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 Breadmore[1], Rosanne Guijt[2], Nial MacDonald[1], and Greg Nordin[3]
[1]University of Tasmania, AUSTRALIA, [2]Deakin University, AUSTRALIA, and [3]Brigham 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 Javanmard[1], Kaushik Sengupta[2], Sam Emaminejad[3], Jeff Zahn[1], Stephen Chou[2], Ken Shepard[4], and Shan Wang[5]
[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 Linnes[1], Elizabeth Johansen[2], and Ashok A. Kumar[3]
[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 Whitesides[1] and Thomas Laurell[2]
[1]Harvard University, USA and [2]Lund 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. Escalante[3], E. Valera[2], C.L. Erskine[3], L. Auvil[2], H.C. Sasieta[3], C. Bushell[2], M. Welge[2], and R.C. Bailey[1,2]
[1]University of Michigan, USA, [2]University of Illinois, Urbana-Champaign, USA, and [3]Mayo Clinic, USA

11:05 **AN INTEGRATED ELECTRICAL ENZYME-LINKED IMMUNOSORBENT ASSAY (E^2LISA) FOR POINT-OF-CARE DIAGNOSIS OF TUBERCULOSIS USING GLYCAN BIOMARKERS**
A. Sarkar[1,2], L.L. Lu[1], J. Han[2], and G. Alter[1]
[1]Massachusetts General Hospital, USA and [2]Massachusetts Institute of Technology, USA

11:25 **THE FEVERDISK: MULTIPLEX DETECTION OF FEVER-CAUSING PATHOGENS FOR RAPID DIAGNOSIS OF TROPICAL DISEASES**

S. Hin[1], B. Lopez-Jimena[2], M. Bakheit[3], V. Klein[1], S. Stack[4], C. Fall[5], A. Sall[5], K. Enan[6], S. Frischmann[3], L. Gillies[4], M. Weidmann[2], S. Goethel[7], V. Rusu[7], O. Strohmeier[1,8], N. Paust[1,8], R. Zengerle[1,8], and K. Mitsakakis[1,8]
[1]University of Freiburg, GERMANY, [2]University of Stirling, UK, [3]Mast Diagnostica GmbH, GERMANY, [4]Mast Group Limited, UK, [5]Institut Pasteur de Dakar, SENEGAL, [6]Central Laboratory, SUDAN, [7]MagnaMedics Diagnostics BV, NETHERLANDS, and [8]Hahn-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. Liu[1], H.-F. Liao[1], S.-P. Lin[1,2], and Y.-W. Lu[1]
[1]National Taiwan University, TAIWAN and [2]Academia 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 HG^{2+} 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. Shen[1], C.W. Coley[1], and K.F. Jensen[1]
[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. Zhao[1], P.-H. Huang[1], M. Wu[2], N. Nama[2], and T.J. Huang[1]
[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. Leonard[1], Y. Haimov[1], L. Holtzman[1], S. Halachmi[2], O. Nativ[2], and E. Segal[1]
[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. Jeong[1], J. Choi[2], G.Y. Lee[1], S. Han[2], T. Lim[1,2], S. Han[2], B. Jin[2], H. Kim[2], S. Song[2], S. Park[2], E.-G. Kim[2], D.Y. Kim[2], T.S. Kim[3], and S. Kwon[1,2,3]
[1]Seoul National University, KOREA, [2]Quantamatrix 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. Zang[1], Y. Liang[1], H. Wang[1], J. Tao[2], X. Zeng[2], D. Zhou[1,2], and **W. Hu**[1,2]
[1]University of Texas, Dallas, USA and [2]Fudan University, CHINA

14:05 **CROSS-MEMBRANE ELECTRICAL DETECTION OF DNA**

M. Guo[1], I. Hernández-Neuta[2], N. Madaboosi[2], M. Nilsson[2], and W. van der Wijngaart[1]
[1]KTH Royal Institute of Technology, SWEDEN and [2]Stockholm 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. Rouse[1], G. Aubry[1], M. Zimmer[2], and H. Lu[1]
[1]Georgia Institute of Technology, USA and
[2]Reasearch 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. Choi[1], K. -H. Na[1], H. Kim[1], Y. -H. Jung[1], C. -H. Kim[2], and S. Chung[1]
[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. Sei[1], N.L. Jeon[2], and Y. Kim[1]
[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. Spychalski, 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. Jia[1], C. Su[1,2], M. He[2], and Q. Lin[1]
[1]Columbia University, USA and [2]Xi'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. Zhang[1], M. He[2], Y. Shang[1], and Y. Zeng[1]
[1]University of Kansas, USA and [2]Kansas 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]
[1]Université Grenoble, Alpes, FRANCE, [2]INSERM, FRANCE, [3]CNRS, FRANCE, [4]Université de Montpellier, FRANCE, and [5]Université de Nîmes, FRANCE

14:40 **SYSTEMS INTEGRATION OF CELLULAR AND MOLECULAR SENSING TOWARDS POINT-OF-CARE TREATMENT MONITORING IN SCHIZOPHRENIA**
T.E. Winkler[1], E. Kim[1], M. Kang[1], G.F. Payne[1], D.L. Kelly[2], and R. Ghodssi[1]
[1]University of Maryland, USA and [2]University 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. Yager[1], K. Abe[1], C.E. Anderson[1], D. Baker[1], Y. Belousov[2], J. Bishop[1], J.R. Buser[1], S.A. Byrnes[1], G. Domingo[3], E. Fu[1], R.P. Gallagher[1], E.K. Heiniger[1], C.A. Holstein[1], S. Huang[1], P. Kauffman[1], E.C. Kline[1], P. D. Ladd[1], L.K. Lafleur[1], B.R. Lutz[1], W. Mahoney[3], S. Kumar[1], N. Scarr[2], L. Stewart[1], E.-M. Strauch[1], B. Toley[1], N.M.J. Vermeulen[3] and X. Zhang[1]
[1]University of Washington, USA, [2]ELITechGroup Molecular Diagnostics, USA, and [3]PATH, Seattle, WA, USA

14:00 **A THREAD-BASED WEARABLE NANOBIOSENSOR**
C. Zhao[1], X. Li[1,2], T. Li[1], Q. Wu[1], and X. Liu[1]
[1]McGill University, CANADA and [2]Stanford 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. Le[1] and T. Tanaka[1,2]
[1]Tokyo Institute of Technology, JAPAN and
[2]Institute 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. Werner[1], T. Dawes[2], and E. Hui[1]
[1]University of California, Irvine, USA and [2]Genentech, 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. Oana[1], T. Takahashi[1], K.O. Okeyo[2], J. Ueda[3], and M. Washizu[1]
[1]University of Tokyo, JAPAN, [2]Kyoto University, JAPAN, and [3]Asahikawa 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. Kim[1], T. Mitsunaka[2], Y. Fujimoto[2], K. Iizuka[2], and T. Fujii[1]
[1]University of Tokyo, JAPAN and [2]SHARP, 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. Garneret[1], L. Magro[1], B. Jacquelin[2], E. Coz[1], F. Monti[1], A. Kwasiborski[2], J. Vanhomwegen[2], J.C. Manuguerra[2], P. Lafaye[2], and P. Tabeling[1]
[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. Kaushik[1], K.E. Mach[2], K. Hsieh[1], C. Tang[1], L. Chen[1], J.C. Liao[2], and T.-H. Wang[1]
[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-Kortum[1], P. Keahey[1], B. Hunt[1], C. Smith[1], and K. Schmeler[2]
[1]Rice University, USA and [2]MD 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. Zhu[1], P.D. Piehowski[1], R. Zhao[1], Y. Shen[1], R.J. Moore[1], J. Chen[2], C.E. Mathews[2], W.-J. Qian[1], R.D. Smith[1], and R.T. Kelly[1]
[1]Pacific Northwest National Laboratory, USA and [2]University of Florida, USA

10:20 **WHOLE TUMOR SCREENING WITH SINGLE CELL MULTIPLEXED PROTEOLYTIC ASSAY THROUGH CONTINUOUS FLOW MICROFLUIDICS**
E.X. Ng[1], G. Sun[1], S.-C. Wei[1], and M.A. Miller[2], and C.-H. Chen[1]
[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. Kim[1], H.E. Karakas[2], J. Park[3], J.M. Oh[3], Y. Choi[1,3], V. Sunkara[1], Y.-S. Park[1,3], D. Gozuacik[2], and Y.-K. Cho[1,3]
[1]Ulsan National Institute of Science & Technology (UNIST), KOREA,
[2]Sabanci 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. Xue[1], Y. Sun[1,2], A. Resto-Irizarry[1], K.M.A. Yong[1], Y. Zheng[1], S. Weng[1], Y. Shao[1], and J. Fu[1]
[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. Isaksson[1], P. Rifes[1,2], T. Laurell[1], 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. Jeong[1], S. Kim[1], J. Buonocore[1], J. Park[2], J. Welsh[1], J. Li[1], and A. Han[1]
[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. Liu[1], Y. Zhu[1,2], and Q. Fang[1]
[1]Zhejiang University, CHINA and [2]Pacific 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. Kaplan[1], S. Nath[1], S. Deutsch[1], J.D. Keasling[1], N.J. Hillson[1], P.D. Adams[1], and A.K. Singh[1,2]
[1]Sandia National Laboratories, USA and [2]University of California Berkeley, USA

10:40 **FORMATION OF DROPLET INTERFACE BILAYERS EQUIPPED WITH OPEN WATER SURFACE FOR ODORANT DETECTION USING OLFACTORY RECEPTORS**
N. Misawa[1], S. Fujii[1], K. Kamiya[1], T. Osaki[1,2], A. Ozoe[3], Y. Takahashi[3], and S. Takeuchi[1,2]
[1]Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN, [2]University of Tokyo, JAPAN, and [3]Sumitomo Chemical Company, JAPAN

11:00 **FORMATION OF DNA MICRO-SKELETON STRUCTURES IN WATER-IN-OIL MICRODROPLETS**
M. Morita[1], S.M. Nomura[2], S. Murata[2], M. Yanagisawa[3], and M. Takinoue[1]
[1]Tokyo Institute of Technology, JAPAN, [2]Tohoku University, JAPAN, and [3]Tokyo 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. Deng[1], M. Rada[2], M. Kizer[1], X. Wang[1], D.-J. Cheon[2], and A.J. Chung[1]
[1]Rensselaer Polytechnic Institute (RPI), USA and [2]Albany 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. Gonzalez[2], A.B. Hiziroglu[1], X. Zhao[1], R. Brien[1], Y.-H. Cheng[1], Z. Zhang[1], C.G. Kleer[2], and E. Yoon[1]
[1]University of Michigan, USA and [2]University 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. Hida[1], K. Ozoe[1], D. Iguro[1], I. Kanno[1], and M. Nogaguchi[2]
[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 INDIVIDALLY ISOLATING OF PANCEREATIC CIRCULATING TUMOR CELLS**
T. Masuda[1], H. Tateno[2], W. Lei[1], I. Arifin[1], and F. Arai[2]
[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. Tentori[1], J.J. Kim[1], W.C. Zhang[2], F.J. Slack[2], and P.S. Doyle[1]
[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. Han[1], and A. Han[1]
[1]Texas A&M University, USA and [2]Korea 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. Kim[1], H. Ito[2], M. Kozuka[2], H. Takagi[2], M. Hirai[2], and T. Fujii[1]
[1]University of Tokyo, JAPAN and [2]ARKRAY, 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-Ratnayake[1], M.L. Hupert[2], M.A. Witek[1], C. Kong[1], M. Hu[2], J.W. Kamande[5], M.A. Lindell[5], S. Vaidyanathan[1], P.M. Vorhees[5], A. Goodwin[3], K. August[3,4], and S.A. Soper[1,2,3]
[1]University of Kansas, USA, [2]Biofluidica, Inc., USA, [3]University of Kansas Medical Center, USA, [4]University of Missouri, Kansas City, USA, and [5]University of North Carolina, Chapel Hill, USA,

16:55 **AUTOMATED PLATFORM FOR YEAST CULTIVATION AND ANALYSIS OF SECRETED PHYTASE IN NANOLITER DROPLET ARRAYS**
D. Hümmer[1], C. Bärtschi[1], R. Steinhoff[1], J. Förster[2], L.M. Blank[2], R. Zenobi[1], and P.S. Dittrich[1]
[1]ETH Zürich, SWITZERLAND and [2]RWTH 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. Zeming[1], R. Vernekar[2], T. Krueger[2], 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. Park[2], V. Sunkara[1], T.-H. Kim[2], 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. Xu[1], J.-H. Lee[2], Y. Zhao[3], Z. Li[3], T. Ordog[2], and R.C. Bailey[1]
[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 Brink[1], A. Asthana[1], J. Bomer[1], E.A. Tolner[2], A. van den Maagdenberg[2], and M. Odijk[1]
[1]University of Twente, NETHERLANDS and
[2]Leiden 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. Sahmoud, 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. Punthambaker[1], P.B. Stranges[1], F. Vigneault[2], J. Nivala[1], A. Trans[3], A. Ayer[3], S. Sun[3], J. Pollard[3], A. Qwan[3], C.W. Fuller[3], and G.M. Church[1]
[1]Harvard Medical School, USA, [2]Harvard University, USA, and
[3]Roche 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. Varhue[1], L. Langman[2], M. Kelly-Goss[2], K.L. Brayman[2], S. Peirce-Cottler[2], and N.S. Swami[1]
[1]University of Virginia, USA and [2]School 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. Shin[1], L. Chen[1], C. Li[1,2], A. Trick[1], and T.-H. Wang[1]
[1]Johns Hopkins University, USA and [2]China 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. Rodríguez[1], L. Horowitz[1], M. Rumaner[1], V.K. Gadi[1], R. Monnat[1], R. Rostomily[2], and A. Folch[1]
[1]University of Washington, USA and [2]Houston 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. Yang[1], Y. Bian[2], F. Guo[2], M. Wu[2], Z. Tian[1], P.-H. Huang[1], and T.J. Huang[1]
[1]Duke University, USA and [2]Pennsylvania State University, USA

T001a **INVESTIGATION ON ACOUSTIC STREAMING PATTERNS IN SHARP-EDGE-BASED DEVICES: EFFECTS OF SHARP-EDGE LOCATION**
P.H. Huang[1], M. Darmawan[2], N. Nama[2], and T.J. Huang[1]
[1]Duke University, USA and [2]Pennsylvania State University, USA

W001a **STAIRCASE ECHO-CHANNEL ACOUSTOFLUIDIC DEVICE FOR CELL POSITION CONTROL**

S. Yigit[1], S.-I. Han[1], Y.-H. Cho[2], and A. Han[1]
[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. Li[1], and X. Xuan[1]
[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. Kaneko[1], T. Osawa[2], Y. Kametani[2], Y. Hasegawa[2], and H. Suzuki[1]
[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. Aeinehvand[1], A. Palermo[2], L.K. Weber[2], F.F. Loeffler[3], A.E. Carvajal[1], D. Mager[2], J.G. Korvink[2], M. Madou[4], and S.O. Martínez-Chapa[1]
[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 NANOCHANNEL FLOWS**
K. Shibata, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

M005a **NANOCHANNELS WITH INTEGRATED ELECTRODES AND COMPLEX IONS CHANGE ELECTRIC DOUBLE LAYER STRUCTURE**
K.-H. Chou[1], C. McCallum[1], S. Mackenzie[1], D. Gillespie[2], and S. Pennathur[1]
[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 NANOCHANNEL**
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. Li[1], J. Xue[2], G. Du[3], and Y. Xie[1]
[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 D_2O AND H_2O**
K. Isogai, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

T007a **STRUCTURAL ANALYSIS OF WATER CONFINED IN NANOCHANNEL: MEASUREMENT OF RADIAL DISTRIBUTION FUNCTION AND HYDROGEN BOND STRUCTURE**

H. Koreeda[1], K. Mawatari[1], K. Ohara[2], S. Kohara[3], T. Yamaguchi[4], K. Yoshida[4], and T. Kitamori[1]

[1]University of Tokyo, JAPAN, [2]Japan Synchrotron Radiation Research Institute (JASRI), JAPAN, [3]National Institute for Materials Science (NIMS), JAPAN, and [4]Fukuoka University, JAPAN

W003a **CLOGGING OF MODEL PORES WITH BROWNIAN PARTICLES**

O. Liot[1,2], P. Bacchin[3], P. Duru[4], P. Joseph[1], and J. Morris[5]

[1]University Toulouse, FRANCE, [2]Fédération Fermat, FRANCE, [3]LGC, FRANCE, [4]Institut de Mécanique des Fluides de Toulouse, FRANCE, and [5]City 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 NANOFLUIDIC 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 HANDING**

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. Reifenberger[1], H.-M. Chuang[2], K.D. Dorfman[2], and H. Cao[1]
[1]Bionano Genomics, USA and [2]University 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-Elezgarai[1], M. García-Hernando[1], L. Basabe-Desmonts[1,2], and F. Benito-Lopez[1]
[1]University of the Basque Country, SPAIN and [2]IKERBASQUE, 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
Wrocław 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. Vereshchagina[1], E. Andreassen[2], R.H. Gaarder[2], and M.M. Mielnik[1]
[1]SINTEF Digital, NORWAY and [2]SINTEF Materials and Chemistry, NORWAY

b - Micro- and Nanoengineering

Assembly

M013b **DIRECT BIOACTUATOR FORMATION ON MICROSTRUCTURE BY QUASI-DIAMAGNETIC ASSEMBLY**
H. Suenaga[1], J. Sugihara[1], M. Horie[2], and Y. Akiyama[1]
[1]Shinshu University, JAPAN and [2]Kyoto 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. Abrishamkar[1], R. Mas-Ballesté[2], A.J. deMello[1], and J. Puigmarti-Luis[1]
[1]ETH Zürich, SWITZERLAND and [2]Universidad 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 BINDNG TECHNIQUE USING HYDROPHILIC/HYDROPHOBIC PATTERNING FOR SELF-ASSEMBLY**
T. Okuyama, T. Okano, and H. Suzuki
Chuo University, JAPAN

W013b **HETEROGENIOUS 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. Moon[1], M. Ku[2], H. Lee[1], J. Yang[2], and K.W. Bong[1]
[1]Korea University, KOREA and [2]Yonsei 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. Feng[1], G. Liu[1], L. Jiang[1], Y. Zhu[2], E.M. Goldys[1], and D.W. Inglis[1]
[1]Macquarie University, AUSTRALIA and [2]RMIT 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. Kim[1], H. Kim[1], Y. Choi[2], H. Bae[2], S.H. Song[1], S. Kwon[2], and W. Park[1]
[1]Kyung Hee University, KOREA and [2]Seoul National University, KOREA

T019b **SIMPLE EPOXY ENCAPSULATION OF INFORMATION DNA-CONJUGATED MICROPARTICLE FOR LONG-TERM STORAGE**
H. Kim[1], S. Kim[1], Y. Choi[2], H. Bae[2], S.H. Song[1], S. Kwon[2], and W. Park[1]
[1]Kyung Hee University, KOREA and [2]Seoul 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. Kim[1], D.G. Choi[2], H.J. Lee[1], M.S. Shim[2], and K.W. Bong[1]
[1]Korea University, KOREA and [2]Incheon National University, KOREA

b - Micro- and Nanoengineering

Nanostructures

M020b **3D TISSUE FORMATION BY STACKING DETACHABLE CELL SHEETS FORMED ON NANOFIBER MESH**
B. Lee[1], M.S. Kim[1], S. Kim[1], S. Bang[1], S.-H. Park[2], and N.L. Jeon[1]
[1]Seoul National University, KOREA and
[2]Korea 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. Ha[1], D.J. Kim[2], Q. Zhou[1], and T. Kim[1]
[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. Ha[1], D.-J. Kim[2], J.G. Park[1], and T. Kim[1]
[1]Ulsan National Institute of Science & Technology (UNIST), KOREA and
[2]Yale University, USA

T022b **LARGE-AREA FABRICATION OF SUB-μM 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. Arora[1], E.K.F. Yim[2], and Y.C. Toh[1]
[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. Futagami[1], T. Hara[2], H. Ottevaere[1], G.V. Baron[1], G. Desmet[1], and W. De Malsche[1]
[1]Vrije Universiteit Brussel, BELGIUM and [2]Kyushu University, JAPAN

W022b **LOCAL MICRO AND NANO PATTERNING OF MICROFLUIDIC DEVICES USING THE SOLID ON LIQUID DEPOSITION PROCESS**

J. Charmet[1], A. Homsy[2], M. Wood[3], J. Covington[1], L. Isa[4], M. Textor[4], T.P.J. Knowles[3], and H. Keppner[2]
[1]University of Warwick, UK, [2]University of Applied Sciences Western Switzerland, SWITZERLAND, [3]University of Cambridge, UK, and [4]ETH Zürich, SWITZERLAND

W023b **RAPID FOLDING OF DNA NANOSTRUCTURES IN MICROFLUIDIC CHANNEL**

K. Hara[1], K. Arima[1], O. Tabata[2], and K. Kawai[1]
[1]Osaka University, JAPAN and [2]Kyoto University, JAPAN

W024b **SINGLE-EXOSOME ANALYSIS PLATORM BASED ON NANOARRAY CHIP TECHNOLOGY**

H. Kuramochi[1], S. Yokota[1], S. Tsuchiya[2], T. Akagi[1], and T. Ichiki[1]
[1]Univerisity of Tokyo, JAPAN and [2]Innovation 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. Spegni[3], F. Simoni[3], and L. Criante[1]
[1]Istituto Italiano di Technologia, ITALY, [2]Politecnico di Milano, ITALY, and [3]Università 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
Wrocław University of Science and Technology, POLAND

T025b **FUNDAMENTALS OF INJECTION MOLDING FOR MICROFLUIDIC CELL-BASED ASSAYS**
U.N. Lee[1], E. Berthier[1], X. Su[1], D.J. Guckenberger[2], A.M. Dostie[1], T. Zhang[1], and A.B. Theberge[1]
[1]University of Washington, USA and [2]Salus Discovery, LLC, USA

T026b **PATTERNING MOLECULAR MOTORS FOR FABRICATION OF STACKED ROTARY ACTUATOR**
K. Minakata[1], Y. Hiratsuka[2], K. Uesigi[1], and K. Morishima[1]
[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. Hashimoto[1], K. Mogi[2], and T. Yamamoto[1]
[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. Bae[1], H. Cho[2], H. Kang[2], G. Wu[2], J. Jollu[2], S. Yang[2], and W. Park[1]
[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-Hualde[1], M.M. de Pancorbo[1], F. Benito-Lopez[1], 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. Ren[1] and M. Noh[2]
[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. Kim[1], H.B. Lee[1], J.U. Kim[1], Y.L. Cui[1], J.A. Kim[2], S.K. Yoo[2], and G.M. Kim[1]
[1]Kyungpook National University, KOREA and
[2]Osong Medical Innovation Foundation, KOREA

T030b **DIRECT ETCHING AND IMPLANTED METALIZATION IN SOFT MATTER**
K. Ichikawa[1], Y. Fukuyama[2], S. Maeda[1], and Y. Yamanishi[2]
[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. Lee[1], K. Seo[2], M. Kim[3], and D.H. Kim[1]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA, [2]LG Chem Research Park, KOREA, and [3]Korea 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. Koduri[1], A. Kumar[1], V. Goudar[1], and F.G. Tseng[1,2]
[1]National Tsing Hua University, TAIWAN and [2]Academia Sinica, TAIWAN

M032b **LASER-MANIPULATED MICROTOOL WITH ENZYME-FUNCTIONALIZED SURFACE FOR ON SITE MOLECULAR PROCESSING**
A. Masuda[1], H. Takao[1], F. Shimokawa[1], and K. Terao[1,2]
[1]Kagawa University, JAPAN and [2]Japan Science and Technology Agency (JST), JAPAN

M033b **PRECONCENTRATION ENHANCED IMMUNOASSAY FOR PROTEIN SENSING**
Y.-J. Fan[1], C.-Z. Deng[2], and H.-J. Sheen[2]
[1]Taipei Medical University, TAIWAN and [2]National 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, COMMERCIALLY 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. Qi[1], and S. Feng[2]
[1]Central China Normal University, CHINA and [2]Macquarie 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. Taniguchi[1], Y. Murakami[1], M. Sohgawa[2], K. Yamashita[1], and M. Noda[1]
[1]Kyoto Institute of Technology, JAPAN and [2]Niigata 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. Vaithiyanathan, 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. Afshar[1], E. Salimi[1], A. Fazelkhah[1], M. Butler[2], G. Bridges[1], and D. Thomson[1]
[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

c - Sensors & Actuators, and Detection Technologies

Electrical and Electrochemical Sensors

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 DETETION 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 PLATFROM 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. Kim[1], L. Wang[2], and T. Cui[1]
[1]University of Minnesota, USA and [2]Tsinghua 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. Hrdý[3], H. Kynclová[2], I. Klepáčova[1,3], M. Bartošík[4], and P. Neužil[1,2]
[1]Northwestern Polytechnical University, CHINA, [2]Central European Institute of Technology, CZECH REPUBLIC, [3]Brno University of Technology, CZECH REPUBLIC, and [4]Masaryk Memorial Cancer Institute, CZECH REPUBLIC

M045c **ULTRA-LOW DETECTION-LIMIT HEAVY METAL ION DETECTION VIA ELECTROCHEMICAL ENHANCED POROUS SILICON PHOTONIC SENSORS**

K.-H. Chih[1], W.-T. Tsai[1], J.-R. Lai[1], M.-H. Nguyen[2], H.-B. Nguyen[3], M.-C. Lee[1], and F.-G. Tseng[1,2]
[1]National Tsing Hua University, TAIWAN, [2]Academia Sinica, TAIWAN, and [3]Center for Microelectronics and Informatics Technology, VIETNAM

T038c **A FLEXIBLE GRAPHENE APTAMERIC NANOSENSOR FOR DETECTION OF TNF-α**

Z. Hao[1,2], Y. Zhu[1], Y. Li[1], X. Wang[1], X. Zhao[2], and Q. Lin[1]
[1]Columbia University, USA and [2]Harbin Institute of Technology, CHINA

T039c **A RECYCLABLE DEVICE FOR REAL-TIME CYTOKINE MONITORING IN CELL MICROENVIRONMENT**

G. Liu[1,2] and C. Cao[1]
[1]Centra China Normal University, CHINA and [2]Macquarie University, AUSTRALIA

T040c **AN APTAMERIC GRAPHENE NANOSENSOR FOR DIRECT AND SENSITIVE VASOPRESSIN DETECTION**

C. Su[1,2], X. Wang[1], M.N. Milosavic[1], M. He[2], and Q. Lin[1]
[1]Columbia University, USA and [2]Xi'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. Kwon[2]
[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. Tiefenauer[1], K. Tybrandt[2], T. Dalgaty[1], and J. Vörös[1]
[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. Xie[1], N. Song[2], W. Shen[2], M. Allen[2], and M. Javanmard[1]
[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 Goias, 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 MoS_2 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. Su[1], A. Harynuk[2], T.A. Hatton[1], and N. Nazemifard[2]
[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. Sui[1], N. Gandotra[2], P. Xie[1], Z. Lin[1], C. Scharfe[2], and M. Javanmard[1]
[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. Gao[1], M. Duan[1], Q. Chen[1], A. Bermak[1,2], and Y.-K. Lee[1]
[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

c - Sensors & Actuators, and Detection Technologies

Materials

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. Menachery[1] 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. Viehrig[1], M. Matteucci[1], A.H. Thilsted[2], M.S. Schmidt[1], and A. Boisen[1]
[1]Technical University of Denmark, DENMARK and [2]SpectroInlets, DENMARK

c - Sensors & Actuators, and Detection Technologies

Nanoscale

M048c **DEVELOPMENT AND REALIZATION OF A FL-SWITCHING VALVE IN EXTENDED-NANO SPACE UTILIZING GLASS DEFORMATION PROPERTIES AT THE NANOMETER SCALE**
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 NANOFLUIDIC-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. Zhang[1], M.F. Czyzyk-Krzeska[1,2], L. Esfandiari[1]
[1]University of Cincinnati, USA and [2]Veterans Affairs Research Service, USA

c - Sensors & Actuators, and Detection Technologies

Optical & Fluorescence Imaging

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. Saez[1], R. Lanfranco[2], E. Di Nicoló[3], M. Buscaglia[2], and F. Benito-Lopez[1]
[1]University of the Basque Country, SPAIN, [2]Università degli Studi di Milano, ITALY, and [3]Solvay 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. Wakao[1], K. Sumiyoshi[2], C. Mizokuchi[2], M. Maeki[1], A. Ishida[1], H. Tani[1], K. Shigemura[2], A. Hibara[3], and M. Tikeshi[1]
[1]Hokkaido University, JAPAN, [2]Tianma Japan, Ltd., JAPAN, and [3]Tohoku University, JAPAN

W052c **MICROANALYTICAL DEVICES TOWARDS INTEGRATED QUALITY CONTROL TESTING OF [^{18}F]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

c - Sensors & Actuators, and Detection Technologies

Optical Sensors & Photonics

M053c **IMPRINTED PHOTONIC CRYSTAL NANOCAVITY FOR μ-SPECTROMETER**
K. Maeno[1], S. Aki[1], K. Satoh[2], S. Murakami[2], Y. Sando[2], Y. Kanaoka[2], K. Sueyoshi[1], H. Hisamoto[1], and T. Endo[1,3]
[1]Osaka Prefecture University, JAPAN, [2]Osaka Research Institute of Industrial Science and Technology, JAPAN, and [3]Japan Science and Technology Agency (JST), JAPAN

M054c **ON-GLASSCHIP INTEGRATION OF PHOTONICS FOR PHOTOTHERMAL OPTICAL PHASE SHIFT DETECTION OF NONFLUORESCENT MOLECULES**
K. Miyake, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

T054c **A LATERAL FLOW-THROUGH LABEL-FREE BIOSENSOR BASED ON SILICON PHOTONICS**
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 MICROCHANNEL**
K. Saga[1], F.H. Kriel[2], C. Priest[2], and T. Tsukahara[1]
[1]Tokyo Institute of Technology, JAPAN and [2]University of South Australia, AUSTRALIA

T056c **PHOTOTHERMAL OPTICAL PHASE SHIFT DETECTION DEVICE FOR MEASUREMENT OF ABSORPTION SPECTRUM IN MICROSPACE**
F. Sugino[1], H. Shimizu[1], M. Sakakura[2], K. Miura[3], K. Mawatari[1], and T. Kitamori[1]
[1]University of Tokyo, JAPAN, [2]Next Generation Laser Processing Technology Reserch Association, JAPAN, and [3]Kyoto University, JAPAN

W053c **AN ULTRA-SMALL, MULTI-POINT AND MULTI-COLOR PHOTO-DETECTION SYSTEM WITH HIGH SENSITIVITY AND HIGH DYNAMIC RANGE**
T. Anazawa[1] and M. Yamazaki[2]
[1]Hitachi, Ltd., JAPAN and [2]Hitachi High-Technologies Corporation, JAPAN

W054c **LYTIC ENZYME-BASED SELECTIVE DETECTION OF STAPHYLOCOCCUS EPIDERMIDIS USING A POROUS SILICON OPTICAL BACTERIA SENSOR**
J. Rasson, C. Nannan, J. Mahillon, and L.A. Francis
Université Catholique de Louvain, BELGIUM

W055c **PHOTOTHERMAL OPTICAL PHASE SHIFT MICROSCOPY USING RELAY OPTICS FOR SENSITIVE DETECTION OF BIOMOLECULES**
S. Takeda, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

c - Sensors & Actuators, and Detection Technologies

Other Sensors

M055c **A CAPACITIVE POLYMER MICROTENSIOMETER**
P. Gijsenbergh and R. Puers
KU Leuven, BELGIUM

M056c **ASSESSMENT OF PATIENT RESPONSE TO TARGETED CANCER THERAPY USING MULTI-FREQUENCY IMPEDANCE CYTOMETRY AND UNSUPERVISED MACHINE LEARNING**
K. Ahuja, Z. Lin, J. Sui, G. Rather, J.R. Bertino, and M. Javanmard
Rutgers University, USA

M057c **FLEXIBLE EPIDERMAL MICROFLUIDIC SYSTEM FOR CONTINUOUS GLUCOSE MONITORING**
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. Jiang[1], M. Pan[1], J. Loeb[1], S.V. Hering[2], A. Eiguren-Fernandez[2], J.A. Lednicky[1], C.-W. Wu[1], and Z.H. Fan[1]
[1]University of Florida, USA and [2]Aerosol 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. Osaki[1], S. Fujii[1], K. Kamiya[1], N. Misawa[1], and S. Takeuchi[1,2]
[1]Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and [2]University of Tokyo, JAPAN

M061c **THE ADVANTAGES AND CHALLENGES OF USING MICROFLUIDICS FOR IN SITU AUTONOMOUS OCEANOGRAPHIC WET CHEMICAL SENSORS**
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. Wang[1], J. Kim[2], and T. Cui[2]
[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. Krauss[1], A.Q. Nauman[2], R.M. Aubrey[1], G. Garner[1], B.E. Root[1], and J.P. Landers[1]
[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. Ishikawa[2], 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 CREASENSOR**

F. Dal Dosso[1], D. Decrop[1], E. Pérez Ruiz[1], D. Daems[1], T. Kokalj[1,2], D. Spasic[1], and J. Lammertyn[1]
[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 NANOHOLE PRECONCENTRATE AND NANOFOREST SERS SENSORS**
M. Li[1], H. Mao[1], H. Wang[2], and C. Huang[1]
[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

c - Sensors & Actuators, and Detection Technologies

Other µFluidic Components

M062c **AN ASSEMBLY-DISPOSABLE MICROFLUIDIC FLOW SENSOR**
J. Kim, H. Cho, H. Kang, H.-U. Park, and K.-H. Han
Inje University, KOREA

M063c **PROGRAMMABLE ACOUSTIC-BASED FLUID PROPULSION**
P.-H. Huang[1], N. Nama[2], and T.J. Huang[1]
[1]*Duke University, USA and* [2]*Pennsylvania State University, USA*

T064c **DEVELOPMENT OF PRINTING SYSTEM FOR MAGNETICALLY ANISOTROPIC ACTUATOR**
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. Venzac[1], Y. Liu[1], I. Ferrante[1], A. Yamada[1], P. Vargas[1], M. Verhulsel[1], L. Malaquin[2], J.-L. Viovy[1], and S. Descroix[1]
[1]Pierre-and-Marie-Curie University, FRANCE and [2]LAAS 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. Zor[2], J.-H. Wang[1,3], K. Sanger[2], W.-M. Wang[1,3], A.M. Capria[2], A. Boisen[2], K.-Y. Huang[1], and E.-T. Hwu[1,3]
[1]National Taiwan University, TAIWAN, [2]Technical University of Denmark, DENMARK, and [3]Academia Sinica, TAIWAN

c - Sensors & Actuators, and Detection Technologies

Particles

M064c **3D PARTICLE LOCALIZATION IN A MICROFLUIDIC IMPEDANCE CYTOMETER**
R. Reale[1], A. De Ninno[2], V. Errico[1], L. Businaro[2], P. Bisegna[1], and F. Caselli[1]
[1]University of Rome Tor Vergata, ITALY and [2]Italian 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. Kim[1], H. Hwang[1], J. Kim[2], and D. Kim[1]
[1]Myongji University, KOREA and [2]Lab Genomics Inc., KOREA

M067c **ENHANCED HYDROSTATIC PRESSURE-DRIVEN PASSIVE MICROPUMP WITH SIPHON-BASED AUTOFILL FUNCTION**
X. Wang[1], D. Zhao[2], and A.P. Lee[2]
[1]Shanghai Jiao Tong University, CHINA and [2]University 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. Besse[1], R.J. Boom[2], B.J. Hoogenberg[2], B. Aksoy[1], M. Blom[2], and H. Shea[1]
[1]École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and [2]Micronit Microtechnologies B.V., NETHERLANDS

W068c **MAGNET-PAPER COMPOSITES FOR LOW-COST TWO-WAY VALVES AND OTHER ACTIVE STRUCTURES IN μPADS**
M. Fratzl[1], B. Chang[2], S. Oyola-Reynoso[2], G. Blaire[1], S. Delshadi[1], T. Devillers[1], O. Cugat[1], N.M. Dempsey[1], M. Thuo[2], and J.-F. Bloch[1]
[1]University Grenoble, Alpes, FRANCE and [2]Iowa 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. Wei[1] and Y.-A. Song[1,2]
[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

M069d **CONNECTED, LOW-COST POINT-OF-CARE DIAGNOSTICS FOR RURAL SOUTH AFRICAN CLINICS**

S. Smith[1,2], K. Land[1], J.G. Korvink[2], and D. Mager[2]
[1]Council for Scientific and Industrial Research, SOUTH AFRICA and
[2]Karlsruhe Institute of Technology (KIT), GERMANY

M070d **PORTABLE PATHOGEN ANALYSIS SYSTEM (PPAS) FOR MICROBIAL WATER QUALITY ANALYSIS**

X. Huang[1], H.N. Gowda[2], X. Wu[1], S.L. Dumas[2], Y. Zhu[1], X. Lin[1], H. Kido[2], X. Xie[1,3], S. Jiang[2], M. Madou[2], and M.R. Hoffmann[1]
[1]California Institute of Technology, USA, [2]University of California, Irvine, USA, and [3]Georgia 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. Jin[1], D.-T. Phan[1], T. Sun[2], and C.-H. Chen[1]
[1]National University of Singapore, SINGAPORE and
*[2]Agency 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. Li[1], N.P. Macdonald[1], P. Smejkal[1], R.M. Guijt[2], and M.C. Breadmore[1]
[1]University of Tasmania, AUSTRALIA and [2]Deakin 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. Sukumar[1], R. Alnemari[1], W. Chen[2], and M.A. Qasaimeh[1,2]
[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

M072d **DIAMAGNETIC PARTICLE SEPARATION AND WASHING IN AN INERTIAL FERROFLUID/WATER CO-FLOW**

Q. Chen[1,2], D. Li[1], J. Lin[2], M. Wang[2], and X. Xuan[1]
[1]Clemson University, USA and [2]China 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. Onoshima[1], H. Yukawa[1], Y. Hattori[1], K. Ishikawa[1], M. Hori[1], and Y. Baba[1,2]
[1]Nagoya University, JAPAN and
[2]National 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. Özkan[1], M.K. Aslan[1], A.C. Atik[1], E. Özgür[2], E. Yıldırım[3], and H. Külah[1,2]
[1]Middle East Technical University, TURKEY, [2]Mikro BiyoSistemler Inc., TURKEY, and [3]Çankaya 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. Yalikun[1,2], Y. Aishan[1,2], K. Sumiyama[1], 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. Liu[1], Y.C. Tzeng[1], Y.J. Chen[1], C. Chuan[1], L.C. Pan[3], 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. Johannsen[1], 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. Juelg[1], M. Specht[1], E. Kipf[2], M. Lehnert[2], C. Eckert[3], 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. Morelli[1], L. Serioli[1], F.A. Centorbi[2], M. Matteucci[1], D. Demarchi[2],
K. Zór[2], and A. Boisen[1]
[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. Perebikovsky[1], Y. Liu[1], C. Halford[2], G. Monti[2], A.T. Hwu[1], D.A. Haake[2], and M.J. Madou[1]
[1]University of California, Irvine, USA and [2]University of California, Los Angeles, USA

d - Integrated Microfluidic Platforms
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. Shvydkiv[1], C.-M. Svensson[1], L. Mahler[1,2], S. Dietrich[1,2], T. Weber[1], M. Choudhary[1], M. Tovar[1,2], M.T. Figge[1], and M. Roth[1]
[1]Hans Knoll Institute, GERMANY and [2]Friedrich 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. Sharma[1], K. Nishigaki[2], Y. Takamura[1], and M. Biyani[1]
[1]Japan Advanced Institute of Science Technology (JAIST), JAPAN and [2]Saitama 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. Zhao[1], N.-T. Nguyen[2], and S.H. Tan[2]
[1]University of Queensland, AUSTRALIA and [2]Griffith University, AUSTRALIA

T079d **AN INTEGERATED MICROFLUIDIC PLATFORM FOR CONTROLLED GENERATION, STORAGE AND MERGING OF MICRODROPLETS**

H. Babahosseini[1], T. Misteli[1], S. Padmanabhan[2], and D.L. DeVoe[2]
[1]National Cancer Institute, National Institutes of Health, USA and
[2]University 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-Orabi[1], M.D. Tarn[1], E. Bringas[2], I. Ortiz[2], V.N. Paunov[1], and N. Pamme[1]
[1]University of Hull, UK and [2]University of Cantabria, SPAIN

T081d **DYNAMICS OF A BIOCHEMICAL BISTABLE SWITCH STUDIED WITH A DROPLET MICROFLUIDIC PLATFORM**

S. Okumura[1,2], G. Gines[2], E. Henry[1], Y. Rondelez[2], T. Fujii[1], and A.J. Genot[1]
[1]University of Tokyo, JAPAN and
[2]Ecole 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. Dudek[1], T. Dumaire[2], and G. Øye[1]
[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. Padmanabhan[1], T. Misteli[2], and D.L. DeVoe[1]
[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. Gu[1], T.A. Hatton[1], and S.A. Khan[2]
[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

d - Integrated Microfluidic Platforms
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

d - Integrated Microfluidic Platforms
Sensors

M086d **FROM FUNCTIONAL STRUCTURE TO PACKAGING: A FULLY-PRINTING FABRICATION OF BIOSENSORS**
F. Zheng[1], Z. Pu[2], E. He[3], D. Li[2], and Z. Li[1]
[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

d - Integrated Microfluidic Platforms

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. Kojima[2], S. Takayama[2], and A.S. Basu[1]
[1]Wayne State University, USA and [2]University of Michigan, USA

M088d **AUTOMATED MICROFLUIDIC PLATFORM FOR HIGH-THROUGHPUT SCREENING OF COLLOIDAL PEROVSKITE NANOCRYSTALS**
R. Epps[1], K. Felton[1], C.W. Coley[2], and M. Abolhasani[1]
[1]North Carolina State University, USA and [2]Massachusetts Institute of Technology, USA

M089d **DEVELOPMENT OF A LABEL FREE MICROFLUIDIC PLATFORM FOR DIRECTED ENZYME EVOLUTION**
D. Holland-Moritz[1], D. Steyer[1], S. Doonan[1], S. Sun[2], X. Diefenbach[2], J. Moore[2], R. Bailey[1], and R. Kennedy[1]
[1]University of Michigan, USA and [2]Merck Research Laboratories, USA

M090d **NOVEL SURFACE SAMPLING TOOL AND TECHNIQUE FOR INTEGRATION INTO COLORIMETRIC DETECTION MICROFLUIDIC DEVICES**
S.T. Krauss[1], V.C. Holt[1], R.M. Aubrey[1], A.Q. Nauman[2], K. Kroupa[3], B.E. Root[1], and J.P. Landers[1]
[1]University of Virginia, USA, [2]TeGrex Technologies, USA, and [3]Department 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 DEVELOPEDMENT 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. Gomez[1], D.A. Baisch[1,2], and K.F. Böhringer[1]
[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. Han[1], H.S. Kim[2], and A. Han[1]
[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. Sleeboom[1], C.M. Sahlgren[2], and J.M.J. Den Toonder[1]
[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. Tamura[1], A. Nakamura[2], K. Takahashi[2], K. Yamada[1], 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. Hisey[1], O. Mitxelena-Iribarren[2], M. Martínez-Calderon[2,3], S. Arana[2,3], M. Mujika[2,3], S.M. Olaizola[2,3], and D.J. Hansford[1]
[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. Kaganovitch[1], X. Steurer[1], D. Dogan[1], W. Wiechert[1,2], and D. Kohlheyer[1,2]
[1]Forschungszentrum Jülich GmbH, GERMANY and
[2]RWTH Aachen University, GERMANY

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. Sticker[1], M. Rothbauer[2], J. Ehgartner[3], C. Steininger[4], W. Neuhaus[4], T. Mayr[3], T. Haraldsson[5], J.P. Kutter[1], and P. Ertl[2]
[1]University of Copenhagen, DENMARK, [2]University of Technology Vienna, AUSTRIA, [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. Misun[1], F. Forschler[1], B. Yesildag[2], O. Frey[1,2], and A. Hierlemann[1]
[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. Kwon[1], R. Yao[1], J.-F.P. Hamel[1], and J. Han[1,2]
[1]Massachusetts Institute of Technology, USA and
[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. Lesher-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. Takayama[2], M. Kumemura[1,2], S. Meignan[3], H. Fujita[1,2], C. Lagadec[2], D. Collard[1,2], and M.C. Tarhan[2]
[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. Ko[1], T.-A. Lee[1], C.-K. Wang[2], C.-C. Peng[1], W.-H. Liao[1], and Y.-C. Tung[1]
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T099e **INFLUENCE OF FLUID FLOW ON MICROTOPOGRAPHY-GUIDED CELL MIGRATION AND UNDERLYING MECHANOTRANSDUCTION**
K. Kushiro[1], A. Ryo[2], and M. Takai[1]
[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. Ito[1], H. Yasaki[1], T. Yasui[1,2], H. Yukawa[1], and Y. Baba[1,3]
[1]Nagoya University, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN, [3]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

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. Altayyeb[1], M. Khashbah[2], A. Esmaeel[2], M. El-Mokhtar[2], A. Sharkawy[2], M. Abdelgawad[2], and E. Othman[2]
[1]Zewail City of Science and Technology, EGYPT and [2]Assiut University, EGYPT

W097e **SINGLE CELL DEFORMATION IN SHEAR AND INERTIA DOMINANT FLOW REGIMES**
F.J. Armistead[1], J.G. De Pablo[1], H. Gadêlha[2], S.A. Peyman[1], and S.D. Evans[1]
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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. Boos[1], A. Michlmayr[1], A. Birchler[1], O. Frey[2], and A. Hierlemann[1]
[1]ETH Zürich, SWITZERLAND and [2]InSphero AG, SWITZERLAND

W098e **MICROFLUIDIC-BASED BLOOD EXCHANGE PLATFORMS FOR UNDERSTANDING THE EFFECT OF CELLULAR COMPONENTS OF THE BLOOD ON AGING**
P. Amiri[1], T. Tran[1], J. Parades[2], I. Conboy[3], and K. Aran[1]
[1]Keck Graduate Institute, USA, [2]Universidad de Navarra, SPAIN, and [3]University 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. Wu[1], H.Y. Chu[1], Y.C. Cheng[1], C.H. Chu[1], and F.G. Tseng[1,2]
[1]National Tsing Hua University, TAIWAN and [2]Academia Sinica, TAIWAN

T102e **A DISPOSABLE MICROSEPARATOR FOR ISOLATING CIRCULATING TUMOR CELLS**
H. Cho[1], J. Kim[1], H.-U. Park[1], H. Kang[1], C.-W. Jeon[2], and K.-H. Han[1]
[1]Inje University, KOREA and [2]Gospel Hospital, Kosin University, KOREA

T103e **AFM COMPATIBLE MICROFLUIDIC PLATFORM FOR MECHANICAL CHARACTERIZATION OF PROSTATE CIRCULATING TUMOR CELLS**
M. Deliorman[1], R. Alnemari[1], F.K. Janahi[2], and M.A. Qasaimeh[1,3]
[1]New York University, Abu Dhabi, UAE, [2]Mohammed Bin Rashid University of Medicine and Health Sciences, UAE, and [3]New York University, USA

T104e **BIO-FUNCTIONALIZED RECOMBINANT SPIDER SILK MODIFIED MICRODEVICE FOR CAPTURE AND RELEASE OF CIRCULATING TUMOR CELLS FROM PANCREATIC CANCER PATIENTS**
H. Ramachandraiah[1], T. Pettersson[1], R. Heuchel[2], M. Löhr[2],
M. Hedhammar[1], and A. Russom[1]
[1]Royal Institute of Technology (KTH), SWEDEN and
[2]Karolinska 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. Nakashima[1], K. Nakatake[1], K. Yasuda[2], Y. Kitamura[1], M. Iwatsuki[1], H. Baba[1], T. Ihara[1], and Y. Nakanishi[1]
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T107e **LABEL-FREE FERROHYDRODYNAMIC CELL SEPARATION OF CIRCULATING TUMOR CELLS**

W. Zhao[1], R. Cheng[1], B.D. Jenkins[1], M.B. Davis[1], S.K. Kavuri[2], Z. Hao[2], C. Schroeder[2], and L. Mao[1]
[1]University of Georgia, USA and [2]Augusta University, USA

T108e **QUANTIFICATION OF THE EFFECTS OF HIGH SHEAR STRESSES ON SINGLE CIRCULATING TUMOR CELLS USING A MICROFLUIDIC DEVICE**

G.M. Landwehr[1], S.M. Rahman[1], J.H. Pettigrew[1], A.J. Kristof[2], U.L. Triantafillu[3], Y. Kim[3], and A.T. Melvin[1]
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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 CIRCULTING 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. Kuboyama[1], D. Onoshima[1], N. Kihara[1,2], H. Tanaka[1], T. Hase[1], H. Yukawa[1], K. Ishikawa[1], H. Odaka[2], Y. Hasegawa[1], M. Hori[1], and Y. Baba[1,3]
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W105e **RAPID CIRCULATING TUMOR CELLS STAINING AND IN-PARALLEL DIAGNOSIS BY TWO-IN-ONE 3D-MICRODIALYSIS AND CELL SELF-ASSEMBLING CHIP**

H.-Y. Chu[1], W. Cho[1], C.-P. Lin[2], J.-K. Jiang[2], and F.-G. Tseng[1,3]
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[3]Academia Sinica, TAIWAN

e - Cell & Vesicle Analysis and Manipulation

Exosomes

M107e **A ZINC OXIDE NANOWIRES DEVICE FOR EXTRACELLULAR VESICLES ISOLATION AND PURIFICATION**

I.A. Thiodorus[1], N. Kaji[1,2], T. Yasui[1,2], and Y. Baba[1,2,3]
[1]Nagoya University, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN, and
[3]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

M108e **EVALUATION OF INDIVIDUAL EXOSOMES OF HUMAN LEUKEMIA CELLS FRACTIONATED BY OPPTIPREP DENSITY GRADIENT ULTRACENTRIFUGATION USING MICROFLUIDIC CHIP-BASED PLATFORM**

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[1]University of Tokyo, JAPAN and
[2]Innovation 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 (Aβ) IN EXOSOMES FROM PLASMA USING MAGNETIC MICROPARTICLES IN WATER-OIL DROPLETS FOR THE DIAGNOSIS OF ALZHEIMER'S DISEASE**

Y. Heo[1,2], M. Park[1], J.H. Ji[1], K.-S. Shin[1], M.C. Park[1,3], K. Shin[2], and J.Y. Kang[1]
[1]Korea Institute of Science and Technology (KIST), KOREA,
[2]Sogang University, KOREA, and [3]Intek 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. Kishita[1], Y. Suehiro[1], M. Nakakuki[1], R. Okamura[1], 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. Jackson[1], M.A. Witek[1], S.R. Pullagurla[1], D.S. Park[1,2], M.L. Hupert[3], K. Herrera[4], M.C. Murphy[1,2], and S.A. Soper[1]
[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. Zhao[2], J. Sibbitt[2], 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. Moore[1], S.S. Linton[2], M. Kester[1], and N.S. Swami[1]
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W107e **EXTRACELLULAR VESICELS SEPARATION BY ELECTROOSMOTIC FLOW-DRIVEN DETERMINISTIC LATERAL DISPLACEMENT IN NANOPILLAR CHIPS**

N. Kaji[1,2], Y. Hattori[1], H. Yasaki[1], 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

e - Cell & Vesicle Analysis and Manipulation

Single Cell Analysis

M111e **A MICROTRAP PLATFORM TO INVESTIGATE SINGLE CELL MECHANICS**
Q. Jin[1], G. Pahapale[1], A. Bhatta[2], A. Dai[1], L. Romer[2], and D.H. Gracias[1,2]
[1]Johns Hopkins University, USA and [2]Johns 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. Kim[1], M.E. Gallina[1], A. Sun[2], M. Shelor[3], M. Kim[1], S. Tang[1], P. Abbyad[2], and G. Pratx[1]
[1]Stanford University, USA, [2]Santa Clara University, USA, and [3]University 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. Li[1], S. Liu[2], and A.P. Lee[1]
[1]University of California, Irvine, USA and [2]Chinese 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. Lüchtefeld, 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. Espulgar[1], T. Okajima[1], H. Takamatsu[1], W. Aoki[2], M. Saito[1], A. Kumanogoh[2], M. Ueda[2], and E. Tamiya[1]
[1]Osaka University, JAPAN and [2]Kyoto University, JAPAN

T113e **AN ON-CHIP GUILLOTINE FOR HIGH-THROUGHPUT SINGLE-CELL WOUND REPAIR STUDIES**

L.R. Blauch[1], Y. Gai[1], J.W. Khor[1], P. Sood[2], W.F. Marshall[2], and S.K.Y. Tang[1]
[1]Stanford University, USA and [2]University 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. Nakao[1], Y. Kazoe[1], K. Morikawa[1], L. Lin[2], A. Yoshizaki[3], K. Mawatari[1], and T. Kitamori[1]
[1]University of Tokyo, JAPAN, [2]National Center for Nanoscience and Technology, CHINA, and [3]University of Tokyo Hospital, JAPAN

T117e **LAB-ON-A-CHIP PLATFORM FOR SINGLE-CELL ELECTROROTATION USING 3D ELECTRODES**

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École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

T118e **MEASURING THE METABOLIC RESPONSE OF SINGLE ADHERENT CELLS TO CHEMOTHERAPY USING RADIOFLUIDIC MICROCHANNELS**

T.J. Kim[1], M. Kim[1], A. Sun[2], P. Abbyad[2], S. Tang[1], and G. Pratx[1]
[1]Stanford University, USA and [2]Santa 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**

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W109e **A MICROFLUIDIC DEVICE TO STUDY SINGLE-CELL CALCIUM DYNAMICS UNDER TIME-VARYING STIMULI**

A.M. Gonzalez-Suarez[1], J.G. Peña-Del Castillo[2], R.J. Jimenez-Valdes[1], A. Hernandez-Cruz[2], and J.L. Garcia-Cordero[1]
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W110e **AUTOMATED MICROARRAY PLATFORM FOR SINGLE CELL ANALYSIS AND COLLECTION OF NON-ADHERENT CELLS MODIFIED WITH CRISPR-CAS9**

P.J. Attayek[1], C.A. LaBelle[1], J.P. Waugh[2], S.A. Hunsucker[1], P.J. Grayeski[1], C.E. Sims[1], P.M. Armistead[1], and N.L. Allbritton[1]
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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. Olofsson[1], V. Carannante[2], T. Frisk[1], K. Kushiro[3], M. Takai[3], A. Lundqvist[2], B. Önfelt[1,2], and M. Wiklund[1]
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W117e **STUDY ON A CELL TRAPPING DEVICE FOR APPLYING MOLECULAR ANALYSIS BY MODULATING LATERAL MICROSTRUCTURE SHAPES**

D.-S. Lee[1], J.W. Park[1], C. Ihm[2], M.Y. Jung[1], K.H. Chung[1], H.-S. Lee[3,4], and D.H. Kim[4]
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[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**

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[2]Nanyang Techonological 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. Kimura[1], M. Maeki[1], Y. Note[1], Y. Sato[1], A. Ishida[1], H. Tani[1], H. Harashima[1], 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. Liu[1], R. Yokokawa[2], and Y.-W. Lu[1]
[1]National Taiwan University, TAIWAN and [2]Kyoto 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. Kurth[1], O.G. Weingart[1], K. Eyer[2], M.J. Lössner[1], and P.S. Dittrich[1]
[1]ETH Zürich, SWITZERLAND, and
[2]École 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. Tokarska[1], Ł. Lamch[2], E. Jastrzębska[1], M. Chudy[1], A. Dybko[1], K.A. Wilk[2], and Z. Brzózka[1]
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[2]Wrocław 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. Kamiya[1], T. Osaki[1,2], S. Fujii[1], N. Misawa[1], and S. Takeuchi[1,2]
[1]Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and
[2]University of Tokyo, JAPAN

T125e **HIGH-THROUGHPUT PRODUCTION OF SMALL AND UNIFORM LIPOSOMES**

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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. McGlone[1], A. Armetta[1], T. Osaki[2,3], S. Takeuchi[2,3], and S. Lee[1]
[1]Iona College, USA, [2]Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN, and [3]University of Tokyo, JAPAN

W120e **COMPARE OF THREE MICROPATTERN METHODS FOR HIGH-THROUGHPUT CELL ARRANGEMENT**

T. Hun[1,3], Y. Liu[2], Y. Guo[2], X. Liu[1], W. Wang[2], Y. Sun[1,3], and Y. Fan[1]
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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. Fujii[1], N. Misawa[1], K. Kamiya[1], T. Osaki[1,2], and S. Takeuchi[1,2]
[1]Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and [2]University of Tokyo, JAPAN

W123e **THREE-DIMENSIONAL LIPOSOME ASSEMBLY TOWORD SYNTHETIC TISSUE**

D.C. Shin[1], Y. Morimoto[1], K. Kamiya[2], and S. Takeuchi[1]
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f - Cells, Organisms, and Organs on Chip

3D Culture/Tissues

M125f **A 96-WELL THREE-DIMENSIONAL MICROFABRICATED WOUND-HEALING ASSAY**

S.L. Luan[1], R. Hao[2,3], Y.C. Wei[2], T. Zhang[4], D.Y. Chen[2,3], B.Y. Fan[2,3], J.B. Wang[2,3], W. Guo[1], and J. Chen[2,3]
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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. Bulka[1], E. Jastrzebska[1], U. Bazylinska[2], A. Dybko[1], M. Chudy[1], K.A. Wilk[2], and Z. Brzozka[1]
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[2]*Wrocław University of Technology, POLAND*

M129f **DYNAMICS OF INSULIN-REGULATED FATTY ACID EXCHANGE IN MURINE ADIPOSE TISSUE USING AUTOMATED MICROFLUIDICS AND FLUORESCENCE IMAGING**

X. Li[1], J.C. Brooks[1,2], J. Hu[1], and C.J. Easley[1]
[1]*Auburn University, USA and* [2]*Tufts University, USA*

M130f **HOLLOW FIBER SYSTEM FOR CONTINUOUS GENERATION OF HUMAN BRAIN ORGANOIDS**

Y. Zhu[1,2], Y. Yu[1,2], L. Wang[1], F. Yin[1,2], Y. Wang[1,2], H. Liu[1], H. Wang[1,2], H. Liu[1,2], and J. Qin[1,2]
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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. Nasseri, 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. Lohasz[1], O. Frey[2], K. Renggli[1], and A. Hierlemann[1]
[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. Liu[1], M. Takeuchi[1], Y. Hasegawa[1], T. Fukuda[1,2,3], and Q. Huang[3]
[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-Holmes[1], R.M. Lawler[1], A.W. Schaefer[1], Z. Wen[2], and H. Lu[1]
[1]*Georgia Institute of Technology, USA and* [2]*Emory University School of Medicine, USA*

T131f **EVALUATION OF PDT EFFECTIVENESS OF ENCAPULATED PHOTESENSITIZERS BASED ON 3D SPHEROID CO-CULTURE**

A. Zuchowska[1], K. Marciniak[1], E. Jastrzebska[1], U. Bazylińska[2], M. Chudy[1], A. Dybko[1], K.A. Wilk[2], and Z. Brzozka[1]
[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. Han[1], J. Kim[1], A. Ma[1], V. Kwan[1], K. Luong[1], R. Li[2], and L.L. Sohn[1]
[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. Nashimoto[1], Y. Teraoka[1], A. Nakamasu[2], S. Hanada[3], Y. Arima[3], Y. Torisawa[1], H. Kotera[1], K. Nishiyama[3], T. Miura[2], and R. Yokokawa[1]
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[3]*Kumamoto University, JAPAN*

T136f **SELF-ORGANIZED AMNIOGENESIS FROM HUMAN PLURIPOTENT STEM CELLS IN AN ENGINEERED BIOMIMETIC NICHE**

Y. Shao[1], K. Taniguchi[2], K. Gurdziel[3], R.F. Townshend[2], X. Xue[1], K.M.A. Yong[1], J. Sang[1], J.R. Spence[2], D.L. Gumucio[2], and J. Fu[1]
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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. Cheng[1], N. Hakimi[1], S. Amini-Nik[2], M. Jeschke[2], and A. Guenther[1]
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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. Nobata[1], T. Kawahara[2], and M. Hagiwara[1]
[1]Osaka Prefecture University, JAPAN and [2]Kyushu Institute of Technology, JAPAN

W130f **MIMICKING THE BOVINE OVIDUCT IN A MICROFLUIDIC DEVICE FOR ADVANCED EMBRYO IN VITRO CULTURE SYSTEMS**

M. Ferraz[1], H.S. Rho[2], J. Delahaye[2], N. Pinheiro[2], H. Henning[1], T. Stout[1], B. Gadella[1], and S. Le Gac[2]
[1]University of Utrecht, NETHERLANDS and [2]University 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. Nasseri, 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. Lam[1], Y.E. Chu[1], A.G. Soetikno[1], and S.C. George[2]
[1]Washington University, St. Louis, USA and [2]University 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. Shih[1], S.-L. Yeh[1], C.-K. Wang[2], T.-A. Lee[1], W.-H. Liao[1], and Y.-C. Tung[1]
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M138f **VEIN-ON-A-CHIP: AN INVESTIGATIONAL TOOL FOR INNOVATING SCLEROTHERAPY**
E. Bottaro[1], J. Paterson[1], X. Zhang[1], M. Hill[1], A.L. Lewis[2], T. Millar[1], and D. Carugo[1]
[1]University of Southampton, UK and [2]Biocompatibles 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. Albers[1], J.E.A. Linssen[2], P.F. Costa[2], H.H.T. Middelkamp[1], L. van der Hout[1], J. Malda[2], R. Passier[1], A. van den Berg[1], and A.D. van der Meer[1]
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[2]*University Medical Center Utrecht, NETHERLANDS*

W133f **ANGIOGENESIS DERIVED FROM SHEAR STRESS OPTIMIZED BY A MICROFLUIDIC DEVICE**
Y. Teraoka[1], M. Nakayama[1], Y. Nashimoto[1], A. Nakamasu[2], S. Hanada[3], Y. Arima[3], Y. Torisawa[1], H. Kotera[1], K. Nishiyama[3], T. Miura[2], and R. Yokokawa[1]
[1]*Kyoto University, JAPAN,* [2]*Kyushu University, JAPAN, and*
[3]*Kumamoto University, JAPAN*

W134f **CONFIGURABLE GEL GEOMETRY VIA FLOW PATTERNING FOR ANGIOGENSIS 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. Nitta[1], A. Ogawa[2], and K. Sato[1]
[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. Lee[1], M. Chung[1], B.J. Lee[1], K. Son[1], J. Ahn[1], N.L. Jeon[1], and J.H. Kim[2]
[1]*Seoul National University, KOREA and* [2]*Seoul National University Hospital, KOREA*

W137f **VASCULAR REMODELING PROCESSES IN AN INTEGRATED MICROFLUIDIC DEVICE**
N. Futai[1], T. Sano[2], M. Sumita[1], A. Takano[3], R. Yokokawa[4], and T. Miura[2]
[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. Ozasa[1], J. Won[2], S. Song[2], and M. Maeda[1]
[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. Chawla[1], M. Leonhardt[1], M.M. Modena[1], F. Lombardo[2], S.C. Bürgel[1], and A. Hierlemann[1]
[1]ETH Zürich, SWITZERLAND and [2]Swiss Tropical and Public Health Institute, SWITZERLAND

W140f **SYNCHRONIZATION OF *C. ELEGANS* THROUGH HIGH-THROUGHPUT SEPARATION OF EGGS IN A MICROFLUIDIC CHIP**

S. Sofela[1], S. Sahloul[1], T. Kwon[3], J. Han[3], M.E. Warkiani[4], and Y.-A. Song[1,2]
[1]New York University, Abu Dhabi, UAE, [2]New York University, USA, [3]Massachusetts Institute of Technology, USA, and [4]University 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. Sakuta[1], I. Takehara[2], T. Imaoka[2], K. Tsunoda[1], and K. Sato[1]
[1]Gunma University, JAPAN and [2]Daiichi Sankyo Co., Ltd., JAPAN

M144f **INTEGRATING LOCALISED CYTOKINE DETECTION INTO MICROFLUIDIC ENDOTHELIAL CELL CULTURE TO MAP RESPONSE TO SPATIAL SHEAR-STRESS GRADIENTS (SSSG)**

M. Xu[1], S. Meucci[2], G. Molema[3], U. Sauer[4], and E. Verpoorte[1]
[1]University of Groningen, NETHERLANDS, [2]Micronit Microtechnologies BV, NETHERLANDS, [3]University Medical Center Groningen, NETHERLANDS, and [4]Austrian Institute of Technology, AUSTRIA

M145f **MECHANICAL STRESS-INDUCED BLOOD CELL PRODUCTION IN A MICROFLUIDIC DEVICE**

E. Kamata[1], K. Yanagisawa[1], K. Kitajima[2], T. Hara[2], and K. Sato[1]
[1]Japan Women's University, JAPAN and
[2]Tokyo Metropolitan Institute of Medical Science, JAPAN

M146f **STRONTIUM ION MEDIATED GELATIN/ALGINATE CO-SHELLED MICROTUBES FOR HIGHLY-VIABLE 3D GLOMERULAR CELLS CULTIVATION**

J.-W. Chen[1], J.-S. Chen[1], M.-H. Chiu[1], Y.-C. Ko[2], H.-H. Hsu[2], and F.-G. Tseng[1,3]
[1]National Tsing Hua University, TAIWAN, [2]Linkou Chang Gung Memorial Hospital, TAIWAN, and [3]Academia 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 Helm[1], O. Henry[2], T. Hamkins-Indik[2], M. Cronce[2], W. Leineweber[2], M. Odijk[1], A. van der Meer[1], J. Eijkel[1], D. Ingber[2], A. van den Berg[1], and L. Segerink[1]
[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. Narciso[1], N. Contento[1], D. Hoelzle[2], and J. Zartman[1]
[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. Wang[1], P. Onck[3], and J. den Toonder[1]
[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 MICROFLIIDIC CELL CULTURE DEVICE USING LOCALIZED LAMINAR FLOWS**
S. Matsumoto[1], E. Leclerc[2], T. Maekawa[1], H. Kinoshita[1], M. Shinohara[1], K. Komori[1], Y. Sakai[1], and T. Fujii[1]
[1]University of Tokyo, JAPAN and [2]LIMMS/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. Hong[1], I. Koh[1], K. Park[2], and P. Kim[1]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA and [2]Korea 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. Fukushi[1], Y. Yajima[1], R. Utoh[1], M. Yamada[1], K. Furusawa[2], and M. Seki[1]
[1]Chiba University, JAPAN and [2]Hokkaido 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. Enright[1], E. Cheng[1], H. Yu[1], K.C. Cheung[1], and A. Ahmadi[2]
[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. Yeh[1], Y.-S. Chen[1], L.-Y. Ke[1], T.-W. Lo[1], T.-H. Hong[1],
C.-T. Yeh[2], X. Wang[3], and C.-H. Liu[1]
[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. Noren[1], A. Reece[1], B. Xia[1], Z. Zhang[1], M. Pope[2], K. Anseth[2], and J. Oakey[1]
[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. Watanabe[1], H. Katsuno[2], K. Abe[2], and N. Inagaki[2]
[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. Nishiwaki[1], H. Hida[1], I. Kanno[1], and M. Notaguchi[2]
[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. Becker[1], A. Kurtz[2], R. Mrowka[3], S. Wölfl[4], and C. Gärtner[1]
[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. Kiiski[1], P. Järvinen[1], S. Tähkä[1], P. Tammela[1], V. Jokinen[2], and T. Sikanen[1]
[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. Kim[1], A.C. Lee[1], H.-B. Lee[2], J. Kim[1], Y. Jung[1], S. Bae[1], W. Han[2], and S. Kwon[1]
[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. Pendharkar[1], Y.-T. Lu[2], C.-M. Chang[2], B.-J. Zhang[1], and C.-H. Liu[1]
[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. Ozawa[1], S. Tsutsumi[2], T. Matsuura[2], Y. Nishimoto[2], K. Kiyoshima[2], and S. Takeuchi[1]
[1]University of Tokyo, JAPAN and [2]Takeda Pharmaceutical Company Limited, JAPAN

T160g **THERAPEUTIC DRUG MONITORING FOR A PERSONALIZED ANTIBIOTHERAPY**
R. Bruch[1], C. Chatelle[1], A. Kling[2], C. Dincer[1], S. Wirth[1], S. Schumann[1], W. Weber[1], and G. Urban[1]
[1]University of Freiburg, GERMANY and [2]ETH 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. Isiksacan[1], O. Erel[2], and C. Elbuken[1]
[1]Bilkent University, TURKEY and [2]Yildirim 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]
[1]Brigham and Women's Hospital, USA, [2]Massachusetts General Hospital, USA, and [3]Harvard Medical School, USA

T161g **A MOBILE DEVICE-ENABLED POINT-OF-CARE DIAGNOSTICS FOR EARLY DETECTION OF IRON DEFICIENCY**
B. Srinivasan[1], D. O'Dell[2], J.L. Finkelstein[1], D. Erickson[1], and S. Mehta[1]
[1]Cornell University, USA and [2]VitaScan, USA

T162g **IMMUNOSENSING BY CENTRIFUGALLY AUTOMATED SURFACE PLASMON RESONANCE DETECTION BASED ON A SMARTPHONE CAMERA**
C.M. Miyazaki[1,2], D.K. Kinahan[2], R. Mishra[2], M. Ferreira[1], and J. Ducrée[2]
[1]Federal University of São Carlos, BRAZIL and [2]Dublin 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 D_3 DEFICIENCIES**
S. Vemulapati[1], E. Rey[1], D. O'Dell[2], S. Mehta[1], and D. Erickson[1]
[1]Cornell University, USA and [2]VitaScan, 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. Vaithiyanathan, K.R. Bajgiran, P. Darapaneni, R. Elkhanoufi, J.A. Dorman, and A.T. Melvin
Louisiana State University, USA

g - Diagnostics, Therapeutics, and Translational Medicine

Nucelic 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. Shen[1], Y. Hsu[2], G.-M. Ho[2], S.-C. Hung[2], and G.-B. Lee[1]
[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. Witters[1], E. Jue[1], N.G. Schoepp[1], S. Begolo[1], J. Rodriguez-Manzano[1], F. Shen[2], H. Maamar[2], A. Shur[1], and R.F. Ismagilov[1]
[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. Wan[1], T.L. Chen[1], J. Gao[1], C. Dong[1], Y. Jia[1], P.-I. Mak[1], 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. Snodgrass[1], A. Gardner[2], V. Kopparthy[1], J. Duru[1], T. Maurer[3], A. Semeere[4], E. Cesarman[2], J. Martin[3], and D. Erickson[1]
[1]Cornell University, USA, [2]Weill Cornell Medical College, USA, [3]University of California, San Francisco, USA, and [4]Infectious Diseases Institute, UGANDA

T164g **A MICROFLUIDIC CIRCULATING DEVICE TO EXPEDITE DUPLEX SPECIFIC NUCLEASE (DSN) MEDIATED MICRORNA DETECTION**

X. Zhou[1] and Y. Zeng[1,2]
[1]University of Kansas, USA and [2]University 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 ASSISSTED THERMAL CONVECTION**

M. Saito, K. Takahashi, W.V. Espulgar, and E. Tamiya
Osaka University, JAPAN

T169g **LAB-ON-FOIL BASED PORTABLE µPCR FOR POC NUCLEIC ACID TESTING OF HIV-1**

A. Ohlander[1], I. Bose[2], D. Njenda[3], U. Neogi[4], C. Kutter[2], and A. Russom[1]
[1]KTH Royal Institute of Technology, GERMANY, [2]Fraunhofer EMFT, GERMANY, [3]Universität Bundeswehr, GERMANY, and [4]Karolinska 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. Thompson[1], D. Le Roux[1], J.A. DuVall[1], C. Birch[1], D.A. Nelson[1], J. Li[1], D.L. Mills[2], A.Tsuei[1], M.G. Ensenberger[3], C. Sprecher[3], D. Storts[3], B. E. Root[1], and J.P. Landers[1]
[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 DETECION OF CHLAMYDIA TRACHOMATIS**

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[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. Becker[1], M. Singh[2], L. Lechuga[3], R. Bockstaele[4], B. Anton[1], D. Martens[5], A. Gonzalez-Guerrero[3], R. Vos[6], A. Elamin[2], and P. Bienstman[5]
[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. Naganawa[1], T. Yasui[1,2], T. Yanagida[3], N. Kaji[1,2], M. Kanai[3], K. Nagashima[3], T. Kawai[4], 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. Phillips[1], T.J. Moehling[1], S. Bhadra[2], A.D. Ellington[2], and J.C. Linnes[1]
[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. Cheung[1], X. Wei[1,2], D. Martins[1], 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. Wu[3], 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 AMYLOYD 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. Mori[1], T. Fukazawa[2], A. Yoshizaki[2], K. Mawatari[1], and T. Kitamori[1]
[1]University of Tokyo, JAPAN and [2]University 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. Simeone[1], M.A. Lateef[1], M. Cahuzac[1], B. Péant[1], E. Carmona[1], J. Kendall-Dupont[1], A.M. Orimoto[1], D. Provencher[1], F. Saad[1], A.-M. Mes-Masson[1], and T. Gervais[1,2]
[1]Université de Montréal, CANADA and [2]École Polytechnique Montréal, CANADA

M174g **SURFACE BINDING SITE DENSITY DETERMINATION IN A NANOFLUIDIC IMMUNOASSAY DEVICE ACHIEVING TOTAL CAPTURE**

C.J. Galvin[1], K. Shirai[2], M. Kakuta[2], and A.Q. Shen[1]
[1]Okinawa Institute of Science and Technology, JAPAN and [2]Sysmex Corporation, JAPAN

T175g **ALZHEIMER'S DISEASE SPECIFIC MARKERS DETECTED WITH MICROFLUIDIC MALDI MASS SPECTROMETRY (MIMAS)**

J. Cruz Villarreal[1], S. Williams[1], A. Egatz-Gomez[1], P. Coleman[1], D. Nedelkov[2], M.R. Sierks[1], and A. Ros[1]
[1]Arizona State University, USA and [2]Isoformix, USA

T176g **FUNCTIONAL DIAGNOSTICS FOR PRECISION MEDICINE WITH SILICON PHOTONIC MICRORING RESONATOR ARRAYS**

J.H. Wade[1], J.N. Sarkaria[2], and R.C. Bailey[1]
[1]University of Michigan, USA and [2]Mayo 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. Bavil 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. Wakai[1], S. Ueno[1,2], and T. Ichiki[1,2]
[1]University of Tokyo, JAPAN and [2]Innovation Center of NanoMedicine (iCONM), JAPAN

W173g **SPATIOTEMPORAL PHOTOTRIGGERED CONTROL OF BIOCHEMICAL REACTION FOR ON-CHIP ULTRAHIGH-THROUGHPUT SCREENING OF ENZYME ACTIVITIES**
S. Ueno[1] and T. Ichiki[2]
[1]Innovation Center of NanoMedicine (iCONM), JAPAN and [2]University 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. Clark[1], K. Xu[2], O. Scott[3], J. Hickey[3], S. Woolf[1], and J.P. Landers[1]
[1]University of Virginia, USA, [2]Pacific Northwest National Laboratory, USA, and [3]MicroLab Inc., USA

W175h **LABEL-FREE ACOUSTOPHORETIC ENRICHMENT OF MONONUCLEAR CELLS FROM BLOOD**
A. Urbansky[1], P. Ohlsson[1,2], A. Lenshof[1], S. Scheding[1,3], and T. Laurell[1,4]
[1]Lund University, SWEDEN, [2]AcouSort AB, SWEDEN,
[3]Skåne University Hospital, SWEDEN, and [4]Dongguk 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. Lee[1], S. Jang[2], G.Y Jung[2], and C.-S. Lee[1]
[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. Isokawa[1], K. Nakanishi[2], T. Kanamori[1], H. Zhuang[1], H. Yamazaki[2], T. Sugaya[2], D.H. Yoon[2], T. Sekiguchi[2], T. Funatsu[1], S. Shoji[2], and M. Tsunoda[1]
[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. Bayat[1], S. Zareian[1,2], and P. Rezai[1]
[1]York University, CANADA and [2]Sharif 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. Hu[1], Y.-M. Feng[1], L.-L. Zhou[1], P. Fang[2], Q. Fang[2], and J. Fang[1]
[1]China Medical University, CHINA and [2]Zhejiang 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. Schmidt[2], and A. Ros[1]
[1]Arizona State University, USA and [2]Göttingen University, GERMANY

W178h **A ZINC-FINGER-PROTEIN-BASED RAPID MICROFLUIDIC HOMOGENOUS ELECTROPHORESIS AFFINITY ASSAY FOR QUANTITATIVE GENE ANALYSIS**
N.G. Arega[1], W.H. Heard[2], M.-S. Kim[2], and D. Kim[1]
[1]Myongji University, KOREA and [2]Western Kentucky University, USA

W179h **ENTROPIC TRAP-BASED TUNABLE SHORT-PASS FILTER TO RECOVER LONG DNA FOR GENOMIC APPLICATIONS**
P. Agrawal[1], Z. Bognár[2], and K.D. Dorfman[1]
[1]University of Minnesota, USA and
[2]Budapest University of Technology and Economics, HUNGARY

W180h **MOLECULE DEPENDENET TIME OF FLIGHT IDENTIFICATION OF NUCLEOTIDES: AN APPROACH FOR SINGLE-MOLECULE DNA SEQUENCING**
C.A. Amarasekara[1], C. O'Neil[2], K.M. W-Ratnayake[1], B. Gross[1], and S.A. Soper[1]
[1]University of Kansas, USA and [2]University 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. Lunte[1], S.M. Gunawardhana[1], and R.A. Saylor[2]
[1]University of Kansas, USA and [2]University of South Carolina, USA

h - Separations and Reactions

Other

M183h **MICROFLUIDIC ADAPTATION OF WET-DRY CYCLES IN PREBIOTIC CHEMISTRY ANALOG EXPERIMENTS**
M. Adiraj Iyer[1], D. Baum[2], and D. Eddington[1]
[1]University of Illinois, Chicago, USA and [2]University 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. Lee[1], Y. Wang[1], C.J. Garson[1], G.J. Klarmann[2], B. Prabhakarpandian[1], K. Pant[1], L.M. Alvarez[2,3], and E. Lai[4,5]
[1]CFD Research Corporation, USA, [2]National Cancer Institute, USA, [3]United States Military Academy, USA, [4]Johns Hopkins University, USA, and [5]United States Army Medical Research and Material Command, USA

M189h **MICROFLUIDIC SORTING OF CELL VIABILITY BASED ON STIFFNESS**
M. Islam[1], T. Bongiorno[1], N. Stone[1], A. Liu[1], W. Lam[1,2], A. Alexeev[1], E.K. Waller[2], and T. Sulchek[1]
[1]Georgia Institute of Technology, USA and [2]Emory 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. Syed[1], M. Rafeie[1], D. Vandamme[1,2], R. Henderson[1], and M.E. Warkiani[3]
[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. Lenshof[1], A. Urbansky[1], S. Scheding[2], 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. Garcia[1], R. Khojah[2], D. Di Carlo[2], and S. Pennathur[1]
[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. Kim[1], X. Chen[1,3], Y. Liu[1], and S. Takayama[1,2]
[1]University of Michigan, USA, [2]Georgia Institute of Technology, USA, and [3]Ocean 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. Feng[1], A.M. Skelley[2], A.G. Anwer[1], G. Liu[1], and D.W. Inglis[1]
[1]Macquarie University, AUSTRALIA and [2]GPB 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-Elezgarai[1], A. Espona-Noguera[1], J. Saez[1], A. Cañibano-Hernández[1], G. Orive[1], R.M. Hernandez[1], L. Saenz del Burgo[1], F. Benito-Lopez[1], J. Ciriza[1], J.L. Pedraz[1], and L. Basabe-Desmonts[1,2]
[1]University of the Basque Country, SPAIN and [2]IKERBASQUE, 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. Nampoothiri[1], M.S. Seshasayee[2], V. Srinivasan[3], M.S. Bobji[1], and P. Sen[1]
[1]Indian Institute of Science, INDIA, [2]National Institute of Technology Tiruchirappalli, INDIA, and [3]University 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. Wu[1], W.-Y. Chen[1], H.-S. Wang[1], C.-P. Chang[1], and F.-G. Tseng[1,2]
[1]National Tsing Hua University, TAIWAN and [2]Academia 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 PLATFOM 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. Pang[1], Y. Gao[1], M. Zhu[2], and S. Choi[1]
[1]State University of New York, Binghamton, USA and
[2]State 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. Porter[1], M.D. Tarn[1], S.N.F. Sikora[1], M.E. Salter[2], T.W. Wilson[1], T.F. Whale[1], J. Shim[1], and B.J. Murray[1]
[1]University of Leeds, UK and [2]Stockholm 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. Shimada[1], T. Yasui[1,2], A. Hibara[3], H. Yasaki[1], T. Yanagida[4], M. Hara[1], N. Kaji[1,2], M. Kanai[4], K. Nagashima[4], T. Kawai[5], and Y. Baba[1,6]
[1]Nagoya University, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN, [3]Tohoku University, JAPAN, [4]Kyushu University, JAPAN, [5]Osaka University, JAPAN, and [6]National 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. Liu[1], W. -B. Lee[1], Y. -C. Tsai[1], L. -Y. Hung[1], C. -Y. Fu[1], Y. -J. Chuang[2], K. -F. Hsu[2], and G. -B. Lee[1]
[1]National Tsing Hua University, TAIWAN and
[2]National 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. Cantrell[1], M. Cato[1], Z. Duca[1], J. Muller[1], D. Eichstedt[1], B. Schmidt[1], S. Foreman[2], J. Kim[2], P. Putman[3], H. Jiao[4], E. Jensen[4], H. Mehrabani[4], and A. Stockton[1]
[1]Georgia Institute of Technology, USA, [2]Texas Tech University, USA, [3]Sierra Lobo, Inc., USA, and [4]HJ 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. Matsushita[1], B. Aileen[1], A. Kirishima[2], and T. Tsukahara[1]
[1]Tokyo Institute of Technology, JAPAN and [2]Tohoku University, JAPAN

i - Other Applications for Microfluidics

Paper µFluidics

M199i **AUTOMATIC MULTISTEP DIGITAL ASSAY IN A SINGLE SHEET OF 3-DIMENSAIONAL 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. Cardoso[1], F.R. de Souza[1], P.T. Garcia[1], D. Rabelo[1], C.S. Henry[2], and W.K.T. Coltro[1]

[1]Federal University of Goias, BRAZIL and [2]Colorado State University, USA

M201i **LOW-COST PAPER DEVICE FOR FAST GENDER IDENTIFICATION ON CRIME SCENES**

E. Azuaje-Hualde[1], S. Arroyo-Jimenez[1], M. Martínez de Pancorbo[1], G. Garai-Ibabe[1], F. Benito-Lopez[1], and L. Basabe-Desmonts[1,2]

[1]University of the Basque Country, SPAIN and [2]IKERBASQUE, 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. Hong[1], G.I.J. Salentijn[1,3], and E. Verpoorte[1]

[1]University of Groningen, NETHERLANDS, [2]Universiti Malaysia, MALAYSIA, and [3]TI-COAST, NETHERLANDS

T204i **PAPER-BASED CRYOPRESERVATION**

R. Alnemari[1], P.S. Sukumar[1], R. Rezgui[1], and M.Q. Qasaimeh[1,2]

[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

T205i **TWO-PHASE COUNTER FLOW ON PAPER**

G.I.J. Salentijn[1,2], M. Grajewski[1], and E. Verpoorte[1]

[1]University of Groningen, NETHERLANDS and [2]TI-COAST, NETHERLANDS

W198i **A REUSABLE PAPER/POLYMER HYBRID PLUG-AND-PLAY MICROFLUIDIC PLATFORM FOR HIGH-SENSITIVITY IMMUNOASSAY**

S.T. Sanjay[1], M. Li[1,2], and X. Li[1]

[1]University of Texas, El Paso, USA and [2]Beijing 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. Garcia[1], E.F.M. Gabriel[1], G.S. Pessôa[2], J.C. Santos Júnior[2], P.C. Mollo Filho[3], R.B.F. Guidugli[3], N.F. Hoehr[2], M.A.Z. Arruda[2,4], and W.K.T. Coltro[1,4]
[1]Universidade Federal de Goiás, BRAZIL, [2]Universidade Estadual de Campinas, BRAZIL, [3]Superintendência da Polícia Técnico Científica, BRAZIL, and [4]Instituto Nacional de Ciência e Tecnologia de Bioanalítica, BRAZIL

j - Microfluidics in Biology

Others

M203j **DROPLET ENCAPSULATION TO STUDY THERAPEUTIC CELL MIGRATION**
A. Benavente-Babace[1], K. Haase[2], and M. Godin[1]
[1]University of Ottawa, CANADA and [2]Massachusetts Institute of Technology, USA

M204j **SELF-PRIMING, VACUUM-SEALED "READY-TO-USE" MICROFLUIDICS**
L.J. Millet[1,2], J. Aufrecht[2], J. Labbé[1], M.J. Doktycz[1,2], and S.T. Retterer[1,2]
[1]Oak Ridge National Laboratory, USA and [2]University of Tennesse, USA

T206j **MOSAIC IMMUNOASSAYS INTERGRATED WITH MICROFLUIDIC CHANNELS FOR HIGH-THROUGHPUT PARALLEL DETECTION**
F. Zheng[1], E. He[1,2], L. Cai[1], D. Huang[1], B. Yu[1], and Z. Li[1]
[1]Peking University, CHINA and [2]Tsinghua 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

j - Microfluidics in Biology

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. Malaquin[4], 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

k - Late News

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. Okawa[2], Y. Hiroi[3], J. Katayama[1,3], T. Funakoshi[4], Y. Yanagida[1], and T. Ohba[1]

[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. Echelmeier[1], J. Coe[1], C.E. Conrad[1], G. Nelson[1], J. Cruz Villarreal[1], U. Weierstall[1], J. Spence[1], S. Köster[2], P. Fromme[1], and A. Ros[1]

[1]Arizona State University, USA and [2]University of Goettingen, GERMANY

M211k **CONCENTRATION POLARIZATION TO MEASURE NANO-PORE ACCESSIBILITY**

M. Solsona[1], A.-E. Nieuwelink[2], V.A. Papadimitriou[1], J.C.T. Eijkel[1], F. Meirer[2], L. Abelmann[1,3], W. Olthuis[1], B.M. Weckhuysen[2], and A. van den Berg[1]

[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. Lin[1], X. Huang[1], X. Xie[1,2], Y. Zhu[1], X. Wu[1], S. Wang[1], and M.R. Hoffmann[1]

[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. Shimizu[1], F. Todão[2], A. Gobbi[2], O. Oliveira Jr.[1], C.D. Garcia[3], and R.S. Lima[2]
[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. Kim[1], J. Nam[2], I.-B. Jung[1], Y.-J. Won[1], W.K. Seong[1], D.-S. Shin[2], and K.-N. Lee[1]
[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. Liu[1], M.U. Caglar[2], Z. Mao[1], C.O. Wilke[2], T.J. Huang[1,3], and C.E. Cameron[1]
[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. Reyes[1]
[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. Awan[2], Q.M. Khan[2], and N. Pamme[1]
[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. Tay[1], R. Dalan[2], B.O. Boehm[1,2], and H.W. Hou[1]
[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. Humayun[1], C.-W. Chow[1,2], and E.W.K. Young[1]
[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. Li[1], N.P. Macdonald[1], R.M. Guijt[2], and M.C. Breadmore[1]
[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. Burger[1], J. Schemberg[2], T. Förster[2], M. Specht[1], M. Rombach[1], N. Paust[1], R. Zengerle[1,3], and M. Karle[1]
[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. Chien[1] and I. Yamaguchi[2]
[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. Lin[1], D.S. Juang[1], and C.-H. Hsu[1,2]
[1]*National Health Research Institutes, TAIWAN and*
[2]*National Chung Hsing University, TAIWAN*

T209k **A MICROFLUDIC 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 μPADS**
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. Guo[1], H.D. Xi[1], and S.H. Tan[2]
[1]Northwestern Polytechnical University, CHINA and [2]Griffith 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

T214k **DESIGN OF PROGRAMMABLE NANOPORE BY USING β-SHEET PEPTIDES**
K. Shimizu[1], N. Saigo[1], Y. Sekiya[1], S. Sakashita[2], Y. Hamada[2], K. Usui[2], and R. Kawano[1]
[1]Tokyo University of Agriculture and Technology, JAPAN and [2]Konan 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. Uesugi[1], H. Mayama[2], and K. Morishima[1]
[1]Osaka University, JAPAN and [2]Asahikawa Medical University, JAPAN

T217k **ELECTROKINETIC SCANNING PROBE FOR BIOMOLECULAR ANALYSIS**
N. Ostromohov[1,2], M. Bercovici[1], and G.V. Kaigala[2]
[1]Israel Institute of Technology (Technion), ISRAEL and [2]IBM 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
Brigham Young University, USA

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. Lee[2], and A. Zhang[1]
[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. Weltin[1], K. Joseph[2], J. Kieninger[1], U.G. Hofmann[2], and G.A. Urban[1]
[1]*University of Freiburg, GERMANY and*
[2]*University Medical Center Freiburg, GERMANY*

T222k **METACHRONAL MOTION OF MAGNETICALY 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. Kaigala[1], and M. Bercovici[2]
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[2]*Israel Institute of Technology (Technion), ISRAEL*

T228k **RAPID AND SENSITIVE DETECTION OF BACTERIA PATHOGEN BASED ON MICROFLUIDIC ENRICHMENT WITH LABEL-FREE NANOBIOSENSOR**

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T229k **RECONFIGURABLE MAGNETIC VALVE ARRAYS: A TOOL FOR THE MULTIPLEXED TESTING OF COMBINATION THERAPIES ON SPHEROIDS**

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T230k **SLIDING ASSEMBLY OF COSCINODISCUS SPECIES DIATOM FRUSTULE ON SILICON SUBSTRATE**

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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
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W207k **AN AUTOMATED MODULAR MICROSYSTEM FOR ENZYMATIC DIGESTION WITH GUT-ON-A-CHIP APPLICATIONS**

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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. Rashed[1], K.C. Grome[1], G. Gasser[2], S.P. Hendricks[3], and S.J. Williams[1]
[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. Chang[1], and M.-S. Chun[2]
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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. Ducrée
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**

A.M. Reichmuth[1], V. Gatterdam[1], A. Frutiger[1], K.-P. Stengele[2], C. Fattinger[3], and J. Vörös[1]
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W216k **HIGH-THROUGHPUT OIL-COVERED DROPLET ARRAY FOR PARTICLE AND CELL CAPTURE**
H. Wu and J. Wu
Shanghai University, CHINA

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
Sogang University, KOREA

W218k **LIPOSOME-BASED RNA DETECTION SYSTEM**
M. Tsugane[1,2] and H. Suzuki[1]
[1]Chuo University, JAPAN and [2]Japan Society for the Promotion of Science, JAPAN

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. Ducrée
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
Carnegie Mellon University, USA

W223k **OPTICAL REAL-TIME MONITORING OF ENDOTHELIAL EXPRESSION MARKERS AT SINGLE-CELL LEVEL ENABLED BY A CENTRIFUGAL MICROFLUIDIC PLATFORM**
D.A. King[1], P. Cahill[1], D. Kernan[1], A. Julius[1], D. Canning[1], K. Healy[1], U. Simonsen[2], and J. Ducrée[1]
[1]Dublin City University, IRELAND and [2]Aarhus University, IRELAND

W224k **PLASMONIC INTERDIGITATED ELECTRODES (PIDEs) FOR *IN VITRO* ANALYSIS OF CELLS**
A. Kundu, S. Varma, J. Thomas, and S. Rajaraman
University of Central Florida, USA

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
University of Central Florida, USA

W227k **MAGNETOPHORETIC SORTING OF FLUID CATALYTIC CRACKING PARTICLES**

M. Solsona[1], A.-E. Nieuwelink[2], M. Odijk[1], F. Meirer[2], L. Abelmann[1,2,3], W. Olthuis[1], B.M. Weckhuysen[2], and A. van den Berg[1]
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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**

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