

The 21st International Conference on Miniaturized
Systems for Chemistry and Life Sciences



μ TAS 2017

SAVANNAH ■ GEORGIA

OCTOBER 22-26, 2017

FINAL PROGRAM

Conference Chairs:

Abraham Lee, *University of California, Irvine, USA*
Don DeVoe, *University of Maryland, College Park, USA*

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CONFERENCE AT A GLANCE

SUNDAY, OCTOBER 22			
08:30	Workshop Registration		
09:00 - 17:00	Morning & Afternoon Workshops		
17:00 - 19:00	Conference Registration and Check-In		
17:00 - 19:00	Wine & Cheese Welcome Reception		
MONDAY, OCTOBER 23			
07:00 - 18:00	Registration		
08:00 - 08:30	Opening Remarks		
08:30 - 09:30	PLENARY PRESENTATION I George Whitesides, <i>Harvard University, USA</i>		
09:30 - 10:15	PLENARY PRESENTATION II Yoshinobu Baba, <i>Nagoya University, JAPAN</i>		
10:15 - 10:45	Break: Exhibit and Poster Inspection		
10:45 - 12:05	SESSION 1A1 Disease Diagnostics	SESSION 1B1 DNA Analysis	SESSION 1C1 Nanoparticle Synthesis
12:05 - 13:35	Lunch		
13:35 - 14:45	SESSION 1A2 3D Printing - Fundamentals	SESSION 1B2 Antibiotic Resistance	SESSION 1C2 Nanowire Synthesis
	KEYNOTE PRESENTATION G.P. Nordin	KEYNOTE PRESENTATION T.-H. Wang	KEYNOTE PRESENTATION W. Hu
14:45 - 16:45	Poster Session 1		
14:45 - 16:45	Exhibitor Industrial Stage 1		
16:45 - 17:45	SESSION 1A3 <i>C. Elegans</i>	SESSION 1B3 Electrokinetic Separations	SESSION 1C3 Angiogenesis
18:00 - 19:30	MicroTAS Student Mixer - Trivia Night		
TUESDAY, OCTOBER 24			
07:55 - 18:15	Registration		
08:25 - 08:30	Announcements		
08:30 - 09:15	PLENARY PRESENTATION III Chwee Teck Lim, <i>National University of Singapore, SINGAPORE</i>		
09:15 - 09:30	Transition		
09:30 - 10:30	SESSION 2A1 3D Printing - Applications	SESSION 2B1 Cancer Analysis	SESSION 2C1 Droplets & Digital Microfluidics
10:30 - 11:00	Break: Exhibit and Poster Inspection		
11:00 - 12:30	MicroTAS 2017 Shark Tank Competition		
12:30 - 13:30	Lunch		
13:30 - 15:00	SESSION 2A2 Neuroscience	SESSION 2B2 Sensing/Sensors	SESSION 2C2 Droplet Microfluidic Fundamentals
	KEYNOTE PRESENTATION C. Villard	KEYNOTE PRESENTATION P. Yager	KEYNOTE PRESENTATION C. Yang
15:00 - 17:00	Poster Session 2		
15:00 - 17:00	Exhibitor Industrial Stage 2		
17:00 - 18:00	SESSION 2A3 Single Cell Analysis I	SESSION 2B3 Paper Microfluidics	SESSION 2C3 Bacteria Analysis & Diagnostics

CONFERENCE AT A GLANCE

WEDNESDAY, OCTOBER 25			
07:30 - 17:45	Registration		
08:00 - 08:05	Announcements		
08:05 - 08:50	PLENARY PRESENTATION IV Rebecca Richards-Kortum, <i>Rice University, USA</i>		
08:50 - 09:10	Analytical Chemistry - Young Innovator Award Presentation		
09:10 - 09:30	Dolomite and Lab on a Chip - Pioneers in Miniaturization Lectureship Prize and Presentation		
09:30 - 10:00	Break: Exhibit and Poster Inspection		
10:00 - 11:20	SESSION 3A1 Single Cell Analysis II	SESSION 3B1 Brain-on-a-Chip	SESSION 3C1 Droplet-Based Assays
11:20 - 12:20	Lunch		
11:45 - 12:20	Hocheun Award Finalist Presentations		
12:20 - 13:05	PLENARY PRESENTATION V Emmanuel Delamarche, <i>IBM Zurich, SWITZERLAND</i>		
13:05 - 13:15	MicroTAS 2018 Announcement		
13:15 - 13:25	Transition		
13:25 - 14:35	SESSION 3A2 Cell Analysis & Manipulation	SESSION 3B2 Engineered Cell Systems	SESSION 3C2 Plant Analytics
	KEYNOTE PRESENTATION S.K.Y. Tang	KEYNOTE PRESENTATION A.M. Taylor	KEYNOTE PRESENTATION L. Dong
14:35 - 16:35	Poster Session 3		
16:35 - 17:35	SESSION 3A3 Cancer Diagnostics	SESSION 3B3 Sample Prep for Cell Isolation	SESSION 3C3 Fluorescence Assays
18:30 - 21:30	Wednesday Evening Dinner Cruise on the Georgia Queen		
THURSDAY, OCTOBER 26			
08:00 - 12:45	Registration		
08:30 - 09:30	SESSION 4A1 Cell Mechanics I	SESSION 4B1 Sampling & Sample Prep	SESSION 4C1 Nanopore Diagnostics
09:30 - 09:40	Transition		
09:40 - 10:40	SESSION 4A2 Cell Mechanics II	SESSION 4B2 Portable Diagnostics	SESSION 4C2 Drug Screening
10:40 - 11:15	Break: Exhibit and Poster Inspection		
11:15 - 12:00	PLENARY PRESENTATION VI Michel Versluis, <i>University of Twente, NETHERLANDS</i>		
12:00 - 12:10	CHEMINAS - Young Researcher Poster Awards		
12:10 - 12:20	Lab on a Chip - Widmer Poster Award		
12:20 - 12:30	NIST and Lab on a Chip - Art in Science Award		
12:30 - 12:40	Dolomite and Lab on a Chip - Video Award		
12:40 - 12:50	Hochuen - Portable Microfluidic Device Awards		
12:50 - 13:00	IMT Masken und Teilungen AG - Microfluidics on Glass Award		
13:00	Closing Remarks - Conference Adjourns		

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Technical Program:

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Country Road Lined with Oaks

PLENARY SPEAKERS

MONDAY, OCTOBER 23

08:30 **George Whitesides**, *Harvard University, USA*09:30 **Yoshinobu Baba**, *Nagoya University, JAPAN*

TUESDAY, OCTOBER 24

08:30 **Chwee Teck Lim**, *National University of Singapore, SINGAPORE*

WEDNESDAY, OCTOBER 25

08:05 **Rebecca Richards-Kortum**, *Rice University, USA*12:20 **Emmanuel Delamarche**, *IBM Research - Zürich, SWITZERLAND*

THURSDAY, OCTOBER 26

11:15 **Michel Versluis**, *University of Twente, NETHERLANDS*

KEYNOTE SPEAKERS

MONDAY, OCTOBER 23

13:35 **Session 1A2 - 3D Printing - Fundamentals****Greg P. Nordin**, *Brigham Young University, USA*13:35 **Session 1B2 - Antibiotic Resistance****Tza-Huei (Jeff) Wang**, *Johns Hopkins University, USA*13:35 **Session 1C2 - Nanowire Synthesis****Wenchuang (Walter) Hu**, *University of Texas, Dallas, USA*

TUESDAY, OCTOBER 24

13:30 **Session 2A2 - Neuroscience****Catherine Villard**, *Institut Curie, FRANCE*13:30 **Session 2B2 - Sensing/Sensors****Paul Yager**, *University of Washington, USA*13:30 **Session 2C2 - Droplet Microfluidic Fundamentals****Chaoyong Yang**, *Xiamen University, CHINA*

WEDNESDAY, OCTOBER 25

13:25 **Session 3A2 - Cell Analysis & Manipulation****Sindy K.Y. Tang**, *Stanford University, USA*13:25 **Session 3B2 - Engineered Cell Systems****Anne Marion Taylor**, *University of North Carolina, Chapel Hill, USA*13:25 **Session 3C2 - Plant Analytics****Liang Dong**, *Iowa State University, USA*

Parallel Oral Sessions

Each day papers will be presented in three parallel sessions. There will be a total of 33 oral sessions throughout the Conference.

Guide to Understanding Session Numbering

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

Session Number: **1A1**

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

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

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

- A** = Chatham Ballroom A/B, Second Floor
- B** = Chatham Ballroom C, Second Floor
- C** = Room 203 - 205, Second Floor

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

- 1** = Concurrent Session 1 - morning
- 2** = Concurrent Session 2 - late-morning
- 3** = Concurrent Session 3 - afternoon

Posters

Three poster sessions will be held in Exhibit Hall A, First Floor on Monday, Tuesday and Wednesday. All posters are listed with their assigned number and day that they are on display. Authors will be available for questions during their appointed time. Posters are color coded by day and classification to coordinate with the poster floor plan on page 121.

Guide to Understanding Poster Numbering

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

Poster Number: **M001a**

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

- | | | |
|-------------------|--------------------|----------------------|
| M = Monday | T = Tuesday | W = Wednesday |
|-------------------|--------------------|----------------------|

The second character (i.e., **001**) is the poster board position on the floor plan. The last character (i.e., **a**) shows the classification color of the poster.

CLASSIFICATION

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

SUNDAY, OCTOBER 22

08:30 Workshop Registration

09:00 - 12:00 Morning Workshops

- Workshop 1 COMMERCIALIZATION OF MICROFLUIDICS**
Holger Becker
microfluidic ChipShop, GERMANY
- Workshop 2 LAB-ON-A-CHIP (LOC) TECHNOLOGIES FOR THE ISOLATION OF CIRCULATING MARKERS: APPLICATION IN LIQUID BIOPSIES**
Steven Soper
University of Kansas, USA
- Workshop 3 3D PRINTING MICROFLUIDIC CHIPS**
Michael Breadmore¹, Rosanne Guijt², Nial MacDonald¹, and Greg Nordin³
¹University of Tasmania, AUSTRALIA, ²Deakin University, AUSTRALIA, and ³Brigham Young University, USA
- Workshop 4 CARING FOR CELLS IN MICROSYSTEMS: ENSURING CELL-SAFE DEVICE DESIGN AND OPERATION**
Joel Voldman and 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: FLEXIBLE, MODULAR AND BIOCOMPATIBLE LABS-ON-CHIP DEVICES**
Werner Haselmayr, Robert Wille, and Andreas Grimmer
Johannes Kepler University Linz, AUSTRIA

14:00 - 17:00 Afternoon Workshops

- Workshop 7 MINIATURIZATION OF BIOMOLECULAR DIAGNOSTICS: HYBRID APPROACHES ACROSS ELECTRONICS, PHOTONICS AND MICROFLUIDICS**
Mehdi Javanmard¹, Kaushik Sengupta², Sam Emaminejad³, Jeff Zahn¹, Stephen Chou², Ken Shepard⁴, and Shan Wang⁵
¹Rutgers University, USA, ²Princeton University, USA, ³University of California, Los Angeles, USA, ⁴Columbia University, USA, and ⁵Stanford University, USA
- Workshop 8 INERTIAL MICROFLUIDICS**
Jian Zhou and Ian Papautsky
University of Illinois, Chicago
- Workshop 9 FUNCTIONAL DROPLETS FOR FEMTOLITER-SCALE SYNTHETIC BIOLOGY**
Manish Biyani
Japanese Advanced Institute of Science and Technology (JAIST), JAPAN
- Workshop 10 INFLAMMATION RESEARCH ENABLED BY MICROFLUIDICS**
Daniel Irimia
Harvard Medical School, USA
- Workshop 11 INCORPORATING THE NEEDS OF USERS INTO POINT-OF-CARE DIAGNOSTICS**
Jacqueline Linnes¹, Elizabeth Johansen², and Ashok A. Kumar³
¹Purdue University, USA, ²Spark Health Design, USA, and ³Jana Care, USA

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

Wine & Cheese Welcome Reception

09:00 - 12:00

Westin Savannah Harbor Golf Resort & Spa



Benches and walkways in a nice southern park in Savannah

MONDAY, OCTOBER 23

07:00 Registration

08:00 Opening Remarks
CBMS President
Teruo Fujii, *University of Tokyo, JAPAN*

MicroTAS 2017 Conference Chairs
Abraham P. Lee, *University of California, Irvine, USA*
Don L. DeVoe, *University of Maryland, College Park, USA*

PLENARY PRESENTATION I - Interview

Chatham Ballroom A/B, Second Floor

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

PLENARY PRESENTATION II

Chair: Sabeth Verpoorte, *University of Groningen, NETHERLANDS*

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



Savannah, Georgia - riverfront promenade at twilight

Session 1A1 - Disease Diagnostics

Chair: Sally Peyman, *University of Leeds, UK*

Chatham Ballroom A/B, Second Floor

- 10:45 MULTIPLEXED CYTOKINE DETECTION FOR IMMUNODIAGNOSTICS USING SILICON PHOTONIC MICRORING RESONATOR ARRAYS**
H.M. Robison^{1,2}, P. Escalante³, E. Valera², C.L. Erskine³, L. Auvi², H.C. Sasieta³, C. Bushell², M. Welge², 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 (E2LISA) FOR POINT-OF-CARE DIAGNOSIS OF TUBERCULOSIS USING GLYCAN BIOMARKERS**
A. Sarkar^{1,2}, L.L. Lu¹, J. Han², and G. Alter¹
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. Hin¹, B. Lopez-Jimena², M. Bakheit³, V. Klein¹, S. Stack⁴, C. Fall⁵, A. Sall⁵, K. Enan⁶, S. Frischmann³, L. Gillies⁴, M. Weidmann², S. Goethel⁷, V. Rusu⁷, O. Strohmeier^{1,8}, N. Paust^{1,8}, R. Zengerle^{1,8}, and K. Mitsakakis^{1,8}
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

Chair: Sumita Pennathur, *University of California, Santa Barbara, USA*

Chatham Ballroom C, Second Floor

- 10:45 DNA METHYLATION STATUS DETECTION BY MELTING CURVE ANALYSIS IN DROPLET-BASED MICROCHIP**
F.-W. Liu¹, H.-F. Liao¹, S.-P. Lin^{1,2}, and Y.-W. Lu¹
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
Chair: Noritada Kaji, Nagoya University, JAPAN

Room 203 - 205

- 10:45 INTEGRATED MICROFLUIDIC CHIP FOR PLASMA SYNTHESIS OF NANOPARTICLES AND ON-SITE DETECTIONS OF HG2+ IONS**
D.-E. Li and C.-H. Lin
National Sun Yat-sen University, TAIWAN
- 11:05 PARALLELIZED MICROFLUIDICS FOR LARGE-SCALE SYNTHESIS OF MULTICOMPONENT NANOPARTICLES**
M.J. Toth and Y. Kim
Georgia Institute of Technology, USA
- 11:25 MICROFLUIDIC STUDIES OF BI-PHASIC LIGAND EXCHANGE OF SEMICONDUCTOR NANOCRYSTALS**
M. Abolhasani^{1,2}, Y. Shen¹, C.W. Coley¹, and K.F. Jensen¹
¹*Massachusetts Institute of Technology, USA and*
²*North Carolina State University, USA*
- 11:45 HIGH-THROUGHPUT, CONTROLLABLE SYNTHESIS OF NANOMATERIALS ENABLED BY A SHARP-EDGE-BASED ACOUSTOFLUIDIC MICROMIXER**
S. Zhao¹, P.-H. Huang¹, M. Wu², N. Nama², and T.J. Huang¹
¹*Duke University, USA and* ²*Pennsylvania State University, USA*

12:05 - 13:35 Lunch - Exhibit Hall B, First Floor

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Session 1A2 - 3D Printing - Fundamentals Chair: David Juncker, McGill University, CANADA

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, GERMANY

Session 1B2 - Antibiotic Resistance Chair: Govind Kaigala, IBM Research Laboratory - Zurich, SWITZERLAND

Chatham Ballroom C, Second Floor

- 13:35 Keynote Presentation**
ALL-IN-ONE DROPLET MICROFLUIDIC CHIPS FOR BIOMOLECULAR ASSAYS
T.-H.J. Wang
Johns Hopkins University, USA
- 14:05 UNRAVELING BACTERIAL NETWORKS AND THEIR ANTIMICROBIAL SUSCEPTIBILITY ON SILICON MICROARCHITECTURES USING INTRINSIC PHASE-SHIFT SPECTROSCOPY**
H. Leonard¹, Y. Haimov¹, L. Holtzman¹, S. Halachmi², O. Nativ², and E. Segal¹
¹*Technion - Israel Institute of Technology, ISRAEL* and
²*Bnai Zion Medical Center, ISRAEL*
- 14:25 DIRECT AND RAPID ANTIMICROBIAL SUSCEPTIBILITY TESTING FOR EXPEDITE TREATMENT OF BLOOD STREAM INFECTION**
H.Y. Jeong¹, J. Choi², G.Y. Lee¹, S. Han², T. Lim^{1,2}, S. Han², B. Jin², H. Kim², S. Song², S. Park², E.-G. Kim², D.Y. Kim², T.S. Kim³, and S. Kwon^{1,2,3}
¹*Seoul National University, KOREA*, ²*Quantamatrix Inc., KOREA*, and
³*Seoul National University Hospital, KOREA*

Session 1C2 - Nanowire Synthesis Chair: Rebecca Pompano, University of Virginia, USA

Room 203 - 205, Second Floor

- 13:35 Keynote Presentation**
SERPENTINE SI NANOWIRE BIOSENSOR FOR DIGITAL SENSING OF SINGLE VIRUS
P. Zang¹, Y. Liang¹, H. Wang¹, J. Tao², X. Zeng², D. Zhou^{1,2}, and **W. Hu^{1,2}**
¹*University of Texas, Dallas, USA* and ²*Fudan University, CHINA*
- 14:05 CROSS-MEMBRANE ELECTRICAL DETECTION OF DNA**
M. Guo¹, I. Hernández-Neuta², N. Madaboosi², M. Nilsson², and W. van der Wijngaart¹
¹*KTH Royal Institute of Technology, SWEDEN* and
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 36.

14:45 - 16:45

Exhibitor Industrial Stage 1 River Concourse, First Floor

Chair: James P. Landers, *University of Virginia, USA*

- 1a - Microfluidic ChipShop GmbH
- 1b - ALine, Inc.
- 1c - Cellix LTD.
- 1d - Micronit Microtechnologies BV
- 1e - Nanoscribe GmbH

Session 1A3 - *C. Elegans*

Chair: Hang Lu, *Georgia Institute of Technology, USA*

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. Gijss
Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- 17:25 DYNAMIC MULTICHEMICAL STIMULATION FOR ANALYZING CHEMOSENSORY CIRCUITS IN *C. ELEGANS***
T. Rouse¹, G. Aubry¹, M. Zimmer², and H. Lu¹
¹*Georgia Institute of Technology, USA and*
²*Research Institute of Molecular Pathology, AUSTRIA*

Session 1B3 - Electrokinetic Separations

Chair: Susan Lunte, *University of Kansas, USA*

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

Chair: David Eddington, *University of Illinois at Chicago, USA*

Room 203 - 205, Second Floor

**16:45 RADIATION EFFECT ON 3D MICRO VASCULAR NETWORK IN
IN VITRO MICROFLUIDIC CHIP**

D.-H. Choi¹, K.-H. Na¹, H. Kim¹, Y.-H. Jung¹, C.-H. Kim²,
and S. Chung¹

¹*Korea University, KOREA and*

²*Korea Institute of Radiological and Medical Sciences, KOREA*

**17:05 PROBING THE EFFECT OF HDL-MIMETIC NANOPARTICLES
ON ANGIOGENESIS USING MICROENGINEERED
VASCULATURE MIMICRY**

J. Ahn^{1,2}, Y. Sei¹, N.L. Jeon², and Y. Kim¹

¹*Georgia Institute of Technology, USA and*

²*Seoul National University, KOREA*

**17:25 ANGIOGENESIS ON CHIP (AoC): STRUCTURAL ANALOGIES
FOR FLUID MECHANICAL DETERMINANTS OF
ENDOTHELIAL SPROUTING**

K.K. Rangharajan, E. Akbari, G.B. Spychalski, J.W. Song, and S. Prakash
Ohio State University, USA

17:45 Adjourn for the Day

MicroTAS Student Mixer - Trivia Night

River Concourse, First Floor

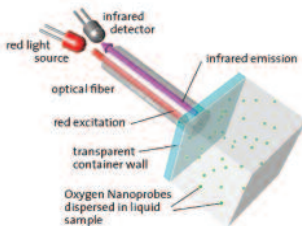
18:00 - 19:30

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**MEMS
JOURNAL**

TUESDAY, OCTOBER 24

07:55 Registration

08:25 Announcements

PLENARY PRESENTATION III

Chair: Joel Voldman, *Massachusetts Institute of Technology, USA*

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

Chair: Darwin Reyes, *National Institute of Standards and Technology (NIST), USA*

Chatham Ballroom A/B, Second Floor

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

K. Kim and W. Park

Kyung Hee University, KOREA

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

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

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

Chair: Jonas Tegenfeldt, *Lund University, SWEDEN*

Chatham Ballroom C, Second Floor

09:30 3D NANOSTRUCTURING OF MICROFLUIDIC DEVICES BY ENGINEERED COLLOIDAL SELF-ASSEMBLY AFFORDS SENSITIVE IMMUNOSENSING OF EXOSOMAL BIOMARKERS

P. Zhang¹, M. He², Y. Shang¹, and Y. Zeng¹

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
Chair: Ashleigh Theberge, *University of Washington, USA*

Room 203 - 205, Second Floor

- 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

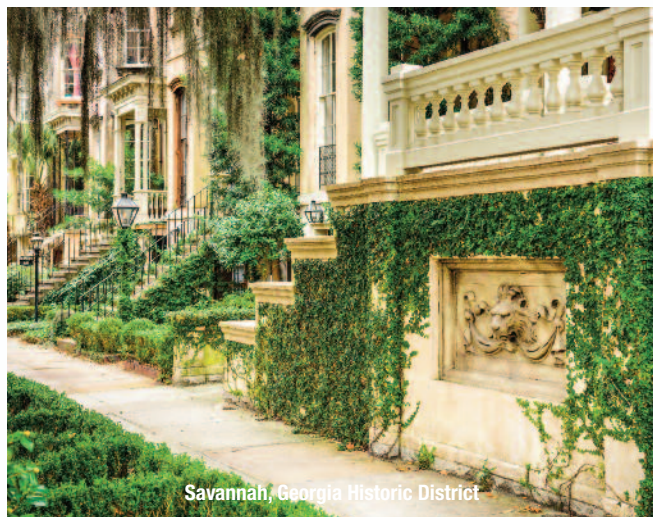
10:30 Break: Exhibit and Poster Inspection

MicroTAS 2017 Shark Tank Competition

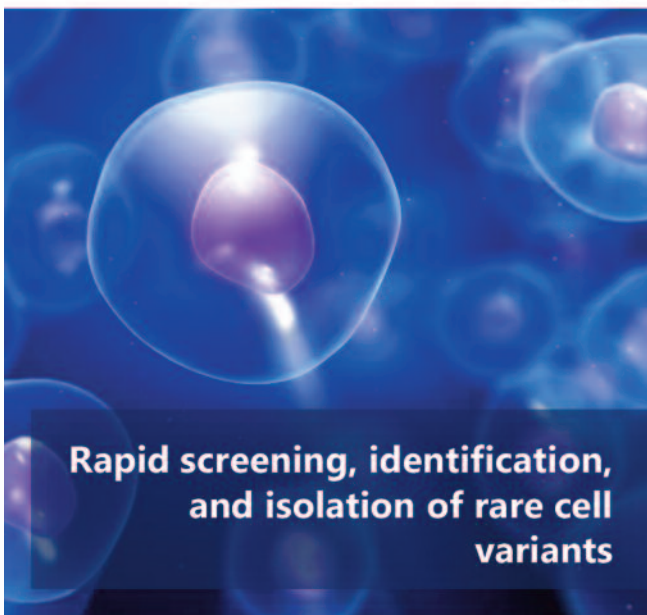
Chatham Ballroom A/B, Second Floor

- 11:00 Judges**
Allen Northrup, Ph.D.
Founder, *Cepheid and Microfluidic Systems, USA*
- Fiona Adair, Ph.D.
Vice President, *Strategy & Innovations, Beckman Coulter Diagnostics, USA*
- Richard Fair, Ph.D.
Founder, *Advanced Liquid Logic and Lord-Chandran Professor, Electrical and Computer Engineering, Duke University, USA*

12:30 - 13:30 Lunch - Exhibit Hall B, First Floor



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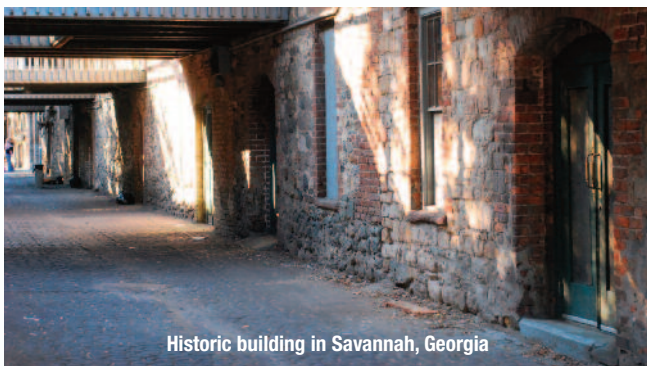
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Session 2A2 - Neuroscience

Chair: Arum Han, *Texas A&M University, USA*

Chatham Ballroom A/B, Second Floor

- 13:30 Keynote Presentation**
A GEOMETRICAL APPROACH OF AXO-DENDRITIC POLARITY AND NEURONAL CONNECTIVITY
C. Villard
Institut Curie, FRANCE
- 14:00 HIGHLY SENSITIVE MEASUREMENT OF TAU PROTEIN WITH ELECTROCHEMICAL IMPEDANCE SENSOR TOWARDS THE DIAGNOSIS OF NEURODEGENERATIVE DISEASE**
M. Park, K.-S. Shin, J. Ji, and J.Y. Kang
Korea Institute of Science and Technology (KIST), KOREA
- 14:20 AN INTEGRATED MICROELECTRODE ARRAY AND MICROFLUIDIC PLATFORM FOR STIMULATING AND RECORDING OF RECONSTRUCTED NEURONAL NETWORKS**
E. Moutaux^{1,2}, B. Charlot^{3,4}, F. Bardin^{3,5}, F. Saudou^{1,2}, and M. Cazorla^{1,2}
¹Université Grenoble, Alpes, FRANCE, ²INSERM, FRANCE, ³CNRS, FRANCE, ⁴Université de Montpellier, FRANCE, and ⁵Université de Nîmes, FRANCE
- 14:40 SYSTEMS INTEGRATION OF CELLULAR AND MOLECULAR SENSING TOWARDS POINT-OF-CARE TREATMENT MONITORING IN SCHIZOPHRENIA**
T.E. Winkler¹, E. Kim¹, M. Kang¹, G.F. Payne¹, D.L. Kelly², and R. Ghodssi¹
¹University of Maryland, USA and ²University of Maryland School of Medicine, USA

Session 2B2 - Sensing/Sensors

Chair: Charles Henry, *Colorado State University, USA*

Chatham Ballroom C, Second Floor

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

Session 2C2 - Droplet Microfluidic Fundamentals

Chair: Jan Eijkel, *Twente University, NETHERLANDS*

Room 203 - 205, Second Floor

- 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. Thuair, F. Navarro, B. Icard, and V. Agache
University Grenoble, FRANCE
- 14:20 DROPLET BREAKUP AT A CO-FLOWING FLUID-FLUID INTERFACE IN A MICROCHANNEL**
 K.S. Jayaprakash and A.K. Sen
Indian Institute of Technology, Madras, INDIA
- 14:40 BINARY ADDRESSABLE DROPLET-ON-DEMAND ARRAY FOR COMBINATORIAL DROPLET GENERATION**
 E. Werner¹, T. Dawes², and E. Hui¹
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 36.

15:00- 17:00

Exhibitor Industrial Stage 2 River Concourse, First Floor

Chair: Jean-Louis Viovy, *Institut Curie, FRANCE*

- 2a - Institute of Microchemical Technology Co., Ltd.
 2b - Toolbox Medical Innovations
 2c - Heidelberg Instruments, Inc.

Session 2A3 - Single Cell Analysis I

Chair: Richard Novak, *Harvard University, USA*

Chatham Ballroom A/B, Second Floor

- 17:00 DIRECT OBSERVATION-BASED ANALYSIS OF COMPACTION STABILITY OF INDIVIDUAL CHROMOSOMES ISOLATED FROM SINGLE MAMMALIAN CELLS**
 H. Oana¹, T. Takahashi¹, K.O. Okeyo², J. Ueda³, and M. Washizu¹
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. Kim¹, T. Mitsunaka², Y. Fujimoto², K. Iizuka², and T. Fujii¹
¹*University of Tokyo, JAPAN* and ²*SHARP, JAPAN*

Session 2B3 - Paper Microfluidics

Chair: Wouter van der Wijngaart, *KTH Royal Institute of Technology, SWEDEN*

Chatham Ballroom C, Second Floor

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

Session 2C3 - Bacteria Analysis & Diagnostics

Chair: Cullen Buie, *Massachusetts Institute of Technology, USA*

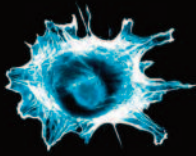
Room 203 - 205, Second Floor

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

18:00 Adjourn for the Day



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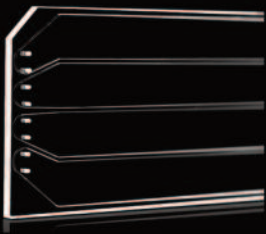


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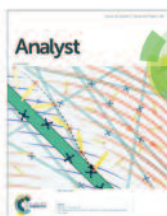
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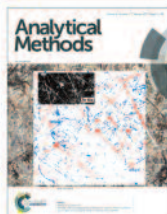
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WEDNESDAY, OCTOBER 25

07:30 Registration

08:00 Announcements

PLENARY PRESENTATION IV

Chair: Amy E. Herr, *University of California, Berkeley, USA*

Chatham Ballroom A/B, Second Floor

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

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

08:50 Dolomite and Lab on a Chip - Pioneers in Miniaturization
Lecture 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

Chair: John Oakey, *University of Wyoming, USA*

Chatham Ballroom A/B, Second Floor

10:00 NANOPOTS: NANOWELL-BASED SAMPLE PREPARATION ENABLES DEEP PROTEOME PROFILING OF SINGLE HUMAN ISLETS
 Y. Zhu¹, P.D. Piehowski¹, R. Zhao¹, Y. Shen¹, R.J. Moore¹, J. Chen²,
 C.E. Mathews², W.-J. Qian¹, R.D. Smith¹, and R.T. Kelly¹
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. Ng¹, G. Sun¹, S.-C. Wei¹, and M.A. Miller², and C.-H. Chen¹
¹*National University of Singapore, SINGAPORE* and
²*Massachusetts General Hospital, USA*

10:40 A HIGH-THROUGHPUT SINGLE-CELL ASSAY PLATFORM TO ANALYZE RESPONSES OF TUMORS TO THERAPEUTIC COMBINATIONS
 J. Choi, H. Kim, Y.R. Nam, A. Atajanov, and S. Yang
Gwangju Institute of Science and Technology (GIST), KOREA

11:00 A MICROFLUIDIC CHIP ENABLING SINGLE CELL ANALYSIS OF TUMOR-STROMAL INTERCELLULAR COMMUNICATION
 J. Kim¹, H.E. Karakas², J. Park³, J.M. Oh³, Y. Choi^{1,3},
 V. Sunkara¹, Y.-S. Park^{1,3}, D. Gozuacik², and Y.-K. Cho^{1,3}
¹*Ulsan National Institute of Science & Technology (UNIST), KOREA*,
²*Sabanci University, TURKEY*, and ³*Institute for Basic Science (IBS), KOREA*

Session 3B1 - Brain-on-a-Chip Chair: Ville Jokinen, Aalto University, FINLAND

Chatham Ballroom C, Second Floor

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

Session 3C1 - Droplet-Based Assays Chair: Qun Fang, Zhejiang University, CHINA

Room 203 - 205, Second Floor

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

11:20 - 12:20 Lunch - Exhibit Hall B, First Floor

11:45 - 12:20 Hocheun Award Finalist Presentations
River Concourse, First Floor

PLENARY PRESENTATION V

Chair: Stephen C. Jacobson, *Indiana University, USA*

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

Chair: Nicole Pamme, *University of Hull, UK*

Chatham Ballroom A/B, Second Floor

13:25 **Keynote Presentation**

A MICROFLUIDIC GUILLOTINE FOR SINGLE-CELL WOUND REPAIR STUDIES

S.K.Y. Tang
Stanford University, USA

13:55 INERTIAL MICROFLUIDIC CELL HYDROPORATOR (iMCH) FOR HIGH-THROUGHPUT & SINGLE-STEP INTRACELLULAR MOLECULE DELIVERY

Y. Deng¹, M. Rada², M. Kizer¹, X. Wang¹, D.-J. Cheon²,
and A.J. Chung¹

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. Gonzalez², A.B. Hiziroglu¹, X. Zhao¹, R. Brien¹,
Y.-H. Cheng¹, Z. Zhang¹, C.G. Kleer², and E. Yoon¹

¹*University of Michigan, USA and*

²*University of Michigan Medical School, USA*

Session 3B2 - Engineered Cell Systems

Chair: Michelle Khine, *University of California, Irvine, USA*

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

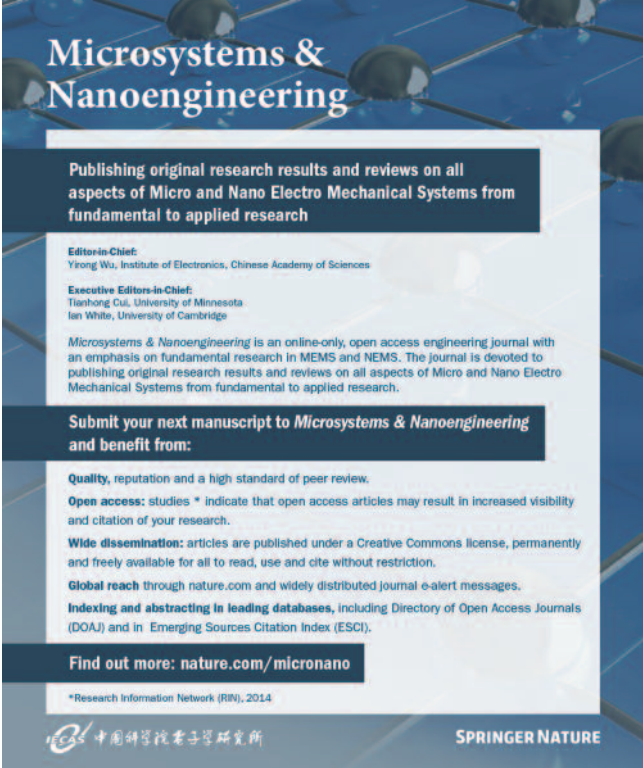
H. Iwadate, N. Kimura, R. Hashimoto, Y. Yajima, R. Utoh,
M. Yamada, and M. Seki
Chiba University, JAPAN

Session 3C2 - Plant Analytics
Chair: Carlos Garcia, Clemson University, USA

Room 203 - 205, Second Floor

- 13:25 **Keynote Presentation****
HIGH-THROUGHPUT PHENOTYPING OF MORPHOLOGICAL TRAITS AND NUTRIENT UPTAKE OF PLANTS USING MICROFLUIDIC DEVICES
L. Dong
Iowa State University, USA
- 13:55 **A MINIATURIZED MICROFLUIDIC ASSAY FOR SINGLE PLANT CELL PROTEIN QUANTITATION****
T.G. Mickleburgh, A. Salehi-Reyhani, A.J. Magness,
W.D. Joyce, O. Ces, and D.R. Klug
Imperial College London, UK
- 14:15 **METHODS FOR PHYSICAL CHARACTERIZATION OF GROWING PLANT ROOTS****
H. Hida¹, K. Ozoe¹, D. Iguro¹, I. Kanno¹, and M. Nogaguchi²
¹Kobe University, JAPAN and ²Nagoya 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 36.



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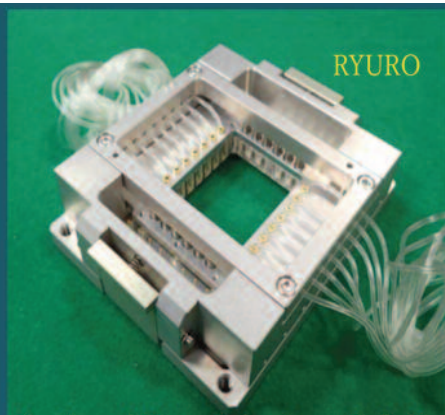
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Session 3A3 - Cancer Diagnostics
Chair: Hugh Fan, University of Florida, USA

Chatham Ballroom A/B, Second Floor

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




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Session 3B3 - Sample Prep for Cell Isolation

Chair: Han Wei Hou, *Nanyang Technological University, SINGAPORE*

Chatham Ballroom C, Second Floor

- 16:35 HIGH LIPID-PRODUCING MICROALGAL MUTANT SCREENING THROUGH LATERAL DIELECTROPHORESIS**
H.S. Kim^{1,2}, S.-I. Han¹, and A. Han¹
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. Kim¹, H. Ito², M. Kozuka², H. Takagi², M. Hirai², and T. Fujii¹
¹*University of Tokyo, JAPAN* and ²*ARKRAY, Inc., JAPAN*

Session 3C3 - Fluorescence Assays

Chair: Akihide Hibara, *Tohoku University, JAPAN*

Room 203 - 205, Second Floor

- 16:35 AUTOMATED MICROFLUIDIC FOR THE ANALYSIS OF CIRCULATING MULTIPLE MYELOMA CELLS (CMMCs) USING "FISH" ANALYSIS**
K.M. W-Ratnayake¹, M.L. Hupert², M.A. Witek¹, C. Kong¹, M. Hu², J.W. Kamande⁵, M.A. Lindell⁵, S. Vaidyanathan¹, P.M. Vorhees⁵, A. Goodwin³, K. August^{3,4}, and S.A. Soper^{1,2,3}
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. Hümmer¹, C. Bärtschi¹, R. Steinhoff¹, J. Förster², L.M. Blank², R. Zenobi¹, and P.S. Dittrich¹
¹*ETH Zürich, SWITZERLAND* and ²*RWTH Aachen, GERMANY*
- 17:15 REAL-TIME ATP MONITORING IN HUMAN SERUM BY AN NANOFUIDIC 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

Wednesday Evening Dinner Cruise on the Georgia Queen

18:30 - 21:30

Boarding will begin at 18:30 at the Rousakis Riverfront Plaza, in front of the Old Savannah Cotton Exchange, which is across the river from the Convention Center. The Cruise will sail from 19:30 - 21:30. Please note that your conference registration does not include a banquet ticket. As of the printing of this program, there are a few tickets remaining for purchase. Please visit the On-Site Conference Registration Desk for availability.



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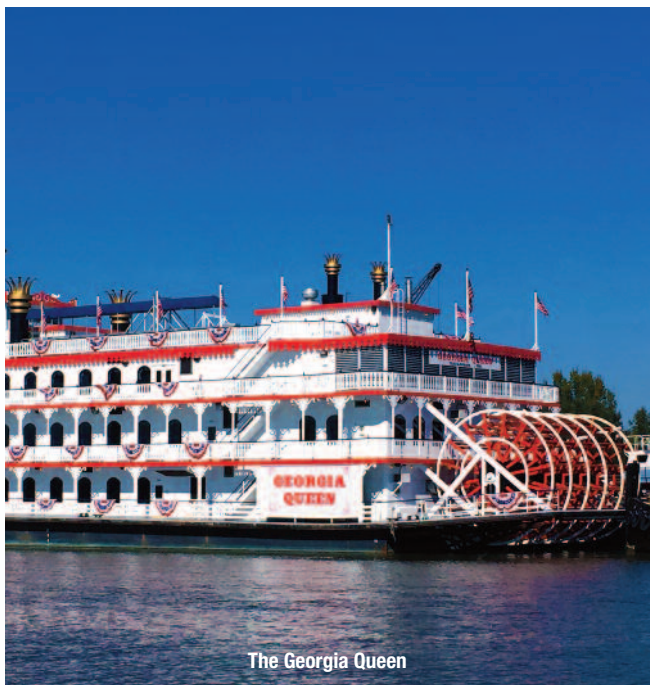
Acoustofluidics in Medicine and Biology
Guest Editors: Martyn Hill and Dario Carugo
Deadline for manuscript submissions: 28 February 2018

Micro Technologies for Single Molecule Manipulation and Detection
Guest Editor: Jeff Tza-Huei Wang
Deadline for manuscript submissions: 1 February 2018

Micro/Nano-Chip Electrokinetics, Volume II
Guest Editors: Xiangchun Xuan and Shizhi Qian
Deadline for manuscript submissions: 30 April 2018



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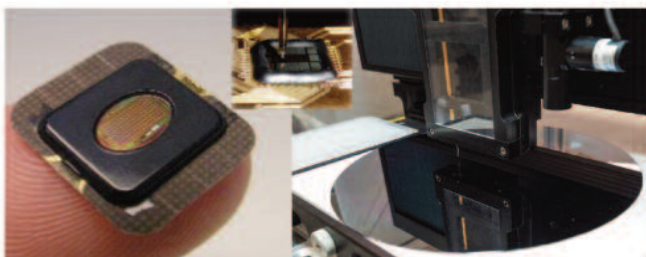


The Georgia Queen

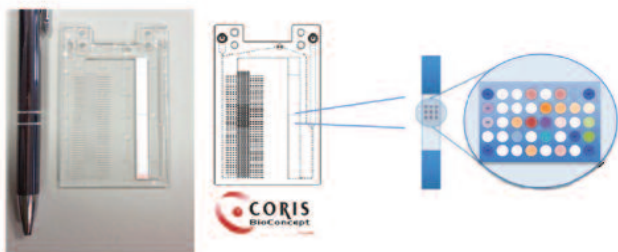
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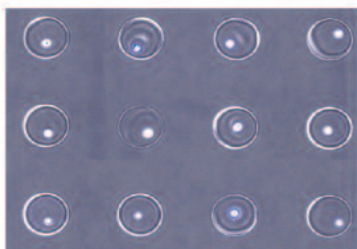
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THURSDAY, OCTOBER 26
08:00 Registration
Session 4A1 - Cell Mechanics I
Chair: Yu-Hsiang Hsu, *National Taiwan University, TAIWAN*
Chatham Ballroom A/B, Second Floor
08:30 WHERE CELLS GO: DEVELOPING MECHANOCHEMICAL HYBRID MODEL OF COLLECTIVE CELL MIGRATION TOWARD DIRECTING COMPLEX TISSUE FORMATION

M. Marumoto, Y. Shiraishi, and M. Hagiwara
Osaka Prefecture University, JAPAN
08:50 MICROFLUIDIC RHEOLOGY TO CHARACTERIZE VISCOELASTIC PROPERTIES OF MALIGNANT AND NON-MALIGNANT EPITHELIAL CELLS

J. Kim and L.L. Sohn
University of California, Berkeley, USA
09:10 LABEL-FREE SIZE AND CELL DEFORMABILITY CONTRAST METHOD FOR SENSITIVE IMMUNE CELL CHARACTERISATION

K.K. Zeming¹, R. Vernekar², T. Krueger², C.-H. Chen^{1,3}, and J. Han^{1,4}
¹*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE*, ²*University of Edinburgh, UK*, ³*National University of Singapore, SINGAPORE*, and ⁴*Massachusetts Institute of Technology, USA*
Session 4B1 - Sampling & Sample Prep
Chair: Gwo-Bin Lee, *National Tsing Hua University, TAIWAN*
Chatham Ballroom C, Second Floor
08:30 LAB-ON-A-DISC FOR FULLY AUTOMATED ISOLATION OF CELL-FREE DNA FROM WHOLE BLOOD OF CANCER PATIENTS

C.-J. Kim^{1,2}, J. Park², V. Sunkara¹, T.-H. Kim², and Y.-K. Cho^{1,2}
¹*Ulsan National Institute of Science & Technology (UNIST), KOREA*, and ²*Institute for Basic Science (IBS), KOREA*
08:50 AUTOMATED SAMPLE PREPARATION FOR NUCLEOSOME POSITIONING ANALYSIS USING DROPLET MICROFLUIDICS

Y. Xu¹, J.-H. Lee², Y. Zhao³, Z. Li³, T. Ordog², and R.C. Bailey¹
¹*University of Michigan, USA*, ²*Mayo Clinic, Rochester, USA*, and ³*Mayo Clinic, Jacksonville, USA*
09:10 MINIATURIZED HYBRID PUSH-PULL PERFUSION PROBE FOR SAMPLING WITH HIGH SPATIAL AND TEMPORAL RESOLUTION

F. van den Brink¹, A. Asthana¹, J. Bomer¹, E.A. Tolner²,
A. van den Maagdenberg², and M. Odijk¹
¹*University of Twente, NETHERLANDS* and ²*Leiden University Medical Hospital, NETHERLANDS*

Session 4C1 - Nanopore Diagnostics

Chair: Mehdi Javanmard, *Rutgers University New Brunswick, USA*

Room 203 - 205, Second Floor

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. Punthambaker¹, P.B. Stranges¹, F. Vigneault², J. Nivala¹, A. Trans³, A. Ayer³, S. Sun³, J. Pollard³, A. Qwan³, C.W. Fuller³, and G.M. Church¹
¹Harvard Medical School, USA, ²Harvard University, USA, and ³Roche Sequencing Solutions, USA

09:30 Transition



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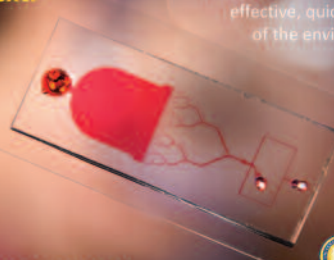
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Session 4A2 - Cell Mechanics II

Chair: Yu-Hsiang Hsu, *National Taiwan University, TAIWAN*

Chatham Ballroom A/B, Second Floor

- 09:40 DEFORMABILITY BASED SEPARATION OF PANCREATIC ISLETS FROM EXOCRINE ACINAR TISSUE FOR TRANSPLANT APPLICATIONS**
W. Varhue¹, L. Langman², M. Kelly-Goss², K.L. Brayman², S. Peirce-Cottler², and N.S. Swami¹
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

Chair: Séverine Le Gac, *University of Twente, NETHERLANDS*

Chatham Ballroom C, Second Floor

- 09:40 A MOBILE PHONE-OPERATED NUCLEIC ACID DIAGNOSTIC PLATFORM FOR DETECTION OF URINARY TRACT INFECTION (UTI)**
D.J. Shin¹, L. Chen¹, C. Li^{1,2}, A. Trick¹, and T.-H. Wang¹
¹*Johns Hopkins University, USA and* ²*China Agricultural University, CHINA*
- 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

Chair: Bruce Gale, *University of Utah, USA*

Room 203 - 205, Second Floor

- 09:40 PERSONALIZED DRUG TESTING OF TUMOR SAMPLES USING A MICROFLUIDIC PLATFORM**
A.D. Rodríguez¹, L. Horowitz¹, M. Rumaner¹, V.K. Gadi¹, R. Monnat¹, R. Rostomily², and A. Folch¹
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. Armbrrecht, 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

Chair: Fan-Gang Tseng, National Tsing Hua University, TAIWAN

Chatham Ballroom A/B, Second Floor

**11:15 ENGINEERING MICROBUBBLES FOR PRECISION MEDICINE
WITH ULTRASOUND**

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

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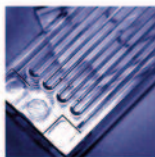
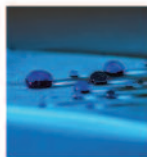
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TUESDAY
15:00 - 17:00

WEDNESDAY
14:25 - 16:30

CLASSIFICATION

- 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

See poster floor plan on page 121.

a - Fundamentals in Microfluidics and Nanofluidics

Acoustofluidics

- M001a** **ACOUSTOFLUIDIC WAVEGUIDES FOR SUBWAVELENGTH LOCALIZED ACOUSTIC FIELD CONTROL AND MICROPARTICLES MANIPULATION**
S. Yang¹, Y. Bian², F. Guo², M. Wu², Z. Tian¹, P.-H. Huang¹, and T.J. Huang¹
¹Duke University, USA and ²Pennsylvania State University, USA

- T001a** **INVESTIGATION ON ACOUSTIC STREAMING PATTERNS IN SHARP-EDGE-BASED DEVICES: EFFECTS OF SHARP-EDGE LOCATION**
P.H. Huang¹, M. Darmawan², N. Nama², and T.J. Huang¹
¹Duke University, USA and ²Pennsylvania State University, USA

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

a - Fundamentals in Microfluidics and Nanofluidics

Electrokinetics

- M002a** **ENHANCED ELECTROKINETIC PARTICLE FOCUSING IN BUFFERS OF REDUCED CONCENTRATIONS**
Z. Liu^{1,2}, D. Li¹, and X. Xuan¹
¹Clemson University, USA and ²Dalian Maritime University, CHINA

- T002a** **GENERATION OF LABILE HEPATITIS B VIRUS CAPSIDS ASSEMBLED WITH GUANIDINE HYDROCHLORIDE AND OBSERVED BY RESISTIVE-PULSE SENSING**
M. Zhang, L.S. Lee, A. Zlotnick, and S.C. Jacobson
Indiana University, USA

a - Fundamentals in Microfluidics and Nanofluidics

Mixing

M003a DESIGN OF A PUMPLESS CHAOTIC MIXING DEVICE DRIVEN BY THE VIBRATION-INDUCED FLOW

K. Kaneko¹, T. Osawa², Y. Kametani², Y. Hasegawa², and H. Suzuki¹
¹Chuo University, JAPAN and ²University of Tokyo, JAPAN

T003a INVESTIGATION AND OPTIMIZATION OF A SHARP-EDGE-BASED ACOUSTOFLUIDIC MICROMIXER

S. Zhao, P.-H. Huang, S. Yang, P. Zhang, and T.J. Huang
 Duke University, USA

W002a ACTIVE PNEUMATIC MICROBALLOON MIXING ON CENTRIFUGAL MICROFLUIDIC PLATFORMS

M.M. Aeinehvand¹, A. Palermo², L.K. Weber², F.F. Loeffler³,
 A.E. Carvajal¹, D. Mager², J.G. Korvink², M. Madou⁴,
 and S.O. Martínez-Chapa¹
¹Tecnológico de Monterrey, MEXICO, ²Karlsruhe Institute of Technology (KIT), GERMANY, ³Max Planck Institute of Colloids and Interfaces, GERMANY, and ⁴University 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. Chou¹, C. McCallum¹, S. Mackenzie¹, D. Gillespie²,
 and S. Pennathur¹
¹University of California, Santa Barbara, USA and
²Rush 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

Nanochannel/Nanopores

- T005a** **NANOFLUIDIC MEMRISTOR: BY ORGANIC ELECTROLYTE SOLUTIONS IN SINGLE CONICAL NANOPORES**
 J. Li¹, J. Xue², G. Du³, and Y. Xie¹
¹Northwestern Polytechnical University, CHINA,
²Peking University, CHINA, and ³Chinese Academy of Sciences, CHINA
- T006a** **PROTON TRANSFER MECHANISM IN EXTENDED-NANO SPACE: PROTON DIFFUSION OF D2O AND H2O**
 K. Isogai, K. Mawatari, and T. Kitamori
 University of Tokyo, JAPAN
- T007a** **STRUCTURAL ANALYSIS OF WATER CONFINED IN NANOCHANNEL: MEASUREMENT OF RADIAL DISTRIBUTION FUNCTION AND HYDROGEN BOND STRUCTURE**
 H. Koreeda¹, K. Mawatari¹, K. Ohara², S. Kohara³, T. Yamaguchi⁴, K. Yoshida⁴, and T. Kitamori¹
¹University of Tokyo, JAPAN, ²Japan Synchrotron Radiation Research Institute (JASRI), JAPAN, ³National Institute for Materials Science (NIMS), JAPAN, and ⁴Fukuoka University, JAPAN
- W003a** **CLOGGING OF MODEL PORES WITH BROWNIAN PARTICLES**
 O. Liot^{1,2}, P. Bacchin³, P. Duru⁴, P. Joseph¹, and J. Morris⁵
¹University Toulouse, FRANCE, ²Fédération Fermat, FRANCE,
³LGC, FRANCE, ⁴Institut de Mécanique des Fluides de Toulouse, FRANCE, and ⁵City College of New York, USA
- W004a** **EFFECT OF SURFACE ELECTROSTATIC INTERACTION ON SAMPLING BEHAVIOR OF SOLUTE MOLECULES AT MICRO/EXTENDED-NANO INTERFACE**
 K. Okamoto, Y. Kazoe, K. Mawatari, and T. Kitamori
 University of Tokyo, JAPAN
- W005a** **NANOPORE PROBE: ANALYSIS OF HOFMEISTER EFFECT IN NANOSPACE**
 M. Matsushita and R. Kawano
 Tokyo University of Agriculture and Technology, JAPAN
- W006a** **SINGLE PARTICLE PING-PONG ACROSS MULTIPLE NANOPORES FOR STUDYING VIRUS CAPSID DISASSEMBLY**
 J. Zhou, L.S. Lee, A. Zlotnick, and S.C. Jacobson
 Indiana University, USA
- W007a** **TRACKING THE IMPACT OF ANTIVIRAL COMPOUNDS ON VIRUS ASSEMBLY DYNAMICS WITH IN-PLANE MULTIPORE 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 HANDLING**
N.P. Macdonald, S. Currivan, B. Paull, and M.C. Breadmore
University of Tasmania, AUSTRALIA
- M009a MEASURING A SLIGHT DIFFERENCE IN STRETCH BETWEEN GC AND AT RICH REGIONS WITHIN THE HUMAN GENOME**
J.G. Reifenger¹, H.-M. Chuang², K.D. Dorfman², and H. Cao¹
¹Bionano Genomics, USA and ²University of Minnesota, USA
- T008a HIGH DENSITY HYDROGEN STORAGE IN ULTRA-THIN LIQUID LAYER**
S. Bhattacharya, P. Kundu, S.-Y. Liu, F.-R. Chen, and F.-G. Tseng
National Tsing Hua University, TAIWAN
- T009a PRESSURE DEPENDENCY OF VIRTUAL VORTEX GEAR**
T. Takayama, C.-H.D. Tsai, H. Ito, and M. Kaneko
Osaka University, JAPAN
- W008a IN-SITU MEASUREMENT OF THERMAL DIFFUSION CONSTANT OF LIQUID USING PHOTOTHERMAL OPTICAL PHASE SHIFT**
T. Sato, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- W009a TIME-CONSTANT RATIOS OF INLET-CHANNEL ELEMENTS TO PREVENT BACKFLOW OF CAPILLARITY NETWORK**
Y. Lee and S.-J. Kim
University of Konkuk, KOREA

b - Micro- and Nanoengineering

3D Printing

- M010b 3D PRINTED CASSETTE EMBEDDED WITH CONDUCTIVE POLYMER ELECTRODES FOR 2D PAPER CHROMATOGRAPHY AND PAPER TEETH SPRAY MASS SPECTROMETRY (PTS-MS) DETECTION OF RESIDUAL PESTICIDES IN AGRICULTURES**
M.-H. Cheng and C.-H. Lin
National Sun Yat-sen University, TAIWAN
- M011b 3D PRINTING OF MICROFLUIDIC DEVICES IN HIGHLY FLUORINATED PERFLUOROPOLYETHERS (PFPE)**
F. Kotz, D. Helmer, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY
- M012b INKJET 3D PRINTED MINIATURE WATER TURBINE AS FLOW METER AND ENERGY HARVESTER FOR WIRELESS SENSOR SYSTEM**
K. Adamski, J. Adamski, J.A. Dziuban, and R. Walczak
Wrocław University of Science and Technology, POLAND
- T010b 3D PRINTED HIGH QUALITY BECHTOP MICROFLUIDIC DEVICES INTEGRATING SMART MATERIALS AS SENSORS**
J. Etxebarria-Elezgarai¹, M. García-Hernando¹, L. Basabe-Desmonts^{1,2}, and F. Benito-Lopez¹
¹University of the Basque Country, SPAIN and ²IKERBASQUE, SPAIN

3D Printing

- 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. Vereshchagina¹, E. Andreassen², R.H. Gaarder², and M.M. Mielnik¹
¹SINTEF Digital, NORWAY and ²SINTEF Materials and Chemistry, NORWAY

b - Micro- and Nanoengineering

Assembly

- M013b DIRECT BIOACTUATOR FORMATION ON MICROSTRUCTURE BY QUASI-DIAMAGNETIC ASSEMBLY**
H. Suenaga¹, J. Sugihara¹, M. Horie², and Y. Akiyama¹
¹Shinshu University, JAPAN and ²Kyoto University, JAPAN
- M014b SYNTHESIS OF CRYSTALLINE MATERIALS USING MICROFLUIDIC DEVICES: FROM ISOLATION OF OUT-OF-EQUILIBRIUM CRYSTAL STRUCTURES TO DIRECT PRINTING OF CONFORMAL FIBERS OF CRYSTALLINE MATERIALS ON SURFACES**
A. Abrishamkar¹, R. Mas-Ballesté², A.J. deMello¹, and J. Puigmarti-Luis¹
¹ETH Zürich, SWITZERLAND and ²Universidad Autónoma de Madrid, SPAIN
- T013b GENERATION OF PICOLITER DROPLETS FROM *IN SITU* ASSEMBLED NANOLITER PLUGS FOR MULTIPLE HIGH THROUGHPUT ASSAYS ON A SINGLE DEVICE**
P. Zhang, A. Kaushik, K. Hsieh, and T.-H. Wang
Johns Hopkins University, USA
- T014b THE SELECTIVE BINDING TECHNIQUE USING HYDROPHILIC/HYDROPHOBIC PATTERNING FOR SELF-ASSEMBLY**
T. Okuyama, T. Okano, and H. Suzuki
Chuo University, JAPAN

Assembly

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. Štofík, D. Wróbel, and J. Malý
Jan Evangelista Purkyně University, CZECH REPUBLIC

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

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

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

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

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

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

b - Micro- and Nanoengineering

Hydrogels

M017b UNCONVERTED DOUBLE BONDS IN THE HYDROGEL NETWORK SYNTHESIZED VIA FLOW LITHOGRAPHY

H.J. Moon¹, M. Ku², H. Lee¹, J. Yang², and K.W. Bong¹
¹Korea University, KOREA and ²Yonsei University, KOREA

T016b A MULTI-LAYER, SELF-ALIGNING HYDROGEL MICROMOLDING PROCESS OFFERING A FABRICATION ROUTE TO PERFUSABLE 3D IN-VITRO MICROVASCULATURE

H. Heidari and H. Taylor
University of California, Berkeley, USA

W016b MICROFLUIDIC ACTUATORS BASED ON TEMPERATURE-RESPONSIVE HYDROGELS

H. Geisler, M. Leman, B. Chollet, L. d'Eramo, M. Kerdraon, F. Monti, Y. Tran, and P. Tabeling
École Supérieure de Physique et de Chimie Industrielles (ESPCI), PARIS

b - Micro- and Nanoengineering

Microneedles

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

b - Micro- and Nanoengineering

Microparticles

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

b - Micro- and Nanoengineering

Nanostructures

M020b 3D TISSUE FORMATION BY STACKING DETACHABLE CELL SHEETS FORMED ON NANOFIBER MESH

B. Lee¹, M.S. Kim¹, S. Kim¹, S. Bang¹, S.-H. Park², and N.L. Jeon¹

¹Seoul National University, KOREA and

²Korea Institute of Industrial Technology, KOREA

M021b NANOPORE SENSING DEVICE INTEGRATING NANOPILLAR ARRAY FOR DNA TRANSLOCATION CONTROL

T. Tanaka, S. Kanetani, K. Arima, and K. Kawai

Osaka University, JAPAN

M022b HIGH-PRECISION FABRICATION OF NANOCHANNELS WITH CONTROLLED CIRCULAR CROSS-SECTION

Y.-S. Park, J.M. Oh, and Y.-K. Cho

Ulsan National Institute of Science & Technology (UNIST), KOREA

M023b MICROFLUIDIC SYNTHESIS OF MULTIFUNCTIONAL HOLLOW MESOPOROUS SILICA NANOSPHERES

Y. Nie, N.J. Hao, and J.X.J. Zhang

Dartmouth College, USA

M024b SILVER NANOWIRE SYNTHESIS USING NANOFLUIDIC CHANNEL NETWORKS FABRICATED BY CRACK-PHOTOLITHOGRAPHY FOR NANOSENSOR APPLICATIONS

D. Ha¹, D.J. Kim², Q. Zhou¹, and T. Kim¹

¹Ulsan National Institute of Science & Technology (UNIST), KOREA and

²Yale 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}

¹Saarland University, GERMANY and

²Korea Institute of Science and Technology (KIST) - Europe, GERMANY

T021b CRACK-PHOTOLITHOGRAPHY-ASSISTED COLLAPSE-FREE AND MASS-TRANSPORT-CONTROLLABLE NANOCHANNEL MICROFABRICATION

D. Ha¹, D.-J. Kim², J.G. Park¹, and T. Kim¹

¹Ulsan National Institute of Science & Technology (UNIST), KOREA and

²Yale 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. Arora¹, E.K.F. Yim², and Y.C. Toh¹

¹National University of Singapore, SINGAPORE and

²University of Waterloo, CANADA

Nanostructures

- T024b** **SINGLE NANOPARTICLE ENCAPSULATION IN FAST-EVAPORATING MICRO-EMULSION PREVENTS PARTICLE AGGLOMERATION IN NANOCOMPOSITES**
M. Pan, F. Lyu, and S.K.Y. Tang
Stanford University, USA
- W020b** **CAPILLARY-FACILITATED COATING OF CARBON NANOTUBE THIN FILM AS A STRAIN GAUGE FOR BLOOD RETRACTION TEST**
Z. Li, X. Xue, D. Peyer, B. McCracken, K. Ward, and J. Fu
University of Michigan, USA
- W021b** **FINE TUNING SILICA MESOPORES TO CONFORMALLY ENHANCE THE SPECIFIC SURFACE IN PILLAR ARRAY COLUMNS IN THE CONTEXT OF CHROMATOGRAPHY**
S. Futagami¹, T. Hara², H. Ottevaere¹, G.V. Baron¹, G. Desmet¹, and W. De Malsche¹
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. Charmet¹, A. Homsy², M. Wood³, J. Covington¹, L. Isa⁴, M. Textor⁴, T.P.J. Knowles³, and H. Keppner²
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. Hara¹, K. Arima¹, O. Tabata², and K. Kawai¹
¹*Osaka University, JAPAN* and ²*Kyoto University, JAPAN*
- W024b** **SINGLE-EXOSOME ANALYSIS PLATFORM BASED ON NANOARRAY CHIP TECHNOLOGY**
H. Kuramochi¹, S. Yokota¹, S. Tsuchiya², T. Akagi¹, and T. Ichiki¹
¹*University 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. Spegini³, F. Simoni³, and L. Criante¹
¹*Istituto Italiano di Tecnologia, ITALY*, ²*Politecnico di Milano, ITALY*, and ³*Università Politecnica delle Marche, ITALY*

Other Microfabrication

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

b - Micro- and Nanoengineering

Patterning/Lithography

- T028b** **LOW TEMPERATURE FLOW LITHOGRAPHY**
H. Lee, H.U. Kim, Y.H. Roh, and K.W. Bong
Korea University, KOREA
- T029b** **SELF-SHAPED LIQUID TEMPLATE ON INKJET-PATTERNED SUPERHYDROPHOBIC SUBSTRATE FOR FABRICATION OF FUNCTIONALIZED MICROFLUIDIC SYSTEMS**
X. Lai, B. Lu, H. Wu, Z. Pu, H. Yu, and D. Li
Tianjin University, CHINA
- W027b** **MICROCONTACT PRINTING OF POLYDOPAMINE ARRAY ON HYDROPHOBIC SURFACE FOR SINGLE CELL PATTERNING**
H. Wu, L. Wu, X. Zhou, B. Liu, and B. Zheng
Chinese University of Hong Kong, HONG KONG

Patterning/Lithography

W028b TOPOGRAPHICAL AND CHEMICAL PATTERNING OF CELL CULTURE SUBSTRATES

E. Azuaje-Hualde¹, M.M. de Pancorbo¹, F. Benito-Lopez¹, and L. Basabe-Desmonts^{1,2}

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

McMaster University, CANADA

M029b FABRICATION OF POROUS POLYDIMETHYLSILOXANE (PDMS) THIN FILM AT TEMPERATURE BELOW ZERO DEGREE

X. Ren¹ and M. Noh²

¹Virginia Polytechnic Institute and State University, USA and

²Drexel University, USA

M030b SIMPLE FABRICATION OF 3D MICRO CONTAINER USING PDMS STENCIL BASED ON SOLVENT EVAPORATION

C.M. Kim¹, H.B. Lee¹, J.U. Kim¹, Y.L. Cui¹, J.A. Kim², S.K. Yoo², and G.M. Kim¹

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²Osong Medical Innovation Foundation, KOREA

T030b DIRECT ETCHING AND IMPLANTED METALIZATION IN SOFT MATTER

K. Ichikawa¹, Y. Fukuyama², S. Maeda¹, and Y. Yamanishi²

¹Shibaura Institute of Technology, JAPAN and ²Kyushu 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. Selvanapathy

McMaster University, CANADA

W029b FABRICATION OF TRANSPARENT SUPERHYDROPHOBIC PDMS USING THERMAL TREATMENT

E. Lee¹, K. Seo², M. Kim³, and D.H. Kim¹

¹Korea Advanced Institute of Science and Technology (KAIST), KOREA,

²LG Chem Research Park, KOREA, and ³Korea Institute of Science and Technology (KIST), KOREA

W030b HIGH STRETCHABLE CONDUCTIVE MICROCHANNEL FABRICATED BY SIMPLE PDMS SOFT LITHOGRAPHY PROCEDURES

X.-C. Guo and C.-W. Tsao

National Central University, TAIWAN

b - Micro- and Nanoengineering

Sensing/Assays

- M031b** **CANCER miRNA DETECTION BY HIGHLY SENSITIVE SERS VIA SELF-ASSEMBLY NANO PARTICLE BASED MICRO PERIODIC DOMAIN (SANP-MPD)**
M.P. Koduri¹, A. Kumar¹, V. Goudar¹, and F.G. Tseng^{1,2}
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. Masuda¹, H. Takao¹, F. Shimokawa¹, 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. Fan¹, C.-Z. Deng², and H.-J. Sheen²
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. Qi¹, and S. Feng²
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. Taniguchi¹, Y. Murakami¹, M. Sohgawa², K. Yamashita¹, and M. Noda¹
¹Kyoto Institute of Technology, JAPAN and ²Niigata University, JAPAN
- W034c** **FULLY POLYMERIC FLEXIBLE PIEZORESISTIVE CANTILEVER IMMUNOSENSOR BASED ON PEDOT/PSS SENSING LAYER**
R. Zhao, H. Guo, J. Tang, Y. Shi, and J. Liu
North University of China, CHINA

c - Sensors & Actuators, and Detection Technologies

Cell Studies

- M035c** **HIGH-THROUGHPUT, SINGLE CELL ANALYSIS OF PEPTIDE UPTAKE AND DEUBIQUITINATING ENZYME ACTIVITY USING A MICROFLUIDIC DROPLET TRAPPING ARRAY**
N. Safabakhsh, M. Vaithyanathan, S. Charles, R. Elkhannoufi, W. Wortmann III, and A.T. Melvin
Louisiana State University, USA
- M036c** **MONITORING THE RESPIRATORY ACTIVITY OF MULTICELLULAR TUMOR SPHEROIDS IN AN INTEGRATED MICROFLUIDIC DEVICE**
Y. Abbas, F. van Rossem, J. Bomer, and S. Le Gac
University of Twente, NETHERLANDS
- T036c** **A HIGH-THROUGHPUT AND LABEL-FREE MULTI-OUTLETS CELL COUNTING MICROSYSTEM USING A SINGLE PAIR OF IMPEDANCE SPECTROSCOPY ELECTRODES**
N. Sobahi and A. Han
Texas A&M University, USA
- T037c** **LENSLESS SINGLE CELL CYTOMETER WITH DIELECTROPHORESIS (DEP) DETECTION**
S. Afshar¹, E. Salimi¹, A. Fazelkhah¹, M. Butler², G. Bridges¹, and D. Thomson¹
¹University of Manitoba, CANADA and ²National 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 DETECTION OF METHYLATED DNA SPIKED IN HUMAN URINE SAMPLE**
S.A. Hong, Y. Yun, Y. Lee, and S. Yang
Gwangju Institute of Science and Technology (GIST), KOREA
- M039c** **BIOSENSOR PLATFORM BASED ON SANDWICH CARBON ELECTRODES ENABLING ENZYMATIC-ELECTROCHEMICAL REDOX CYCLING**
J. Lee, D. Sharma, and H. Shin
Ulsan National Institute of Science & Technology (UNIST), KOREA
- M040c** **ELECTROCHEMICAL APTAMER SENSORS FOR THE DETECTION OF QUORUM SENSING MOLECULES FROM CLINICAL PATHOGENS**
H.J. Sismaet and E.D. Goluch
Northeastern University, USA
- M041c** **GRAPHENE BASED ULTRA SENSITIVE ION SENSOR FOR PHOSPHATE DETECTION**
J. Kim¹, L. Wang², and T. Cui¹
¹University of Minnesota, USA and ²Tsinghua University, USA
- M042c** **INTEGRATED ELECTROCHEMICAL SENSING WITH HIGH SENSITIVITY MASS SPECTROMETRY ANALYSIS ON A SIMPLE AND RAPID NANOSTRUCTURED SILICON PLATFORM**
Z.-M. Guo and C.-W. Tsao
National Central University, TAIWAN
- M043c** **LSI-BASED ELECTROCHEMICAL DEVICE FOR EVALUATION OF RESPIRATORY ACTIVITY OF THREE-DIMENSIONAL CULTURED CELLS**
K. Ino, T. Onodera, and H. Shiku
Tohoku University, JAPAN
- M044c** **PORTABLE LOCK-IN AMPLIFIER-BASED ELECTROCHEMICAL METHOD TO MEASURE AN ARRAY OF 64 SENSORS FOR POINT OF CARE APPLICATIONS**
R. Hrdý³, H. Kynclová², I. Klepáčová^{1,3}, M. Bartošík⁴, and P. Neuzil^{1,2}
¹Northwestern Polytechnical University, CHINA, ²Central European Institute of Technology, CZECH REPUBLIC, ³Brno University of Technology, CZECH REPUBLIC, and ⁴Masaryk Memorial Cancer Institute, CZECH REPUBLIC

Electrical and Electrochemical Sensors

- M045c** **ULTRA-LOW DETECTION-LIMIT HEAVY METAL ION DETECTION VIA ELECTROCHEMICAL ENHANCED POROUS SILICON PHOTONIC SENSORS**
K.-H. Chih¹, W.-T. Tsai¹, J.-R. Lai¹, M.-H. Nguyen², H.-B. Nguyen³, M.-C. Lee¹, and F.-G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN, ²Academia Sinica, TAIWAN, and ³Center for Microelectronics and Informatics Technology, VIETNAM
- T038c** **A FLEXIBLE GRAPHENE APTAMERIC NANOSENSOR FOR DETECTION OF TNF- α**
Z. Hao^{1,2}, Y. Zhu¹, Y. Li¹, X. Wang¹, X. Zhao², and Q. Lin¹
¹Columbia University, USA and ²Harbin Institute of Technology, CHINA
- T039c** **A RECYCLABLE DEVICE FOR REAL-TIME CYTOKINE MONITORING IN CELL MICROENVIRONMENT**
G. Liu^{1,2} and C. Cao¹
¹Centra China Normal University, CHINA and ²Macquarie University, AUSTRALIA
- T040c** **AN APTAMERIC GRAPHENE NANOSENSOR FOR DIRECT AND SENSITIVE VASOPRESSIN DETECTION**
C. Su^{1,2}, X. Wang¹, M.N. Milosavic¹, M. He², and Q. Lin¹
¹Columbia University, USA and ²Xi'an Jiaotong University, CHINA
- T041c** **INCORPORATION OF THERMOPLASTIC GRAPHITE INTERDIGITATED ELECTRODE ARRAY INTO PAPER-BASED MICROFLUIDIC DEVICES**
C.S. Henry, E. Noviana, R. Channon, M. Nguyen, D. Dandy, and B. Geiss
Colorado State University, USA
- T042c** **ELECTROCHEMICAL IMMUNOSENSOR BASED ON 3D TRIPLE ELECTRODE SYSTEM FOR SENSITIVE DETECTION OF CARDIAC BIOMARKER**
D. Sharma, J. Lee, and H. Shin
Ulsan National Institute of Science & Technology (UNIST), KOREA
- T043c** **HUMAN OLFATORY RECEPTOR-FUNCTIONALIZED GRAPHENE-FET SENSOR AS HIGH PERFORMANCE BIOELECTRONIC NOSE**
H.S. Song^{1,2} and O.S. Kwon²
¹Korea Basic Science Institute (KBSI), KOREA and ²Korea Research Institute of Bioscience and Biotechnology, KOREA
- T044c** **INVESTIGATION OF THE SOLID-LIQUID INTERFACE WITH A DUAL PLASMONIC AND ELECTRONIC BIOSENSING PLATFORM**
R.F. Tiefenauer¹, K. Tybrandt², T. Dalgaty¹, and J. Vörös¹
¹ETH Zürich, SWITZERLAND and ²Linköpings University, SWEDEN
- T045c** **NANOWELL ARRAY IMPEDANCE SENSOR FOR LABEL-FREE QUANTIFICATION OF CYTOKINES IN SERUM AT FEMTOMOLAR LEVEL DETECTION LIMITS**
P. Xie¹, N. Song², W. Shen², M. Allen², and M. Javanmard¹
¹Rutgers University, USA and ²University of Pennsylvania, USA

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- 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 MoS₂ FIELD-EFFECT TRANSISTOR COMBINED WITH PDMS-CONSTRICTION-CHANNEL**
J. Lee, Y. Yoon, H. Yang, Y. An, O. Sul, S.-J. Lee, and S.-B. Lee
Hanyang University, KOREA
- W038c A WILD TYPE T4 PHAGE BASED IMPEDIMETRIC WIDE-DYNAMIC-RANGE MICRO ELECTROCHEMICAL SENSOR FOR DETECTION OF VIABLE BACTERIA**
J. Xu, B. Gao, Y. Hua, Q. Chen, Y. Chau, and Y.-K. Lee
Hong Kong University of Science and Technology, HONG KONG
- W039c AN ORGANOMETALLIC POLYMER-BASED MICROFLUIDIC PLATFORM FOR REDOX-MEDIATED ELECTROCHEMICAL SENSING**
X. Su¹, A. Harynuk², T.A. Hatton¹, and N. Nazemifard²
¹*Massachusetts Institute of Technology, USA and*
²*University of Alberta, CANADA*
- W040c EFFECT OF AGGREGATED AMYLOID BETA ON THE SIGNAL VARIATION OF ELECTROCHEMICAL IMPEDANCE SENSING SYSTEM TOWARDS THE DIAGNOSIS OF ALZHEIMER'S DISEASE**
J. Ji, M. Park, Y. Heo, K.-S. Shin, and J.Y. Kang
Korea Institute of Science and Technology (KIST), KOREA
- W041c GELATIN-ENABLED MICROSENSOR (GEM) FOR PANCREATIC PROTEASE MONITORING**
G.E. Banis, L.A. Beardslee, and R. Ghodssi
University of Maryland, USA
- W042c HYBRID PAPER-BASED POTENTIOSTAT FOR LOW-COST POINT-OF-NEED DIAGNOSTICS**
P. Bezuidenhout, S. Smith, K. Land, and T. Joubert
University of Pretoria, SOUTH AFRICA
- W043c LABEL-FREE DNA QUANTIFICATION BY MULTI-FREQUENCY IMPEDANCE CYTOMETRY AND MACHINE LEARNING ANALYSIS**
J. Sui¹, N. Gandotra², P. Xie¹, Z. Lin¹, C. Scharfe², and M. Javanmard¹
¹*Rutgers University, USA and* ²*Yale University, USA*

Electrical and Electrochemical Sensors

W044c OPTIMIZATION OF OPERATION REGIMES FOR EXTENDED-GATE FIELD EFFECT TRANSISTORS (EGFET) INTEGRATED WITH ION SELECTIVE MEMBRANE (ISM) FOR AMPEROMETRIC pH SENSING WITH gM/ID THEORY

B. Gao¹, M. Duan¹, Q. Chen¹, A. Bermak^{1,2}, and Y.-K. Lee¹

¹*Hong Kong University of Science and Technology, HONG KONG and*

²*Hamad Bin Khalifa University, QATAR*

W045c WEARABLE AND STRETCHABLE POROUS REDUCED GRAPHENE OXIDE (RGO)-CNT NETWORK-MODIFIED ELECTROCHEMICAL SENSOR FOR AMMONIUM IN SWEAT

Y. Hua, S.C.T. Kwok, B. Gao, J. Xu, Y.-K. Lee, and M.M.F. Yuen

Hong Kong University of Science and Technology, HONG KONG

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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. Menachery¹ and M.A. Qasaimeh^{1,2}

¹*New York University, Abu Dhabi, UAE and* ²*New York University, USA*

T048c AN AUTOMATED SYSTEM FOR THE SHAPE OPTIMIZATION OF DOUBLE EMULSION DROPLETS USED IN THE FABRICATION OF INERTIAL FUSION ENERGY TARGET SHELLS

J. Li, F. Wu, H. Wang, J. Cuenca, X. Yang, and D. Barrow

Cardiff University, UK

T049c GLUCOSE AND OXYGEN SENSITIVE HYDROGEL FOR BIOANALYTES MONITORING

J. Sawayama and S. Takeuchi

University of Tokyo, JAPAN

W046c 3D PRINTED, ALL-ELASTOMER PNEUMATIC ARTIFICIAL MUSCLES FOR MEDICAL APPLICATIONS

L.-Y. Liu, L.-Y. Liu, and Y.-C. Su

National Tsing Hua University, TAIWAN

W047c E-BEAM PATTERNED GOLD NANOSTRUCTURE MATRIX ON PDMS FOR PLASMOMECHANICAL PRESSURE SENSOR SKIN

A. Kakati and S. Das

Indian Institute of Technology, Kharagpur, INDIA

W048c HIGH-THROUGHPUT FABRICATION OF NANOCONE SUBSTRATES THROUGH POLYMER INJECTION MOULDING FOR SERS ANALYSIS IN MICROFLUIDIC SYSTEMS

M. Viehri¹, M. Matteucci¹, A.H. Thilsted², M.S. Schmidt¹, and A. Boisen¹

¹*Technical University of Denmark, DENMARK and*

²*Spectrolinlets, DENMARK*

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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 NANOFUIDIC-EMBEDDED BIOSENSOR

J. Cacheux, M. Brut, A. Bancaud, P. Cordelier, and T. Leïchlé

Université de Toulouse, FRANCE

W049c NANOPORE-BASED SENSOR FOR SEQUENCE-SPECIFIC MICRORNA DETECTION

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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. Saez¹, R. Lanfranco², E. Di Nicoló³, M. Buscaglia², and F. Benito-Lopez¹

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²*Università degli Studi di Milano, ITALY, and*

³*Solvay Specialty Polymers, ITALY*

Optical & Fluorescence Imaging

- M052c NEAR VIDEO RATE DROPLET TRACKING WITH COMPUTATIONALLY-EFFICIENT IMAGE PROCESSING SOFTWARE**
A. Vedhanayagam and A.S. Basu
Wayne State University, USA
- T052c DETECTION OF CHEMICAL NUTRIENTS IN WATER USING A FLUIDIC MICROPLASMA CHIP WITH ENHANCED OPTICAL COLLECTION EFFICIENCY**
S. Gong, C. Song, D. Qiao, and L. Que
Iowa State University, USA
- T053c MEASUREMENT OF OXYGEN DISTRIBUTION IN THREE-DIMENSIONAL TISSUE USING FLUORESCENCE MICROSENSORS**
H. Maruayma, Y. Akita, S. Omata, T. Masuda, and F. Arai
Nagoya University, JAPAN
- W050c A NANOPAPER DEVICE FOR HIGHLY SENSITIVE AND HOMOGENEOUS SURFACE-ENHANCED RAMAN SPECTROSCOPY**
L. Chen, B. Ying, P. Song, and X. Liu
McGill University, CANADA
- W051c HIGH-THROUGHPUT FLUORESCENCE POLARIZATION MEASUREMENT SYSTEM TOWARDS MOLECULAR INTERACTION ANALYSIS**
O. Wakao¹, K. Sumiyoshi², C. Mizokuchi², M. Maeki¹, A. Ishida¹, H. Tani¹, K. Shigemura², A. Hibara³, and M. Tikeschi¹
¹Hokkaido University, JAPAN, ²Tianma Japan, Ltd., JAPAN, and ³Tohoku University, JAPAN
- W052c MICROANALYTICAL DEVICES TOWARDS INTEGRATED QUALITY CONTROL TESTING OF [18F]FDG RADIOTRACER**
M.D. Tarn, M.M.N. Esfahani, L. Patinglag, Y.C. Chan, J.X. Buch, C.C. Onyije, P.J. Gawne, D.J.B. Gambin, N.J. Brown, S.J. Archibald, and N. Pamme
University of Hull, UK

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Optical Sensors & Photonics

- M053c IMPRINTED PHOTONIC CRYSTAL NANOCAVITY FOR μ -SPECTROMETER**
K. Maeno¹, S. Aki¹, K. Satoh², S. Murakami², Y. Sando², Y. Kanaoka², K. Sueyoshi¹, H. Hisamoto¹, and T. Endo^{1,3}
¹Osaka Prefecture University, JAPAN, ²Osaka Research Institute of Industrial Science and Technology, JAPAN, and ³Japan Science and Technology Agency (JST), JAPAN
- M054c ON-GLASSCHIP INTEGRATION OF PHOTONICS FOR PHOTOTHERMAL OPTICAL PHASE SHIFT DETECTION OF NONFLUORESCENT MOLECULES**
K. Miyake, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

Optical Sensors & Photonics

- 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. Saga¹, F.H. Kriel², C. Priest², and T. Tsukahara¹
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. Sugino¹, H. Shimizu¹, M. Sakakura², K. Miura³, K. Mawatari¹, and T. Kitamori¹
¹*University of Tokyo, JAPAN, ²Next Generation Laser Processing Technology Reserch Association, JAPAN, and ³Kyoto University, JAPAN*
- W053c** **AN ULTRA-SMALL, MULTI-POINT AND MULTI-COLOR PHOTO-DETECTION SYSTEM WITH HIGH SENSITIVITY AND HIGH DYNAMIC RANGE**
T. Anazawa¹ and M. Yamazaki²
¹*Hitachi, Ltd., JAPAN and ²Hitachi 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

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- M055c** **A CAPACITIVE POLYMER MICROTENSIO METER**
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

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- M058c** **FLU VIRUS AEROSOL COLLECTION AND PAPER-BASED VIRAL RNA DETECTION**
X. Jiang¹, M. Pan¹, J. Loeb¹, S.V. Hering², A. Eiguren-Fernandez², J.A. Lednicky¹, C.-W. Wu¹, and Z.H. Fan¹
¹University of Florida, USA and ²Aerosol Dynamics Inc., USA
- M059c** **MICROFLUIDIC DIFFERENTIAL NANOCALORIMETRY SYSTEM FOR MEASUREMENT OF MIXING ENTHALPY AND CELLULAR HEAT**
R. Krenger, R. Trouillon, T. Lehnert, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- M060c** **READY-TO-USE LIPID BILAYER DEVICE FOR SENSOR APPLICATIONS**
T. Osaki¹, S. Fujii¹, K. Kamiya¹, N. Misawa¹, and S. Takeuchi^{1,2}
¹Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and ²University of Tokyo, JAPAN
- 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. Wang¹, J. Kim², and T. Cui²
¹Tsinghua University, CHINA and ²University of Minnesota, USA
- T060c** **INCREASED BANDWIDTH IN COLORIMETRIC DETECTION OF EXPLOSIVES THROUGH TINTING AND HUE ANALYSIS**
S.T. Krauss¹, A.Q. Nauman², R.M. Aubrey¹, G. Garner¹, B.E. Root¹, and J.P. Landers¹
¹University of Virginia, USA and ²TeGrex Technologies, USA
- T061c** **MILLISECOND TIME-RESOLVED SURFACE TENSION MEASUREMENT OF MICROSCALE INTERFACES**
T. Endo^{1,2}, K. Ishikawa², M. Fukuyama^{1,3}, and A. Hibara^{1,2}
¹Tohoku University, JAPAN, ²Tokyo Institute of Technology, JAPAN, and ³Japan Science and Technology Agency (JST), JAPAN

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- T062c SELF-POWERED SIMPLE CHIP FOR CKD DIAGNOSIS AND MONITORING USING THE POC CREASENSOR**
 F. Dal Dosso¹, D. Decrop¹, E. Pérez Ruiz¹, D. Daems¹,
 T. Kokalj^{1,2}, D. Spasic¹, and J. Lammertyn¹
¹*KU Leuven, BELGIUM and*
²*Institute of Metals and Technology, SLOVENIA*
- T063c TWO-PHOTON EXCITATION BASED NANOSCOPIC VELOCIMETER USING SMALL NEUTRAL MOLECULAR DYE AS TRACER**
 A. Wang, A. Abdalrahman, J. Deng, and G. Wang
University of South Carolina, USA
- W056c A MICROFLUIDIC SENSOR USING FREQUENCY DIVISION MULTIPLE ACCESS FOR MULTIPLEXED DETECTION OF CELLS IN MICROFLUIDIC CHANNELS**
 N. Wang, R. Liu, M. Boya, and A.F. Sarioglu
Georgia Institute of Technology, USA
- W057c DIELECTROPHORESIS-ENABLED DYNAMIC FORMATION OF HIGHER-ORDER NANOSTRUCTURE CONSISTING OF AU-NANOPARTICLES-DECORATED POLYSTYRENE BEADS FOR SERS DETECTION**
 A. Yamaguchi, T. Fukuoka, and Y. Utsumi
University of Hyogo, JAPAN
- W058c GRAPHENE-BASED INLINE PRESSURE SENSOR INTEGRATED WITH ELASTIC MICROFLUIDIC TUBE**
 N. Inoue and H. Onoe
Keio University, JAPAN
- W059c MATRIX-FREE BIOMOLECULE ANALYSIS BY A MINIATURIZED ON-CHIP PULSE-HEATING IONIZATION MASS SPECTROMETER**
 X. Luo, P. Trong Tue, and Y. Takamura
Japan Advanced Institute of Science Technology (JAIST), JAPAN
- W060c RAPID DETECTION OF *E. COLI* IN WATER BASED ON NANO HOLE PRECONCENTRATE AND NANOFORST SERS SENSORS**
 M. Li¹, H. Mao¹, H. Wang², and C. Huang¹
¹*Chinese Academy of Sciences, CHINA and*
²*National Health and Family Planning Commission (NHFP), CHINA*
- W061c SEQUENTIAL STEREO LITHOGRAPHIC PRINTING OF TWO BIOCOMPATIBLE RESINS FOR BIOMICROFLUIDICS APPLICATIONS**
 K. Castro, Y.T. Kim, N. Bhattacharjee, and A. Folch
University of Washington, USA
- W062c MICROFLUIDIC DETECTION WITH ACOUSTIC SPECTROSCOPY FOR INSULIN**
 C. McIntosh, K. Scida, and S. Pennathur
University of California, Santa Barbara, USA

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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. Huang¹, N. Nama², and T.J. Huang¹
¹Duke University, USA and ²Pennsylvania 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. Venzac¹, Y. Liu¹, I. Ferrante¹, A. Yamada¹, P. Vargas¹, M. Verhulsel¹, L. Malaquin², J.-L. Viovy¹, and S. Descroix¹
¹Pierre-and-Marie-Curie University, FRANCE and ²LAAS CNRS, FRANCE
- W063c FINGERTIP-SIZE PRESSURE SENSOR FOR LUER TAPER OF THREE-WAY STOPCOCK IN LIQUID CIRCUIT**
K. Takenaka, S. Togashi, A. Kazama, K. Miyajima, and T. Nagano
Hitachi, Ltd., JAPAN
- W064c WIRELESS, SMARTPHONE CONTROLLED POTENTIOSTAT INTEGRATED WITH LAB-ON-DISC PLATFORM**
C.-H. Cheng^{1,3}, K. Zor², J.-H. Wang^{1,3}, K. Sanger², W.-M. Wang^{1,3}, A.M. Capria², A. Boisen², K.-Y. Huang¹, and E.-T. Hwu^{1,3}
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²Technical University of Denmark, DENMARK, and
³Academia Sinica, TAIWAN

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Particles

- M064c 3D PARTICLE LOCALIZATION IN A MICROFLUIDIC IMPEDANCE CYTOMETER**
R. Reale¹, A. De Ninno², V. Errico¹, L. Businaro², P. Bisegna¹, and F. Caselli¹
¹University of Rome Tor Vergata, ITALY and
²Italian National Research Council, ITALY
- M065c SINGLE STREAM INERTIAL FOCUSING OF PARTICLES IN MICROCHANNELS WITH TRIANGULAR CROSS-SECTION**
P. Mukherjee and I. Papautsky
University of Illinois, Chicago, USA
- T066c ELECTRONICALLY BARCODED PARTICLES FOR MULTIPLEXED MOLECULAR BIOANALYSIS: A STUDY OF THE EFFECT OF THIN FILM DIELECTRIC PERMITTIVITY AND THICKNESS**
J. Sui, P. Xie, Z. Lin, and M. Javanmard
Rutgers University, USA

Particles

- 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

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Pumps & Valves

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

Bioanalysis & Diagnostics

- M068d A MULTI-WELL BASED DETECTION PLATFORM WITH INTEGRATED PDMS CONCENTRATORS FOR RAPID MULTIPLEXED ENZYMATIC ASSAYS**
X. Wei¹ and Y.-A. Song^{1,2}
¹New York University, Abu Dhabi, UAE and ²New York University, USA
- M069d CONNECTED, LOW-COST POINT-OF-CARE DIAGNOSTICS FOR RURAL SOUTH AFRICAN CLINICS**
S. Smith^{1,2}, K. Land¹, J.G. Korvink², and D. Mager²
¹Council for Scientific and Industrial Research, SOUTH AFRICA and ²Karlsruhe Institute of Technology (KIT), GERMANY
- M070d PORTABLE PATHOGEN ANALYSIS SYSTEM (PPAS) FOR MICROBIAL WATER QUALITY ANALYSIS**
X. Huang¹, H.N. Gowda², X. Wu¹, S.L. Dumas², Y. Zhu¹, X. Lin¹, H. Kido², X. Xie^{1,3}, S. Jiang², M. Madou², and M.R. Hoffmann¹
¹California Institute of Technology, USA,
²University of California, Irvine, USA, and
³Georgia Institute of Technology, USA
- T070d A MULTIPLEXED MICROFLUIDIC SINGLE CELL SAMPLE PREPARATION DEVICE FOR TRANSCRIPTOME SEQUENCING**
B. Zhang, A. Sun, and Y. Chen
Chinese Academy of Sciences, CHINA
- T071d DUAL-HEIGHT FLUIDIC-CHANNEL-INTEGRATED MICROPORE SENSOR FOR HIGH-THROUGHPUT SINGLE-PARTICLE DETECTIONS**
W. Tonomura, M. Tsutsui, K. Yokota, A. Arima, M. Taniguchi, and T. Kawai
Osaka University, JAPAN
- T072d STRETCHABLE MICROFLUIDIC INTEGRATING LINEAR DILUTIONS FOR QUANTITATIVE MULTI-STEP ASSAYS**
C. Parent, N. Verplanck, J.-L. Achard, F. Boizot, M. Cubizolles, and Y. Foullet
University Grenoble, Alpes, FRANCE
- W069d AN AUTO-REGENERATABLE ELECTROCHEMICAL APTASENSOR FOR CONTINUOUS MONITORING OF BIOMOLECULES ENABLED BY ION CONCENTRATION POLARIZATION**
L. Jin¹, D.-T. Phan¹, T. Sun², and C.-H. Chen¹
¹National University of Singapore, SINGAPORE and
²Agency for Science, Technology and Research (A*STAR), SINGAPORE
- W070d FABRICATION OF AN INTEGRATED MICROFLUIDIC DEVICE USING MULTIMATERIAL 3D PRINTING FOR POINT-OF-CARE DETECTION OF DRUGS IN BODY FLUIDS**
F. Li¹, N.P. Macdonald¹, P. Smejkal¹, R.M. Gijjt², and M.C. Breadmore¹
¹University of Tasmania, AUSTRALIA and ²Deakin University, AUSTRALIA

d - Integrated Microfluidic Platforms

Cell Manipulation & Analysis

M071d AIR-PLUG ENABLED LOCALIZATION OF SINGLE CELL ENTRAPMENT IN AN ARRAY OF RECTANGULAR MICROWELLS

P. Sukumar¹, R. Alnemari¹, W. Chen², and M.A. Qasaimeh^{1,2}

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

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

Q. Chen^{1,2}, D. Li¹, J. Lin², M. Wang², and X. Xuan¹

¹Clemson University, USA and ²China Agricultural University, CHINA

M073d HepG2 CELLS PATTERNING BY EWOD ON THIN-FILM-TRANSISTOR ARRAY DEVICES- AN ANALYSIS TO PREVENT CELL DEATH

F.A. Shaik, G. Cathcart, S. Ihida, A. Tixier-Mita, and H. Toshiyoshi

University of Tokyo, JAPAN

M074d ON-CHIP CELL SEPARATION BASED ON MECHANICAL CHARACTERISTICS

K. Nakahara, S. Sakuma, and F. Arai

Nagoya University, JAPAN

T073d CELL DEPOSITION AND ISOLATION WITH MICROPIPETTE CONTROL OVER LIQUID INTERFACE MOTION IN MICROFLUIDIC CHANNEL

D. Onoshima¹, H. Yukawa¹, Y. Hattori¹, K. Ishikawa¹, M. Hori¹, and Y. Baba^{1,2}

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T074d DROPLET BASED CELL SCREENING SYSTEM INTEGRATED WITH CMOS IMAGE SENSOR AND ANDROID-BASED APPLICATION

M.D. Özkan¹, M.K. Aslan¹, A.C. Atik¹, E. Özgür², E. Yıldırım³, and H. Külah^{1,2}

¹Middle East Technical University, TURKEY, ²Mikro BiyoSistemler Inc., TURKEY, and ³Çankaya University, TURKEY

T075d INTEGRATED CENTRIFUGAL PLATFORM FOR POINT-OF-CARE CELL SEPARATION

N. Mehendale and D. Paul

Indian Institute of Technology, Bombay, INDIA

W071d AIR-LIQUID INTERFACE-INDUCED DEFORMABILITY CYTOMETRY

R.S. Kotesa, G.K. Ananthasuresh, and P. Sen

Indian Institute of Science, INDIA

W072d ALL SURFACE IMAGING METHOD OF OOCYTE BY USING SMALLER VERTICAL ROTATIONAL FLOW

Y. Yalikun^{1,2}, Y. Aishan^{1,2}, K. Sumiyama¹, and Y. Tanaka^{1,2}

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²Osaka University, JAPAN

Cell Manipulation & Analysis

- W073d** **INTERGRATED MICROFLUIDIC SPERM SORTING AND OOCYTE INCUBATION SYSTEM FOR *IN-VITRO* FERTILIZATION ENHANCEMENT**
H. Liu¹, Y.C. Tzeng¹, Y.J. Chen¹, C. Chuan¹, L.C. Pan³, and F.G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN, ²Academia Sinica, TAIWAN, and ³Taipei Medical University, TAIWAN

d - Integrated Microfluidic Platforms

Centrifugal Systems

- M075d** **DISK-INTEGRATED REPEATED DISPENSING OF 200 NL VOLUMES FOR THE AUTOMATION OF PYROSEQUENCING**
B. Johannsen¹, R. Zengerle^{1,2}, and N. Paust^{1,2}
¹Hahn-Schickard, GERMANY and ²University Freiburg, GERMANY

- T076d** **CENTRIFUGAL MICROFLUIDIC AUTOMATION OF DILUTION SERIES FOR HIGH DYNAMIC RANGE ASSAYS DEMONSTRATED FOR DECADAL DILUTIONS UP TO 1:100,000**
P. Juelg¹, M. Specht¹, E. Kipf², M. Lehnert², C. Eckert³, S. Wadle^{1,2}, M. Keller^{1,2}, N. Paust^{1,2}, R. Zengerle^{1,2}, and T. Hutzenlaub^{1,2}
¹Hahn-Schickard, GERMANY, ²University Freiburg, GERMANY, and ³Charité - Universitaetsmedizin Berlin, GERMANY

- T077d** **EXTRACTION AND SERS BASED DETECTION OF BACTERIAL METABOLITES IN MIXTURE ON A CENTRIFUGAL MICROFLUIDIC DEVICE**
L. Morelli¹, L. Seriola¹, F.A. Centorbi², M. Matteucci¹, D. Demarchi², K. Zór², and A. Boisen¹
¹Technical University of Denmark, DENMARK and ²Politecnico 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 SPIN STAND**
A. Perebikovskiy¹, Y. Liu¹, C. Halford², G. Monti², A.T. Hwu¹, D.A. Haake², and M.J. Madou¹
¹University of California, Irvine, USA and ²University of California, Los Angeles, USA

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

Droplets/Fluid Digitalization

- M078d COLORED MICROBEAD ENCODING OF PICOLITER DROPLET POPULATIONS FOR BIOTECHNOLOGICAL APPLICATIONS**
O. Shvydkiv¹, C.-M. Svensson¹, L. Mahler^{1,2}, S. Dietrich^{1,2}, T. Weber¹, M. Choudhary¹, M. Tovar^{1,2}, M.T. Figge¹, and M. Roth¹
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. Sharma¹, K. Nishigaki², Y. Takamura¹, and M. Biyani¹
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. Zhao¹, N.-T. Nguyen², and S.H. Tan²
¹*University of Queensland, AUSTRALIA and*
²*Griffith University, AUSTRALIA*
- T079d AN INTEGRATED MICROFLUIDIC PLATFORM FOR CONTROLLED GENERATION, STORAGE AND MERGING OF MICRODROPLETS**
H. Babahosseini¹, T. Misteli¹, S. Padmanabhan², and D.L. DeVoe²
¹*National Cancer Institute, National Institutes of Health, USA and*
²*University of Maryland, USA*

Droplets/Fluid Digitalization

- T080d** **CONTINUOUS GENERATION OF STABLE POLYELECTROLYTE MULTILAYER CAPSULES INSIDE A SNAKES-AND-LADDERS CHIP**
J. Gómez-Pastora^{1,2}, A.Q. Al-Orabi¹, M.D. Tarn¹, E. Bringas², I. Ortiz², V.N. Paunov¹, and N. Pamme¹
¹University of Hull, UK and ²University of Cantabria, SPAIN
- T081d** **DYNAMICS OF A BIOCHEMICAL BISTABLE SWITCH STUDIED WITH A DROPLET MICROFLUIDIC PLATFORM**
S. Okumura^{1,2}, G. Gines², E. Henry¹, Y. Rondelez², T. Fujii¹, and A.J. Genot¹
¹University of Tokyo, JAPAN and ²Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE
- T082d** **GENERATION OF "DROPLET TRAINS" FOR CONTINUOUS AND MULTIPLE SAMPLE OR MULTIPLE STEP ASSAYS IN DROPLET MICROFLUIDICS**
G.W.H. Evans, A.M. Nightingale, S.-U. Hassan, and X. Niu
University of Southampton, UK
- T083d** **MAGNETIC "MECHANICAL HAND": 3D MANIPULATION OF DROPLETS USING A SUPERHYDROPHOBIC ELECTROMAGNET NEEDLE**
C. Yang and G. Li
Chongqing University, CHINA
- T084d** **ON-DEMAND MICROFLUIDIC DROPLET VOLUME CONTROL BY SURFACE ACOUSTIC WAVE**
J. Park, J.H. Jung, G. Destgeer, K. Park, H. Ahmed, R. Ahmad, and H.J. Sung
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- T085d** **THE FORMATION OF DROPLETS BY DENSITY-INDUCED FLOW-FOCUSING IN 3D-PRINTED DEVICE**
Y.-H. Hwang and D.-P. Kim
Pohang University of Science and Technology (POSTECH), KOREA
- W076d** **A MICROFLUIDIC METHOD TO STUDY THE COALESCENCE OF CRUDE OIL DROPS IN WATER - THE EFFECT OF CRUDE OIL AND WATER COMPOSITION**
M. Dudek¹, T. Dumaire², and G. Øye¹
¹Norwegian University of Science and Technology, NORWAY and ²Pierre-and-Marie-Curie University, FRANCE
- W077d** **FORMATION OF CHAINED ALGINATE HYDROGEL FIBERS WITH Ø GLASS TUBE**
K. Nishimura, Y. Morimoto, N. Mori, and S. Takeuchi
University of Tokyo, JAPAN
- W078d** **CONTROLLED DROPLET DISCRETIZATION, RELEASE, TRANSPORT, AND CAPTURE USING MEMBRANE DISPLACEMENT TRAPS**
S. Padmanabhan¹, T. Misteli², and D.L. DeVoe¹
¹University of Maryland, USA and ²National Institutes of Health, USA

Droplets/Fluid Digitalization

W079d HIGHLY CONTROLLED MATERIAL TRANSFER INTO MICROFLUIDIC DROPLETS FROM AN ACTIVE COLLOIDAL CONTINUOUS PHASE

T. Gu¹, T.A. Hatton¹, and S.A. Khan²

¹Massachusetts Institute of Technology, USA and

²National 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. Zheng¹, Z. Pu², E. He³, D. Li², and Z. Li¹
¹Peking University, CHINA, ²Tianjin University, CHINA, and ³Tsinghua 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. Kojima², S. Takayama², and A.S. Basu¹
¹Wayne State University, USA and ²University of Michigan, USA
- M088d AUTOMATED MICROFLUIDIC PLATFORM FOR HIGH-THROUGHPUT SCREENING OF COLLOIDAL PEROVSKITE NANOCRYSTALS**
R. Epps¹, K. Felton¹, C.W. Coley², and M. Abolhasani¹
¹North Carolina State University, USA and ²Massachusetts Institute of Technology, USA
- M089d DEVELOPMENT OF A LABEL FREE MICROFLUIDIC PLATFORM FOR DIRECTED ENZYME EVOLUTION**
D. Holland-Moritz¹, D. Steyer¹, S. Doonan¹, S. Sun², X. Diefenbach², J. Moore², R. Bailey¹, and R. Kennedy¹
¹University of Michigan, USA and ²Merck Research Laboratories, USA
- M090d NOVEL SURFACE SAMPLING TOOL AND TECHNIQUE FOR INTEGRATION INTO COLORIMETRIC DETECTION MICROFLUIDIC DEVICES**
S.T. Krauss¹, V.C. Holt¹, R.M. Aubrey¹, A.Q. Nauman², K. Kroupa³, B.E. Root¹, and J.P. Landers¹
¹University of Virginia, USA, ²TeGrex Technologies, USA, and ³Department of Defense, USA
- M091d STANDARDIZED AND MODULAR MICROFLUIDIC PLATFORM FOR FAST LAB ON CHIP SYSTEM DEVELOPMENT**
S. Dekker, A. van den Berg, and M. Odijk
University of Twente, NETHERLANDS

System Integration Automation

- T089d THE DEVELOPMENT OF FILM-BASED BIOSENSING CHIP FOR DNA AMPLIFICATION AND ELECTROCHEMICAL DETECTION OF FOOD ILLNESSES PATHOGEN**
Y.M. Park, S.Y. Lim, S.J. Shin, C.H. Kim, S.W. Jeong, S.Y. Shin, N.H. Bae, S.J. Lee, and T.J. Lee
National Nanofab Center (NNFC), KOREA
- T090d AUTOMATED SPECIES IDENTIFICATION DEVICE FOR CONSERVATION BIOLOGY**
H.R. Holmes^{1,2}, A.E. Gomez¹, D.A. Baisch^{1,2}, and K.F. Böhlinger¹
¹University of Washington, USA and ²Conservation X Labs, USA
- T091d DEVELOPMENT OF A USER-DEFINED LOCAL STIMULATION SLIPCHIP DEVICE**
M.A. Catterton and R.R. Pompano
University of Virginia, USA
- T092d SIMULTANEOUS 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 (OE) DEVICES FOR *IN SITU* WATER QUALITY DETECTION**
D. Jiang, S. Lee, S. Bae, and S.-Y. Park
National University of Singapore, SINGAPORE

e - Cell & Vesicle Analysis and Manipulation

Cell Culture & Manipulation

- M092e A SCALABLE MICROFLUIDIC PIPETTE TIP FOR HIGH-THROUGHPUT GENETIC ENGINEERING**
P.A. Garcia, R.N. McCormack, and C.R. Buie
Massachusetts Institute of Technology, USA
- M093e DIELECTROPHORETIC IN-DROPLET CELL CONCENTRATION**
S.-I. Han¹, H.S. Kim², and A. Han¹
¹Texas A&M University, USA and
²Korea Institute of Machinery & Materials (KIMM), KOREA

Cell Culture & Manipulation

- M094e** **LAYER-BY-LAYER SYSTEM BASED ON CELLULOSE NANOFIBRILS FOR CAPTURE AND RELEASE OF CELLS IN MICROFLUIDIC DEVICE**
H. Ramachandraiah, T. Pettersson, and A. Russom
Royal Institute of Technology (KTH), SWEDEN
- M095e** **MODELING THE PRE-INVASIVE BREAST CANCER MICROENVIRONMENT USING HIGH-THROUGHPUT MICROFLUIDIC CELL ENCAPSULATION**
J.J.F. Sleeboom¹, C.M. Sahlgren², and J.M.J. Den Toonder¹
¹*Eindhoven University of Technology, NETHERLANDS and*
²*Åbo Akademi University, FINLAND*
- M096e** **RAPID BIOLOGICAL RISK EVALUATION OF COSMIC RADIATION ON A MICROFLUIDIC CHIP**
T. Tamura¹, A. Nakamura², K. Takahashi², K. Yamada¹, and T. Suzuki^{1,3}
¹*Gunma University, JAPAN, ²Ibaraki University, JAPAN, and*
³*Japan Science and Technology Agency (JST), JAPAN*
- T093e** **A HIGH-PERFORMANCE MICROCHEMOSTAT ENABLING REUSAGE AND STORAGE OF WHOLE-CELL MICROBIAL BIOSENSORS FOR ON-SITE HEAVY METAL DETECTION**
J. Bae, J.W. Lim, and T. Kim
Ulsan National Institute of Science & Technology (UNIST), KOREA
- T094e** **CANCER CELL TRAPPING AND MIGRATION IN A MICROFLUIDIC DEVICE FOR ANTI-MIGRATION DRUG SCREENING**
C.L. Hisey¹, O. Mitxelena-Iribarren², M. Martínez-Calderon², S. Arana², M. Mujika², S.M. Olaizola², and D.J. Hansford¹
¹*Ohio State University, USA and*
²*Centro de Estudios e Investigaciones Técnicas, SPAIN*
- T095e** **DOWNSTREAM MICROFLUIDIC COLLAGEN CULTURE CHAMBER FOR ADVANCING MECHANISTIC UNDERSTANDING OF DIELECTROPHORETIC BEHAVIOR IN CELLS**
T.A. Douglas, P. Graybill, N. Alinezhadbalalami, N. Balani, J. Cemazar, E.M. Schmelz, and R.V. Davalos
Virginia Polytechnic Institute and State University, USA
- T096e** **MICROBIAL BATCH CULTIVATIONS INSIDE PICOLITER SIZED GROWTH CHAMBERS**
E. Kaganovitch¹, X. Steurer¹, D. Dogan¹, W. Wiechert^{1,2}, and D. Kohlheyer^{1,2}
¹*Forschungszentrum Jülich GmbH, GERMANY and*
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

Cell Culture & Manipulation

- T098e USING OXYGEN-CONSUMING THERMOSET PLASTICS TO GENERATE HYPOXIC CONDITIONS IN MICROFLUIDIC DEVICES FOR POTENTIAL CELL CULTURE APPLICATIONS**
D. Sticker¹, M. Rothbauer², J. Ehgartner³, C. Steininger⁴, W. Neuhaus⁴, T. Mayr³, T. Haraldsson⁵, J.P. Kutter¹, and P. Ertl²
¹University of Copenhagen, DENMARK,
²University of Technology Vienna, AUSTRIA,
³Graz University of Technology, AUSTRIA,
⁴Austrian Institute of Technology GmbH, AUSTRIA, and
⁵KTH Royal Institute of Technology, SWEDEN
- W090e A MICROFLUIDIC HANGING-DROP SYSTEM TO STUDY THE SECRETION DYNAMICS OF SINGLE PANCREATIC ISLET MICROTISSUES**
P.M. Misun¹, F. Forscherl¹, B. Yesildag², O. Frey^{1,2}, and A. Hierlemann¹
¹ETH Zürich, SWITZERLAND and ²InSphero AG, SWITZERLAND
- W091e CELL MODEL OF MYOCARDIAL HYPOXIA IN LAB-ON-A-CHIP SYSTEM**
A. Kobuszewska, E. Jastrzebska, M. Chudy, A. Dybko, and Z. Brzozka
Warsaw University of Technology, POLAND
- W092e HIGH-DENSITY PERFUSION CULTURE OF SUSPENDED MAMMALIAN CELLS AND CONTINUOUS REMOVAL OF CELL DEBRIS AND SMALLER NON-VIABLE CELLS USING INERTIAL MICROFLUIDICS**
T. Kwon¹, R. Yao¹, J.-F.P. Hamel¹, and J. Han^{1,2}
¹Massachusetts Institute of Technology, USA and ²Singapore-MIT Alliance for Research and Technology Centre (SMART), SINGAPORE
- W093e MICROFLUIDIC GRADIENT GENERATORS FOR EVALUATING CELLS IN CLINICALLY-RELEVANT INJECTABLE HYALURONIC ACID HYDROGELS**
S.C. Leshner-Pérez, Y. Zhang, and T. Segura
University of California, Los Angeles, USA
- W094e NUMERICAL SIMULATION FOR CELL RAILING ON 3D SILICON MICROELECTRODES FEATURING SIDEWALL UNDERCUTS**
M.L. Chau, X. Xing, and L. Yobas
Hong Kong University of Science and Technology, HONG KONG

e - Cell & Vesicle Analysis and Manipulation

Cell Mechanics

- M097e CELL MIGRATION THROUGH FLEXIBLE MICRO-CONSTRICTION**
A. Raj and A.K. Sen
Indian Institute of Technology, Madras, INDIA
- M098e MECHANICAL CHARACTERIZATION OF SINGLE CELLS TO DISTINGUISH DIFFERENT BREAST CANCER CELLS**
G. Perret^{1,2}, Y. Takayama², M. Kumemura^{1,2}, S. Meignan³, H. Fujita^{1,2}, C. Lagadec², D. Collard^{1,2}, and M.C. Tarhan²
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Cell Mechanics

- M099e** **STUDY IN-PLANE ELASTICITY OF ALVEOLAR EPITHELIAL CELLS WITH DIFFERENT ONCOGENE EXPRESSION LEVELS USING MICROFLUIDIC DEVICES**
P.-L. Ko¹, T.-A. Lee¹, C.-K. Wang², C.-C. Peng¹, W.-H. Liao¹, and Y.-C. Tung¹
¹Academia Sinica, TAIWAN and ²Tamkang University, TAIWAN
- T099e** **INFLUENCE OF FLUID FLOW ON MICROTOPOGRAPHY-GUIDED CELL MIGRATION AND UNDERLYING MECHANOTRANSDUCTION**
K. Kushiro¹, A. Ryo², and M. Takai¹
¹University of Tokyo, JAPAN and ²Yokohama City University, JAPAN
- T100e** **MILLISECOND MECHANOPHENOTYPING OF STEM CELLS BY ELECTRICAL DETECTION IN MICROFLUIDIC CONSTRICTIONS**
N. Kaji^{1,2}, S. Ito¹, H. Yasaki¹, T. Yasui^{1,2}, H. Yukawa¹, and Y. Baba^{1,3}
¹Nagoya University, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN, and ³National 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. Altayyeb¹, M. Khashbah², A. Esmaeel², M. El-Mokhtar², A. Sharkawy², M. Abdelgawad², and E. Othman²
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- W097e** **SINGLE CELL DEFORMATION IN SHEAR AND INERTIA DOMINANT FLOW REGIMES**
F.J. Armistead¹, J.G. De Pablo¹, H. Gadêlha², S.A. Peyman¹, and S.D. Evans¹
¹University of Leeds, UK and ²University of York, USA

e - Cell & Vesicle Analysis and Manipulation

Cell Studies

- M100e** **STUDYING CELL-TO-CELL COMMUNICATION FOR MOTILITY IN BACILLUS SUBTILIS WITH MICROFLUIDIC DEVICES**
Y. Yu, J.D. Baker, J. Zhou, D.B. Kearns, and S.C. Jacobson
Indiana University, USA
- T101e** **ADDING METABOLISM TO THE EMBRYONIC STEM CELL TEST**
J.A. Boos¹, A. Michlmayr¹, A. Birchler¹, O. Frey², and A. Hierlemann¹
¹ETH Zürich, SWITZERLAND and ²InSphero AG, SWITZERLAND
- W098e** **MICROFLUIDIC-BASED BLOOD EXCHANGE PLATFORMS FOR UNDERSTANDING THE EFFECT OF CELLULAR COMPONENTS OF THE BLOOD ON AGING**
P. Amiri¹, T. Tran¹, J. Parades², I. Conboy³, and K. Aran¹
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e - Cell & Vesicle Analysis and Manipulation

Circulating Tumor Cells

- M101e** **A MICROFLUIDIC PLATFORM INTEGRATED WITH FIELD-EFFECT TRANSISTORS FOR DETECTION OF CIRCULATING TUMOR CELLS**
Y.-H. Chen, A.K. Pulikkathodi, Y.-L. Wang, and G.-B. Lee
National Tsing Hua University, TAIWAN
- M102e** **AN INTEGRATED MICROFLUIDIC CHIP CAPABLE OF WHOLE BLOOD TREATMENT AND PNEUMATICALLY-MODULATED FILTERING FOR DETECTING CIRCULATING TUMOR CELLS IN CLINICAL SPECIMEN**
Y.-C. Tsai, L.-Y. Hung, F.-G. Tseng, H.-Y. Chang, and G.-B. Lee
National Tsing Hua University, TAIWAN
- M103e** **CAPTURE OF CANCER CELLS USING MAGNETIC FIELD ENHANCED MICROFLUIDIC DEVICES**
J. Zhang, M. Unni, T. George, M. Segal, C. Rinaldi, and Z.H. Fan
University of Florida, USA
- M104e** **DIALYSIS-LIKE TUMOR CELL REMOVAL USING CAPILLARY BUNDLES**
P. Dopico, C. Wang, C.-W. Rinaldi, T.-J. George, M. Segal, and Z.H. Fan
University of Florida, USA
- M105e** **INTERFERENCE-BASED LABEL-FREE ANALYSIS OF FILOPODIA DYNAMICS IN CANCER CELLS OF DIFFERENT METASTATIC POTENTIAL**
J.C. Contreras-Naranjo, A. Jayaraman, and V.M. Ugaz
Texas A&M University, USA
- M106e** **LIVE CIRCULATING TUMOR CELLS SELECTION ON SELF-ASSEMBLED CELL ARRAY (SACA) CHIP BY IN-PARALLEL IMAGE ANALYSIS AND *IN-SITU* CELL CAPTURE**
S.Y. Wu¹, H.Y. Chu¹, Y.C. Cheng¹, C.H. Chu¹, and F.G. Tseng^{1,2}
¹*National Tsing Hua University, TAIWAN* and ²*Academia Sinica, TAIWAN*
- T102e** **A DISPOSABLE MICROSEPARATOR FOR ISOLATING CIRCULATING TUMOR CELLS**
H. Cho¹, J. Kim¹, H.-U. Park¹, H. Kang¹, C.-W. Jeon², and K.-H. Han¹
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. Deliorman¹, R. Alnemari¹, F.K. Janahi², 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. Ramachandraiah¹, T. Pettersson¹, R. Heuchel², M. Löhr², M. Hedhammar¹, and A. Russom¹
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Circulating Tumor Cells

- T105e** **CONTINUOUS CIRCULATING TUMOR CELL ISOLATION AND RETRIEVAL VIA AN ULTRAHIGH FREQUENCY PIEZOELECTRIC NANO-ELECTROMECHANICAL DEVICE**
Y. Yang, W. Cui, M. He, H. Zhang, Y. Wang, W. Pang, and X. Duan
Tianjin University, CHINA
- T106e** **DYNAMIC DEFORMABLE MICROFILTER FOR CAPTURING CIRCULATING TUMOR CELLS**
Y. Nakashima¹, K. Nakatake¹, K. Yasuda², Y. Kitamura¹, M. Iwatsuki¹, H. Baba¹, T. Ihara¹, and Y. Nakanishi¹
¹Kumamoto University, JAPAN and ²Ogic Technologies Co., Ltd., JAPAN
- T107e** **LABEL-FREE FERROHYDRODYNAMIC CELL SEPARATION OF CIRCULATING TUMOR CELLS**
W. Zhao¹, R. Cheng¹, B.D. Jenkins¹, M.B. Davis¹, S.K. Kavuri², Z. Hao², C. Schroeder², and L. Mao¹
¹University of Georgia, USA and ²Augusta University, USA
- T108e** **QUANTIFICATION OF THE EFFECTS OF HIGH SHEAR STRESSES ON SINGLE CIRCULATING TUMOR CELLS USING A MICROFLUIDIC DEVICE**
G.M. Landwehr¹, S.M. Rahman¹, J.H. Pettigrew¹, A.J. Kristof², U.L. Triantafyllu³, Y. Kim³, and A.T. Melvin¹
¹Louisiana State University, USA,
²North Carolina State University, USA, and
³University of Alabama, USA
- W099e** **A HIGH-THROUGHPUT ENTRAPMENT CHIP FOR CIRCULATING TUMOR CELL (CTC-HTECH)**
X. Ren, P. Ghassemi, J.S. Strobl, and M. Agah
Virginia Polytechnic Institute and State University, USA
- W100e** **AN ANTIBODY-COATED, SIZE-BASED MICROFLUIDIC CHIP WITH WAVE-SHAPED ARRAYS FOR ISOLATING CIRCULATING TUMOR CELLS**
H. Chen
Chinese Academy of Sciences, CHINA
- W101e** **BIOCOMPATIBLE AND LABEL-FREE SEPARATION OF CANCER CELLS FROM BLOOD IN FERROFLUIDS**
W. Zhao, R. Cheng, S.H. Lim, J.R. Miller, W. Zhang, W. Tang, J. Xie, and L. Mao
University of Georgia, USA
- W102e** **CONTINUOUS SEPARATION OF CIRCULATING TUMOR CELLS FROM WHOLE BLOOD USING A MICROFLUIDIC DEVICE WITH DIAGONAL WEIR**
Y. Yoon, J. Choi, J. Lee, K.-C. Yoo, O. Sul, S.-J. Lee, and S.-B. Lee
Hanyang University, KOREA
- W103e** **HIGHLY EFFICIENT TRAPPING AND ANALYSIS OF RARE CELLS USING AN ELECTROACTIVE MICROWELL ARRAY WITH BARRIERS**
M. Takeuchi, S.H. Kim, K. Nagasaka, M. Yoshida, Y. Kawata, K. Oda, and T. Fujii
University of Tokyo, JAPAN

Circulating Tumor Cells

W104e LEUKOCYTE DEPLETION AND SIZE-BASED ENRICHMENT OF CIRCULATING TUMOR CELLS WITH PRESSURE-SENSING MICROFILTRATION SYSTEM

D. Kuboyama¹, D. Onoshima¹, N. Kihara^{1,2}, H. Tanaka¹, T. Hase¹, H. Yukawa¹, K. Ishikawa¹, H. Odaka², Y. Hasegawa¹, M. Hori¹, and Y. Baba^{1,3}

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

W105e RAPID CIRCULATING TUMOR CELLS STAINING AND IN-PARALLEL DIAGNOSIS BY TWO-IN-ONE 3D-MICRODIALYSIS AND CELL SELF-ASSEMBLING CHIP

H.-Y. Chu¹, W. Cho¹, C.-P. Lin², J.-K. Jiang², and F.-G. Tseng^{1,3}

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³Academia Sinica, TAIWAN

e - Cell & Vesicle Analysis and Manipulation

Exosomes

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

I.A. Thiodorus¹, N. Kaji^{1,2}, T. Yasui^{1,2}, and Y. Baba^{1,2,3}

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

R. Okamura¹, T. Akagi¹, and T. Ichiki^{1,2}

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²Innovation Center of Nano Medicine (iCONM), JAPAN

M109e ON-CHIP FILTRATION UTILIZING DOUBLE LAYERS OF MEMBRANE FILTERS FOR EXTRACELLULAR VESICLES ISOLATION FROM WHOLE BLOOD

Y.-S. Chen, H.-L. Cheng, C. Chen, and G.-B. Lee

National Tsing Hua University, TAIWAN

M110e QUICK IMMUNOASSAY OF AMYLOID BETA (A β) IN EXOSOMES FROM PLASMA USING MAGNETIC MICROPARTICLES IN WATER-OIL DROPLETS FOR THE DIAGNOSIS OF ALZHEIMER'S DISEASE

Y. Heo^{1,2}, M. Park¹, J.H. Ji¹, K.-S. Shin¹, M.C. Park^{1,3}, K. Shin², and J.Y. Kang¹

¹Korea Institute of Science and Technology (KIST), KOREA,

²Sogang University, KOREA, and ³Intek Plus, KOREA

Exosomes

- T109e ANALYSIS OF INDIVIDUAL EXTRACELLULAR VESICLES DOWN TO THIRTY NANOMETER WITH SMALL SAMPLE VOLUME TOWARD EXOSOMAL BIOMARKER APPLICATIONS**
T. Akagi^{1,2}, H. Kishita¹, Y. Suehiro¹, M. Nakakuki¹, R. Okamura¹, and T. Ichiki^{1,2}
¹University of Tokyo, JAPAN and
²Innovation Center of Nano Medicine (iCONM), JAPAN
- T110e MICROFLUIDIC AFFINITY PURIFICATION OF CANCER-SPECIFIC EXTRACELLULAR VESICLES**
J.M. Jackson¹, M.A. Witek¹, S.R. Pullagurla¹, D.S. Park^{1,2}, M.L. Hupert³, K. Herrera⁴, M.C. Murphy^{1,2}, and S.A. Soper¹
¹University of Kansas, USA, ²Louisiana State University, USA, ³Biofluidica, Inc., USA, and ⁴University of North Carolina, Chapel Hill, USA
- T111e ON-CHIP HARVESTING AND PHOTO-RELEASE OF IMMUNOGENIC EXTRACELLULAR VESICLES FOR CANCER IMMUNOTHERAPY**
Z. Zhao², J. Sibbitt², and M. He^{1,2}
¹Kansas State University, USA and
²Terry C. Johnson Cancer Research Center, USA
- T112e RESISTIVE-PULSE SENSING TUMOR-DERIVED EXOSOME DETECTION DEVICE FOR RESOURCE-LIMITED SETTINGS**
T.R. Carey, C.W. Yu, and L.L. Sohn
University of California, Berkeley, USA
- W106e DIELECTROPHORETIC ISOLATION OF EXOSOMES FOR STRATIFYING TUMORIGENICITY**
J.H. Moore¹, S.S. Linton², M. Kester¹, and N.S. Swami¹
¹University of Virginia, USA and ²Penn State College of Medicine, USA
- W107e EXTRACELLULAR VESICLES SEPARATION BY ELECTROOSMOTIC FLOW-DRIVEN DETERMINISTIC LATERAL DISPLACEMENT IN NANOPILLAR CHIPS**
N. Kaji^{1,2}, Y. Hattori¹, H. Yasaki¹, T. Yasui^{1,2}, and Y. Baba^{1,3}
¹Nagoya University, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN, and ³National 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. Jin¹, G. Pahapale¹, A. Bhatta², A. Dai¹, L. Romer², 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. Kim¹, M.E. Gallina¹, A. Sun², M. Shelor³, M. Kim¹, S. Tang¹, P. Abbyad², and G. Pratz¹
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. Li¹, S. Liu², and A.P. Lee¹
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. Aebbersold, H. Dermutz, I. Luchtefeld, J.F. Saenz Cogollo, S.-C. Lin, C. Burchert, M. Schneider, H. Han, L. Demkó, T. Zambelli, and J. Vörös
ETH Zürich, SWITZERLAND
- M118e SINGLE CELL SURFACE RECEPTOR ANALYSIS IN THE DESIGNED MICROFLUIDIC DEVICE**
 W.V. Espulgar¹, T. Okajima¹, H. Takamatsu¹, W. Aoki², M. Saito¹, A. Kumanogoh², M. Ueda², and E. Tamiya¹
¹ *Osaka University, JAPAN and ² Kyoto University, JAPAN*

Single Cell Analysis

- T113e AN ON-CHIP GUILLOTINE FOR HIGH-THROUGHPUT SINGLE-CELL WOUND REPAIR STUDIES**
L.R. Blauch¹, Y. Gai¹, J.W. Khor¹, P. Sood², W.F. Marshall², and S.K.Y. Tang¹
¹Stanford University, USA and
²University of California, San Francisco, USA
- T114e CLICKABLE MULTIFUNCTIONAL DUMBBELL PARTICLES FOR *IN SITU* SINGLE-CELL CYTOKINE DETECTION**
P. Zhao, J. George, B. Li, and J. Wang
State University of New York, Albany, USA
- T115e CYTOPLASMIC TRANSFER BETWEEN LIVE SINGLE CELLS BY ACHIEVING TRANSIENT CYTOPLASMIC CONNECTION**
K.-I. Wada, K. Hosokawa, Y. Ito, and M. Maeda
Institute of Physical and Chemical Research (RIKEN), JAPAN
- T116e DEVELOPMENT OF EXTENDED-NANO FEMTOLITTER MESS-PIPETTE IN LIVING SINGLE CELL ANALYSIS DEVICE**
T. Nakao¹, Y. Kazoe¹, K. Morikawa¹, L. Lin², A. Yoshizaki³, K. Mawatari¹, and T. Kitamori¹
¹University of Tokyo, JAPAN, ²National Center for Nanoscience and Technology, CHINA, and ³University of Tokyo Hospital, JAPAN
- T117e LAB-ON-A-CHIP PLATFORM FOR SINGLE-CELL ELECTROROTATION USING 3D ELECTRODES**
K. Keim, P. Maoddi, S. Kilchenmann, M. Comino, and C. Guiducci
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T118e MEASURING THE METABOLIC RESPONSE OF SINGLE ADHERENT CELLS TO CHEMOTHERAPY USING RADIOFLUIDIC MICROCHANNELS**
T.J. Kim¹, M. Kim¹, A. Sun², P. Abbyad², S. Tang¹, and G. Pratz¹
¹Stanford University, USA and ²Santa Clara University, USA
- T119e SINGLE CELL IMPEDANCE CYTOMETRY FOR RAPID AND LABEL-FREE PHENOTYPING OF MONOCYTE ACTIVATION AND DIFFERENTIATION**
C. Petchakup, H.M. Tay, N.V. Menon, H.W. Hou, and K.H.H. Li
Nanyang Technological University, SINGAPORE
- T120e SINGLE-CELL BASED MORPHOLOGICAL ANALYSIS OF BACTERIA USING MICROWELL-PATTERNED HYDROGEL STRUCTURE**
J. Yoon¹, Y.K. Kim^{2,3}, Y.G. Jung^{2,3}, and W. Park¹
¹Kyung Hee University, KOREA, ²College of Natural Science, KOREA, and
³Myongji University, KOREA
- W109e A MICROFLUIDIC DEVICE TO STUDY SINGLE-CELL CALCIUM DYNAMICS UNDER TIME-VARYING STIMULI**
A.M. Gonzalez-Suarez¹, J.G. Peña-Del Castillo², R.J. Jimenez-Valdes¹, A. Hernandez-Cruz², and J.L. Garcia-Cordero¹
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²Universidad Nacional Autonoma de Mexico, MEXICO

Single Cell Analysis

- W110e** **AUTOMATED MICROARRAY PLATFORM FOR SINGLE CELL ANALYSIS AND COLLECTION OF NON-ADHERENT CELLS MODIFIED WITH CRISPR-CAS9**
P.J. Attayek¹, C.A. LaBelle¹, J.P. Waugh², S.A. Hunsucker¹,
P.J. Grayeski¹, C.E. Sims¹, P.M. Armistead¹, and N.L. Allbritton¹
¹University of North Carolina, Chapel Hill, USA and
²Northwestern University, USA
- W111e** **COMBINING MICROFLUIDICS AND LARGE-SCALE PLASMONIC NANO-HOLES FOR SINGLE CELL-SUBSTRATE ATTACHMENT PROCESS MONITORING**
L. Tu, L. Huang, S. Bian, Y. Yu, J. Li, M. Lei, P. Liu, Q. Wu, and W. Wang
Tsinghua University, CHINA
- W112e** **DETERMINISTIC AND TRUE SINGLE-CELL ENCAPSULATION**
M. Sauzade and E. Brouzes
Stony Brook University, USA
- W113e** **DROPLET MICROFLUIDICS FOR COMPARTMENTALIZED CELL LYSIS AND EXTENSION OF DNA FROM SINGLE CELLS**
P. Zimny, W. Reisner, and D. Juncker
McGill University, CANADA
- W114e** **LIGHT ENTRAINMENT OF SINGLE CELL CIRCADIAN OSCILLATOR MEASURED BY A HIGH-THROUGHPUT MICROFLUIDIC DROPLET PLATFORM**
Z. Deng, J. Arnold, and L. Mao
University of Georgia, USA
- W115e** **PHENOTYPING ANTIBIOTIC RESISTANCE WITH SINGLE-CELL RESOLUTION FOR THE DETECTION OF HETERORESISTANCE**
F. Lyu, M. Pan, J. Andrews, and S.K.Y. Tang
Stanford University, USA
- W116e** **SINGLE CELL RESOLUTION ANALYSIS OF ULTRASOUND-PRODUCED MULTI-CELLULAR TUMOR SPHEROIDS**
K. Olofsson¹, V. Carannante², T. Frisk¹, K. Kushiro³, M. Takai³,
A. Lundqvist², B. Önfelt^{1,2}, and M. Wiklund¹
¹KTH Royal Institute of Technology, SWEDEN,
²Karolinska Institutet, SWEDEN, and ³University of Tokyo, JAPAN
- W117e** **STUDY ON A CELL TRAPPING DEVICE FOR APPLYING MOLECULAR ANALYSIS BY MODULATING LATERAL MICROSTRUCTURE SHAPES**
D.-S. Lee¹, J.W. Park¹, C. Ihm², M.Y. Jung¹, K.H. Chung¹,
H.-S. Lee^{3,4}, and D.H. Kim⁴
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²Eulji University, KOREA, ³Seoul National University, KOREA, and
⁴Technical 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
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T121e CONTINUOUS FLOW MICROFLUIDIC SYSTEM FOR CUSTOMIZABLE BACTERIAL CELLULOSE PRODUCTION THROUGH SYNTHETIC BIOLOGY

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W118e LIPOBOT: NEGATIVE CHEMOTAXIS BY OSMOTIC PRESSURE

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e - Cell & Vesicle Analysis and Manipulation

Vesicles & Lipid Membranes

M120e A SMALL-SIZED LIPID NANOPARTICLES PRODUCTION METHOD USING MICROFLUIDIC DEVICES WITH BAFFLE STRUCTURES

N. Kimura¹, M. Maeki¹, Y. Note¹, Y. Sato¹, A. Ishida¹, H. Tani¹, H. Harashima¹, and M. Tokeshi^{1,2}

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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

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M122e MICROTUBULE POLYMERIZATION USING TEMPERATURE GRADIENT IN MICROCHIP

J.-H. Liu¹, R. Yokokawa², and Y.-W. Lu¹

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

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M124e MICROFLUIDIC LIPOSOME BIOSENSOR FOR DETECTING BOTULINUM NEUROTOXIN PHYSIOLOGICAL ACTIVITY

F. Kurth¹, O.G. Weingart¹, K. Eyer², M.J. Lössner¹, and P.S. Dittrich¹

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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

Vesicles & Lipid Membranes

- T123e** **COMBINED CHEMO-PHOTODYNAMIC THERAPY USING BIODEGRADABLE MICELLES**
K. Tokarska¹, Ł. Lamch², E. Jastrzębska¹, M. Chudy¹, A. Dybko¹, K.A. Wilk², and Z. Brzózka¹
¹Warsaw University of Technology, POLAND and
²Wrocław University of Science and Technology, POLAND
- T124e** **FORMATION OF A GIANT LIPID VESICLE CONTAINING TWO TYPES OF LIQUID SOLUTIONS USING A THETA-GLASS CAPILLARY**
K. Kamiya¹, T. Osaki^{1,2}, S. Fujii¹, N. Misawa¹, and S. Takeuchi^{1,2}
¹Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and ²University of Tokyo, JAPAN
- T125e** **HIGH-THROUGHPUT PRODUCTION OF SMALL AND UNIFORM LIPOSOMES**
N. Soga¹, R. Watanabe^{1,2}, and H. Noji¹
¹University of Tokyo, JAPAN and ²AMED-PRIME, JAPAN
- T126e** **SELECTIVE PAIRING AND FUSION OF CELL-SIZED LIPOSOMES BY ROUND-TIP DIELECTROPHORETIC TWEEZER**
S. Yoshida and S. Takeuchi
University of Tokyo, JAPAN
- W119e** **CHARACTERIZATION OF MONOOLEIN BILAYER THICKNESS USING SPECIFIC MEMBRANE CAPACITANCE**
M. McGlone¹, A. Armetta¹, T. Osaki^{2,3}, S. Takeuchi^{2,3}, and S. Lee¹
¹Iona College, USA, ²Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN, and ³University of Tokyo, JAPAN
- W120e** **COMPARE OF THREE MICROPATTERN METHODS FOR HIGH-THROUGHPUT CELL ARRANGEMENT**
T. Hun^{1,3}, Y. Liu², Y. Guo², X. Liu¹, W. Wang², Y. Sun^{1,3}, and Y. Fan¹
¹Beihang University, CHINA, ²Peking University, CHINA, and
³Chinese Academy of Sciences, CHINA
- W121e** **GENERATION OF 3-DIMENSIONAL LIPID STRUCTURE ARRAY ATTACHED TO SI MICROWELLS**
W.B. Han, R. Kwak, and T.S. Kim
Korea Institute of Science and Technology (KIST), KOREA
- W122e** **HYDROGEL-BASED LIPID BILAYER SYSTEM FOR CONTINUOUS VAPOR DETECTION**
S. Fujii¹, N. Misawa¹, K. Kamiya¹, T. Osaki^{1,2}, and S. Takeuchi^{1,2}
¹Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN and ²University of Tokyo, JAPAN
- W123e** **THREE-DIMENSIONAL LIPOSOME ASSEMBLY TOWARD SYNTHETIC TISSUE**
D.C. Shin¹, Y. Morimoto¹, K. Kamiya², and S. Takeuchi¹
¹University of Tokyo, JAPAN and ²Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN

f - Cells, Organisms, and Organs on Chip

3D Culture/Tissues

- M125f A 96-WELL THREE-DIMENSIONAL MICROFABRICATED WOUND-HEALING ASSAY**
 S.L. Luan¹, R. Hao^{2,3}, Y.C. Wei², T. Zhang⁴, D.Y. Chen^{2,3}, B.Y. Fan^{2,3}, J.B. Wang^{2,3}, W. Guo¹, and J. Chen^{2,3}
¹Chinese PLA General Hospital, CHINA, ²Chinese Academy of Sciences, CHINA, ³University of Chinese Academy of Sciences, CHINA, and ⁴Peking University People's Hospital, CHINA
- M126f A HIGH-THROUGHPUT PLATFORM TO PROBE MODULATORS OF ENDOTHELIAL PERMEABILITY**
 A.L. Crampton, K.A. Cummins, and D.K. Wood
 University of Minnesota, USA
- M127f ANALYSIS OF THE PRODUCTION OF L929 CELL-BASED CYTOKINE, M-CSF, USING 3D SPHEROID CULTURE SYSTEM**
 Y.H. Jung, K. Na, J. Kim, D. Choi, H. Kim, Y. Cho, and S. Chung
 Korea University, KOREA
- M128f CYTO- AND PHOTOCYTOTOXICITY OF NANOPHOTOSENSITIZERS ON A 3D MULTILAYER OVARIAN CELL CULTURE IN A MICROFLUIDIC SYSTEM**
 M. Bulka¹, E. Jastrzebska¹, U. Bazylińska², A. Dybko¹, M. Chudy¹, K.A. Wilk², and Z. Brzozka¹
¹Warsaw University of Technology, POLAND and ²Wrocław University of Technology, POLAND
- M129f DYNAMICS OF INSULIN-REGULATED FATTY ACID EXCHANGE IN MURINE ADIPOSE TISSUE USING AUTOMATED MICROFLUIDICS AND FLUORESCENCE IMAGING**
 X. Li¹, J.C. Brooks^{1,2}, J. Hu¹, and C.J. Easley¹
¹Auburn University, USA and ²Tufts University, USA
- M130f HOLLOW FIBER SYSTEM FOR CONTINUOUS GENERATION OF HUMAN BRAIN ORGANOID**
 Y. Zhu^{1,2}, Y. Yu^{1,2}, L. Wang¹, F. Yin^{1,2}, Y. Wang^{1,2}, H. Liu¹, H. Wang^{1,2}, H. Liu^{1,2}, and J. Qin^{1,2}
¹Dalian Institute of Chemical Physics, CHINA and ²University of Chinese Academy of Sciences, JAPAN
- M131f INDIVIDUALLY ADDRESSABLE AND SPATIALLY PROGRAMMABLE BIOPOLYMER FLUITRODE FOR MULTI-SPECIES 3D CELL ASSEMBLY**
 P. Pham, J. Choy, and X. Luo
 Catholic University of America, USA
- M132f NOVEL MICROSYSTEM FOR EVALUATION OF INFLUENCE OF GRAPHENE OXIDE ON SPHEROID AND MONOLAYER CELL CULTURE**
 A. Zuchowska, E. Jasterzebska, M. Chudy, A. Dybko, M. Mazurkiewicz-Pawlicka, A. Malolepszy, L. Stobinski, and Z. Brzozka
 Warsaw University of Technology, POLAND

3D Culture/Tissues

- M133f** **USING TWO-PHOTON MICROSCOPY TO MONITOR DRUG PENETRATION INTO TUMOUR SPHEROIDS WITHIN A MICROFLUIDIC HYPOXIA CONTROL SYSTEM**
S.M. Grist, S.S. Nasser, L. Laplatine, L. Chrostowski, and K.C. Cheung
University of British Columbia, CANADA
- T127f** **A GUT-ON-A-CHIP STUDY: ENABLING ON-DEMAND MANIPULATION OF THE OUTER CELL MICROENVIRONMENT IN A MULTICOMPARTMENTAL 3D CULTURE ARRAY**
B. Gumuscu, H.J. Albers, A. van den Berg, J. Eijkel, and A.D. van der Meer
University of Twente, NETHERLANDS
- T128f** **A MICROFLUIDIC TILTING PLATFORM FOR *IN-VIVO*-LIKE DRUG EXPOSURE OF THREE-DIMENSIONAL MICROTISSUES**
C. Lohasz¹, O. Frey², K. Renggli¹, and A. Hierlemann¹
¹*ETH Zürich, SWITZERLAND* and ²*InSphero AG, SWITZERLAND*
- T129f** **BIO-FABRICATION OF CA-ALGINATE CELL SHEETS WITH THE ELECTRODEPOSITION METHOD FOR HEPATIC LOBULE TISSUE RECONSTRUCTS**
Z. Liu¹, M. Takeuchi¹, Y. Hasegawa¹, T. Fukuda^{1,2,3}, and Q. Huang³
¹*Nagoya University, JAPAN*, ²*Meijo University, JAPAN*, and ³*Beijing Institute of Technology, CHINA*
- T130f** **DESIGN OF A 3D PRINTED MICROFLUIDIC PLATFORM FOR ORGANOID CULTURE**
E.L. Jackson-Holmes¹, R.M. Lawler¹, A.W. Schaefer¹, Z. Wen², and H. Lu¹
¹*Georgia Institute of Technology, USA* and ²*Emory University School of Medicine, USA*
- T131f** **EVALUATION OF PDT EFFECTIVENESS OF ENCAPULATED PHOTSENSITIZERS BASED ON 3D SPHEROID CO-CULTURE**
A. Zuchowska¹, K. Marciniak¹, E. Jastrzebska¹, U. Bazylińska², M. Chudy¹, A. Dybko¹, K.A. Wilk², and Z. Brzozka¹
¹*Warsaw University of Technology, POLAND* and ²*Wrocław University of Science and Technology, POLAND*
- T132f** **HYDROPHOBIC PATTERNED-BASED THREE DIMENSIONAL MICROFLUIDIC CELL-CULTURE ASSAY**
S. Han¹, J. Kim¹, A. Ma¹, V. Kwan¹, K. Luong¹, R. Li², and L.L. Sohn¹
¹*University of California, Berkeley, USA* and ²*University of Minnesota, USA*
- T133f** **MICROWELL-BASED DYNAMIC CULTURE SYSTEM FOR THE GENERATION OF FUNCTIONALIZED ISLET-LIKE ORGANOIDS**
Y. Lee, M. Jang, I. Yong, E. Shin, Y.-M. Han, J.H. Shin, H. Kim, and P. Kim
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- T134f** **MULTISPECIES CO-CULTURE PLATFORM TO ENABLE SPATIOTEMPORAL ANALYSIS OF MICROBIAL COMMUNICATION**
C.A. Vaiana, Z. Ge, C.A. Voigt, and C.R. Buie
Massachusetts Institute of Technology, USA

3D Culture/Tissues

- T135f** **PERFUSION CULTURE THROUGH A VASCULATURE CONSTRUCTED IN A TUMOR SPHEROID**
Y. Nashimoto¹, Y. Teraoka¹, A. Nakamasu², S. Hanada³, Y. Arima³, Y. Torisawa¹, H. Kotera¹, K. Nishiyama³, T. Miura², and R. Yokokawa¹
¹*Kyoto University, JAPAN*, ²*Kyushu University, JAPAN*, and ³*Kumamoto University, JAPAN*
- T136f** **SELF-ORGANIZED AMNIOGENESIS FROM HUMAN PLURIPOTENT STEM CELLS IN AN ENGINEERED BIOMIMETIC NICHE**
Y. Shao¹, K. Taniguchi², K. Gurdziel³, R.F. Townshend², X. Xue¹, K.M.A. Yong¹, J. Sang¹, J.R. Spence², D.L. Gumucio², and J. Fu¹
¹*University of Michigan, USA*, ²*University of Michigan Medical School, USA*, and ³*Wayne State University, USA*
- T137f** **THICKNESS-CONTROLLED MICROCARRIER AGGREGATES FOR THREE-DIMENSIONAL EXPANSION OF MYOBLASTS**
K. Ikeda, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN
- W124f** **A MICROFLUIDIC DEVICE TO CULTURE MULTI-TYPE 3D *IN VITRO* TISSUES WITH PERFUSED HUMAN CAPILLARY NETWORK**
D. Zhao, D.T.T. Phan, C.C.W. Hughes, and A.P. Lee
University of California, Irvine, USA
- W125f** **A NOVEL *IN SITU* MONITORING SYSTEM OF 3D ENGINEERING MUSCLE**
X. Zhang and G.A. Truskey
Duke University, USA
- W126f** **BIOMATERIAL EXTRUSION AND ORGANIZATION FOR *IN-SITU* SKIN CELL DEPOSITION**
R. Cheng¹, N. Hakimi¹, S. Amini-Nik², M. Jeschke², and A. Guenther¹
¹*University of Toronto, CANADA* and ²*Sunnybrook Research Institute, CANADA*
- W127f** **DISC-ON-A-CHIP: MICROFLUIDIC ORGAN CULTURE OF MOUSE INTERVERTEBRAL DISCS TO TACKLE DEGENERATIVE DISC DISEASE**
J. Li, L. Xiao, X. Li, and J.P. Landers
University of Virginia, USA
- W128f** **HANGING DROP CHIP FOR SIMULTANEOUS TRANSPLANTATION OF MULTIPLE SPHEROIDS INTO HYDROGEL ARRAY**
H. Kim, C.H. Cho, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- W129f** ***IN VITRO* 3D CULTURE PLATFORM ENABLING 3D CELL CONSTRUCTION WITH WHOLE TISSUE IMAGING**
R. Nobata¹, T. Kawahara², and M. Hagiwara¹
¹*Osaka Prefecture University, JAPAN* and ²*Kyushu Institute of Technology, JAPAN*

3D Culture/Tissues

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

M. Ferraz¹, H.S. Rho², J. Delahaye², N. Pinheiro², H. Henning¹, T. Stout¹, B. Gadella¹, and S. Le Gac²

¹University of Utrecht, NETHERLANDS and

²University of Twente, NETHERLANDS

W131f ON-CHIP STUDY OF THE EFFECT OF HYPOXIA ON LIPID NANOPARTICLE ABSORPTION IN MCF-7 BREAST CANCER TUMOUR SPHEROIDS

S.S. Nasser, S.M. Grist, S. Chen, A. Meng, J. Hou, Y.Y.C. Tam, P. Cullis, and K.C. Cheung

University of British Columbia, CANADA

W132f VERSATILE CRADLE-TO-GRAVE CULTURE PLATFORM FOR 3D SPHEROID FORMATION AND ANALYSIS

L. Zhao, S. Mok, and C. Moraes

McGill University, CANADA

f - Cells, Organisms, and Organs on Chip

Angiogenesis/Vasculature

M134f A NOVEL EXTRACELLULAR MATRIX (ECM) PATTERNING TECHNIQUE FOR ENGINEERING BIOMIMETIC 3D MICROVASCULATURE

N.V. Menon, H.M. Tay, S.N. Wee, K.H.H. Li, and H.W. Hou

Nanyang Technological University, SINGAPORE

M135f CONTROLLING OXYGEN GRADIENTS WITHIN MICROFLUIDIC DEVICES TO STUDY ANGIOGENESIS

S.F. Lam¹, Y.E. Chu¹, A.G. Soetikno¹, and S.C. George²

¹Washington University, St. Louis, USA and

²University of California, Davis, USA

M136f MICROFLUIDIC TRANSCELLULAR MONITOR FOR PROBING THE FREQUENCY RESPONSE OF THE VASCULAR ENDOTHELIUM TO OSCILLATORY SHEAR STRESS

Y.J. Sei, S.I. Ahn, T. Virtue, T. Kim, and Y. Kim

Georgia Institute of Technology, USA

M137f STUDY ENDOTHELIAL CELL SPROUTING IN THREE-DIMENSIONAL MATRIX UNDER OXYGEN GRADIENTS USING MICROFLUIDIC DEVICES

H.-C. Shih¹, S.-L. Yeh¹, C.-K. Wang², T.-A. Lee¹,

W.-H. Liao¹, and Y.-C. Tung¹

¹Academia Sinica, TAIWAN and ²Tamkang University, TAIWAN

M138f VEIN-ON-A-CHIP: AN INVESTIGATIONAL TOOL FOR INNOVATING SCLEROTHERAPY

E. Bottaro¹, J. Paterson¹, X. Zhang¹, M. Hill¹, A.L. Lewis²,

T. Millar¹, and D. Carugo¹

¹University of Southampton, UK and ²Biocompatibles UK Ltd, UK

3D Culture/Tissues

- T138f** **COLLAGEN SPONGE-LIKE SCAFFOLD FOR A 3D PERFUSABLE VASCULARIZED TISSUE**
N. Mori, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN
- T139f** **IN VITRO 3D MICROVESSEL CONSTRUCTION BY GROOVED COLLAGEN-GEL SANDWICH**
A. Shima, Y. Morimoto, and S. Takeuchi
University of Tokyo, JAPAN
- T140f** **MULTI-CHANNEL CHIPS TO SIMULATE PULMONARY ARTERIAL HYPERTENSION (PAH) PATHOPHYSIOLOGY AND SCREEN ANTI-PAH DRUGS**
T.A. Al-Hilal, A. Keshavarz, W. Li, and F. Ahsan
Texas Tech University, USA
- T141f** **USING 3D-PRINTING TO FABRICATE A MICROFLUIDIC VASCULAR MODEL TO MIMIC ARTERIAL THROMBOSIS**
H.J. Albers¹, J.E.A. Linssen², P.F. Costa², H.H.T. Middelkamp¹, L. van der Hout¹, J. Malda², R. Passier¹, A. van den Berg¹, and A.D. van der Meer¹
¹*University of Twente, NETHERLANDS and*
²*University Medical Center Utrecht, NETHERLANDS*
- W133f** **ANGIOGENESIS DERIVED FROM SHEAR STRESS OPTIMIZED BY A MICROFLUIDIC DEVICE**
Y. Teraoka¹, M. Nakayama¹, Y. Nashimoto¹, A. Nakamasu², S. Hanada³, Y. Arima³, Y. Torisawa¹, H. Kotera¹, K. Nishiyama³, T. Miura², and R. Yokokawa¹
¹*Kyoto University, JAPAN, ²Kyushu University, JAPAN, and*
³*Kumamoto University, JAPAN*
- W134f** **CONFIGURABLE GEL GEOMETRY VIA FLOW PATTERNING FOR ANGIOGENESIS ASSAYS**
J. Loessberg-Zahl, D. Makkinga, A. van der Meer, J. Eijkel, and A. van den Berg
University of Twente, NETHERLANDS
- W135f** **DEVELOPMENT OF CELL STRETCHING DEVICE FOR PULMONARY HYPERTENSION STUDIES**
M. Nitta¹, A. Ogawa², and K. Sato¹
¹*Japan Women's University, JAPAN and*
²*National Hospital Organization Okayama Medical Center, JAPAN*
- W136f** **RPE-CHOROID COMPLEX MICROFLUIDIC MODEL FOR CHOROIDAL NEOVASCULARIZATION (CNV) PATHOGENESIS RESEARCH**
S. Lee¹, M. Chung¹, B.J. Lee¹, K. Son¹, J. Ahn¹, N.L. Jeon¹, and J.H. Kim²
¹*Seoul National University, KOREA and*
²*Seoul National University Hospital, KOREA*

Angiogenesis/Vasculature

- W137f VASCULAR REMODELING PROCESSES IN AN INTEGRATED MICROFLUIDIC DEVICE**
 N. Futai¹, T. Sano², M. Sumita¹, A. Takano³, R. Yokokawa⁴, and T. Miura²
¹Shibaura Institute of Technology, JAPAN, ²Kyushu University, JAPAN,
³Singapore University of Technology and Design, SINGAPORE, and
⁴Kyoto University, JAPAN

f - Cells, Organisms, and Organs on Chip

Embryos and Organisms

- M139f MICROFLUIDIC DEVICES FOR LIFE LONG HIGH-RESOLUTION AND HIGH THROUGHPUT IMAGING OF SUBTLE PHENOTYPES IN *C. ELEGANS***
 S.S. Bosari and A. San Miguel
 North Carolina State University, USA
- M140f SINGLE EMBRYO PIPETTE FOR ACCURATE *C. ELEGANS* BIOASSAYS**
 L. Dong, J. Zhang, T. Lehnert, and M. Gijs
 École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- M141f TEMPORAL CHANGE OF PHOTOPHOBIC RESPONSE OF EUGLENA GRACILIS OBSERVED IN A MICRO-AQUARIUM CHIP**
 K. Ozasa¹, J. Won², S. Song², and M. Maeda¹
¹Institute of Physical and Chemical Research (RIKEN), JAPAN and
²Hanyang 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

Embryos and Organisms

- W139f MICROFLUIDIC IMPEDANCE PLATFORM FOR AUTOMATED SCHISTOSOMAL MOTILITY DETECTION**
K. Chawla¹, M. Leonhardt¹, M.M. Modena¹, F. Lombardo², S.C. Bürgel¹, and A. Hierlemann¹
¹ETH Zürich, SWITZERLAND and
²Swiss Tropical and Public Health Institute, SWITZERLAND
- W140f SYNCHRONIZATION OF *C. ELEGANS* THROUGH HIGH-THROUGHPUT SEPARATION OF EGGS IN A MICROFLUIDIC CHIP**
S. Sofela¹, S. Sahloul¹, T. Kwon³, J. Han³, M.E. Warkiani⁴, and Y.-A. Song^{1,2}
¹New York University, Abu Dhabi, UAE, ²New York University, USA,
³Massachusetts Institute of Technology, USA, and
⁴University of New South Wales, AUSTRALIA

f - Cells, Organisms, and Organs on Chip

Organ on a Chip

- M142f A MICROENGINEERED HUMAN CORNEA-ON-A-CHIP FOR EVALUATING MASS TRANSPORT OF OCULAR DRUGS**
D. Bennet, Z. Estlack, and J. Kim
Texas Tech University, USA
- M143f DEVELOPMENT OF A MICROKIDNEY MODEL MIMICKING GLOMERULAR FILTRATION AND TUBULAR SECRETION**
Y. Sakuta¹, I. Takehara², T. Imaoka², K. Tsunoda¹, and K. Sato¹
¹Gunma University, JAPAN and ²Daiichi Sankyo Co., Ltd., JAPAN
- M144f INTEGRATING LOCALISED CYTOKINE DETECTION INTO MICROFLUIDIC ENDOTHELIAL CELL CULTURE TO MAP RESPONSE TO SPATIAL SHEAR-STRESS GRADIENTS (SSSG)**
M. Xu¹, S. Meucci², G. Molema³, U. Sauer⁴, and E. Verpoorte¹
¹University of Groningen, NETHERLANDS,
²Micronit Microtechnologies BV, NETHERLANDS,
³University Medical Center Groningen, NETHERLANDS, and
⁴Austrian Institute of Technology, AUSTRIA
- M145f MECHANICAL STRESS-INDUCED BLOOD CELL PRODUCTION IN A MICROFLUIDIC DEVICE**
E. Kamata¹, K. Yanagisawa¹, K. Kitajima², T. Hara², and K. Sato¹
¹Japan Women's University, JAPAN and
²Tokyo Metropolitan Institute of Medical Science, JAPAN
- M146f STRONTIUM ION MEDIATED GELATIN/ALGINATE CO-SHELLED MICROTUBES FOR HIGHLY-VIABLE 3D GLOMERULAR CELLS CULTIVATION**
J.-W. Chen¹, J.-S. Chen¹, M.-H. Chiu¹, Y.-C. Ko², H.-H. Hsu², and F.-G. Tseng^{1,3}
¹National Tsing Hua University, TAIWAN,
²Linkou Chang Gung Memorial Hospital, TAIWAN, and
³Academia Sinica, TAIWAN

Organ on a Chip

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

Organ on a Chip

- W145f** **POSITION-SELECTIVE CELL SAMPLING IN A MICROFLUIDIC CELL CULTURE DEVICE USING LOCALIZED LAMINAR FLOWS**
S. Matsumoto¹, E. Leclerc², T. Maekawa¹, H. Kinoshita¹, M. Shinohara¹, K. Komori¹, Y. Sakai¹, and T. Fujii¹
¹University of Tokyo, JAPAN and ²LIMMS/CNRS-IIS, JAPAN
- W146f** **VERTICAL ANASTOMOSIS FOR LARGE SCALE PERFUSED CAPILLARY NETWORKS AND ORGANS-ON-CHIP APPLICATIONS**
T. Yue, D. Zhao, D.T.T. Phan, C.C.W. Hughes, and A.P. Lee
University of California, Irvine, USA

f - Cells, Organisms, and Organs on Chip

Other

- M147f** **CELL-DERIVED EXTRACELLULAR MATRIX (ECM) SHEET-ON-CHIP**
Y. Hong¹, I. Koh¹, K. Park², and P. Kim¹
¹Korea Advanced Institute of Science and Technology (KAIST), KOREA and ²Korea Institute of Science and Technology (KIST), KOREA
- M148f** **DOUBLE-LAYER COLLAGEN MICROTUBE FOR PERFUSABLE HETEROGENEOUS CULTURE**
S. Itai and H. Onoe
Keio University, JAPAN
- M149f** **IN VITRO THROMBUS MODEL BASED ON MICROFLUIDICS FOR NANO DISC DDS EVALUATION**
S. Yokoyama, S. Yoshida, Y. Okamura, and H. Kimura
Tokai University, JAPAN
- M150f** **MICROPATTERNED FIBRIN AS A PLATFORM FOR WOUND HEALING STUDIES**
R. McBride, Z. Jiang, B. Noren, and J. Oakey
University of Wyoming, USA
- M151f** **PREPARATION OF QUASI-CELL PARTICLE FOR INVESTIGATION OF EFFECT OF PHYSICAL CUES TO CELL FUNCTION**
H. Oda and S. Takeuchi
University of Tokyo, JAPAN
- T151f** **COLLAGEN GELATION ON PHOSPHATE PARTICLE-EMBEDDING PDMS (PP-PDMS) CHANNEL: AN EFFICIENT APPROACH TO VASCULAR TISSUE ENGINEERING**
M. Fukushi¹, Y. Yajima¹, R. Utoh¹, M. Yamada¹, K. Furusawa², and M. Seki¹
¹Chiba University, JAPAN and ²Hokkaido University, JAPAN
- T152f** **ENGINEERING HYDROGEL ECM SCAFFOLD COMPONENT FOR IN VITRO 3D SKELETAL MUSCLE TISSUE**
J. Ahn, H. Jeong, J. Kim, and S. Chung
Korea University, KOREA

Other

- T153f** **INKJET SYSTEM DESIGN OPTIMIZATION FOR RELIABLE CELL PRINTING**
B. Enright¹, E. Cheng¹, H. Yu¹, K.C. Cheung¹, and A. Ahmadi²
¹University of British Columbia, CANADA and
²University of Prince Edward Island, CANADA
- T154f** **MIMETIC LOBULE WITH PHOTOPOLYMERIZED HYDROGEL ENCAPSULATION VIA 3D MICROCHANNEL AND LAMINAR FLOW PATTERNING**
T.-Y. Yeh¹, Y.-S. Chen¹, L.-Y. Ke¹, T.-W. Lo¹, T.-H. Hong¹, C.-T. Yeh², X. Wang³, and C.-H. Liu¹
¹National Tsing Hua University, TAIWAN,
²Chang Gung Memorial Hospital, TAIWAN, and
³Tsinghua University, CHINA
- W147f** **DISPERSIBLE REMOTE CONTROL MICROPROBES TO MAP REAL-TIME EVOLUTION OF TISSUE BIOMECHANICS**
S. Mok, C. Ledoux, S. Al-Habyan, W. Lee, L. McCaffrey, and C. Moraes
McGill University, CANADA
- W148f** **FLOW FOCUSING FOR CELL ENCAPSULATION AT ASYMMETRIC HYDROGEL NICHES**
B. Noren¹, A. Reece¹, B. Xia¹, Z. Zhang¹, M. Pope², K. Anseth², and J. Oakey¹
¹University of Wyoming, USA and ²University 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. Lutge, and J.M.J. den Toonder
Eindhoven University of Technology, NETHERLANDS
- W150f** **NOVEL LAMININ-BASED MICROSYSTEM FOR QUANTITATIVE ANALYSIS OF AXONAL HAPTOTAXIS**
R. Watanabe¹, H. Katsuno², K. Abe², and N. Inagaki²
¹University of Tokyo, JAPAN and
²Nara Institute of Science and Technology, JAPAN

f - Cells, Organisms, and Organs on Chip

Plants

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

f - Cells, Organisms, and Organs on Chip

Toxicity

- M152f** **MICROFLUIDIC HEART MODEL FOR DRUG CYTOTOXICITY ANALYSIS**
E. Tomecka, K. Zukowski, E. Jastrzebska, M. Chudy, and Z. Brzozka
Warsaw University of Technology, POLAND
- M153f** **STUDY OF THE NUTRITION DEPRIVED CONDITION ON THE DEVELOPMENT OF A MICROTUMOR**
T.-H. Wu, W.-W. Liu, Y.-H. Chen, C.J.-T. Lee, P.-C. Lee, and Y.-H. Hsu
National Taiwan University, TAIWAN
- T156f** **STEM-CELL DERIVED TWO-ORGAN MODEL FOR METABOLISM-INDUCED TOXICITY TESTING**
H. Becker¹, A. Kurtz², R. Mrowka³, S. Wölfl⁴, and C. Gärtner¹
¹*Microfluidic ChipShop GmbH, GERMANY,*
²*Charité - Universitätsmedizin Berlin, GERMANY,*
³*University Clinics Jena, GERMANY, and*
⁴*Heidelberg University, GERMANY*
- T157f** **THIOL-ENE -BASED ON-CHIP TOXICITY ASSAYS FOR CHEMICAL TOXICITY SCREENING**
I. Kiiski¹, P. Järvinen¹, S. Tähkä¹, P. Tammela¹, V. Jokinen², and T. Sikanen¹
¹*University of Helsinki, FINLAND and* ²*Aalto University, FINLAND*
- W152f** **MODELING OF HANGING-DROP NETWORKS TO OPTIMIZE THE MOBILITY OF FLOWING CELLS IN A PHYSIOLOGICAL ENVIRONMENT**
N. Rousset, M. de Geus, A.J. Kaestli, K. Renggli, and A. Hierlemann
ETH Zürich, SWITZERLAND

g - Diagnostics, Therapeutics, and Translational Medicine

Bacteria/Infectious Diseases

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

g - Diagnostics, Therapeutics, and Translational Medicine

Cancer

M155g IDENTIFICATION OF EXOSOMAL MIRNA SIGNATURES FOR MACHINE LEARNING DIAGNOSIS OF PANCREATIC CANCER

J. Ko, N. Bhagwat, Y. Na, S. Fisher, T. Black, J. Kim, E.L. Carpenter, B.Z. Stanger, and D. Issadore
University of Pennsylvania, USA

T159g SPATIALLY RESOLVED CANCER GENOME SEQUENCING BY PHENOTYPE-BASED HIGH-THROUGHPUT LASER ISOLATION

S. Kim¹, A.C. Lee¹, H.-B. Lee², J. Kim¹, Y. Jung¹, S. Bae¹, W. Han², and S. Kwon¹
¹*Seoul National University, KOREA and*
²*Seoul National University College of Medicine, KOREA*

W154g CELL ELECTROFUSION ON A MICROFLUIDIC FLIP CHIP FOR CANCER IMMUNOTHERAPY

G. Pendharkar¹, Y.-T. Lu², C.-M. Chang², B.-J. Zhang¹, and C.-H. Liu¹
¹*National Tsing Hua University, TAIWAN and*
²*Mackay Medical College, TAIWAN*

g - Diagnostics, Therapeutics, and Translational Medicine

Drug Delivery/Drug Monitoring

M156g PROBIOTIC MICROFIBER FOR ORAL DELIVERY TO REGULATE MICROBIOME

F. Ozawa¹, S. Tsutsumi², T. Matsuura², Y. Nishimoto², K. Kiyoshima², and S. Takeuchi¹
¹*University of Tokyo, JAPAN and*
²*Takeda Pharmaceutical Company Limited, JAPAN*

T160g THERAPEUTIC DRUG MONITORING FOR A PERSONALIZED ANTIBIOTHERAPY

R. Bruch¹, C. Chatelle¹, A. Kling², C. Dincer¹, S. Wirth¹, S. Schumann¹, W. Weber¹, and G. Urban¹
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. Isiksacan¹, O. Erel², and C. Elbuken¹
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. Srinivasan¹, D. O'Dell², J.L. Finkelstein¹, D. Erickson¹, and S. Mehta¹
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. Kinahan², R. Mishra², M. Ferreira¹, and J. Ducreé²
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 D3 DEFICIENCIES**
S. Vemulapati¹, E. Rey¹, D. O'Dell², S. Mehta¹, and D. Erickson¹
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. Vaithyanathan, K.R. Bajgirani, P. Darapaneni,

R. Elkhanoufi, J.A. Dorman, and A.T. Melvin

Louisiana State University, USA

g - Diagnostics, Therapeutics, and Translational Medicine

Nucleic Acid Detection/Amplification

M161g A WORLD-TO-DIGITAL MICROFLUIDIC INTERFACE FOR MicroRNA PREPARATION FROM PLASMA SAMPLES

M.J. Jebrail, A. Cho, I.P. Hong, G. Beltran, M. Martick, M. Chauleau, J. Soto, and F. Christodoulou

Miroculus, USA

M162g AN INTEGRATED MICROFLUIDIC SYSTEM FOR RAPID DETECTION AND MULTIPLE SUBTYPING OF INFLUENZA A VIRUSES BY USING POLYSACCHARIDE-COATED BEADS AND RT-PCR

G.-M. Shen¹, Y. Hsu², G.-M. Ho², S.-C. Hung², and G.-B. Lee¹

¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN

M163g AUTONOMOUS AND PORTABLE DEVICE FOR RAPID SAMPLE-TO-ANSWER MOLECULAR DIAGNOSTICS AT THE POINT-OF-CARE

D. Witters¹, E. Jue¹, N.G. Schoepp¹, S. Begolo¹, J. Rodriguez-Manzano¹, F. Shen², H. Maamar², A. Shur¹, and R.F. Ismagilov¹

¹California Institute of Technology, USA and ²SlipChip Corp., USA

M164g CONTINUOUS-FLOW DROPLET MICROFLUIDIC PLATFORM FOR SINGLE-CELL RT-qPCR ANALYSIS

M. Serra, I. Hajji, L. Geremie, R. Renault, I. Ferrante,

J.-L. Viovy, S. Descroix, and D. Ferraro

Institut Curie, FRANCE

M165g DIGITAL MICROFLUIDIC PLATFORM FOR FALSE-POSITIVE-FREE LOOP-MEDIATED ISOTHERMAL AMPLIFICATION

L. Wan¹, T.L. Chen¹, J. Gao¹, C. Dong¹, Y. Jia¹,

P.-I. Mak¹, and R.P. Martins^{1,2}

¹University of Macau, CHINA and ²Universidade 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

Nucleic Acid Detection/Amplification

- M167g** **MULTIPLEX QUANTITATIVE LAMP DETECTION ON A PMMA/PAPER HYBRID SPINCHIP**
M. Dou, S.T. Sanjay, and X. Li
University of Texas, El Paso, USA
- M168g** **QUANTIFYING MICROFLUIDIC PCR AT EXTREME SPEEDS**
A.R. Jafek, H. Brady, S. Harbertson, A. Millington, R. Samuel, and B. Gale
University of Utah, USA
- M169g** **SINGLE CELL WHOLE GENOME AMPLIFICATION VIA MICROPILLAR ARRAYS FOR REDUCING AMPLIFICATION BIAS**
H.C. Tian and H.G. Craighead
Cornell University, USA
- M170g** **TINY: A PORTABLE SYSTEM FOR NUCLEIC ACID QUANTIFICATION IN THE FIELD USING ALTERNATIVE HEAT SOURCES**
R. Snodgrass¹, A. Gardner², V. Koppa¹, J. Duru¹, T. Maurer³, A. Semeere⁴, E. Cesarman², J. Martin³, and D. Erickson¹
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. Zhou¹ 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 ASSISTED THERMAL CONVECTION**
M. Saito, K. Takahashi, W.V. Espulgar, and E. Tamiya
Osaka University, JAPAN
- T169g** **LAB-ON-FOIL BASED PORTABLE μ PCR FOR POC NUCLEIC ACID TESTING OF HIV-1**
A. Ohlander¹, I. Bose², D. Njenda³, U. Neogi⁴, C. Kutter², and A. Russom¹
¹*KTH Royal Institute of Technology, GERMANY*, ²*Fraunhofer EMFT, GERMANY*, ³*Universität Bundeswehr, GERMANY*, and ⁴*Karolinska Institute, SWEDEN*

Nucleic Acid Detection/Amplification

- T170g MICROFLUIDIC-BASED *IN SITU* PADLOCK PROBE ROLLING-CIRCLE AMPLIFICATION FOR MRNA ANALYSIS**
C. Kase, Y. Ishigaki, and K. Sato
Japan Women's University, JAPAN
- T171g PRECISE RECOGNITION FOR TRANSLOCATION OF SINGLE-STRANDED DNA THROUGH A BIOLOGICAL NANOPORE USING WAVELET TRANSFORM**
A. Tamotsu, M. Hiratani, and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN
- T172g PROGNOSIS OF TRAUMATIC BRAIN INJURY USING MACHINE LEARNING BASED MIRNA SIGNATURES IN NANOMAGNETICALLY ISOLATED BRAIN-DERIVED EXOSOMES**
J. Ko, M. Hemphill, E. Sewell, Y. Na, D. Sandsmark, S. Fisher, E. Torre, R. Diaz-Arrastia, J. Kim, D. Meaney, and D. Issadore
University of Pennsylvania, USA
- T173g STORAGE OF LAMP REAGENTS TO ENABLE TRANSLATION OF POINT-OF-CARE TECHNOLOGIES**
T.J. Moehling and J.C. Linnes
Purdue University, USA
- T174g ULTRAFast 15-MINUTE MULTIPLEX PCR ON POLYESTER MICRODEVICES FOR HUMAN IDENTIFICATION VIA SHORT TANDEM REPEAT ANALYSIS**
B.L. Thompson¹, D. Le Roux¹, J.A. DuVall¹, C. Birch¹, D.A. Nelson¹, J. Li¹, D.L. Mills², A. Tsuei¹, M.G. Ensenberger³, C. Sprecher³, D. Storts³, B. E. Root¹, and J.P. Landers¹
¹University of Virginia, USA, ²TeGrex Technologies, USA, and ³Promega Corporation, USA
- W160g A NOVEL DUAL FRET COMPETITIVE PROBE FOR INTRACELLULAR MESSENGER RNA DETECTION**
B. Wang, Z. You, and D. Ren
Tsinghua University, CHINA
- W161g AN INTEGRATED DEVICE FOR SAMPLE PREPARATION, RNA ISOTHERMAL AMPLIFICATION, AND DETECTION OF CHLAMYDIA TRACHOMATIS**
B. Liu¹, E. Zeng², and R. Liu²
¹Arcadia High School, USA and ²Hochuen 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

Nucleic Acid Detection/Amplification

- W163g CHARACTERIZATION OF MEMBRANE SUBSTRATES TO ENABLE DNA CAPTURE AND DIRECT AMPLIFICATION FOR PAPER-BASED NUCLEIC ACID AMPLIFICATION TESTS**
I.A. Nanayakkara and I.M. White
University of Maryland, USA
- W164g DIGITAL HIGH RESOLUTION MELT PLATFORM FOR ASSESSING EPIGENETIC HETEROGENEITY ON A MICROFLUIDIC CHIP**
C. O'Keefe, T. Pisanic, and T.-H.J. Wang
Johns Hopkins University, USA
- W165g MICROFLUIDIC CARTRIDGE FOR LAM-BASED TB POC-DIAGNOSTICS USING SILICON PHOTONICS SENSOR**
H. Becker¹, M. Singh², L. Lechuga³, R. Bockstaele⁴, B. Anton¹, D. Martens⁵, A. Gonzalez-Guerrero³, R. Vos⁶, A. Elamin², and P. Bienstman⁵
¹*Microfluidic ChipShop GmbH, GERMANY*, ²*Lionex GmbH, GERMANY*, ³*Catalan Institute of Nanoscience and Nanotechnology, SPAIN*, ⁴*Trinian BV, BELGIUM*, ⁵*Ghent University, BELGIUM*, and ⁶*IMEC, BELGIUM*
- W166g NANOWIRES ENABLING CANCER DIAGNOSIS FROM 1 mL URINE**
T. Naganawa¹, T. Yasui^{1,2}, T. Yanagida³, N. Kaji^{1,2}, M. Kanai³, K. Nagashima³, T. Kawai⁴, and Y. Baba^{1,5}
¹*Nagoya University, JAPAN*, ²*Japan Science and Technology Agency (JST), JAPAN*, ³*Kyushu University, JAPAN*, ⁴*Osaka University, JAPAN*, and ⁵*National Institute of Advanced Industrial Science and Technology, JAPAN*
- W167g PROBED-STRAND DISPLACEMENT FOR SPECIFIC NUCLEIC ACID AMPLICON DETECTION BY LATERAL FLOW IMMUNOASSAY**
E.A. Phillips¹, T.J. Moehling¹, S. Bhadra², A.D. Ellington², and J.C. Linnes¹
¹*Purdue University, USA* and ²*University of Texas, Austin, USA*
- W168g RAPID DETECTION OF EXOSOMES & EXOSOMAL MICRORNA BIOMARKERS BY ELECTROKINETIC CONCENTRATION FOR LIQUID BIOPSY ON CHIP**
L. Cheung¹, X. Wei^{1,2}, D. Martins¹, and Y.-A. Song^{1,2}
¹*New York University, Abu Dhabi, UAE* and ²*New York University, USA*
- W169g THERMAL GRADIENT FOR FLUOROMETRIC OPTIMIZATION OF DROPLET PCR IN VIRTUAL REACTION CHAMBERS**
X. Li^{1,2}, W. Wu³, and A. Manz^{1,2}
¹*Saarland University, GERMANY*, ²*Korea Institute of Science and Technology (KIST) - Europe, GERMANY*, and ³*Chinese Academy of Sciences, CHINA*

g - Diagnostics, Therapeutics, and Translational Medicine

Protein Diagnostics/Immunoassays

- M171g A MICROFLUIDIC-BASED TECHNIQUE FOR CREATING AMYLOID NANOSTRUCTURES AND ITS APPLICATION TO ENZYME REACTION**
M. Maeki, S. Sato, A. Ishida, H. Tani, and M. Tokeshi
Hokkaido University, JAPAN
- M172g DEVELOPMENT NEW ANALYSIS METHOD BASED ON MICROFLUIDIC ELISA FOR DETECTION OF LOW-ABUNDANT PROTEIN**
E. Mori¹, T. Fukazawa², A. Yoshizaki², K. Mawatari¹, and T. Kitamori¹
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. Simeone¹, M.A. Lateef¹, M. Cahuzac¹, B. Péant¹, E. Carmona¹, J. Kendall-Dupont¹, A.M. Orimoto¹, D. Provencher¹, F. Saad¹, A.-M. Mes-Masson¹, and T. Gervais^{1,2}
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. Galvin¹, K. Shirai², M. Kakuta², and A.Q. Shen¹
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 Villarreal¹, S. Williams¹, A. Egatz-Gomez¹, P. Coleman¹, D. Nedelkov², M.R. Sierks¹, and A. Ros¹
¹*Arizona State University, USA* and ²*Isoformix, USA*
- T176g FUNCTIONAL DIAGNOSTICS FOR PRECISION MEDICINE WITH SILICON PHOTONIC MICRORING RESONATOR ARRAYS**
J.H. Wade¹, J.N. Sarkaria², and R.C. Bailey¹
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

Protein Diagnostics/Immunoassays

- W170g** **A CAPILLARY FLOW-DRIVEN MICROFLUIDIC DEVICE FOR MICROPARTICLE-LABELED IMMUNOASSAY**
A.K. Bavit and J. Kim
Texas Tech University, USA
- W171g** **DESIGN OF A PDMS MICROCHANNEL ARRAY-BASED FAST AND SINGLE-STEP IMMUNOASSAY PRINCIPLE USING HYDROPHILIC POLYMER-COATED GRAPHENE OXIDE POSSESSING MULTIPLE FUNCTIONS**
A. Shirai, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN
- W172g** **IN-SITU COVALENT IMMOBILIZATION OF PROTEIN ON A CHIP BY SORTASE-MEDIATED PEPTIDE LIGATION**
R. Wakai¹, S. Ueno^{1,2}, and T. Ichiki^{1,2}
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. Ueno¹ and T. Ichiki²
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. Clark¹, K. Xu², O. Scott³, J. Hickey³, S. Woolf¹, and J.P. Landers¹
¹*University of Virginia, USA, ²Pacific Northwest National Laboratory, USA, and ³MicroLab Inc., USA*
- W175h** **LABEL-FREE ACOUSTOPHORETIC ENRICHMENT OF MONONUCLEAR CELLS FROM BLOOD**
A. Urbansky¹, P. Ohlsson^{1,2}, A. Lenshof¹, S. Scheding^{1,3}, and T. Laurell^{1,4}
¹*Lund University, SWEDEN, ²AcouSort AB, SWEDEN, ³Skåne University Hospital, SWEDEN, and ⁴Dongguk University, KOREA*

h - Separations and Reactions

Bacteria

M176h A HIGH-THROUGHPUT MICROFLUIDIC ASSAY FOR EVALUATION OF CELL ELECTRICAL PROPERTIES

K. Kikkeri, N.B. White, and M. Agah

Virginia Polytechnic Institute and State University, USA

T180h MICROFLUIDIC STATIC DROPLET ARRAY FOR SCREENING AND ENRICHMENT OF CHEMICAL PRODUCING BACTERIA

B. Lee¹, S. Jang², G.Y Jung², and C.-S. Lee¹

¹*Chungnam National University, KOREA and*

²*Pohang University of Science and Technology (POSTECH), KOREA*

W176h RAPID AND SELECTIVE ELECTROKINETIC CONCENTRATION OF BACTERIA USING AC SIGNAL SUPERPOSITION ON TWO COPLANAR ELECTRODES

C.-H. Han, S.Y. Woo, A. Sharma, and J. Jang

Ulsan National Institute of Science & Technology (UNIST), KOREA

h - Separations and Reactions

Chromatography

M177h A MICROMACHINED LIQUID CHROMATOGRAPHY CHIP WITH A PILLAR ARRAY MIXER FOR POST-COLUMN DERIVATIZATION IN THE ANALYSIS OF NEUROTRANSMITTERS

M. Isokawa¹, K. Nakanishi², T. Kanamori¹, H. Zhuang¹, H. Yamazaki², T. Sugaya², D.H. Yoon², T. Sekiguchi², T. Funatsu¹, S. Shoji², and M. Tsunoda¹

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M178h DEVELOPMENT OF LIQUID COMPONENT SEPARATION DEVICE FOR SEPARATION OF WATER MOLECULE ISOTOPE USING LUDWIG SORET EFFECT

S. Miyamoto, K. Eguchi, R. Kita, and H. Kimura

Tokai University, JAPAN

T181h DEVELOPMENT OF A NEW ON-SITE DEVICE COMBINING ELECTROOSMOTIC PUMP AND SELECTIVE MOLECULAR RECOGNITION

H. Inoue, T. Naito, T. Kubo, and K. Otsuka

Kyoto University, JAPAN

T182h HIGH THROUGHPUT SOLUTION EXCHANGE OF MICROPARTICLES USING MAGNETOPHORESIS IN CURVED MICROCHANNELS

P. Bayat¹, S. Zareian^{1,2}, and P. Rezai¹

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. Hu¹, Y.-M. Feng¹, L.-L. Zhou¹, P. Fang², Q. Fang², and J. Fang¹
¹China Medical University, CHINA and ²Zhejiang University, CHINA
- T184h** **MICROCHIP ELECTROPHORESIS OF PRETERM BIRTH BIOMARKERS IN 3D PRINTED DEVICES**
M.J. Beauchamp, H. Gong, G.P. Nordin, and A.T. Woolley
Brigham Young University, USA
- T185h** **ON-CHIP GEL ELECTROPHORESIS IN INKJET 3D PRINTED CONFIGURABLE AND MODULAR LAB-ON-A-CHIP**
K. Adamski, W. Kubicki, and R. Walczak
Wrocław University of Science and Technology, POLAND
- T186h** **TOWARDS SEPARATION OF SINGLE WALLED CARBON NANOTUBES WITH INSULATOR-BASED DIELECTROPHORESIS**
M.T. Rabbani^{1,2}, C.F. Schmidt², and A. Ros¹
¹Arizona State University, USA and ²Göttingen University, GERMANY
- W178h** **A ZINC-FINGER-PROTEIN-BASED RAPID MICROFLUIDIC HOMOGENOUS ELECTROPHORESIS AFFINITY ASSAY FOR QUANTITATIVE GENE ANALYSIS**
N.G. Arega¹, W.H. Heard², M.-S. Kim², and D. Kim¹
¹Myongji University, KOREA and ²Western Kentucky University, USA

Electrophoresis

W179h ENTROPIC TRAP-BASED TUNABLE SHORT-PASS FILTER TO RECOVER LONG DNA FOR GENOMIC APPLICATIONS

P. Agrawal¹, Z. Bognár², and K.D. Dorfman¹

¹University of Minnesota, USA and

²Budapest University of Technology and Economics, HUNGARY

W180h MOLECULE DEPENDENT TIME OF FLIGHT IDENTIFICATION OF NUCLEOTIDES: AN APPROACH FOR SINGLE-MOLECULE DNA SEQUENCING

C.A. Amarasekara¹, C. O'Neil², K.M. W-Ratnayake¹,

B. Gross¹, and S.A. Soper¹

¹University of Kansas, USA and

²University of North Carolina, Chapel Hill, USA

W181h SEPARATION-BASED SENSOR FOR DOPAMINE AND ITS METABOLITES USING MICRODIALYSIS COUPLED TO MICROCHIP ELECTROPHORESIS WITH ELECTROCHEMICAL DETECTION

S.M. Lunte¹, S.M. Gunawardhana¹, and R.A. Saylor²

¹University of Kansas, USA and ²University of South Carolina, USA

h - Separations and Reactions

Other

M183h MICROFLUIDIC ADAPTATION OF WET-DRY CYCLES IN PREBIOTIC CHEMISTRY ANALOG EXPERIMENTS

M. Adiraj Iyer¹, D. Baum², and D. Eddington¹

¹University of Illinois, Chicago, USA and

²University of Wisconsin, Madison, USA

T187h PORTABLE, DROPLET-BASED MICROFLUIDIC DEVICE FOR AQUEOUS TWO-PHASE-EXTRACTIONS AND COLORIMETRIC DETECTION OF Cd²⁺

M. Hermann, P. Agrawal, and R.D. Oleschuk

Queen's University, CANADA

W182h CHEMICAL SYNTHESIS OF REVERSE DNA AS A BARCODE TAG FOR mRNA ANALYSIS USING MILD REAGENTS ON PDMS CHIP

R. Bhardwaj and Y. Takamura

Japan Advanced Institute of Science Technology (JAIST), JAPAN

W183h TOWARDS 3D COMPOSITIONAL CONTROL OF ADDRESSABLE BIOFUNCTIONAL SITES WITHIN A MICROFLUIDIC ENVIRONMENT

N. Nordin, L. Bordonali, J.G. Korvink, V. Badilita, and N. MacKinnon

Karlsruhe Institute of Technology (KIT), GERMANY

h - Separations and Reactions

Particle & Cell Separation

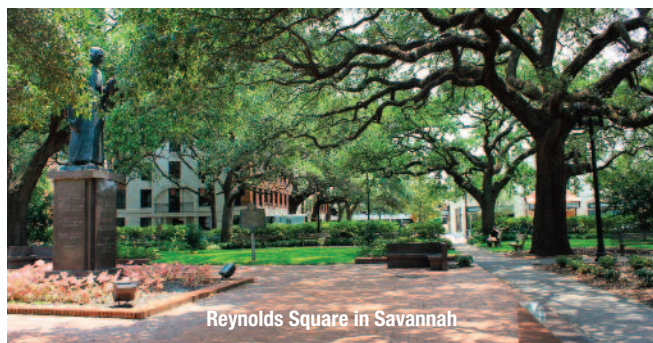
- M184h 3D-PRINTED MICRO HYDROCYCLONES FOR HIGH-THROUGHPUT PARTICLE SEPARATION**
J.Y. Han, B. Krasniqi, and D.L. DeVoe
University of Maryland, USA
- M185h ACOUSTIC MICROFLUIDIC PARTICLE ENRICHMENT IN A LONGITUDINAL STANDING BULK ACOUSTIC WAVE (LSBAW)**
M. Cui, M.M. Binkley, and J.M. Meacham
Washington University, St. Louis, USA
- M186h DIELECTROPHORETIC SEPARATION OF MICROSCALE PARTICLES BY FREQUENCY HOPPING**
P. Modarres and M. Tabrizian
McGill University, CANADA
- M187h ENHANCED FOCUSING AND SEPARATION OF SPERM CELL IN MICROFLUIDIC INERTIAL SEPARATION DEVICE WITH VISCOELASTIC LIQUID**
H. Feng, T. Jenkins, A. Jafek, R. Samuel, and B.K. Gale
University of Utah, USA
- M188h ENRICHMENT OF HUMAN ADIPOSE-DERIVED STEM CELLS BY A SPIRAL-SHAPED INERTIAL MICROFLUIDIC SORTER**
L.M. Lee¹, Y. Wang¹, C.J. Garson¹, G.J. Klarmann², B. Prabhakarpandian¹, K. Pant¹, L.M. Alvarez^{2,3}, and E. Lai^{4,5}
¹CFD Research Corporation, USA, ²National Cancer Institute, USA, ³United States Military Academy, USA, ⁴Johns Hopkins University, USA, and ⁵United States Army Medical Research and Material Command, USA
- M189h MICROFLUIDIC SORTING OF CELL VIABILITY BASED ON STIFFNESS**
M. Islam¹, T. Bongiorno¹, N. Stone¹, A. Liu¹, W. Lam^{1,2}, A. Alexeev¹, E.K. Waller², and T. Sulchek¹
¹Georgia Institute of Technology, USA and ²Emory School of Medicine, USA
- M190h PARTICLES SEPARATION VIA SHEATH-FREE DETERMINISTIC LATERAL DISPLACEMENT WITH INERTIALLY FOCUSED SINGLE INPUT**
N. Tottori and T. Nisisako
Tokyo Institute of Technology, JAPAN
- M191h SELECTIVE SEPARATION OF MICROALGAE CELLS USING INERTIAL MICROFLUIDICS**
M.S. Syed¹, M. Rafeie¹, D. Vandamme^{1,2}, R. Henderson¹, and M.E. Warkiani³
¹University of New South Wales, AUSTRALIA, ²KU Leuven, BELGIUM, and ³University 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

Particle & Cell Separation

- T188h A MICROFLUIDIC DEVICE FOR LABEL-FREE ELECTRONIC IMMUNOPHENOTYPING OF CELL POPULATIONS**
R. Liu, C.-H. Chu, N. Wang, and A.F. Sarioglu
Georgia Institute of Technology, USA
- T189h DEVELOPMENT OF A STREAMING DIELECTROPHORESIS NUMBER TO DESCRIBE A SYSTEM FOR CONTINUOUS PARTICLE SEPARATION**
R. Natu, M. Islam, and R. Martinez-Duarte
Clemson University, USA
- T190h DIELECTROPHORETIC SORTING SYSTEM FOR SCREENING OF NAD(P)-DEPENDENT OXIDOREDUCTASES**
Y. Kanai, S. Shimokihara, S. Shitara, R. Oyobiki, T. Watanabe, Y. Einaga, K. Wakamatsu, Y. Matsumoto, K. Fujiwara, and N. Doi
Keio University, JAPAN
- T191h HIGH PERFORMANCE MULTIPLEX ACOUSTOPHORESIS FOR WBC SUBPOPULATION ISOLATION**
A. Lenshof¹, A. Urbansky¹, S. Scheding², and T. Laurell^{1,3}
¹*Lund University, SWEDEN*, ²*University Hospital Skåne, SWEDEN*, and ³*Dongguk University, KOREA*
- T192h INERTIAL FOCUSING AND ENRICHMENT OF WHITE BLOOD CELLS USING MICRO-TANGENTIAL FLOW FILTRATION**
M. Garcia¹, R. Khojah², D. Di Carlo², and S. Pennathur¹
¹*University of California, Santa Barbara, USA* and ²*University of California, Los Angeles, USA*
- T193h MORPHOLOGY BASED CONTINUOUS CELL SEPARATION VIA ELASTOINERTIAL PINCHED FLOW FRACTIONATION**
D. Li, P. Walker, M. Newcomer, J. Zielinski, L. Kozubowski, and X. Xuan
Clemson University, USA
- T194h PLASTIC MULTI-CHANNEL ACOUSTIC SEPARATOR FOR HIGH-THROUGHPUT PURIFICATION OF LYMPHOCYTES**
R. Dubay, C. Lissandrello, K. Kotz, C. Juarez, and J. Fiering
Draper, USA
- T195h SHEATH-FREE DEAN-FLOW COUPLED INERTIAL SEPARATION OF TETRAHYMENA NUCLEI IN SPIRAL MICROCHANNELS**
X. Lu^{1,2}, G.-A. Kim¹, X. Chen^{1,3}, Y. Liu¹, and S. Takayama^{1,2}
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

Particle & Cell Separation

- W185h DIELECTROPHORETIC CHARACTERIZATION OF CANDIDA SPECIES WITH 3D CARBON ELECTRODES TOWARDS SEPARATION AND SPECIES-SPECIFIC DIAGNOSIS**
M. Islam, J. Gilmore, K. Wallace, and R. Martinez-Duarte
Clemson University, USA
- W186h DIFFUSIOPHORESIS-BASED SELECTIVE PARTICLE ENTRAPMENT IN 3D MICROFUNNELS INTEGRATED IN A MIXED-SCALE PDMS FLUIDIC DEVICE**
J. Hong, B. Kim, and H. Shin
Ulsan National Institute of Science & Technology (UNIST), KOREA
- W187h EXTENDED ELASTO-INERTIAL MICROFLUIDICS FOR HIGH THROUGHPUT SEPARATION IN LOW ASPECT RATIO SPIRAL MICROCHANNELS**
H. Ramachandraiah, T. Kumar, I. Banerjee, and A. Russom
Royal Institute of Technology (KTH), SWEDEN
- W188h MAXIMIZING PARTICLE CONCENTRATION IN DETERMINISTIC LATERAL DISPLACEMENT ARRAYS**
S. Feng¹, A.M. Skelley², A.G. Anwer¹, G. Liu¹, and D.W. Inglis¹
¹Macquarie University, AUSTRALIA and ²GPB Scientific LLC, USA
- W189h MULTIPLEX AND SHEATHLESS ELASTO-MAGNETIC SORTING OF MAGNETIC AND NON-MAGNETIC MICROPARTICLES IN NON-NEWTONIAN FLUIDS**
V. Kumar, S. Dibaji, and P. Rezai
York University, CANADA
- W190h PURIFICATION OF ALGINATE ENCAPSULATED CELLS IN A 3D PRINTED MICROFLUIDIC MAGNETIC SORTING DEVICE**
J. Etxebarria-Elezgarai¹, A. Espona-Noguera¹, J. Saez¹, A. Cañibano-Hernández¹, G. Orive¹, R.M. Hernandez¹, L. Saenz del Burgo¹, F. Benito-Lopez¹, J. Ciriza¹, J.L. Pedraz¹, and L. Basabe-Desmonts^{1,2}
¹University of the Basque Country, SPAIN and ²IKERBASQUE, SPAIN
- W191h SHEATHLESS DETERMINISTIC LATERAL DISPLACEMENT FOR CONTINUOUS PARTICLE SEPARATION IN VISCOELASTIC FLUID**
N. Tottori and T. Nisisako
Tokyo Institute of Technology, JAPAN



Reynolds Square in Savannah

h - Separations and Reactions

Temperature & Pressure Controlled

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

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

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

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

R.M. Ripken, J.G.E. Gardeniers, and S. Le Gac
University of Twente, NETHERLANDS

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

Y. Zhai, A. Wang, and K.W. Oh
State University of New York, Buffalo, USA

h - Separations and Reactions

Vapor-Phase Separation/Detection

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

K.K. Rangharajan and S. Prakash
Ohio State University, USA

i - Other Applications for Microfluidics

Energy (Fuel Cell & Battery)

M194i A MICRO REFORMING-TYPE PHOSPHORIC ACID FUEL CELL SYSTEM HYBRID WITH EVAPORATOR, WATER REMOVAL CHANNEL, AND OSRM METHANOL REFORMER

Y.-C. Wu¹, W.-Y. Chen¹, H.-S. Wang¹, C.-P. Chang¹, and F.-G. Tseng^{1,2}

¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN

M195i POLYMER-BASED BENDABLE DIRECT METHANOL FUEL CELL FOR WEARABLE APPLICATIONS

W.-Y. Huang, T.-C. Liu, F.-G. Tseng, and P.-C. Wang
National Tsing Hua University, TAIWAN

T197i A PAPER-BASED MICROFLUIDIC PLATFORM FOR PHOTOSYNTHETIC BIOELECTRICITY GENERATION

L. Liu and S. Choi
State University of New York, Binghamton, USA

T198i SQUEEZE-BIOBATTERY: ON-DEMAND POWER GENERATION FROM LYOPHILIZED EXOELECTROGENS USING A FINGER-ACTIVATED, SELF-CONTAINED MEDIA POUCH

Y. Gao and S. Choi
State University of New York, Binghamton, USA

Energy (Fuel Cell & Battery)

W194i A MICROFLUIDIC FLEXIBLE AND STRETCHABLE BIOBATTERY

S. Pang¹, Y. Gao¹, M. Zhu², and S. Choi¹

¹State University of New York, Binghamton, USA and

²State University of New York, New York, USA

i - Other Applications for Microfluidics

Others

M196i A MICROFLUIDIC PLATFORM FOR THE STUDY OF ICE-NUCLEATING PARTICLES IN REMOTE MARINE ENVIRONMENTS

G.C.E. Porter¹, M.D. Tarn¹, S.N.F. Sikora¹, M.E. Salter², T.W. Wilson¹, T.F. Whale¹, J. Shim¹, and B.J. Murray¹

¹University of Leeds, UK and ²Stockholm University, SWEDEN

M197i GEOMETRIC OPTIMIZATION OF IONIC CURRENT RECTIFICATION IN BIPOLAR NANOCANNEL NETWORK MEMBRANE

G.T. Chang, C. Wang, J. Kim, and J. Park

Sogang University, KOREA

M198i PM2.5 COLLECTION INTO AQUEOUS SOLUTION VIA HYDROPHILIC OXIDE NANOWIRE SURFACE

T. Shimada¹, T. Yasui^{1,2}, A. Hibara³, H. Yasaki¹, T. Yanagida⁴, M. Hara¹, N. Kaji^{1,2}, M. Kanai⁴, K. Nagashima⁴, T. Kawai⁵, and Y. Baba^{1,6}

¹Nagoya University, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN, ³Tohoku University, JAPAN, ⁴Kyushu University, JAPAN,

⁵Osaka University, JAPAN, and ⁶National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T199i AN INTEGRATED MICROFLUIDIC SYSTEM FOR CONTINUOUS SELECTION OF APTAMERS BY USING TISSUE SAMPLES

W.-T. Liu¹, W.-B. Lee¹, Y.-C. Tsai¹, L.-Y. Hung¹, C.-Y. Fu¹, Y.-J. Chuang², K.-F. Hsu², and G.-B. Lee¹

¹National Tsing Hua University, TAIWAN and

²National Cheng Kung University, TAIWAN

T200i HIGH-IMPACT MICROFLUIDICS: AN INTEGRATED INSTRUMENT TO DETECT EXTRATERRESTRIAL ORGANIC SIGNATURES (AND MAYBE LIFE) ON A KINETIC PENETRATOR PLATFORM

T.P. Cantrell¹, M. Cato¹, Z. Duca¹, J. Muller¹, D. Eichstedt¹, B. Schmidt¹, S. Foreman², J. Kim², P. Putman³, H. Jiao⁴, E. Jensen⁴, H. Mehrabani⁴, and A. Stockton¹

¹Georgia Institute of Technology, USA, ²Texas Tech University, USA,

³Sierra Lobo, Inc., USA, and ⁴HJ Science & Technology, USA

W195i A MEMBRANELESS LAMINAR-FLOW BASED BIO-SOLAR CELL

L. Liu, W. Yang, and S. Choi

State University of New York, Binghamton, USA

W196i AUTONOMOUS BIOACTUATOR DRIVEN BY CHICKEN CARDIOMYOCYTES

K. Furuike, A. Shima, S. Yoshida, Y. Morimoto, and S. Takeuchi

University of Tokyo, JAPAN

Others

W197i MICRO CHEMICAL ANALYSIS FOR GAMMA-EMITTING ACTINIDE SPECIES IN RADIOACTIVE WASTES GENERATED FROM NUCLEAR ACCIDENTS

K. Matsushita¹, B. Aileen¹, A. Kirishima², and T. Tsukahara¹

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-DIMENSIONAL PAPER-BASED ANALYTICAL DEVICE

S.-G. Jeong, J. Kim, S.H. Jin, B. Lee, D.-Y. Kim, G. Shim, and C.-S. Lee
Chungnam National University, KOREA

M200i FABRICATION OF PAPER-BASED MICROFLUIDIC DEVICES WITH SCHOLAR GLUE AND MAGNETIC MASKS

T.M.G. Cardoso¹, F.R. de Souza¹, P.T. Garcia¹, D. Rabelo¹,
C.S. Henry², and W.K.T. Coltro¹

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-Hualde¹, S. Arroyo-Jimenez¹, M. Martínez de Pancorbo¹,
G. Garai-Ibabe¹, F. Benito-Lopez¹, 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. Hong¹, G.I.J. Salentijn^{1,3}, and E. Verpoorte¹

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

T204i PAPER-BASED CRYOPRESERVATION

R. Alnemari¹, P.S. Sukumar¹, R. Rezgui¹, and M.Q. Qasaimeh^{1,2}

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

Paper μFluidics

- T205i** **TWO-PHASE COUNTER FLOW ON PAPER**
G.I.J. Salentijn^{1,2}, M. Grajewski¹, and E. Verpoorte¹
¹University of Groningen, NETHERLANDS and ²Ti-COAST, NETHERLANDS
- W198i** **A REUSABLE PAPER/POLYMER HYBRID PLUG-AND-PLAY MICROFLUIDIC PLATFORM FOR HIGH-SENSITIVITY IMMUNOASSAY**
S.T. Sanjay¹, M. Li^{1,2}, and X. Li¹
¹University of Texas, El Paso, USA and ²Beijing Normal University, CHINA
- W199i** **FABRICATION OF PAPER-BASED MICROFLUIDIC DEVICES VIA LOCAL DEPOSITION OF PHOTO-POLYMER FOLLOWED BY UV CURING**
P.J.W. HE, I.N. Katis, R.W. Eason, and C.L. Sones
University of Southampton, UK
- W200i** **HIGHLY SENSITIVE PAPER-BASED ANALYTICAL DEVICES**
J.-Y. Huang, C.-W. Chen, and C.-F. Chen
National Taiwan University, TAIWAN
- W201i** **PAPER-BASED MICROFLUIDIC DEVICES ON THE CRIME SCENE: A SIMPLE TOOL FOR RAPID ESTIMATION OF POST-MORTEM INTERVAL USING VITREOUS HUMOUR**
P.T. Garcia¹, E.F.M. Gabriel¹, G.S. Pessôa², J.C. Santos Júnior², P.C. Mollo Filho³, R.B.F. Guidugli³, N.F. Hoehr², M.A.Z. Arruda^{2,4}, and W.K.T. Coltro^{1,4}
¹Universidade Federal de Goiás, BRAZIL, ²Universidade Estadual de Campinas, BRAZIL, ³Superintendência da Polícia Técnico Científica, BRAZIL, and ⁴Instituto Nacional de Ciência e Tecnologia de Bioanálítica, BRAZIL

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Others

- M203j** **DROPLET ENCAPSULATION TO STUDY THERAPEUTIC CELL MIGRATION**
A. Benavente-Babace¹, K. Haase², and M. Godin¹
¹University of Ottawa, CANADA and
²Massachusetts Institute of Technology, USA
- M204j** **SELF-PRIMING, VACUUM-SEALED "READY-TO-USE" MICROFLUIDICS**
L.J. Millet^{1,2}, J. Aufrecht², J. Labbé¹, M.J. Doktycz^{1,2}, and S.T. Retterer^{1,2}
¹Oak Ridge National Laboratory, USA and
²University of Tennessee, USA
- T206j** **MOSAIC IMMUNOASSAYS INTERGRATED WITH MICROFLUIDIC CHANNELS FOR HIGH-THROUGHPUT PARALLEL DETECTION**
F. Zheng¹, E. He^{1,2}, L. Cai¹, D. Huang¹, B. Yu¹, and Z. Li¹
¹Peking University, CHINA and ²Tsinghua University, CHINA

Others

W202j A MICROFLUIDIC PLATFORM TO PROBE THE ROLE OF PERICELLULAR MATRIX IN METASTATIC EXTRAVASATION AND INVASION OF BREAST CANCER EPITHELIAL CELLS

M.-E. Brett, H.E. Bomberger, G.R. Doak, M.A. Price, J.B. McCarthy, and D.K. Wood
University of Minnesota, USA

W203j SAMPLE PROCESSOR FOR LIFE ON ICY WORLDS (SPLIce): DESIGN AND TEST RESULTS

T.N. Chinn, A.K. Lee, T.D. Boone, M.X. Tan, M.M. Chin, G.C. McCutcheon, M.F. Horne, M.R. Padgen, J.T. Blaich, J.B. Forgione, P.T. Zell, K.F. Bywaters, E.T. Kelly, A.F. Davila, R.C. Quinn, and A.J. Ricco
NASA Ames Research Center, USA

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Sample Prep

M205j REAGENT-FREE HIGH-THROUGHPUT EXTRACTION OF NUCLEIC ACIDS AND PROTEINS VIA RAPID MECHANICAL CELL LYSIS USING SILICON POINT-CONSTRICTIONS

X. Huang, Y. Pan, X. Xing, and L. Yobas
Hong Kong University of Science and Technology, HONG KONG

T207j DEVELOPMENT OF HIGH YIELD PLASMA SEPARATION DEVICE FROM WHOLE BLOOD PREVENTING BLOOD CELL CLOGGING IN A MICRO/EXTENDED-NANO CHIP

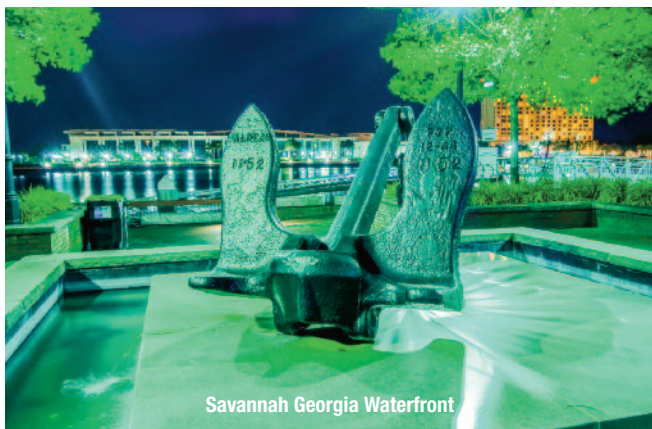
J. Mitsuse, K. Morikawa, E. Mori, R. Ohta, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

W204j NEW GENERATION OF MICROFLUIDIC MAGNETIC FLUIDIZED BED FOR HIGH THROUGHPUT SAMPLE PRETREATMENT

L. Alexandre^{1,2,3}, I. Pereiro^{1,2,3}, A. Bendali^{1,2,3}, J.-L. Viovy^{1,2,3}, L. Malaquin⁴, and S. Descroix^{1,2,3}

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³Institut Pierre Gilles de Gennes, FRANCE, and ⁴LAAS-CNRS, FRANCE



Savannah Georgia Waterfront

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- M206k 3D BLOOD VESSEL SHAPING OF CHICK EMBRYO FOR MECHANOBIOLOGY RESEARCH**
M. Itayama and T. Kawahara
Kyushu Institute of Technology, JAPAN
- M207k A CLOSED MICROCIRCULATION SYSTEM WITH NON-FOULING AND SLIPPERY MICROFLUIDIC NETWORKS FOR WHOLE BLOOD HEMODYNAMICS ANALYSIS**
H. Zou, T. Xu, X. Yao, H.Y. Cheung, and M. Yang
City University of Hong Kong, HONG KONG
- M208k A SILICON BIOREACTOR WITH THREE-DIMENSIONAL FLOW-FOCUSING STRUCTURE TO GENERATE PLATELETS**
K. Fujimoto^{1,2}, Y. Okawa², Y. Hiroi³, J. Katayama^{1,3}, T. Funakoshi⁴, Y. Yanagida¹, and T. Ohba¹
¹*Tokyo Institute of Technology, JAPAN*, ²*Dai Nippon Printing Co., Ltd., JAPAN*, ³*Nissan Chemical Industries, Ltd., JAPAN*, and ⁴*Fujikin Inc., JAPAN*
- M209k CELL MECHANICS STUDY AND ENHANCED INVASIVE CELL SORTING WITH A MICROFLUIDIC SYSTEM**
Y. Xia, W. Li, Y. Chen, and S.-Y. Zheng
Pennsylvania State University, USA
- M210k COMBINED HYDRODYNAMIC MIXER AND GAS DYNAMIC VIRTUAL NOZZLE DEVICES FOR SERIAL FEMTOSECOND CRYSTALLOGRAPHY**
G. Brehm^{1,2}, A. Echelmeier¹, J. Coe¹, C.E. Conrad¹, G. Nelson¹, J. Cruz Villarreal¹, U. Weierstall¹, J. Spence¹, S. Köster², P. Fromme¹, and A. Ros¹
¹*Arizona State University, USA* and ²*University of Goettingen, GERMANY*
- M211k CONCENTRATION POLARIZATION TO MEASURE NANO-PORE ACCESSIBILITY**
M. Solsona¹, A.-E. Nieuwelink², V.A. Papadimitriou¹, J.C.T. Eijkel¹, F. Meirer², L. Abelmann^{1,3}, W. Olthuis¹, B.M. Weckhuysen², and A. van den Berg¹
¹*University of Twente, NETHERLANDS*, ²*University of Utrecht, NETHERLANDS*, and ³*KIST Europe, GERMANY*
- M212k CYTO-MINE®: AN INTEGRATED PICODROPLET SYSTEM FOR SINGLE CELL ANALYSIS AND MONOCLONALITY ASSURANCE**
D. Josephides, M. Vallet, S. Davoli, E. Shvets, X. Liu, M. Rehak, F.F. Craig, and D. Holmes
Sphere Fluidics Ltd., UK
- M213k DETECTION OF PHOSPHATES FOR ENVIRONMENTAL ANALYSIS OF RIVER WATER BY A LAY-PERSON USING A PAPER BASED DEVICE**
S. Richardson, A. Iles, J.M. Rotchell, M. Lorch, and N. Pamme
University of Hull, UK
- M214k DIGITAL LAMP ON A COMMERCIAL MEMBRANE**
X. Lin¹, X. Huang¹, X. Xie^{1,2}, Y. Zhu¹, X. Wu¹, S. Wang¹, and M.R. Hoffmann¹
¹*California Institute of Technology, USA* and ²*Georgia Institute of Technology, USA*

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- M215k DYNAMIC INSULIN RESPONSES OF SINGLE ISLETS OF LANGERHANS TO AN ANTI-DIABETIC LIPID**
B. Bandak, L. Yi, N. Mukhitov, K.C. Evans, and M.G. Roper
Florida State University, USA
- M216k FABRICATION OF EXTRACELLULAR MATRIX COATED MEMBRANES IN LUNG-ON-CHIPS USING TWO-PHOTON POLYMERIZATION**
S. Méance, Y. Lin, M. Machireddy, P. Fu, V. Gaponenko, S.J. Ackerman, V. Natarajan, and J. Xu
University of Illinois, Chicago, USA
- M217k FUNCTIONALIZATION-FREE MICROFLUIDIC ELECTRONIC TONGUE BASED ON A SINGLE RESPONSE**
F. Shimizu¹, F. Todão², A. Gobbi², O. Oliveira Jr.¹, C.D. Garcia³, and R.S. Lima²
¹*Centro Nac. de Pesquisa em Energia e Materiais, BRAZIL,*
²*Universidade de São Paulo, BRAZIL, and* ³*Clemson University, USA*
- M218k HYDROGEL MEMBRANE-BASED BIOSENSOR FOR RAPID DETECTION OF NITRITE IONS**
S.-E. Kim¹, J. Nam², I.-B. Jung¹, Y.-J. Won¹, W.K. Seong¹, D.-S. Shin², and K.-N. Lee¹
¹*Korea Electronics Technology Institute (KETI), KOREA and*
²*Sookmyung Women's University, KOREA*
- M219k INTEGRATED OPTICAL WAVEGUIDES FOR *IN SITU* MICROFLOW MEASUREMENT**
J.R. Hands and G.A. Cooksey
National Institute of Standards and Technology (NIST), USA
- M220k MECHANISTIC DIFFERENCES OF ANTIVIRALS REVEALED BY MICROFLUIDICS-BASED SINGLE-CELL VIROLOGY**
W. Liu¹, M.U. Caglar², Z. Mao¹, C.O. Wilke², T.J. Huang^{1,3}, and C.E. Cameron¹
¹*Pennsylvania State University, USA,* ²*University of Texas, Austin, USA, and* ³*Duke University, USA*
- M221k MICROFABRICATION OF A 3D, ELASTIC CELL MICROENVIRONMENT WITH NANOSCALE PRECISION USING LAYER-BY-LAYER DEPOSITION**
M. Ibo^{1,2}, L. Motabar^{1,3}, K. Bhadriraju^{1,4}, and D.R. Reyes¹
¹*National Institute of Standards and Technology (NIST), USA,*
²*Theiss Research, USA,* ³*University of Maryland, USA, and*
⁴*Prometheus Computing, USA*
- M222k MICROFLUIDIC PAPER BASED ANALYTICAL DEVICE FOR DETECTION OF ANTIBIOTIC RESISTANT STAPHYLOCOCCUS AUREUS IN MILK IN RESOURCE LIMITED AREAS**
M. Asif^{1,2}, F.R. Awan², Q.M. Khan², and N. Pamme¹
¹*University of Hull, UK and* ²*National Institute for Biotechnology and Genetic Engineering, PAKISTAN*

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- M223k NETOSIS-ON-A-CHIP: AN INTEGRATED MICRODEVICE TO QUANTIFY NEUTROPHIL EXTRACELLULAR TRAPS (NETS) IN DIABETES**
H.M. Tay¹, R. Dalan², B.O. Boehm^{1,2}, and H.W. Hou¹
¹*Nanyang Technological University, SINGAPORE and*
²*Tan Tock Seng Hospital, SINGAPORE*
- M224k NUCLEI'S ROLE IN CELL TRANSLOCATION THROUGH MICRO-RESTRICTIONS**
Y. Xia, Y. Wan, S. Hao, and S.-Y. Zheng
Pennsylvania State University, USA
- M225k ORGAN-ON-A-CHIP SYSTEM FOR STUDYING SMOOTH MUSCLE AND EPITHELIAL CELL INTERACTIONS OF THE LUNG AIRWAY**
M. Humayun¹, C.-W. Chow^{1,2}, and E.W.K. Young¹
¹*University of Toronto, CANADA and*
²*Toronto General Hospital Research Institute, CANADA*
- M226k PRINTING ORIENTATION INFLUENCES FLUIDIC BEHAVIOUR IN CHANNELS MADE BY FUSED DEPOSITION MOLDING**
F. Li¹, N.P. Macdonald¹, R.M. Guijt², and M.C. Breadmore¹
¹*University of Tasmania, AUSTRALIA and* ²*Deakin University, AUSTRALIA*
- M227k RAPID EXTRACTION AND CONCENTRATION OF MAGNETIC PARTICLES FROM WHOLE BLOOD WITH MICROFLUIDIC MAGNETIC RATCHETING**
O. Adeyiga, C. Murray, and D. Di Carlo
University of California, Los Angeles, USA
- M228k SEPARATION OF LOW-ABUNDANCE CELLS AS AN APP ON STANDARD LABORATORY CENTRIFUGE**
S. Burger¹, J. Schemberg², T. Förster², M. Specht¹, M. Rombach¹, N. Paust¹, R. Zengerle^{1,3}, and M. Karle¹
¹*Hahn-Schickard, GERMANY,* ²*Institute for Bioprocessing and Analytical Measurement Techniques, GERMANY, and* ³*University Freiburg, GERMANY*
- M229k SPLIT-ISOTACHOPHORESIS FOCUSING IN MULTIPLE-TURN MICROFLUIDIC CHANNELS**
R.-L. Chien¹ and I. Yamaguchi²
¹*Wako Life Sciences, USA and* ²*Wako Pure Chemical Industries, JAPAN*
- M230k THIOL-ENE SURFACE MODIFICATIONS FOR MICROCHIP ELECTROPHORESIS BASED INTERACTION ASSAYS**
S. Tähkä, L. Batelic, C. Capasso, V. Cerullo, S.K. Wiedmer, and T. Sikanen
University of Helsinki, FINLAND
- T208k A 3D CULTURE COMBINATORIAL DRUG SCREENING DEVICE**
H.-C. Chang^{1,2}, C.-H. Lin¹, D.S. Juang¹, and C.-H. Hsu^{1,2}
¹*National Health Research Institutes, TAIWAN and*
²*National Chung Hsing University, TAIWAN*
- T209k A MICROFLUIDIC DEVICE INTEGRATING MICROWELL WITH A PERMANENT MAGNET FOR IMMUNOMAGNETIC SINGLE CELL TRAPPING**
Y.-J. Hwong, R.L. Lai, and N.-T. Huang
National Taiwan University, TAIWAN

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- T210k ADDRESSING THE DISTRIBUTION OF PROTEINS SPOTTED ON μ PADS**
L. McCann, S. Holtsclaw, and C.D. Garcia
Clemson University, USA
- T211k CELLULAR ANTI-ADHESIVE EFFECTS OF NANOPILLARS BY A COSTEFFECTIVE METHOD USING NANOIMPRINT TECHNOLOGY**
K. Fujimoto, Y. Okawa, and T. Kakegawa
Dai Nippon Printing Co., Ltd., JAPAN
- T212k COMPLETE LIQUID FILLING IN CLOSED-END MICROCHANNELS FOR INTERDIGITAL TRANSDUCERS (IDTS) - THEORETICAL MODEL AND EXPERIMENTAL OBSERVATIONS**
W. Guo¹, H.D. Xi¹, and S.H. Tan²
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. Shimizu¹, N. Saigo¹, Y. Sekiya¹, S. Sakashita², Y. Hamada², K. Usui², and R. Kawano¹
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. Uesugi¹, H. Mayama², and K. Morishima¹
¹*Osaka University, JAPAN and* ²*Asahikawa Medical University, JAPAN*
- T217k ELECTROKINETIC SCANNING PROBE FOR BIOMOLECULAR ANALYSIS**
N. Ostromohov^{1,2}, M. Bercovici¹, and G.V. Kaigala²
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

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T220k IN-SITU PROTEIN DETECTION IN HUMAN PLASMA BY DUAL-GATE NANORIBBON-BASED ION-SENSITIVE FIELD-EFFECT TRANSISTOR BIOSENSOR

S. Ma^{1,2}, Y.-K. Lee², and A. Zhang¹

¹*Xi'an Jiaotong University, CHINA and*

²*Hong Kong University of Science and Technology, HONG KONG*

T221k INVESTIGATION OF ELECTRICAL STIMULATION BY GLUTAMATE SENSING FROM BRAIN SLICES WITH MICROSENSORS

A. Weltin¹, K. Joseph², J. Kieninger¹, U.G. Hofmann², and G.A. Urban¹

¹*University of Freiburg, GERMANY and*

²*University Medical Center Freiburg, GERMANY*

T222k METACHRONAL MOTION OF MAGNETICALLY ACTUATED CILIA

S. Hanasoge, A. Alexeev, and P.J. Hesketh

Georgia Institute of Technology, USA

T223k MICROFLUIDIC DEVICE FOR SELECTIVE MANIPULATION OF GIANT LIPOSOMES

T. Okano and H. Suzuki

Chuo University, JAPAN

T224k MICROFLUIDIC SYNTHESIS OF SILICONE ELASTOMER MICROGELS USING ON-CHIP CHEMICAL CROSS-LINKING

J. Bennett, A. Kristof, J. Genzer, J. Srogl, and M. Abolhasani

North Carolina State University, USA

T225k NOVEL DUAL-MOTOR SPINNING SYSTEM FOR ACTIVE APPLICATIONS ON MICROFLUIDIC COMPACT DISCS

W. Al-Faqheri, G. Al Shishani, A. Al-Bagdady, and A. Al-Halhoul

German Jordanian University, JORDAN

T226k ON-CHIP FLUIDIC ACTUATION FOR TEM LIQUID CELLS

M. Denoual, V. Menon, T. Sato, and H. Fujita

University of Tokyo, JAPAN

T227k PATTERNING ELECTRO-OSMOTIC FLOW USING NON-UNIFORM SURFACE CHARGE IN A HELE-SHAW CELL

F. Paratore^{1,2}, G.V. Kaigala¹, and M. Bercovici²

¹*IBM Research Laboratory - Zurich, SWITZERLAND and*

²*Israel Institute of Technology (Technion), ISRAEL*

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

T.Y. Lee¹ and Y. Shin²

¹*Chungnam National University, KOREA and*

²*University of Ulsan College of Medicine, KOREA*

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

A.R. Brunet^{1,2}, P. Wong², and T. Gervais^{1,2}

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²*Université de Montréal, CANADA*

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- T230k SLIDING ASSEMBLY OF COSCINODISCUS SPECIES DIATOM FRUSTULE ON SILICON SUBSTRATE**
A. Li¹, S. Anderson², and X. Zhang¹
¹*Boston University, USA* and ²*Boston University Medical Center, USA*
- T231k STRENGTH ENHANCEMENT OF SU-8 HOLLOW MICRONEEDLES USING C-MEMS PROCESS FOR DRUG DELIVERY**
R. Mishra, B. Pramanick, T.K. Maiti, and T.K. Bhattacharyya
Indian Institute of Technology, Kharagpur, INDIA
- T232k TWENTY-DAY CULTURING OF TUBULAR SCAFFOLDS USING MICRO-CONNECTOR WITH HEART-MIMICKING MEDIUM PUMPING FOR BLOOD VESSEL MODELING**
T.D. Van, Y. Lee, T. Nguyen, M. Choi, H.L. Phan, Y.K. Lee, H. Park, D. Shin, and K. Koo
University of Ulsan, KOREA
- T233k WRAPPING LIQUID LASERS AROUND MICROFLUIDIC DROPLETS**
L. Zheng, M. Zhi, Y. Chan, and S.A. Khan
National University of Singapore, SINGAPORE
- W205k A 3D PNEUMATIC MICROFLUIDIC DISC FOR CIRCULATING TUMOR CELL ISOLATION AND THEREAFTER CELL CULTURE**
S.-C. Tsai, T. Wang, W.-S. Wu, W.-Y. Chang, Y.-J. Chen, and H. Doong
LifeCode Biotech Company, TAIWAN
- W206k A MICROFLUIDIC DEVICE WITH CELL CULTURE AND DIGITAL DETECTION SYSTEM FOR ISOLATED CIRCULATING TUMOR CELLS**
S.-C. Tsai, Y.-J. Chen, W.-Y. Chang, T. Wang, W.-S. Wu, and H. Doong
LifeCode Biotech Company, TAIWAN
- W207k AN AUTOMATED MODULAR MICROSYSTEM FOR ENZYMATIC DIGESTION WITH GUT-ON-A-CHIP APPLICATIONS**
P. de Haan^{1,2}, M.A. Ivanovska^{1,2}, K. Mathwig¹, H. Bouwmeester³, and E. Verpoorte¹
¹*University of Groningen, NETHERLANDS*, ²*TI-COAST, NETHERLANDS*, and ³*Wageningen University, NETHERLANDS*
- W208k CHARACTERIZATION OF OPTIMAL INTEGRATION STRATEGIES FOR THE BIOTIN-STREPTAVIDIN REACTION WITHIN LATERAL FLOW ASSAYS USING COMPUTATIONAL MODELING AND EXPERIMENTATION**
D. Gasperino, T. Baughman, and B. Weigl
Intellectual Ventures Laboratory, USA
- W209k COMPREHENSIVE SINGLE CELL DIELECTRIC SPECTROSCOPY USING ISOMOTIVE DIELECTROPHORESIS (ISODEP)**
M.Z. Rashed¹, K.C. Grome¹, G. Gasser², S.P. Hendricks³, and S.J. Williams¹
¹*University of Louisville, USA*, ²*Georgia Institute of Technology, USA*, and ³*Murray State University, USA*

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- W210k** **CONTINUOUS SORTING AND DIFFERENTIATION POTENTIAL OF ADULT STEM CELLS BASED ON FILTERLESS MICROFLUIDIC FILTRATION**
C.J. Shim^{1,2}, H. Jeon^{1,2}, M.-S. Chang¹, and M.-S. Chun²
¹Seoul National University, KOREA and
²Korea Institute of Science and Technology (KIST), KOREA
- W211k** **DETECTING SINGLE-CELL APOPTOSIS AND VIABILITY ENABLED BY SIMULTANEOUS REAL-TIME MONITORING OF RECEPTOR ACTIVATION AND LECTIN BINDING ON THE LAB-IN-A-TRENCH PLATFORM**
D. King, T. O'Connell, A. Julius, A. Coudray, D. Canning, K. Healy, J. Cawley, D. Monaghan, D. Walls, B. O'Connor, and J. 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. Reichmuth¹, V. Gatterdam¹, A. Frutiger¹, K.-P. Stengele², C. Fattinger³, and J. Vörös¹
¹ETH Zürich, SWITZERLAND, ²Roche Diagnostics GmbH, GERMANY, and
³Roche Innovation Center Basel, SWITZERLAND
- 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. Suzuki¹
¹Chuo University, JAPAN and
²Japan 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

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- W220k MICROFLUIDIC ISOLATION OF SINGLE CELLS USING ARC-EDGE-CROSS-SECTION MONOLITHIC VALVES FOR GENE MUTATION HETEROGENEITY ANALYSIS**
T. Xu, H. Fu, and M. Yang
City University of Hong Kong, HONG KONG
- W221k MULTI-PARAMETER BIOPHYSICAL CHARACTERISATION OF CANCER CELLS TOWARDS POTENTIAL RESISTANCE TO SPINDLE-POISON BASED CHEMOTHERAPIES ON A CENTRIFUGAL PLATFORM**
M. Al-Ofi, D. King, M. Glynn, T. Glennon, and J. Ducreé
Dublin City University, IRELAND
- W222k NOVEL MICROFABRICATION TECHNIQUE OF 3D SILICONE STRUCTURES FROM PLANAR SUBSTRATE BY TENSILE BUCKLING**
P. Arambel, M. Riek, and R.E. Taylor
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. King¹, P. Cahill¹, D. Kernan¹, A. Julius¹, D. Canning¹, K. Healy¹, U. Simonsen², and J. Ducreé¹
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. Solsona¹, A.-E. Nieuwelink², M. Odijk¹, F. Meirer², L. Abelman^{1,2,3}, W. Olthuis¹, B.M. Weckhuysen², and A. van den Berg¹
¹*University of Twente, NETHERLANDS*, ²*Utrecht University, NETHERLANDS*, and ³*KIST Europe, GERMANY*
- W228k SYNCHRONIZING SELF-REGULATE MICROFLUIDIC OSCILLATORS VIA CAPACITIVE COUPLING**
S.C. Leshier-Pérez^{1,2}, C. Zhang^{1,3}, and S. Takayama^{1,4}
¹*University of Michigan, USA*, ²*University of California, Los Angeles, USA*, ³*Chongqing University, CHINA*, and ⁴*Georgia Institute of Technology, USA*

k - Late News

W229k TWO-DIMENSIONAL PROFILING OF CANCER CELL SUBPOPULATIONS
M. Poudineh, M. Labib, E.H. Sargent, and S.O. Kelley
University of Toronto, CANADA

W230k XENOPTICON: MICROFLUIDIC PLATFORM FOR TIME-RESOLVED ANALYSIS OF XENOPUS EMBRYO DEVELOPMENT
R. Novak¹, Y. Choe¹, A. Dinis¹, M. Ingram¹, V. Keshari¹, B.A. Nestor¹, M. Super¹, M. Levin^{1,2}, and D.E. Ingber^{1,3}
¹Harvard University, USA, ²Tufts University, USA, and
³Boston Children's Hospital and Harvard Medical School, USA



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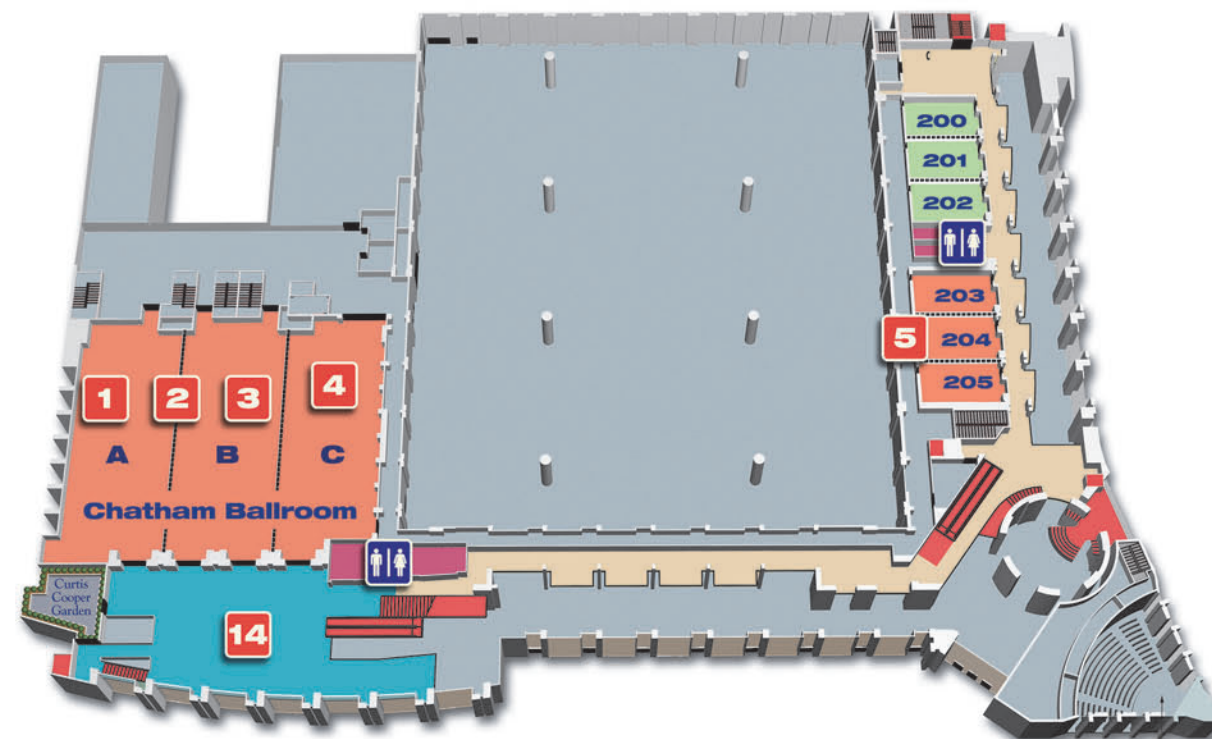
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CLASSIFICATION

- 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

SECOND FLOOR

- 1 Plenary Sessions
- 2 Concurrent Sessions A
- 3 Award Presentations
- 4 Concurrent Sessions B
- 5 Concurrent Sessions C
- 6 Lunch Distribution
- 7 Poster Sessions
- 8 Exhibits
- 9 Breaks (mid-morning & afternoon)
- 10 Exhibitor Industrial Stage
- 11 Hochuen Presentations
- 12 MicroTAS Student Mixer
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