C. Burchert, M. Schneider, H. Han, L. Demkó, T. Zambelli, and J. Vörös
ETH Zürich, SWITZERLAND

- M118e** **SINGLE CELL SURFACE RECEPTOR ANALYSIS IN THE DESIGNED MICROFLUIDIC DEVICE**
W.V. Espulgar¹, T. Okajima¹, H. Takamatsu¹, W. Aoki², M. Saito¹, A. Kumanogoh², M. Ueda², and E. Tamiya¹
¹Osaka University, JAPAN and ²Kyoto University, JAPAN
- T113e** **AN ON-CHIP GUILLOTINE FOR HIGH-THROUGHPUT SINGLE-CELL WOUND REPAIR STUDIES**
L.R. Blauch¹, Y. Gai¹, J.W. Khor¹, P. Sood², W.F. Marshall², and S.K.Y. Tang¹
¹Stanford University, USA and ²University of California, San Francisco, USA
- T114e** **CLICKABLE MULTIFUNCTIONAL DUMBBELL PARTICLES FOR IN SITU SINGLE-CELL CYTOKINE DETECTION**
P. Zhao, J. George, B. Li, and J. Wang
State University of New York, Albany, USA
- T115e** **CYTOPLASMIC TRANSFER BETWEEN LIVE SINGLE CELLS BY ACHIEVING TRANSIENT CYTOPLASMIC CONNECTION**
K.-I. Wada, K. Hosokawa, Y. Ito, and M. Maeda
Institute of Physical and Chemical Research (RIKEN), JAPAN
- T116e** **DEVELOPMENT OF EXTENDED-NANO FEMTOLITTER MESS-PIPETTE IN LIVING SINGLE CELL ANALYSIS DEVICE**
T. Nakao¹, Y. Kazoe¹, K. Morikawa¹, L. Lin², A. Yoshizaki³, K. Mawatari¹, and T. Kitamori¹
¹University of Tokyo, JAPAN, ²National Center for Nanoscience and Technology, CHINA, and ³University of Tokyo Hospital, JAPAN
- T117e** **LAB-ON-A-CHIP PLATFORM FOR SINGLE-CELL ELECTROROTATION USING 3D ELECTRODES**
K. Keim, P. Maoddi, S. Kilchenmann, M. Comino, and C. Guiducci
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T118e** **MEASURING THE METABOLIC RESPONSE OF SINGLE ADHERENT CELLS TO CHEMOTHERAPY USING RADIOFLUIDIC MICROCHANNELS**
T.J. Kim¹, M. Kim¹, A. Sun², P. Abbyad², S. Tang¹, and G. Pratz¹
¹Stanford University, USA and ²Santa Clara University, USA
- T119e** **SINGLE CELL IMPEDANCE CYTOMETRY FOR RAPID AND LABEL-FREE PHENOTYPING OF MONOCYTE ACTIVATION AND DIFFERENTIATION**
C. Petchakup, H.M. Tay, N.V. Menon, H.W. Hou, and K.H.H. Li
Nanyang Technological University, SINGAPORE
- T120e** **SINGLE-CELL BASED MORPHOLOGICAL ANALYSIS OF BACTERIA USING MICROWELL-PATTERNED HYDROGEL STRUCTURE**
J. Yoon¹, Y.K. Kim^{2,3}, Y.G. Jung^{2,3}, and W. Park¹
¹Kyung Hee University, KOREA, ²College of Natural Science, KOREA, and ³Myongji University, KOREA

- W109e** **A MICROFLUIDIC DEVICE TO STUDY SINGLE-CELL CALCIUM DYNAMICS UNDER TIME-VARYING STIMULI**
A.M. Gonzalez-Suarez¹, J.G. Peña-Del Castillo², R.J. Jimenez-Valdes¹,
A. Hernandez-Cruz², and J.L. Garcia-Cordero¹
¹*Centro de Investigacion y de Estudios Avanzados del IPN, MEXICO and*
²*Universidad Nacional Autonoma de Mexico, MEXICO*
- W110e** **AUTOMATED MICROARRAY PLATFORM FOR SINGLE CELL ANALYSIS AND COLLECTION OF NON-ADHERENT CELLS MODIFIED WITH CRISPR-CAS9**
P.J. Attayek¹, C.A. LaBelle¹, J.P. Waugh², S.A. Hunsucker¹, P.J. Grayeski¹, C.E. Sims¹,
P.M. Armistead¹, and N.L. Allbritton¹
¹*University of North Carolina, Chapel Hill, USA and* ²*Northwestern University, USA*
- W111e** **COMBINING MICROFLUIDICS AND LARGE-SCALE PLASMONIC NANO-HOLES FOR SINGLE CELL-SUBSTRATE ATTACHMENT PROCESS MONITORING**
L. Tu, L. Huang, S. Bian, Y. Yu, J. Li, M. Lei, P. Liu, Q. Wu, and W. Wang
Tsinghua University, CHINA
- W112e** **DETERMINISTIC AND TRUE SINGLE-CELL ENCAPSULATION**
M. Sauzade and E. Brouzes
Stony Brook University, USA
- W113e** **DROPLET MICROFLUIDICS FOR COMPARTMENTALIZED CELL LYSIS AND EXTENSION OF DNA FROM SINGLE CELLS**
P. Zimny, W. Reisner, and D. Juncker
McGill University, CANADA
- W114e** **LIGHT ENTRAINMENT OF SINGLE CELL CIRCADIAN OSCILLATOR MEASURED BY A HIGH-THROUGHPUT MICROFLUIDIC DROPLET PLATFORM**
Z. Deng, J. Arnold, and L. Mao
University of Georgia, USA
- W115e** **PHENOTYPING ANTIBIOTIC RESISTANCE WITH SINGLE-CELL RESOLUTION FOR THE DETECTION OF HETERORESISTANCE**
F. Lyu, M. Pan, J. Andrews, and S.K.Y. Tang
Stanford University, USA
- W116e** **SINGLE CELL RESOLUTION ANALYSIS OF ULTRASOUND-PRODUCED MULTI-CELLULAR TUMOR SPHEROIDS**
K. Olofsson¹, V. Carannante², T. Frisk¹, K. Kushiro³, M. Takai³, A. Lundqvist²,
B. Önfelt^{1,2}, and M. Wiklund¹
¹*KTH Royal Institute of Technology, SWEDEN,* ²*Karolinska Institutet, SWEDEN, and*
³*University of Tokyo, JAPAN*

- W117e** **STUDY ON A CELL TRAPPING DEVICE FOR APPLYING MOLECULAR ANALYSIS BY MODULATING LATERAL MICROSTRUCTURE SHAPES**
D.-S. Lee¹, J.W. Park¹, C. Ihm², M.Y. Jung¹, K.H. Chung¹, H.-S. Lee^{3,4}, and D.H. Kim⁴
¹*Electronics and Telecommunications Research Institute (ETRI), KOREA,*
²*Eulji University, KOREA,* ³*Seoul National University, KOREA,*
and ⁴*Technical Research Center, KOREA*

e - Cell & Vesicle Analysis and Manipulation

Synthetic Biology

- M119e** **AN AUTOMATED INDUCTION MICROFLUIDICS SYSTEM FOR SYNTHETIC BIOLOGY**
M.C. Husser, P.Q.N. Vo, H. Sinha, F. Ahmadi, and S.C.C. Shih
Concordia University, CANADA
- T121e** **CONTINUOUS FLOW MICROFLUIDIC SYSTEM FOR CUSTOMIZABLE BACTERIAL CELLULOSE PRODUCTION THROUGH SYNTHETIC BIOLOGY**
J. Yu¹, G. Sun¹, M. Hsu¹, V.V. Sundaravadanam², S. Lim², and C.-H. Chen¹
¹*National University of Singapore, SINGAPORE and*
²*Nanyang Technological University, SINGAPORE*
- W118e** **LIPOBOT: NEGATIVE CHEMOTAXIS BY OSMOTIC PRESSURE**
K. Shoji and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN

e - Cell & Vesicle Analysis and Manipulation

Vesicles & Lipid Membranes

- M120e** **A SMALL-SIZED LIPID NANOPARTICLES PRODUCTION METHOD USING MICROFLUIDIC DEVICES WITH BAFFLE STRUCTURES**
N. Kimura¹, M. Maeki¹, Y. Note¹, Y. Sato¹, A. Ishida¹, H. Tani¹, H. Harashima¹,
and M. Tokeshi^{1,2}
¹*Hokkaido University, JAPAN and* ²*Nagoya University, JAPAN*
- M121e** **COMBINATION OF A MICROFLUIDIC DEVICE AND FLUORESCENCE CORRELATION SPECTROSCOPY TO STUDY PEPTIDE TRANSLOCATION ACROSS MODEL MEMBRANES**
S. Bachler, C.-C. Lin, and P.S. Dittrich
ETH Zürich, SWITZERLAND

- M122e** **MICROTUBULE POLYMERIZATION USING TEMPERATURE GRADIENT IN MICROCHIP**
J.-H. Liu¹, R. Yokokawa², and Y.-W. Lu¹
¹National Taiwan University, TAIWAN and ²Kyoto University, JAPAN
- M123e** **HIGH-THROUGHPUT LIPOSOME SYNTHESIS USING A 3D PRINTED MICROFLUIDIC VERTICAL FLOW FOCUSING DEVICE**
Z. Chen, J.Y. Han, L. Shumate, and D. DeVoe
University of Maryland, USA
- M124e** **MICROFLUIDIC LIPOSOME BIOSENSOR FOR DETECTING BOTULINUM NEUROTOXIN PHYSIOLOGICAL ACTIVITY**
F. Kurth¹, O.G. Weingart¹, K. Eyer², M.J. Lössner¹, and P.S. Dittrich¹
¹ETH Zürich, SWITZERLAND, and ²École Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE
- T122e** **AN INTERWEAVED-RELEASE SILICON NITRIDE FILM FABRICATION TECHNIQUE FOR MITOCHONDRIAL VESICLES ELECTRON MICROSCOPY**
B. Yu, T. Li, P. Yu, Y. Wu, M. Sun, D. Huang, F. Zheng, Q. Chen, and Z. Li
Peking University, CHINA
- T123e** **COMBINED CHEMO-PHOTODYNAMIC THERAPY USING BIODEGRADABLE MICELLES**
K. Tokarska¹, Ł. Lamch², E. Jastrzębska¹, M. Chudy¹, A. Dybko¹, K.A. Wilk², and Z. Brzózka¹
¹Warsaw University of Technology, POLAND and ²Wrocław University of Science and Technology, POLAND
- T124e** **FORMATION OF A GIANT LIPID VESICLE CONTAINING TWO TYPES OF LIQUID SOLUTIONS USING A THETA-GLASS CAPILLARY**
K. Kamiya¹, T. Osaki^{1,2}, S. Fujii¹, N. Misawa¹, and S. Takeuchi^{1,2}
¹Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and ²University of Tokyo, JAPAN
- T125e** **HIGH-THROUGHPUT PRODUCTION OF SMALL AND UNIFORM LIPOSOMES**
N. Soga¹, R. Watanabe^{1,2}, and H. Noji¹
¹University of Tokyo, JAPAN and ²AMED-PRIME, JAPAN
- T126e** **SELECTIVE PAIRING AND FUSION OF CELL-SIZED LIPOSOMES BY ROUND-TIP DIELECTROPHORETIC TWEEZER**
S. Yoshida and S. Takeuchi
University of Tokyo, JAPAN

- W119e** **CHARACTERIZATION OF MONOOLEIN BILAYER THICKNESS USING SPECIFIC MEMBRANE CAPACITANCE**
M. McGlone¹, A. Armetta¹, T. Osaki^{2,3}, S. Takeuchi^{2,3}, and S. Lee¹
¹Iona College, USA, ²Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN, and ³University of Tokyo, JAPAN
- W120e** **COMPARE OF THREE MICROPATTERN METHODS FOR HIGH-THROUGHPUT CELL ARRANGEMENT**
T. Hun^{1,3}, Y. Liu², Y. Guo², X. Liu¹, W. Wang², Y. Sun^{1,3}, and Y. Fan¹
¹Beihang University, CHINA, ²Peking University, CHINA, and ³Chinese Academy of Sciences, CHINA
- W121e** **GENERATION OF 3-DIMENSIONAL LIPID STRUCTURE ARRAY ATTACHED TO SI MICROWELLS**
W.B. Han, R. Kwak, and T.S. Kim
Korea Institute of Science and Technology (KIST), KOREA
- W122e** **HYDROGEL-BASED LIPID BILAYER SYSTEM FOR CONTINUOUS VAPOR DETECTION**
S. Fujii¹, N. Misawa¹, K. Kamiya¹, T. Osaki^{1,2}, and S. Takeuchi^{1,2}
¹Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and ²University of Tokyo, JAPAN
- W123e** **THREE-DIMENSIONAL LIPOSOME ASSEMBLY TOWORD SYNTHETIC TISSUE**
D.C. Shin¹, Y. Morimoto¹, K. Kamiya², and S. Takeuchi¹
¹University of Tokyo, JAPAN and ²Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN

f - Cells, Organisms, and Organs on Chip

3D Culture/Tissues

- M125f** **A 96-WELL THREE-DIMENSIONAL MICROFABRICATED WOUND-HEALING ASSAY**
S.L. Luan¹, R. Hao^{2,3}, Y.C. Wei², T. Zhang⁴, D.Y. Chen^{2,3}, B.Y. Fan^{2,3}, J.B. Wang^{2,3}, W. Guo¹, and J. Chen^{2,3}
¹Chinese PLA General Hospital, CHINA, ²Chinese Academy of Sciences, CHINA, ³University of Chinese Academy of Sciences, CHINA, and ⁴Peking University People's Hospital, CHINA
- M126f** **A HIGH-THROUGHPUT PLATFORM TO PROBE MODULATORS OF ENDOTHELIAL PERMEABILITY**
A.L. Crampton, K.A. Cummins, and D.K. Wood
University of Minnesota, USA

- M127f** **ANALYSIS OF THE PRODUCTION OF L929 CELL-BASED CYTOKINE, M-CSF, USING 3D SPHEROID CULTURE SYSTEM**
Y.H. Jung, K. Na, J. Kim, D. Choi, H. Kim, Y. Cho, and S. Chung
Korea University, KOREA
- M128f** **CYTO- AND PHOTOCYTOTOXICITY OF NANOPHOTOSENSITIZERS ON A 3D MULTILAYER OVARIAN CELL CULTURE IN A MICROFLUIDIC SYSTEM**
M. Bulka¹, E. Jastrzebska¹, U. Bazylińska², A. Dybko¹, M. Chudy¹, K.A. Wilk², and Z. Brzozka¹
¹*Warsaw University of Technology, POLAND and*
²*Wroclaw University of Technology, POLAND*
- M129f** **DYNAMICS OF INSULIN-REGULATED FATTY ACID EXCHANGE IN MURINE ADIPOSE TISSUE USING AUTOMATED MICROFLUIDICS AND FLUORESCENCE IMAGING**
X. Li¹, J.C. Brooks^{1,2}, J. Hu¹, and C.J. Easley¹
¹*Auburn University, USA and* ²*Tufts University, USA*
- M130f** **HOLLOW FIBER SYSTEM FOR CONTINUOUS GENERATION OF HUMAN BRAIN ORGANIDS**
Y. Zhu^{1,2}, Y. Yu^{1,2}, L. Wang¹, F. Yin^{1,2}, Y. Wang^{1,2}, H. Liu¹, H. Wang^{1,2}, H. Liu^{1,2}, and J. Qin^{1,2}
¹*Dalian Institute of Chemical Physics, CHINA and*
²*University of Chinese Academy of Sciences, JAPAN*
- M131f** **INDIVIDUALLY ADDRESSABLE AND SPATIALLY PROGRAMMABLE BIOPOLYMER FLUITRODE FOR MULTI-SPECIES 3D CELL ASSEMBLY**
P. Pham, J. Choy, and X. Luo
Catholic University of America, USA
- M132f** **NOVEL MICROSYSTEM FOR EVALUATION OF INFLUENCE OF GRAPHENE OXIDE ON SPHEROID AND MONOLAYER CELL CULTURE**
A. Zuchowska, E. Jasterzebska, M. Chudy, A. Dybko, M. Mazurkiewicz-Pawlicka, A. Malolepszy, L. Stobinski, and Z. Brzozka
Warsaw University of Technology, POLAND
- M133f** **USING TWO-PHOTON MICROSCOPY TO MONITOR DRUG PENETRATION INTO TUMOUR SPHEROIDS WITHIN A MICROFLUIDIC HYPOXIA CONTROL SYSTEM**
S.M. Grist, S.S. Nasser, L. Laplatine, L. Chrostowski, and K.C. Cheung
University of British Columbia, CANADA
- T127f** **A GUT-ON-A-CHIP STUDY: ENABLING ON-DEMAND MANIPULATION OF THE OUTER CELL MICROENVIRONMENT IN A MULTICOMPARTMENTAL 3D CULTURE ARRAY**
B. Gumuscu, H.J. Albers, A. van den Berg, J. Eijkel, and A.D. van der Meer
University of Twente, NETHERLANDS

- T128f** **A MICROFLUIDIC TILTING PLATFORM FOR *IN-VIVO*-LIKE DRUG EXPOSURE OF THREE-DIMENSIONAL MICROTISSUES**
C. Lohasz¹, O. Frey², K. Renggli¹, and A. Hierlemann¹
¹*ETH Zürich, SWITZERLAND* and ²*InSphero AG, SWITZERLAND*
- T129f** **BIO-FABRICATION OF CA-ALGINATE CELL SHEETS WITH THE ELECTRODEPOSITION METHOD FOR HEPATIC LOBULE TISSUE RECONSTRUCTS**
Z. Liu¹, M. Takeuchi¹, Y. Hasegawa¹, T. Fukuda^{1,2,3}, and Q. Huang³
¹*Nagoya University, JAPAN*, ²*Meijo University, JAPAN*, and ³*Beijing Institute of Technology, CHINA*
- T130f** **DESIGN OF A 3D PRINTED MICROFLUIDIC PLATFORM FOR ORGANOID CULTURE**
E.L. Jackson-Holmes¹, R.M. Lawler¹, A.W. Schaefer¹, Z. Wen², and H. Lu¹
¹*Georgia Institute of Technology, USA* and ²*Emory University School of Medicine, USA*
- T131f** **EVALUATION OF PDT EFFECTIVENESS OF ENCAPULATED PHOTSENSITIZERS BASED ON 3D SPHEROID CO-CULTURE**
A. Zuchowska¹, K. Marciniak¹, E. Jastrzebska¹, U. Bazylińska², M. Chudy¹, A. Dybko¹, K.A. Wilk², and Z. Brzozka¹
¹*Warsaw University of Technology, POLAND* and ²*Wrocław University of Science and Technology, POLAND*
- T132f** **HYDROPHOBIC PATTERNED-BASED THREE DIMENSIONAL MICROFLUIDIC CELL-CULTURE ASSAY**
S. Han¹, J. Kim¹, A. Ma¹, V. Kwan¹, K. Luong¹, R. Li², and L.L. Sohn¹
¹*University of California, Berkeley, USA* and ²*University of Minnesota, USA*
- T133f** **MICROWELL-BASED DYNAMIC CULTURE SYSTEM FOR THE GENERATION OF FUNCTIONALIZED ISLET-LIKE ORGANOIDS**
Y. Lee, M. Jang, I. Yong, E. Shin, Y.-M. Han, J.H. Shin, H. Kim, and P. Kim
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- T134f** **MULTISPECIES CO-CULTURE PLATFORM TO ENABLE SPATIOTEMPORAL ANALYSIS OF MICROBIAL COMMUNICATION**
C.A. Vaiana, Z. Ge, C.A. Voigt, and C.R. Buie
Massachusetts Institute of Technology, USA
- T135f** **PERFUSION CULTURE THROUGH A VASCULATURE CONSTRUCTED IN A TUMOR SPHEROID**
Y. Nashimoto¹, Y. Teraoka¹, A. Nakamasu², S. Hanada³, Y. Arima³, Y. Torisawa¹, H. Kotera¹, K. Nishiyama³, T. Miura², and R. Yokokawa¹
¹*Kyoto University, JAPAN*, ²*Kyushu University, JAPAN*, and ³*Kumamoto University, JAPAN*

- T136f** **SELF-ORGANIZED AMNIOGENESIS FROM HUMAN PLURIPOTENT STEM CELLS IN AN ENGINEERED BIOMIMETIC NICHE**
Y. Shao¹, K. Taniguchi², K. Gurdziel³, R.F. Townshend², X. Xue¹,
K.M.A. Yong¹, J. Sang¹, J.R. Spence², D.L. Gumucio², and J. Fu¹
¹University of Michigan, USA, ²University of Michigan Medical School, USA, and
³Wayne State University, USA
- T137f** **THICKNESS-CONTROLLED MICROCARRIER AGGREGATES FOR THREE-DIMENSIONAL EXPANSION OF MYOBLASTS**
K. Ikeda, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN
- W124f** **A MICROFLUIDIC DEVICE TO CULTURE MULTI-TYPE 3D *IN VITRO* TISSUES WITH PERFUSED HUMAN CAPILLARY NETWORK**
D. Zhao, D.T.T. Phan, C.C.W. Hughes, and A.P. Lee
University of California, Irvine, USA
- W125f** **A NOVEL IN SITU MONITORING SYSTEM OF 3D ENGINEERING MUSCLE**
X. Zhang and G.A. Truskey
Duke University, USA
- W126f** **BIOMATERIAL EXTRUSION AND ORGANIZATION FOR IN-SITU SKIN CELL DEPOSITION**
R. Cheng¹, N. Hakimi¹, S. Amini-Nik², M. Jeschke², and A. Guenther¹
¹University of Toronto, CANADA and ²Sunnybrook Research Institute, CANADA
- W127f** **DISC-ON-A-CHIP: MICROFLUIDIC ORGAN CULTURE OF MOUSE INTERVERTEBRAL DISCS TO TACKLE DEGENERATIVE DISC DISEASE**
J. Li, L. Xiao, X. Li, and J.P. Landers
University of Virginia, USA
- W128f** **HANGING DROP CHIP FOR SIMULTANEOUS TRANSPLANTATION OF MULTIPLE SPHEROIDS INTO HYDROGEL ARRAY**
H. Kim, C.H. Cho, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- W129f** **IN VITRO 3D CULTURE PLATFORM ENABLING 3D CELL CONSTRUCTION WITH WHOLE TISSUE IMAGING**
R. Nobata¹, T. Kawahara², and M. Hagiwara¹
¹Osaka Prefecture University, JAPAN and ²Kyushu Institute of Technology, JAPAN
- W130f** **MIMICKING THE BOVINE OVIDUCT IN A MICROFLUIDIC DEVICE FOR ADVANCED EMBRYO IN VITRO CULTURE SYSTEMS**
M. Ferraz¹, H.S. Rho², J. Delahaye², N. Pinheiro², H. Henning¹, T. Stout¹, B. Gadella¹,
and S. Le Gac²
¹University of Utrecht, NETHERLANDS and ²University of Twente, NETHERLANDS

W131f **ON-CHIP STUDY OF THE EFFECT OF HYPOXIA ON LIPID NANOPARTICLE ABSORPTION IN MCF-7 BREAST CANCER TUMOUR SPHEROIDS**
S.S. Nasser, S.M. Grist, S. Chen, A. Meng, J. Hou, Y.Y.C. Tam, P. Cullis,
and K.C. Cheung
University of British Columbia, CANADA

W132f **VERSATILE CRADLE-TO-GRAVE CULTURE PLATFORM FOR 3D SPHEROID FORMATION AND ANALYSIS**
L. Zhao, S. Mok, and C. Moraes
McGill University, CANADA

f - Cells, Organisms, and Organs on Chip

Angiogenesis/Vasculature

M134f **A NOVEL EXTRACELLULAR MATRIX (ECM) PATTERNING TECHNIQUE FOR ENGINEERING BIOMIMETIC 3D MICROVASCULATURE**
N.V. Menon, H.M. Tay, S.N. Wee, K.H.H. Li, and H.W. Hou
Nanyang Technological University, SINGAPORE

M135f **CONTROLLING OXYGEN GRADIENTS WITHIN MICROFLUIDIC DEVICES TO STUDY ANGIOGENESIS**
S.F. Lam¹, Y.E. Chu¹, A.G. Soetikno¹, and S.C. George²
¹Washington University, St. Louis, USA and ²University of California, Davis, USA

M136f **MICROFLUIDIC TRANSCELLULAR MONITOR FOR PROBING THE FREQUENCY RESPONSE OF THE VASCULAR ENDOTHELIUM TO OSCILLATORY SHEAR STRESS**
Y.J. Sei, S.I. Ahn, T. Virtue, T. Kim, and Y. Kim
Georgia Institute of Technology, USA

M137f **STUDY ENDOTHELIAL CELL SPROUTING IN THREE-DIMENSIONAL MATRIX UNDER OXYGEN GRADIENTS USING MICROFLUIDIC DEVICES**
H.-C. Shih¹, S.-L. Yeh¹, C.-K. Wang², T.-A. Lee¹, W.-H. Liao¹, and Y.-C. Tung¹
¹Academia Sinica, TAIWAN and ²Tamkang University, TAIWAN

M138f **VEIN-ON-A-CHIP: AN INVESTIGATIONAL TOOL FOR INNOVATING SCLEROTHERAPY**
E. Bottaro¹, J. Paterson¹, X. Zhang¹, M. Hill¹, A.L. Lewis², T. Millar¹, and D. Carugo¹
¹University of Southampton, UK and ²Biocompatibles UK Ltd, UK

T138f **COLLAGEN SPONGE-LIKE SCAFFOLD FOR A 3D PERFUSABLE VASCULARIZED TISSUE**
N. Mori, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN

- T139f** **IN VITRO 3D MICROVESSEL CONSTRUCTION BY GROOVED COLLAGEN-GEL SANDWICH**
A. Shima, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN
- T140f** **MULTI-CHANNEL CHIPS TO SIMULATE PULMONARY ARTERIAL HYPERTENSION (PAH) PATHOPHYSIOLOGY AND SCREEN ANTI-PAH DRUGS**
T.A. Al-Hilal, A. Keshavarz, W. Li, and F. Ahsan
Texas Tech University, USA
- T141f** **USING 3D-PRINTING TO FABRICATE A MICROFLUIDIC VASCULAR MODEL TO MIMIC ARTERIAL THROMBOSIS**
H.J. Albers¹, J.E.A. Linssen², P.F. Costa², H.H.T. Middelkamp¹, L. van der Hout¹, J. Malda², R. Passier¹, A. van den Berg¹, and A.D. van der Meer¹
¹*University of Twente, NETHERLANDS* and
²*University Medical Center Utrecht, NETHERLANDS*
- W133f** **ANGIOGENESIS DERIVED FROM SHEAR STRESS OPTIMIZED BY A MICROFLUIDIC DEVICE**
Y. Teraoka¹, M. Nakayama¹, Y. Nashimoto¹, A. Nakamasu², S. Hanada³, Y. Arima³, Y. Torisawa¹, H. Kotera¹, K. Nishiyama³, T. Miura², and R. Yokokawa¹
¹*Kyoto University, JAPAN*, ²*Kyushu University, JAPAN*, and
³*Kumamoto University, JAPAN*
- W134f** **CONFIGURABLE GEL GEOMETRY VIA FLOW PATTERNING FOR ANGIOGENESIS ASSAYS**
J. Loessberg-Zahl, D. Makkinga, A. van der Meer, J. Eijkel, and A. van den Berg
University of Twente, NETHERLANDS
- W135f** **DEVELOPMENT OF CELL STRETCHING DEVICE FOR PULMONARY HYPERTENSION STUDIES**
M. Nitta¹, A. Ogawa², and K. Sato¹
¹*Japan Women's University, JAPAN* and
²*National Hospital Organization Okayama Medical Center, JAPAN*
- W136f** **RPE-CHOROID COMPLEX MICROFLUIDIC MODEL FOR CHOROIDAL NEOVASCULARIZATION (CNV) PATHOGENESIS RESEARCH**
S. Lee¹, M. Chung¹, B.J. Lee¹, K. Son¹, J. Ahn¹, N.L. Jeon¹, and J.H. Kim²
¹*Seoul National University, KOREA* and ²*Seoul National University Hospital, KOREA*
- W137f** **VASCULAR REMODELING PROCESSES IN AN INTEGRATED MICROFLUIDIC DEVICE**
N. Futai¹, T. Sano², M. Sumita¹, A. Takano³, R. Yokokawa⁴, and T. Miura²
¹*Shibaura Institute of Technology, JAPAN*, ²*Kyushu University, JAPAN*, ³*Singapore University of Technology and Design, SINGAPORE*, and ⁴*Kyoto University, JAPAN*

f - Cells, Organisms, and Organs on Chip

Embryos and Organisms

- M139f** **MICROFLUIDIC DEVICES FOR LIFE LONG HIGH-RESOLUTION AND HIGH THROUGHPUT IMAGING OF SUBTLE PHENOTYPES IN *C. ELEGANS***
S.S. Bosari and A. San Miguel
North Carolina State University, USA
- M140f** **SINGLE EMBRYO PIPETTE FOR ACCURATE *C. ELEGANS* BIOASSAYS**
L. Dong, J. Zhang, T. Lehnert, and M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- M141f** **TEMPORAL CHANGE OF PHOTOPHOBIC RESPONSE OF EUGLENA GRACILIS OBSERVED IN A MICRO-AQUARIUM CHIP**
K. Ozasa¹, J. Won², S. Song², and M. Maeda¹
¹*Institute of Physical and Chemical Research (RIKEN), JAPAN and*
²*Hanyang University, KOREA*
- T142f** **A TRANSPARENT PAPER-BASED 3-D CULTURE SYSTEM FOR CAENORHABDITIS ELEGANS**
M. Tahernia, M. Mohammadifar, and S. Choi
State University of New York, Binghamton, USA
- T143f** **HIGH-THROUGHPUT ES CELL AGGREGATION MICRODEVICES FOR GENE-INCORPORATED MICE CREATION**
Y. Tanaka and K. Sumiyama
Institute of Physical and Chemical Research (RIKEN), JAPAN
- T144f** **SINGLE-ANIMAL-BASED DRUG TESTING AND HIGH-CONTENT SCREENING IS ENABLED ON *C. ELEGANS* BY AN AUTOMATED MICROFLUIDIC PLATFORM**
M.C. Letizia, M. Cornaglia, R. Trouillon, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T145f** **ZEBRAFISH LARVA'S CYCLIC ELECTROTAXIS BEHAVIOR AND ITS DEPENDENCY ON DOPAMINE LEVEL ENABLED BY A NOVEL MICROFLUIDIC ASSAY**
A.R. Peimani, G. Zoidl, and P. Rezai
York University, CANADA
- W138f** **BACTERIAL FEEDING CONTROL SYSTEM FOR ON-CHIP CULTURE OF THE NEMATODE *CAENORHABDITIS ELEGANS***
M.C. Letizia, P.G. Testa, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

W139f **MICROFLUIDIC IMPEDANCE PLATFORM FOR AUTOMATED SCHISTOSOMAL MOTILITY DETECTION**
K. Chawla¹, M. Leonhardt¹, M.M. Modena¹, F. Lombardo², S.C. Bürgel¹,
and A. Hierlemann¹
¹ETH Zürich, SWITZERLAND and ²Swiss Tropical and Public Health Institute,
SWITZERLAND

W140f **SYNCHRONIZATION OF C. ELEGANS THROUGH HIGH-THROUGHPUT SEPARATION OF EGGS IN A MICROFLUIDIC CHIP**
S. Sofela¹, S. Sahloul¹, T. Kwon³, J. Han³, M.E. Warkiani⁴, and Y.-A. Song^{1,2}
¹New York University, Abu Dhabi, UAE, ²New York University, USA, ³Massachusetts
Institute of Technology, USA, and ⁴University of New South Wales, AUSTRALIA

f - Cells, Organisms, and Organs on Chip

Organ on a Chip

M142f **A MICROENGINEERED HUMAN CORNEA-ON-A-CHIP FOR EVALUATING MASS TRANSPORT OF OCULAR DRUGS**
D. Bennet, Z. Estlack, and J. Kim
Texas Tech University, USA

M143f **DEVELOPMENT OF A MICROKIDNEY MODEL MIMICKING GLOMERULAR FILTRATION AND TUBULAR SECRETION**
Y. Sakuta¹, I. Takehara², T. Imaoka², K. Tsunoda¹, and K. Sato¹
¹Gunma University, JAPAN and ²Daiichi Sankyo Co., Ltd., JAPAN

M144f **INTEGRATING LOCALISED CYTOKINE DETECTION INTO MICROFLUIDIC ENDOTHELIAL CELL CULTURE TO MAP RESPONSE TO SPATIAL SHEAR-STRESS GRADIENTS (SSSG)**
M. Xu¹, S. Meucci², G. Molema³, U. Sauer⁴, and E. Verpoorte¹
¹University of Groningen, NETHERLANDS, ²Micronit Microtechnologies BV,
NETHERLANDS, ³University Medical Center Groningen, NETHERLANDS, and
⁴Austrian Institute of Technology, AUSTRIA

M145f **MECHANICAL STRESS-INDUCED BLOOD CELL PRODUCTION IN A MICROFLUIDIC DEVICE**
E. Kamata¹, K. Yanagisawa¹, K. Kitajima², T. Hara², and K. Sato¹
¹Japan Women's University, JAPAN and
²Tokyo Metropolitan Institute of Medical Science, JAPAN

M146f **STRONTIUM ION MEDIATED GELATIN/ALGINATE CO-SHELLED MICROTUBES FOR HIGHLY-VIABLE 3D GLOMERULAR CELLS CULTIVATION**
J.-W. Chen¹, J.-S. Chen¹, M.-H. Chiu¹, Y.-C. Ko², H.-H. Hsu², and F.-G. Tseng^{1,3}
¹National Tsing Hua University, TAIWAN, ²Linkou Chang Gung Memorial Hospital,
TAIWAN, and ³Academia Sinica, TAIWAN

- T146f** **A MICROFLUIDIC DEVICE FOR TRAPPING AND DYNAMIC INTERROGATION OF ARTERIOLES**
X. Chen, J.V. Pagaduan, A. Bhatta, D.H. Gracias, and L. Romer
Johns Hopkins School of Medicine, USA
- T147f** **ELECTRICAL SIMULATIONS AND EXPERIMENTAL RESULTS OF 4-ELECTRODE AC TRANSEPITHELIAL ELECTRICAL MEASUREMENTS IN GUT-ON-A-CHIP**
M. van der Helm¹, O. Henry², T. Hamkins-Indik², M. Cronic², W. Leineweber²,
M. Odijk¹, A. van der Meer¹, J. Eijkel¹, D. Ingber², A. van den Berg¹, and L. Segerink¹
¹*University of Twente, NETHERLANDS* and ²*Wyss Institute at Harvard University, USA*
- T148f** **WITHDRAWN**
- T149f** **MICROFLUIDIC DEVICE FOR TWO-WAY LYMPH NODE-LYMPH NODE COMMUNICATION**
S. Shim and R.R. Pompano
University of Virginia, USA
- T150f** **SUPERIOR DIFFERENTIATION IN FULL THICKNESS HUMAN SKIN-ON-A-CHIP**
M. Alberti, G. Sriram, Y. Dancik, B. Wu, R. Wu, S. Ramasamy,
M. Bigliardi-Qi, P.L. Bigliardi, and Z. Wang
*Agency for Science, Technology and Research (A*STAR), SINGAPORE*
- W141f** **A MECHANICALLY AND ELECTRICALLY DEFINED MICROFLUIDIC ENVIRONMENT FOR MICRO-ORGAN CULTURE**
C. Narciso¹, N. Contento¹, D. Hoelzle², and J. Zartman¹
¹*University of Notre Dame, USA* and ²*Ohio State University, USA*
- W142f** **ARTIFICIAL MINI-HEART: AN INTERNAL MICROPUMP BASED ON MAGNETICALLY ACTUATED ARTIFICIAL CILIA THAT CAN INDUCE FLOWS IN A MICROFLUIDIC CHANNEL NETWORK**
S. Zhang^{1,2}, Y. Wang¹, P. Onck³, and J. den Toonder¹
¹*Eindhoven University of Technology, NETHERLANDS*, ²*China Scholarship Council, CHINA*, and ³*University of Groningen, NETHERLANDS*
- W143f** **GASTROINTESTINAL TRACT IN-A-BOX**
S. Xiao, S. Westfall, A. Ng, S. Prakash, and D. Juncker
McGill University, CANADA
- W144f** **INVESTIGATION OF OXYGEN TRANSPORT EFFICIENCIES IN PRECISION-CUT LIVER SLICE-BASED ORGAN-ON-A-CHIP DEVICES**
M.G. Christensen, C. Cawthorne, C.E. Dyer, J. Greenman, and N. Pamme
University of Hull, UK

W145f **POSITION-SELECTIVE CELL SAMPLING IN A MICROFLUIDIC CELL CULTURE DEVICE USING LOCALIZED LAMINAR FLOWS**
S. Matsumoto¹, E. Leclerc², T. Maekawa¹, H. Kinoshita¹, M. Shinohara¹,
K. Komori¹, Y. Sakai¹, and T. Fujii¹
¹University of Tokyo, JAPAN and ²LIMMS/CNRS-IIS, JAPAN

W146f **VERTICAL ANASTOMOSIS FOR LARGE SCALE PERFUSED CAPILLARY NETWORKS AND ORGANS-ON-CHIP APPLICATIONS**
T. Yue, D. Zhao, D.T.T. Phan, C.C.W. Hughes, and A.P. Lee
University of California, Irvine, USA

f - Cells, Organisms, and Organs on Chip

Other

M147f **CELL-DERIVED EXTRACELLULAR MATRIX (ECM) SHEET-ON-CHIP**
Y. Hong¹, I. Koh¹, K. Park², and P. Kim¹
¹Korea Advanced Institute of Science and Technology (KAIST), KOREA and ²Korea Institute of Science and Technology (KIST), KOREA

M148f **DOUBLE-LAYER COLLAGEN MICROTUBE FOR PERFUSABLE HETEROGENEOUS CULTURE**
S. Itai and H. Onoe
Keio University, JAPAN

M149f **IN VITRO THROMBUS MODEL BASED ON MICROFLUIDICS FOR NANO DISC DDS EVALUATION**
S. Yokoyama, S. Yoshida, Y. Okamura, and H. Kimura
Tokai University, JAPAN

M150f **MICROPATTERNED FIBRIN AS A PLATFORM FOR WOUND HEALING STUDIES**
R. McBride, Z. Jiang, B. Noren, and J. Oakey
University of Wyoming, USA

M151f **PREPARATION OF QUASI-CELL PARTICLE FOR INVESTIGATION OF EFFECT OF PHYSICAL CUES TO CELL FUNCTION**
H. Oda and S. Takeuchi
University of Tokyo, JAPAN

T151f **COLLAGEN GELATION ON PHOSPHATE PARTICLE-EMBEDDING PDMS (PP-PDMS) CHANNEL: AN EFFICIENT APPROACH TO VASCULAR TISSUE ENGINEERING**
M. Fukushi¹, Y. Yajima¹, R. Utoh¹, M. Yamada¹, K. Furusawa², and M. Seki¹
¹Chiba University, JAPAN and ²Hokkaido University, JAPAN

- T152f** **ENGINEERING HYDROGEL ECM SCAFFOLD COMPONENT FOR IN VITRO 3D SKELETAL MUSCLE TISSUE**
J. Ahn, H. Jeong, J. Kim, and S. Chung
Korea University, KOREA
- T153f** **INKJET SYSTEM DESIGN OPTIMIZATION FOR RELIABLE CELL PRINTING**
B. Enright¹, E. Cheng¹, H. Yu¹, K.C. Cheung¹, and A. Ahmadi²
¹*University of British Columbia, CANADA and*
²*University of Prince Edward Island, CANADA*
- T154f** **MIMETIC LOBULE WITH PHOTOPOLYMERIZED HYDROGEL ENCAPSULATION VIA 3D MICROCHANNEL AND LAMINAR FLOW PATTERNING**
T.-Y. Yeh¹, Y.-S. Chen¹, L.-Y. Ke¹, T.-W. Lo¹, T.-H. Hong¹,
C.-T. Yeh², X. Wang³, and C.-H. Liu¹
¹*National Tsing Hua University, TAIWAN,* ²*Chang Gung Memorial Hospital, TAIWAN,*
and ³*Tsinghua University, CHINA*
- W147f** **DISPERSIBLE REMOTE CONTROL MICROPROBES TO MAP REAL-TIME EVOLUTION OF TISSUE BIOMECHANICS**
S. Mok, C. Ledoux, S. Al-Habyan, W. Lee, L. McCaffrey, and C. Moraes
McGill University, CANADA
- W148f** **FLOW FOCUSING FOR CELL ENCAPSULATION AT ASYMMETRIC HYDROGEL NICHES**
B. Noren¹, A. Reece¹, B. Xia¹, Z. Zhang¹, M. Pope², K. Anseth², and J. Oakey¹
¹*University of Wyoming, USA and* ²*University of Colorado, Boulder, USA*
- W149f** **INTEGRATING EXTRACELLULAR MATRIX-MIMICKING LAYERS IN MICROFLUIDIC DEVICES: MORE CONTROL OVER THE TUMOR MICROENVIRONMENT**
H.E. Amirabadi, S. SahebAli, J.-P. Frimat, R. Luttge, and J.M.J. den Toonder
Eindhoven University of Technology, NETHERLANDS
- W150f** **NOVEL LAMININ-BASED MICROSYSTEM FOR QUANTITATIVE ANALYSIS OF AXONAL HAPTOTAXIS**
R. Watanabe¹, H. Katsuno², K. Abe², and N. Inagaki²
¹*University of Tokyo, JAPAN and* ²*Nara Institute of Science and Technology, JAPAN*

f - Cells, Organisms, and Organs on Chip

Plants

- T155f** **DEVELOPMENT OF AUTONOMOUSLY OPERABLE CHEMOTAXIS ASSAY FOR TIP-GROWING PLANT CELL USING CELL ELONGATION ASSISTED CAPILLARY DRIVEN FLOW**
N. Yanagisawa and T. Higashiyama
Nagoya University, JAPAN
- W151f** **ON-CHIP MECHANICAL STRESS TEST ON PLANT ROOT GROWTH**
D. Nishiwaki¹, H. Hida¹, I. Kanno¹, and M. Notaguchi²
¹*Kobe University, JAPAN* and ²*Nagoya University, JAPAN*

f - Cells, Organisms, and Organs on Chip

Toxicity

- M152f** **MICROFLUIDIC HEART MODEL FOR DRUG CYTOTOXICITY ANALYSIS**
E. Tomecka, K. Zukowski, E. Jastrzebska, M. Chudy, and Z. Brzozka
Warsaw University of Technology, POLAND
- M153f** **STUDY OF THE NUTRITION DEPRIVED CONDITION ON THE DEVELOPMENT OF A MICROTUMOR**
T.-H. Wu, W.-W. Liu, Y.-H. Chen, C.J.-T. Lee, P.-C. Lee, and Y.-H. Hsu
National Taiwan University, TAIWAN
- T156f** **STEM-CELL DERIVED TWO-ORGAN MODEL FOR METABOLISM-INDUCED TOXICITY TESTING**
H. Becker¹, A. Kurtz², R. Mrowka³, S. Wölf⁴, and C. Gärtner¹
¹*Microfluidic ChipShop GmbH, GERMANY*, ²*Charité - Universitätsmedizin Berlin, GERMANY*, ³*University Clinics Jena, GERMANY*, and ⁴*Heidelberg University, GERMANY*
- T157f** **THIOL-ENE -BASED ON-CHIP TOXICITY ASSAYS FOR CHEMICAL TOXICITY SCREENING**
I. Kiiski¹, P. Järvinen¹, S. Tähkä¹, P. Tammela¹, V. Jokinen², and T. Sikanen¹
¹*University of Helsinki, FINLAND* and ²*Aalto University, FINLAND*
- W152f** **MODELING OF HANGING-DROP NETWORKS TO OPTIMIZE THE MOBILITY OF FLOWING CELLS IN A PHYSIOLOGICAL ENVIRONMENT**
N. Rousset, M. de Geus, A.J. Kaestli, K. Renggli, and A. Hierlemann
ETH Zürich, SWITZERLAND

g - Diagnostics, Therapeutics, and Translational Medicine

Bacteria/Infectious Diseases

- M154g** **MECHANISTIC DETERMINATION OF ELECTROCEUTICAL BACTERICIDAL EFFECTS ON *PSEUDOMONAS AERUGINOSA* BIOFILMS**
V. Lochab, T.H. Jones, D.H. Dusane, C.K. Sen, S. Roy, P. Stoodley,
D. Wozniak, V.V. Subramaniam, and S. Prakash
Ohio State University, USA
- T158g** **ZIKA VIRUS ANTIBODY DETECTION USING AN ULTRASENSITIVE CAPACITIVE DEVICE**
L. Wang, J. Filer, B. Geiss, and D.S. Dandy
Colorado State University, USA
- W153g** **PORTABLE SAMPLE-TO-ANSWER MULTIPLEXED MOLECULAR DIAGNOSIS FOR MALARIA IN REMOTE AREAS**
G. Choi, T.J. Prince, J. Miao, L. Cui, and W. Guan
Pennsylvania State University, USA

g - Diagnostics, Therapeutics, and Translational Medicine

Cancer

- M155g** **IDENTIFICATION OF EXOSOMAL MIRNA SIGNATURES FOR MACHINE LEARNING DIAGNOSIS OF PANCREATIC CANCER**
J. Ko, N. Bhagwat, Y. Na, S. Fisher, T. Black, J. Kim, E.L. Carpenter, B.Z. Stanger,
and D. Issadore
University of Pennsylvania, USA
- T159g** **SPATIALLY RESOLVED CANCER GENOME SEQUENCING BY PHENOTYPE-BASED HIGH-THROUGHPUT LASER ISOLATION**
S. Kim¹, A.C. Lee¹, H.-B. Lee², J. Kim¹, Y. Jung¹, S. Bae¹, W. Han², and S. Kwon¹
¹*Seoul National University, KOREA* and ²*Seoul National University College of Medicine, KOREA*
- W154g** **CELL ELECTROFUSION ON A MICROFLUIDIC FLIP CHIP FOR CANCER IMMUNOTHERAPY**
G. Pendharkar¹, Y.-T. Lu², C.-M. Chang², B.-J. Zhang¹, and C.-H. Liu¹
¹*National Tsing Hua University, TAIWAN* and ²*MacKay Medical College, TAIWAN*

g - Diagnostics, Therapeutics, and Translational Medicine

Drug Delivery/Drug Monitoring

- M156g** **PROBIOTIC MICROFIBER FOR ORAL DELIVERY TO REGULATE MICROBIOME**
F. Ozawa¹, S. Tsutsumi², T. Matsuura², Y. Nishimoto², K. Kiyoshima², and S. Takeuchi¹
¹University of Tokyo, JAPAN and ²Takeda Pharmaceutical Company Limited, JAPAN
- T160g** **THERAPEUTIC DRUG MONITORING FOR A PERSONALIZED ANTIBIOTHERAPY**
R. Bruch¹, C. Chatelle¹, A. Kling², C. Dincer¹, S. Wirth¹, S. Schumann¹, W. Weber¹, and G. Urban¹
¹University of Freiburg, GERMANY and ²ETH Zürich, SWITZERLAND
- W155g** **IMPLANTABLE DRUG DELIVERY SYSTEMS (IDDS) WITH RELEASE-ON-DEMAND BY ELECTRICALLY INDUCED BUBBLES**
Y. Fukuyama and Y. Yamanishi
Kyushu University, JAPAN
- W156g** **THERAPEUTIC SAFETY FOR TRANSPLANTATION OF IPSC-DERIVED CELLS BY CELL ENCAPSULATION**
S. Nagata and S. Takeuchi
University of Tokyo, JAPAN

g - Diagnostics, Therapeutics, and Translational Medicine

Hand-Held/Portable

- M157g** **A HANDHELD MICROFLUIDIC DEVICE FOR WHOLE BLOOD COAGULATION MEASUREMENT USING ERYTHROCYTE AGGREGATION**
Z. Isiksacan¹, O. Erel², and C. Elbuken¹
¹Bilkent University, TURKEY and ²Yildirim Beyazit University, TURKEY
- M158g** **FINGER-ACTUATED MICROFLUIDIC DEVICE TO REDUCE USER-DEPENDENT ERRORS BY INDIRECT CONTROL OF THE PRESSURE IN A FLUIDIC CHANNEL**
J. Park and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- M159g** **PORTABLE INTERNET-OF-THINGS ENABLED RAPID SEMEN ANALYSIS SYSTEM FOR INFERTILITY SCREENING**
M.K. Kanakasabapathy^{1,3}, P. Thirumalaraju^{1,3}, V. Yogesh^{1,3}, V. Natarajan^{1,3}, C.L. Bormann^{2,3}, J.C. Petrozza^{2,3}, and H. Shafiee^{1,3}
¹Brigham and Women's Hospital, USA, ²Massachusetts General Hospital, USA, and ³Harvard Medical School, USA

- T161g** **A MOBILE DEVICE-ENABLED POINT-OF-CARE DIAGNOSTICS FOR EARLY DETECTION OF IRON DEFICIENCY**
B. Srinivasan¹, D. O'Dell², J.L. Finkelstein¹, D. Erickson¹, and S. Mehta¹
¹Cornell University, USA and ²VitaScan, USA
- T162g** **IMMUNOSENSING BY CENTRIFUGALLY AUTOMATED SURFACE PLASMON RESONANCE DETECTION BASED ON A SMARTPHONE CAMERA**
C.M. Miyazaki^{1,2}, D.K. Kinahan², R. Mishra², M. Ferreira¹, and J. Ducreé²
¹Federal University of São Carlos, BRAZIL and ²Dublin City University, IRELAND
- T163g** **WEARABLE IMPEDANCE CYTOMETER ON FLEXIBLE CIRCUIT BOARD WITH WIRELESS SMARTPHONE READOUT**
A. Furniturewalla, M. Chan, J. Sui, and M. Javanmard
Rutgers University, USA
- W157g** **DROPLET-BASED MICROFLUIDIC ELISA PLATFORM FOR DETECTION OF FOOD ALLERGENS VIA SMARTPHONE DEVICE**
P. Agrawal, M. Wiebe, and R. Oleschuk
Queen's University, CANADA
- W158g** **NUTRIPHONE: A QUANTITATIVE POINT OF CARE ASSAY FOR THE ASSESSMENT OF VITAMIN D₃ DEFICIENCIES**
S. Vemulapati¹, E. Rey¹, D. O'Dell², S. Mehta¹, and D. Erickson¹
¹Cornell University, USA and ²VitaScan, USA

g - Diagnostics, Therapeutics, and Translational Medicine

Nanoparticle

- M160g** **SIMULATION OF NANOPARTICLE EXTRAVASATION USING AN EASY-TO-OBSERVE MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE**
Y. Moriya, M. Odanaka, and N. Sasaki
Toyo University, JAPAN
- W159g** **LUMINESCENT NANOPARTICLES FOR HIGH-THROUGHPUT MICROFLUIDIC DROPLET BARCODING**
M. Vaithyanathan, K.R. Bajgirani, P. Darapaneni, R. Elkhanoufi, J.A. Dorman, and A.T. Melvin
Louisiana State University, USA

g - Diagnostics, Therapeutics, and Translational Medicine

Nucleic Acid Detection/Amplification

- M161g** **A WORLD-TO-DIGITAL MICROFLUIDIC INTERFACE FOR MicroRNA PREPARATION FROM PLASMA SAMPLES**
M.J. Jebrail, A. Cho, I.P. Hong, G. Beltran, M. Martick, M. Chauleau, J. Soto, and F. Christodoulou
Miroculus, USA
- M162g** **AN INTEGRATED MICROFLUIDIC SYSTEM FOR RAPID DETECTION AND MULTIPLE SUBTYPING OF INFLUENZA A VIRUSES BY USING POLYSACCHARIDE-COATED BEADS AND RT-PCR**
G.-M. Shen¹, Y. Hsu², G.-M. Ho², S.-C. Hung², and G.-B. Lee¹
¹*National Tsing Hua University, TAIWAN* and ²*Academia Sinica, TAIWAN*
- M163g** **AUTONOMOUS AND PORTABLE DEVICE FOR RAPID SAMPLE-TO-ANSWER MOLECULAR DIAGNOSTICS AT THE POINT-OF-CARE**
D. Witters¹, E. Jue¹, N.G. Schoepp¹, S. Begolo¹, J. Rodriguez-Manzano¹, F. Shen², H. Maamar², A. Shur¹, and R.F. Ismagilov¹
¹*California Institute of Technology, USA* and ²*SlipChip Corp., USA*
- M164g** **CONTINUOUS-FLOW DROPLET MICROFLUIDIC PLATFORM FOR SINGLE-CELL RT-qPCR ANALYSIS**
M. Serra, I. Hajji, L. Geremie, R. Renault, I. Ferrante, J.-L. Viovy, S. Descroix, and D. Ferraro
Institut Curie, FRANCE
- M165g** **DIGITAL MICROFLUIDIC PLATFORM FOR FALSE-POSITIVE-FREE LOOP-MEDIATED ISOTHERMAL AMPLIFICATION**
L. Wan¹, T.L. Chen¹, J. Gao¹, C. Dong¹, Y. Jia¹, P.-I. Mak¹, and R.P. Martins^{1,2}
¹*University of Macau, CHINA* and ²*Universidade de Lisboa, PORTUGAL*
- M166g** **MICROFLUIDIC DEVICE FOR ISOLATION OF CELL-FREE DNA FROM PLASMA**
C.D.M. Campos, M.A. Witek, and S.A. Soper
University of Kansas, USA
- M167g** **MULTIPLEX QUANTITATIVE LAMP DETECTION ON A PMMA/PAPER HYBRID SPINCHIP**
M. Dou, S.T. Sanjay, and X. Li
University of Texas, El Paso, USA
- M168g** **QUANTIFYING MICROFLUIDIC PCR AT EXTREME SPEEDS**
A.R. Jafek, H. Brady, S. Harbertson, A. Millington, R. Samuel, and B. Gale
University of Utah, USA

- M169g** **SINGLE CELL WHOLE GENOME AMPLIFICATION VIA MICROPILLAR ARRAYS FOR REDUCING AMPLIFICATION BIAS**
H.C. Tian and H.G. Craighead
Cornell University, USA
- M170g** **TINY: A PORTABLE SYSTEM FOR NUCLEIC ACID QUANTIFICATION IN THE FIELD USING ALTERNATIVE HEAT SOURCES**
R. Snodgrass¹, A. Gardner², V. Koppa¹, J. Duru¹, T. Maurer³, A. Semeere⁴,
E. Cesarman², J. Martin³, and D. Erickson¹
¹Cornell University, USA, ²Weill Cornell Medical College, USA, ³University of California, San Francisco, USA, and ⁴Infectious Diseases Institute, UGANDA
- T164g** **A MICROFLUIDIC CIRCULATING DEVICE TO EXPEDITE DUPLEX SPECIFIC NUCLEASE (DSN) MEDIATED MICRORNA DETECTION**
X. Zhou¹ and Y. Zeng^{1,2}
¹University of Kansas, USA and ²University of Kansas Cancer Center, USA
- T165g** **AN AUTOMATIC MICROFLUIDIC DNA MICROARRAY PLATFORM FOR SNP DETECTION USING A DNA INTERCALATING DYE AND GRAPHENE OXIDE**
S.-H. Huang, Y.-S. Chang, K.-W. Chang, M.-H. Tsai, and N.-T. Huang
National Taiwan University, TAIWAN
- T166g** **AN ULTRAFAST DPCR SYSTEM WITH OVER 20 MILLION WELLS**
H. Zhang, H. Chang, Y. Xu, and P. Neuzil
Northwestern Polytechnical University, CHINA
- T167g** **BEAMING (BEADS, EMULSION, AMPLIFICATION, MAGNETICS) ON A CHIP FOR CLINICAL USE**
A. Tagawa, K. Cai, K. Yamawaki, Y. Kawamoto, and K. Nakanishi
Sysmex Corporation, JAPAN
- T168g** **DEVELOPMENT OF THE DESKILLED PCR DEVICE FOR POCT DRIVEN BY CENTRIFUGATION ASSISTED THERMAL CONVECTION**
M. Saito, K. Takahashi, W.V. Espulgar, and E. Tamiya
Osaka University, JAPAN
- T169g** **LAB-ON-FOIL BASED PORTABLE μ PCR FOR POC NUCLEIC ACID TESTING OF HIV-1**
A. Ohlander¹, I. Bose², D. Njenda³, U. Neogi⁴, C. Kutter², and A. Russom¹
¹KTH Royal Institute of Technology, GERMANY, ²Fraunhofer EMFT, GERMANY, ³Universität Bundeswehr, GERMANY, and ⁴Karolinska Institute, SWEDEN
- T170g** **MICROFLUIDIC-BASED IN SITU PADLOCK PROBE ROLLING-CIRCLE AMPLIFICATION FOR MRNA ANALYSIS**
C. Kase, Y. Ishigaki, and K. Sato
Japan Women's University, JAPAN

- T171g** **PRECISE RECOGNITION FOR TRANSLOCATION OF SINGLE-STRANDED DNA THROUGH A BIOLOGICAL NANOPORE USING WAVELET TRANSFORM**
A. Tamotsu, M. Hiratani, and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN
- T172g** **PROGNOSIS OF TRAUMATIC BRAIN INJURY USING MACHINE LEARNING BASED MIRNA SIGNATURES IN NANOMAGNETICALLY ISOLATED BRAIN-DERIVED EXOSOMES**
J. Ko, M. Hemphill, E. Sewell, Y. Na, D. Sandsmark, S. Fisher, E. Torre, R. Diaz-Arrastia, J. Kim, D. Meaney, and D. Issadore
University of Pennsylvania, USA
- T173g** **STORAGE OF LAMP REAGENTS TO ENABLE TRANSLATION OF POINT-OF-CARE TECHNOLOGIES**
T.J. Moehling and J.C. Linnes
Purdue University, USA
- T174g** **ULTRAFast 15-MINUTE MULTIPLEX PCR ON POLYESTER MICRODEVICES FOR HUMAN IDENTIFICATION VIA SHORT TANDEM REPEAT ANALYSIS**
B.L. Thompson¹, D. Le Roux¹, J.A. DuVall¹, C. Birch¹, D.A. Nelson¹, J. Li¹, D.L. Mills², A. Tsuei¹, M.G. Ensenberger³, C. Sprecher³, D. Storts³, B. E. Root¹, and J.P. Landers¹
¹*University of Virginia, USA*, ²*TeGrex Technologies, USA*, and ³*Promega Corporation, USA*
- W160g** **A NOVEL DUAL FRET COMPETITIVE PROBE FOR INTRACELLULAR MESSENGER RNA DETECTION**
B. Wang, Z. You, and D. Ren
Tsinghua University, CHINA
- W161g** **AN INTEGRATED DEVICE FOR SAMPLE PREPARATION, RNA ISOTHERMAL AMPLIFICATION, AND DETECTION OF CHLAMYDIA TRACHOMATIS**
B. Liu¹, E. Zeng², and R. Liu²
¹*Arcadia High School, USA* and ²*Hochuen Medical Technology Co. Ltd, USA*
- W162g** **LIBRARY PREPARATION FOR THE OXFORD MINION SEQUENCER WITH ‘ASPIRE’: AUTOMATED SAMPLE PREP BY INDEXED ROTARY EXCHANGE**
H. Jayamohan, A. Sinha, R. Krishnakumar, H.S. Edwards, T.A. Younis, J.D. Trevithick, K.D. Patel, and M.S. Bartsch
Sandia National Laboratories, USA
- W163g** **CHARACTERIZATION OF MEMBRANE SUBSTRATES TO ENABLE DNA CAPTURE AND DIRECT AMPLIFICATION FOR PAPER-BASED NUCLEIC ACID AMPLIFICATION TESTS**
I.A. Nanayakkara and I.M. White
University of Maryland, USA

- W164g** **DIGITAL HIGH RESOLUTION MELT PLATFORM FOR ASSESSING EPIGENETIC HETEROGENEITY ON A MICROFLUIDIC CHIP**
C. O'Keefe, T. Pisanic, and T.-H.J. Wang
Johns Hopkins University, USA
- W165g** **MICROFLUIDIC CARTRIDGE FOR LAM-BASED TB POC-DIAGNOSTICS USING SILICON PHOTONICS SENSOR**
H. Becker¹, M. Singh², L. Lechuga³, R. Bockstaele⁴, B. Anton¹, D. Martens⁵,
A. Gonzalez-Guerrero³, R. Vos⁶, A. Elamin², and P. Bienstman⁵
¹*Microfluidic ChipShop GmbH, GERMANY*, ²*Lionex GmbH, GERMANY*,
³*Catalan Institute of Nanoscience and Nanotechnology, SPAIN*, ⁴*Trinian BV, BELGIUM*,
⁵*Ghent University, BELGIUM*, and ⁶*IMEC, BELGIUM*
- W166g** **NANOWIRES ENABLING CANCER DIAGNOSIS FROM 1 mL URINE**
T. Naganawa¹, T. Yasui^{1,2}, T. Yanagida³, N. Kaji^{1,2}, M. Kanai³, K. Nagashima³,
T. Kawai⁴, and Y. Baba^{1,5}
¹*Nagoya University, JAPAN*, ²*Japan Science and Technology Agency (JST), JAPAN*,
³*Kyushu University, JAPAN*, ⁴*Osaka University, JAPAN*, and
⁵*National Institute of Advanced Industrial Science and Technology, JAPAN*
- W167g** **PROBED-STRAND DISPLACEMENT FOR SPECIFIC NUCLEIC ACID AMPLICON DETECTION BY LATERAL FLOW IMMUNOASSAY**
E.A. Phillips¹, T.J. Moehling¹, S. Bhadra², A.D. Ellington², and J.C. Linnes¹
¹*Purdue University, USA* and ²*University of Texas, Austin, USA*
- W168g** **RAPID DETECTION OF EXOSOMES & EXOSOMAL MICRORNA BIOMARKERS BY ELECTROKINETIC CONCENTRATION FOR LIQUID BIOPSY ON CHIP**
L. Cheung¹, X. Wei^{1,2}, D. Martins¹, and Y.-A. Song^{1,2}
¹*New York University, Abu Dhabi, UAE* and ²*New York University, USA*
- W169g** **THERMAL GRADIENT FOR FLUOROMETRIC OPTIMIZATION OF DROPLET PCR IN VIRTUAL REACTION CHAMBERS**
X. Li^{1,2}, W. Wu³, and A. Manz^{1,2}
¹*Saarland University, GERMANY*, ²*Korea Institute of Science and Technology (KIST) - Europe, GERMANY*, and ³*Chinese Academy of Sciences, CHINA*

g - Diagnostics, Therapeutics, and Translational Medicine

Protein Diagnostics/Immunoassays

- M171g** **A MICROFLUIDIC-BASED TECHNIQUE FOR CREATING AMYLOID NANOSTRUCTURES AND ITS APPLICATION TO ENZYME REACTION**
M. Maeki, S. Sato, A. Ishida, H. Tani, and M. Tokeshi
Hokkaido University, JAPAN

- M172g** **DEVELOPMENT NEW ANALYSIS METHOD BASED ON MICROFLUIDIC ELISA FOR DETECTION OF LOW-ABUNDANT PROTEIN**
E. Mori¹, T. Fukazawa², A. Yoshizaki², K. Mawatari¹, and T. Kitamori¹
¹University of Tokyo, JAPAN and ²University of Tokyo Hosiptal, JAPAN
- M173g** **MICRO-DISSECTED TISSUE ARRAY: A CHIP-BASED STRATEGY FOR MORPHOLOGICAL AND IMMUNOHISTOCHEMICAL EVALUATION OF THERAPEUTIC RESPONSE**
R. Guay-Lord^{1,2}, K. Simeone¹, M.A. Lateef¹, M. Cahuzac¹, B. Péant¹, E. Carmona¹, J. Kendall-Dupont¹, A.M. Orimoto¹, D. Provencher¹, F. Saad¹, A.-M. Mes-Masson¹, and T. Gervais^{1,2}
¹Université de Montréal, CANADA and ²École Polytechnique Montréal, CANADA
- M174g** **SURFACE BINDING SITE DENSITY DETERMINATION IN A NANOFUIDIC IMMUNOASSAY DEVICE ACHIEVING TOTAL CAPTURE**
C.J. Galvin¹, K. Shirai², M. Kakuta², and A.Q. Shen¹
¹Okinawa Institute of Science and Technology, JAPAN and ²Sysmex Corporation, JAPAN
- T175g** **ALZHEIMER'S DISEASE SPECIFIC MARKERS DETECTED WITH MICROFLUIDIC MALDI MASS SPECTROMETRY (MIMAS)**
J. Cruz Villarreal¹, S. Williams¹, A. Egatz-Gomez¹, P. Coleman¹, D. Nedelkov², M.R. Sierks¹, and A. Ros¹
¹Arizona State University, USA and ²Isoformix, USA
- T176g** **FUNCTIONAL DIAGNOSTICS FOR PRECISION MEDICINE WITH SILICON PHOTONIC MICRORING RESONATOR ARRAYS**
J.H. Wade¹, J.N. Sarkaria², and R.C. Bailey¹
¹University of Michigan, USA and ²Mayo Clinic, USA
- T177g** **RAPID, SIMPLE, SENSITIVE, AND MULTIPLE ENZYME ACTIVITY ASSAY USING A REAGENT-RELEASE CAPILLARY-ASSEMBLED MICRODEVICE WITH DOUBLE SWEEPING**
K. Sueyoshi, R. Sanuki, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN
- T178g** **WESTERN BLOT FOR MULTIPLEXED ANALYSIS OF PROTEINS USING MICROCHIP ELECTROPHORESIS AND DIRECT DEPOSITION OF IMMUNOASSAY REAGENTS ONTO A CAPTURE MEMBRANE**
N.E. Arvin and R.T. Kennedy
University of Michigan, USA
- W170g** **A CAPILLARY FLOW-DRIVEN MICROFLUIDIC DEVICE FOR MICROPARTICLE-LABELED IMMUNOASSAY**
A.K. Bavin and J. Kim
Texas Tech University, USA

- W171g** **DESIGN OF A PDMS MICROCHANNEL ARRAY-BASED FAST AND SINGLE-STEP IMMUNOASSAY PRINCIPLE USING HYDROPHILIC POLYMER-COATED GRAPHENE OXIDE POSSESSING MULTIPLE FUNCTIONS**
A. Shirai, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN
- W172g** **IN-SITU COVALENT IMMOBILIZATION OF PROTEIN ON A CHIP BY SORTASE-MEDIATED PEPTIDE LIGATION**
R. Wakai¹, S. Ueno^{1,2}, and T. Ichiki^{1,2}
¹University of Tokyo, JAPAN and ²Innovation Center of NanoMedicine (iCONM), JAPAN
- W173g** **SPATIOTEMPORAL PHOTOTRIGGERED CONTROL OF BIOCHEMICAL REACTION FOR ON-CHIP ULTRAHIGH-THROUGHPUT SCREENING OF ENZYME ACTIVITIES**
S. Ueno¹ and T. Ichiki²
¹Innovation Center of NanoMedicine (iCONM), JAPAN and ²University of Tokyo, JAPAN

h - Separations and Reactions

Acoustic Separations

- M175h** **AN ACOUSTOFLUIDIC DEVICE POWERED BY A CELL PHONE**
H. Bachman, P.-H. Huang, S. Yang, and T.J. Huang
Duke University, USA
- T179h** **ACOUSTOFLUIDIC SEPARATION OF BIOMOLECULES USING CARRIER MICROSPHERES**
G. Destgeer, R. Ahmad, M. Afzal, H. Ahmed, J. Park, J.H. Jung, K. Park, and H.J. Sung
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- W174h** **IMPROVEMENTS IN ACOUSTIC DIFFERENTIAL EXTRACTION OF SEXUAL ASSAULT SAMPLES**
C. Clark¹, K. Xu², O. Scott³, J. Hickey³, S. Woolf¹, and J.P. Landers¹
¹University of Virginia, USA, ²Pacific Northwest National Laboratory, USA, and ³MicroLab Inc., USA
- W175h** **LABEL-FREE ACOUSTOPHORETIC ENRICHMENT OF MONONUCLEAR CELLS FROM BLOOD**
A. Urbansky¹, P. Ohlsson^{1,2}, A. Lenshof¹, S. Scheduling^{1,3}, and T. Laurell^{1,4}
¹Lund University, SWEDEN, ²AcouSort AB, SWEDEN, ³Skåne University Hospital, SWEDEN, and ⁴Dongguk University, KOREA

h - Separations and Reactions

Bacteria

- M176h** **A HIGH-THROUGHPUT MICROFLUIDIC ASSAY FOR EVALUATION OF CELL ELECTRICAL PROPERTIES**
K. Kikkeri, N.B. White, and M. Agah
Virginia Polytechnic Institute and State University, USA
- T180h** **MICROFLUIDIC STATIC DROPLET ARRAY FOR SCREENING AND ENRICHMENT OF CHEMICAL PRODUCING BACTERIA**
B. Lee¹, S. Jang², G.Y Jung², and C.-S. Lee¹
¹*Chungnam National University, KOREA and*
²*Pohang University of Science and Technology (POSTECH), KOREA*
- W176h** **RAPID AND SELECTIVE ELECTROKINETIC CONCENTRATION OF BACTERIA USING AC SIGNAL SUPERPOSITION ON TWO COPLANAR ELECTRODES**
C.-H. Han, S.Y. Woo, A. Sharma, and J. Jang
Ulsan National Institute of Science & Technology (UNIST), KOREA

h - Separations and Reactions

Chromatography

- M177h** **A MICROMACHINED LIQUID CHROMATOGRAPHY CHIP WITH A PILLAR ARRAY MIXER FOR POST-COLUMN DERIVATIZATION IN THE ANALYSIS OF NEUROTRANSMITTERS**
M. Isokawa¹, K. Nakanishi², T. Kanamori¹, H. Zhuang¹, H. Yamazaki², T. Sugaya², D.H. Yoon², T. Sekiguchi², T. Funatsu¹, S. Shoji², and M. Tsunoda¹
¹*University of Tokyo, JAPAN and* ²*Waseda University, JAPAN*
- M178h** **DEVELOPMENT OF LIQUID COMPONENT SEPARATION DEVICE FOR SEPARATION OF WATER MOLECULE ISOTOPE USING LUDWIG SORET EFFECT**
S. Miyamoto, K. Eguchi, R. Kita, and H. Kimura
Tokai University, JAPAN
- T181h** **DEVELOPMENT OF A NEW ON-SITE DEVICE COMBINING ELECTROOSMOTIC PUMP AND SELECTIVE MOLECULAR RECOGNITION**
H. Inoue, T. Naito, T. Kubo, and K. Otsuka
Kyoto University, JAPAN

T182h **HIGH THROUGHPUT SOLUTION EXCHANGE OF MICROPARTICLES USING MAGNETOPHORESIS IN CURVED MICROCHANNELS**
P. Bayat¹, S. Zareian^{1,2}, and P. Rezaei¹
¹York University, CANADA and ²Sharif University of Technology, IRAN

W177h **SIMPLE GRADIENT ELUTION SYSTEM INTEGRATED WITH EXTENDED-NANO CHROMATOGRAPHY**
K. Toyoda, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

h - Separations and Reactions

Electrophoresis

M179h **BIOLOGICAL NANOPORE FILTER: SEPARATION AND DETECTION OF OLIGONUCEOTIDES**
A. Tada, A. Tamotsu, M. Hiratani, and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN

M180h **FIBER BASED ELECTROFLUIDIC PLATFORMS FOR DIRECT ANALYSIS OF METABOLITES IN COMPLEX SAMPLES**
J.M. Cabot, M.C. Breadmore, and B. Paull
University of Tasmania, AUSTRALIA

M181h **PROFILING OF HUMAN SERUM N-GLYCANS DERIVATIZED WITH ISOMER-SPECIFIC TAGS AND ANALYZED BY MICROCHIP ELECTROPHORESIS AND CAPILLARY ELECTROPHORESIS -MASS SPECTROMETRY**
X. Zhou, C.M. Snyder, M.V. Novotny, and S.C. Jacobson
Indiana University, USA

M182h **SEPARATION OF A PANEL OF PRETERM BIRTH BIOMARKERS USING MICROCHIP ELECTROPHORESIS**
A.V. Nielsen, J.B. Nielsen, and A.T. Woolley
Brigham Young University, USA

T183h **DROPLET CAPILLARY ELECTROPHORESIS BASED PCR-RFLP SYSTEM FOR CONTINUOUS DETECTION OF MULTI-GENE MUTATIONS IN TUMOR TISSUES BY VERTICAL ELECTROPHORETIC SAMPLING**
T.-T. Hu¹, Y.-M. Feng¹, L.-L. Zhou¹, P. Fang², Q. Fang², and J. Fang¹
¹China Medical University, CHINA and ²Zhejiang Universtiy, CHINA

T184h **MICROCHIP ELECTROPHORESIS OF PRETERM BIRTH BIOMARKERS IN 3D PRINTED DEVICES**
M.J. Beauchamp, H. Gong, G.P. Nordin, and A.T. Woolley
Brigham Young University, USA

- T185h** **ON-CHIP GEL ELECTROPHORESIS IN INKJET 3D PRINTED CONFIGURABLE AND MODULAR LAB-ON-A-CHIP**
K. Adamski, W. Kubicki, and R. Walczak
Wrocław University of Science and Technology, POLAND
- T186h** **TOWARDS SEPARATION OF SINGLE WALLED CARBON NANOTUBES WITH INSULATOR-BASED DIELECTROPHORESIS**
M.T. Rabbani^{1,2}, C.F. Schmidt², and A. Ros¹
¹Arizona State University, USA and ²Göttingen University, GERMANY
- W178h** **A ZINC-FINGER-PROTEIN-BASED RAPID MICROFLUIDIC HOMOGENOUS ELECTROPHORESIS AFFINITY ASSAY FOR QUANTITATIVE GENE ANALYSIS**
N.G. Arega¹, W.H. Heard², M.-S. Kim², and D. Kim¹
¹Myongji University, KOREA and ²Western Kentucky University, USA
- W179h** **ENTROPIC TRAP-BASED TUNABLE SHORT-PASS FILTER TO RECOVER LONG DNA FOR GENOMIC APPLICATIONS**
P. Agrawal¹, Z. Bognár², and K.D. Dorfman¹
¹University of Minnesota, USA and ²Budapest University of Technology and Economics, HUNGARY
- W180h** **MOLECULE DEPENDENT TIME OF FLIGHT IDENTIFICATION OF NUCLEOTIDES: AN APPROACH FOR SINGLE-MOLECULE DNA SEQUENCING**
C.A. Amarasekara¹, C. O'Neil², K.M. W-Ratnayake¹, B. Gross¹, and S.A. Soper¹
¹University of Kansas, USA and ²University of North Carolina, Chapel Hill, USA
- W181h** **SEPARATION-BASED SENSOR FOR DOPAMINE AND ITS METABOLITES USING MICRODIALYSIS COUPLED TO MICROCHIP ELECTROPHORESIS WITH ELECTROCHEMICAL DETECTION**
S.M. Lunte¹, S.M. Gunawardhana¹, and R.A. Saylor²
¹University of Kansas, USA and ²University of South Carolina, USA

h - Separations and Reactions

Other

- M183h** **MICROFLUIDIC ADAPTATION OF WET-DRY CYCLES IN PREBIOTIC CHEMISTRY ANALOG EXPERIMENTS**
M. Adiraj Iyer¹, D. Baum², and D. Eddington¹
¹University of Illinois, Chicago, USA and ²University of Wisconsin, Madison, USA
- T187h** **PORTABLE, DROPLET-BASED MICROFLUIDIC DEVICE FOR AQUEOUS TWO-PHASE-EXTRACTIONS AND COLORIMETRIC DETECTION OF Cd²⁺**
M. Hermann, P. Agrawal, and R.D. Oleschuk
Queen's University, CANADA

W182h **CHEMICAL SYNTHESIS OF REVERSE DNA AS A BARCODE TAG FOR mRNA ANALYSIS USING MILD REAGENTS ON PDMS CHIP**
R. Bhardwaj and Y. Takamura
Japan Advanced Institute of Science Technology (JAIST), JAPAN

W183h **TOWARDS 3D COMPOSITIONAL CONTROL OF ADDRESSABLE BIOFUNCTIONAL SITES WITHIN A MICROFLUIDIC ENVIRONMENT**
N. Nordin, L. Bordonali, J.G. Korvink, V. Badilita, and N. MacKinnon
Karlsruhe Institute of Technology (KIT), GERMANY

h - Separations and Reactions

Particle & Cell Separation

M184h **3D-PRINTED MICRO HYDROCYCLONES FOR HIGH-THROUGHPUT PARTICLE SEPARATION**
J.Y. Han, B. Krasniqi, and D.L. DeVoe
University of Maryland, USA

M185h **ACOUSTIC MICROFLUIDIC PARTICLE ENRICHMENT IN A LONGITUDINAL STANDING BULK ACOUSTIC WAVE (LSBAW)**
M. Cui, M.M. Binkley, and J.M. Meacham
Washington University, St. Louis, USA

M186h **DIELECTROPHORETIC SEPARATION OF MICROSCALE PARTICLES BY FREQUENCY HOPPING**
P. Modarres and M. Tabrizian
McGill University, CANADA

M187h **ENHANCED FOCUSING AND SEPARATION OF SPERM CELL IN MICROFLUIDIC INERTIAL SEPARATION DEVICE WITH VISCOELASTIC LIQUID**
H. Feng, T. Jenkins, A. Jafek, R. Samuel, and B.K. Gale
University of Utah, USA

M188h **ENRICHMENT OF HUMAN ADIPOSE-DERIVED STEM CELLS BY A SPIRAL-SHAPED INERTIAL MICROFLUIDIC SORTER**
L.M. Lee¹, Y. Wang¹, C.J. Garson¹, G.J. Klarmann², B. Prabhakarpanian¹, K. Pant¹, L.M. Alvarez^{2,3}, and E. Lai^{4,5}
¹CFD Research Corporation, USA, ²National Cancer Institute, USA, ³United States Military Academy, USA, ⁴Johns Hopkins University, USA, and ⁵United States Army Medical Research and Materiel Command, USA

M189h **MICROFLUIDIC SORTING OF CELL VIABILITY BASED ON STIFFNESS**
M. Islam¹, T. Bongiorno¹, N. Stone¹, A. Liu¹, W. Lam^{1,2}, A. Alexeev¹, E.K. Waller², and T. Sulchek¹
¹Georgia Institute of Technology, USA and ²Emory School of Medicine, USA

- M190h** **PARTICLES SEPARATION VIA SHEATH-FREE DETERMINISTIC LATERAL DISPLACEMENT WITH INERTIALLY FOCUSED SINGLE INPUT**
N. Tottori and T. Nisisako
Tokyo Institute of Technology, JAPAN
- M191h** **SELECTIVE SEPARATION OF MICROALGAE CELLS USING INERTIAL MICROFLUIDICS**
M.S. Syed¹, M. Rafeie¹, D. Vandamme^{1,2}, R. Henderson¹, and M.E. Warkiani³
¹*University of New South Wales, AUSTRALIA*, ²*KU Leuven, BELGIUM*, and ³*University of Technology Sydney, AUSTRALIA*
- M192h** **SIZE SORTING AND *IN SITU* LABELING OF WHOLE BLOOD USING ACOUSTIC MICROSTREAMING**
N. Garg, T. Westerhof, E. Nelson, and A. Lee
University of California, Irvine, USA
- T188h** **A MICROFLUIDIC DEVICE FOR LABEL-FREE ELECTRONIC IMMUNOPHENOTYPING OF CELL POPULATIONS**
R. Liu, C.-H. Chu, N. Wang, and A.F. Sarioglu
Georgia Institute of Technology, USA
- T189h** **DEVELOPMENT OF A STREAMING DIELECTROPHORESIS NUMBER TO DESCRIBE A SYSTEM FOR CONTINUOUS PARTICLE SEPARATION**
R. Natu, M. Islam, and R. Martinez-Duarte
Clemson University, USA
- T190h** **DIELECTROPHORETIC SORTING SYSTEM FOR SCREENING OF NAD(P)-DEPENDENT OXIDOREDUCTASES**
Y. Kanai, S. Shimokihara, S. Shitara, R. Oyobiki, T. Watanabe, Y. Einaga, K. Wakamatsu, Y. Matsumoto, K. Fujiwara, and N. Doi
Keio University, JAPAN
- T191h** **HIGH PERFORMANCE MULTIPLEX ACOUSTOPHORESIS FOR WBC SUBPOPULATION ISOLATION**
A. Lenshof¹, A. Urbansky¹, S. Scheduling², and T. Laurell^{1,3}
¹*Lund University, SWEDEN*, ²*University Hospital Skåne, SWEDEN*, and ³*Dongguk University, KOREA*
- T192h** **INERTIAL FOCUSING AND ENRICHMENT OF WHITE BLOOD CELLS USING MICRO-TANGENTIAL FLOW FILTRATION**
M. Garcia¹, R. Khojah², D. Di Carlo², and S. Pennathur¹
¹*University of California, Santa Barbara, USA* and ²*University of California, Los Angeles, USA*
- T193h** **MORPHOLOGY BASED CONTINUOUS CELL SEPARATION VIA ELASTOINERTIAL PINCHED FLOW FRACTIONATION**
D. Li, P. Walker, M. Newcomer, J. Zielinski, L. Kozubowski, and X. Xuan
Clemson University, USA

- T194h** **PLASTIC MULTI-CHANNEL ACOUSTIC SEPARATOR FOR HIGH-THROUGHPUT PURIFICATION OF LYMPHOCYTES**
R. Dubay, C. Lissandrello, K. Kotz, C. Juarez, and J. Fiering
Draper, USA
- T195h** **SHEATH-FREE DEAN-FLOW COUPLED INERTIAL SEPARATION OF TETRAHYMENA NUCLEI IN SPIRAL MICROCHANNELS**
X. Lu^{1,2}, G.-A. Kim¹, X. Chen^{1,3}, Y. Liu¹, and S. Takayama^{1,2}
¹University of Michigan, USA, ²Georgia Institute of Technology, USA, and
³Ocean University of China, CHINA
- W184h** **A PUMPLESS ACOUSTOFLUIDIC CHIP FOR THE CONCENTRATION AND SEPARATION OF PARTICLES**
H. Ahmed, G. Destgeer, J. Park, R. Ahmad, K. Park, and H.J. Sung
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- W185h** **DIELECTROPHORETIC CHARACTERIZATION OF CANDIDA SPECIES WITH 3D CARBON ELECTRODES TOWARDS SEPARATION AND SPECIES-SPECIFIC DIAGNOSIS**
M. Islam, J. Gilmore, K. Wallace, and R. Martinez-Duarte
Clemson University, USA
- W186h** **DIFFUSIOPHORESIS-BASED SELECTIVE PARTICLE ENTRAPMENT IN 3D MICROFUNNELS INTEGRATED IN A MIXED-SCALE PDMS FLUIDIC DEVICE**
J. Hong, B. Kim, and H. Shin
Ulsan National Institute of Science & Technology (UNIST), KOREA
- W187h** **EXTENDED ELASTO-INERTIAL MICROFLUIDICS FOR HIGH THROUGHPUT SEPARATION IN LOW ASPECT RATIO SPIRAL MICROCHANNELS**
H. Ramachandraiah, T. Kumar, I. Banerjee, and A. Russom
Royal Institute of Technology (KTH), SWEDEN
- W188h** **MAXIMIZING PARTICLE CONCENTRATION IN DETERMINISTIC LATERAL DISPLACEMENT ARRAYS**
S. Feng¹, A.M. Skelley², A.G. Anwer¹, G. Liu¹, and D.W. Inglis¹
¹Macquarie University, AUSTRALIA and ²GPB Scientific LLC, USA
- W189h** **MULTIPLEX AND SHEATHLESS ELASTO-MAGNETIC SORTING OF MAGNETIC AND NON-MAGNETIC MICROPARTICLES IN NON-NEWTONIAN FLUIDS**
V. Kumar, S. Dibaji, and P. Rezai
York University, CANADA

W190h PURIFICATION OF ALGINATE ENCAPSULATED CELLS IN A 3D PRINTED MICROFLUIDIC MAGNETIC SORTING DEVICE

J. Etxebarria-Elezgarai¹, A. Espona-Noguera¹, J. Saez¹, A. Cañibano-Hernández¹, G. Orive¹, R.M. Hernandez¹, L. Saenz del Burgo¹, F. Benito-Lopez¹, J. Ciriza¹, J.L. Pedraz¹, and L. Basabe-Desmonts^{1,2}

¹University of the Basque Country, SPAIN and ²IKERBASQUE, SPAIN

W191h SHEATHLESS DETERMINISTIC LATERAL DISPLACEMENT FOR CONTINUOUS PARTICLE SEPARATION IN VISCOELASTIC FLUID

N. Tottori and T. Nisisako

Tokyo Institute of Technology, JAPAN

h - Separations and Reactions

Temperature & Pressure Controlled

M193h DIRECT HEATING OF DROPLETS FOR CHEMICAL AND BIOLOGICAL REACTIONS ON LAB-ON-CHIP DEVICES USING HIGH FREQUENCY AC VOLTAGE

K.N. Nampoothiri¹, M.S. Seshasayee², V. Srinivasan³, M.S. Bobji¹, and P. Sen¹

¹Indian Institute of Science, INDIA, ²National Institute of Technology Tiruchirappalli, INDIA, and ³University of Minnesota, USA

T196h REAL-TIME MONITORING OF COMPLEX MULTIPHASE BEHAVIOR IN A HIGH PRESSURE AND HIGH TEMPERATURE MICROFLUIDIC CHIP

R.M. Ripken, J.G.E. Gardeniers, and S. Le Gac

University of Twente, NETHERLANDS

W192h A SIMPLE PRESSURE BALANCER FOR INCREASING MIXING PERFORMANCE IN PASSIVE DRIVEN MICROFLUIDIC SYSTEM

Y. Zhai, A. Wang, and K.W. Oh

State University of New York, Buffalo, USA

h - Separations and Reactions

Vapor-Phase Separation/Detection

W193h SURFACE WETTABILITY DIRECTED HIGH FLUX SEPARATION OF TRACE AMOUNTS OF TOLUENE AND CHLOROFORM FROM WATER

K.K. Rangharajan and S. Prakash

Ohio State University, USA

i - Other Applications for Microfluidics

Energy (Fuel Cell & Battery)

- M194i** **A MICRO REFORMING-TYPE PHOSPHORIC ACID FUEL CELL SYSTEM HYBRID WITH EVAPORATOR, WATER REMOVAL CHANNEL, AND OSRM METHANOL REFORMER**
Y.-C. Wu¹, W.-Y. Chen¹, H.-S. Wang¹, C.-P. Chang¹, and F.-G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN
- M195i** **POLYMER-BASED BENDABLE DIRECT METHANOL FUEL CELL FOR WEARABLE APPLICATIONS**
W.-Y. Huang, T.-C. Liu, F.-G. Tseng, and P.-C. Wang
National Tsing Hua University, TAIWAN
- T197i** **A PAPER-BASED MICROFLUIDIC PLATFORM FOR PHOTOSYNTHETIC BIOELECTRICITY GENERATION**
L. Liu and S. Choi
State University of New York, Binghamton, USA
- T198i** **SQUEEZE-BIOBATTERY: ON-DEMAND POWER GENERATION FROM LYOPHILIZED EXOELECTROGENS USING A FINGER-ACTIVATED, SELF-CONTAINED MEDIA POUCH**
Y. Gao and S. Choi
State University of New York, Binghamton, USA
- W194i** **A MICROFLUIDIC FLEXIBLE AND STRETCHABLE BIOBATTERY**
S. Pang¹, Y. Gao¹, M. Zhu², and S. Choi¹
¹State University of New York, Binghamton, USA and ²State University of New York, New York, USA

i - Other Applications for Microfluidics

Others

- M196i** **A MICROFLUIDIC PLATFORM FOR THE STUDY OF ICE-NUCLEATING PARTICLES IN REMOTE MARINE ENVIRONMENTS**
G.C.E. Porter¹, M.D. Tarn¹, S.N.F. Sikora¹, M.E. Salter², T.W. Wilson¹, T.F. Whale¹, J. Shim¹, and B.J. Murray¹
¹University of Leeds, UK and ²Stockholm University, SWEDEN
- M197i** **GEOMETRIC OPTIMIZATION OF IONIC CURRENT RECTIFICATION IN BIPOLAR NANOCHANNEL NETWORK MEMBRANE**
G.T. Chang, C. Wang, J. Kim, and J. Park
Sogang University, KOREA

- M198i** **PM_{2.5} COLLECTION INTO AQUEOUS SOLUTION VIA HYDROPHILIC OXIDE NANOWIRE SURFACE**
 T. Shimada¹, T. Yasui^{1,2}, A. Hibara³, H. Yasaki¹, T. Yanagida⁴, M. Hara¹,
 N. Kaji^{1,2}, M. Kanai⁴, K. Nagashima⁴, T. Kawai⁵, and Y. Baba^{1,6}
¹Nagoya University, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN,
³Tohoku University, JAPAN, ⁴Kyushu University, JAPAN, ⁵Osaka University, JAPAN,
 and ⁶National Institute of Advanced Industrial Science and Technology (AIST), JAPAN
- T199i** **AN INTEGRATED MICROFLUIDIC SYSTEM FOR CONTINUOUS SELECTION OF APTAMERS BY USING TISSUE SAMPLES**
 W.-T. Liu¹, W. -B. Lee¹, Y. -C. Tsai¹, L. -Y. Hung¹, C. -Y. Fu¹, Y. -J. Chuang²,
 K. -F. Hsu², and G. -B. Lee¹
¹National Tsing Hua University, TAIWAN and
²National Cheng Kung University, TAIWAN
- T200i** **HIGH-IMPACT MICROFLUIDICS: AN INTEGRATED INSTRUMENT TO DETECT EXTRATERRESTRIAL ORGANIC SIGNATURES (AND MAYBE LIFE) ON A KINETIC PENETRATOR PLATFORM**
 T.P. Cantrell¹, M. Cato¹, Z. Duca¹, J. Muller¹, D. Eichstedt¹, B. Schmidt¹, S. Foreman²,
 J. Kim², P. Putman³, H. Jiao⁴, E. Jensen⁴, H. Mehrabani⁴, and A. Stockton¹
¹Georgia Institute of Technology, USA, ²Texas Tech University, USA,
³Sierra Lobo, Inc., USA, and ⁴HJ Science & Technology, USA
- W195i** **A MEMBRANELESS LAMINAR-FLOW BASED BIO-SOLAR CELL**
 L. Liu, W. Yang, and S. Choi
 State University of New York, Binghamton, USA
- W196i** **AUTONOMOUS BIOACTUATOR DRIVEN BY CHICKEN CARDIOMYOCYTES**
 K. Furuike, A. Shima, S. Yoshida, Y. Morimoto, and S. Takeuchi
 University of Tokyo, JAPAN
- W197i** **MICRO CHEMICAL ANALYSIS FOR GAMMA-EMITTING ACTINIDE SPECIES IN RADIOACTIVE WASTES GENERATED FROM NUCLEAR ACCIDENTS**
 K. Matsushita¹, B. Aileen¹, A. Kirishima², and T. Tsukahara¹
¹Tokyo Institute of Technology, JAPAN and ²Tohoku University, JAPAN

i - Other Applications for Microfluidics

Paper μ Fluidics

- M199i** **AUTOMATIC MULTISTEP DIGITAL ASSAY IN A SINGLE SHEET OF 3-DIMENSIONAL PAPER-BASED ANALYTICAL DEVICE**
 S.-G. Jeong, J. Kim, S.H. Jin, B. Lee, D.-Y. Kim, G. Shim, and C.-S. Lee
 Chungnam National University, KOREA

- M200i** **FABRICATION OF PAPER-BASED MICROFLUIDIC DEVICES WITH SCHOLAR GLUE AND MAGNETIC MASKS**
T.M.G. Cardoso¹, F.R. de Souza¹, P.T. Garcia¹, D. Rabelo¹, C.S. Henry²,
and W.K.T. Coltro¹
¹Federal University of Goias, BRAZIL and ²Colorado State University, USA
- M201i** **LOW-COST PAPER DEVICE FOR FAST GENDER IDENTIFICATION ON CRIME SCENES**
E. Azuaje-Hualde¹, S. Arroyo-Jimenez¹, M. Martínez de Pancorbo¹, G. Garai-Ibabe¹,
F. Benito-Lopez¹, and L. Basabe-Desmonts^{1,2}
¹University of the Basque Country, SPAIN and ²IKERBASQUE, SPAIN
- M202i** **PAPER-BASED MICROFLUIDIC PLATFORMS FOR OSTEOPOROSIS DIAGNOSIS**
M.R. Yerrapragada and H.N. Unni
Indian Institute of Technology, INDIA
- T201i** **A HIGH-PERFORMANCE PAPER-BASED BIOBATTERY STACK USING PRUSSIAN BLUE CATHODES**
M. Mohammadifar and S. Choi
State University of New York, Binghamton, USA
- T202i** **ENZYME STABILIZATION ON A CHEMICALLY MODIFIED CELLULOSE-BASED SUBSTRATE (MICROPAD)**
E.B. Strong, K.M. Radomski, E.H. Escamilla, A.W. Martinez, and N.W. Martinez
California Polytechnic State University, USA
- T203i** **FLEXIBLE PATTERNING TECHNIQUE FOR PAPER MICROFLUIDIC DEVICES USING WATER-BASED ALKYL KETENE DIMER INK**
N.N. Hamidon^{1,2}, Y. Hong¹, G.I.J. Salentijn^{1,3}, and E. Verpoorte¹
¹University of Groningen, NETHERLANDS, ²Universiti Malaysia, MALAYSIA, and ³TI-COAST, NETHERLANDS
- T204i** **PAPER-BASED CRYOPRESERVATION**
R. Alnemari¹, P.S. Sukumar¹, R. Rezgui¹, and M.Q. Qasimeh^{1,2}
¹New York University, Abu Dhabi, UAE and ²New York University, USA
- T205i** **TWO-PHASE COUNTER FLOW ON PAPER**
G.I.J. Salentijn^{1,2}, M. Grajewski¹, and E. Verpoorte¹
¹University of Groningen, NETHERLANDS and ²TI-COAST, NETHERLANDS
- W198i** **A REUSABLE PAPER/POLYMER HYBRID PLUG-AND-PLAY MICROFLUIDIC PLATFORM FOR HIGH-SENSITIVITY IMMUNOASSAY**
S.T. Sanjay¹, M. Li^{1,2}, and X. Li¹
¹University of Texas, El Paso, USA and ²Beijing Normal University, CHINA

W199i **FABRICATION OF PAPER-BASED MICROFLUIDIC DEVICES VIA LOCAL DEPOSITION OF PHOTO-POLYMER FOLLOWED BY UV CURING**
P.J.W. HE, I.N. Katis, R.W. Eason, and C.L. Sones
University of Southampton, UK

W200i **HIGHLY SENSITIVE PAPER-BASED ANALYTICAL DEVICES**
J.-Y. Huang, C.-W. Chen, and C.-F. Chen
National Taiwan University, TAIWAN

W201i **PAPER-BASED MICROFLUIDIC DEVICES ON THE CRIME SCENE: A SIMPLE TOOL FOR RAPID ESTIMATION OF POST-MORTEM INTERVAL USING VITREOUS HUMOUR**
P.T. Garcia¹, E.F.M. Gabriel¹, G.S. Pessôa², J.C. Santos Júnior², P.C. Mollo Filho³, R.B.F. Guidugli³, N.F. Hoehr², M.A.Z. Arruda^{2,4}, and W.K.T. Coltro^{1,4}
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M203j **DROPLET ENCAPSULATION TO STUDY THERAPEUTIC CELL MIGRATION**
A. Benavente-Babace¹, K. Haase², and M. Godin¹
¹University of Ottawa, CANADA and ²Massachusetts Institute of Technology, USA

M204j **SELF-PRIMING, VACUUM-SEALED "READY-TO-USE" MICROFLUIDICS**
L.J. Millet^{1,2}, J. Aufrecht², J. Labbé¹, M.J. Doktycz^{1,2}, and S.T. Retterer^{1,2}
¹Oak Ridge National Laboratory, USA and ²University of Tennessee, USA

T206j **MOSAIC IMMUNOASSAYS INTERGRATED WITH MICROFLUIDIC CHANNELS FOR HIGH-THROUGHPUT PARALLEL DETECTION**
F. Zheng¹, E. He^{1,2}, L. Cai¹, D. Huang¹, B. Yu¹, and Z. Li¹
¹Peking University, CHINA and ²Tsinghua University, CHINA

W202j **A MICROFLUIDIC PLATFORM TO PROBE THE ROLE OF PERICELLULAR MATRIX IN METASTATIC EXTRAVASATION AND INVASION OF BREAST CANCER EPITHELIAL CELLS**
M.-E. Brett, H.E. Bomberger, G.R. Doak, M.A. Price, J.B. McCarthy, and D.K. Wood
University of Minnesota, USA

W203j **SAMPLE PROCESSOR FOR LIFE ON ICY WORLDS (SPLIce):
DESIGN AND TEST RESULTS**
T.N. Chinn, A.K. Lee, T.D. Boone, M.X. Tan, M.M. Chin, G.C. McCutcheon,
M.F. Horne, M.R. Padgen, J.T. Blaich, J.B. Forgione, P.T. Zell, K.F. Bywaters,
E.T. Kelly, A.F. Davila, R.C. Quinn, and A.J. Ricco
NASA Ames Research Center, USA

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Sample Prep

- M205j** **REAGENT-FREE HIGH-THROUGHPUT EXTRACTION OF NUCLEIC ACIDS
AND PROTEINS VIA RAPID MECHANICAL CELL LYSIS USING SILICON
POINT-CONSTRICTIONS**
X. Huang, Y. Pan, X. Xing, and L. Yobas
Hong Kong University of Science and Technology, HONG KONG
- T207j** **DEVELOPMENT OF HIGH YIELD PLASMA SEPARATION DEVICE FROM
WHOLE BLOOD PREVENTING BLOOD CELL CLOGGING IN A
MICRO/EXTENDED-NANO CHIP**
J. Mitsuse, K. Morikawa, E. Mori, R. Ohta, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- W204j** **NEW GENERATION OF MICROFLUIDIC MAGNETIC FLUIDIZED BED FOR
HIGH THROUGHPUT SAMPLE PRETREATMENT**
L. Alexandre^{1,2,3}, I. Pereiro^{1,2,3}, A. Bendali^{1,2,3}, J.L. Viovy^{1,2,3}, L. Malaquin⁴,
and S. Descroix^{1,2,3}
¹*Institut Curie, FRANCE*, ²*Pierre-and-Marie-Curie University, FRANCE*,
³*Institut Pierre Gilles de Gennes, FRANCE*, and ⁴*LAAS-CNRS, FRANCE*

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- M206k** **3D BLOOD VESSEL SHAPING OF CHICK EMBRYO FOR
MECHANOBIOLOGY RESEARCH**
M. Itayama and T. Kawahara
Kyushu Institute of Technology, JAPAN
- M207k** **A CLOSED MICROCIRCULATION SYSTEM WITH NON-FOULING AND
SLIPPERY MICROFLUIDIC NETWORKS FOR WHOLE BLOOD
HEMODYNAMICS ANALYSIS**
H. Zou, T. Xu, X. Yao, H.Y. Cheung, and M. Yang
City University of Hong Kong, HONG KONG

- M208k** **A SILICON BIOREACTOR WITH THREE-DIMENSIONAL FLOW-FOCUSING STRUCTURE TO GENERATE PLATELETS**
K. Fujimoto^{1,2}, Y. Okawa², Y. Hiroi³, J. Katayama^{1,3}, T. Funakoshi⁴, Y. Yanagida¹, and T. Ohba¹
¹*Tokyo Institute of Technology, JAPAN*, ²*Dai Nippon Printing Co., Ltd., JAPAN*, ³*Nissan Chemical Industries, Ltd., JAPAN*, and ⁴*Fujikin Inc., JAPAN*
- M209k** **CELL MECHANICS STUDY AND ENHANCED INVASIVE CELL SORTING WITH A MICROFLUIDIC SYSTEM**
Y. Xia, W. Li, Y. Chen, and S.-Y. Zheng
Pennsylvania State University, USA
- M210k** **COMBINED HYDRODYNAMIC MIXER AND GAS DYNAMIC VIRTUAL NOZZLE DEVICES FOR SERIAL FEMTOSECOND CRYSTALLOGRAPHY**
G. Brehm^{1,2}, A. Echelmeier¹, J. Coe¹, C.E. Conrad¹, G. Nelson¹, J. Cruz Villarreal¹, U. Weierstall¹, J. Spence¹, S. Köster², P. Fromme¹, and A. Ros¹
¹*Arizona State University, USA* and ²*University of Goettingen, GERMANY*
- M211k** **CONCENTRATION POLARIZATION TO MEASURE NANO-PORE ACCESSIBILITY**
M. Solsona¹, A.-E. Nieuwelink², V.A. Papadimitriou¹, J.C.T. Eijkel¹, F. Meirer², L. Abelmann^{1,3}, W. Olthuis¹, B.M. Weckhuysen², and A. van den Berg¹
¹*University of Twente, NETHERLANDS*, ²*University of Utrecht, NETHERLANDS*, and ³*KIST Europe, GERMANY*
- M212k** **CYTO-MINE®: AN INTEGRATED PICODROPLET SYSTEM FOR SINGLE CELL ANALYSIS AND MONOCLONALITY ASSURANCE**
D. Josephides, M. Vallet, S. Davoli, E. Shvets, X. Liu, M. Rehak, F.F. Craig, and D. Holmes
Sphere Fluidics Ltd., UK
- M213k** **DETECTION OF PHOSPHATES FOR ENVIRONMENTAL ANALYSIS OF RIVER WATER BY A LAY-PERSON USING A PAPER BASED DEVICE**
S. Richardson, A. Iles, J.M. Rotchell, M. Lorch, and N. Pamme
University of Hull, UK
- M214k** **DIGITAL LAMP ON A COMMERCIAL MEMBRANE**
X. Lin¹, X. Huang¹, X. Xie^{1,2}, Y. Zhu¹, X. Wu¹, S. Wang¹, and M.R. Hoffmann¹
¹*California Institute of Technology, USA* and ²*Georgia Institute of Technology, USA*
- M215k** **DYNAMIC INSULIN RESPONSES OF SINGLE ISLETS OF LANGERHANS TO AN ANTI-DIABETIC LIPID**
B. Bandak, L. Yi, N. Mukhitov, K.C. Evans, and M.G. Roper
Florida State University, USA

- M216k** **FABRICATION OF EXTRACELLULAR MATRIX COATED MEMBRANES IN LUNG-ON-CHIPS USING TWO-PHOTON POLYMERIZATION**
S. Méance, Y. Lin, M. Machireddy, P. Fu, V. Gaponenko, S.J. Ackerman, V. Natarajan, and J. Xu
University of Illinois, Chicago, USA
- M217k** **FUNCTIONALIZATION-FREE MICROFLUIDIC ELECTRONIC TONGUE BASED ON A SINGLE RESPONSE**
F. Shimizu¹, F. Todão², A. Gobbi², O. Oliveira Jr.¹, C.D. Garcia³, and R.S. Lima²
¹*Centro Nac. de Pesquisa em Energia e Materiais, BRAZIL,*
²*Universidade de São Paulo, BRAZIL, and* ³*Clemson University, USA*
- M218k** **HYDROGEL MEMBRANE-BASED BIOSENSOR FOR RAPID DETECTION OF NITRITE IONS**
S.-E. Kim¹, J. Nam², I.-B. Jung¹, Y.-J. Won¹, W.K. Seong¹, D.-S. Shin², and K.-N. Lee¹
¹*Korea Electronics Technology Institute (KETI), KOREA and*
²*Sookmyung Women's University, KOREA*
- M219k** **INTEGRATED OPTICAL WAVEGUIDES FOR *IN SITU* MICROFLOW MEASUREMENT**
J.R. Hands and G.A. Cooksey
National Institute of Standards and Technology (NIST), USA
- M220k** **MECHANISTIC DIFFERENCES OF ANTIVIRALS REVEALED BY MICROFLUIDICS-BASED SINGLE-CELL VIROLOGY**
W. Liu¹, M.U. Caglar², Z. Mao¹, C.O. Wilke², T.J. Huang^{1,3}, and C.E. Cameron¹
¹*Pennsylvania State University, USA,* ²*University of Texas, Austin, USA, and*
³*Duke University, USA*
- M221k** **MICROFABRICATION OF A 3D, ELASTIC CELL MICROENVIRONMENT WITH NANOSCALE PRECISION USING LAYER-BY-LAYER DEPOSITION**
M. Ibo^{1,2}, L. Motabar^{1,3}, K. Bhadriraju^{1,4}, and D.R. Reyes¹
¹*National Institute of Standards and Technology (NIST), USA,* ²*Theiss Research, USA,*
³*University of Maryland, USA, and* ⁴*Prometheus Computing, USA*
- M222k** **MICROFLUIDIC PAPER BASED ANALYTICAL DEVICE FOR DETECTION OF ANTIBIOTIC RESISTANT *STAPHYLOCOCCUS AUREUS* IN MILK IN RESOURCE LIMITED AREAS**
M. Asif^{1,2}, F.R. Awan², Q.M. Khan², and N. Pamme¹
¹*University of Hull, UK and*
²*National Institute for Biotechnology and Genetic Engineering, PAKISTAN*
- M223k** **NETOSIS-ON-A-CHIP: AN INTEGRATED MICRODEVICE TO QUANTIFY NEUTROPHIL EXTRACELLULAR TRAPS (NETS) IN DIABETES**
H.M. Tay¹, R. Dalan², B.O. Boehm^{1,2}, and H.W. Hou¹
¹*Nanyang Technological University, SINGAPORE and*
²*Tan Tock Seng Hospital, SINGAPORE*

- M224k** **NUCLEI'S ROLE IN CELL TRANSLOCATION THROUGH MICRO-RESTRICTIONS**
Y. Xia, Y. Wan, S. Hao, and S.-Y. Zheng
Pennsylvania State University, USA
- M225k** **ORGAN-ON-A-CHIP SYSTEM FOR STUDYING SMOOTH MUSCLE AND EPITHELIAL CELL INTERACTIONS OF THE LUNG AIRWAY**
M. Humayun¹, C.-W. Chow^{1,2}, and E.W.K. Young¹
¹*University of Toronto, CANADA and*
²*Toronto General Hospital Research Institute, CANADA*
- M226k** **PRINTING ORIENTATION INFLUENCES FLUIDIC BEHAVIOUR IN CHANNELS MADE BY FUSED DEPOSITION MOLDING**
F. Li¹, N.P. Macdonald¹, R.M. Guijt², and M.C. Breadmore¹
¹*University of Tasmania, AUSTRALIA and* ²*Deakin University, AUSTRALIA*
- M227k** **RAPID EXTRACTION AND CONCENTRATION OF MAGNETIC PARTICLES FROM WHOLE BLOOD WITH MICROFLUIDIC MAGNETIC RATCHETING**
O. Adeyiga, C. Murray, and D. Di Carlo
University of California, Los Angeles, USA
- M228k** **SEPARATION OF LOW-ABUNDANCE CELLS AS AN APP ON STANDARD LABORATORY CENTRIFUGE**
S. Burger¹, J. Schemberg², T. Förster², M. Specht¹, M. Rombach¹, N. Paust¹, R. Zengerle^{1,3}, and M. Karle¹
¹*Hahn-Schickard, GERMANY,* ²*Institute for Bioprocessing and Analytical Measurement Techniques, GERMANY, and* ³*University Freiburg, GERMANY*
- M229k** **SPLIT-ISOTACHOPHORESIS FOCUSING IN MULTIPLE-TURN MICROFLUIDIC CHANNELS**
R.-L. Chien¹ and I. Yamaguchi²
¹*Wako Life Sciences, USA and* ²*Wako Pure Chemical Industries, JAPAN*
- M230k** **THIOL-ENE SURFACE MODIFICATIONS FOR MICROCHIP ELECTROPHORESIS BASED INTERACTION ASSAYS**
S. Tähkä, L. Batelic, C. Capasso, V. Cerullo, S.K. Wiedmer, and T. Sikanen
University of Helsinki, FINLAND
- T208k** **A 3D CULTURE COMBINATORIAL DRUG SCREENING DEVICE**
H.-C. Chang^{1,2}, C.-H. Lin¹, D.S. Juang¹, and C.-H. Hsu^{1,2}
¹*National Health Research Institutes, TAIWAN and*
²*National Chung Hsing University, TAIWAN*
- T209k** **A MICROFLUIDIC DEVICE INTEGRATING MICROWELL WITH A PERMANENT MAGNET FOR IMMUNOMAGNETIC SINGLE CELL TRAPPING**
Y.-J. Hwong, R.L. Lai, and N.-T. Huang
National Taiwan University, TAIWAN

- T210k ADDRESSING THE DISTRIBUTION OF PROTEINS SPOTTED ON μ PADS**
L. McCann, S. Holtsclaw, and C.D. Garcia
Clemson University, USA
- T211k CELLULAR ANTI-ADHESIVE EFFECTS OF NANOPILLARS BY A COSTEFFECTIVE METHOD USING NANOIMPRINT TECHNOLOGY**
K. Fujimoto, Y. Okawa, and T. Kakegawa
Dai Nippon Printing Co., Ltd., JAPAN
- T212k COMPLETE LIQUID FILLING IN CLOSED-END MICROCHANNELS FOR INTERDIGITAL TRANSDUCERS (IDTS) - THEORETICAL MODEL AND EXPERIMENTAL OBSERVATIONS**
W. Guo¹, H.D. Xi¹, and S.H. Tan²
¹Northwestern Polytechnical University, CHINA and ²Griffith University, AUSTRALIA
- T213k CONSTRUCTION OF VASCULARIZED BETA CELL CLUSTERS EMBEDDED IN MICROPATTERNED COLLAGEN SHEET**
H. Seo, J. Son, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
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K. Shimizu¹, N. Saigo¹, Y. Sekiya¹, S. Sakashita², Y. Hamada², K. Usui²,
and R. Kawano¹
¹Tokyo University of Agriculture and Technology, JAPAN and ²Konan University, JAPAN
- T215k DEVELOPMENT OF IN-PLANE SENSOR MONITORING FORMATION OF LUNG CELLS**
S. Noh and H. Kim
University of Utah, USA
- T216k DIRECT MICRO FORCE MEASUREMENT OF WATER STRIDER'S OARING FORCE FOR REVEALING MECHANISM OF WATER-REPELLENCY**
K. Uesugi¹, H. Mayama², and K. Morishima¹
¹Osaka University, JAPAN and ²Asahikawa Medical University, JAPAN
- T217k ELECTROKINETIC SCANNING PROBE FOR BIOMOLECULAR ANALYSIS**
N. Ostromohov^{1,2}, M. Bercovici¹, and G.V. Kaigala²
¹Israel Institute of Technology (Technion), ISRAEL and ²IBM Research Laboratory - Zurich, SWITZERLAND
- T218k FLEXIBLE AND PORTABLE BIOSENSORS FOR REAL-TIME, ON-THE-SHELF PATHOGEN DETECTION IN FOOD PACKAGING USING MICRO-PATTERNED DNazyme PROBES**
H. Yousefi, M.M. Ali, S. Jahanshahi-Anbuhi, C.D.M. Filipe, and T.F. Didar
McMaster University, CANADA

- T219k** **HIGH DENSITY, REVERSIBLE 3D PRINTED MICROFLUIDIC INTERCONNECTS**
H. Gong, A.T. Woolley, and G.P. Nordin
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- T220k** **IN-SITU PROTEIN DETECTION IN HUMAN PLASMA BY DUAL-GATE NANORIBBON-BASED ION-SENSITIVE FIELD-EFFECT TRANSISTOR BIOSENSOR**
S. Ma^{1,2}, Y.-K. Lee², and A. Zhang¹
¹*Xi'an Jiaotong University, CHINA and*
²*Hong Kong University of Science and Technology, HONG KONG*
- T221k** **INVESTIGATION OF ELECTRICAL STIMULATION BY GLUTAMATE SENSING FROM BRAIN SLICES WITH MICROSENSORS**
A. Weltin¹, K. Joseph², J. Kieninger¹, U.G. Hofmann², and G.A. Urban¹
¹*University of Freiburg, GERMANY and*
²*University Medical Center Freiburg, GERMANY*
- T222k** **METACHRONAL MOTION OF MAGNETICALLY ACTUATED CILIA**
S. Hanasoge, A. Alexeev, and P.J. Hesketh
Georgia Institute of Technology, USA
- T223k** **MICROFLUIDIC DEVICE FOR SELECTIVE MANIPULATION OF GIANT LIPOSOMES**
T. Okano and H. Suzuki
Chuo University, JAPAN
- T224k** **MICROFLUIDIC SYNTHESIS OF SILICONE ELASTOMER MICROGELS USING ON-CHIP CHEMICAL CROSS-LINKING**
J. Bennett, A. Kristof, J. Genzer, J. Srogl, and M. Abolhasani
North Carolina State University, USA
- T225k** **NOVEL DUAL-MOTOR SPINNING SYSTEM FOR ACTIVE APPLICATIONS ON MICROFLUIDIC COMPACT DISCS**
W. Al-Faqheri, G. Al Shishani, A. Al-Bagdady, and A. Al-Halhouli
German Jordanian University, JORDAN
- T226k** **ON-CHIP FLUIDIC ACTUATION FOR TEM LIQUID CELLS**
M. Denoual, V. Menon, T. Sato, and H. Fujita
University of Tokyo, JAPAN
- T227k** **PATTERNING ELECTRO-OSMOTIC FLOW USING NON-UNIFORM SURFACE CHARGE IN A HELE-SHAW CELL**
F. Paratore^{1,2}, G.V. Kaigala¹, and M. Bercovici²
¹*IBM Research Laboratory - Zurich, SWITZERLAND and*
²*Israel Institute of Technology (Technion), ISRAEL*

- T228k** **RAPID AND SENSITIVE DETECTION OF BACTERIA PATHOGEN BASED ON MICROFLUIDIC ENRICHMENT WITH LABEL-FREE NANOBIOSENSOR**
T.Y. Lee¹ and Y. Shin²
¹Chungnam National University, KOREA and
²University of Ulsan College of Medicine, KOREA
- T229k** **RECONFIGURABLE MAGNETIC VALVE ARRAYS: A TOOL FOR THE MULTIPLEXED TESTING OF COMBINATION THERAPIES ON SPHEROIDS**
A.R. Brunet^{1,2}, P. Wong², and T. Gervais^{1,2}
¹École Polytechnique de Montréal, CANADA and ²Université de Montréal, CANADA
- T230k** **SLIDING ASSEMBLY OF COSCINODISCUS SPECIES DIATOM FRUSTULE ON SILICON SUBSTRATE**
A. Li¹, S. Anderson², and X. Zhang¹
¹Boston University, USA and ²Boston University Medical Center, USA
- T231k** **STRENGTH ENHANCEMENT OF SU-8 HOLLOW MICRONEEDLES USING C-MEMS PROCESS FOR DRUG DELIVERY**
R. Mishra, B. Pramanick, T.K. Maiti, and T.K. Bhattacharyya
Indian Institute of Technology, Kharagpur, INDIA
- T232k** **TWENTY-DAY CULTURING OF TUBULAR SCAFFOLDS USING MICRO-CONNECTOR WITH HEART-MIMICKING MEDIUM PUMPING FOR BLOOD VESSEL MODELING**
T.D. Van, Y. Lee, T. Nguyen, M. Choi, H.L. Phan, Y.K. Lee, H. Park, D. Shin, and K. Koo
University of Ulsan, KOREA
- T233k** **WRAPPING LIQUID LASERS AROUND MICROFLUIDIC DROPLETS**
L. Zheng, M. Zhi, Y. Chan, and S.A. Khan
National University of Singapore, SINGAPORE
- W205k** **A 3D PNEUMATIC MICROFLUIDIC DISC FOR CIRCULATING TUMOR CELL ISOLATION AND THEREAFTER CELL CULTURE**
S.-C. Tsai, T. Wang, W.-S. Wu, W.-Y. Chang, Y.-J. Chen, and H. Doong
LifeCode Biotech Company, TAIWAN
- W206k** **A MICROFLUIDIC DEVICE WITH CELL CULTURE AND DIGITAL DETECTION SYSTEM FOR ISOLATED CIRCULATING TUMOR CELLS**
S.-C. Tsai, Y.-J. Chen, W.-Y. Chang, T. Wang, W.-S. Wu, and H. Doong
LifeCode Biotech Company, TAIWAN
- W207k** **AN AUTOMATED MODULAR MICROSYSTEM FOR ENZYMATIC DIGESTION WITH GUT-ON-A-CHIP APPLICATIONS**
P. de Haan^{1,2}, M.A. Ianovska^{1,2}, K. Mathwig¹, H. Bouwmeester³, and E. Verpoorte¹
¹University of Groningen, NETHERLANDS, ²TI-COAST, NETHERLANDS, and ³Wageningen University, NETHERLANDS

- W208k** **CHARACTERIZATION OF OPTIMAL INTEGRATION STRATEGIES FOR THE BIOTIN-STREPTAVIDIN REACTION WITHIN LATERAL FLOW ASSAYS USING COMPUTATIONAL MODELING AND EXPERIMENTATION**
D. Gasperino, T. Baughman, and B. Weigl
Intellectual Ventures Laboratory, USA
- W209k** **COMPREHENSIVE SINGLE CELL DIELECTRIC SPECTROSCOPY USING ISOMOTIVE DIELECTROPHORESIS (ISODEP)**
M.Z. Rashed¹, K.C. Grome¹, G. Gasser², S.P. Hendricks³, and S.J. Williams¹
¹*University of Louisville, USA*, ²*Georgia Institute of Technology, USA*, and ³*Murray State University, USA*
- W210k** **CONTINUOUS SORTING AND DIFFERENTIATION POTENTIAL OF ADULT STEM CELLS BASED ON FILTERLESS MICROFLUIDIC FILTRATION**
C.J. Shim^{1,2}, H. Jeon^{1,2}, M.-S. Chang¹, and M.-S. Chun²
¹*Seoul National University, KOREA* and ²*Korea Institute of Science and Technology (KIST), KOREA*
- W211k** **DETECTING SINGLE-CELL APOPTOSIS AND VIABILITY ENABLED BY SIMULTANEOUS REAL-TIME MONITORING OF RECEPTOR ACTIVATION AND LECTIN BINDING ON THE LAB-IN-A-TRENCH PLATFORM**
D. King, T. O'Connell, A. Julius, A. Coudray, D. Canning, K. Healy, J. Cawley, D. Monaghan, D. Walls, B. O'Connor, and J. Ducreé
Dublin City University, IRELAND
- W212k** **DIFFERENTIATION OF PATTERNED SKELETAL MUSCLE MYOBLASTS WITHIN ASSEMBLED HYDROGELS**
Y.-H. Yang, J.-T. Liao, S.-C. Hsieh, and S.-K. Fan
National Taiwan University, TAIWAN
- W213k** **DROPLET TRACKING AT >600 FRAMES PER SECOND USING GPU ACCELERATED IMAGE PROCESSING**
A. Vedhanayagam and A.S. Basu
Wayne State University, USA
- W214k** **FABRICATION OF 3D REVERSE TRANSCRIPTION PCR MICRODEVICE INTEGRATED WITH ON-SITE FLUORESCENCE DETECTION**
Q.N. Pham, K.T.L. Trinh, T.N.D. Trinh, P.Q.H. Nguyen, and N.Y. Lee
Gachon University, KOREA
- W215k** **FOCAL MOLOGRAPHY APPLIED TO PEPTIDE ARRAYS**
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- W216k HIGH-THROUGHPUT OIL-COVERED DROPLET ARRAY FOR PARTICLE AND CELL CAPTURE**
H. Wu and J. Wu
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- W217k INFLUENZA A (H1N1) VIRUS DETECTION USING QDOT-APTAMER BEACON IN EMISSION LIGHT GUIDANCE BASED 3D PHOTONIC CRYSTAL**
N. Lee, C. Wang, and J. Park
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- W218k LIPOSOME-BASED RNA DETECTION SYSTEM**
M. Tsugane^{1,2} and H. Suzuki¹
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- W219k MICROENGINEERED SOFT HYDROGEL PROBE TO CHARACTERIZE SPATIAL STIFFNESS PATTERNS IN BIOLOGICAL TISSUE SECTIONS**
S. Kouthouridis, W. Lee, E. Neuber, and C. Moraes
McGill University, CANADA
- W220k MICROFLUIDIC ISOLATION OF SINGLE CELLS USING ARC-EDGE-CROSS-SECTION MONOLITHIC VALVES FOR GENE MUTATION HETEROGENEITY ANALYSIS**
T. Xu, H. Fu, and M. Yang
City University of Hong Kong, HONG KONG
- W221k MULTI-PARAMETER BIOPHYSICAL CHARACTERISATION OF CANCER CELLS TOWARDS POTENTIAL RESISTANCE TO SPINDLE-POISON BASED CHEMOTHERAPIES ON A CENTRIFUGAL PLATFORM**
M. Al-Ofi, D. King, M. Glynn, T. Glennon, and J. Ducreé
Dublin City University, IRELAND
- W222k NOVEL MICROFABRICATION TECHNIQUE OF 3D SILICONE STRUCTURES FROM PLANAR SUBSTRATE BY TENSILE BUCKLING**
P. Arambel, M. Riek, and R.E. Taylor
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- W223k OPTICAL REAL-TIME MONITORING OF ENDOTHELIAL EXPRESSION MARKERS AT SINGLE-CELL LEVEL ENABLED BY A CENTRIFUGAL MICROFLUIDIC PLATFORM**
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- W224k PLASMONIC INTERDIGITATED ELECTRODES (PIDEs) FOR *IN VITRO* ANALYSIS OF CELLS**
A. Kundu, S. Varma, J. Thomas, and S. Rajaraman
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- W225k** **RAPID DETECTION OF BACTERIA IN BLOOD USING ENGINEERED BACTERIOPHAGE AND ACOUSTIC SEPARATION**
P. Dow, K. Kotz, S. Gruszka, J. Holder, and J. Fiering
Draper, USA
- W226k** **3-D PRINTING, INK CASTING AND LAMINATION (3-D PICL): A RAPID, ROBUST, AND COST EFFECTIVE PROCESS TECHNOLOGY TOWARD THE FABRICATION OF MICROFLUIDIC AND BIOLOGICAL DEVICES**
T. Ausaf, A. Kundu, and S. Rajaraman
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- W227k** **MAGNETOPHORETIC SORTING OF FLUID CATALYTIC CRACKING PARTICLES**
M. Solsona¹, A.-E. Nieuwelink², M. Odijk¹, F. Meirer², L. Abelmann^{1,2,3}, W. Olthuis¹, B.M. Weckhuysen², and A. van den Berg¹
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- W228k** **SYNCHRONIZING SELF-REGULATE MICROFLUIDIC OSCILLATORS VIA CAPACITIVE COUPLING**
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- W229k** **TWO-DIMENSIONAL PROFILING OF CANCER CELL SUBPOPULATIONS**
M. Poudineh, M. Labib, E.H. Sargent, and S.O. Kelley
University of Toronto, CANADA
- W230k** **XENOPTICON: MICROFLUIDIC PLATFORM FOR TIME-RESOLVED ANALYSIS OF XENOPUS EMBRYO DEVELOPMENT**
R. Novak¹, Y. Choe¹, A. Dinis¹, M. Ingram¹, V. Keshari¹, B.A. Nestor¹, M. Super¹, M. Levin^{1,2}, and D.E. Ingber^{1,3}
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