

The 20th International Conference on Miniaturized
Systems for Chemistry and Life Sciences



FINAL PROGRAM

Conference Chairs:

Nicole Pamme, *University of Hull, UK*

Jens Ducreé, *Dublin City University, IRELAND*

Sponsored by:



MONDAY, 10 OCTOBER

07:00 - 18:20	Registration - Foyer, Ground Level		
08:00 - 08:30	Opening Remarks		
08:30 - 09:15	PLENARY PRESENTATION I Kenneth A. Dawson, <i>University College, Dublin, IRELAND</i>		
09:15 - 09:30	Transition		
09:30 - 10:30	SESSION 1A1 Cell Culture	SESSION 1B1 Capillary Flow Devices	SESSION 1C1 Physical & Chemical Sensors
10:30 - 11:00	Break: Exhibit and Poster Inspection		
11:00 - 12:20	SESSION 1A2 Organs and Organisms	SESSION 1B2 Centrifugal Microfluidics	SESSION 1C2 Biosensors
12:20 - 13:15	Grab 'n Go Lunch		
13:15 - 14:30	PLENARY PRESENTATION II - COMMERCIALIZATION PANEL • Reid Brennen, <i>Agilent Technologies, USA</i> • Luc Bousse, <i>InSilixa, USA</i> • Claudia Gärtner, <i>Microfluidic ChipShop GmbH, GERMANY</i> • Jim Walsh, <i>Dublin City University, IRELAND</i>		
14:30 - 16:50	Poster Session 1		
14:30 - 16:10	Exhibitor Industrial Stage 1		
16:50 - 18:20	SESSION 1A3 In-Vitro Studies	SESSION 1B3 Droplets and Cells	SESSION 1C3 Bio-Assays
	KEYNOTE PRESENTATION 16:50 - 17:20	KEYNOTE PRESENTATION 16:50 - 17:20	KEYNOTE PRESENTATION 16:50 - 17:20

TUESDAY, 11 OCTOBER

07:45 - 17:50	Registration - Foyer, Ground Level		
08:15 - 08:30	Announcements		
08:30 - 09:15	PLENARY PRESENTATION III Anja Boisen, <i>Technical University of Denmark, DENMARK</i>		
09:15 - 09:30	Transition		
09:30 - 10:50	SESSION 2A1 Cancer Cells	SESSION 2B1 Droplet Generation	SESSION 2C1 Optical Detection
10:50 - 11:20	Break: Exhibit and Poster Inspection		
11:00 - 13:00	MicroTAS Outreach Event 11:00 - 11:50 and 12:10 - 13:00 Lab-on-a-Chip Lecture Elisabeth M.J. Verpoorte, <i>University of Groningen, NETHERLANDS</i> Exhibit and Poster Inspection		
12:20 - 13:15	Grab 'n Go Lunch		
13:15 - 14:00	PLENARY PRESENTATION IV Ben Zhong Tang <i>Hong Kong University of Science & Technology, CHINA</i>		
14:00 - 16:20	Poster Session 2		
14:00 - 15:20	Exhibitor Industrial Stage 2		
16:20 - 17:50	SESSION 2A3 Electrochemical Sensors	SESSION 2B3 microRNA Analysis	SESSION 2C3 Self-Assembly & Biopolymers
	KEYNOTE PRESENTATION 16:20 - 16:50	KEYNOTE PRESENTATION 16:20 - 16:50	KEYNOTE PRESENTATION 16:20 - 16:50



CONFERENCE AT A GLANCE

WEDNESDAY, 12 OCTOBER

07:45 - 18:00	Registration - Foyer, Ground Level		
08:15 - 08:30	Announcements		
08:30 - 09:15	PLENARY PRESENTATION V David J. Beebe, <i>University of Wisconsin, USA</i>		
09:15 - 09:30	Transition		
09:30 - 10:30	SESSION 3A1 Bacterial Analysis	SESSION 3B1 Droplet Platforms	SESSION 3C1 Particle Separation
10:30 - 11:00	Break: Exhibit and Poster Inspection		
11:00 - 12:20	SESSION 3A2 Mechanical Cell Analysis	SESSION 3B2 Acoustic and Magnetic Actuation	SESSION 3C2 Microscale Fabrication
12:20 - 13:15	Grab 'n Go Lunch		
13:15 - 13:35	Analytical Chemistry - Young Innovator Award		
13:35 - 13:55	Lab on a Chip and Corning Inc. - Pioneers in Miniaturization Prize		
14:00 - 14:10	MicroTAS 2017 Announcement		
14:10 - 16:30	Poster Session 3		
16:30 - 18:00	SESSION 3A3 Antibiotic Resistance	SESSION 3B3 DNA Mapping & Sequencing	SESSION 3C3 Point-of-Care Diagnostics
	KEYNOTE PRESENTATION 16:30 - 17:00	KEYNOTE PRESENTATION 16:30 - 17:00	KEYNOTE PRESENTATION 16:30 - 17:00
19:00 - 23:00	Wednesday Evening at Café en Seine		

THURSDAY, 13 OCTOBER

08:15 - 13:00	Registration - Foyer, Ground Level		
08:45 - 10:05	SESSION 4A1 Organisms and Plants	SESSION 4B1 Single Cell Analysis	SESSION 4C1 Material Applications
10:05 - 10:35	Break: Exhibit and Poster Inspection		
10:35 - 11:35	SESSION 4A2 Stem Cells	SESSION 4B2 Electric Separations	SESSION 4C2 Cellular Analysis
11:35 - 11:45	Transition		
11:45 - 12:30	PLENARY PRESENTATION VI Takehiko Kitamori, <i>University of Tokyo, JAPAN</i>		
12:30 - 12:45	CHEMINAS - Young Researcher Poster Awards Lab on a Chip - Widmer Poster Award		
12:45 - 13:00	NIST and Lab on a Chip Art in Science Award Dolomite and Lab on a Chip - Video Award		
13:00	Closing Remarks - Conference Adjourns		

TRACK/CLASSIFICATION

a	Cell Separation and Analysis
b	Cells, Organisms, and Organs on Chip
c	Commercialization
d	Diagnostics, Theranostics, and Translational Medicine
e	Fundamentals in Microfluidics and Nanofluidics
f	Integrated Microfluidic Platforms
g	Micro- and Nanoengineering
h	Sensors & Actuators, and Detection Technologies
i	Separations, Reactions, and Other Applications for Microfluidics

PLENARY SPEAKERS**MONDAY, 10 OCTOBER**

08:30 - 09:15 Kenneth A. Dawson, *University College, Dublin, IRELAND*

13:15 - 14:30 **Commercialization Panel**

Reid Brennan, *Agilent Technologies, USA*

Luc Bousse, *POC Medical Systems Inc., USA*

Claudia Gärtner, *Microfluidic ChipShop GmbH, GERMANY*

Jim Walsh, *Dublin City University, IRELAND*

TUESDAY, 11 OCTOBER

08:30 - 09:15 Anja Boisen, *Technical University of Denmark, DENMARK*

13:15 - 14:00 Ben Zhong Tang, *Hong Kong University of Science & Technology, CHINA*

WEDNESDAY, 12 OCTOBER

08:30 - 09:15 David J. Beebe, *University of Wisconsin, USA*

THURSDAY, 13 OCTOBER

11:45 - 12:30 Takehiko Kitamori, *University of Tokyo, JAPAN*

KEYNOTE SPEAKERS**MONDAY, 10 OCTOBER**

16:50 - 17:20 **Session 1A3 - In-Vitro Studies**

S. Le Gac, *University of Twente, NETHERLANDS*

16:50 - 17:20 **Session 1B3 - Droplets and Cells**

C.N. Baroud, *Ecole Polytechnique, FRANCE*

16:50 - 17:20 **Session 1C3 - Bio-Assays**

J.M. Cooper, *University of Glasgow, UK*

TUESDAY, 11 OCTOBER

16:20 - 16:50 **Session 2A3 - Electrochemical Sensors**

S.M. Lunte, *University of Kansas, USA*

16:20 - 16:50 **Session 2B3 - microRNA Analysis**

D.-H. Min, *Seoul National University, KOREA*

16:20 - 16:50 **Session 2C3 - Self-Assembly & Biopolymers**

M.R. Begley, *University of California, Santa Barbara, USA*

WEDNESDAY, 12 OCTOBER

16:30 - 17:00 **Session 3A3 - Antibiotic Resistance**

S. Kwon, *Seoul National University, KOREA*

16:30 - 17:00 **Session 3B3 - DNA Mapping & Sequencing**

H. Takeyama, *Waseda University, JAPAN*

16:30 - 17:00 **Session 3C3 - Point-of-Care Diagnostics**

C.M. Klapperich, *Boston University, USA*

Parallel Oral Sessions

Each day papers will be presented in three parallel sessions. There will be a total of 30 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** = Auditorium, Level 3
B = Liffey A, Level 1
C = Liffey B, Level 1

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

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

Posters

Three poster sessions will be held in the Forum, Ground Level, and the Foyer, Level 3 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 category to coordinate with the floor plans on the last page of this program.

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 track/classification color of the poster.

Tracks “**a**” and “**b**” are located on Foyer, Level 3. Tracks “**c**” through “**j**” are located in the Forum, Ground Level.

a Cell Separation and Analysis

b Cells, Organisms, and Organs on Chip

c Commercialization

d Diagnostics, Theranostics, and Translational Medicine

e Fundamentals in Microfluidics and Nanofluidics

f Integrated Microfluidic Platforms

g Micro- and Nanoengineering

h Sensors & Actuators, and Detection Technologies

i Separations, Reactions, and Other Applications for Microfluidics

j Late News

SUNDAY, 9 OCTOBER

08:30 Workshop Registration

09:00 - 12:00 Morning Workshops

Workshop 1 PAPER MICROFLUIDICS: INTEGRATION CHALLENGES & SOLUTIONS FOR POINT-OF-NEED TESTING

Barry Lutz, *University of Washington, USA*
Caitlin E. Anderson, *University of Washington, USA*
Joshua R. Buser, *University of Washington, USA*
Samantha A. Byrnes, *University of Washington, USA*
Kamal G. Shah, *University of Washington, USA*
Shichu Huang, *University of Washington, USA*
Koji Abe, *University of Washington, USA*

Workshop 2 ORGAN-ON-A-CHIP

Paul Vulto, *Mimetas B.V., NETHERLANDS (Group Leader)*
Katia Kraals, *Emulate, USA*
Olivier Frey, *ETH Zürich, SWITZERLAND*
Tobias Hasenberg, *TissUse, GmbH, GERMANY*

Workshop 3 COMMERCIALIZATION ASPECTS OF MICROFLUIDICS

Holger Becker, *Microfluidic ChipShop GmbH, GERMANY*

Workshop 4 MICROFLUIDIC LARGE-SCALE INTEGRATION

Sebastian Maerkl, *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

Workshop 5 3D PRINTING FOR MICROFLUIDICS

Michael Breadmore, *University of Tasmania, AUSTRALIA*
Rosanne Guijt, *University of Tasmania, AUSTRALIA*
Feng Li, *University of Tasmania, AUSTRALIA*

14:00 - 17:00 Afternoon Workshops

Workshop 6 INTRODUCTION TO DIGITAL MICROFLUIDICS (DMF)

Aaron Wheeler, *University of Toronto, CANADA*
Ryan Fobel, *University of Toronto, CANADA*
Christian Fobel, *University of Toronto, CANADA*

Workshop 7 POINT-OF-CARE DIAGNOSTIC

Aman Russom, *KTH Royal Institute of Technology, SWEDEN (Group Leader)*
Yoon-Kyoung Cho, *Ulsan National Institute of Science & Technology (UNIST), KOREA*
Stéphanie Descroix, *Institut Curie, FRANCE*
Victor M. Ugaz, *Texas A&M University, USA*
Joan Bienvenue, *University of Virginia, USA*

Workshop 8 ON-CHIP CELL CULTURE AND ANALYSIS

Petra S. Dittrich, *ETH Zürich, SWITZERLAND*
Felix Kurth, *ETH Zürich, SWITZERLAND*

Workshop 9 NANOFLUIDICS: PRINCIPLES AND APPLICATIONS

Jan Eijkel, *University of Twente, NETHERLANDS*

Workshop 10 INERTIAL MICROFLUIDICS

Ian Papautsky, *University of Cincinnati, USA*

17:00 - 19:00 Conference Registration and Welcome Reception

MONDAY, 10 OCTOBER

07:00 - 18:20 **Registration** - Foyer, Ground Level

08:00 - 08:30

Opening Remarks
CBMS President
 Thomas Laurell, *Lund University, SWEDEN*

MicroTAS 2016 Conference Chairs
 Nicole Pamme, *University of Hull, UK*
 Jens Ducreé, *Dublin City University, IRELAND*

Analytical Chemistry Trust Fund Representative
 Melissa Hanna-Brown
Pfizer Technology & Innovation UK/EU Liaise, UK

Irish Representative

PLENARY PRESENTATION I

Auditorium, Level 3

Chair: E.M.J. Verpoorte, *University of Groningen, NETHERLANDS*

08:30 - 09:15

FUNCTIONAL MAPPING OF BIOLOGICAL NANO- AND MESOSCOPIC STRUCTURES IN COMPLEX BIOFLUIDS
 E. Polo, V. Castagnola, M.C. Lo Giudice, and
Kenneth A. Dawson, *University College, Dublin, IRELAND*

09:15 - 09:30 **Transition**

Sessions are color coded with the Track/Classification chart below, so you can easily navigate through the conference program and decide which sessions you want to attend.

TRACK/CLASSIFICATION

Plenary Presentation

a **Cell Separation and Analysis**

b **Cells, Organisms, and Organs on Chip**

c **Commercialization**

d **Diagnostics, Theranostics, and Translational Medicine**

e **Fundamentals in Microfluidics and Nanofluidics**

f **Integrated Microfluidic Platforms**

g **Micro- and Nanoengineering**

h **Sensors & Actuators, and Detection Technologies**

i **Separations, Reactions, and Other Applications for Microfluidics**



River Liffey, Dublin

Session 1A1 - Cell Culture

Chair: F.G. Tseng, *National Tsing Hua University, TAIWAN*

Auditorium, Level 3

09:30 SIMPLE AND RAPID FORMATION OF 3D CO-CULTURE CELL LADEN MICROSTRUCTURES BY USING CELL ORIGAMI TECHNIQUE

Q. He, T. Okajima, and K.K. Shigetomi
Hokkaido University, JAPAN

09:50 ORIGAMI-ENABLED ARTIFICIAL LIVER TISSUE

T. Liu¹, A.X. Chen², A. Dodge¹, G.J. Fernandez³, J.A. Miranda⁴, A. Chhabra², M. Bigdeli Karimi¹, S.N. Bhatia², R.J. Lang⁵, and C. Livermore¹

¹*Northeastern University, USA*, ²*Massachusetts Institute of Technology, USA*, ³*Middlesex Community College, USA*, ⁴*Revere Public Schools, USA*, and ⁵*Lang Origami, USA*

10:10 VERTICALLY SEPARATED ANISOTROPIC 3D COLLAGEN MICROCHAMBER ARRAY

S. Yoshida¹, M. Takinoue², and H. Onoe¹

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

Session 1B1 - Capillary Flow Devices

Chair: D. Juncker, *McGill University, CANADA*

Liffey A, Level 1

09:30 PASSIVE "ORTHOGONAL FLOW MIXERS" FOR HOMOGENEOUS DISSOLUTION OF REAGENTS IN MICROFLUIDICS

O. Gökçe¹, S. Castonguay², Y. Temiz¹, T. Gervais², and E. Delamarche¹

¹*IBM Research, Zurich, SWITZERLAND* and ²*École Polytechnique de Montréal, CANADA*

09:50 CHOLINIUM BASED POLY IONIC LIQUID HYDROGEL AS NEGATIVE FLOW PASSIVE PUMP IN PAPER-BASED ANALYTICAL DEVICES

T. Akyazi^{1,2}, A. Tudor³, D. Diamond³, L. Basabe-Desmonts^{1,4}, L. Florea³, and F. Benito-Lopez^{1,3}

¹*University of the Basque Country, SPAIN*, ²*University of Navarra, SPAIN*, ³*Dublin City University, IRELAND*, and ⁴*Ikerbasque, Basque Foundation for Science, SPAIN*

10:10 VISCOSITY INDEPENDENT PAPER MICROFLUIDIC IMBIBITION

W. Guo, J. Hansson, and W. van der Wijngaart
KTH Royal Institute of Technology, SWEDEN

Session 1C1 - Physical & Chemical Sensors

Chair: A. Hibara, *Tohoku University, JAPAN*

Liffey B, Level 1

09:30 HIGH-RESOLUTION MONITORING OF LIQUID FILLING IN MICROFLUIDICS USING CAPACITANCE MEASUREMENTS AND LONGITUDINAL ELECTRODES

Y. Temiz and E. Delamarche
IBM Research, Zurich, SWITZERLAND

09:50 A TOOLKIT OF THREAD-BASED, MICROFLUIDIC, PH SENSOR, ELECTRONIC FOR MEDICAL DIAGNOSTICS

P. Mostafalu^{1,2}, M. Akbari², K.A. Alberti¹, Q. Xu¹, A. Khademhosseini¹, and S.R. Sonkusale¹

¹*Tufts University, USA* and ²*Brigham and Women's Hospital, Harvard Medical School, USA*

10:10 MEASUREMENT OF BLOOD VISCOSITIES IN A WIDE SHEAR RATE REGIME USING A MICROFLUIDIC SENSOR WITH MULTIPLE CHANNEL ARRAYS CONNECTED IN SERIES

B.J. Kim, S.Y. Lee, Y. Jung, J. Ahn, and S. Yang
Gwangju Institute of Science and Technology (GIST), KOREA

10:30 - 11:00 Break: Exhibit and Poster Inspection

Session 1A2 - Organs and Organisms
Chair: A. Han, Texas A&M University, USA

Auditorium, Level 3

- 11:00 THREE-DIMENSIONAL PANCREATIC ISLET-ON-A-CHIP TO INVESTIGATE FLOW EFFECTS ON ISLET SURVIVAL AND FUNCTION**
Y. Jun, J.S. Lee, and S.H. Lee
Korea University, KOREA
- 11:20 ATHEROSCLEROSIS-ON-A-CHIP: A 3D CELL CULTURE MODEL TO STUDY HEMODYNAMICS AND LEUKOCYTE INTERACTIONS IN ARTERIAL STENOSIS**
N.V. Menon¹, S.N. Wee¹, H.M. Tay¹, R. Dalan², S.C. Wong³, K.H.H. Li¹, and H.W. Hou¹
¹*Nanyang Technological University, SINGAPORE,*
²*Tan Tock Seng Hospital, SINGAPORE, and*
³*Agency for Science, Technology and Research (A*STAR), SINGAPORE*
- 11:40 ENDOTHELIAL CELL-LADEN COLLAGEN SHEETS FOR MICROVASCULARIZED 3D TISSUE RECONSTRUCTION**
J. Son, Y. Lee, H. Seo, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- 12:00 BIOTIC CUBE: CHICK EMBRYO BASED 3D-2D HYBRID PLATFORM FOR ANGIOGENESIS RESEARCH**
T. Kawahara¹, W. Huang², M. Itayama¹, and F. Arai³
¹*Kyushu Institute of Technology, JAPAN,* ²*University of Tokyo, JAPAN, and*
³*Nagoya University, JAPAN*

Session 1B2 - Centrifugal Microfluidics

Chair: Y.-K. Cho, Ulsan National Institute of Science & Technology (UNIST), KOREA

Liffey A, Level 1

- 11:00 AN INTEGRATED, ROTATIONALLY-DRIVEN MICRODEVICE FOR RAPID, PORTABLE, AND COST-EFFECTIVE FORENSIC DNA ANALYSIS**
D.A. Nelson¹, B.L. Thompson¹, J.A. DuVall¹, A.-C. Tsuei¹, D. Le Roux¹, C. Birch¹, J. Li¹, D.L. Mills², B.E. Root¹, and J.P. Landers¹
¹*University of Virginia, USA and* ²*TeGreX Technologies, LLC, USA*
- 11:20 PROGRAMMABLE ALIQUOTS IN PASSIVE MICROFLUIDIC DEVICES USING A CENTRIFUGAL PLATFORM WITH ACTIVE PNEUMATIC PUMPING**
D. Brassard, L. Clime, M. Mounier, and T. Veres
National Research Council, CANADA
- 11:40 ON-SITE ISOLATION AND DETECTION OF URINARY EXTRACELLULAR VESICLES**
H.-K. Woo¹, V. Sunkara¹, and Y.-K. Cho^{1,2}
¹*Ulsan National Institute of Science & Technology (UNIST), KOREA and*
²*Institute for Basic Science (IBS), KOREA*
- 12:00 A POLYESTER-PAPER HYBRID MICROFLUIDIC DEVICE USING CENTRIFUGALLY-DRIVEN FLOW, ON-BOARD REAGENTS AND SMARTPHONE COLORIMETRIC DETECTION FOR EXPLOSIVES IDENTIFICATION**
S.T. Krauss, V.C. Holt, N. Shukla, B.E. Root, and J.P. Landers
University of Virginia, USA

Session 1C2 - Biosensors
Chair: O. Frey, ETH Zürich, SWITZERLAND

Liffey B, Level 1

- 11:00 ODORANT SENSOR USING AN INSECT OLFACTORY RECEPTOR RECONSTRUCTED IN ARTIFICIAL CELL MEMBRANE**
N. Misawa¹, S. Fujii¹, K. Kamiya¹, T. Osaki^{1,2}, Y. Miyama³, T. Takaku³, Y. Takahashi³, K. Saito³, and S. Takeuchi^{1,2}
¹Kanagawa Academy of Science and Technology (KAST), JAPAN,
²University of Tokyo, JAPAN, and ³Sumitomo Chemical Company, Limited, JAPAN
- 11:20 LABEL-FREE OPTICAL DETECTION OF MOLECULAR AND CELLULAR BINDING ON REFLECTIONLESS GLASS**
S. Biffi¹, G. Tagliabue¹, M. Travagnin¹, F. Damin², M. Chiari², S. Deegan³, M. Tijero⁴, J. Saez⁵, F. Benito-Lopez^{5,6}, M. Salina⁷, and M. Buscaglia¹
¹Università degli Studi di Milano, ITALY, ²Consiglio Nazionale delle Ricerche, ITALY, ³Aquila Bioscience, Ltd., IRELAND, ⁴IK4-Ikerlan, SPAIN, ⁵University of the Basque Country, SPAIN, ⁶Dublin City University, IRELAND, and ⁷Proxentia, S.r.l., ITALY
- 11:40 SPATIALYSE - SPATIALLY PRECISE ANALYSIS OF NUCLEIC ACIDS USING LOCAL CELL LYSIS WITH A MICROFLUIDIC PROBE**
A. Kashyap^{1,2}, J.F. Cors^{1,2}, and G.V. Kaigala¹
¹IBM Research, Zurich, SWITZERLAND and ²ETH Zürich, SWITZERLAND
- 12:00 WEARABLE DROPLET-BASED MICROFLUIDIC SENSOR DEVICE FOR CONTINUOUS SAMPLING AND REAL-TIME ANALYSIS**
S. Hassan¹, A.M. Nightingale¹, C.L. Leong¹, Y. Zhang¹, G. Evans¹, M.G. Boutelle², and X.Z. Niu¹
¹University of Southampton, UK and ²Imperial College London, UK

12:20 - 13:15 Grab 'n Go Lunch: Exhibit and Poster Inspection

PLENARY PRESENTATION II
Auditorium, Level 3

Chair: H. Becker, microfluidic ChipShop GmbH, GERMANY

- 13:15 - 14:30 IT IS OUT THERE! LESSONS AND TRENDS FROM THE MICROFLUIDICS INDUSTRY**
Reid Brennen, Agilent Technologies, USA
Luc Bousse, POC Medical Systems Inc., USA
Claudia Gärtner, microfluidic ChipShop GmbH, GERMANY
Jim Walsh, Dublin City University, IRELAND

- 14:30 - 16:50 Poster Session 1**
Poster presentations are listed by topic category with their as signed number starting on page 61.

- 14:30 - 16:10 Exhibitor Industrial Stage 1**
Liffey A, Level 1
Chair: A. Wheeler, University of Toronto, CANADA
- 1a - FESTO AG
 - 1b - z-microsystems
 - 1c - Microfluidic ChipShop GmbH
 - 1d - Belektronik GmbH
 - 1e - Cellix Ltd.
 - 1f - IMT Masken und Teilungen AG

Session 1A3 - In-Vitro Studies Chair: N. Reis, Loughborough University, UK

Auditorium, Level 3

- 16:50 Keynote Presentation**
DRUG SCREENING ON 3D TUMOR SPHEROIDS
S. Le Gac
University of Twente, NETHERLANDS
- 17:20 ATHEROFLUIDIC SYSTEM FOR MODELING HUMAN ATHEROGENESIS AND PATHOPHYSIOLOGY IN VITRO**
S. Varma¹, B.R. Slegtenhorst², G. Garcia-Cardena², and J. Voldman¹
¹Massachusetts Institute of Technology, USA and
²Harvard Medical School, USA
- 17:40 MICROFLUIDIC HIGH-THROUGHPUT MOTILITY-BASED CELL SELECTION FOR ENRICHING TUMOR INITIATING CELLS AND DISCOVERING INHIBITION PATHWAYS OF CANCER MIGRATION**
Y.-C. Chen, A. Xiao, Z. Zhang, Y. Luan, K. Luker, G. Luker, and E. Yoon
University of Michigan, USA
- 18:00 REAL-TIME MONITORING OF TUMOUR SPHEROID SWELLING UNDER TRANSIENT HYPOXIA USING TWO-PHOTON MICROSCOPY**
S.M. Grist, L. Laplatine, S.S. Nasser, A. Díaz Gaxiola, M.-C.A. Liu, L. Chrostowski, and K.C. Cheung
University of British Columbia, CANADA

Session 1B3 - Droplets and Cells Chair: P.S. Dittrich, ETH Zürich, SWITZERLAND

Liffey A, Level 1

- 16:50 Keynote Presentation**
THREE-DIMENSIONAL CELL CULTURE IN DROPLETS: FROM MULTILEVEL CYTOMETRY TO TISSUE ENGINEERING
S. Sart, R.F.-X. Tomasi, G. Amselem, and **C.N. Baroud**
Ecole Polytechnique, FRANCE
- 17:20 CYTO-MINE®: AN INTEGRATED PICODROPLET PLATFORM FOR CELL LINE DISCOVERY AND ENGINEERING**
M. Vallet¹, G. Benazzi¹, D. Josephides¹, S. Davoli¹, J. Bailey¹, X. Liu¹, S. Bekiaris¹, M. Rehak¹, F.F. Craig¹, D. Horner², W. Reiter², A. Paris², R. Lintern³, G. Sanders³, R. Stella³, and D. Holmes¹
¹Sphere Fluidics Ltd., UK, ²Sony DADC Biosciences, AUSTRIA, and
³TTP, UK
- 17:40 PAPER AS A SUBSTRATE FOR HANGING DROP CELL CULTURE APPLICATION**
I.J. Michael^{1,2}, J. Kim^{1,2}, and Y.-K. Cho^{1,2}
¹Ulsan National Institute of Science & Technology (UNIST), KOREA and
²Institute for Basic Science, KOREA
- 18:00 A BULK SUB-FEMTOLITER IN VITRO COMPARTMENTALIZATION SYSTEM FOR MINIMAL ARTIFICIAL CELLULAR BIOREACTORS**
B. Sharma, K. Sharma, Y. Takamura, and M. Biyani
Japan Advanced Institute of Science and Technology (JAIST), JAPAN



Temple Bar, Dublin

Session 1C3 - Bio-Assays

Chair: K.J. Shaw, *Manchester Metropolitan University, UK*

Liffey B, Level 1

- 16:50 Keynote Presentation**
INTERACTIONS BETWEEN FLUIDS AND PHONONIC STRUCTURES - CREATING UNIQUE FLOWS IN LIQUIDS
J.M. Cooper
University of Glasgow, UK
- 17:20 RAPID DETECTION OF E. COLI O157:H7 BY IFAST AND ATP BIOLUMINESCENCE ASSAY FOR WATER ANALYSIS**
 B. Ngamsom¹, L. Fourie², M.D. Tarn¹, S. Kumar², K. Moodley², K. Land², and N. Pamme¹
¹*University of Hull, UK* and ²*Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA*
- 17:40 STUDYING ENZYMATIC REACTIONS IN PICOLITER CHAMBERS WITH LOCALIZED MAGNETIC BEAD ASSEMBLIES**
 L. Armbrrecht, T. Stadelmann, G. Bovens, and P.S. Dittrich
ETH Zürich, SWITZERLAND
- 18:00 INTEGRATED MICROFLUIDIC SYSTEMS FOR SCREENING OF APTAMERS SPECIFIC TO CARDIOVASCULAR BIOMARKERS**
 A. Sinha¹, Y.-D. Chung¹, P. Gopinathan¹, L.-Y. Hung¹, C.-H. Yang², S.-C. Shiesh², and G.-B. Lee¹
¹*National Tsing Hua University, TAIWAN* and
²*National Cheng Kung University, TAIWAN*

18:20 Adjourn for the Day



Long Room, Trinity College, Dublin

MEMS JOURNAL

MARKET RESEARCH DATABASE

Microfluidics Companies & Commercialized Products



This database includes details such as each contact's first and last name, email address, job title, company name, company size (i.e. number of employees), company funding history and amounts, company products and technology, as well as company product or service type with specific details. The database includes full details on 672 companies and 1112 individuals.

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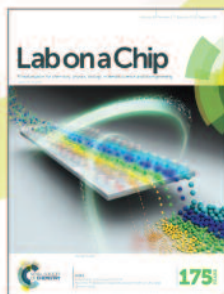
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TUESDAY, 11 OCTOBER

07:45 - 17:50 **Registration** - Foyer, Ground Level

08:15 - 08:30 **Announcements**

PLENARY PRESENTATION III

Auditorium, Level 3

Chair: M. Tokeshi, *Hokkaido University, JAPAN*

08:30 - 09:15 **NANOSTRUCTURES FOR SENSING -
APPLICATIONS IN HEALTH**

Anja Boisen

Technical University of Denmark, DENMARK

09:15 - 09:30 **Transition**

Session 2A1 - Cancer Cells

Chair: J.-K. Park, *Korea Advanced Institute of Science and Technology (KAIST), KOREA*

Auditorium, Level 3

09:30 **SINGLE-CELL TRANSCRIPTOME ANALYSIS TO STUDY TUMOR-
STROMAL INTERACTION ON CANCER-STEM-CELLS USING
VERTICAL ADHESION-SUSPENSION CO-CULTURE PLATFORMS**
Y.-C. Chen, Z. Zhang, Y.-H. Cheng, and E. Yoon
University of Michigan, USA

09:50 **COMPREHENSIVE MOLECULAR PROFILING OF SINGLE CIRCULATING
TUMOR CELLS FROM LUNG CANCER PATIENTS**
S.-M. Park¹, D.J. Wong², C.C. Ooi², D.M. Kurtz¹, O. Vermesh¹,
A. Aalipour¹, S. Suh³, K.L. Pian², J.J. Chabon¹, S.H. Lee⁴,
M. Jamali¹, C. Say¹, J.N. Carter¹, L.P. Lee⁴, W.G. Kuschner¹,
E.J. Schwartz¹, J.B. Shrager¹, J.W. Neal¹, H.A. Wakelee¹,
M. Diehn¹, V.S. Nair¹, S.X. Wang², and S.S. Gambhir¹
¹Stanford University School of Medicine, USA, ²Stanford University, USA,
³Case Western Reserve University School of Medicine, USA, and
⁴University of California, Berkeley, USA

10:10 **INTEGRATED ISOLATION, EMULSIFICATION, AND SINGLE-CELL
PROTEASE SECRETION ASSAY FOR CIRCULATING TUMOR CELLS**
M. Dhar, J.N. Lam, and D. Di Carlo
University of California, Los Angeles, USA

10:30 **3-DIMENSIONAL IN VITRO MODEL FOR STUDYING MONOCYTE-
INDUCED PRE-METASTATIC CANCER INVASION**
H. Kim¹, H. Chung², Y. Shin³, D.-H. Choi¹, S. Chung¹, and S.H. Seok²
¹Korea University, KOREA, ²Seoul National University, KOREA, and
³Massachusetts Institute of Technology, USA



Trinity College, Dublin

Session 2B1 - Droplet Generation
Chair: J. Oakey, *University of Wyoming, USA*

Liffey A, Level 1

- 09:30 IN-AIR MICROFLUIDICS FOR CHIP-FREE GENERATION OF MICRODROPLETS, -PARTICLES, -FIBERS, AND 3D HIERARCHICAL PRINTS**
T. Kamperman, C.W. Visser, J. Leijten, D. Lohse, and M. Karperien
University of Twente, NETHERLANDS
- 09:50 HIGHLY SCALABLE 256-BIT DROPLET RANDOM ACCESS MEMORY (dRAM) PLATFORM FOR CAPTURE AND RELEASE OF SINGLE MICRODROPLETS**
P.D. Weerappuli^{1,2}, T. Kojima^{2,3}, S. Robinson², S. Takayama², and A. Basu¹
¹Wayne State University, USA, ²University of Michigan, USA, and ³University of Freiburg, GERMANY
- 10:10 IMBIBED IMMISCIBLE SOLVENT SPLITS AQUEOUS SOLUTION INTO A TWO-DIMENSIONAL DROPLET ARRAY WITHOUT PRECISE PIPETTING OR PUMPING**
H. Yasuga and N. Miki
Keio University, JAPAN
- 10:30 DELIVERY OF MINIMALLY DISPERSED LIQUID INTERFACES FOR SEQUENTIAL SURFACE CHEMISTRY USING A MICROFLUIDIC PROBE**
N. Ostromohov^{1,2}, M. Bercovici¹, and G.V. Kaigala²
¹Technion - Israel Institute of Technology, ISRAEL and ²IBM Research, Zurich, SWITZERLAND

Session 2C1 - Optical Detection
Chair: K. Mawatari, *University of Tokyo, JAPAN*

Liffey B, Level 1

- 09:30 PLASMONIC SCHIRMER TEAR TEST STRIP FOR SURFACE-ENHANCED RAMAN SCATTERING**
M. Park, H. Jung, and K.-H. Jeong
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- 09:50 PLASMONICS AND NANOFUIDICS FOR SINGLE MOLECULE DETECTION**
I. Fernandez-Cuesta^{1,2}, P. Bayat¹, T. Klings¹, M. West², S. Cabrini², and R. Blick¹
¹University of Hamburg, GERMANY and ²Lawrence Berkeley Lab, USA
- 10:10 TOWARDS A PORTABLE SYSTEM FOR THE DETECTION OF MILK PROTEIN ADULTERATION**
V. Shkolnikov¹, M.A. Delos-Reyes¹, Y. Zhao², M. Overbay¹, C.M. Santori³, S.J. Barcelo⁴, S.J. Simske¹, and A. Rogacs¹
¹HP Inc., USA, ²Applied Materials, USA, ³Verily, USA, and ⁴Hewlett-Packard Enterprise, USA
- 10:30 AN ELECTRICALLY TUNABLE ASYMMETRICAL LIQUID LENS SYSTEM FOR OPTICAL COHERENT TOMOGRAPHY**
P.-W. Hu¹, C.-W. Lee¹, R.-Y. Tsai², and F.-G. Tseng^{1,3}
¹National Tsing Hua University, TAIWAN, ²Industrial Technology Research Institute, TAIWAN, and ³Academia Sinica, TAIWAN

10:50 - 11:20 Break: Exhibit and Poster Inspection

MicroTAS Outreach Event

11:00 - 13:00

11:00 - 11:50 and 12:10 - 13:00

Auditorium, Level 3

Lab-on-a-Chip Lecture

Elisabeth M.J. Verpoorte, *University of Groningen, NETHERLANDS*

Exhibit and Poster Inspection

12:20 - 13:15

Grab 'n Go Lunch: Exhibit and Poster Inspection

PLENARY PRESENTATION IV

Auditorium, Level 3

Chair: A.P. Lee, *University of California, Irvine, USA*

13:15 - 14:00

MINIATURE AIE DOTS FOR BIOIMAGING, DIAGNOSIS AND THERAPY

Ben Zhong Tang

Hong Kong University of Science & Technology, CHINA

14:00 - 16:20

Poster Session 2

Poster presentations are listed by topic category with their as signed number starting on page 61.

14:00 - 15:20

Exhibitor Industrial Stage 2

Liffey A, Level 1

Chair: C. Henry, *Colorado State University, USA*

2a - Hahn-Schickard

2b - Net Market Fluidics

2c - Fluigent SA

2d - Micronit Microtechnologies B.V.

Session 2A3 - Electrochemical Sensors

Chair: J.C.T. Eijkel, *Twente University, NETHERLANDS*

Auditorium, Level 3

16:20

Keynote Presentation

NEW STRATEGIES AND APPLICATIONS IN ELECTROCHEMICAL DETECTION FOR MICROCHIP ELECTROPHORESIS

S.M. Lunte

University of Kansas, USA

16:50

MICROFLUIDIC LONG-PORE-CHANNEL TO HIGHLIGHT BACTERIA CONTENTS

H. Yasaki¹, T. Yasui¹, T. Yanagida^{2,3}, N. Kaji¹, M. Kanai², M. Fukuyama⁴, K. Nagashima², T. Kawai³, and Y. Baba^{1,5}

¹Nagoya University, JAPAN, ²Kyusyu University, JAPAN,

³Osaka University, JAPAN, ⁴Kyoto Institute of Technology, JAPAN, and

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

17:10

ELECTROCHEMICAL SENSING WITH A SUSPENDED SINGLE NANOWIRE

P.E. Oomen, Y. Zhang, R.C. Chiechi, E. Verpoorte, and K. Mathwig

University of Groningen, NETHERLANDS

17:30

MULTICOLOR ELECTROCHEMICAL IMAGING FOR SIMULTANEOUS MULTIPLEX CELL ASSAY USING A CHIP DEVICE

Y. Kanno¹, K. Ino¹, H. Abe¹, K.Y. Inoue¹, M. Matsudaira¹, A. Suda², R. Kunikata², H. Shiku¹, and T. Matsue¹

¹Tohoku University, JAPAN and

²Japan Aviation Electronics Industry, Ltd., JAPAN

Session 2B3 - microRNA Analysis

Chair: J.M.J. den Toonder, *Eindhoven University of Technology, NETHERLANDS*

Liffey A, Level 1

16:20 Keynote Presentation

CANCER SPECIFIC MICRORNA AS AN ACTIVATOR OF PHOTSENSITIZER FOR TARGETED PHOTODYNAMIC THERAPY IN VIVO

J.-S. Lee¹, S. Kim¹, and D.-H. Min^{1,2}

¹Seoul National University, KOREA and ²Lemonex Inc., KOREA

16:50 NANOWIRES FOR EARLY CANCER AND DIABETES DIAGNOSIS VIA MICRO-RNA DETECTION IN URINE EXTRACELLULAR VESICLES

T. Yasui^{1,2}, D. Takeshita¹, T. Yanagida^{3,4}, N. Kaji¹, M. Kanai³, K. Nagashima³, H. Yukawa¹, T. Kawai⁴, and Y. Baba^{1,5}

¹Nagoya University, JAPAN, ²Japan Science and Technology Agency

(JST), JAPAN, ³Kyushu University, JAPAN, ⁴Osaka University, JAPAN, and

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

17:10 AN INTEGRATED MICROFLUIDIC PLATFORM FOR SINGLE-CELL TRAPPING AND MRNA EXTRACTION

X. Li, Y. Tao, D.-H. Lee, H.K. Wickramasinghe, and A.P. Lee

University of California, Irvine, USA

17:30 LIPID BILAYER-BASED NOISE-FREE MICRORNA DETECTION

S. Fujii¹, K. Kamiya¹, T. Osaki¹, N. Misawa¹, and S. Takeuchi^{1,2}

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

²University of Tokyo, JAPAN

Session 2C3 - Self Assembly & Biopolymers

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

Liffey B, Level 1

16:20 Keynote Presentation

ACOUSTIC ASSEMBLY AND 3D PRINTING OF MULTI-PHASE MATERIALS

T.R. Ray¹, R.C. Collino¹, L. Friedrich¹, J. Sietins², and M.R. Begley¹

¹University of California, Santa Barbara, USA and

²Army Research Laboratory, USA

16:50 SELF-ASSEMBLED NANOPATES AT THE WATER-OIL INTERFACE

D. Ishikawa¹, Y. Suzuki², C. Kurokawa³, M. Ohara³, M. Morita¹,

M. Yanagisawa³, R. Kawano³, M. Endo², and M. Takinoue¹

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

³Tokyo University of Agriculture and Technology, JAPAN

17:10 A SINGLE MOLECULAR LOGIC GATE: "AND" OPERATION USING DNA IMMOBILIZED IN BIOLOGICAL NANOPORE

M. Ohara and R. Kawano

Tokyo University of Agriculture and Technology, JAPAN

17:30 DESIGNING MECHANICAL AND ELECTRICAL PROPERTIES OF MICROTUBULES TO MODULATE GLIDING TRAJECTORIES

N. Isozaki¹, H. Shintaku¹, H. Kotera¹, T.L. Hawkins², J.L. Ross³, and R. Yokokawa¹

¹Kyoto University, JAPAN, ²University of Wisconsin, USA, and

³University of Massachusetts, USA

17:50

Adjourn for the Day



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WEDNESDAY, 12 OCTOBER

07:45 - 18:00 **Registration** - Foyer, Ground Level

08:15 - 08:30 **Announcements**

PLENARY PRESENTATION V

Auditorium, Level 3

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

08:30 - 09:15 **CAN ENGINEERED MICRO-SCALE ORGANOTYPIC MODELS PREDICT PATIENT-SPECIFIC RESPONSES?**

P.N. Ingram¹, J. Yu¹, J. Jimenez-Torres¹, M.H. Lee¹, E.J. Abel¹, H.S. Basu², and **David J. Beebe**¹

¹*University of Wisconsin, USA and*

²*MD Anderson Cancer Center, USA*

09:15 - 09:30 **Transition**

Session 3A1 - Bacterial Analysis

Chair: D. Kinahan, *Dublin City University, IRELAND*

Auditorium, Level 3

09:30 **ELECTROCONVECTIVE VORTEX-ASSISTED CONTINUOUS BACTERIAL LYSIS FOR DNA/RNA ANALYSIS**

M. Kim¹, L. Wu², J. Liu², D.T. Hung², and J. Han¹

¹*Massachusetts Institute of Technology, USA and*

²*Broad Institute of MIT and Harvard, USA*

09:50 **STRONG CORRELATION BETWEEN BACTERIAL EXTRACELLULAR ELECTRON TRANSPORT AND CELL ENVELOPE POLARIZABILITY**

Q. Wang¹, A.-A. Jones¹, P. Zhang¹, L. Lin², and C.R. Buie¹

¹*Massachusetts Institute of Technology, USA and*

²*University of California, Berkeley, USA*

10:10 **MICROFLUIDIC EXPERIMENTS MEASURE THE ABILITY OF MAGNETOTACTIC BACTERIA TO SWIM AGAINST MICROFLOWS**

S. Rismani Yazdi¹, C. Stevens¹, D. Vogel^{1,2}, P. Davies¹, and C. Escobedo¹

¹*Queen's University, CANADA and* ²*University of Basel, SWITZERLAND*

Session 3B1 - Droplet Platforms

Chair: P. Garstecki, *Polish Academy of Sciences, POLAND*

Liffey A, Level 1

09:30 **A DIGITAL MICROFLUIDIC PLATFORM FOR NON-INVASIVE PRENATAL GENETIC DIAGNOSTIC SCREENING**

M.D. Chamberlain¹, J. Lamanna¹, M.D.M. Dryden¹, H. Situ¹, M. Vlasschaert², E. Kolomietz², D. Chitayat², and A. Wheeler¹

¹*University of Toronto, CANADA and* ²*Mount Sinai Hospital, CANADA*

09:50 **HYBRID DROPLET/DIGITAL MICROFLUIDIC PLATFORM WITH INTEGRATED OPTICAL DETECTION SYSTEM FOR HIGH-THROUGHPUT GENETIC ENGINEERING**

K. Iwai¹, J. Sustarich¹, P.W. Kim¹, P.C. Gach¹, M. Raje¹, J.V. Heinemann^{1,2}, T.A. Duncombe¹, K. Deng¹, T.R. Northen^{1,2}, N.J. Hillson^{1,2}, P.D. Adams^{1,2,3}, and A.K. Singh¹

¹*Sandia National Laboratories, USA,* ²*Lawrence Berkeley National Laboratory, USA, and* ³*University of California, Berkeley, USA*

10:10 **MULTI-STEP RADIOCHEMICAL REACTIONS IN MICROLITER DROPLETS LEVERAGING SURFACE TENSION-DRIVEN REAGENT TRANSPORT VIA PATTERNED WETTABILITY**

J. Wang and R.M. van Dam

University of California, Los Angeles, USA

Session 3C1 - Particle Separation
Chair: M.D. Tarn, *University of Leeds, UK*

Liffey B, Level 1

- 09:30 FIBER MICROFLUIDICS: COMPLEX, MULTIMATERIAL MICROCHANNELS FABRICATED VIA DIMENSIONAL REDUCTION**
R. Yuan, H. Su, J. Lee, E. Levy, J. Voldman, and Y. Fink
Massachusetts Institute of Technology, USA
- 09:50 THERMALLY TUNABLE DETERMINISTIC LATERAL DISPLACEMENT THROUGH HYDROGEL MICRO PILLAR ARRAYS**
N. Tottori, Y. Sakurai, T. Nisisako, Y. Yanagida, and T. Hatsuzawa
Tokyo Institute of Technology, JAPAN
- 10:10 REAL-TIME NANOSCALE PROTEIN COAT DETECTION USING LABEL FREE DETERMINISTIC LATERAL DISPLACEMENT METHODS**
K.K. Zeming, T. Salafi, S. Chiew, and Y. Zhang
National University of Singapore, SINGAPORE

10:30 - 11:00 Break: Exhibit and Poster Inspection

Session 3A2 - Mechanical Cell Analysis
Chair: Q. Fang, *Zhejiang University, CHINA*

Auditorium, Level 3

- 11:00 TIME-LAPSE MECHANICAL CHARACTERIZATION OF A SINGLE OOCYTE**
K. Nakahara, S. Sakuma, and F. Arai
Nagoya University, JAPAN
- 11:20 GAPLESS PROTEIN PATTERNING IN MICROFLUIDIC DEVICES ENABLING MECHANISTIC STUDIES OF PRE-ACTIVATION OF TYPE-1 DIABETIC PLATELETS**
F. Zhou, C. Zhu, and H. Lu
Georgia Institute of Technology, USA
- 11:40 NEXT GENERATION DEFORMABILITY CYTOMETRY: FULLY AUTOMATED, HIGH-THROUGHPUT AND NEAR REAL-TIME CELL MECHANOTYPING**
Y. Deng and A.J. Chung
Rensselaer Polytechnic Institute, USA
- 12:00 ON-CHIP MEASUREMENT OF PROTRUSIVE FORCE EXERTED BY SINGLE HYPHAL TIPS OF PATHOGENIC MICROORGANISMS**
A. Tayagui¹, A. Garrill¹, D. Collings², and V. Nock¹
¹*University of Canterbury, NEW ZEALAND and*
²*University of Newcastle, AUSTRALIA*



The Scalp, Burnaslingan, Dublin

Session 3B2 - Acoustic and Magnetic Actuation

Chair: S.A. Peyman, *University of Leeds, UK*

Liffey A, Level 1

- 11:00 BIO-INSPIRED MICROFLUIDIC PUMPING BY ROLL-PRINTED ARTIFICIAL CILIA**
Y. Wang, S. Zhang, R.M. Cardinaels, P.D. Anderson, and J.M.J. den Toonder
Eindhoven University of Technology, NETHERLANDS
- 11:20 A SNAKES-AND-LADDERS CHIP FOR THE LAYER-BY-LAYER ASSEMBLY OF POLYELECTROLYTES ON MAGNETIC DROPLETS**
A.Q. Al-Orabi, M.D. Tarn, V.N. Paunov, and N. Pamme
University of Hull, UK
- 11:40 MODE SWITCHING OF ON-CHIP MANIPULATION METHOD USING VIBRATIN-INDUCED FLOW FOR SINGLE PARTICLE LOADING**
T. Hayakawa, S. Sakuma, and F. Arai
Nagoya University, JAPAN
- 12:00 ACOUSTOPHORETIC MANIPULATION OF SUB-MICRON OBJECTS ENABLED BY DENSITY GRADIENTS**
P. Augustsson¹, J.T. Karlsen², and H. Bruus²
¹*Lund University, SWEDEN* and
²*Technical University of Denmark, DENMARK*

Session 3C2 - Microscale Fabrication

Chair: M.C. Breadmore, *University of Tasmania, AUSTRALIA*

Liffey B, Level 1

- 11:00 FABRICATING VEINED MICROSTRUCTURE USING ON-DEMAND CRYSTALLIZATION IN A MICROFLUIDIC CHANNEL**
K. Kim and W. Park
Kyung Hee University, KOREA
- 11:20 EDGE LIGHTING TECHNIQUE FOR DIRECTIONALLY ENCODED MICROPARTICLES**
J. Yoon and W. Park
Kyung Hee University, KOREA
- 11:40 CMOS COMPATIBLE EMBEDDED MICROCHANNELS**
R. Stoute¹, J.M. Muganda¹, S. Dahar¹, A. Arslan¹, R.J.M. Henderikx², P.C.M. van Stiphout³, J.M.J. den Toonder², and R. Dekker¹
¹*Delft University of Technology, NETHERLANDS*,
²*Eindhoven University of Technology, NETHERLANDS*, and
³*Bionchip, NETHERLANDS*
- 12:00 RAPID PRINTING IN PDMS – FUSED DEPOSITION MODELING (FDM) MEETS MICROFLUIDICS**
D. Helmer, A. Voigt, S. Wagner, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY



Cliffs of Moher

12:20 - 13:15 **Grab 'n Go Lunch: Exhibit and Poster Inspection**

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

**MICROENGINEERED PHYSIOLOGICAL BIOMIMICRY:
HUMAN ORGANS-ON-CHIPS**

Dan Huh

University of Pennsylvania, USA

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

**THE AMAZING NEUTROPHIL: UNEXPECTED INSIGHTS
FROM TINY DEVICES**

Daniel Irimia

Massachusetts General Hospital, USA

14:00 - 14:10 **MicroTAS 2017 Announcement**

14:30 - 16:30 **Poster Session 3**
Poster presentations are listed by topic category with their
as signed number starting on page 61.

Session 3A3 - Antibiotic Resistance

Chair: K.C. Cheung, *University of British Columbia, CANADA*

Auditorium, Level 3

16:30 **Keynote Presentation**

**MICROFLUIDIC RAPID ANTIBIOTIC SUSCEPTIBILITY TEST FOR
FIGHTING GLOBAL ANTIMICROBIAL RESISTANCE**

S. Kwon^{1,2,3}, H.Y. Jeong¹, E.-G. Kim², S. Han², G.Y. Lee¹, S. Han²,
B. Jin², S. Lee², H.C. Lee³, T.S. Kim³, Y.-G. Jung², and D.Y. Kim²

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

³Seoul National University Hospital, KOREA

17:00 **KINETICS OF BACTERIAL DETECTION IN A NOVEL
"LAB-IN-A-COMB" FOR HIGH-THROUGHPUT
ANTIBIOTIC RESISTANCE TESTING**

J. Pivetal¹, N. Reis², and A. Edwards¹

¹University of Reading, UK and ²Loughborough University, UK

17:20 **RAPID, ACCURATE, AND GENERAL SINGLE-CELL ANTIBIOTIC
SUSCEPTIBILITY TEST IN DIGITAL BACTERIA PICOARRAY**

K. Hsieh, H.C. Zec, L. Chen, A. Kaushik, and T.-H. Wang

Johns Hopkins University, USA

17:40 **SCALABILITY OF MICROTHERMOFORMING FOR LAB-ON-A-CHIP
CARTRIDGES BY THE EXAMPLE OF RAPID DIAGNOSIS OF
ANTIBIOTIC RESISTANT TUBERCULOSIS**

D. Kosse^{1,2}, M. Keller^{1,2}, J. Obele¹, M. Specht¹, D. Baumann²,
P. Beckert^{3,4}, S. Feuerriegel^{3,4}, G. Roth², S. Niemann^{3,4},

R. Zengerle^{1,2}, and D. Mark^{1,2}

¹Hahn-Schickard, GERMANY, ²University of Freiburg, GERMANY,

³Research Center Borstel, GERMANY, and

⁴Partner Site Hamburg-Borstel-Luebeck, GERMANY



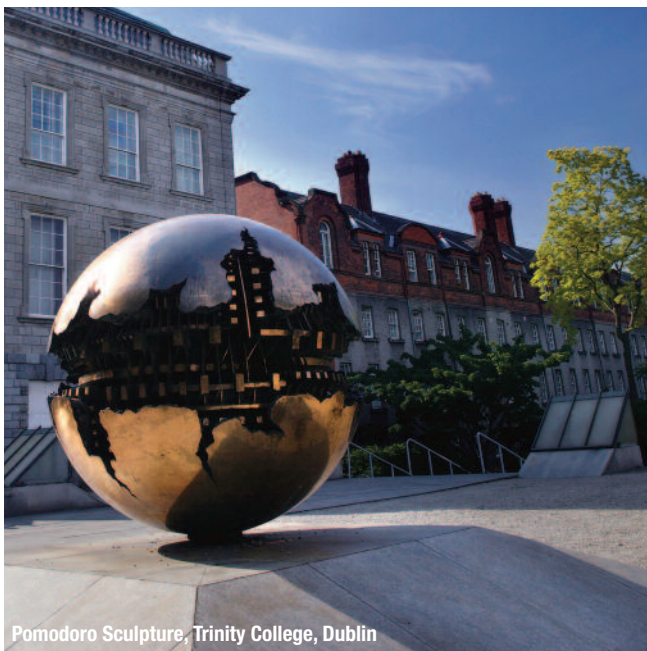
Colliemore Harbour, Dublin

Session 3B3 - DNA Mapping & Sequencing

Chair: J. Lammertyn, KU Leuven, BELGIUM

Liffey A, Level 1

- 16:30 Keynote Presentation**
DROPLET MICROFLUIDICS FOR PRECISE AND HIGH THROUGHPUT WHOLE GENOME AMPLIFICATION TOWARD SINGLE-CELL GENOME SEQUENCING
 H. Hosokawa^{1,2}, Y. Nishikawa¹, M. Kogawa¹, **H. Takeyama¹**
¹Waseda University, JAPAN and
²Japan Science and Technology Agency (JST), JAPAN
- 17:00 DESIGN AND CHARACTERIZATION OF A NANOPORE-COUPLED POLYMERASE FOR SINGLE MOLECULE DNA SEQUENCING BY SYNTHESIS ON AN INTEGRATED ELECTRONIC ARRAY**
 P.B. Stranges¹, M. Palla¹, S. Kalachikov², J. Nivala¹, M. Dorwart³, A. Trans³, S. Kumar², M. Porel², M. Chien², C. Tao², I. Morozova², Z. Li², S. Shi², A. Abera⁴, C. Arnold³, A. Yang³, A. Aguirre³, E.T. Harada³, D. Korenblum³, J. Pollard³, A. Bibillo³, R. Chen³, R. Davis³, J.J. Russo², C.W. Fuller³, S. Roevers³, J. Ju², and G.M. Church¹
¹Harvard Medical School, USA, ²University, USA,
³Genia Technologies, USA, and ⁴Arizona State University, USA
- 17:20 DIRECT ACQUISITION OF GENOME-WIDE EPIGENETIC INFORMATION ALONG INTACT CHROMATIN FIBERS OF INDIVIDUAL CHROMOSOMES ISOLATED FROM SINGLE MAMMALIAN CELLS**
 T. Takahashi¹, K.O. Okeyo¹, M. Washizu¹, J. Ueda², and H. Oana¹
¹University of Tokyo, JAPAN and ²Chubu University, JAPAN
- 17:40 SUPER-RESOLUTION OPTICAL DNA MAPPING ON A DIGITAL MICROFLUIDIC PLATFORM**
 B. Vanspauwen¹, J. Su¹, T. Kokalj^{1,2}, R. Puers¹, J. Hofkens¹, and J. Lammertyn¹
¹KU Leuven, BELGIUM and ²IMT, SLOVENIA



Pomodoro Sculpture, Trinity College, Dublin

Session 3C3 - Point-of-Care Diagnostics
Chair: J.P. Landers, *University of Virginia, USA*

Liffey B, Level 1

- 16:30 Keynote Presentation**
PAPERFLUIDIC PLATFORM TO DETECT NEISSERIA GONORRHOEAE IN URETHRAL AND VAGINAL SWAB SAMPLES
A.L. Horst¹, J.M. Rosenbohm¹, N. Kolluri¹, C.A. Gaydos², J. Hardick², M. Cabodi¹, J.C. Linnes³, and **C.M. Klapperich¹**
¹*Boston University, USA*, ²*Johns Hopkins University, USA*, and ³*Purdue University, USA*
- 17:00 A LAB-ON-A-CHIP FOR DECENTRALIZED DETECTION OF MEASLES AND RUBELLA INFECTION AND IMMUNITY IN RESOURCE-LIMITED SETTINGS**
D.G. Rackus, A.H.C. Ng, R. Fobel, C. Fobel, J. Lamanna, C. Dixon, M.D.M. Dryden, C. Lam, M. Ho, N. Mufti, V. Lee, M.A.M. Asri, D. Chamberlain, and A.R. Wheeler
University of Toronto, CANADA
- 17:20 A DISPOSABLE SWAB-TO-RESULT INFLUENZA RAPID TEST DEVICE BASED ON A 2-DIMENSIONAL PAPER NETWORK**
S. Huang¹, S. Bennett¹, K. Abe¹, P. Ladd¹, T. Liang¹, K. Shah¹, P.C. Kauffman¹, S. Paul¹, M. Purfield¹, C.E. Anderson¹, L. Yokobe², B. Strelitz³, K. Follmer³, K. Pullar³, L. Sanchez-Erebia³, J. Englund³, and P. Yager¹
¹*University of Washington, USA*, ²*PATH, USA*, and ³*Seattle Children's Hospital, USA*
- 17:40 AN INTEGRATED PAPER-BASED MICROFLUIDIC PLATFORM FOR AUTONOMOUS, POINT-OF-CARE ELISA**
H. Fu, Q. Wu, C. Zhao, X. Li, N. Li-Jessen, and X. Liu
McGill University, CANADA

17:50 Adjourn for the Day

19:00 - 23:00 Wednesday Evening at Café en Seine



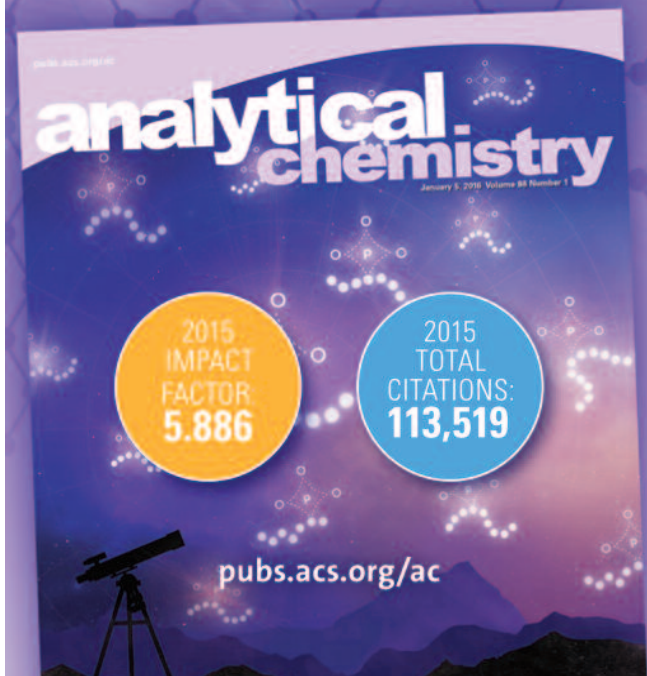
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THURSDAY, 13 OCTOBER

08:15 - 13:00 **Registration** - Foyer, Ground Level

Session 4A1 - Organisms and Plants
Chair: M. Utz, University of Southampton, UK

Auditorium, Level 3

- 08:45 DROPLET-ON-DEMAND PLATFORM FOR COMBINATORIAL SCREENING OF CHEMICALS IN CAENORHABDITIS ELEGANS**
G. Aubry and H. Lu
Georgia Institute of Technology, USA
- 09:05 A MICROFLUIDIC PLATFORM FOR AUTOMATED MONITORING OF C. ELEGANS EMBRYO-TO-ADULT DEVELOPMENT AT SINGLE-ORGANISM RESOLUTION**
M.C. Letizia, M. Cornaglia, V. Sorrentino, L. Mouchiroud, J. Auwerx, and M.A.M. Gijis
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- 09:25 MULTILAYER PLANT-IN-CHIP PLATFORM FOR NON-DESTRUCTIVE VISUALIZATION OF ROOT MORPHOLOGY DURING CO-CULTURE WITH BENEFICIAL BACTERIA**
J.A. Aufrecht^{1,2}, C.M. Timm², J.M. Ryan², A.N. Bible¹, L.J. Millet¹, A. Nebenfuehr², J.L. Morrell-Falvey^{1,2}, M.J. Doktycz^{1,2}, and S.T. Retterer^{1,2}
¹*Oak Ridge National Laboratory, USA* and ²*University of Tennessee, USA*
- 09:45 SELECTING HIGH-GROWTH/HIGH-LIPID PRODUCING MICROALGAE FROM A MUTANT LIBRARY THROUGH DROPLET MICROFLUIDICS**
H.S. Kim¹, S. Han¹, A.R. Guzman¹, N. Sobahi¹, H.R. Thapa¹, D. Browne¹, M. Tatli¹, S. Hsu², D.B. Stern², T.P. Devarenne¹, and A. Han¹
¹*Texas A&M University, USA* and ²*Boyce Thompson Institute for Plant Research, USA*

Session 4B1 - Single Cell Analysis

Chair: R. Walczak, Wrocław University of Science and Technology, POLAND

Liffey A, Level 1

- 08:45 ISOFORM CYTOMETRY: ISOELECTRIC FOCUSING RESOLVES PROTEIN ISOFORMS DIFFERING BY A SINGLE-CHARGE UNIT WITH SINGLE-CELL RESOLUTION**
K.A. Yamauchi, A.M. Tentori, and A.E. Herr
University of California, Berkeley, USA
- 09:05 MASSIVE PARALLEL ANALYSIS OF SINGLE CELLS IN A MICROFLUIDIC DEVICE**
R.J. Jiménez-Valdés, J.R. Rodríguez-Moncayo, F.A. Casillas-García, and J.L. García-Cordero
Centro de Investigación y de Estudios Avanzados del IPN, MEXICO
- 09:25 MICRO-WELL ARRAY BASED GENETIC DETERMINATION OF EGFR MUTATION AT SINGLE-CELL LEVEL**
R. Li, M. Zhou, J. Li, W. Zhang, Z. Wang, Z. Wei, and Z. Hu
National Center for Nanoscience and Technology, CHINA
- 09:45 A FREQUENCY-MULTIPLEXED, MICROFLUIDIC PARALLEL FLOW CYTOMETER FOR HIGH-THROUGHPUT SCREENING**
J. Lin^{1,2}, K. Owsley^{1,2}, M. Bahr¹, E. Diebold², and D. Di Carlo¹
¹*University of California, Los Angeles, USA* and ²*Omiga Biosystems, Inc., USA*

Session 4C1 - Material Applications

Chair: V. Jokinen, *Aalto University, FINLAND*

Liffey B, Level 1

- 08:45 IN-FLOW FORMATION OF HIGHLY ALIGNED COLLAGEN SHEETS**
S. Malladi¹, D.M. Nieves², L. Leng¹, S. Grainger², E.L. Chaikof³,
and A. Guenther¹
¹*University of Toronto, CANADA*, ²*Harvard University, USA*, and
³*Beth Israel Deaconess Medical Center, USA*
- 09:05 DESALINATION BY ELECTRODIALYSIS USING A STACK OF CHARGED HYDROGELS IN A MICROFLUIDIC PLATFORM**
B. Gumuscu, A.S. Haase, A.M. Benneker, A. van den Berg,
R.G.H. Lammertink, and J.C.T. Eijkel
University of Twente, NETHERLANDS
- 09:25 DESIGN RULES FOR 3D-PRINTED AUTONOMOUS CAPILLARIC CIRCUITS**
A.O. Olanrewaju and D. Juncker
McGill University, CANADA
- 09:45 FIBRE-BASED PLATFORMS FOR MICROFLUIDICS, SENSING AND DIAGNOSTIC APPLICATIONS**
J.M. Cabot, N.P. Macdonald, M.C. Breadmore, and B. Paull
University of Tasmania, AUSTRALIA

10:05 - 10:35 Break: Exhibit and Poster Inspection

Session 4A2 - Stem Cells

Chair: I. Papautsky, *University of Illinois, Chicago, USA*

Auditorium, Level 3

- 10:35 SPATIO-TEMPORAL PATTERNING OF 3D NEUROEPITHELIUM STRUCTURES FROM HUMAN PLURIPOTENT STEM CELLS**
G. Sahni¹ and Y.-C. Toh^{1,2}
¹*National University of Singapore, SINGAPORE* and
²*Singapore Institute for Neurotechnology, SINGAPORE*
- 10:55 CULTURE PATCH METHOD FOR DIFFERENTIATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS TOWARD FUNCTIONAL CARDIOMYOCYTES AND CELL-BASED ASSAYS**
Y. Tang¹, L.I. Liu², J. Li², L. Yu², L.I. Wang¹, J. Shi¹, and Y. Chen¹
¹*Pierre and Marie Curie University, FRANCE* and ²*Kyoto University, JAPAN*
- 11:15 HUMAN ADIPOSE-DERIVED STEM CELL DIFFERENTIATION AND LIPID ANALYSIS UNDER CONTROLLED MICROENVIRONMENT ON CHIP**
X. Wu, N. Schneider, R. Zengerle, and M. Meier
University of Freiburg, GERMANY



Ha'penny Bridge, Dublin

Session 4B2 - Electric Separations
Chair: A. Escarpa, University of Alcalá, SPAIN

Liffey A, Level 1

- 10:35 "SOLID-STATE" ELECTROPHORESIS**
P. Nanthasurasak¹, H.H. See², R.M. Guijt^{1,3}, and M.C. Breadmore¹
¹*Australia Center Research on Separation Science, AUSTRALIA,*
²*University Teknologi Malaysia, MALAYSIA, and*
³*University of Tasmania, AUSTRALIA*
- 10:55 SIMULTANEOUS DNA PURIFICATION AND FRACTIONATION IN AGAROSE GEL ON THE MICRO-SCALE**
B. Gumuscu, A. van den Berg, and J.C.T. Eijkel
University of Twente, NETHERLANDS
- 11:15 DIELECTROPHORETIC SORTING OF LIPID-CONTAINING MICROORGANISMS USING HIGH FREQUENCY ELECTRIC FIELDS IN CONDUCTING POST ARRAYS**
A.R. Schor and C.R. Buie
Massachusetts Institute of Technology, USA

Session 4C2 - Cellular Analysis
Chair: M. Meier, University of Freiburg, GERMANY

Liffey B, Level 1

- 10:35 MICROFILAMENT-BASED TRANSIENT COMPARTMENTALIZATION FOR CELLULAR ASSAYS**
A. Yamada^{1,2,3}, B. Venzac^{1,2,3}, I. Pereiro^{1,2,3}, R. Renault^{1,2,3}, S. Coscoy^{1,2}, M. Verhulsel^{1,2,3}, C. Villard^{1,2,3}, J.-L. Viovy^{1,2,3}, and S. Descroix^{1,2,3}
¹*Institut Curie, FRANCE,* ²*Pierre and Marie Curie University, FRANCE, and*
³*Institut Pierre-Gilles de Gennes, FRANCE*
- 10:55 STUDYING PROTEIN PHOSPHORYLATION WITH ULTRA-HIGH TEMPORAL RESOLUTION USING A μ MIXING μ FLUIDIC DEVICE**
M. Dell'Aica, P. Novo, D. Janasek, and R.P. Zahedi
Leibniz-Institut für Analytische Wissenschaften, ISAS, e.V., GERMANY
- 11:15 WHOLE IMMUNOHISTOCHEMISTRY ON A MICROFLUIDIC CHIP**
C.H. Cho, S. Kwon, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

11:35 - 11:45 Transition

PLENARY PRESENTATION VI
Auditorium, Level 3
Chair: D.J. Harrison, University of Alberta, CANADA

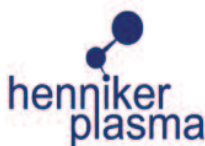
11:45 - 12:30 INNOVATING MICROFLUIDICS AND PIONEERING NANOFLUIDICS
Takehiko Kitamori
University of Tokyo, JAPAN

12:30 - 12:45 CHEMINAS - Young Researcher Poster Awards
Lab on a Chip - Widmer Poster Award

12:45 - 13:00 NIST and Lab on a Chip - Art in Science Award
Dolomite and Lab on a Chip - Video Award

13:00 Closing Remarks - Conference Adjourns

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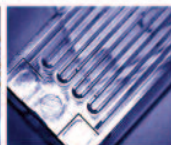
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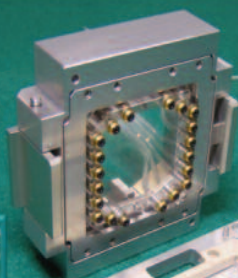


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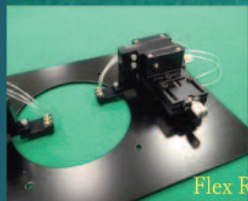
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MONDAY
14:30 - 16:50

TUESDAY
14:00 - 16:20

WEDNESDAY
14:10 - 16:30

TRACK/CLASSIFICATION

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

See poster floor plans on the last page of this program.

Tracks “a” and “b” are located on Foyer, Level 3. Tracks “c” through “j” are located in the Forum, Ground Level.

a - Cell Separation and Analysis

Cell Capture, Counting, & Sorting

- M001a** **A 12,800-WELL SINGLE-CELL-DERIVED SPHERE ASSAY CHIP UTILIZING HIGHLY-PARALLEL MICROFLUIDIC STRUCTURES FOR CANCER HETEROGENEITY STUDIES**
Y.-H. Cheng, Y.-C. Chen, R. Brien, and E. Yoon
University of Michigan, USA
- M002a** **FLUIDIC CIRCUIT BASED MICROFLUIDIC DEVICE FOR DETERMINISTIC SINGLE-CELL TRAPPING WITH HIGH EFFICIENCY AND ADAPTIVITY**
L. Mi, L. Huang, J.X. Li, G.Q. Xu, Q. Wu, and W.H. Wang
Tsinghua University, CHINA
- M003a** **LABEL-FREE MICROFLUIDIC SORTING OF PRIMARY HUMAN SKELETAL STEM CELLS FOR BONE REGENERATION: A BIO-PHYSICAL CHARACTERISATION**
M. Xavier, D. Spencer, R.O.C. Oreffo, and H. Morgan
University of Southampton, UK
- M004a** **MICROFLUIDIC SEPARATION OF PARASITES AND PARASITE-INFECTED CELLS FROM BLOOD FOR THE DIAGNOSIS OF LEISHMANIASIS**
C. Regnault¹, K. Punyani², S. Holm², J.P. Beech², O. Otto³, C. Herold³, M. Herbig³, J. Guck³, J.O. Tegenfeldt², and M.P. Barrett¹
¹University of Glasgow, UK, ²Lund University, SWEDEN, and ³Technische Universität Dresden, GERMANY
- M005a** **ONCHIP PASSIVE ISOLATION AND LONG TERM CULTURE OF CIRCULATING TUMOR CELLS IN A SIMPLE MICROFLUIDIC DEVICE**
J. Zhou¹, C. Tu¹, Y. Liang¹, B. Huang¹, Y. Xu¹, Y. Fang^{1,2}, X. Liang^{1,2}, and X. Ye¹
¹Zhejiang University, CHINA and ²Sir Run Run Shaw Hospital, CHINA

Cell Capture, Counting, & Sorting

- M006a PURIFICATION OF SPERM FROM HIGH WBC SEMEN SAMPLES USING A SPIRAL CHANNEL**
J. Son¹, B.K. Gale¹, J.M. Hotaling², and D.T. Carrell²
¹University of Utah, USA and ²University of Utah School of Medicine, USA
- M007a SORTING BACTERIA BY CHAIN LENGTH - A FACTOR OF VIRULENCE?**
J.P. Beech¹, B.D. Ho¹, V. Oliveira², G. Garriss², B. Henriques Normark², and J.O. Tegenfeldt¹
¹Lund University, SWEDEN and ²Karolinska Institute, SWEDEN
- T001a DIGITAL COUNTING OF BACTERIA OVER A BROAD DYNAMIC RANGE OF CONCENTRATIONS**
O. Scheler^{1,2}, N. Pacocha¹, P.R. Debski¹, A. Ruszczak¹, T.S. Kaminski¹, and P. Garstecki¹
¹Polish Academy of Sciences, POLAND and ²University of Tartu, ESTONIA
- T002a HIGH-THROUGHPUT AND EFFICIENT SEPARATION USING MICROFLUIDICS DETERMINISTIC LATERAL DISPLACEMENT WITH TRIANGLE I-SHAPED PILLAR**
T. Salafi, K.K. Zemling, and Y. Zhang
National University of Singapore, SINGAPORE
- T003a MATED MICROARRAYS FOR HIGH THROUGHPUT MICRORRAFT-BASED CELL SORTING**
M. DiSalvo^{1,2}, D.L. West¹, J.M. Ramsey^{1,2}, C.E. Sims¹, and N.L. Allbritton^{1,2}
¹University of North Carolina, Chapel Hill, USA and ²North Carolina State University, USA
- T004a NEGATIVE ISOLATION OF BACTERIA FROM THE WHOLE BLOOD USING CLOSED-LOOP INERTIAL AND MAGNETIC-ACTIVATED CELL SORTING**
K. Choi¹, H. Ryu¹, L. Wu¹, and J. Han^{1,2,3}
¹Massachusetts Institute of Technology, USA, ²Broad Institute of MIT and Harvard, USA, and ³Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE
- T005a SHEATH-FLOW-AIDED INERTIAL MICROFLUIDIC CELL SORTER FOR HIGH-THROUGHPUT BLOOD SORTING**
X. Wang, H. Gao, and I. Papautsky
University of Cincinnati, USA
- T006a UNIVERSAL LAB-ON-A-CHIP SYSTEM FOR CELL COUNTING AND CELL DENSITY MEASUREMENTS IN HUMAN AND VETERINARY DIAGNOSTICS APPLICATIONS**
R. Sewart¹, A. de Moor², L.I. Segerink³, C. Gärtner¹, and H. Becker¹
¹microfluidic ChipShop GmbH, GERMANY, ²Characell BV, NETHERLANDS, and ³University of Twente, NETHERLANDS
- W001a DIRECTED EVOLUTION OF MAGNETOTACTIC BACTERIA (AMB-1) WITH MAGNETIC RATCHETING PLATFORM**
A. Tay^{1,2}, C. Murray¹, K. Owsley¹, and D. Di Carlo¹
¹University of California, Los Angeles, USA and ²National University of Singapore, SINGAPORE

Cell Capture, Counting, & Sorting

W002a HIGH-THROUGHPUT CELLS SEPARATION AND CIRCULATING TUMOR CELLS (CTCs) ENRICHMENT FROM WHOLE BLOOD BY HYDRODYNAMIC AND INERTIAL FORCE
Y.-C. Chang¹, H.C. Tseng¹, R.-G. Wu¹, H.-Y. Chang¹, and F.-G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN

W003a MICRO BUBBLE JET CELL SORTER: ADVANCEMENTS AND VALIDATION OF HIGH THROUGHPUT PARALLEL SORTING
K. de Wijs^{1,2}, C. Liu¹, A. Dusa¹, D. Vercruysse¹, B. Majeed¹, S. Mao¹, E. Sohn¹, K. Blaszkiewicz¹, X. Rottenberg¹, D. Sabuncuoglu Tezcan¹, P. Deshpande¹, and L. Lagae^{1,2}
¹imec, BELGIUM and ²KU Leuven, BELGIUM

W004a NEW PHENOMENON: OUTER WALL FOCUSING AT HIGH CELL DENSITIES ENABLES HIGH PERFORMANCE CELL MICROFILTER AT LOW SHEAR STRESS
S. Goh¹, S.M. Tan¹, D.S. Tan², and Y.S. Yang¹
¹Bioprocessing Technology Institute, SINGAPORE and ²National University of Singapore, SINGAPORE

W005a PLATELET ENRICHMENT IN A CONTINUOUS AND CLOG-FREE MICROFLUIDIC FILTER WITH SUNFLOWER HEAD GEOMETRY
N. Mehendale, O. Sharma, C. Dcosta, and D. Paul
Indian Institute of Technology, Bombay, INDIA

W006a SINGLE CELL-CAPTURING DEVICE IN HIGH FLOW RATES WITH CONTROLLED MICROSTRUCTURE SHAPES AND THEIR ARRANGEMENTS
D.S. Lee¹, J.W. Park¹, H.S. Lee³, C. Ihm², and M.Y. Jung¹
¹Electronics and Telecommunications Research Institute (ETRI), KOREA, ²Eulji University, KOREA, and ³Seoul National University, KOREA

a - Cell Separation and Analysis

Circulating Tumor Cells

M008a ANTIBODY-FUNCTIONALIZED MICROFABRICATED FILTERS FOR ENHANCED ENRICHMENT OF CIRCULATING TUMOR CELLS
A. Meunier¹, J.A. Hernández-Castro^{1,2}, K. Turner¹, K. Li², T. Veres^{1,2}, and D. Juncker¹
¹McGill University, CANADA and ²National Research Council of Canada, CANADA

M009a LIVE CIRCULATING TUMOR CELLS SELECTION ON SELF-ASSEMBLED CELL ARRAY (SACA) CHIP BY IN-PARALLEL IMAGE ANALYSIS AND IN-SITU CELL CAPTURE
M.-H. Chiu¹, Y.-H. Weng¹, H.-Y. Chen¹, W.-Y. Cho¹, H.-Y. Chu¹, T.-J. Chen¹, S.S. Yang², J.-Y. Tseng², C.-P. Lin³, C.-Y. Yang⁴, C.-H. Lin², J.-K. Jiang³, and F.-G. Tseng¹
¹National Tsing Hua University, TAIWAN, ²National Yang-Ming University, TAIWAN, ³Veterans General Hospital-Taipei, TAIWAN, and ⁴Taipei City Hospital, TAIWAN

Circulating Tumor Cells

- M010a MICROFLUIDIC CLUSTER ASSAY FOR PATIENT-DERIVED CIRCULATING TUMOR CELLS WITH RELEVANCE IN PATIENT PROGNOSIS**
 B.L. Khoo¹, G. Grenici², T. Jing^{1,2}, Y.B. Lim², S.C. Lee^{3,4}, J.P. Thiery², J. Han^{1,5}, and C.T. Lim^{1,2}
¹Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE, ²National University of Singapore (NUS), SINGAPORE, ³National University Hospital, SINGAPORE, ⁴Cancer Science Institute of Singapore, SINGAPORE, and ⁵Massachusetts Institute of Technology, USA
- M011a SELECTIVE CAPTURE AND CULTURE OF CIRCULATING TUMOR CELLS USING ANTI-EPCAM ANTIBODY CONJUGATED ETHANOL-DISPERSED NANOFIBERS**
 J. Yoon¹, H.-S. Yoon¹, Y. Shin², S. Kim¹, Y. Ju¹, J. Kim¹, and S. Chung¹
¹Korea University, KOREA and ²Massachusetts Institute of Technology, USA
- T007a CONSIDERATIONS AND BEST PRACTICES FOR TESTING CTC ENRICHMENT DEVICES**
 J. Che¹, S. Liu¹, C. Lemaire¹, C.L. Wilkerson¹, N. Barzanian¹, K.-W. Huang¹, C. Renier¹, D. Di Carlo², R. Englert¹, M. Kochersperger¹, and E. Sollier-Christen¹
¹Vortex Biosciences, USA and ²University of California, Los Angeles, USA
- T008a HIGHLY EFFICIENT TRAPPING OF RARE CELLS IN WHOLE BLOOD USING ACOUSTIC MICROSTREAMING**
 N. Garg and A.P. Lee
 University of California, Irvine, USA
- T009a OSMOTIC PRESSURE DEPENDENT CELL IDENTIFICATION FOR DIFFERENTIATION OF METASTATIC CANCER STEM CELLS AND EPITHELIAL CANCER CELLS FROM WHITE BLOOD CELLS**
 J. Bu, Y.-T. Kang, J.H. Choi, T.H. Lee, and Y.-H. Cho
 Korea Advanced Institute of Science and Technology (KAIST), KOREA
- T010a SINGLE CIRCULATING TUMOR CELL ISOLATION CHIP BY PULSE LASER SYSTEM**
 O. Kim, D. Lee, A.C. Lee, and S. Kwon
 Seoul National University, KOREA
- W007a A SYSTEM ENABLING ISOLATION AND ELECTRICAL PROPERT CHARACTERIZATION OF CIRCULATING TUMOUR CELLS**
 T.K. Chiu¹, Y. Zhao², D.Y. Chen², C.H. Hsieh^{1,3}, K. Wang², W.P. Chou¹, B.Y. Fan², J.B. Wang², J. Chen², and M.H. Wu¹
¹Chang Gung University, TAIWAN, ²Chinese Academy of Sciences, CHINA, and ³Chang Gung Memorial Hospital, TAIWAN
- W008a HETEROGENEOUS EPITHELIAL AND MESENCHYMAL CIRCULATING TUMOR CELL ISOLATION USING DUAL-IMMUNOPATTERNED MICROFLUIDIC DEVICE WITH ANTI-EPCAM AND ANTI-63B6**
 Y.-T. Kang¹, J. Bu¹, Y.J. Kim¹, H.M. Lee², Y.-H. Cho¹, and C.J. Ryu²
¹Korea Advanced Institute of Science and Technology (KAIST), KOREA and ²Sejong University, KOREA

Circulating Tumor Cells

W009a MICRO SAND TIMER IN GLASS MEMBRANE DEVICE SEPARATES SINGLE CIRCULATING TUMOR CELLS IN BLOOD

D. Kuboyama¹, D. Onoshima¹, H. Yukawa¹, M. Tanaka¹, K. Ishikawa¹, M. Hori¹, and Y. Baba^{1,2}

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

W010a PRECISELY ENUMERATING CTCS FROM CLINICAL BLOOD SAMPLES UTILIZING INTEGRATED MICROFLUIDIC CHIP AND AUTOMATIC IMAGE PROCESSING

M. Zhou, H. Zheng, R. Li, W. Zhang, Z. Wang, Z. Wei, and Z. Hu
National Center for Nanoscience and Technology, CHINA

a - Cell Separation and Analysis

Integrative Cell Analysis

M012a AN INTEGRATED SYSTEM FOR INVESTIGATING CYTOTOXICITY AND GENOTOXICITY OF DNA CROSSLINKING AGENTS BASED ON MICROARRAY TECHNIQUE

Q.L. Liang and L.L. Li
Tsinghua University, CHINA

M013a DEVELOPMENT OF A NOVEL DEVICE WITH HIGH THROUGHOUT AXONAL TRANSPORT QUANTIFICATION

S. Yokoyama¹, J. Wada¹, T. Kushida¹, R. Araki¹, T. Ishida¹, A. Otom^{1,2}, S. Hadano², and H. Kimura¹

¹Tokai University, JAPAN and ²Tokai University School of Medicine, JAPAN

M014a QUANTITATING CYTOKINE SECRETION FROM A POPULATION OF CELLS IN A MICROFLUIDIC DEVICE

R. Rodríguez-Moncayo, R.J. Jiménez-Valdés, and J.L. García-Cordero
Centro de Investigacion y de Estudios Avanzados del IPN, MEXICO

T011a ANALYSIS OF MICROALGAE LIPID PRODUCTION USING HIGH-THROUGHPUT FLUORESCENCE IMAGING FLOW CYTOMETRY

M. Li¹, H.E. Muñoz¹, J. Lin¹, K. Owsley¹, E. Diebold², K. Goda^{1,3,4}, and D. Di Carlo¹

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T012a INSIDE AND OUTSIDE AN ARTIFICIAL PANCREAS: SIMULTANEOUS INTRA- AND EXTRACELLULAR MEASUREMENTS

L. Yi, X. Wang, B. Bandak, and M.G. Roper
Florida State University, USA

W011a "CHAMELEON EFFECT" OF RBC UNDER LOADING IN MICRO-FLUIDIC CHANNEL

M. Horade¹, C.-H.D. Tsai¹, H. Ito¹, M. Tanaka², and M. Kaneko¹

¹Osaka University, JAPAN and ²Kyoto University, JAPAN

Integrative Cell Analysis

W012a CONTINUOUS, TIME-CONTROLLABLE, AND MULTISTEP MICROFLUIDIC CELL PROCESSOR BASED ON HYDRODYNAMIC CARRIER-MEDIUM EXCHANGE

H. Toyoda, M. Yamada, and M. Seki

Chiba University, JAPAN

W013a LABEL-FREE, FEW-CELL CYTOMETRY OF CYTOSKELETAL CHANGES IN CONFLUENT ENDOTHELIAL CELL LAYERS

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²*University Medical Center Groningen, NETHERLANDS*

a - Cell Separation and Analysis

Liposomes/ Vesicles

M015a EXOSOME-SPECIFIC DUAL-PATTERNED IMMUNO-FILTRATION (EXODIF) DEVICES FOR THE RAPID CAPTURE AND EFFICIENT RELEASE OF CIRCULATING EXOSOME FROM CANCER PATIENTS' SERUM

Y.T. Kang¹, Y.J. Kim¹, J. Bu¹, I. Doh¹, Y.-H. Cho¹, S.W. Han², and B.I. Moon³

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²*Seoul National University Hospital, KOREA, and*

³*Ewha Womans University Medical Center, KOREA*

T013a DETECTING MicroRNA FROM EXTRACELLULAR VESICLES FOR CARDIOVASCULAR DISEASES BY USING A MICROFLUIDIC SYSTEM

H.-L. Cheng, W.-H. Chang, H.-Y. Lin, C. Chen, and G.-B. Lee

National Tsing Hua University, TAIWAN

T014a SEPARATION OF CANCER-CELL-DERIVED MICROVESICLES AND EXOSOMES IN MICROFLUIDIC FABRY-PEROT ACOUSTIC RESONATORS

P. Sehgal, J. Hartman, and B.J. Kirby

Cornell University, USA

W014a SINGLE-STEP ISOLATION OF MICROPARTICLES FROM WHOLE BLOOD FOR RAPID VASCULAR HEALTH PROFILING IN DIABETES MELLITUS

H.M. Tay¹, Z.J. Chen¹, R. Dalan², S.C.J. Loo¹, B.O. Boehm^{1,2}, and H.W. Hou¹

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²*Tan Tock Seng Hospital, SINGAPORE*



Dublin Castle Gardens

a - Cell Separation and Analysis

Others

- M016a** **SCRAPE-LOADING ASSISTED INTRACELLULAR DELIVERY VIA MICROCONSTRICTION FEATURING A SHARP EDGE**
Y. Pan, X. Xing, L. Duan, and L. Yobas
Hong Kong University of Science and Technology, HONG KONG
- T015a** **ULTRASOUND PULSE-ECHO ANALYSIS OF BLOOD AGGREGATION IN MICROFLUIDICS**
L. Lanotte^{1,2}, D. Laux², B. Charlot², and M. Abkarian¹
¹CNRS INSERM, FRANCE and ²University Montpellier, FRANCE

a - Cell Separation and Analysis

Single Cell Analysis

- M017a** **A MICROFLUIDIC SYSTEM ENABLING HIGH-THROUGHPUT SINGLE-CELL INTRACELLULAR PROTEIN QUANTIFICATION**
X. Li¹, B. Fan¹, D. Chen¹, X. Zhao², W. Yue², J. Wang¹, and J. Chen¹
¹Chinese Academy of Sciences, CHINA and ²Capital Medical University, CHINA
- M018a** **BEER ON A CHIP: IDENTIFICATION OF SUPERIOR INDUSTRIAL YEASTS USING DROPLET MICROFLUIDICS**
Y. Vervoort^{1,2,3}, R.S. Wiederkehr¹, T. Stakenborg¹, L. Lagae^{1,2}, and K.J. Verstrepen^{2,3}
¹imec, BELGIUM, ²KU Leuven, BELGIUM, and ³VIB, BELGIUM
- M019a** **CONTROLLED ORGANELLE TRANSFER BETWEEN LIVE SINGLE CELLS BY USING MICROFLUIDIC DEVICE**
K.-I. Wada, K. Hosokawa, Y. Ito, and M. Maeda
RIKEN, JAPAN
- M020a** **ELECTROACTIVE TRAP-WELL ARRAY COUPLED WITH PDMS REACTION-WELL ARRAY ALLOWS HIGHLY EFFICIENT SINGLE-CELL TRAPPING FOLLOWED BY ON-CHIP ANALYSIS WITH A CONTROLLABLE DILUTION RATIO OF CELL LYSATES**
K. Ogata, S.H. Kim, and T. Fujii
University of Tokyo, JAPAN
- M021a** **FUNCTIONAL STUDY OF SINGLE LEUKOCYTES USING AN INTEGRATED DROPLET PLATFORM**
T. Jing^{1,2}, Z. Lai¹, L. Wu³, J. Han^{2,3}, C.T. Lim^{1,2,4}, and C.-H. Chen^{1,2,5}
¹National University of Singapore, SINGAPORE, ²Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE, ³Massachusetts Institute of Technology, USA, ⁴Mechanobiology Institute, SINGAPORE, and ⁵Singapore Institute for Neurotechnology, SINGAPORE
- M022a** **WITHDRAWN**

Single Cell Analysis

- M023a** **MILLISECOND MEASUREMENT OF SINGLE CELL SIZE AND DEFORMABILITY BY ELECTRICAL DETECTION IN MICROFLUIDIC DEVICE WITH TWO CONSECUTIVE CONSTRICTIONS**
 N. Kaji¹, M. Sano¹, H. Yasaki¹, T. Yasui¹, and Y. Baba^{1,2}
¹Nagoya University, JAPAN and ²National Institute of Advanced Industrial Science and Technology (AIST), JAPAN
- M024a** **STUDYING DEVELOPMENT OF INDIVIDUAL BACTERIA WITH AN AUTOMATED MICROFLUIDIC DEVICE WITH AN INTEGRATED NANOCHANNEL ARRAY**
 J.D. Baker, D.T. Kysela, J. Zhou, Y.V. Brun, and S.C. Jacobson
 Indiana University, USA
- T016a** **ANALYSIS OF RED BLOOD CELLS RELAXATION TIME FLOWING OUT OF MICROFLUIDIC CONSTRICTIONS REVEALS THE IMPACT OF BUFFER VISCOSITY AND FLOW SPEED**
 A. Amirouche, J. Esteves, R. Ferrigno, and M. Faivre
 Universite Lyon, FRANCE
- T017a** **CHARACTERIZATION OF MICROCHAMBER DEVICE FOR EFFLUX ASSAY OF ADHERENT CELL**
 T. Eda, M. Tsugane, Y. Okada, and H. Suzuki
 Chuo University, JAPAN
- T018a** **DETECTING PROTEIN SECRETION FROM SINGLE CELLS IN A MICROFLUIDIC DEVICE USING MICROBEADS**
 D.F. Cedillo-Alcántar, R.J. Jiménez-Valdés, and J.L. García-Cordero
 Centro de Investigacion y de Estudios Avanzados del IPN, MEXICO
- T019a** **HIGH-THROUGHTPUT INERTIAL FOCUSING OF BIOPARTICLES: FROM BACTERIA TO SUBCELLULAR ORGANELLES**
 L. Wang and D.S. Dandy
 Colorado State University, USA
- T020a** **LIVING SINGLE CELL RELEASE AND CULTURE AFTER FEMTO-LITER SAMPLING BY EXTENDED-NANO/MICRO INTERFACE**
 L. Lin, K. Mawatari, K. Morikawa, and T. Kitamori
 University of Tokyo, JAPAN
- T021a** **MICROFLUIDIC DEVICE FOR CONTROL AND SENSING OF DYNAMIC OXYGEN LEVELS DURING CELL CULTIVATION**
 E. Kaganovitch, M. Krischer, C. Probst, A. Grünberger, E. Zunic, C. Freier, W. Wiechert, and D. Kohlheyer
 Forschungszentrum Jülich GmbH, GERMANY
- T022a** **NEURAL PUZZLE: MORPHOLOGICAL CONTROL AND ASSEMBLY OF SINGLE PRIMARY NEURONS USING MOBILE MICROPLATES**
 S. Yoshida¹, M. Negishi-Kato^{1,2}, and S. Takeuchi^{1,2}
¹University of Tokyo, JAPAN and
²Japan Science and Technology Agency (JST), JAPAN

Single Cell Analysis

- T023a** **SINGLE CELL PROTEOLYTIC ASSAYS TO INVESTIGATE CLONAL HETEROGENEITY AND CELL DYNAMICS USING EFFICIENT MICROFLUIDIC CELL LOADING**
Y.-C. Chen, Y.-H. Cheng, P. Ingram, and E. Yoon
University of Michigan, USA
- W015a** **A 3D PILLARS IMPEDANCE-BASED STRATEGY FOR THE DISCRIMINATION OF IN VITRO ACTIVATED T-LYMPHOCYTES**
E. Rollo¹, E. Tenaglia¹, R. Genolet², A. Harari², and C. Guiducci¹
¹*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND* and
²*Université de Lausanne, SWITZERLAND*
- W016a** **BEAT MOTION KINETICS OF NEONATAL RAT CARDIOMYOCYTES TRAPPED IN A CENTRIFUGAL MICROFLUIDIC CHIP: EVALUATED WITH VIDEO ANALYSIS AND RAMAN IMAGING**
W.V. Espulgar, M. Saito, J.-K. Lee, and E. Tamiya
Osaka University, JAPAN
- W017a** **CONSTRICTION BASED MICROFLUIDIC DEVICE FOR THE CELL PHENOTYPING**
A. Raj, M. Dixit, and A.K. Sen
Indian Institute of Technology, Madras, INDIA
- W018a** **DIELECTRIC CHARACTERISATION AND IDENTIFICATION OF MALARIA-INFECTED RED BLOOD CELLS USING MICROFLUIDIC IMPEDANCE CYTOMETRY**
C. Honrado¹, L. Ciuffreda², D. Spencer¹,
L. Ranford-Cartwright², and H. Morgan¹
¹*University of Southampton, UK* and ²*University of Glasgow, UK*
- W019a** **IDENTIFYING EGFR-EXPRESSED CELLS AND DETERMINING THE ABUNDANCES OF DIFFERENT EGFR MUTATION TYPES AT SINGLE-CELL LEVEL**
R. Li, M. Zhou, C. Yue, W. Zhang, Z. Wei, and Z. Hu
National Center for Nanoscience and Technology, CHINA
- W020a** **LIVE IMAGING OF SOMATIC NUCLEAR REPROGRAMMING USING AN ELECTROFUSION MICROFLUIDIC DEVICE WITH AIR-LOCK PATTERNED ADHESION AREAS FOR FUSANT LOCALIZATION**
S. Sakamoto, K.O. Okeyo, O. Kurosawa, H. Oana, and M. Washizu
University of Tokyo, JAPAN
- W021a** **MICROWELL ARRAYS FOR MULTIPLEX MICRORNA QUANTITATION**
A.M. Tentori, J.J. Kim, and P.S. Doyle
Massachusetts Institute of Technology, USA
- W022a** **SINGLE ADHERENT CELL PROTEIN SECRETION ANALYSIS THROUGH DROPLET ENCAPSULATIONS OF HYDROGEL PARTICLES**
M. Wang, E.X. Ng, H.L. Leo, C.T. Lim, and C.H. Chen
National University of Singapore, SINGAPORE
- W023a** **TIME-LAPSE MEASUREMENT OF SINGLE-CELL RESPONSE TO NANOMATERIAL: A MICROFLUIDIC APPROACH**
C.A. Cunha-Matos, O.R. Millington, A.W. Wark, and M. Zagnoni
University of Strathclyde, UK

a - Cell Separation and Analysis

Stem Cells

M025a DEMENTIA ON A CHIP: MONITORING SYNAPTIC DYSFUNCTION OF PATIENT DERIVED HUMAN NEURONS

G. Robertson¹, T. Sposito², S. Wray², J. Hardy², T.J. Bushell¹, and M. Zagnoni¹

¹University of Strathclyde, UK and ²University College London, UK

T024a THREE-DIMENSIONAL CULTURE OF IPS CELLS IN MICRO-SCALE COLLAGEN BEADS

S. Nagata and S. Takeuchi

University of Tokyo, JAPAN

b - Cells, Organisms, and Organs On Chip

Bioinspired, Biomimetic & Biohybrid Devices

M026b DIRECT MUSCLE TISSUE FORMATION BETWEEN MICROPILLARS BY LABEL-FREE MAGNETIC CELL ASSEMBLY

Y. Akiyama and J. Sugihara

Shinshu University, JAPAN

M027b STUDIES FOR THREAD RELEASE AND EJECTION DYNAMICS OF CNIDARIAN NEMATOCYSTS AND THEIR DEP CHARACTERIZATION/MANIPULATION FOR OSMOTIC BASED DELIVERY SYSTEMS

S. Park¹, G. Piriatskiy², U. Shavit¹, T. Lotan², and G. Yossifon¹

¹Technion - Israel Institute of Technology, ISRAEL and

²Haifa University, ISRAEL

T025b PERFUSABLE METER-LONG HYDROGEL μ TUBES WITH CIRCUMFERENTIALLY ALIGNED GROOVES FOR MIMICKING SMALL DIAMETER ARTERY

M. Nie¹ and S. Takeuchi^{1,2}

¹University of Tokyo, JAPAN and

²Japan Science and Technology Agency (JST), JAPAN

W024b BIOMIMETIC 3D PLATFORM INDUCES NEPHRIN UPREGULATION IN DIFFERENTIATING PODOCYTES IN VITRO

A. Korolj¹, B.Y. Zhang¹, C. Laschinger¹, C. James², E. Hu², R.N. Willette², and M. Radisic^{1,3,4}

¹University of Toronto, CANADA, ²GlaxoSmithKline Pharmaceuticals, USA,

³University Health Network, CANADA, and

⁴Heart and Stroke/Richard Lewar Centre of Excellence, CANADA

W025b SPATIOTEMPORALLY CONTROLLED DISSOLVED OXYGEN CONCENTRATION GRADIENT GENERATION INSIDE OF MICROFLUIDIC CHIP WITHOUT GAS SUPPLIES

H. Jang and S.-H. Lee

Korea University, KOREA

b - Cells, Organisms, and Organs On Chip

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

- M028b** **A MICROFLUIDIC PLATFORM FOR PERFUSION CULTURE AND MULTI-FUNCTIONAL PHENOTYPIC ANALYSIS OF INDIVIDUAL STEM CELL AGGREGATES**
 E.L. Jackson¹, T.C. McDevitt², and H. Lu¹
¹Georgia Institute of Technology, USA and ²Gladstone Institutes, USA
- M029b** **A PUMP-FREE 3D MICROFLUIDIC PLATFORM FOR LONG TERM DIFFERENTIATION OF HUMAN LIVER PROGENITOR CELLS**
 L.O.J. Ye¹, L.H. Chong¹, L. Jin¹, E.T.Y. Zhang¹, and Y.-C. Toh^{1,2}
¹National University of Singapore, SINGAPORE and
²Singapore Institute for Neurotechnology, SINGAPORE
- M030b** **BIOMIMETIC AND HETEROGENEOUS MICROSTRUCTURE WITH MULTIPLE HYDROGELS USING ELECTROMICROFLUIDIC TECHNIQUES**
 Y.-T. Lo, J.-H. Lee, J.-T. Liao, and S.-K. Fan
 National Taiwan University, TAIWAN
- M031b** **FROM EMULSION TO SINGLE-PHASE MICROFLUIDICS: AN INTEGRATED APPROACH TO CULTURE AND PERFUSION OF MULTICELLULAR SPHEROIDS**
 K.S. McMillan, M. Boyd, and M. Zagnoni
 University of Strathclyde, UK
- M032b** **MICROFLUIDIC PLATFORM FOR NMR METABOLOMICS OF MAMMALIAN CELLS UNDER HYPOXIC AND NORMOXIC CONDITIONS**
 M. Utz and A. Yilmaz
 University of Southampton, UK
- M033b** **ON-CHIP STUDY OF THE DRUG RESPONSE OF MCF-7 BREAST CANCER TUMOUR SPHEROIDS UNDER CHRONIC AND CYCLING HYPOXIA**
 S.M. Grist, S.S. Nasser, L. Laplatine, A. Díaz Gaxiola, M.-C.(A.) Liu, L. Chrostowski, and K.C. Cheung
 University of British Columbia, CANADA
- M034b** **PREPARATION OF PERFUSABLE CAPILLARY TISSUE BLOCKS BY ACCUMULATION CULTIVATION WITH COLLAGEN MICROBEADS IN MICROFLUIDIC DEVICES**
 M. Miyazaki, A. Hori, Y. Yajima, M. Yamada, and M. Seki
 Chiba University, JAPAN
- M035b** **RAPID CIRCULATING TUMOR CELLS STAINING IN THREE-DIMENSIONAL MICROWELL PERFUSION CHIP**
 K.H. Chen¹, H.-Y. Chen¹, Y.-H. Weng¹, H.-Y. Chu¹, F.-G. Tseng¹, S.-S. Yang², J.-Y. Tseng², C.-P. Lin³, C.-Y. Yang⁴, J.-K. Jiang³, and C.-H. Liu²
¹National Tsing Hua University, TAIWAN,
²National Yang-Ming University, TAIWAN,
³Veterans General Hospital-Taipei, TAIWAN, and
⁴Taipei City Hospital, TAIWAN

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

- M036b UNANCHORED MICRO-TUMORS IN AN ULTRASONIC ACTUATED MULTI-WELL MICROPLATE WITH PROTEIN REPELLENT COATING**
K. Olofsson¹, V. Carannante², T. Frisk¹, K. Kushiro³, M. Takai³, B. Önfelt¹, and M. Wiklund¹
¹ *Royal Institute of Technology, SWEDEN*,
² *Karolinska Institutet, SWEDEN*, and ³ *University of Tokyo, JAPAN*
- M037b VISUALIZATION OF OXYGEN GRADIENT IN A PDMS HEPATOCYTE CULTURE DEVICE**
S. Matsumoto¹, E. Leclerc², T. Maekawa¹, H. Kinoshita¹, M. Shinohara¹, K. Komori¹, Y. Sakai¹, and T. Fujii¹
¹ *University of Tokyo, JAPAN* and ² *LIMMS/CNRS-IIS, JAPAN*
- T026b 3D ASSEMBLY OF FIBER-BASED TISSUES COMBINED WITH MICRO PILLAR CONNECTORS**
K. Furuie¹, Y. Morimoto¹, S. Yoshida¹, N. Mori¹, and S. Takeuchi^{1,2}
¹ *University of Tokyo, JAPAN* and
² *Japan Science and Technology Agency (JST), JAPAN*
- T027b A MICROFABRICATED PLATFORM WITH ON-CHIP STRAIN SENSING AND HYDROGEL ARRAYS FOR MECHANICAL STIMULATION AND MEASUREMENT OF ENGINEERED TISSUES**
H. Liu, C. Simmons, and Y. Sun
University of Toronto, CANADA
- T028b A THREE-DIMENSIONAL MICROWELL PERFUSION-ARRAY FOR OOCYTES ZONA-REMOVAL AND INCUBATION**
C.W. Lee¹, C. Chang¹, Y.L. Lin², L.C. Pan², and F.G. Tseng¹
¹ *National Tsing Hua University, TAIWAN* and
² *Taipei Medical University and Hospital, TAIWAN*
- T029b COLLAGEN-SILICONE HYBRID MICROTUBE DEVICE FOR 3D-LAYERED TISSUE CULTURE WITH PERFUSION**
H. Tajima and H. Onoe
Keio University, JAPAN
- T030b IN VITRO LIVER FIBROSIS MODEL INDUCED BY ALCOHOL**
J.S. Lee and S.H. Lee
Korea University, KOREA
- T031b MICROFLUIDIC THREE-DIMENSIONAL CULTURE OF HUMAN INDUCED PLURIPOTENT STEM CELLS**
J. Kim¹, H.-J. Park¹, J. Jang², E.J. Jeon¹, and S.-W. Cho¹
¹ *Yonsei University, KOREA* and
² *Yonsei University School of Medicine, KOREA*
- T032b PERFUSABLE 3D ANGIOGENESIS IN HIGH-THROUGHPUT**
V. van Duinen¹, S.J. Trietsch², A.J. van Zonneveld³, T. Hankemeier¹, and P. Vulto²
¹ *Leiden University, NETHERLANDS*, ² *Mimetas BV, NETHERLANDS*, and
³ *Leiden University School of Medicine, NETHERLANDS*

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

- T033b PUMP-FREE PERFUSION TISSUE CULTURE PLATE FOR LARGE SCALE PRODUCTION OF LIVER BUD**
 T. Ohkubo¹, M. Kanai¹, H. Abe¹, S. Ayano², H. Taniguchi³, and M. Kino-oka⁴
¹Shimadzu Corporation, JAPAN, ²Kuraray Co., Ltd., JAPAN, ³Yokohama City University, JAPAN, and ⁴Osaka University, JAPAN
- T034b SPROUTING FROM ON-CHIP VASCULAR NETWORKS BY A PRESSURE-DRIVEN FLOW**
 M. Nakayama¹, Y. Nashimoto¹, I. Kunita², A. Nakamasu³, Y.-S. Torisawa¹, H. Shintaku¹, H. Kotera¹, K. Nishiyama², T. Miura³, and R. Yokokawa¹
¹Kyoto University, JAPAN, ²Kumamoto University, JAPAN, and ³Kyushu University, JAPAN
- T035b USE OF ELECTROSPINNING AND DYNAMIC AIR FOCUSING TO DIRECTLY CREATE 3D SCAFFOLDS IN MICROFLUIDIC DEVICES FOR CELL CULTURE WITH INTEGRATED ANALYSIS**
 R.S. Martin and C. Chen
 Saint Louis University, USA
- W026b 3D CULTURE OF RAT PRIMARY HEPATIC CELLS USING CELL-FIBER TECHNOLOGY FOR LONG-TERM MAINTENANCE OF LIVER-SPECIFIC FUNCTIONS IN VITRO**
 E. Mazari-Arrighi, T. Okitsu, H. Aoyagi, M. Kiyosawa, M. Yano, and S. Takeuchi
 University of Tokyo, JAPAN
- W027b A MODULAR BIOREACTOR WITH INTEGRATED IMPEDANCE SPECTROSCOPY ELECTRODES FOR MONITORING OF EPITHELIAL AND ENDOTHELIAL BARRIERS**
 J. Yeste^{1,2}, L. Martínez-Gimeno³, X. Illa^{1,2}, A. Guimerà^{1,2}, I. Giménez³, and R. Villa^{1,2}
¹Institut de Microelectrònica de Barcelona, SPAIN, ²Networking Centre on Bioengineering, Biomaterials and Nanomedicine, SPAIN, and ³Instituto Aragonés de Ciencias de la Salud, SPAIN
- W028b ADVANCED A549 AND MRC-5 3D SPHEROID CULTURE IN MICROFLUIDIC SYSTEM**
 A. Zuchowska, E. Jastrzebska, M. Chudy, A. Dybko, and Z. Brzozka
 Warsaw University of Technology, POLAND
- W029b FABRICATION OF FREELY STANDING ORIENTED MYOTUBES USING A NOVEL MESH CULTURE METHOD AND ANALYSIS OF CALCIUM DYNAMICS FOR FUNCTIONALITY ASSAY**
 K.O. Okeyo, M. Azeyanagi, O. Kurosawa, H. Oana, and M. Washizu
 University of Tokyo, JAPAN
- W030b MICROENCAPSULATION OF CULTURE OF HEPATIC LOBULE MODEL USING SHAPE-CONTROLLED ALGINATE-POLY-L-LYSINE (PLL) MICROCAPSULES WITH THE ELECTRODEPOSITION METHOD**
 Z. Liu¹, M. Takeuchi¹, M. Nakajima¹, Y. Hasegawa¹, T. Fukuda^{1,2,3}, and Q. Huang³
¹Nagoya University, JAPAN, ²Meijo University, JAPAN, and ³Beijing Institute of Technology, JAPAN

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

- W031b** **ENGINEERING SMALL BIOLOGICAL TUBES WITH CHANGES IN DIAMETER TO PROBE THE EFFECTS OF GRADIENTS OF SHEAR STRESS AND CURVATURE ON EPITHELIAL MONOLAYER**
 B. Venzac^{1,2,3}, R. Madoun^{1,2}, T. Benarab^{1,2}, S. Monnier^{1,2,3},
 F. Cayrac^{1,2}, L. Leconte^{1,2}, S. Saunier⁴, P. Silberzan^{1,2,3},
 F. Amblard^{1,2}, J.-L. Viovy^{1,2,3}, S. Descroix^{1,2,3}, and S. Coscoy^{1,2,3}
¹Institut Curie, FRANCE, ²Pierre and Marie Curie University, FRANCE, and
³Institut Pierre-Gilles de Gennes, FRANCE, and ⁴Hopital Necker, FRANCE
- W032b** **PERFUSION BASED MICROFLUIDIC SYSTEM FOR PHARMACOLOGICAL PROFILING OF NEURONAL NETWORKS**
 C. MacKerron, G. Robertson, T.J. Bushell, and M. Zagnoni
 University of Strathclyde, UK
- W033b** **QUANTUM DOTS CYTOTOXICITY STUDIES ON CELL CULTURES REPRESENTING VARIOUS TISSUES IN MICROFLUIDIC SYSTEM**
 I. Grabowska-Jadach, M. Olesik, M. Drozd, M. Pietrzak,
 E. Malinowska, and Z. Brzozka
 Warsaw University of Technology, POLAND
- W034b** **THREE DIMENSIONAL CLOSED MICROCHAMBER FOR EVALUATION OF SHAPES EFFECT ON STEM CELL DIFFERENTIATION**
 Y. Matsushiro¹, M. Kato-Negishi², and H. Onoe¹
¹Keio University, JAPAN and ²University of Tokyo, JAPAN
- W035b** **VASCULAR FAILURE ON A MICROFLUIDIC CHIP**
 J.H. Ahn, K. Son, D. Park, and N.L. Jeon
 Seoul National University, KOREA

b - Cells, Organisms, and Organs On Chip

Inter- & Intracellular Signaling, Cell Migration

- M038b** **DIRECTIONAL AND TRANS-ENDOTHELIAL MIGRATION OF MESENCHYMAL STEM CELL TOWARDS SDF-1A GRADIENT ON A MICROFLUIDIC DEVICE**
 S. Park¹, H.S. Jang¹, G.S. Jung², B.S. Kim¹, and Y. Park¹
¹Korea University, KOREA and ²Asan Medical Center, KOREA
- M039b** **LABEL-FREE QUANTIFICATION OF THERAPEUTICS TARGETING INTRACELLULAR MITOCHONDRIAL MACHINERY**
 A. Rohani, J.H. Moore, J. Kashatus, D.F. Kashatus, and N.S. Swami
 University of Virginia, USA
- T036b** **A 96-WELL THREE-DIMENSIONAL MICROFLUIDIC WOUND-HEALING ASSAY**
 R. Hao¹, Y.C. Wei¹, F. Chen², W. Guo², D.Y. Chen¹,
 J.B. Wang¹, and J. Chen¹
¹Chinese Academy of Sciences, CHINA and
²Chinese PLA General Hospital, CHINA
- T037b** **DYNAMIC CHARACTERIZATION OF INVASIVE LEADER CELLS DURING 3D COLLECTIVE CANCER INVASION**
 Z. Dean¹, U. Utzinger¹, and P.K. Wong²
¹University of Arizona, USA and ²Pennsylvania State University, USA

Inter- & Intracellular Signaling, Cell Migration

T038b SIMULTANEOUS EVALUATION OF DIAMETER AND PROTEIN EXPRESSION OF INDIVIDUAL EXOSOMES USING A MICROCAPILLARY CHIPS TOWARDS EXOSOMAL BIOMARKER RESEARCH

T. Akagi¹, H. Kishita¹, Y. Suehiro¹, and T. Ichiki^{1,2}

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W036b CHANGES IN CANCER CELL MIGRATION BEHAVIORS WITH INCREASING MALIGNANCY ON MICROGROOVE TOPOGRAPHY

K. Kushiro¹, A. Ryo², and M. Takai¹

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W037b DYNAMIC MOLECULAR COMMUNICATION BETWEEN BACTERIAL COLONIES IN MICROFLUIDIC ENVIRONMENTS

C.M. Austin¹, D.M. Caro¹, W.F. Penniman¹, J.E. Perdomo¹, S. Sankar¹, L. Hu², S. Watve¹, B.K. Hammer¹, and C.R. Forest¹

¹Georgia Institute of Technology, USA and

²University of California, Berkeley, USA

b - Cells, Organisms, and Organs On Chip

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

M040b ANALYSIS OF DOXYCYCLINE EFFECTS ON C.ELEGANS MITOCHONDRIAL STRESS AND NEURODEGENERATION WITHIN A MICROFLUIDIC "SMART-PLATE"

M. Cornaglia, L. Mouchiroud, G. Krishnamani, V. Sorrentino, T. Lehnert, J. Auwerx, and M.A.M. Gijs

École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

M041b HIGH-THROUGHPUT ZEBRAFISH IMMOBILIZATION BY A FISH-SHAPED MICROFLUIDIC DEVICE FOR BEHAVIORAL STUDY

W. Chen, J. Chen, C. Wen, S. Walker, Y. Ke, W. Yung, and S.C. Chen

Chinese University of Hong Kong, HONG KONG

M042b POLLEN TUBE GUIDANCE ASSAY ON A MICROFLUIDIC PLATFORM

N. Yanagisawa and T. Higashiyama

Nagoya University, JAPAN

M043b SIZE-DEPENDENT SORTING OF C. ELEGANS NEMATODES THROUGH AN ADJUSTABLE MICROFLUIDIC FILTER STRUCTURE

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

École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

T039b A MICROFLUIDIC DEVICE FOR HEAD IMMOBILIZATION, CHEMICAL EXPOSURE, AND BEHAVIORAL SCREENING OF ZEBRAFISH LARVAE

A. Nady, A.R. Peimani, G. Zoidl, and P. Rezai

York University, CANADA

T040b IMMOBILIZATION OF C. ELEGANS IN LIQUID USING 3D-ELECTRODE DIELECTROPHORESIS

X.Y. Zeng¹, L. Huang¹, H.S. Chuang², and W.H. Wang¹

¹Tsinghua University, CHINA and ²National Cheng Kung University, TAIWAN

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

- T041b** **MICROFLUIDIC SYSTEM WITH SPATIOTEMPORALLY CONTROLLED MICRO-ENVIRONMENT FOR STUDYING C. ELEGANS DEVELOPMENTAL ARREST RESPONSES**
W. Zhuo, P. McGrath, and H. Lu
Georgia Institute of Technology, USA
- T042b** **RAPID AND ADDRESSABLE IMMOBILIZATION OF CAENORHABDITIS ELEGANS IN A THERMO-REVERSIBLE HYDROGEL ENABLED BY AN OPTOELECTRIC MICROCHIP**
H.S. Chuang and W.Y. Chuang
National Cheng Kung University, TAIWAN
- W038b** **ANALYTICAL METHODS OF ROOT GROWTH BEHAVIOR USING AN ARTIFICIAL SOIL DEVICE**
H. Hida¹, D. Nishiwaki¹, M. Notaguchi², and I. Kanno¹
¹*Kobe University, JAPAN* and ²*Nagoya University, JAPAN*
- W039b** **HIGH-RESOLUTION CONFOCAL IMAGING OF MITOCHONDRIAL DYNAMICS IN C.ELEGANS USING A GENTLE AND REVERSIBLE HYDROGEL/MICROBEAD-BASED WORM IMMOBILIZATION TECHNIQUE**
M. Cornaglia, G. Krishnamani, E. Katsyuba, L. Mouchiroud, J. Auwerx, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- W040b** **INERTIAL FOCUSING TO SEPARATE XENOPUS LAEVIS EMBRYO NUCLEI FOR DROPLET ENCAPSULATION**
K. Nelson, D.L. Levy, and J. Oakey
University of Wyoming, USA
- W041b** **ON-CHIP BIOCOMMUNICATION THROUGH EXCHANGE OF DIFFUSIVE COMPOUNDS SECRETED BY MALE C. ELEGANS NEMATODES**
L. Dong, M. Cornaglia, H. Yang, T. Lehnert, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- W042b** **SINGLE YEAST CELL TRAPS FOR MONITORING CHROMOSOME DYNAMICS**
S.H. Jin¹, S.C. Jang¹, B. Lee¹, S.G. Jeong¹, Y.A. Son¹, S.S. Lee², K.P. Kim³, and C.S. Lee¹
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b - Cells, Organisms, and Organs On Chip

Organs on Chip

- M044b** **A MULTI-CHANNEL IN VITRO BLOOD-BRAIN BARRIER MODEL**
S.H. Jeong¹, S. Kim¹, J. Buonocore¹, J. Park², C.J. Welsh¹, J. Li¹, and A. Han¹
¹*Texas A&M University, USA* and ²*South University of Science and Technology of China, CHINA*

Organs on Chip

- M045b** **AN ACTUATOR CHIP FOR IN VITRO MECHANO-STIMULI RESPONSIVE STUDIES OF PRIMARY CORTICAL CELL NETWORKS**
 S. Xie¹, J.G.E. Gardeniers¹, and R. Luttge²
¹University of Twente, NETHERLANDS and
²Eindhoven University of Technology, NETHERLANDS
- M046b** **HEPATOCYTE MAINTENANCE IN VITRO USING AN ADVANCED MICROFLUIDIC BIOREACTOR FOR BIOMEDICAL RESEARCH AND PHARMACEUTICAL APPLICATIONS**
 M. Ortega-Ribera^{1,2}, X. Illa², C. Fondevila¹, C. Peralta¹, R. Villa², and J. Gracia-Sancho¹
¹August Pi i Sunyer Biomedical Research Institute (IDIBAPS), SPAIN and
²Consejo Superior de Investigaciones Científicas (CSIC), SPAIN
- M047b** **INTEGRATION OF A CARDIOVASCULAR SYSTEM FOR RENAL EXCRETION ASSAY**
 Y. Sakuta, K. Tsunoda, and K. Sato
 Gunma University, JAPAN
- M048b** **3D NETWORKS OF IPSC-DERIVED NEURONS FOR HIGH-THROUGHPUT NEUROTOXICITY SCREENING**
 A. Nicolas, N.R. Wevers, K.J. Wilschut, R. van Vught, H.L. Lanz, S.J. Trietsch, J. Joore, and P. Vulto
 Mimetas B.V., NETHERLANDS
- T043b** **3-DIMENSIONAL IN-VITRO HUMAN NASAL MUCOUS MEMBRANE WITH GLANDS**
 K. Na¹, M. Lee², H.-W. Shin², and S. Chung¹
¹Korea University, KOREA and ²Seoul National University, KOREA
- T044b** **A NOVEL MICROFLUIDIC DEVICE FOR ORGAN CULTURE: IN VITRO SPERMATOGENESIS ON CHIP**
 M. Komeya¹, H. Kimura², T. Fujii³, and T. Ogawa¹
¹Yokohama City University, JAPAN, ²Tokai University, JAPAN, and
³University of Tokyo, JAPAN
- T045b** **ASSESSING ELECTROCHEMICALLY THE CHEMICAL ACTIVITY OF CELLS IN A CELLS-ON-PAPER SYSTEM**
 R. Trouillon, K. Menzies, K. Schoonjans, and M.A.M. Gijs
 École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T046b** **DUAL FLOW MICROFLUIDICS FOR THE MAINTENANCE OF FULL THICKNESS HUMAN INTESTINAL TISSUE**
 A. Dawson¹, J. Macfie², C. Dyer¹, M. Jacobsen³, and J. Greenman¹
¹University of Hull, UK, ²Scarborough General Hospital, UK, and
³Østfold Hospital Trust, NORWAY
- T047b** **IN VITRO BLOOD-BRAIN BARRIER MODEL USING MICROFLUIDIC PLATFORM**
 S.M. Lee, M.H. Chung, K.M. Son, and N.L. Jeon
 Seoul National University, KOREA

Organs on Chip

T048b **INTESTINAL ORGANOID INITIATED IN MICROFLUIDICS-BASED DOUBLE EMULSIONS**

X. Ma, M.L. Jepsen, A.K. Ivarsen, J.V. Nygaard, C. Tesaro,
B.R. Knudsen, and Y.-P. Ho
Aarhus University, DENMARK

T049b **RECAPITULATING SMOKING PATHOPHYSIOLOGY IN A HUMAN LUNG SMALL AIRWAY-ON-A-CHIP**

K.H. Benam¹, R. Novak¹, J. Nawroth^{1,2}, M. Hirano-Kobayashi^{1,3},
T.C. Ferrante¹, Y. Choe¹, R. Prantil-Baun¹, A. Bahinski¹,
K.K. Parker^{1,2}, and D.E. Ingber^{1,3}

¹Wyss Institute for Biologically Inspired Engineering, USA,

²Harvard School of Engineering and Applied Sciences, USA, and

³Boston Children's Hospital and Harvard Medical School, USA

W043b **A MICROFLUIDIC 3D IN VITRO MODEL OF GLOMERULAR ENDOTHELIUM**

J. Kim¹, S. Han², J. Nam³, S. Chung¹, and E.Y. Lee⁴

¹Korea University, KOREA,

²University of California, Berkeley, USA,

³University of Seoul, KOREA, and

⁴Soonchunhyang University, KOREA

W044b **A PNEUMATIC PRESSURE-DRIVEN MULTI-THROUGHPUT MULTI-ORGANS-ON-A-CHIP**

T. Satoh¹, S. Sugiura¹, K. Shin¹, S. Ishida², T. Fujimoto³,
H. Miyamoto³, N. Taneichi³, and T. Kanamori¹

¹National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, ²National Institute of Health Sciences, JAPAN, and ³Tokyo Ohka Kogyo Co., Ltd., JAPAN

W045b **BLOOD CELL GENERATION SYSTEM IN A MICROFLUIDIC DEVICE**

E. Kamata¹, S. Ishii¹, K. Kitajima², T. Hara², and K. Sato¹

¹Japan Women's University, JAPAN and

²Tokyo Metropolitan Institute of Medical Science, JAPAN

W046b **HEART-ON-A-CHIP - STUDIES OF CARDIAC (H9C2) CELL PROLIFERATION USING IMPEDANCE SPECTROSCOPY**

A. Kobuszewska¹, P. Cwik¹, E. Jastrzebska¹, P. Renaud², and Z. Brzozka¹

¹Warsaw University of Technology, POLAND and

²École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

W047b **IN VITRO MAMMARY DUCT RECONSTRUCTION BASED LOCALIZED COLLAGEN EXTRACELLULAR MATRIX IN MICROFLUIDIC PLATFORM**

Y. Cho¹, S.H. Lee², Y. Shin³, J. Kim¹, S. Chung¹, and W.K. Moon²

¹Korea University, KOREA, ²Seoul National University Hospital, KOREA, and

³Massachusetts Institute of Technology, USA

W048b **LOCAL STIMULATION OF LYMPH NODE SLICES ON-CHIP**

A.E. Ross and R.R. Pompano
University of Virginia, USA

Organs on Chip

W049b STUDYING NANOPARTICLE-3D TUMOUR SPHEROID INTERACTIONS IN A MICROFLUIDIC FORMAT: TOWARDS THE ASSESSMENT OF DRUG DELIVERY TO COMPLEX TUMOUR TISSUES UNDER PHYSIOLOGICAL CONDITIONS

J.-G. Blondé, D. Babu, D. Priwitaningrum, A. Sridhar, J. Prakash, and S. Le Gac
University of Twente, NETHERLANDS

b - Cells, Organisms, and Organs On Chip

Others

M049b CELL-FREE CYCLE CONTROL WITH PHOTOLABILE HYDROGEL

B. Noren¹, J. Bisht¹, J. Gatlin¹, P. LeValley², P. Kharkar², A. Kloxin², and J. Oakey¹
¹*University of Wyoming, USA* and ²*University of Delaware, USA*

M050b SINGLE LENS LIGHT SHEET MICROSCOPY ON-CHIP

E. Zagato, T. Brans, S. Verstuyft, D. Van Thourhout, K. Remaut, J. Missinne, G. Van Steenberge, J. Demeester, S. De Smedt, K. Neyts, and K. Braeckmans
Ghent University, BELGIUM

T050b MICROFLUIDIC CULTURE OF HEAD AND NECK TUMOUR MAINTAINS VIABILITY, AS SHOWN BY SINGLE CELL ANALYSIS, PROVIDING POTENTIAL FOR NOVEL APPLICATIONS AND PERSONALISED MEDICINE

R. Bower¹, V. Green¹, D. Kuvshinov¹, S. Crank², N. Stafford³, and J. Greenman¹
¹*University of Hull, UK*, ²*Hull and East Yorkshire NHS Trust, UK*, and ³*Hull York Medical School, UK*

T051b STUDY OF MELATONIN EFFECT ON HEPATOCELLULAR STRESS RESPONSE INDUCED BY il-6 USING NEWLY DEVELOPED IN VITRO LIVER-ON-A-CHIP

M. Jang^{1,2}, A. Kleiber¹, and A. Manz^{1,2}
¹*Saarland University, GERMANY* and ²*Korea Institute of Science and Technology (KIST) Europe, GERMANY*

W050b MIMICKING CASCADING LIVER METABOLIC REACTIONS ON A MICROFLUIDIC PLATFORM

G. Kulsharova¹, P. Panjan², Y.-Y. Chiang¹, N. Dimov¹, M.P.C. Marques¹, A.M. Sesay², F. Baganz¹, and N. Szita¹
¹*University College London, UK* and ²*University of Oulu, FINLAND*

W051b TIP CHIP: SUBCELLULAR SAMPLING FROM SINGLE CANCER CELLS

J. Quist¹, E. Sarajlic², S.C.S. Lai¹, and S.G. Lemay¹
¹*University of Twente, NETHERLANDS* and ²*SmartTip BV, NETHERLANDS*

b - Cells, Organisms, and Organs On Chip

Synthetic Biology

M051b A MICROFLUIDIC TECHNIQUE FOR HIGH EFFICIENCY AND HIGH-THROUGHPUT GENETIC TRANSFORMATION OF BACTERIA

P.A. Garcia, Z. Ge, and C.R. Buie

Massachusetts Institute of Technology, USA

M052b LIGHT-DRIVEN DRAG AND DROP ASSEMBLY OF MICRON-SCALE BILAYER NETWORKS FOR SYNTHETIC BIOLOGY

M.S. Friddin, G. Bolognesi, Y. Elani, N.J. Brooks, R.V. Law,

J.M. Seddon, M.A.A. Neil, and O. Ces

Imperial College London, UK

T052b CONTINUOUS PRODUCTION OF DROPLET INTERFACE BILAYERS

W.G. Cochrane and B.M. Paegel

Scripps Research Institute Florida, USA

T053b METABOLIC CONVERSIONS IN ARTIFICIAL MICROCOMPARTMENTS

T. Beneyton¹, D. Krafft², I. Ivanov², T. Vidakovi-Koch²,

K. Sundmacher², and J.-C. Baret¹

¹University Bordeaux, FRANCE and ²Max Planck Institute for

Dynamics of Complex Technical Systems, GERMANY

W052b HIGH THROUGHPUT DROPLET SORTING OF YEAST FOR p-COUMARIC ACID PRODUCTION DETECTED BY CO-ENCAPSULATED E. COLI BIOSENSOR BACTERIA

S. Siedler¹, N.K. Khatri², A. Zsohar¹, I. Kjærboelling¹,

M. Vogt³, P. Hammar², S.G. Stahlhut¹, J. Marienhagen³,

M.O.A. Sommer¹, and H.N. Joensson²

¹Technical University of Denmark, DENMARK, ²KTH Royal Institute of

Technology, SWEDEN, and ³Forschungszentrum Jülich GmbH, GERMANY

W053b QUANTITATIVE MICROFLUIDIC APPROACH FOR MICROBIAL ECOLOGY: COMPARING GROWTH RATES AND LAG TIMES AT THE SINGLE CELL LEVEL

X. Yuan¹, J.M. Couto¹, A. Glidle¹, C. Quince², W. Sloan¹, and H. Yin¹

¹University of Glasgow, UK and ²University of Warwick, UK

c - Commercialization

Techno-Economical Aspects for the Successful Commercialization of Microfluidics-Based Products

M053c COMMERCIALIZATION OF A LOW-COST, LOW-COMPLEXITY POINT-OF-CARE DIAGNOSTIC TEST FOR INFECTIOUS DISEASE

J.C. Carrano, J.J. Carrano, J.C. Hofstetter, and R.Q. Schneider

Paratus Diagnostics, USA

T054c MICROFLUIDIC STANDARDIZATION: PAST, PRESENT AND FUTURE

H. van Heeren¹, T. Atkins², M. Blom³, J.-E. Bullema⁴, R. Tantra⁵,

D. Verhoeven⁶, and N. Verplanck⁷

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⁴TNO, NETHERLANDS, ⁵National Physical Laboratory, UK,

⁶Axxicon Moulds, NETHERLANDS, and ⁷CEA/Leti, FRANCE

d - Diagnostics, Theranostics, and Translational Medicine

Cancer Research

- M054d CELL-LADEN MICROBEAD-BASED 3D GASTRIC CANCER MODEL FOR EVALUATION OF CHEMORESISTANCE**
M. Jang¹, S. Jung¹, J.-H. Cheong², and P. Kim¹
¹Korea Advanced Institute of Science and Technology (KAIST), KOREA and
²Yonsei University College of Medicine, KOREA
- M055d EVALUATION OF EFFECTIVENESS OF CANCER THERAPY DURING LONG-TERM 3D SPHEROID CULTURE**
A. Zuchowska, E. Jastrzebska, M. Chudy, A. Dybko, and Z. Brzozka
Warsaw University of Technology, POLAND
- M056d ON-CHIP CHOLANGIOCARCINOMA CELL CAPTURE AND IMMUNOFLOUORESCENCE STAINING FOR CLINICAL DIAGNOSIS BY USING BILE JUICE AND WHOLE BLOOD**
L.-Y. Hung¹, W.-C. Tsai¹, C.-Y. Fu¹, N.-J. Chiang²,
Y.-C. Wang², Y.-S. Shan², and G.-B. Lee¹
¹National Tsing Hua University, TAIWAN and
²National Cheng Kung University Hospital, TAIWAN
- T055d EVALUATION OF ANTI-CANCER DRUG SUBEROYLANILIDE HYDROXAMIC ACID (SAHA) ON CANCER CELL PHENOTYPE IN A THREE-DIMENSIONAL (3D) BREAST TUMOR-STROMA PLATFORM**
N. Peela¹, D. Truong¹, E.S. Barrientos¹, G. Mouneimne², and M. Nikkhah¹
¹Arizona State University, USA and ²University of Arizona, USA
- T056d GUIDANCE AND EVALUATION OF CANCER CELL INVASION BY OPEN AIR CULTURE SYSTEM USING MICROENGINEERED HYDROGEL SHEETS**
M. Sugimoto, Y. Kitagawa, M. Yamada, and M. Seki
Chiba University, JAPAN
- T057d ON-CHIP COMBINED RADIOTHERAPY AND CHEMOTHERAPY TESTING ON SOFT-TISSUE SARCOMA SPHEROIDS**
B. Patra^{1,2}, A.R. Brunet^{1,2}, K. Zerouali³, J.F. Carrier³,
P. Wong^{2,3}, and T. Gervais^{1,2}
¹École Polytechnique de Montréal, CANADA, ²Institut du Cancer de Montréal, CANADA, and ³Centre Hospitalier de l'Université de Montréal (CHUM), CANADA
- W054d CANCER TRAPPING ON STICKY MICROGELS THROUGH ENHANCED FREE THIOLS**
J. Cha¹, J.-K. Shim², S.-G. Kang², and P. Kim¹
¹Korea Advanced Institute of Science and Technology (KAIST), KOREA and
²Yonsei University College of Medicine, KOREA
- W055d FLUORESCENT IN SITU HYBRIDIZATION (FISH) ENHANCEMENT USING MICROFLUIDIC FLOW FOR AN ACCURATE, FAST AND ECONOMICAL ASSESSMENT OF HER2 STATUS IN BREAST CANCER**
H.-T. Nguyen¹, R. Trouillon¹, S. Matsuoka¹, M. Fiche², L. de Leval²,
B. Bisig², and M.A.M. Gijss¹
¹École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and
²Centre Hospitalier Universitaire Vaudois - University of Lausanne, SWITZERLAND

Cancer Research

W056d FULLY INTEGRATED MICROFLUIDIC DEVICE FOR DETECTING TUMOR ASSOCIATED miRNA CLUSTERS FOR POINT-OF CARE CLINICAL DIAGNOSTICS

S. Freyberg¹, T. Brandstetter², H. Frey², J. Rühle², J. Lampe², G. Dame², J. Bächle³, W. Weigel⁴, M. Hirschfeld⁵, H. Becker¹, and C. Gärtner¹

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³Sensovation GmbH, GERMANY, ⁴Scienion AG, GERMANY, and

⁵Universitätsklinik Freiburg, GERMANY

W057d ON-CHIP FORMATION OF 3D SPHEROIDS FOR PATIENT-DERIVED TISSUE SCREENING

T. Christ¹, S. Payne², Y. Yan¹, J. Ren¹, J. Edwards², M. Boyd¹, and M. Zagnoni¹

¹University of Strathclyde, UK and ²University of Glasgow, UK

d - Diagnostics, Theranostics, and Translational Medicine

Clinical Chemistry

M057d DIRECT URINARY DIAGNOSIS SYSTEM FOR BLADDER CANCER: FOURIER ANALYSIS OF MICRORNA PATTERN FROM NANOPORE MEASUREMENTS

A. Tamotsu, M. Hiratani, M. Ohara, and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN

M058d SINGLE-STEP IMMUNOASSAY MICRODEVICE BASED ON GRAPHENE OXIDE-CONTAINING HYDROGEL POSSESSING FLUORESCENCE QUENCHING AND SIZE SEPARATION FUNCTIONS

A. Shirai, K. Nakashima, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

T058d FIFTY-SECOND ANALYSIS OF OXIDATIVE STRESS MARKERS IN HUMAN PLASMA USING AMIDE-MODIFIED LIQUID CHROMATOGRAPHY CHIP

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

¹University of Tokyo, JAPAN and ²University, JAPAN

T059d THIN-LIQUID LAYER FORMED BY μ m-SIZED CHANNEL FOR SENSITIVE IMMUNOASSAY

T. Nakao¹, K. Mawatari¹, H. Shimizu¹, E. Mori¹, A. Yoshizaki², and T. Kitamori¹

¹University of Tokyo, JAPAN and ²University of Tokyo Hospital, JAPAN

W058d MICROFLUIDIC BEAD-REACTOR FOR MULTIPLEXED KINETICS IN ALLERGY PROTEOMICS

B. Harink¹, H. Nguyen¹, B. Baxter¹, K. Brower², J. Roy², J. DeRisi^{1,3}, M. Cyert², P. Fordyce², and K. Thorn¹

¹University of California, San Francisco, USA,

²Stanford University, USA, and ³Howard Hughes Medical Institute, USA

d - Diagnostics, Theranostics, and Translational Medicine

Drug Development & Delivery

- M059d HIGH-THROUGHPUT MICROFLUIDIC CHIP FOR AUTOMATED IN VITRO RELEASE TESTING**
M. Alberti, Y. Dancik, B. Wu, Z. Feng, R.G. Wu, M. Bigliardi-Qi, P.L. Bigliardi, and Z.P. Wang
*Agency for Science, Technology and Research (A*STAR), SINGAPORE*
- M060d SILICON HOLLOW MICRONEEDLE FOR DRUG DELIVERY APPLICATIONS**
P.F. Eng¹, G.J. Blayney¹, B. Gualeni^{2,4}, X. Zhao², K. Roberts³, K. Riddell³, H. Ashraf³, J.C. Birchall^{2,4}, S.A. Coulmann^{2,4}, and O.J. Guy¹
¹Swansea University, UK, ²Cardiff University, UK, ³SPTS Technologies Ltd., UK, and ⁴Extraject Technologies Ltd., UK
- T060d IN VITRO SELECTION OF NOVEL PEPTIDE AGONISTS FOR HUMAN SOMATOSTATIN RECEPTOR SUBTYPE-2 USING A WATER-IN-OIL MICRODROPLET PLATFORM**
T. Sakurai¹, R. Iizuka¹, Y. Nakamura², J. Ishii², A. Kondo², A. Iguchi³, D.H. Yoon³, T. Sekiguchi³, S. Shoji³, and T. Funatsu¹
¹University of Tokyo, JAPAN, ²Kobe University, JAPAN, and ³Waseda University, JAPAN
- W059d A SYSTEMATIC STUDY ON MOLECULAR MECHANISM OF PORE-FORMING PEPTIDES FOR DISCOVERING ANTIMICROBIAL MEDICINE**
Y. Sekiya¹, H. Watanabe¹, K. Usui², and R. Kawano¹
¹Tokyo University of Agriculture and Technology, JAPAN and ²Konan University, JAPAN
- W060d INVERSE ENCAPSULATION FORM OF COMPLEX COACERVATE FOR EFFECTIVE DRUG DELIVERY SYSTEM**
K.D. Seo, H.Y. Yoo, S. Eom, D.S. Hwang, and D.S. Kim
Pohang University of Science and Technology (POSTECH), KOREA

d - Diagnostics, Theranostics, and Translational Medicine

Neurobiology/ Neuroscience

- M061d MICROFLUIDIC DEPOSITION OF PHYSIOLOGICALLY RELEVANT QUANTITIES OF PRIMARY NEURONS**
B.G.C. Maisonneuve, M. Elias, and T. Honegger
University Grenoble, Alpes, FRANCE
- T061d AXON REGENERATION DRUG SCREENING MICROCHIP**
H.S. Kim¹, C. Koo², and A. Han¹, and J. Park³
¹Texas A&M University, USA, ²Hanbat National University, KOREA, and ³Southern University of Science and Technology, CHINA
- T062d STRUCTURAL CONNECTIVITY MODULATION OF NEURAL NETWORKS IN COMPARTMENTALIZED MICROFLUIDIC CHIPS**
M. Elias, B.G.C. Maisonneuve, and T. Honegger
University Grenoble, Alpes, FRANCE

Neurobiology/ Neuroscience

W061d DEVELOPMENT OF "BRAIN-ON-CHIP" DEVICE INCLUDING MICROPUMP FOR RAPID ADMINISTRATION OF TRANSMITTERS BY AND VOLTAGE IMAGING SYSTEM FOR NEURO SIGNAL DETECTION

K. Harada and Y. Yoshimi
Shibaura Institute of Technology, JAPAN

d - Diagnostics, Theranostics, and Translational Medicine

Nucleic Acid Analysis (Digital PCR, Next Generation Sequencing)

M062d A POLYMER/PAPER HYBRID MICROFLUIDIC DEVICE FOR MULTIPLEXED INSTRUMENT-FREE DETECTION OF BACTERIAL MENINGITIS

M. Dou, S. Sharma Timilsina, and X.J. Li
University of Texas, El Paso, USA

M063d INTERCALATING DYE SEQUESTRATION FOR ORDER OF MAGNITUDE IMPROVEMENT IN SIGNAL APPLIED TO DIGITAL NUCLEIC ACID AMPLIFICATION TESTS

J.E. Kong, M. Margolis, and D. Di Carlo
University of California, Los Angeles, USA

M064d SMART PHONE-ENABLED DIAGNOSTIC PLATFORM FOR DETECTION OF PATHOGEN NUCLEIC ACIDS

R.J. Meagher, A. Priye, C.S. Ball, C.-Y. Koh, R.F. Renzi, and Y.K. Light
Sandia National Laboratories, USA

T063d CONTAMINATION-RESISTANT REAL-TIME LAMP

P.L. Mage¹, K. Hsieh², and H.T. Soh¹
¹Stanford University, USA and ²Johns Hopkins University, USA

T064d ENRICHMENT, SEPARATION AND CHARACTERIZATION OF CAG REPEATS FOR HUNTINGTON'S DISEASE DIAGNOSIS

R. Malbec¹, P. Joseph¹, T. Leïchlé¹, E. Trofimenko², L. Aeschbach², V. Dion², and A. Bancaud¹
¹LAAS CNRS, FRANCE and ²Université de Lausanne, SWITZERLAND

T065d RAPID ON-CHIP DETECTION OF CHLAMYDIA TRACHOMATIS FOR HOME-CARE USING LOOP-MEDIATED ISOTHERMAL AMPLIFICATION

V. Tröger^{1,2}, A. Scherber¹, D. Moos³, S. Howitz³, T. Bohatzsch³, M. Lehes⁴, I. Tulp⁴, and D. Kuhlmeier¹
¹Fraunhofer Institute of Cell Therapy and Immunology, GERMANY,
²University of Leipzig, GERMANY,
³Gesim – Gesellschaft für Silizium-Mikrosysteme mbH, GERMANY, and
⁴Selfdiagnostics GmbH, GERMANY

W062d 40 CYCLE PCR USING HUMAN GENOMIC DNA IN LESS THAN 1 MINUTE ON A MICROFLUIDIC CHIP

R. Samuel, A. Jafek, J. Trauba, K. Carney, R. Pryor, B. Gale, C. Wittwer, and K. Aston
University of Utah, USA

Nucleic Acid Analysis (Digital PCR, Next Generation Sequencing)

W063d DETECTION OF MULTIPLE SINGLE NUCLEOTIDE POLYMORPHISMS ON A SINGLE MICROFLUIDIC CHIP

L. Zhang, Q. Cai, R.S. Wiederkehr, M. Fauvart, P. Fiorini, B. Majeed, and T. Stakenborg
imec, BELGIUM

W064d HIGH-DENSITY UNIFORM SPHERICAL MICROCAVITY ARRAY FOR DIGITAL PCR

Y. Fu¹, F. Jing¹, and G. Li²

¹Chinese Academy of Sciences, CHINA and ²Chongqing University, CHINA

W065d SINGLE-MOLECULE VISUALIZATION OF ALCOHOL-INDUCED DNA DAMAGE IN E. COLI

Y. Kang, J. Lee, and K. Jo
Sogang University, KOREA

d - Diagnostics, Theranostics, and Translational Medicine

Others

M065d HIGH-THROUGHPUT PRODUCTION OF MICROBUBBLE CONTRAST AGENTS USING AN ULTRASOUND-MODULATED MICROFLUIDIC DEVICE

D. Carugo^{1,2}, R.J. Browning¹, P. Rademeyer¹, and E. Stride¹

¹University of Oxford, UK and ²University of Southampton, UK

M066d TECHNOLOGICAL BASIS OF NATIONAL GUIDELINE FOR MEDICAL APPLICATION OF MICROFLUIDICS

E. Mori¹, Y. Haishima², R. Nakaoka², K. Ootsuki³, Y. Hosoya⁴, A. Yoshizaki⁴, K. Mawatari¹, and T. Kitamori¹

¹University of Tokyo, JAPAN, ²National Institute of Health Sciences, JAPAN,

³Pharmaceuticals and Medical Devices Agency, JAPAN, and

⁴University of Tokyo Hospital, JAPAN

T066d AN INTEGRATED MICROFLUIDIC SYSTEM FOR BACTERIA DETECTION BY USING MANNANOSE-BINDING LECTIN

J.-C. Yu¹, W.-H. Chang¹, Y.-S. Wang², M.S. Lee³,

K.-T. Peng², and G.-B. Lee¹

¹National Tsing Hua University, TAIWAN,

²Chiayi Chang Gung Memorial Hospital, TAIWAN, and

³Kaohsiung Chang Gung Memorial Hospital, TAIWAN

T067d PROBING ERYTHROCYTE DEFORMABILITY USING A MICROFLUIDIC CELL-SQUEEZER FOR MECHANODIAGNOSTICS OF DIABETES

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

Indian Institute of Science, INDIA

T068d TWENTY SECOND ACOUSTOFLUIDIC WHOLE BLOOD HEMATOCRIT ASSAY

K. Petersson¹, O. Jakobsson¹, P. Ohlsson¹,

P. Augustsson¹, and T. Laurell^{1,2}

¹Lund University, SWEDEN and ²Dongguk University, KOREA

Others

W066d EFFECTS OF FLUID DYNAMICS ON ENCRUSTATION IN A MICROFLUIDIC MODEL OF THE OCCLUDED AND STENTED URETER

A. Mosayyebi¹, X. Zhang¹, D. Carugo¹, and C. Manes²

¹University of Southampton, UK and ²Politecnico di Torino, ITALY

W067d RAPID AND HIGH SENSITIVE DETECTION OF INFLUENZA VIRUS BY DIRECT COUNTING

K.V. Tabata^{1,3,4}, Y. Moriizumi^{1,3}, S. Kidokoro¹, S. Yamayoshi¹, Y. Fujioka², Y. Ohba², Y. Kawaoka¹, and H. Noji^{1,3}

¹University of Tokyo, JAPAN, ²Hokkaido University, JAPAN,

³ImPACT, JAPAN, and ⁴Japan Science and Technology Agency (JST), JAPAN

d - Diagnostics, Theranostics, and Translational Medicine

Personalized Medicine & Pharmaceutical Analysis

M067d DEVELOPMENT OF TWO NOVEL AUTOMATED FLUOROPOLYMER MICROFLUIDIC PLATFORMS FOR HIGH SENSITIVITY MULTIPLEX DIAGNOSTIC IMMUNOASSAYS

N. Reis^{1,2}, F. Pereira¹, A. Barbosa^{1,2}, A. Castanheira^{1,2}, and A.D. Edwards^{1,3}

¹Capillary Film Technology Ltd, UK, ²University of Loughborough, UK, and

³University of Reading, UK

M068d SCALABLE MULTIPLEXED DRUG-COMBINATION SCREENING PLATFORMS USING 3D MICROTUMOR MODEL FOR PRECISION MEDICINE

Z. Zhang, S. Urs, Y.-C. Chen, K.B. Sangani, D. Simeone, and E. Yoon
University of Michigan, USA

T069d IMMOBILIZED CYTOCHROME P450 MICROREACTORS WITH INTEGRATED HEATERS

I. Kiiski¹, S. Tähkä¹, G. Sathyanarayanan¹, M. Haapala¹, V. Jokinen², and T. Sikanen¹

¹University of Helsinki, FINLAND and ²Aalto University, FINLAND

T070d THE DEVELOPMENT OF A LAB-ON-A-STICK FOR ONE-STEP MULTI-ANALYTE CELLULAR MICROFLUIDIC DIPSTICK ASSAYS

A.D. Edwards¹, J. Pivetal¹, A. Loo-Zazueta², J.M.S. Barros¹, I.P. Alves², and N.M. Reis²

¹University of Reading, UK and ²Loughborough University, UK

W068d AUTOMATIC OPTIMIZATION OF DRUG COCKTAIL ON AN INTEGRATED MICROFLUIDIC SYSTEM

W.Y. Huang¹, C.A. Liu², R.S. Fan¹, Z.D. Lin¹, K. Wang², and G.B. Lee¹

¹National Tsing Hua University, TAIWAN and

²Taipei Medical University, TAIWAN

Personalized Medicine & Pharmaceutical Analysis

W069d IMMUNO-WALL LAB-ON-A-CHIP PROTEIN ANALYSIS DEVICES FOR HIGH PRECISION SURGERY OF GLIOMAS

T. Kasama^{1,2}, A. Yamamichi^{2,3}, F. Ohka², Y. Kato⁴, H. Suzuki², A. Kato², K. Motomura², M. Hirano², M. Ranjit², L. Chalise², M. Kurimoto², G. Kondo², K. Aoki², N. Kaji², T. Matsubara³, H. Suzuki³, M. Tokeshi^{2,5}, T. Wakabayashi², A. Natsume², and Y. Baba²

¹University of Tokyo, JAPAN, ²Nagoya University, JAPAN,

³Mie University, JAPAN, ⁴Tohoku University, JAPAN, and

⁵Hokkaido University, JAPAN

d - Diagnostics, Theranostics, and Translational Medicine

Protein Analysis & Characterization (e.g., Proteomics)

M069d CRUDE PLANAR CELL MEMBRANE ON A CHIP

K. Kamiya¹, T. Osaki^{1,2}, K. Nakao³, S. Fujii¹, N. Misawa¹, and S. Takeuchi^{1,2}

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

²Takeda Pharmaceutical Co. Ltd., JAPAN, and ³University of Tokyo, JAPAN

M070d MULTIPLEXED PROTEIN/PEPTIDE BINDING MEASUREMENTS ON SPECTRALLY ENCODED BEADS

H.Q. Nguyen¹, B.C. Baxter¹, B. Harink¹, C. Diaz-Botia¹, K. Brower², J. Roy², J.L. DeRisi^{1,3}, M.S. Cyert², P.M. Fordyce², and K.S. Thorn¹

¹University of California, San Francisco, USA,

²Stanford University, USA, and ³Howard Hughes Medical Institute, USA

M071d SINGLE-MOLECULE ELISA UTILIZING EXTENDED-NANO FLUIDIC DEVICE

R. Ohta, K. Mawatari, E. Mori, and T. Kitamori

University of Tokyo, JAPAN

T071d ELECTRICAL ANALYSIS OF THE PORE-FORMING TRANSLOCON USING LIPID BILAYERS IN DROPLET SYSTEM

K. Hakamada, H. Watanabe, R. Kawano, K. Noguchi, and M. Yohda
Tokyo University of Agriculture and Technology, JAPAN

T072d PORTABLE IMMUNOASSAY FOR LABEL-FREE ANTIBODY DETECTION IN WHOLE BLOOD

T.E. Winkler, F. Zang, F.O. Stevenson, J.N. Culver, and R. Ghodssi

University of Maryland, USA

W070d A FUNCTIONAL LAB-ON-A-CHIP COMPATIBLE WITH SMARTPHONES FOR CHEMILUMINESCENCE BASED ELISA

S. Ghosh¹, A. Chakraborty¹, K. Aggarwal¹, J. Oh², J. Jeong², and C.H. Ahn¹

¹University of Cincinnati, USA and ²Sogang University, KOREA

W071d ISOTACHOPHORESIS-BASED SURFACE IMMUNOASSAY

F. Paratore^{1,2}, T. Zeidman Kalman¹, T. Rosenfeld¹, G.V. Kaigala², and M. Bercovici¹

¹Technion - Israel Institute of Technology, ISRAEL and

²IBM Research, Zurich, SWITZERLAND

Protein Analysis & Characterization (e.g., Proteomics)

W072d PROTEIN NMR ON A CHIP

G. Finch and M. Utz

University of Southampton, UK

d - Diagnostics, Theranostics, and Translational Medicine

Regenerative Medicine & Tissue Engineering

M072d SUSPENDED LARGE AREA GRAPHENE NANOPATTERNS FOR ENGINEERING STRUCTURE AND FUNCTION OF STEM CELLS

J. Kim¹, S. Park¹, W.-G. Bae², S. Park², N.L. Jeon², B.H. Hong², and J.H. Chung²

¹*Chonnam National University, KOREA and*

²*Seoul National University, KOREA*

T073d MICRO FLUIDIC VACUUM CHUCK SYSTEM FOR HANDLING OF REGENERATIVE THREE DIMENSIONAL TISSUE

K. Uesugi, K. Fukumoto, F. Shima, S. Miyagawa, Y. Sawa, M. Akashi, and K. Morishima

Osaka University, JAPAN

W073d REVERSE DERMATOME; IN-SITU BIOPRINTING OF ENGINEERED SKIN SUBSTITUTES

N. Hakimi¹, R. Cheng¹, M. Sotoudehfar¹, P. Qing Ba¹, L. Leng¹, S. Amini Nik², M. Jeschke², and A. Guenther¹

¹*University of Toronto, CANADA and*

²*Sunnybrook Research Institute, CANADA*

d - Diagnostics, Theranostics, and Translational Medicine

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

M073d AUTOMATED MICROFLUIDIC CARTRIDGES FOR POINT-OF-CARE CELL COUNTING

S. Smith¹, P. Madzivhandila¹, R. Sewart², U. Govender¹, H. Becker², K. Land¹, and P. Roux¹

¹*Council for Scientific and Industrial Research, SOUTH AFRICA and*

²*microfluidic ChipShop GmbH, GERMANY*

M074d INTACT BACTERIA ISOLATION AND SELECTIVE BLOOD CELL LYSIS USING A MICROFLUIDIC POROUS SILICA MONOLITH

J.Y. Han and D.L. DeVoe

University of Maryland, USA

M075d MASSIVELY PARALLEL SINGLE NUCLEI ASSAY ON MICROCHAMBER ARRAY DEVICES

S. Ito¹, N. Kajji¹, T. Yasui¹, and Y. Baba^{1,2}

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

M076d MICROFLUIDIC SAMPLE PREPARATION COMPONENTS FOR DNA-BASED FOOD PATHOGEN DETECTION

K. Tsougeni, A.S. Kastania, G. Kaprou, A. Tserepi, and E. Gogolides

National Center for Scientific Research (NCSR) Demokritos, GREECE

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

- M077d RARE-CELL ENRICHMENT USING CLOSED-LOOP OPERATION OF SPIRAL MICROFLUIDICS**
H. Ryu¹, K. Choi¹, Y. Qu², T. Kwon¹, J. Lee², and J. Han¹
¹*Massachusetts Institute of Technology, USA and*
²*University of Pittsburgh Medical Center, USA*
- M078d SIMPLIFYING NUCLEIC ACID AMPLIFICATION WITH CELL LYSIS, DNA CAPTURE, AND DIRECT PCR AT THE SURFACE OF CHITOSAN MICROBEADS**
I.A. Nanayakkara and I.M. White
University of Maryland, USA
- T074d AN INTEGRATED SAMPLE PREPARATION SYSTEM FOR LARGE VOLUME PROCESSING AT THE POINT OF CARE**
S.A. Byrnes, J.R. Buser, E. Kline, J.D. Bishop, M.D. Wheeler, and P. Yager
University of Washington, USA
- T075d CELL LYSIS AND CHROMOSOME EXTRACTION IN MICROFLUIDIC PINCHED FLOW DEVICE**
H. Feng, M. Hockin, S. Zhang, H. Sant, and B.K. Gale
University of Utah, USA
- T076d LOW-COST POINT-OF-CARE DIAGNOSTICS USING PRINTED CELL COUNTING CHAMBERS**
J. van Dalum, D. Wasserberg, X. Zhang, C. Breukers, L.W.M.M. Terstappen, and M. Beck,
University of Twente, NETHERLANDS
- T077d MICRO-VOLUME BILIRUBIN TESTER FOR NEONATES**
M. Yamanaka, S. Matsumoto, K. Kobata, and S. Matsumoto
Ushio Inc., JAPAN
- T078d PARALLEL EX-VIVO STUDIES ON AN AORTA USING A MICROFLUIDIC DEVICE**
J.M. de Hoyos-Vega, A.M. Gámez-Méndez, B.A. Escalante-Acosta, and J.L. García-Cordero
Centro de Investigacion y de Estudios Avanzados del IPN, MEXICO
- T079d SCALING MICROFLUIDICS FOR INDUSTRIAL THROUGHPUT: BREAKING 1 LITRE/MINUTE**
B.M. Miller
Heriot Watt University, UK
- W074d ASYMMETRIC CAPILLARY FLOW DRIVEN BLOOD-PLASMA SEPARATION IN MICROCHANNEL WITH A HYDROPHOBIC PATCH AND ON-CHIP DETECTION**
M. Sneha Maria, P.E. Rakesh, T.S. Chandra, and A.K. Sen
Indian Institute of Technology, Madras, INDIA
- W075d CENTRIFUGAL MICROFLUIDIC SAMPLE PREPARATION FOR METABOLITES ANALYSIS IN HUMAN SERUM MASS SPECTROMETRY**
Y. Zhao, Y. Zhou, and D.J. Harrison
University of Alberta, CANADA

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

- W076d** **MAGNETICALLY ACTUATED PHYSICAL IMPINGEMENT FOR ELUTION OF ARTIFICIAL MUCOUS FROM A SWAB**
S. Banik, J. Mahony, and P.R. Selvaganapathy
McMaster University, CANADA
- W077d** **MICROFLUIDIC NEUTROPHIL ASSAY FOR THE DIAGNOSTIC AND MONITORING OF PATIENTS WITH SEPSIS**
F. Ellett, J. Jorgensen, Y.M. Liu, M. Martinez, K. Butler, D. Irimia
Massachusetts General Hospital, Harvard Medical School, Shriners Burns Hospital, USA
- W078d** **RAPID CONCENTRATION OF BACTERIA USING MICROFLUIDIC MAGNETIC RATCHETING**
O. Adeyiga, C. Murray, and D. Di Carlo
University of California, Los Angeles, USA
- W079d** **SAMPLE INTRODUCTION INTERFACE FOR ON-CHIP NUCLEIC ACID-BASED ANALYSIS OF HELICOBACTER PYLORI FROM STOOL SAMPLES**
O. Mosley¹, L. Melling¹, M.D. Tarn², C. Kemp², M.M.N. Esfahani², N. Pamme², and K.J. Shaw¹
¹*Manchester Metropolitan University, UK* and ²*University of Hull, UK*

e - Fundamentals in Microfluidics and Nanofluidics

Acoustofluidics

- M079e** **MODELING AND EXPERIMENTS OF ACOUSTIC TRAPPING FORCES IN A SMALL GLASS CAPILLARY**
M.W.H. Ley¹, C. Johannesson², M. Evander², T. Laurell², and H. Bruus¹
¹*Technical University of Denmark, DENMARK* and ²*Lund University, SWEDEN*
- M080e** **TWO-DIMENSIONAL ACOUSTIC FOCUSING OF MICROPARTICLES IN TWO-PHASE DROPLET-BASED MICROFLUIDIC SYSTEMS INCREASES PARTICLE DETECTABILITY**
M. Ohlin¹, A. Fornell², and M. Tenje^{1,2}
¹*Uppsala University, SWEDEN* and ²*Lund University, SWEDEN*
- T080e** **ACOUSTIC BUBBLES MICROSTREAMING-INDUCED FRAGMENTATION OF RAMIFIED IRON ELECTRODEPOSITS IN A MICROCHANNEL**
A. Iranzo, T. Tzedakis, and F. Chauvet
Université de Toulouse, FRANCE
- T081e** **NUMERICAL STUDY OF ACOUSTOFLUIDIC SEPARATION CONFIGURATIONS FOR MICROBEADS AND CELLS**
T. Yang¹, F. Bragheri², R. Osellame², I. Cristiani¹, and P. Minzioni¹
¹*University of Pavia, ITALY* and ²*Politecnico di Milano, ITALY*
- W080e** **EXPERIMENTAL INVESTIGATION OF RESONANCE CONDITIONS FOR PARTICLE FOCUSING IN DROPLET ACOUSTOFLUIDICS**
A. Fornell¹, F. Garofalo¹, J. Nilsson¹, and M. Tenje^{1,2}
¹*Lund University, SWEDEN* and ²*Uppsala University, SWEDEN*

Acoustofluidics

W081e THEORY OF THE ACOUSTIC FORCE DENSITY ACTING ON INHOMOGENEOUS FLUIDS

J.T. Karlsen¹, P. Augustsson², and H. Bruus¹

¹Technical University of Denmark, DENMARK and

²Lund University, SWEDEN

e - Fundamentals in Microfluidics and Nanofluidics

Droplets & Multiphase Systems

M081e DOUBLE-STACKING LIPID BILAYER FORMATION USING FIVE-LAYERED MICROCHANNELS

K. Shoji and R. Kawano

Tokyo University of Agriculture and Technology, JAPAN

M082e GENERATION OF MULTISOMES AND GIANT UNILAMELLAR VESICLES FROM STORABLE DOUBLE EMULSION TEMPLATES

D. Vallejo, S.-H. Lee, and A. Lee

University of California, Irvine, USA

M083e LIMMPET: LIQUID METAL MICROFLUIDIC PORTABLE ENERGY TRANSDUCER

A. Smith, J. Loessberg, S. Sherman, M. Napoli,

D. Weld, and S. Pennathur

University of California, Santa Barbara, USA

M084e MICROFLUIDIC FABRICATION OF NOVEL PH-RESPONSIVE AMPHIPHILIC MICROGEL FOR DRUG DELIVERY

B. Lu¹, M.D. Tarn¹, N. Pamme¹, and T.K. Georgiou²

¹University of Hull, UK and ²Imperial College London, UK

M085e ROBUST DROPLET GENERATION AND SAMPLING WITH MICRO-PERISTALTIC PUMP AND ANTIPHASE PULSED FLOWS

G.W.H. Evans, A.M. Nightingale, S. Hassan, B.J. Kim, and X. Niu

University of Southampton, UK

M086e TOWARDS HIGH RESOLUTION NMR IN DROPLET MICROFLUIDICS

R. Greenhalgh, G. Finch, and M. Utz

University of Southampton, UK

T082e BEYOND POISSON: PASSIVE FOCUSING TOWARD ONE-CELL-PER-DROP PRINTING

Y. Li, A. Ahmadi, H. Yu, and K.C. Cheung

University of British Columbia, CANADA

T083e FORMATION OF CHEMICALLY RESPONSIVE MULTISOMES USING DROPLET MICROFLUIDICS

J. Li, D.K. Baxani, O.K. Castell, and D.A. Barrow

Cardiff University, UK

T084e HIGH-SPEED IMAGING OF THE pH DROP IN AQUEOUS SOLUTIONS IN CONTACT WITH SUPERCRITICAL CO₂ SEGMENTS

M. Andersson, L. Klintberg, and K. Hjort

Uppsala University, SWEDEN

Droplets & Multiphase Systems

- T085e** **IN SITU SEPARATION OF MAIN AND SATELLITE DROPLETS USING A DETERMINISTIC LATERAL DISPLACEMENT MICROFLUIDIC DEVICE**
N. Tottori, T. Nisisako, Y. Yanagida, and T. Hatsuzawa
Tokyo Institute of Technology, JAPAN
- T086e** **PREPARATION OF MONODISPERSE MICROCAPSULES USING A PAPER-INTEGRATED MICROFLUIDIC DEVICE**
D.-H. Lee and A.P. Lee
University of California, Irvine, USA
- T087e** **SCALING OF HIGHLY VISCOUS NON-NEWTONIAN DROPLET FORMATION IN A MICROFLUIDIC FLOW FOCUSING DEVICE**
C. Authesserre^{1,2}, F. Bottausci^{1,2}, G. Costa^{1,2}, M. Alessio^{1,2}, P.-Y. Benhamou^{1,3}, B. Icard^{1,2}, and F. Rivera^{1,2}
¹University Grenoble, Alpes, FRANCE, ²CEA Leti, FRANCE, and ³Grenoble University Hospital, FRANCE
- W082e** **DEVELOPMENT OF TiO₂ NANOPILLAR PATTERNED CHIP FOR NANO-DROPLETS FORMATION USING EXTENDED NANOCHANNELS**
K. Morikawa¹, S. Ishihara², and T. Tsukahara²
¹University of Tokyo, JAPAN and ²Tokyo Institute of Technology, JAPAN
- W083e** **FORMING OIL LAYER INSIDE MICROBUBBLES THROUGH SINGLE STEP MICROFLUIDICS, TOWARDS HYDROPHOBIC DRUG DELIVERY**
A.H. Churchman, V. Mico, J. Gala De Pablo, S.A. Peyman, and S.D. Evans
University of Leeds, UK
- W084e** **IMPROVEMENT OF IN VITRO FERTILITY RATE BY USING DROPLET-BASED DIELECTROPHORETIC MICROFLUIDIC BIOCHIP**
Y.-L. Lai and D.-J. Yao
National Tsing Hua University, TAIWAN
- W085e** **MICROFLUIDIC CHARACTERISATION OF ULTRALOW INTERFACIAL TENSION DROPLETS BY THERMAL CAPILLARY WAVE ANALYSIS**
G. Bolognesi¹, A.I.I. Tyler¹, Y. Saito¹, A.D. Ward², C.D. Bain³, and O. Ces¹
¹Imperial College London, UK, ²Science & Technology Facilities Council, UK, and ³Durham University, UK
- W086e** **QUANTIFICATION OF REPLICATION-COMPETENT HIV RESERVOIRS USING SINGLE-CELL ANALYSIS**
D.-K. Kang^{1,2}, T.N. Nguyen², C.J. Spragg², R.H. Sedlak³, K.R. Jerome³, and W. Zhao²
¹Incheon National University, KOREA, ²University of California, Irvine, USA, and ³University of Washington, USA
- W087e** **SELF-POWERED MICRO-DROPLETS FOR BIOMIMETIC MICROFLUIDICS**
W. Francis, C. Delaney, L. Florea, and D. Diamond
Dublin City University, IRELAND

e - Fundamentals in Microfluidics and Nanofluidics

Electrokinetic Phenomena

M087e DEVELOPMENT OF DIFFUSION OSMOTIC STREAMING CURRENT MEASUREMENT SYSTEM IN EXTENDED NANOSPACES FOR NON-PROBE ION MOBILITY MEASUREMENT

K. Morikawav, Y. Kazoe¹, and T. Tsukahara²

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

M088e PLASMON-ENHANCED PYROELECTRIC TWEETING OF MICROPARTICLES IN A MICROFLUIDIC SYSTEM

J.R. Sperling, O. Esan, G. Macias, E. Heydari, J. Grant, D.R.S. Cumming, J.M. Cooper, S.L. Neale, and A.W. Clark
University of Glasgow, UK

T088e CHANNEL DEFORMATION IN ELECTROKINETIC MICRO/NANOFLUIDIC SYSTEMS

J.M. de Rutte¹, K.G.H. Janssen¹, N.R. Tas², J.C.T. Eijkel², and S. Pennathur¹

¹University of California, Santa Barbara, USA and

²University of Twente, NETHERLANDS

T089e DETERMINING ELECTROOSMOTIC VELOCITY IN A FREE LIQUID FILM

A. Hussein Sheik, H.C.H. Bandulasena, V. Starov, and A. Trybala
Loughborough University, UK

W088e CONTACT LINE RELAXATION DYNAMICS FOR SENSING LOCAL FLUID PROPERTIES

S. Bansal and P. Sen

Indian Institute of Science, INDIA

W089e MEASUREMENT OF DIELECTRIC CONSTANT IN EXTENDED-NANO SPACES BY USING AC IMPEDANCE MEASUREMENT

K. Imai, K. Mawatari, K. Morikawa, and T. Kitamori

University of Tokyo, JAPAN

e - Fundamentals in Microfluidics and Nanofluidics

Magnetofluidics (Magnetic Particles & Related Phenomena)

M089e MULTIPLEXED PARTICLE AND PARTICLE-FREE ACTUATION OF DROPLETS ON SUPERHYDROPHOBIC SURFACES FOR DIGITAL MICROFLUIDIC APPLICATIONS

L. Mats, K. Bachus, P. Agrawaal, T. Hutama, P. Grouse, M. Jor, and R. Oleschuk

Queen's University, CANADA

T090e ELECTROMICROFLUIDIC AND ELECTROMAGNETIC MANIPULATION OF FERROFLUID DROPLETS

W. Dai^{1,2}, H. Chen¹, Y.-K. Lai¹, and S.-K. Fan¹

¹National Taiwan University, TAIWAN and ²Peking University, TAIWAN

T091e PUMPING INDUCED BY BIO-MIMETIC MAGNETIC MICRO-CILIA IN CREEPING FLOWS

S. Hanasoge, M. Ballard, A. Alexeev, and P. Hesketh

Georgia Institute of Technology, USA

Magnetofluidics (Magnetic Particles & Related Phenomena)

W090e MICRO-MAGNETICALLY CONTROLLED VALVES FOR ULTRA-COMPACT INTEGRATED MICRO-TOTAL ANALYSIS SYSTEMS

A. Gholizadeh and M. Javanmard

Rutgers University, USA

e - Fundamentals in Microfluidics and Nanofluidics

Modeling/ Numerical Simulation

M090e ELECTRIC ANALOGY FOR MICROFLOWS IN DEFORMABLE POLYMERIC FOAMS: MODELING AND TEST EXPERIMENTS

G. Gropplero, L. Davoust, F. Revol-Cavalier, and Y. Fouillet

University Grenoble, Alpes, FRANCE

M091e ROBUST LUMPED-ELEMENT MODELLING OF CENTRIFUGO-PNEUMATIC AND SIPHON VALVING TOWARDS HIGHLY PREDICTIVE SIMULATION OF LARGE-SCALE INTEGRATED MICROFLUIDIC NETWORKS

M. Mohammadi, R. Mishra, and J. Ducreé

Dublin City University, IRELAND

T092e LUMPED ELEMENT SIMULATION OF A HIGHLY INTEGRATED BIOANALYTICAL CENTRIFUGAL PROCESSING UNIT ("BioCPU")

M. Mohammadi, D. Kinahan, and J. Ducreé

Dublin City University, IRELAND

T093e SORTING RED BLOOD CELLS BY THEIR DYNAMICAL PROPERTIES

E. Henry¹, S.H. Holm², Z. Zhang¹, J.P. Beech², J.O. Tegenfeldt², D.A. Fedosov¹, and G. Gompper¹

¹Forschungszentrum Jülich GmbH, GERMANY and

²Lund University, SWEDEN

W091e DEFORMABILITY-BASED SORTING OF RED BLOOD CELLS IN DETERMINISTIC LATERAL DISPLACEMENT DEVICES

Z. Zhang¹, K. Punyani², E. Henry¹, S.H. Holm², J.P. Beech², J.O. Tegenfeldt², G. Gompper¹, and D.A. Fedosov¹

¹Forschungszentrum Jülich GmbH, GERMANY and

²Lund University, SWEDEN

W092e MODELING COPLANAR ELECTRODE NETWORKS FOR MULTIPLEXED RESISTIVE PULSE SENSING OF CELLS IN MICROFLUIDIC CHANNELS

R. Liu, N. Wang, W. Waheed, C.-H. Chu, and A.F. Sarioglu

Georgia Institute of Technology, USA

W093e SUPPORTING HIGH-SENSITIVITY LATERAL FLOW ASSAY DEVELOPMENT THROUGH PREDICTIVE MODELING

D.J. Gasperino, B. Grant, J. Dantzler, and B. Weigl

Intellectual Ventures Laboratory, USA

e - Fundamentals in Microfluidics and Nanofluidics

Nanofluidic Phenomena (Nanochannels and Nanopores)

- M092e BEHAVIOR OF SOLUTE MOLECULES AT MICRO TO EXTENDED-NANO CHANNEL**
Y. Xu, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- M093e ENTRANCE EFFECTS INDUCED RECTIFIED ION TRANSPORT IN A NANOPORE**
Y. Ma and Y. Xie
Northwestern Polytechnical University, CHINA
- M094e MEASUREMENT OF FLOW VELOCITY DISTRIBUTION IN EXTENDED-NANO SPACES BY MOLECULAR IMAGE VELOCIMETRY**
S. Takeda, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- M095e THERMAL DIFFUSIVITY MEASUREMENT IN EXTENDED-NANO SPACE BY USING DIFFERENTIAL INTERFERENCE CONTRAST THERMAL LENS MICROSCOPE**
Y. Takagi, H. Shimizu, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- T094e CHANNEL SIZE DEPENDENCE OF ANTIBODY-ANTIGEN BINDING KINETICS IN NANOFLUIDIC CHANNELS**
K. Shirai, P. Arya, and M. Kakuta
Sysmex Corporation, JAPAN
- T095e EVALUATION OF LIQUID PROPERTIES OF TRIVALENT ION SOLUTION FOR ION SEPARATION USING EXTENDED NANOFLUIDIC CHANNELS**
K. Morikawa¹ and T. Tsukahara²
¹*University of Tokyo, JAPAN* and ²*Tokyo Institute of Technology, JAPAN*
- T096e NANOFLUIDIC MEMRISTOR BY ROOM TEMPERATURE IONIC LIQUID/WATER MIXTURE IN SINGLE CONICAL NANOCANNELS**
Q. Sheng¹, J. Li², X.W. Wang³, J.M. Xue¹, and Y.B. Xie²,
¹*Peking University, CHINA*, ²*Northwestern Polytechnical University, CHINA*, and ³*Peking University Shenzhen Graduate School, CHINA*
- T097e SURFACE CONDUCTION ENHANCED DIELECTROPHORESIS FOR BIOMARKER ENRICHMENT IN PHYSIOLOGICAL MEDIA**
A. Rohani¹, W.B. Varhue¹, B.J. Sanghavi, K.-T. Liao², C.-F. Chou², and N.S. Swami¹
¹*University of Virginia, USA* and ²*Academia Sinica, TAIWAN*
- W094e CHARACTERIZATION OF FLUID FLOWS IN 101 NM EXTENDED-NANO SPACES**
Y. Kazoe, K. Ikeda, K. Morikawa, Y. Pihosh, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

Nanofluidic Phenomena (Nanochannels and Nanopores)

W095e INTEGRATED NANOCHANNEL MIXING TEE AND RESISTIVE-PULSE SENSING FOR STUDYING VIRUS ASSEMBLY WITH SUB-SECOND REACTION TIMES

A.R. Kneller, L.S. Lee, A. Zlotnick, and S.C. Jacobson

Indiana University, USA

W096e RECOGNITION MICROPORES FOR DETECTING SINGLE-BACTERIA

M. Tsutsui¹, K. Yokota¹, T. Yasui², H. Yasaki², M. Okochi³,

M. Taniguchi¹, T. Washio¹, Y. Baba², and T. Kawai¹

¹Osaka University, JAPAN, ²Nagoya University, JAPAN, and

³Tokyo Institute of Technology, JAPAN

e - Fundamentals in Microfluidics and Nanofluidics

Optofluidics

M096e DEAN FLOW BASED OPTOFLUIDIC FABRICATION FOR COMPLEX SHAPED PARTICLE GENERATION

K.S. Paulsen and A.J. Chung

Rensselaer Polytechnic Institute, USA

M097e OPTOFLUIDIC DEVICE FOR REFRACTIVE INDEX MEASUREMENT WITH DIRECT BACKGROUND CANCELLATION

F. Jürgens^{1,2}, A. Dietzel², and T.P. Burg¹

¹Max Planck Institute for Biophysical Chemistry, GERMANY and

²Technische Universität, Braunschweig, GERMANY

T098e MULTIPLE-COLORED FLEXIBLE OPTICAL FILTER WITH PATTERNED PHOTONIC COLLOIDAL POLYMER GELS

N. Suzuki¹, K. Niibe¹, E. Iwase², and H. Onoe¹

¹Keio University, JAPAN and ²Waseda University, JAPAN

T099e MICROFLUIDIC FABRICATION OF PLASMONIC MICROCAPSULES

J. Wang¹, M.L. Jin¹, J.C.T. Eijkel^{1,2}, A.v.d. Berg^{1,2}, G.F. Zhou¹,

and L.L. Shui¹

¹South China Normal University, CHINA and

²University of Twente, NETHERLANDS

W097e A FRET PROBE FOR DNA DETECTION COMBINING FLUORESCENCE INTENSITY AND FLUORESCENCE POLARIZATION

D. Ren, B. Wang, and Z. You

Tsinghua University, CHINA

W098e MICROFLUIDIC-BASED WATER/OIL DROPLETS-TRAIN REFLECTIVE DISPLAY

K. Kobayashi and H. Onoe

Keio University, JAPAN

W099e RAPID, REAL-TIME DRUG SCREENING ON CANCER CELLS AT SINGLE-CELL RESOLUTION USING THE MICROFLUIDIC "LAB-IN-A-TRENCH" PLATFORM

D. King, T. O'Connell, S. Cindric, R. Lalor, A. Coudray,

M. Glynn, and J. Ducreé

Dublin City University, IRELAND

e - Fundamentals in Microfluidics and Nanofluidics

Others

- M098e** **AN EXPERIMENTAL APPROACH FOR INVESTIGATION OF DEAN FLOW VELOCITY AND SWITCHING IN CURVED MICROCHANNELS**
P. Bayat and P. Rezai
York University, CANADA
- M099e** **MEASUREMENT OF VENOUS THROMBUS FORMATION AND MASS TRANSFER EFFECTS IN THE INITIAL STAGE USING MICROCHANNEL FLOW**
Y. Yamamoto¹, K. Tatsumi¹, H. Shirouzu¹, H. Hirakata², N. Sugita¹, K. Inoue¹, and K. Nakabe¹
¹Kyoto University, JAPAN and ²Kyoto City Hospital, JAPAN
- T100e** **COMPLEX CHECK-LIKE CROSS-SECTIONAL FLOW FORMATION FOR FIBER-SHAPED MATERIALS**
K. Kobayashi, D.H. Yoon, T. Sekiguchi, and S. Shoji
Waseda University, JAPAN
- T101e** **MICROFLUIDIC-BASED CELL MANIPULATION IN VISCOELASTIC FLUIDS**
F. Del Giudice, S. Sathish, and A.Q. Shen
Okinawa Institute of Science and Technology, JAPAN
- W100e** **LINEAR AND NON-LINEAR CONCENTRATION GRADIENT GENERATION USING ORTHOGONAL MICROFLUIDICS**
A. Menachery, N. Kumawat, and M.A. Qasaimeh
New York University, Abu Dhabi, UAE

f - Integrated Microfluidic Platforms

Centrifugal Microfluidics

- M100f** **A PAPER-POLYMER CENTRIFUGAL DEVICE FOR LOW-COST SAMPLE PRE-CONCENTRATION AND COLORIMETRIC LATERAL FLOW ASSAY ENHANCEMENT**
M.S. Wiederoeder^{1,2}, S. Smith¹, P. Madzivhandila¹, D. Mager³, K. Moodley¹, D.L. DeVoe², and K.J. Land¹
¹Council for Scientific and Industrial Research, SOUTH AFRICA, ²University of Maryland, USA, and ³Karlsruhe Institute of Technology, GERMANY
- M101f** **CENTRIFUGAL AUTOMATION OF A HIGHLY CUSTOMIZABLE RAPID-ELISA TEST TOWARDS DETECTION OF CERVICAL CANCER IN POINT-OF-CARE SETTINGS**
R. Mishra¹, R. Alam², D. McAuley¹, T. Bharaj², D. Kinahan¹, C. Nwankire¹, K.S. Anderson², and J. Ducreé¹
¹Dublin City University, IRELAND and ²Arizona State University, USA
- M102f** **A NOVEL APPROACH DEAD-VOLUME-FREE REHYDRATION AND MIXING OF DRY PRE-STORED REAGENTS IN NON-TERMINAL CHAMBERS ON CENTRIFUGAL MICROFLUIDIC PLATFORMS**
S. Hin¹, N. Paust^{1,2}, M. Keller^{1,2}, O. Strohmeier^{1,2}, R. Zengerle^{1,2}, and K. Mitsakakis^{1,2}
¹University of Freiburg, GERMANY and ²Hahn-Schickard, GERMANY

Centrifugal Microfluidics

M103f HIGHLY SCALABLE COMBINATORIAL MIXING OF SAMPLES WITH TARGET-SPECIFIC PRIMERS FOR RAPID PATHOGEN DETECTION ON A CENTRIFUGAL PLATFORM

D.W.Y. Chung¹, D.J. Kinahan¹, C. Schoen², T. Dreo³, and J. Ducrée¹

¹Dublin City University, IRELAND, ²Wageningen University & Research, NETHERLANDS, and ³National Institute of Biology, SLOVENIA

M104f PORTABLE CENTRIFUGAL MICROFLUIDIC PLATFORM FOR NUCLEIC ACID DETECTION

C.R. Phaneuf, Y.K. Light, H.M. Tran, A.K. Singh, and C.-Y. Koh

Sandia National Laboratories, USA

M105f THE LABCARD – A NEW APPROACH FOR CENTRIFUGAL ASSAY AUTOMATION

M. Rombach¹, M. Keller¹, N. Paust¹, F. von Stetten¹,

D. Mark¹, R. Zengerle^{1,2}, and M. Karle¹

¹Hahn-Schickard, GERMANY and

²University of Freiburg - IMTEK, GERMANY

T102f AUTOMATION OF HETEROGENEOUS PROSTATE CANCER IMMUNOASSAY BASED ON MULTI-VALVE TRIGGERING USING PURELY ROTATIONAL FLOW CONTROL

R. Mishra, J. Zapatero-Rodríguez, S. Sharma, D. Kelly,

D. McAuley, R. O'Kennedy, and J. Ducrée

Dublin City University, IRELAND

T103f CENTRIFUGAL MICROFLUIDIC APPROACH TO HUMAN BLOOD FRACTIONATION WITH DENSITY GRADIENT MEDIUM AND WORLD-TO-CHIP CONNECTIVITY

L. Clime, D. Brassard, J. Daoud, C. Miville-Godin, and T. Veres

National Research Council, CANADA

T104f DISC-EMBEDDED GRINDING MILL TOWARDS PROCESS INTEGRATED HYDRO-MECHANICAL CELL LYSIS ON CENTRIFUGAL MICROFLUIDIC PLATFORMS

J. Gaughran, R. Kelly, D. Kinahan, and J. Ducrée

Dublin City University, IRELAND

T105f NUMERICAL ANALYSIS OF FLUID-ASSISTED SEPARATION TECHNOLOGY (FAST) IN CENTRIFUGAL MICROFLUIDICS

J.M. Oh^{1,2}, T.-H. Kim², J. Park², M. Lim², and Y.-K. Cho¹

¹IBS Center for Soft and Living Matter, KOREA and

²Ulsan National Institute of Science & Technology (UNIST), KOREA

T106f RAPID AND INEXPENSIVE FABRICATION OF MICROFLUIDIC DEVICES FOR HUMAN IDENTIFICATION USING POLYESTER, ADHESIVES AND GOLD LEAF

C. Birch¹, B.L. Thompson¹, J. Li¹, A.-C. Tsuei¹, D.A. Nelson¹,

J.A. Duvall¹, D. Le Roux¹, D.A. Mills², G.T. Garner¹,

B.E. Root³, and J.P. Landers¹

¹University of Virginia, USA, ²TeGrex Technologies, USA, and

³Applied Research Institute, USA

Centrifugal Microfluidics

- W101f** **A FULLY AUTOMATED IMMUNOASSAY ON A DISK PLATFORM USING WHOLE BLOOD SAMPLES**
H. Wu and C. Shih
Feng Chia University, TAIWAN
- W102f** **BRANCHED HYDROGEL FIBER FABRICATED BY CENTRIFUGATION FOR VESSEL-LIKE CHANNEL**
K. Nishimura¹, N. Mori¹, Y. Morimoto¹, and S. Takeuchi^{1,2}
¹*University of Tokyo, JAPAN and*
²*Japan Science and Technology Agency (JST), JAPAN*
- W103f** **CENTRIFUGAL MICROFLUIDIC PLATFORM FOR INTEGRATED ANALYSIS OF PROTEINS AND NUCLEIC ACIDS FROM CLINICAL AND ENVIRONMENTAL SAMPLES**
C.-Y. Koh, C.R. Phaneuf, Y.K. Light, B. Mangadu, H.M. Tran, J.I. Helm, D.J. Throckmorton, and A.K. Singh
Sandia National Laboratories, USA
- W104f** **DIGITAL PULSE ACTUATED FLOW CONTROL ON A CENTRIFUGAL DISC TOWARDS MULTIPARAMETER WATER QUALITY MONITORING**
D.J. Kinahan, K. McConville, B. Henderson, M. McCaul, E. McNamara, D. Diamond, and J. Ducreé
Dublin City University, IRELAND
- W105f** **PARALLEL ROBUST HYDRAULIC RESISTANCE ALIQUOTING FOR EQUAL REACTION CONDITIONS ON THE CENTRIFUGAL MICROFLUIDIC PLATFORM**
I. Schwarz¹, D. Kosse¹, F. Schwemmer¹, R. Zengerle^{1,2}, and N. Paust^{1,2}
¹*Hahn-Schickard, GERMANY and* ²*University of Freiburg, GERMANY*
- W106f** **SOLVENT-SELECTIVE MEMBRANES FOR AUTOMATING SEQUENTIAL LIQUID RELEASE AND ROUTING OF NUCLEIC ACID PURIFICATION PROTOCOLS ON A SIMPLE SPINDLE MOTOR**
J. Gaughran, D. Kinahan, R. Mishra, and J. Ducreé
Dublin City University, IRELAND

f - Integrated Microfluidic Platforms

Digital Microfluidics on Surfaces

- M106f** **DIGITAL MICROFLUIDIC BASED FLUORESCENT BIOSENSOR FOR THE MULTIPLEX AND RAPID DETECTION OF CRYPTOSPORIDIUM**
G. Luka, E. Samiei, H. Najjaran, and M. Hoorfar
University of British Columbia, CANADA
- M107f** **DENSITY-BASED SINGLE PARTICLE ISOLATION USING MICRO-WELLS ON DIGITAL MICROFLUIDICS**
M. Paknahad, A. Ahmadi, B. Enright, K.C. Cheung, and M. Hoorfar
University of British Columbia, CANADA
- M108f** **INTEGRATION OF FLOWS AND DROPLETS IN DIGITAL MICROFLUIDIC PLATFORM**
Y. Liu and I. Papautsky
University of Cincinnati, USA

Digital Microfluidics on Surfaces

- T107f** **A 50\$ COMPLETE DIGITAL MICROFLUIDICS DEVICE AND ACTUATION SETUP**
A. Abualsayed, K. Shaaban, A. Abo El-Lail, and M. Abdelgawad
Assiut University, EGYPT
- T108f** **ELECTRIC FIELD AIDED WIRE-GUIDED DROPLETS MANIPULATION PLATFORM**
Y. Zhang, G. Gertjegerdes, and G. Wittstock
Carl von Ossietzky University of Oldenburg, GERMANY
- T109f** **GRAVITATIONAL ACTUATION AND ANALYSIS OF BIOLOGICAL FLUIDS IN A 3D-PRINTED DEVICE**
P.E. Oomen¹, J.P.S.H. Mulder¹, E. Verpoorte¹, and R.D. Oleschuk²
¹*University of Groningen, NETHERLANDS and*
²*Queen's University, CANADA*
- W107f** **A CALIBRATION-FREE THERMAL DIGITAL MICROFLUIDIC DEVICE FOR ULTRAFAST DNA MELTING CURVE ANALYSIS**
T. Chen, Y. Jia, C. Dong, J. Gao, L. Wan, P.-I. Mak, and R.P. Martins
University of Macau, CHINA
- W108f** **DIGITAL MICROFLUIDIC CHIP WITH BLADE STRUCTURES FOR PRECISE DROPLET SPLITTING**
C. Dong, Y.W. Jia, T.L. Chen, J. Gao, L. Wan, P.I. Mak, M.I. Vai, and R.P. Martins
University of Macau, CHINA
- W109f** **IMPLEMENTING HETEROGENEOUS IMMUNOASSAY USING CHANNEL AND DROPLETS IN DIGITAL MICROFLUIDIC PLATFORM**
Y. Liu and I. Papautsky
University of Cincinnati, USA

f - Integrated Microfluidic Platforms

Electrokinetic Microfluidics

- M109f** **INCREASING THE DETECTION SENSITIVITY FOR DNA-MORPHOLINO HYBRIDIZATION IN SUB-NANOMOLAR REGIME BY ENHANCING THE SURFACE ION CONDUCTANCE OF PEDOT:PSS MEMBRANE IN A MICROCHANNEL**
X. Wei¹, Q. Zhang², and Y.-A. Song^{1,2}
¹*New York University, Abu Dhabi, UAE and* ²*New York University, USA*
- T110f** **FOCUSING ANALYTES FROM 10 μ L INTO 500 μ L: ON-CHIP PROCESSING OF LARGE VOLUMES USING ISOTACHOPHORESIS**
X.F. van Kooten^{1,2}, M. Truman-Rosentsvit¹, G.V. Kaigala², and M. Bercovici¹
¹*Technion - Israel Institute of Technology, ISRAEL and*
²*IBM Research, Zurich, SWITZERLAND*
- T111f** **INTEGRATION OF IMAC PRECONCENTRATION, SEPARATION, DETECTION OF PHOSPHORYLATED BIOMARKERS IN A μ TAS**
M. Araya-Farias¹, S. Dziomba^{1,2}, B. Carbonnier², M. Guerrouache², N. Aboud¹, M. Taverna¹, and N.T. Tran¹
¹*Université Paris Saclay, FRANCE and* ²*University Paris-Est, FRANCE*

Electrokinetic Microfluidics

W110f IMPLANTABLE FLUIDIC-FLUSHABLE ELECTRODES FOR ELECTROPHORETICALLY-MEDIATED DRUG DELIVERY

T. Parupudi¹, R. Rahimi¹, M. Ammirati², and B. Ziaie¹

¹Purdue University, USA and

²Ohio State University Wexner Medical Center, USA

f - Integrated Microfluidic Platforms

Large Scale Integration (Massively Parallel and High Throughput Systems)

M110f HIGH THROUGHPUT MICROFLUIDIC SCREENING SYSTEM FOR PRESERVED EYEDROPS IN HUMAN CORNEAL EPITHELIAL CELLS

R.N. Lee¹, K. Cho², J. Ju², E. Lee³, and J.Y. Kim¹

¹Dankook University, KOREA, ²Korea University, KOREA, and

³Seoul National University, KOREA

M111f MULTIPLEXING SLANTED SPIRAL MICROCHANNELS FOR ULTRA-FAST BLOOD PLASMA SEPARATION

M. Rafeie¹, J. Zhang², M. Asadnia³, W. Li², and M.E. Warkiani¹

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²University of Wollongong, AUSTRALIA, and

³Macquarie University, AUSTRALIA

T112f HIGH-THROUGHPUT DROPLET PRODUCTION USING A MULTI-CHIPS PARALLELIZED PLATFORM

M. Drobot

Blacktrace Holdings Ltd, UK

W111f APPLICATION OF A MULTIPLEX MICROFLUIDIC PLATFORM TO FAST POLYMORPH SCREENING OF PHARMACEUTICAL COMPOUNDS

E. Simone^{1,2}, J. McVeigh², Z.K. Nagy^{2,3}, and N.M. Reis²

¹University of Leeds, UK, ²Loughborough University, UK, and

³Purdue University, USA

W112f MICROFLUIDIC BASED HIGH THROUGHPUT SCREENING SYSTEM OPHTHALMOLOGICAL WOUND HEALING MODEL

R. Lee¹, K. Cho¹, C. Koo², and J. Kim¹

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f - Integrated Microfluidic Platforms

Other Microfluidic Platforms

M112f A MICROFLUIDIC TRANSISTOR-BASED PLATFORM CONCEPT FACILITATING ON-CHIP FLOW CONTROL

P. Frank^{1,2}, D. Gräfe^{1,3}, S. Haefner^{1,2}, M. Elstner¹, D. Appelhans³, B. Voit^{1,3}, and A. Richter¹

¹Technische Universität Dresden, GERMANY,

²Deutsche Forschungsgemeinschaft, GERMANY, and

³Leibniz-Institute for Polymer Research Dresden e.V., GERMANY

M113f AUTOMATED COLORIMETRIC POC ASSAY PLATFORM WITH ON-CHIP REAGENT STORAGE

E.L. Kendall, J.Y. Han, M.S. Wiederoder, K.M. King, and D.L. DeVoe
University of Maryland, USA

Other Microfluidic Platforms

- M114f JACQUARD-STYLE MANIFOLDS FOR INSTRUMENT-FREE PNEUMATIC ACTUATION OF MICROFLUIDIC DEVICES**
S. Begolo, D. Darden, P.S. Ehrlich, J. Podczewiński, and L.M. Levine
ALine Inc., USA
- M115f LOGIC PATTERN OPERATION USING TWO SEPARATED GROUPS OF EUGLENA CELLS IN MICROCHIPS BY OPTICAL CROSSLINK FEEDBACK**
K. Ozasa¹, J. Won², S. Song², and M. Maeda¹
¹RIKEN, JAPAN and ²Hanyang University, KOREA
- M116f ONE STEP FABRICATION OF A MICROFLUIDIC DEVICE WITH AN INTEGRATED MEMBRANE BY MULTIMATERIAL 3D PRINTING**
F. Li, P. Smejkal, R.M. Guijt, and M.C. Breadmore
University of Tasmania, AUSTRALIA
- M117f THE DEVELOPMENT OF AN AUTOMATED 3D-PRINTED GRAVITY DRIVEN SANDWICH-ELISA MICROFLUIDIC SYSTEM**
J.E. McVeigh, A.I. Barbosa, M. Lewis, and N.M. Reis
Loughborough University, UK
- M118f WAX MICROFLUIDICS-BASED SAMPLING DEVICE**
M. Díaz-González, A. Baldi, and C. Fernández-Sánchez
Consejo Superior de Investigaciones Científicas (CSIC), SPAIN
- T113f 3D PRINTED MICROFLUIDIC PUMPS AND MULTIPLEXERS**
H. Gong, A.T. Woolley, and G.P. Nordin
Brigham Young University, USA
- T114f AN INTEGRATED MICROFLUIDIC PLATFORM FOR SCREENING OF APTAMERS SPECIFIC TO CHOLANGIOCARCINOMA BY UTILIZING ON-CHIP CELL SELEX PROCESS**
P. Gopinathan¹, L.-Y. Hung¹, C.-H. Wang¹, N.-J. Chiang², Y.-C. Wang², Y.-S. Shan², and G.-B. Lee¹
¹National Tsing Hua University, TAIWAN and
²National Cheng Kung University Hospital, TAIWAN
- T115f DEVELOPMENT OF MICROFLUIDIC PROBE INTEGRATED DEVICE TOWARD CELL-BASED ASSAYS**
K. Shinha¹, M. Horayama¹, T. Fujii², and H. Kimura¹
¹Tokai University, JAPAN and ²University of Tokyo, JAPAN
- T116f LEGO BRICK MICROFLUIDICS**
C.E. Owens and A.J. Hart
Massachusetts Institute of Technology, USA
- T117f MICROFLUIDIC MEASUREMENT OF ERYTHROCYTE SEDIMENTATION RATE AND MONITORING OF ERYTHROCYTE AGGREGATION**
Z. Isiksacan and C. Elbuken
Bilkent University, TURKEY
- T118f PIPETTING-BASED MICROFLUIDIC IMMUNOHISTOCHEMISTRY PLATFORM**
S. Kim, S. Kwon, C.H. Cho, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

Other Microfluidic Platforms

T119f **WITHDRAWN**

T120f **X-RAY COMPATIBLE MICROFLUIDICS FOR IN-SITU BIOLOGICAL AND CHEMICAL STUDIES AT SYNCHROTRON LIGHT SOURCES**

J. Brenker¹, K. Henzler², C. Borca¹, V. Cardarso²,
T. Huthwelker², and T. Alan¹

¹*Monash University, AUSTRALIA and*

²*Paul Scherrer Institut, SWITZERLAND*

W113f **A MICROFLUIDIC DEVICE TO STUDY AGING IN YEAST UNDER MICROGRAVITY CONDITIONS**

A.M. Gonzalez-Suarez, S.B. Tristan-Landin, S.E. Campos,
A. DeLuna, and J.L. García-Cordero

Unidad Monterrey, MEXICO

W114f **REAL TIME AUTONOMOUS SURVEILLANCE FOR VECTORBORNE PATHOGENS**

C.S. Ball¹, A. Priye¹, R.F. Renzi¹, M.A. Claudnic¹, J. Helm¹,
Y.K. Light¹, S.A. Langevin¹, S.S. Wheeler², C.A. Steiner²,
L.A. Coffey², and R.J. Meagher¹

¹*Sandia National Laboratories, USA and*

²*University of California, Davis, USA*

W115f **FOAM-BASED MICROFLUIDIC DEVICES: AN INNOVATIVE, LOW-COST AND FLEXIBLE APPROACH**

G. Groppero, L. Davoust, Y. Fouillet, and F. Revol-Cavalier

University Grenoble, Alpes, FRANCE

W116f **LOCAL STIMULATION TO METER-LONG CELL-LADEN FIBER**

Y. Morimoto¹ and S. Takeuchi^{1,2}

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²*Japan Science and Technology Agency (JST), JAPAN*

W117f **MICROFLUIDIC SCREENING PLATFORM WITH SHEAR STRESS GRADIENT FOR THE EFFECTIVE STEM CELL DIFFERENTIATION**

H.W. Kim, J. Lim, and D.S. Kim

Pohang University of Science and Technology (POSTECH), KOREA

W118f **SINGLE-LAYER 3D HYDRODYNAMIC FOCUSING MICROFLUIDIC DEVICE**

G. Eluru, L.A.N. Julius, and S.S. Gorthi

Indian Institute of Science, INDIA

W119f **VALIDATION AND INTEGRATION OF AN EFFERVESCENT REACTION FOR FLUID ACTUATION IN A MICROFLUIDIC PLATFORM**

C. Parent, Y. Fouillet, N. Verplanck, and J.-L. Achard

University Grenoble, Alpes, FRANCE

f - Integrated Microfluidic Platforms

Paper Microfluidics

- M119f** **A SMARTPHONE-COUPLED PORTABLE BIOSENSOR FOR ASSESSMENT OF IRON DEFICIENCY IN CHILDREN**
B. Srinivasan, S. Lee, D. O'Dell, D. Erickson, and S. Mehta
Cornell University, USA
- M120f** **COMPARING THE SENSITIVITY OF PRE-MIXED AND SEQUENTIAL REAGENT DELIVERY FOR AN AMPLIFIED INFLUENZA A NUCLEOPROTEIN IMMUNOASSAY**
K. Abe and P. Yager
University of Washington, USA
- M121f** **NOTHING IS SATURATED: CORRECTING THE ASSUMPTIONS MADE WHILE PREDICTING FLOW IN PAPER MICROFLUIDICS**
J.R. Buser, J.E. Atwood, and P. Yager
University of Washington, USA
- M122f** **PAPER-BASED MICROFLUIDIC BIOFUEL CELL FOR IN-VITRO APPLICATIONS OPERATING UNDER CONCENTRATIONS**
M.J. González Guerrero¹, F.J. del Campo¹, J.P. Esquivel^{1,2}, D. Leech³, and N. Sabaté¹
¹*Universitat Autònoma de Barcelona, SPAIN,*
²*University of Washington, USA, and*
³*National University of Ireland, Galway, IRELAND*
- M123f** **THE M-CAT'S OUT OF THE BAG – A PAPER-BASED MICROFLUIDIC IMMUNOASSAY FOR THE RAPID DETECTION OF MEPHEDRONE**
C. Pearson, O.B. Sutcliffe, and K.J. Shaw
Manchester Metropolitan University, UK
- T121f** **A TWO DIMENSIONAL PAPER NETWORK FOR AUTOMATED DETECTION OF THE INFLUENZA VIRUS EMPLOYING COMPUTATIONALLY-DESIGNED AFFINITY PROTEINS**
C.E. Anderson, J.R. Buser, E.M. Strauch, R. Marzan, D. Baker, and P. Yager
University of Washington, USA
- T122f** **DEVELOPMENT OF A NEW TECHNIQUE FOR WASHING STEPS IN MULTISTEP ASSAYS USING MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICES**
S. Mohammadi, M. Maeki, A. Ishida, H. Tani, and M. Tokeshi
Hokkaido University, JAPAN
- T123f** **GUILTY BY DISSOCIATION: PAPER-FLUIDIC PRESUMPTIVE TESTING OF THE NEW PSYCHOACTIVE SUBSTANCE, DIPHENIDINE**
P. Holmes, L. McNeill, O.B. Sutcliffe, and K.J. Shaw
Manchester Metropolitan University, UK
- T124f** **POINT-OF-CARE HIV-1 DIAGNOSTIC: 15-MINUTE NUCLEIC ACID EXTRACTION AND AMPLIFICATION FROM WHOLE BLOOD USING ELECTROKINETIC PAPER SUBSTRATES**
M.D. Borysiak¹, A.T. Bender¹, D.S. Boyle², and J.D. Posner¹
¹*University of Washington, USA and* ²*PATH, USA*

Paper Microfluidics

T125f **VERTICAL FLOW ASSAYS WITH PROGRAMMED REAGENT LOADING IN A 3D PAPER-BASED MICROFLUIDIC DEVICE**
J. Park and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

W120f **A LOW-COST, PAPER-BASED VISUAL INDICATOR PATCH FOR MONITORING DEHYDRATION RATE DUE TO SWEATING**
V. Jain, M. Ochoa, and B. Ziaie
Purdue University, USA

W121f **COMPARING SURFACE CHEMISTRIES FOR BIOMOLECULE IMMOBILIZATION ON PAPER-BASED MICROFLUIDIC DEVICES**
H. Fu and X. Liu
McGill University, CANADA

W122f **FLOW-RATE CONTROL IN 3-DIMENSIONAL PAPER-BASED MICROFLUIDIC DEVICES FOR AUTOMATIC MULTI-STEP HIV ASSAY**
S.G. Jeong, J. Kim, K.S. Park, S.J. Yeom, D.Y. Kim, S.H. Jin, B. Lee, Y.A. Son, and C.S. Lee
Chungnam National University, KOREA

W123f **OPEN MICROFLUIDICS IN EMBOSSED PAPER MICRO-CHANNELS**
D. Gosselin^{1,2,4,5}, J.-M. Baumlin³, B. Joyard-Pitiot³, F. Navarro^{1,2}, N. Belgacem^{1,4,5}, D. Chaussy^{1,4,5}, and J. Berthier^{1,2}
¹University Grenoble, Alpes, FRANCE, ²CEA LETI MINATEC, FRANCE, ³Arjowiggins Creative Papers, FRANCE, ⁴CNRS LGP2, FRANCE, and ⁵Agefpi LGP2, FRANCE

W124f **SEQUENTIAL DELIVERY IN LATERAL FLOW IMMUNOASSAYS**
D.M. Cate, S. Garing, D. Gasperino, K.P. Nichols, and B.H. Weigl
Intellectual Ventures, USA

f - Integrated Microfluidic Platforms

Passive Microfluidics

M124f **CAPILLARY MICROFLUIDIC CIRCUITS TO QUANTIFY BLOOD ANTIBODY CONCENTRATION FOR VACCINE EFFICACY STUDIES**
A. Tavakoli, L. Xing, B. Ward, and D. Juncker
McGill University, CANADA

M125f **SELF-POWERED PROGRAMMABLE MICROFLUIDIC PLATFORM FOR LOC APPLICATIONS**
F. Dal Dosso, T. Kokalj, and J. Lammertyn
KU Leuven, BELGIUM

T126f **DEVELOPMENT OF A MICROFLUIDIC ADHESIVE PATCH FOR THE DETECTION OF BIOMARKERS IN SWEAT**
G.A. Aragon¹, B. Greiner¹, A. Dreimann², C. Müller¹, A. Linnemann¹, and H. Mathis¹
¹Fraunhofer Institute for Applied Information Technology, GERMANY and ²Hamm-Lippstadt, GERMANY

Passive Microfluidics

T127f MULTI-STAGED CHIP FOR SELF-SORTING BACTERIAL CELLS TO OBTAIN PURE CULTURES

N. Tandogan¹, C.R. Santiveri², and E.D. Goluch¹

¹Northeastern University, USA and ²Universitat Rovira i Virgili, SPAIN

T128f TINY INERTIAL FOCUSING CHIPS BASED ON ENHANCED SECONDARY FLOW

J. Feng, W. Xun, and H. Chang

Northwestern Polytechnical University, CHINA

W125f BURST PRESSURE OF ALL-POLYMER PHASEGUIDE STRUCTURES OF DIFFERENT HEIGHTS

F. Garbarino, K. Kistrup, G. Rizzi, and M.F. Hansen

Technical University of Denmark, DENMARK

f - Integrated Microfluidic Platforms

Segmented Flow and Droplet Based Microfluidics in Channels

M126f AUTOMATIC LARGE SCALE GENERATION OF BARCODED DROPLET POPULATIONS

O.J. Dressler, A.J. deMello, and X. Casadevall i Solvas

ETH Zürich, SWITZERLAND

M127f FULLY AUTOMATED OPERATION OF MICROFLUIDIC DEVICE WITH IMPEDANCE BASED VALVE CONTROL

B. Axt, Y.F. Hsieh, H.C. Zec, K. Hsieh, T. Zheng, A. Kaushik, and T.H. Wang

Johns Hopkins University, USA

M128f SPONTANEOUS GENERATION OF MONODISPERSE PICOLITRE DROPLETS FOR DIGITAL PCR

X.N. Xu¹, H.B. Zhou², and S.H. Yao¹

¹Hong Kong University of Science and Technology, CHINA and

²Chinese Academy of Science, CHINA

T129f CRYSTALLIZATION IN MICRO-DROPLETS INDUCED BY PICOLITER REACTANT INJECTION

S. Li, T. Gaule, M.J. McPherson, and F.C. Meldrum

University of Leeds, UK

T130f ON-CHIP POROUS MICROGEL BASED INSULIN AUTOANTIBODY (IAA) DETECTION FOR TYPE I DIABETES DIAGNOSTICS

K. Duan, G. Ghosh, and J.F. Lo

University of Michigan, USA

T131f TRAP & RELEASE: DETERMINISTIC SINGLE BEAD ENCAPSULATION IN DROPLETS

G.K. Kurup, N. Zhang, G. Arzumanyan, and A.P. Lee

University of California, Irvine, USA

W126f WITHDRAWN

Segmented Flow and Droplet Based Microfluidics in Channels

W127f **DROPLET EXTRACTION MODULE FOR THE ANALYSIS OF SEGMENTED FLOW GENERATED BY A NEURAL PROBE**
G. Petit-Pierre, C. Darbellay, A. Bertsch, and P. Renaud
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

W128f **SILICONE OIL IMPROVES SMALL MOLECULE RETENTION FOR DROPLET-BASED BIOASSAYS**
T. Zheng, H.C. Zec, K. Hsieh, A. Kaushik, B. Axt, Y. Hsieh, and T.H. Wang
Johns Hopkins University, USA

g - Micro- and Nanoengineering

Bonding, Sealing & Interfacing Technologies

M129g **FABRICATION OF NANOFLUIDIC CHIP FOR LIQUID TEM CELL USING PARYLENE AND SILICON NITRIDE DIRECT BONDING**
H. Jang, J. Kim, J. Kim, and W. Lee
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T132g **ROOM TEMPERATURE ATMOSPHERIC DIRECT BONDING OF VARIOUS PLASTICS BY VACUUM ULTRAVIOLET LESS THAN 160NM WAVELENGTH**
Y. Hashimoto, K. Mogi, and T. Yamamoto
Tokyo Institute of Technology, JAPAN

W129g **FABRICATION OF AN EASY-TO-OBSERVE MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE**
S. Watanabe and N. Sasaki
Tokyo University, JAPAN

g - Micro- and Nanoengineering

Bonding, Sealing & Interfacing Technologies

M130g **A BIOREACTOR FOR PLATELET GENERATION WITH HIGH PRODUCTIVITY THROUGH NARROW SLITS OF PDMS**
K. Fujimoto^{1,2}, Y. Okawa², A. Tsukune^{1,3}, A. Aihara⁴, Y. Hiroi⁴, J. Katayama^{1,4}, T. Funakoshi⁵, and T. Ohba¹
¹*Tokyo Institute of Technology, JAPAN,*
²*Dai Nippon Printing Co., Ltd., JAPAN,*
³*Taiyo Nippon Sanso Corp., JAPAN,*
⁴*Nissan Chemical Industries, Ltd., JAPAN, and*
⁵*Fujikin Inc., JAPAN*

M131g **ACCURATE VALIDATION OF MICRO INJECTION MOLDING PROCESS FOR MANUFACTURING THIN-WALLED POLYMERIC PARTS FOR MICRO/NANO FLUIDICS DEVICES**
Q.L. Su¹, N. Zhang^{1,2}, and M.D. Gilchrist¹
¹*University College Dublin, IRELAND and* ²*Tianjin University, CHINA*

M132g **BIREFRINGENT QUARTZ MICRO-CYLINDERS FOR ANGULAR OPTICAL TWEEZERS**
Z. Santybayeva¹, C. De Marin¹, A. Meghit^{1,2}, R. Desgarceaux², R. Teissier², B. Charlot², and F. Pedaci¹
¹*CNRS INSERM, FRANCE and* ²*CNRS University Montpellier, FRANCE*

Bonding, Sealing & Interfacing Technologies

- M133g DESIGN AND FABRICATION OF LAB-ON-CHIP (LoC) INCORPORATING DNA AMPLIFICATION AND DETECTION ON PARTIALLY REDUCED GRAPHENE OXIDE BIOSENSORS**
M. Filippidou, A. Stamouli, E. Tegou, G. Kaprou, Y. Petrou, A. Tserepi, and S. Chatzandroulis
National Center for Scientific Research (NCSR) Demokritos, GREECE
- M134g FACILE SPINNING OF HETEROGENEOUS MULTI-HOLLOW MICROFIBER ON CHIP**
Y. Yu, H. Liu, Y. Wang, and J. Qin
Chinese Academy of Sciences, CHINA
- M135g LOW COST INTEGRATION OF MICROWIRE ELECTRODES INTO SILICONE ELASTOMERIC DEVICES USING MODIFIED XUROGRAPHIC METHODS**
J. Liu, J.B. Mahony, and P.R. Selvaganapathy
McMaster University, CANADA
- M136g MICROFLUIDIC INKING PROCESSES FOR LARGE-SCALE AND MULTIPLEXED MICRO-CONTACT PRINTING**
J. Foncy¹, C. Colin¹, A. Degache², A. Estève¹, J.-C. Cau², B. Berteloite², E. Trévisiol¹, C. Vieu¹, and L. Malaquin¹
¹LAAS, CNRS, INSA, UPS, FRANCE and ²INNOPSYS, FRANCE
- M137g MULTIPLEXED AND FAST IMMUNOASSAY USING THE ENCODED SILICON MICROCHIPS DEPOSITED ONTO THE PDMS SURFACE**
K. Zhang, C. Chen, W. Xu, L. Fan, K. Zheng, J. Li, and H. Wang
Chinese Academy of Sciences, CHINA
- M138g PICOLITER-DROPLET ARRAY FORMATION ON PETRI DISH AND ITS USAGE FOR GENERATING PARTICLE OR HYDROGEL ARRAY**
W. Wang¹, C. Yang², Y. Yan³, X.Y. Qi¹, S.X. Wu¹, Y.P.D. Seah¹, D.Y. Wang³, and Z.P. Wang¹
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²Nanyang Technological University, SINGAPORE, and
³National University of Singapore, SINGAPORE
- M139g RAPID MANUFACTURING OF MICROFLUIDIC CHIPS IN GLASS**
F. Kotz, K. Arnold, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY
- M140g SIMPLE FABRICATION OF ALL-GLASS HERRINGBONE DEVICES FOR THE RAPID PRODUCTION OF LIPOSOMES**
M.D. Tarn^{1,2}, S.A. Peyman², S.J. Archibald¹, S.D. Evans², and N. Pamme¹
¹University of Hull, UK and ²University of Leeds, UK
- T133g A PCB-BASED ELECTROCHEMICAL GLUCOSE BIOSENSING PLATFORM**
D. Moschou, H. Morgan, and T. Prodromakis
University of Southampton, UK

Bonding, Sealing & Interfacing Technologies

- T134g ADAPTED TRANSFER PRINTING TECHNIQUE FOR FLEXIBLE FILM BULK ACOUSTIC RESONATOR FABRICATION**
Y. Jiang, M. Zhang, Z. Han, X. Duan, and W. Pang
Tianjin University, CHINA
- T135g ASSEMBLY OF HETEROGENEOUS ZIPPER-STRUCTURE MICROFIBER**
J. Bae and W. Park
Kyung Hee University, KOREA
- T136g DIGITALLY CONTROLLED WRINKLE PATTERNING**
H.J. Bae¹, S. Bae¹, C. Park², J. Yoon², S. Hong¹, W. Park², and S. Kwon¹
¹*Seoul National University, KOREA* and ²*Kyung Hee University, KOREA*
- T137g FAST PROTOTYPING OF PASSIVE VALVES FOR POLYMERIC CENTRIFUGAL MICROFLUIDIC PLATFORMS USING LOW TEMPERATURE CO-FIRED CERAMIC MASTERS**
O. Ymbern, P. Couceiro, M. Berenguel-Alonso, N. Sández, and J. Alonso
Universitat Autònoma de Barcelona, SPAIN
- T138g LOW-COST FABRICATION OF ELASTOMER LENSES WITH REAL-TIME CONTROL ON LENS CURVATURE**
B. Karunakaran, J. Tharion, D. Paul, and S. Mukherji
Indian Institute of Technology, Bombay, INDIA
- T139g MULTICOLORED MICROCONTACT PRINTING USING A MICROFLUIDIC INKPAD FOR DISCOVERY OF TUMOR-IMAGING PROBES IN CLINICAL SPECIMENS**
T. Osaki^{1,3}, H. Onoyama^{2,3}, Y. Kuriki^{2,3}, K. Kamiya^{1,3}, S. Fujii¹, N. Misawa¹, M. Kamiya^{2,3}, Y. Urano^{2,3}, and S. Takeuchi^{1,3}
¹*Kanagawa Academy of Science and Technology (KAST), JAPAN*,
²*University of Tokyo, JAPAN*, and ³*Japan Science and Technology Agency (JST), JAPAN*
- T140g NOVEL AND SIMPLE METHOD FOR FABRICATION OF MULTICHANNEL PLCL NERVE GUIDANCE CONDUIT**
D. Park and S.-H. Lee
Korea University, KOREA
- T141g PLASTIC SCINTILLATOR-BASED MICROFLUIDIC DEVICES FOR RADIODETECTION TOWARDS THE QUALITY CONTROL TESTING OF PET RADIOTRACERS**
M.D. Tarn¹, N. Yavuzkanat², M.M.N. Esfahani¹, N.J. Brown¹, N. Pamme¹, D. Jenkins², and S.J. Archibald¹
¹*University of Hull, UK* and ²*University of York, UK*
- T142g RAPID PROTOTYPING OF MICROFLUIDIC DIGITAL LOGIC**
E.M. Werner, M. Chu, and E.E. Hui
University of California, Irvine, USA
- W130g 3D-PRINTED MONOLITHIC PINHEADS FOR ALIGNED, MICROSCALE PATTERNING OF HIGHLY VISCOUS INKS WITH PROTEINS AND CELLS**
G. Ongo and D. Juncker
McGill University, CANADA

Bonding, Sealing & Interfacing Technologies

- W131g A RAPID MICROFLUIDIC STAMPING DEVICE FOR STUDYING CARDIAC STEM CELLS AND ENDOTHELIAL CELLS CO-CULTURE**
A.H. Barforoushi¹, J. Shemesh¹, N. Farbehi¹, M. Asadnia², G.H. Yeoh¹, R.E. Nordon¹, and M.E. Warkiani¹
¹University of New South Wales, AUSTRALIA and
²Macquarie University, AUSTRALIA
- W132g ANISOTROPIC PYROCHEMICAL FABRICATION OF POLYTETRAFLUOROETHYLENE AND METALLIC NANOPARTICLES INITIATED BY SYNCHROTRON RADIATION FOR MICROFLUIDIC DEVICES**
A. Yamaguchi¹, H. Kido¹, Y. Ukita², M. Kishihara³, T. Fukuoka¹, and Y. Utsumi¹
¹University of Hyogo, JAPAN, ²University of Yamanashi, JAPAN and
³Okayama Prefectural University, JAPAN
- W133g CONTROL OF WRINKLE DENSITY ON WRINKLED MICROPARTICLES USING GRAYSCALE OPTOFLUIDIC MASKLESS LITHOGRAPHY**
C. Park¹, H.J. Bae², S.-H. Song¹, S. Kwon², and W. Park¹
¹Kyunghee University, KOREA and ²Seoul National University, KOREA
- W134g FABRICATION OF LARGE AREA POLYMER MICRO-FILTERS VIA VACUUM ASSISTED UV MICRO-MOLDING**
J.A. Hernández-Castro^{1,2}, K. Li², A. Meunier¹, T. Veres^{1,2}, and D. Juncker¹
¹McGill University, CANADA and
²National Research Council of Canada, CANADA
- W135g INNOVATIVE 3D PRINTING OF FLUIDICALLY SEALED DEVICES**
M. Drobot, M.P.T. Gilligan, and M. Grosso
Blacktrace Holdings Ltd, UK
- W136g MICROFLUIDIC DEVICES FABRICATED USING SOFT LITHOGRAPHY FOR THE STUDY OF PROTEIN STRUCTURES USING SYNCHROTRON RADIATION CIRCULAR DICHROISM**
J. Charmet¹, C. Bortolini^{1,2}, D. Copic¹, I. Condado Morales¹, Y. Zhang¹, P.K. Challa¹, T. Jávorf³, R. Hussain³, G. Siligardi³, and T.P.J. Knowles¹
¹University of Cambridge, UK, ²Aarhus University, DENMARK, and
³Diamond Light Source, UK
- W137g MULTIMATERIAL 3D PRINTING: INTEGRATING ELECTRODES FOR OF BACTERIA CELLS**
S.C. Phung, F. Li, M. Macka, S.M. Powell, R.M. Guijt, and M.C. Breadmore
University of Tasmania, AUSTRALIA
- W138g DIGITAL PRESSURE CONTROL ON A CHIP IMPLEMENTED BY HYBRID 3D PRINTED AND MOLDED MICROFLUIDICS**
L.Y. Liu and Y.C. Su
National Tsing Hua University, TAIWAN
- W139g POROUS MICROWELLS FOR GEOMETRY-SELECTIVE, LARGE-SCALE MICROPARTICLE ARRAYS**
J.J. Kim¹, K.W. Bong^{2,3}, E. Reátegui², D. Irimia², and P.S. Doyle¹
¹Massachusetts Institute of Technology, USA,
²Massachusetts General Hospital, USA, and
³Korea University, KOREA

Bonding, Sealing & Interfacing Technologies

- W140g SELF-ROLLED MICROSYSTEMS: A PROMISING ROUTE TOWARD FULLY FUNCTIONALIZED AND LOW-COST MICRO-CAPILARIES**
 R. Brossard¹, V. Luchnikov², P. Guenoun¹, and F. Malloggi¹
¹Université Paris-Saclay, FRANCE and ²Université Haute-Alsace, FRANCE

g - Micro- and Nanoengineering

Nanobiotechnology

- M141g MEASUREMENT OF ENTROPIC UNFOLDING FORCE OF CONFINED DNA IN THE ODIJK REGIME**

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- M142g NEW HIGHLY SELECTIVE PORPHYRIN-BASED NANOPHOTOSENSITIZER INVESTIGATED USING A MICROFLUIDIC SYSTEM**

K. Tokarska¹, E. Jastrzebska¹, M. Chudy¹, A. Dybko¹,

U. Bazylińska², K.A. Wilk², and Z. Brzozka¹

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²Wrocław University of Technology, POLAND

- T143g EXTRACELLULAR VESICLE SEPARATION BASED ON SURFACE PROTEINS USING A MICRO FREE-FLOW ELECTROPHORESIS DEVICE**

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- T144g MOLECULAR QUILTS IN MICROFLUIDIC CHANNEL FOR IMAGING DYNAMICS OF SINGLE CIRCULAR DNA MOLECULES**

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- T145g PULSE LASER ACTIVATED PHOTOPORATION FOR HIGH EFFICIENT INTRACELLULAR DELIVERY USING NANO-CORRUGATED MUSHROOM SHAPE GOLD NANOPARTICLES**

T.S. Santra¹ and F.-G. Tseng^{2,3}

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²National Tsing Hua University, TAIWAN, and

³Academia Sinica, TAIWAN

- W141g INTEGRATED THERMOPLASTIC NANOFLUIDIC DEVICE FOR DETECTION OF CHEMOTHERAPEUTICALLY INDUCED DAMAGE IN GENOMIC DNA**

K.M. Weerakoon-Ratnayake¹, V. Singh^{1,2}, F.I. Uba¹,

R.M. Schotzinger¹, J. Choi², Z. Jia², P.D. Chastain¹,

D.G. Kaufman¹, S. Park², and S.A. Soper^{1,2}

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Nanobiotechnology

- W142g** **NANOTOPOGRAPHY PROMOTES CELL MIGRATION THROUGH THE ACTIVATION OF FAK SIGNALING PATHWAY**
J. Lim, A. Choi, H.W. Kim, and D.S. Kim
Pohang University of Science and Technology (POSTECH), KOREA

g - Micro- and Nanoengineering

Nanoscale Assembly

- M143g** **ULTRASENSITIVE MICRO SENSOR BASED ON LAYER-BY-LAYER SELF-ASSEMBLED GRAPHENE AND GOLD NANOPARTICLES FOR TRACE MERCURY (II) IONS DETERMINATION**
Z. Wu¹, L. Wang¹, G. Jing¹, and T. Cui²
¹*Tsinghua University, CHINA* and ²*University of Minnesota, USA*

- W143g** **CONTINUOUS PREPARATION OF POLYMER-PROTEIN HYBRID NANO CARRIERS BY USING POLYMERIC SELF-ASSEMBLY ON INTER FACE OF LAMINATED FLUID FLOW**
H.J. Jeon, M.J. Kim, X.D. Nguyen, D.H. Park, C.Y. Lee, H.J. Paik, and J.S. Go
Pusan National University, KOREA

g - Micro- and Nanoengineering

Nanoscale Fabrication, Patterning, and Integration

- M144g** **CONTROL OF NANOPORE FORMATION TO INSULATOR MEMBRANE IN ELECTROLYTE SOLUTION**
K. Kawai¹, T. Hayashi¹, Y. Shibuno², Z. Ma², N. Yamashita², S. Park², K. Arima¹, M. Morita¹, and O. Tabata²
¹*Osaka University, JAPAN* and ²*Kyoto University, JAPAN*

- M145g** **GRAYSCALE LITHOGRAPHY TO FABRICATE VARYING-DEPTH NANOCANNELS IN A SINGLE STEP**
A. Naillon¹, H. Massadi¹, R. Courson², P.-F. Calmon¹, L. Sevenov, M. Prat¹, and P. Joseph¹
¹*Université de Toulouse, FRANCE* and ²*Kloe SA, FRANCE*

- M146g** **NOVEL NANOFLUIDIC CONFIGURATION WITH METAMATERIALS INTEGRATED FOR ULTRA-SENSITIVE INFRARED ABSORPTION SPECTROSCOPY**
T.H.H. Le¹ and T. Tanaka^{1,2}
¹*RIKEN, JAPAN* and ²*Tokyo Institute of Technology, JAPAN*

- T146g** **A HIGHLY ALIGNED, SEMI-TRANSPARENT, FREE-STANDING NANOFIBER MEMBRANE VIA ELECTROLYTE-ASSISTED ELECTROSPINNING FOR ORGAN-ON-A-CHIP**
S.M. Park, S. Eom, H.W. Kim, and D.S. Kim
Pohang University of Science and Technology (POSTECH), KOREA

- T147g** **FABRICATION OF MIXED-SCALE PMMA CHANNEL NETWORKS BY NANOIMPRINT USING A CONVEX CARBON MOLD**
J. Hong and H. Shin
Ulsan National Institute of Science & Technology (UNIST), KOREA

Nanoscale Fabrication, Patterning, and Integration

T148g INTEGRATING BOTTOM-UP GROWN SILICON NANOWIRES ON A CMOS CHIP TO REALIZE HIGH-DENSITY TRANSISTOR ARRAYS FOR CHEMICAL SENSING

V. Sessi^{1,2}, F. Seichepine⁵, S. Pregl³, N. Szabo³, A. Hierlemann⁴, T. Mikolajick^{1,2,3}, W.M. Weber^{2,3}, and U. Frey^{4,5}

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W144g CAPILLARY ORIGAMI AS A NEW METHOD FOR PRINTING NANOPARTICLES ON 3D SURFACES

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W145g FEMTO-LITER SAMPLING CONTROL AND TRANSPORT BY LAPLACE NANO VALVE FOR SINGLE CELL ANALYSIS

L. Lin, K. Mawatari, K. Morikawa, and T. Kitamori

University of Tokyo, JAPAN

W146g LARGE-AREA FABRICATION OF SUB-30 NM PERIODIC NANOSTRUCTURES

H. Le-The, E. Berenschot, R.M. Tiggelaar, N.R. Tas,

A. van den Berg, and J.C.T. Eijkel

University of Twente, NETHERLANDS

g - Micro- and Nanoengineering

Novel, Smart, and Responsive Materials

M147g NEXT GENERATION, IN-SITU MICROFLUIDIC FLOW CONTROL USING STIMULI RESPONSIVE MATERIALS FOR BIOMIMETIC MICROFLUIDIC PLATFORMS

S. Coleman¹, A. Ben Azouz¹, J. ter Schiphorst², J. Saez³,

J. Whyte^{1,4}, P. McCluskey¹, N. Kent^{1,4}, F. Benito-Lopez^{1,3},

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M148g STIMULI-RESPONSIVE MICROFIBER FABRICATED WITH DOUBLE-NETWORK HYDROGEL

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T149g DNA MICRODISK: PACKAGING AND INDEXING OF DIGITAL INFORMATION STORED DNA ON ENCODED MICROPARTICLE

Y. Choi¹, H.J. Bae¹, S. Song², S. Kwon¹, and W. Park²

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T150g ONE-STEP PRODUCTION OF NON-CROSSLINKED COLLAGEN MICROFIBERS BY PH MODULATION IN MICROFLUIDIC DEVICES

S. Enomoto¹, Y. Yajima¹, Y. Watabe¹, M. Yamada¹,

R. Utoh¹, K. Furusawa², and M. Seki¹

¹Chiba University, JAPAN and ²Hokkaido University, JAPAN

Novel, Smart, and Responsive Materials

- T151g** **TEMPERATURE-CONTROLLED POLY(IONIC LIQUID) MICROFLUIDIC VALVES**
A. Tudor¹, J. Saez², L. Florea¹, F. Benito-Lopez^{1,2}, and D. Diamond¹
¹*Dublin City University, IRELAND and*
²*University of the Basque Country UPV, SPAIN*
- W147g** **FUNCTIONALIZED CORE-SHELL HYDROGEL MICROSPRINGS FABRICATED WITH BEVEL-TIP MICROFLUIDIC CAPILLARY**
K. Yoshida and H. Onoe
Keio University, JAPAN
- W148g** **pH AND PHOTO-RESPONSIVE HYDROGEL ACTUATORS**
A. Dunne, S. Mac Ardle, J. Hennessy, L. Florea, and D. Diamond
Dublin City University, IRELAND

g - Micro- and Nanoengineering

Surface Modification

- M149g** **DIRECT MICROSTRUCTURING OF PDMS SURFACE USING A CD/DVD LASER FOR ON-DEMAND CELL CULTURE PLATFORM FABRICATION**
L. Cabriaes, M.J. González, G. Vázquez-Victorio, M. Macias-Silva, and M. Hautefeuille
Universidad Nacional Autónoma de México, MEXICO
- M150g** **LOCAL VISIBLE-LIGHT INDUCED MODIFICATION OF THE INSIDE OF GLASS AND COC MICROFLUIDIC CHANNELS**
R.R. Carvalho^{1,2}, S.P. Pujari¹, E.X. Vrouwe², and H. Zuilhof¹
¹*Wageningen University and Research, NETHERLANDS and*
²*Micronit Microfluidics BV, NETHERLANDS*
- M151g** **SURFACE FUNCTIONALIZATION OF POWER-FREE PDMS MICROCHIP FOR MICRORNA DETECTION UTILIZING UV-INDUCED GRAFT POLYMERIZATION**
R. Ishihara¹, K. Tanabe¹, Y. Uchino¹, K. Hosokawa², M. Maeda², and A. Kikuchi¹
¹*Tokyo University of Science, JAPAN and* ²*RIKEN, JAPAN*
- T152g** **ETHANOL DETERMINATION IN BEERS USING DROPLET ARRAYS FABRICATED BY LASER MICROMACHINING SUPERHYDROPHOBIC (SH) COATED GLASS**
B. Ghimire, K. Bachus, L. Mats, and R.D. Oleschuk
Queen's University, CANADA
- T153g** **MICRO AND NANOPATTERNED AMINOSILANES FOR COVALENT GRAFTING OF BIOMOLECULES IN MULTIPLEXED MICROFLUIDIC BIOASSAYS**
S. Sathish, S.G. Ricoult, K. Toda-Peters, and A.Q. Shen
Okinawa Institute of Science and Technology Graduate University, JAPAN
- T154g** **SURFACE WETTABILITY CONTROL BY CHANGING SILVER NANOPARTICLE SIZE ON ZINC OXIDE NANOWIRES FOR HYDROPHOBIC SURFACE GENERATION**
N. Kim and H.W. Kang
Chonnam National University, KOREA

Surface Modification

W149g ANTIFOULING SURFACE MODIFICATION OF NANOCHANNELS USING A SILANIZED PHOSPHOLIPID MONOMER

Y. Xu and Q. Wu

Osaka Prefecture University, JAPAN

W150g LAPLACE PRESSURE DRIVEN SURFACE-TENSION-CONFINED MICROFLUIDICS ON A HYBRID AND DIRECTIONAL SURFACE

J. Wu^{1,2}, L. Zhang², Y. Wang², and P. Wang²

¹*Shanghai University, CHINA and*

²*King Abdullah University of Science and Technology, SAUDI ARABIA*

W151g SELF-ASSEMBLED MONOLAYER AND PEPTIDE COATED NANOWIRE DEVICES FOR SELECTIVE DETECTION OF C-REACTIVE PROTEIN AND E.COLI WITHOUT ANTIBODY

A. Yokoyama¹, T. Yasui¹, T. Goda², T. Yanagida³, M. Tanaka⁴, M. Muto⁴, M. Okochi⁴, N. Kaji¹, M. Kanai³, K. Nagashima³, Y. Miyahara², T. Kawai⁵, and Y. Baba^{1,6}

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³*Kyushu University, JAPAN, ⁴Tokyo Institute of Technology, JAPAN,*

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

h - Sensors & Actuators, and Detection Technologies

Biosensors

M152h A HIGH-THROUGHPUT IMPEDANCE SPECTROSCOPY-BASED MICROSYSTEM FOR PRECISE CELL POSITION IDENTIFICATION

N. Sobahi, H. Wang, and A. Han

Texas A&M University, USA

M153h A MICROFLUIDIC PLATFORM FOR BRETTANOMYCES DETECTION BASED ON IMPEDANCE SPECTROSCOPY ANALYSIS OF IMMUNOLOGICAL REACTIONS

E. Perez-Lorenzo^{1,2}, I. Tubía^{1,2}, J. Paredes^{1,2}, and S. Arana^{1,2}

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M154h A NOVEL POINT-OF-USE, ULTRAFast AND SENSITIVE FLUORESCENCE IMMUNOASSAY FOR THE SIMULTANEOUS DETECTION OF MULTIPLE MYCOTOXINS USING NANOPOROUS AGAROSE BEADS CONFINED IN MICROCHANNELS

R.R.G. Soares^{1,2}, I.F. Pinto^{1,2}, D.R. Santos^{1,2}, A.M. Azevedo², V. Chu¹, M.R. Aires-Barros², and J.P. Conde¹

¹*INESC Microsystems and Nanotechnologies, PORTUGAL and*

²*Institute for Bioengineering and Biosciences, PORTUGAL*

M155h AN OPTICAL BIOSENSING PLATFORM BASED ON THE LIGHT INTERFERENCE AND WAVELENGTH FILTERING FROM CHROMOGENIC REACTIONS

H.J. Chun, K.R. Kim, Y.D. Han, and H.C. Yoon

Ajou University, KOREA

Biosensors

- M156h BIOLOGICAL ASSAYS PERFORMED ON SUSPENDED DROPLETS**
R. Hernández-Pérez¹, H. Fan², and J.L. García-Cordero¹
¹Centro de Investigación y de Estudios Avanzados del IPN, MEXICO and
²University of Florida, USA
- M157h DISCRIMINATION OF DROPLETS CONTAINING SINGLE CULTURED FILAMENTOUS FUNGAL CELL USING IMPEDANCE SPECTROSCOPY**
N. Sobahi, J. Dai, W.-B. Shim, and A. Han
Texas A&M University, USA
- M158h ELECTRICAL STIMULATOR-INTEGRATED PDMS DIAPHRAGM SENSOR FOR DRUG-INDUCED CARDIAC TOXICITY SCREENING**
Y.J. Jeong, B.-K. Lee, and D.W. Lee
Chonnam National University, KOREA
- M159h GRAPHENE SENSORS FOR DETECTION OF ESCHERICHIA COLI O157:H7**
S. Sando and T. Cui
University of Minnesota, USA
- M160h INTEGRATED PERISTALTIC PUMP FOR PROBING A BIOFILM ONLINE MONITORING SYSTEM**
K. Sachsenheimer, J. Bruchmann, T. Schwartz, and B.E. Rapp
Karlsruhe Institute of Technology (KIT), GERMANY
- M161h MAGNETO-NANOSensor PLATFORM FOR PROBING LOW-AFFINITY PROTEIN-PROTEIN INTERACTION: CHARACTERIZATION OF PD-1 - PD-L1/PD-L2 INHIBITORY CHECKPOINT AXIS**
J.-R. Lee¹, D.J. Bechstein¹, C.C. Ooi¹, A. Patel², R.S. Gaster^{1,3}, E. Ng¹, L.C. Gonzalez², and S.X. Wang¹
¹Stanford University, USA, ²Genentech Inc., USA, and
³Harvard University, USA
- M162h MULTIPLEXED RESISTIVE PULSE SENSING OF CELLS USING ARBITRARY PULSE SEQUENCES**
R. Liu, N. Wang, C.-H. Chu, and A.F. Sarioglu
Georgia Institute of Technology, USA
- M163h ON-WAFER QUARTZ BASED BROADBAND DIELECTRIC SPECTROSCOPY FOR μ L BIOLOGICAL LIQUIDS UP TO 50 GHz**
J. Bao, S. Liu, I. Ocket, and B. Nauwelaers
KU Leuven, BELGIUM
- M164h QUANTUM DOT-FULLERENE BASED MOLECULAR BEACONS FOR HIGHLY SENSITIVE DNA DETECTION**
Y. Liu, A. Kannegulla, and L.-J. Cheng
Oregon State University, USA
- M165h SINGLE PARTICLES ANALYSIS USING A NANOPORE TRAPPING METHOD**
A. Arima, M. Tsutsui, M. Taniguchi, and T. Kawai
Osaka University, JAPAN

Biosensors

- M166h** **SYNTHESIS OF ZNO NANOWIRES ON MICROCANTILEVER ARRAYS FOR HIGH SENSITIVITY BIOSENSORS**
S. Stassi, A. Chiadò, V. Cauda, G. Canavese, M. Laurenti, and C. Ricciardi
Politecnico di Torino, ITALY
- T155h** **A HOLLOW MEMS SENSOR FOR COMBINED DENSITY, VISCOSITY, BUOYANT MASS AND IR ABSORPTION SPECTROMETRY**
P.E. Larsen, S. Schmid, and A. Boisen
Technical University of Denmark, DENMARK
- T156h** **A NOVEL EUROPIUM-ENCAPSULATED NANOPARTICLE FOR TIME-RESOLVED FLUORESCENCE IMMUNOSENSOR SIGNALING**
K.R. Kim¹, H.J. Chun¹, D.K. Hong², M.H. Lee², K.N. Lee², and H.C. Yoon¹
¹*Ajou University, KOREA and*
²*Korea Electronics Technology Institution (KETI), KOREA*
- T157h** **ACCELERATION OF ON-CHIP IMMUNOASSAYS WITH ASSOCIATION OF CENTRIFUGAL THERMAL CONVECTION CONTROL**
M. Saito, T. Tadokoro, W.V. Espulgar, and E. Tamiya
Osaka University, JAPAN
- T158h** **ANALYSIS OF SURFACE MARKERS ON CTCs USING IMMUNO-MAGNETIC SEPARATION AND MULTI-FREQUENCY IMPEDANCE SPECTROSCOPY**
Z. Lin, S.-Y. Lin, P. Xie, J.R. Bertino, and M. Javanmard
Rutgers University, USA
- T159h** **CARBON NANODOTS PREPARED FROM DOPAMINE AND TRISODIUM CITRATE AS AN EFFECTIVE FLUORESCENT SENSING PLATFORM FOR THE LABEL-FREE DETECTION OF FERRIC IONS**
W.C. Wu^{1,2}, S.C. Lin¹, F.R. Chen¹, H.T. Chang¹, and F.G. Tseng¹
¹*National Tsing Hua University, TAIWAN and* ²*Academia Sinica, TAIWAN*
- T160h** **ELASTOMERIC SENSOR SURFACES FOR HIGH-THROUGHPUT FORCE BIOLOGY AND SCREENING**
I. Pushkarsky¹, M. Dhar¹, R. Damoiseaux², and D. Di Carlo^{1,2}
¹*University of California, Los Angeles, USA and*
²*California NanoSystems Institute, USA*
- T161h** **ENHANCING THE SENSITIVITY OF HIGH-THROUGHPUT PLASMONIC BIOSENSORS WITH MICROFLUIDICS**
A. Belushkin, F. Yesilkoy, M. Soler, A. Tittl, C. Ozdemir, L. Xiaokang, and H. Altug
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T162h** **HIGH SENSITIVE DETECTION ON IGG PROTEIN BY USING 3D SILICON NANOWIRE FETS**
X. Gong, R. Zhao, and X. Yu
Peking University, CHINA
- T163h** **LABEL FREE INTERDIGITATED CAPACITIVE BIOSENSOR FOR THE DETECTION OF CRYPTOSPORIDIUM**
G. Luka, E. Samiei, S. Dehghani, T. Johnson, H. Najjaran, and M. Hoorfar
University of British Columbia, CANADA

Biosensors

- T164h MEASUREMENT OF PERMEABILITY OF BLOOD PROTEIN PASSED THROUGH A GENERATED FIBRIN NETWORK FOR ANALYZING BLOOD COAGULATION**
S. Inoue, K. Hayashi, Y. Iwasaki, M. Seyama, and H. Koizumi
Nippon Telegraph and Telephone Corporation, JAPAN
- T165h NANO OXYGEN PARTICLES FOR CELL PHYSIOLOGICAL CONDITION MONITORING**
M.P. Koduri, Y.-W. Shao, and F.-G. Tseng
National Tsing Hua University, TAIWAN
- T166h OPTOMAGNETIC STUDIES OF PH-SWITCHABLE NANOPARTICLE AGGLOUTINATION VIA TRIPLEX DNA FORMATION**
G.A.S. Minero¹, J. Fock¹, J.S. McCaskill², and M.F. Hansen¹
¹*Technical University of Denmark, DENMARK* and
²*Ruhr-University Bochum, GERMANY*
- T167h RAPID DRUG-RESISTANT GENE DETECTION DEVICE FOR BEDSIDE MONITORING BY CENTRIFUGAL CONVECTIVE PCR**
K. Takahashi, M. Saito, W.V. Espulgar, N. Yamamoto, Y. Akeda, K. Tomono, and E. Tamiya
Osaka University, JAPAN
- T168h SPHEROIDS ON A CMOS CHIP FOR A PORTABLE ODORANT SENSOR**
Y. Hirata¹, S. Yoshida¹, S. Tabata¹, E. Nam¹, Y. Morimoto¹, and S. Takeuchi^{1,2}
¹*University of Tokyo, JAPAN* and
²*Japan Science and Technology Agency (JST), JAPAN*
- T169h TOP-DOWN FABRICATION MEETS BOTTOM-UP SYNTHESIS: ELECTRONICALLY BARCODED PARTICLES FOR MULTIPLEXED MOLECULAR ANALYSIS**
P. Xie, X. Cao, Z. Lin, and M. Javanmard
Rutgers University, USA
- W152h A CONTINUOUS FLOW, ELECTRICALLY TRIGGERED MICROELECTROPORATOR**
M. Zheng, J.J. Sherba, J.W. Shan, H. Lin, D.I. Shreiber, and J.D. Zahn
Rutgers University, USA
- W153h A MICROCAPSULE ARRAY CHIP BASED ON DNA ISOTHERMAL AMPLIFICATION FOR DIRECT VISUAL DETECTION OF SALMONELLA**
E.Q. He¹, L.Y. Cai², F.Y. Zheng², Y.L. Zhou², X.X. Zhang², and Z.H. Li^{1,2}
¹*State Key Laboratory of Tribology, CHINA* and ²*Peking University, CHINA*
- W154h A NOVEL GOLD NANOPARTICLE-DNA APTAMER-BASED PLASMONIC CHIP FOR RAPID AND SENSITIVE DETECTION OF BACTERIAL PATHOGENS**
Y. Sun, T.P. Long, A. Wolff, and D.D. Bang
Technical University of Denmark, DENMARK
- W155h AN APTAMER-BASED APPROACH TO CONTINUOUS, REAL-TIME MOLECULAR MEASUREMENTS IN VIVO**
K.W. Plaxco and N. Arroyo-Currás
University of California, Santa Barbara, USA

Biosensors

- W156h ASYMMETRIC BEAD IMMUNOAGGREGATION FOR LABEL-FREE PROTEIN DETECTION**
S. Kim, N. Verma, Y. Lee, S. Han, P. Purwar, and J. Lee
Seoul National University, KOREA
- W157h CHARACTERIZING BIOMOLECULE VISCOSITY USING PARTICLE SCATTERING DIFFUSOMETRY**
K.N. Clayton, D.H. Lee, T. Moehling, J.C. Linnes, T.L. Kinzer-Ursem, and S.T. Wereley
Purdue University, USA
- W158h ELECTRICAL DETECTION OF PROTEINS USING BATCH-FABRICATED VERTICAL METAL NANOGAP BREAK-JUNCTIONS**
A. Banerjee, T. Ghosh, R. Likhite, N. Hasan, H. Kim and C.H. Mastrangelo
University of Utah, USA
- W159h GOLD NANOROD ROTARY MOTORS FOR ULTRA-SENSITIVE DNA DETECTION**
H. Šípová, L. Shao, and M. Käll
Chalmers University of Technology, SWEDEN
- W160h HIGHLY MINIATURIZED SYSTEM FOR ON-CHIP DETECTION OF DNA**
D. Caputo¹, F. Costantini¹, N. Lovecchio¹, V. Viri¹, M. Tucci², P. Mangiapane², A. Ruggi³, G. Petrucci¹, A. Nascetti¹, and G. de Cesare¹
¹Sapienza University of Rome, ITALY, ²ENEA, ITALY, and ³University of Fribourg, SWITZERLAND
- W161h WITHDRAWN**
- W162h MICROFLUIDIC ASSAYS WITHOUT SAMPLE PREPARATION: NEW MICROFLUIDIC STRATEGIES FOR OVERCOMING BIOLOGICAL MATRIX INTERFERENCE**
A.I. Barbosa and N.M. Reis
Loughborough University, UK
- W163h NANOFLUIDIC CONDUCTIVITY SENSING FOR REAL-TIME DNA QUANTIFICATION**
K.G.H. Janssen, K.A. Tsia, S. Boden, K.W. Plaxco, and S. Pennathur
University of California, Santa Barbara, USA
- W164h PAPER-BASED METHODS FOR DETECTING PATHOGENIC MICROORGANISMS**
K.E. Boehle¹, J.A. Adkins¹, C. Wheeldon², M. Srisa-Art^{1,3}, B.J. Geiss¹, and C.S. Henry¹
¹Colorado State University, USA, ²Occidental College, USA, and ³Chulalongkorn University, THAILAND

Biosensors

- W165h** **RECOGNITION OF MICRORNA EXPRESSION PATTERN IN SERUM USING PROGRAMMABLE DROPLET SYSTEM FOR CANCER DIAGNOSIS**
M. Hiratani, M. Ohara, and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN
- W166h** **STRUCTURAL MICROGELS FOR BIOLOGICAL BINDING ASSAYS VIA DROPLET MICROFLUIDICS**
M.N. Hsu, E.X. Ng, Y. Zhang, and C.H. Chen
National University of Singapore, SINGAPORE

h - Sensors & Actuators, and Detection Technologies

Chemical & Electrochemical Sensors

- M167h** **A METHOD TO CONCURRENTLY MEASURE AN ARRAY OF ELECTROCHEMICAL BIOSENSORS FOR POINT-OF-CARE APPLICATIONS**
P. Neuzil^{1,2}, H. Kynclova², M. Bartosik³, R. Hrdy², and J. Hubalek²
¹*Northwestern Polytechnical University, CHINA,*
²*Brno University of Technology, CZECH REPUBLIC, and*
³*Masaryk Memorial Cancer Institute, CZECH REPUBLIC*
- M168h** **ALTERNATIVE RAMAN SPECTROSCOPY OF GLYCINE BINDING ON AU-NANOPARTICLE-DECORATED POLYSTYRENE BEADS DUE TO AGGREGATION INDUCED BY DIELECTROPHORESIS IN MICRO-OPTOFLUIDIC DEVICES**
A. Yamaguchi, T. Fukuoka, and Y. Utsumi
University of Hyogo, JAPAN
- M169h** **DEVELOPMENT OF STIMUTI-RESPONSIVE GEL PHOTONIC-CRYSTAL MICROCHIP FOR METAL ION SENSING**
T. Tsukahara, K. Saga, K. Morikawa, and K.-C. Park
Tokyo Institute of Technology, JAPAN
- M170h** **DIMENSIONAL ANALYSIS TO DISTINGUISH DIFFUSION-LIMITED AND CHARGE-TRANSFER REACTION-LIMITED PROCESSES OF FABRICATED IMPEDIMETRIC MICRO ELECTROCHEMICAL SENSORS TO DETECT HYDROGEN AND AMMONIUM IONS**
B. Gao^{1,2}, Y. Hua¹, C. Zhao¹, W. Xu¹, S. Ma^{1,2}, A.P. Zhang², M. Yuen¹, and Y.-K. Lee¹
¹*Hong Kong University of Science and Technology, HONG KONG and*
²*Xi'an Jiaotong University, CHINA*
- M171h** **HIGHLY SENSITIVE MICROFLUIDIC SENSOR BASED ON CARBON NANOTUBES FOR DETECTING BROMINATED DISINFECTION BYPRODUCTS IN DRINKING WATER**
M.B. Yu, X.H. Wu, J. Huang, and Z. Li
Tongji University, CHINA

Chemical & Electrochemical Sensors

- M172h INCREASING THE EFFICIENCY OF DNA ELECTROCHEMICAL HYBRIDIZATION DETECTION USING MICROELECTRODES IN A TWO-ELECTRODE CONFIGURATION IN MICROFLUIDICS**
M.-C. Horny^{1,2}, M. Lazerges³, J.-M. Siaugue¹, A. Pallandre², A.-M. Haghiri-Gosnet², and J. Gamby^{1,2}
¹*Pierre and Marie Curie University, FRANCE*, ²*CNRS, FRANCE*, and ³*Université Paris Descartes, FRANCE*
- M173h NANOCALORIMETRIC DEVICE FOR ANALYSIS OF MIXING ENTHALPY IN MICROLITER SEGMENTED FLOW PLUGS**
R. Krenger, R. Padovani, T. Lehnert, and M.A.M. Gijis
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- M174h RAPID QUANTITATION OF PROTEIN LEVELS BY COMBINING MICROFLUIDICS AND PRINTED ELECTRONIC TRANSDUCERS**
S.P. White, C.D. Frisbie, and K.D. Dorfman
University of Minnesota, USA
- M175h SENSING-IN-BRIEFCASE: A SIMPLE INEXPENSIVE ON-SITE DETECTION OF HEAVY METAL POLLUTANTS FOR UNREACHED COMMUNITIES**
M. Biyani^{1,2,3}, R. Biyani^{1,2}, T. Tsuchihashi³, H. Ushijima³, E. Tamiya³, Y. Takamura⁴, and M. Biyani^{1,2,4}
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- M176h SWEAT PH AND GLUCOSE ANALYZER BASED ON PAPER MICROFLUIDICS AND SOLID-STATE MICROSENSORS**
E.P. Córcoles, C. Fernández-Sánchez, and A. Baldi
Consejo Superior de Investigaciones Científicas (CSIC), SPAIN
- T170h A MICROFLUIDIC DEVICE INTEGRATED DUAL CMOS POLYSILICON NANOWIRE SENSORS FOR ON-CHIP WHOLE BLOOD PROCESSING AND SIMULTANEOUS DETECTION OF MULTIPLE ANALYTES**
D.-H. Kuan, I.-S. Wang, C.-T. Lin, and N.-T. Haung
National Taiwan University, TAIWAN
- T171h AN IMPLANTABLE ULTRASONICALLY POWERED ELECTROLYTIC MICRO-DEVICE FOR TUMOR ABLATION**
T. Parupudi, R. Rahimi, J. Zhou, F. Afyani, S. Lelievre, and B. Ziaie
Purdue University, USA
- T172h DIFFUSION-BASED MICROFLUIDIC BREATH ANALYZER FOR DETECTION OF CANNABIS USE**
M. Paknahad, A. Ahmadi, and M. Hoorfar
University of British Columbia, CANADA
- T173h DIRECT GENOMIC AND VIRAL DNA ELECTROCHEMICAL SENSING AT THE SUB-FEMTOMOLAR LEVEL: IMPORTANCE OF THE CARBON-BASED TRANSDUCER**
B. Zribi^{1,2,3}, A. Ouerghi¹, E. Roy¹, A. Pallandre^{1,2}, S. Chebil¹, M. Koubaa³, N. Mejri², H. Magdinier Gomez², C. Sola², H. Korri-Yousseoufi², and A.-M. Haghiri-Gosnet¹
¹*LPN CNRS, FRANCE*, ²*Université Paris-Sud, FRANCE*, and ³*Université de Sfax, TUNISIE*

Chemical & Electrochemical Sensors

- T174h** **HIGHLY STABLE MICRO CATALYTIC METHANE SENSOR ARRAY BY IN-SITU HYBRID SCREEN-INKJET PRINTING**
W. Lu¹, H. Yu¹, G. Jing¹, and T. Cui²
¹ Tsinghua University, CHINA and ² University of Minnesota, USA
- T175h** **MASKLESS PHOTOLITHOGRAPHIC INTEGRATION OF LUMINESCENT CHEMICAL SENSORS INTO OFF-THE-SHELF ALL-GLASS MICROREACTORS**
S.A. Pfeiffer¹, S.M. Borisov², and S. Nagl¹
¹ Universität Leipzig, GERMANY and ² Technische Universität Graz, AUSTRIA
- T176h** **NOVEL PUMP-FREE MICROFLUIDIC SYSTEM FOR CONTINUOUS ELECTROCHEMICAL TITRATION**
H. Kakimoto¹, S. Higuchi¹, Y. Takesako¹, R. Miyake², and Y. Murakami¹
¹ Toyohashi University of Technology, JAPAN and ² University of Tokyo, JAPAN
- T177h** **REAL-TIME DETERMINATION OF OXYGEN AND PH IN DROPLET MICROFLUIDIC CULTURING SYSTEMS USING OPTICAL NANOSENSOR PARTICLES**
S. Sun¹, M. Horka¹, M. Tovar³, L. Mahler³, A. Ruszczak², J. Ehgartner¹, M. Roth³, P. Garstecki², and T. Mayr¹
¹ Graz University of Technology, AUSTRIA, ² Polish Academy of Science, POLAND, and ³ Hans Knöll Institute, GERMANY
- T178h** **SIMULTANEOUS IONIC CURRENT AND OPTICAL DETECTION OF FINE PARTICULATE MATTERS (PM2.5) BASED ON CROSS-JUNCTION MICROFLUIDIC DEVICE**
S. Rahong¹, T. Yasui¹, H. Yasaki¹, T. Yanagida², M. Kanai², K. Nagashima², N. Kaji¹, T. Kawai³, and Y. Baba¹
¹ Nagoya University, JAPAN, ² Kyushu University, JAPAN, and ³ Osaka University, JAPAN
- T179h** **ULTRA-FAST RESPONSIVE PHOTONIC CRYSTAL BASED VOLATILE ORGANIC COMPOUNDS (VOCs) SENSOR USING PEEL-OFF PROCESS**
H.-K. Chang and J. Park
Sogang University, KOREA
- W167h** **A GRAPHENE-BASED FORMALDEHYDE GAS SENSOR WITH IMMOBILIZED ENZYME BY LAYER-BY-LAYER SELF-ASSEMBLY**
S. Sando and T. Cui
University of Minnesota, USA
- W168h** **A MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICE FOR POINT-OF-CARE DETECTION OF THE ZIKA VIRUS**
R.B. Channon, Y. Yang, J.A. Adkins, B.J. Geiss, D.S. Dandy, and C.S. Henry
Colorado State University, USA
- W169h** **DEVELOPMENT OF AN ELECTROCHEMICALLY GENERATED FLUORESCENCE REPORTER SYSTEM FOR MICROCHIP ELECTROPHORESIS BASED ON A BIPOLAR ELECTRODE**
M.B. Wijesinghe¹, D.B. Gunasekara², and S.M. Lunte¹
¹ University of Kansas, USA and ² University of North Carolina, USA

Chemical & Electrochemical Sensors

- W170h** **DIGITAL ELECTROCHEMICAL ARRAY DETECTION ON A SINGLE WORKING ELECTRODE**
K. Ino, H. Shiku, and T. Matsue
Tohoku University, JAPAN
- W171h** **ELECTROCHEMICAL PAPER ANALYTICAL DEVICE FOR COMPOSITIONAL ASSESSMENT OF PARTICULATE MATTER COLLECTED ON WEARABLE SAMPLERS**
J. Mettakoonpitak, J. Volckens, and C.S. Henry
Colorado State University, USA
- W172h** **HIERARCHICALLY POROUS MICROSPHERES OF Co304@GRAPHENE FOR HIGHLY SELECTIVE AND SENSITIVE ELECTROCHEMICAL BIOSENSORS**
J.M. Jeong¹, H.B. Kim¹, E.J. Park¹, S.H. Seok¹, E.J. Lee¹, B.G. Choi², and D.H. Kim¹
¹*Korea Advanced Institute of Science and Technology (KAIST), KOREA* and ²*Kangwon National University, KOREA*
- W173h** **CARBONANOTUBE MODIFICATION OF MICRO-REFERENCE ELECTRODE FOR IMPROVED STABILITY OF POTENTIAL**
P. Vazquez¹, A. Sheehy¹, L. Smith², and E. Moore¹
¹*Tyndall National Institute, IRELAND* and ²*University College Cork, IRELAND*
- W174h** **OXYGEN SENSITIVE HYDROGEL MATRIX FOR 3D CELL CULTURE AND 3D OXYGEN CONCENTRATION MAPPING**
M. Virumbrales-Muñoz^{1,2,3}, A. Sridhar⁴, R. Monge^{1,2,3,4,5}, J.M. Ayuso^{1,2,3}, G.A. Llamazares^{1,2,3}, I. Ochoa^{1,2,3}, A. Ruggi⁶, L. Fernández^{1,2,3}, and S. Le Gac⁴
¹*Centro Investigacion Biomedica en Red, Bioingenieria, Biomateriales y Nanomedicina (CIBER-BBN), SPAIN*, ²*University of Zaragoza, SPAIN*, ³*Instituto de Salud Carlos III, SPAIN*, ⁴*University of Twente, NETHERLANDS*, ⁵*BEONCHIP S.L., SPAIN*, and ⁶*University of Fribourg, SWITZERLAND*
- W175h** **EXPLORE THE APPROPRIATE BIOLOGICAL NANOPORE SELECTED FROM PORE FORMING PROTEIN FAMILIES**
H. Watanabe¹, K. Tanaka², K. Tsumoto², and R. Kawano¹
¹*Tokyo University of Agriculture and Technology, JAPAN* and ²*University of Tokyo, JAPAN*
- W176h** **STAPLE-BASED ELECTROCHEMICAL PLATFORM FOR QUANTITATIVE ANALYSIS ON PAPER**
P.I. Nanni^{1,2}, A. González-López¹, E. Nuñez-Bajo¹, L. Blanco-Covian¹, C. Blanco-López¹, R.E. Madrid², and M.T. Fernández-Abedul¹
¹*Universidad de Oviedo, SPAIN* and ²*Universidad Nacional de Tucumán, ARGENTINA*

h - Sensors & Actuators, and Detection Technologies

Mass Spectrometric Detection

- M177h** **SAMPLE PRECONCENTRATION FOR PAPER SPRAY IONIZATION WITH A SELECTIVELY PERMEABLE VALVE**
G.I.J. Salentijn^{1,2}, N.N. Hamidon¹, and E. Verpoorte¹
¹*University of Groningen, NETHERLANDS* and ²*TI-COAST, NETHERLANDS*

Mass Spectrometric Detection

M178h ULTRA-SENSITIVE DETECTION METHOD WITH DROPLET BASED MICROFLUIDIC COUPLED TO MALDI-TOF

K. Mesbah, S. Bregant, R. Thai, V. Dive, and F. Malloggi
Université Paris-Saclay, FRANCE

T180h STAINLESS STEEL MICROREACTOR WITH CORONA DISCHARGE IONIZATION TIP FOR MASS SPECTROMETRIC ANALYSIS OF CHEMICAL REACTIONS

G. Scotti¹, S.M.E. Nilsson¹, V.-P. Matilainen², M. Haapala¹,
A. Salminen², and T. Kotiaho¹

¹*University of Helsinki, FINLAND and*

²*Lappeenranta University of Technology, FINLAND*

W177h TOWARDS A FULLY INTEGRATED, MINIATURIZED ION SOURCE FOR PORTABLE MASS SPECTROMETRY

G.I.J. Salentijn^{1,2}, R.D. Oleschuk³, and E. Verpoorte¹

¹*University of Groningen, NETHERLANDS, ²TI COAST, NETHERLANDS, and*

³*Queen's University, CANADA*

h - Sensors & Actuators, and Detection Technologies

Micropumps, Valves, and Dispensers

M179h CHIP INTEGRATED PERISTALTIC MICROPUMP

A. Loth and R. Förster

Beuth University of Applied Sciences, GERMANY

M180h FREQUENCY TUNING ALLOWS FLOW DIRECTION CONTROL IN A MICROFLUIDIC NETWORK WITH PASSIVE FEATURES

R. Jain and B. Lutz

University of Washington, USA

M181h LOW-COST, HIGH-PERFORMANCE AND MODULAR VALVES AND PUMPS USING HIGH-STROKE ACTUATORS FOR FLUID HANDLING

A. Shabanian, F. Goldschmidtboeing, A. Bhat Kashekodi, S. Vilches,
H.H. Phan, A. Jamali, and P. Woias

University of Freiburg, GERMANY

T181h A pH-REGULATED DRUG DELIVERY DEVICE FOR TARGETING INFECTED REGIONS IN CHRONIC DERMAL WOUNDS

H. Jiang, R. Rahimi, M. Ochoa, T. Parupudi, and B. Ziaie

Purdue University, USA

T182h DEVELOPMENT AND DEMONSTRATION OF MICROFLUIDIC GLAUCOMA DRAINAGE DEVICE

R.C. Hsu¹, H. Kinoshita¹, R. Asaoka², M. Aihara², and T. Fujii¹

¹*University of Tokyo, JAPAN and ²University of Tokyo Hospital, JAPAN*

T183h FABRICATION AND CHARACTERIZATION OF LOW-COST STANDALONE POLYMER-BASED DISPOSABLE INKJET DISPENSER

A. Bsoul^{1,2}, S. Pan¹, E. Cretu¹, B. Stoeber¹, and K. Walus¹

¹*University of British Columbia, CANADA and*

²*Jordon University of Science and Technology, JORDON*

Micropumps, Valves, and Dispensers

- T184h MICROFLUIDICS VALVES WITH ZERO DEAD-VOLUME AND NEGLIGIBLE BACKFLOW FOR DROPLETS MANIPULATIONS**
D. Ferraro, M. Serra, J.-L. Viovy, and S. Descroix
Institut Curie/Institut Pierre-Gilles de Gennes, FRANCE
- W178h ARTIFICIAL CILIA FOR MICROPARTICLE MANIPULATION AND ANTI-FOULING**
S. Zhang^{1,2}, Y. Wang¹, and J. den Toonder¹
¹*Eindhoven University of Technology, NETHERLANDS and*
²*China Scholarship Council, CHINA*
- W179h ELECTRICALLY CONTROLLED THERMOELASTIC VALVE ARRAY FOR MULTIPLEXED IMMUNOASSAY**
Z.H. Fan, S. Augustine, C. Wang, P. Gu, X. Zheng, and T. Nishida
University of Florida, USA
- W180h GENERATION OF DROPLET SEQUENCES WITH PRE-SPECIFIED COMPOSITIONS USING A "HARDCODED" PERISTALTIC MICROPUMP**
A.M. Nightingale, G.W.H. Evans, S. Hassan, B.J. Kim, and X. Niu
University of Southampton, UK
- W181h VERIFICATION OF A FEMTOLITER-SWITCHING VALVE IN EXTENDED-NANO SPACE UTILIZING THIN GLASS DEFLECTION**
H. Takahashi, Y. Pihosh, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

h - Sensors & Actuators, and Detection Technologies

Optical Detection

- M182h A MICROFLUIDIC CHIP FOR SENSING ACTIVE CHLORINE AND CHLORAMINES IN SWIMMING POOLS**
C. Priest¹, S. Elmas¹, V. Vasilev¹, and T. Nann²
¹*University of South Australia, AUSTRALIA and*
²*Victoria University of Wellington, NEW ZEALAND*
- M183h ENHANCEMENT OF SENSITIVITY OF PHOTOTHERMAL PHASE CONTRAST DETECTOR USING MACH-ZEHNDER INTERFEROMETER WAVEGUIDE**
H. Shimizu, H. Morita, M. Sakakura, K. Miura, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- M184h HIGHLY SENSITIVE DETECTION OF SCATTERED LIGHT FROM PARTICLES BASED ON HETERODYNE INTERFEROMETRY**
D. Sakai, D. Sunada, and M. Motosuke
Tokyo University of Science, JAPAN
- M185h RAMAN SPECTROSCOPY COMPATIBLE PDMS DROPLET MICROFLUIDIC CULTURE AND ANALYSIS PLATFORM FOR ON-CHIP LIPIDOMICS**
S. Waqued, H.S. Kim, T.P. Devarenne, V. Yakovlev, and A. Han
Texas A&M University, USA

Optical Detection

- M186h SINGLE-MOLECULE BRIGHTNESS ANALYSIS IN NANOFLUIDIC CHANNELS**
H. Cheng, S. Stein, J. Thiart, I. Gregor, and J. Enderlein
Georg August University, Göttingen, GERMANY
- T185h A FULLY AUTOMATED WIRELESSLY POWERED CENTRIFUGAL PLATFORM TOWARDS A SAMPLE-TO-ANSWER CHEMILUMINESCENT ELISA ASSAY FOR CVD DETECTION**
S.M. Torres Delgado¹, D.J. Kinahan², N.A. Kilcawley², L.A.N. Julius², B. Henderson², J.G. Korvink³, J. Ducreé², and D. Mager³
¹*University of Freiburg, GERMANY*, ²*Dublin City University, IRELAND*, and ³*Karlsruhe Institute of Technology, GERMANY*
- T186h FILTER-FREE FLUORESCENCE MEASUREMENTS AT THE POINT OF CARE: A SIMPLE DEVICE TO IMPROVE THE LIMIT OF DETECTION OF LATERAL FLOW ASSAYS**
K.G. Shah, K. Abe, P.C. Kauffman, and P. Yager
University of Washington, USA
- T187h INTERFERENCE-BASED PROBE OF THE NANO-SCALE TOPOGRAPHY OF MICROPARTICLES**
J.C. Contreras-Naranjo, J. Chang, A. Jayaraman, and V.M. Ugaz
Texas A&M University, USA
- T188h OPTICAL SENSING OF OXYGEN IN MICROCAPILLARY FILMS**
N. Reis¹, C. Campos¹, B. Cardoso¹, K. Elvira², and A. deMello²
¹*Loughborough University, UK* and ²*ETH Zürich, SWITZERLAND*
- T189h REAL-TIME QUANTIFICATION OF BACTERIA OPTICAL DENSITY FOR PROPER FEEDING OF C. ELEGANS CULTURE ON A MICROFLUIDIC CHIP**
M.C. Letizia and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T190h ULTRA-SENSITIVE OPTICAL DETECTION METHOD OF NON-FLUORESCENT MOLECULES IN EXTENDED-NANO SPACES UTILIZING LIGHT DIFFRACTION**
Y. Tsuyama, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- W182h ANALYSES OF PARTICLE COMPOSITION IN VEGETABLES SUSPENSION USING EXCITATION-FLUORESCENT SPECTRAL FLOW CYTOMETER**
K. Takenaka and S. Togashi
Hitachi, Ltd., JAPAN
- W183h FLUORESCENCE FLOW MORIOMETRY - FLOW CYTOMETRY-LIKE ANALYSIS METHOD FOR SINGLE MOLECULE AND PARTICLE CHARACTERIZATION**
C.W. Beh^{1,2}, Y. Zhang², and T.-H. Wang²
¹*Agency for Science, Technology and Research (A*STAR), SINGAPORE* and ²*Johns Hopkins University, USA*

Optical Detection

W184h NANOPLASMON-ENHANCED MOLECULAR BEACONS FOR DNA DETECTION

A. Kannegulla, Y. Liu, and L.-J. Cheng
Oregon State University, USA

W185h PHANTOM MICROBEADS CHROMATOGRAPHY COLUMN IN MICROFLUIDICS

J. Saez¹, R. Lanfranco², M. Buscaglia², and F. Benito-Lopez^{1,3}
¹*University of the Basque Country, SPAIN*, ²*Università degli Studi di Milano, ITALY*, and ³*Insight, IRELAND*

W186h SIMPLE AND HIGHLY SENSITIVE FLUORESCENCE DETECTION BY SIDE-ENTRY LASER-BEAM ZIGZAG IRRADIATION FOR MULTI-CHANNEL MICROCHIP ELECTROPHORESIS

T. Anazawa¹, Y. Uchiho¹, T. Yokoi¹, and M. Yamazaki²
¹*Hitachi, Ltd., JAPAN* and ²*Hitachi High-Technologies Corporation, JAPAN*

h - Sensors & Actuators, and Detection Technologies

Others

M187h NANOMATERIALS MEET SELF-PROPELLED MICROMOTORS: TOWARDS "SMART" TOOLS FOR REAL-TIME SENSING AND MICROCHIP APPLICATIONS

B. Jurado-Sánchez, R. María-Hormigos, and A. Escarpa
University of Alcalá, SPAIN

T191h ONE-POT MICROSPHERE BARCODING USING FLUORESCENT OLIGONUCLEOTIDES

M. Dagher, M. Kleinman, R. Zonis, A. Ng, and D. Juncker
McGill University, CANADA

W187h FLEXIBLE AND WEARABLE HEALTH MONITORING DEVICES

Y. Yamamoto, S. Harada, W. Honda, T. Arie, S. Akita, and K. Takei
Osaka Prefecture University, JAPAN

h - Sensors & Actuators, and Detection Technologies

Physical Sensors

M188h ELECTRICAL SENSING OF BACTERIAL GROWTH IN μ L-VOLUME MICROFLUIDIC DROPLETS

B.P. Cahill, N. Karippai, S. Wiedemeier, Y. Li, A. Barthel, T. Nacke, and G. Gastrock
Institut für Bioprozess- und Analysenmesstechnik, GERMANY

M189h MAGNETIC MICROBEADS SENSING BY FERROMAGNETIC RESONANCE USING A SINGLE CHIP MICROWAVE OSCILLATOR

E. Montinaro, G. Gualco, J. Brugger, and G. Boero
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

Physical Sensors

- M190h WINE FERMENTATION MONITORING USING PIEZOELECTRIC MEMS RESONATORS**
G. Pfusterschmied¹, M. Kucera^{1,2}, J. Toledo³, W. Steindl^{1,2}, V. Ruiz-Diez³, A. Bittner¹, M. Schneider¹, J.L. Sanchez-Rojas³, and U. Schmid¹
¹Vienna University of Technology, AUSTRIA, ²AC2T Research GmbH, AUSTRIA, and ³University de Castilla, La Mancha, SPAIN
- T192h FORCE SENSOR PROBE USING QUARTZ CRYSTAL RESONATOR HAVING 104 MEASUREMENT RANGE FOR MECHANICAL CHARACTERIZATION OF SPHEROIDS**
A. Sato¹, S. Sakuma¹, N. Kojima², F. Tao², and F. Arai¹
¹Nagoya University, JAPAN, and ²Yokohama City University, JAPAN
- T193h MIDAS: MICROFLUIDICS DETECTION USING ACOUSTIC SPECTROSCOPY**
C. McIntosh, A. Chen, M. Napoli, B. Bamieh, K. Turner, and S. Pennathur
University of California, Santa Barbara, USA
- T194h WIRELESS AND PASSIVE PIEZOELECTRIC MICROELECTROMECHANICAL RESONANT SENSORS FOR REAL TIME PHYSICAL AND BIOCHEMICAL SENSING**
Y. Duan, Y. Chang, J. Liang, Y. Jiang, W. Pang, X.X. Duan, and M.L. Zhang
Tianjin University, CHINA
- W188h A MULTIPLEXED RESISTIVE PULSE SENSOR NETWORK FOR SIMULTANEOUS DETECTION OF CELLS IN A 10-CHANNEL MICROFLUIDIC CHIP**
N. Wang, R. Liu, C. Chu, and A.F. Sarioglu
Georgia Institute of Technology, USA
- W189h IMPROVEMENT OF SENSITIVITY FOR A β PROTEIN IN ON CANTILEVER BIOSENSOR BY INCORPORATING DPPC LIPOSOME WITH CHOLESTEROL**
Y. Murakami¹, Z. Zhang¹, T. Taniguchi¹, M. Sohgewa², K. Yamashita¹, and M. Noda¹
¹Kyoto Institute of Technology, JAPAN and ²Niigata University, JAPAN
- W190h SUSPENDED SILVER-POLYDIMETHYLSILOXANE MICROBRIDGES FOR SENSING THE BULK TEMPERATURE OF MICROFLOWS**
B. Barron, M. Pallapa, and P. Rezai
York University, CANADA

h - Sensors & Actuators, and Detection Technologies

Visualization & Imaging Technologies

- M191h FLOURESCENTLY VISIBLE PARYLENE-C COATED PIPETTE FOR TARGETED CELL MANIPULATION**
L.Q. Zhang, Y.P. Liu, X.F. Zhao, Z.H. Li, and W. Wang
Peking University, CHINA
- M192h MICRON-RESOLUTION SHEAR STRESS IMAGING**
Y. Ichikawa, M. Yamamoto, and M. Motosuke
Tokyo University of Science, JAPAN

Visualization & Imaging Technologies

- M193h UNDERWATER ATOMIC FORCE MICROSCOPE FOR IN-SITU NANOSCALE IMAGING IN DEEP SEA**
S. Nishida¹, N. Matsubara¹, T. Fukuba², M. Kyo², and T. Fujii¹
¹University of Tokyo, JAPAN and
²Japan Agency for Marine-Earth Science, JAPAN
- T195h FLUORESCENCE POLARIZATION-BASED MULTIPLE SAMPLES DETECTION USING MICROCHAMBER ARRAY TOWARDS HIGH-THROUGHPUT MOLECULAR INTERACTION ANALYSIS**
O. Wakao¹, M. Maeki¹, A. Ishida¹, H. Tani¹, A. Hibara², and M. Tokeshi¹
¹Hokkaido University, JAPAN and ²Tohoku University, JAPAN
- T196h NARROW PHOTONIC-PLASMONIC RESONANCES IN PETAL-LIKE-CAPPED-NANOPILLAR RESONATORS FOR REAL-TIME, ULTRASENSITIVE COLORIMETRIC SENSING**
J. Fan, W. Wu, J. Zhu, and H. Yun
Peking University, CHINA
- T197h VISUALIZATION OF LOCAL "HOT SPOTS" DURING ISOELECTRIC FOCUSING ON CHIP BY IR THERMOGRAPHY**
N. Nordman, M. Haapala, R. Kostianen, and T. Sikanen
University of Helsinki, FINLAND
- W191h AN INTEGRATED MICROFLUIDICS AND MOBILE MICROSCOPY PLATFORM FOR SICKLE CELL DISEASE SCREENING AT THE POINT OF CARE**
C. D'Costa, M. Singh, O. Sharma, S. Singh, N. Mehendale, S. Satti, and D. Paul
Indian Institute of Technology, Bombay, INDIA
- W192h MEASUREMENT OF HEAT DIFFUSION OF SINGLE LIVING CELLS AND LIPOSOMES USING IR LASER AND MICROCHAMBER**
K. Okabe^{1,2}, M. Takinoue^{2,3}, M. Morita³, K.V. Tabata^{1,2}, H. Noji¹, and T. Funatsu¹
¹University of Tokyo, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN, and ³Tokyo Institute of Technology, JAPAN
- W193h REAL-TIME OPEN SOURCE MACHINE VISION SOFTWARE FOR CLOSED LOOP CONTROL OF FLOW IN MICROFLUIDICS DEVICES**
A.M. Esmaeel, A.B. Sharkawy, T. ElMelegy, and M. Abdelgawad
Assiut University, EGYPT

i - Separations, Reactions, and Other Applications for Microfluidics

Chemical & Particle Synthesis

- M194i EFFECTS OF THE GROOVED STRUCTURES AND THE ETHANOL CONCENTRATION ON THE SMALL-SIZED LIPID NANOPARTICLES FORMATION**
Y. Fujishima¹, M. Maeki¹, Y. Sato¹, T. Yasui², A. Ishida¹, H. Tani¹, Y. Baba², H. Harashima¹, and M. Tokeshi^{1,2}
¹Hokkaido University, JAPAN and ²Nagoya University, JAPAN
- M195i MICROFLUIDIC FORMATION OF FUNCTIONAL CORE-SHELL BEADS**
M. Shimanuki, Y. Komazaki, and T. Torii
University of Tokyo, JAPAN

Chemical & Particle Synthesis

- T198i** **HETEROGENEOUS GROWTH OF SILVER NANOWIRES THROUGH SILVER CHLORIDE AND ITS APPLICATION FOR A FLUORESCENCE ENHANCEMENT BASED ON LOCALIZED SURFACE PLASMON RESONANCE**
S. Bae¹, H. Han², J.G. Bae¹, S.H. Im², D.-H. Kim¹, and T.S. Seo¹
¹*Korea Advanced Institute of Science and Technology (KAIST), KOREA* and
²*Kyunghee university, KOREA*
- T199i** **SCHLENK LINE TO GO: SMALL-SCALE PREPARATION OF AIR-SENSITIVE PRECURSOR SOLUTIONS AND NANOCRYSTALS**
P. Saberi¹, R. Wang², and A. Guenther¹
¹*University of Toronto, CANADA* and
²*University of California, Berkeley, USA*
- W194i** **A NOVEL MICROFLUIDIC SCREENING PLATFORM FOR COMBINATORIAL DROPLET SCREENING**
L.A. Bawazer¹, S. Li¹, M.J. McPherson¹, X. Niu², A. DeMello³, and F.C. Meldrum¹
¹*University of Leeds, UK*, ²*of Southampton, UK*, and
³*ETH Zürich, SWITZERLAND*
- W195i** **LOW TEMPERATURE CO-FIRED CERAMICS MICROREACTOR FOR THE SYNTHESIS OF CARBON DOTS WITH FLUORESCENCE IMAGING OF THE REACTION PROGRESS**
M. Berenguel-Alonso¹, A. Salinas-Castillo², B. Fernández², P. Couceiro¹, J. Alonso-Chamarro¹, L.F. Capitán-Vallvey², and M. Puyol¹
¹*Universitat Autònoma de Barcelona, SPAIN* and
²*Universidad de Granada, SPAIN*

i - Separations, Reactions, and Other Applications for Microfluidics

Chromatographic Separations

- M196i** **DEVELOPMENT OF A MICROFLUIDIC DEVICE WITH INTEGRATED VALVES AND PHOTODIODES FOR RAPID OPTIMIZATION OF CHROMATOGRAPHIC SEPARATIONS OF MONOCLONAL ANTIBODIES**
I.F. Pinto^{1,2}, D.R. Santos^{1,2}, G. Petrucci^{1,3}, R.R.G. Soares^{1,2}, M.R. Aires-Barros², V. Chu¹, J.P. Conde¹, and A.M. Azevedo²
¹*INESC Microsystems and Nanotechnologies and Institute of Nanoscience and Nanotechnology, PORTUGAL*, ²*Institute for Bioengineering and Biosciences, PORTUGAL* and
³*University of Rome, La Sapienza, ITALY*
- M197i** **SUPPRESSION OF BAND BROADENING IN MONODISPERSED AND POLYDISPERSED MICROPILLAR ARRAY COLUMNS IN LIQUID CHROMATOGRAPHY**
T. Iwaba, T. Naito, T. Kubo, and K. Otsuka
Kyoto University, JAPAN
- T200i** **PROTEIN PURIFICATION AND SEPARATION USING INTEGRATED GLASS NANOCAPILLARIES UNDER PRESSURE-DRIVEN CONDITIONS**
L. Duan and L. Yobas
Hong Kong University of Science and Technology, HONG KONG

Chromatographic Separations

- T201i** **SEPARATION AND DETECTION OF BIOMOLECULES IN EXTENDED-NANO CHANNEL USING UV DIFFERENTIAL INTERFERENCE CONTRAST THERMAL LENS MICROSCOPE**
H. Shimizu, N. Miyawaki, A. Smirnova, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- W196i** **ANALYTICAL PROTEIN AFFINITY CHROMATOGRAPHY OF NANOLITER VOLUMES IN ON DEMAND WRITTEN LIQUID LINES**
T. Gleichmann¹, B. Hamouda¹, L. Gutzweiler¹, M.A. Graewert³, R. Zengerle^{1,2}, P. Koltay¹, and L. Riegger¹
¹University of Freiburg, GERMANY, ²Hahn-Schickard Freiburg, GERMANY, and ³EMBL Hamburg, GERMANY
- W197i** **ON-CHIP INTEGRATION OF HIGH PRESSURE CHIP LIQUID CHROMATOGRAPHY AND DROPLET MICROFLUIDICS**
R. Gerhardt and D. Belder
University of Leipzig, GERMANY

i - Separations, Reactions, and Other Applications for Microfluidics

Electrophoretic Separations

- M198i** **CONFINEMENT EFFECTS ON NON-EQUILIBRIUM DNA HYBRIDIZATION IN MICRO AND NANOFUIDIC CHANNELS**
C. McCallum, Y. Lin, J. de Rutte, I. Chen, and S. Pennathur
University of California, Santa Barbara, USA
- M199i** **ELECTROPHORETIC FRACTIONATION AND DETECTION OF PROTEINS USING DROPLETS**
M.S. Utomo and A.S. Basu
Wayne State University, USA
- M200i** **MATRIX-FREE DETERMINISTIC LATERAL DISPLACEMENT FOR DNA SEPARATION USING ELECTRO-HYDRODYNAMIC ACTUATION IN VISCOELASTIC LIQUIDS**
S. Méance, B. Chami, L. Boyer, C. Blatché, and A. Bancaud
Université de Toulouse, FRANCE
- M201i** **MONOLITHIC FREE FLOW ELECTROPHORESIS MICROFLUIDIC PLATFORM FABRICATED USING LOW TEMPERATURE CO-FIRED CERAMICS TECHNOLOGY WITH CONTINUOUS FLUORESCENCE IMAGING MONITORING OF THE SEPARATION PROCESS**
P. Couceiro and J. Alonso-Chamarro
Universidad Autònoma de Barcelona, SPAIN
- M202i** **ONLINE COUPLING OF LIQUID-LIQUID EXTRACTION AND ELECTROPHORETIC SEPARATION OF SODIUM AND GLUTAMATE USING AQUEOUS TWO-PHASE SYSTEMS**
C.D.M. Campos¹, F.G.R. Reyes¹, A. Manz², and J.A.F. da ¹
¹State University of Campinas, BRAZIL and
²Korea Institute of Science and Technology (KIST) - Europe, GERMANY

Electrophoretic Separations

- T202i** **CONTACTLESS CONDUCTIVITY DETECTION OF PROTEINS FOR MICROFLUIDIC ISOELECTRIC FOCUSING**
N.G. Arega¹, J. Song¹, K.J. Song², J. Kim³, M. Chung², and D. Kim¹
¹Myongji University, KOREA, ²Hongik University, KOREA, and ³Konkuk University, KOREA
- T203i** **DEVELOPMENT OF A DESIGNABLE DIGITAL ELECTROPHORESIS DEVICE BY CONNECTING CAPILLARY CARTRIDGES FILLED WITH A DIFFERENT FUNCTIONALIZED HYDROGEL**
Y. Aoki, T. Kanaoka, K. Matsuda, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN
- T204i** **MICROCHIP CE-ESI-MS FOR ASSESSING DIABETES MANAGEMENT**
M. Ramos-Payán^{1,3,4}, E.A. Redman², J.S. Mellors², and J.M. Ramsey¹
¹University of North Carolina, USA, ²5908 Devices Inc., USA, ³Microelectronic National Centre, SPAIN, and ⁴University of Seville, SPAIN
- T205i** **NOVEL VOLUMETRIC MICRO-INJECTOR FOR HIGHLY REPRODUCIBLE CAPILLARY ELECTROPHORESIS**
N.S. Ha, J. Ly, S. Cheung, and R.M. van Dam
University of California, Los Angeles, USA
- T206i** **SIZE-BASED RNA FRACTIONATION USING ISOTACHOPHORESIS**
C. Eid¹, J.G. Santiago¹, and R.J. Meagher²
¹Stanford University, USA and ²Sandia National Laboratories, USA
- W198i** **A HIGH-SENSITIVITY CYCLODEXTRIN-MICROCHIP ELECTROPHORESIS SIMULTANEOUS ANALYSIS OF GABAPENTIN AND PREGABALIN**
A.M. Zeid^{1,2}, J. Nasr², N. Kaji¹, F.F. Belal², M.I. Walash², and Y. Baba¹
¹Nagoya University, JAPAN and ²Mansoura University, EGYPT
- W199i** **CONTINUOUS-FLOW BIOMOLECULE SEPARATION THROUGH A 2D PERIODIC ARRAY BASED ON A GLASS CAPILLARY-WELL MOTIF**
L. Duan and L. Yobas
Hong Kong University of Science and Technology, HONG KONG
- W200i** **DIELECTROPHORESIS AT A NANOSLIT: CONTINUOUS-FLOW SEPARATION AND ANALYSIS OF GENE VACCINES**
M. Viehues¹, S. Wegener¹, A. Rischmüller^{1,2}, M. Schleef^{1,2}, and D. Anselmetti¹
¹Bielefeld University, GERMANY and ²PlasmidFactory GmbH & Co. KG, GERMANY
- W201i** **MICROFLUIDICS WITH POLYCARBONATE MEMBRANES FOR PROTEIN SEPARATION VIA FREE FLOW ISOELECTRIC FOCUSING ELECTROPHORESIS**
P. Novo, M. Jender, M. Dell'Aica, R.P. Zahedi, and D. Janasek
Leibniz-Institut für Analytische Wissenschaften, ISAS, e.V., GERMANY
- W202i** **ON-CHIP GEL ELECTROPHORESIS OF DNA IN INKJET 3D PRINTED LAB-ON-A-CHIP**
K. Adamski, W. Kubicki, and R. Walczak
Wrocław University of Science and Technology, POLAND

i - Separations, Reactions, and Other Applications for Microfluidics

Environmental Analysis

- M203i** **EFFICIENT DECONTAMINATION OF VOLATILE ORGANIC COMPOUNDS IN WATER BASED ON ZINC-OXIDE NANO-ENABLED MICROFLUIDIC REACTOR**
I. Azzouz, M. Capochichi-Gnanbodie, Y.G. Habba, Y. Leprince-Wang, F. Marty, and T. Bourouina
Université Paris-Est, FRANCE
- T207i** **MICROFLUIDIC DEVICE FOR IN SITU QUANTIFICATION OF MARINE MICROBIAL ATP WITH IN-LINE PHOTOLYSIS OF CAGED ATP AS INTERNAL STANDARD**
T. Fukuba¹, K. Hanatani², K. Okamura³, and T. Fujii²
¹Japan Agency for Marine-Earth Science and Technology, JAPAN, ²University of Tokyo, JAPAN, and ³Kochi University, JAPAN
- W203i** **BIOLOGICAL NANOPORE PROBE: EVALUATION OF PHYSICOCHEMICAL PROPERTIES OF DNA IN YOCTO (10⁻²⁴) LITRE SPACE**
M. Matsushita, H. Watanabe, M. Ohara, and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN
- W204i** **WATER FILM DEVICE FOR CONTINUOUS PARTICULATE MATTER COLLECTION**
T. Shimada¹, T. Yasui¹, A. Hibara², T. Yanagida³, N. Kaji¹, M. Kanai³, K. Nagashima³, T. Kawai⁴, and Y. Baba^{1,5}
¹Nagoya University, JAPAN, ²Tohoku University, JAPAN, ³Kyusyu University, JAPAN, ⁴Osaka University, JAPAN, and ⁵National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

i - Separations, Reactions, and Other Applications for Microfluidics

Fuel Cells

- M204i** **A HIGH-EFFICIENT AND ULTRA-LOW-TEMPERATURE REFORMING TYPE MICRO FUEL CELL SYSTEM**
H.S. Wang¹, C.P. Chang¹, Y.C. Su¹, Y.J. Huang², and F.G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN
- M205i** **OPTIMIZATION OF PROTON TRANSPORT IN EXTENDED-NANOCHANNELS TOWARDS INCREASE PERFORMANCE OF A μ FUEL CELL DEVICE**
K. Toyoda, Y. Pihosh, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN
- T208i** **HIGH PERFORMANCE MICRO PHOSPHORIC ACID FUEL CELL VIA LOW LEAKAGE PROTON EXCHANGE MEMBRANE COMPOSITED BY GRAPHENE OXIDE/GLASS MICROPOROUS FIBER**
C.-P. Chang¹, Y.-T. Chiu¹, C.-L. Lu¹, and F.-G. Tseng^{1,2}
¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN

Fuel Cells

W205i HIGH-EFFICIENT PROTON CONDUCTOR NANOCANNELS ARRAY BASED ON A FERROELECTRIC PROTON TRANSFER PHASE SUBSTRATE TOWARDS A μ -FUEL CELL

Y. Pihosh¹, H. Seo¹, K. Mawatari¹, Y. Kazoe¹, O. Tabata², T. Tsuchiya², and T. Kitamori¹

¹University of Tokyo, JAPAN and ²Kyoto University, JAPAN

i - Separations, Reactions, and Other Applications for Microfluidics

Microreactors & Micromixers

M206i HYDRODYNAMIC AND MASS TRANSFER CHARACTERISTICS OF A MICROBUBBLE COLUMN-BIOREACTOR

S. Lladó Maldonado¹, D. Rasch¹, A. Kasjanow², D. Bouwes², and R. Krull¹

¹Technische Universität Braunschweig, GERMANY and

²Micronit GmbH, GERMANY

M207i MICROFLUIDICS TO CONTROL SELECTIVITY DURING OXIDATION OF NAPHTHENIC-AROMATIC HYDROCARBONS

M. Siddiquee, A. de Klerk, and N. Nazemifard

University of Alberta, CANADA

T209i ACOUSTIC-ENHANCED 3D T JUNCTION FOR NANODRUG CRYSTALLIZATION

N.H.A. Le¹, J. Yu², H.V. Phan¹, A. Neild¹, H.K. Chan², and T. Alan¹

¹Monash University, AUSTRALIA and ²University of Sydney, AUSTRALIA

T210i INVESTIGATION OF CELL TRAJECTORIES IN CHAOTIC FLOW FIELDS GENERATED BY A HELICAL STATIC MICROMIXER FOR RAPID CROSSLINKING KINETICS

A. Priye, R. Renzi, M. Wu, R.J. Meagher, and K. Poorey

Sandia National Laboratories, USA

T211i THIOL-ENE-BASED, REPLICATED, HIGH-ASPECT RATIO MICROPILLAR ARRAYS AS IMMOBILIZED CHYMOTRYPSIN REACTORS

S. Tähkä¹, R. Provenzali¹, G. Boije af Gennäs¹, J. Yli-Kauhaluoma¹, V. Jokinen², and T. Sikanen¹

¹University of Helsinki, FINLAND and ²Aalto University, FINLAND

W206i CONTACTLESS MICROWAVE HEATING OF CONTINUOUS FLOW MICROFLUIDICS ON SILICON

T. Markovic¹, I. Ocket^{1,2}, B. Jones², and B. Nauwelaers¹

¹KU Leuven, BELGIUM and ²imec, BELGIUM

W207i MICROFLUIDIC EMULSIONS FOR EFFICIENT MASS TRANSPORT IN SOLVENT EXTRACTION PROCESSES

M.G. Simon, N.N. Watkins, and N.R. Beer

Lawrence Livermore National Laboratory, USA

i - Separations, Reactions, and Other Applications for Microfluidics

Other Energy/ Power Devices

M208i **ENHANCING MASS AND HEAT TRANSFER BY DEAN VORTICES AND CHAOTIC ADVECTION IN A SPIRAL MICROCHANNEL WITH 3D OBSTRUCTION STRUCTURES**

R. Arayanarakool, L. Balasubramaniam, B. Li, S.M.B. Maulod, S.D. Marshall, W. Heng, P.S. Lee, and P.C.Y. Chen
National University of Singapore, SINGAPORE

T212i **MODULAR CUSTOMIZABLE 3D-PRINTED BATTERIES FOR WEARABLE APPLICATIONS**

W. Yu, J. Zhou, R. Rahimi, H. Jiang, M. Ochoa, and B. Ziaie
Purdue University, USA

W208i **CONTINUOUS PRODUCTION OF BIODIESEL BY A PASSIVE MILLIMETER-MICROMETER FLUIDIC SYSTEM**

I.-L. Chen, S.-I. Yeh, and J.-T. Yang
National Taiwan University, TAIWAN

W209i **OPTIMIZATION THEORY FOR BALLISTIC ENERGY CONVERSION**

Y. Xie¹, M. Versluis², A. van den Berg², and J.C.T. Eijkel¹

¹*Northwestern Polytechnical University, CHINA and*

²*University of Twente, NETHERLANDS*

i - Separations, Reactions, and Other Applications for Microfluidics

Others

M209i **MOLECULAR EVOLUTION OF TRANSLATION-COUPLED RNA REPLICATING SYSTEM IN MICRO-SIZED COMPARTMENT UNDER CONTINUOUS STIRRING AND FLOW**

T. Yoshiyama, N. Ichihashi, and T. Ichii
Osaka University, JAPAN

M210i **PRESSURE AND FLOW-BALANCED MICROFLUIDIC SERIAL DILUTION NETWORK FOR POINT-OF-CARE DIAGNOSTIC DEVICES**

N. Vasilakis, D. Moschou, H. Morgan, and T. Prodromakis
University of Southampton, UK

T213i **MOLECULAR EVOLUTION OF ANTIMICROBIAL PEPTIDES USING FROM ASCIDIACEA, FROG, AND HUMAN**

N. Saigo, Y. Sekiya, H. Watanabe, and R. Kawano
Tokyo University of Agriculture and Technology, JAPAN

W210i **MINECRAFT FOR MICROFLUIDICS: TEACHING LAB-ON-A-CHIP TO YOUNGER GENERATIONS**

M.D. Tarn^{1,2}, S.A. Peyman², C. Corlyon¹, H. Momtazian¹, J. Smith¹, M.D. Spencer¹, S.L. Taylor¹, M. Lorch¹, and N. Pamme¹

¹*University of Hull, UK and* ²*University of Leeds, UK*

i - Separations, Reactions, and Other Applications for Microfluidics

Particle Separations

- M211i** **DESIGN OF A RADIAL MICROFLUIDIC FILTER FOR CONTINUOUS HIGH-THROUGHPUT CLOG-FREE OPERATION**
N. Mehendale, O. Sharma, C. Dcosta, and D. Paul
Indian Institute of Technology, Bombay, INDIA
- M212i** **FLOW-RATE INSENSITIVE DETERMINISTIC PARTICLE SORTING USING A COMBINATION OF TRAVELLING AND STANDING SURFACE ACOUSTIC WAVES**
J.W. Ng¹, D.J. Collins², C. Devendran¹, Y. Ai², and A. Neild¹
¹*Monash University, AUSTRALIA* and
²*Singapore University of Technology and Design, SINGAPORE*
- M213i** **HIGH-RESOLUTION DEAN FLOW FRACTIONATION (HiDFF): A NOVEL DEAN MIGRATION PHENOMENON FOR SMALL MICROPARTICLE SEPARATION**
H.M. Tay, K.K. Tan, S. Kharel, S.C.J. Loo, and H.W. Hou
Nanyang Technological University, SINGAPORE
- M214i** **MICROMAGNETIC TRAPPING OF NANOMETRIC NON-SEDIMENTING SUPERPARAMAGNETIC PARTICLES FOR LAB-ON-CHIP DEVICES**
M. Fratzl, G. Blaire, S. Delshadi, P. Kauffmann, T. Devillers, F. Bruckert, O. Cugat, and N.M. Dempsey
University Grenoble, Alpes, FRANCE
- M215i** **SEXUAL OFFENDER NODAL ISOLATION OF CELLS (SONIC): ACOUSTOPHORETIC SEPARATION OF SPERM CELLS FROM MOCK SEXUAL ASSAULT SAMPLES**
C. Clark, O. Scott, K. Jackson, A. Tsuei, and J.P. Landers
University of Virginia, USA
- T214i** **A MEMBRANELESS HIGH-THROUGHPUT MICRO-SEPARATOR**
B.-H. Choi¹, J.-H. Huang¹, A. Priye¹, B. Presley², A. Jayaraman¹, and V.M. Ugaz¹
¹*Texas A&M University, USA* and ²*Design 1 Solutions, USA*
- T215i** **DNA SAMPLE CLEANUP USING DETERMINISTIC LATERAL DISPLACEMENT**
R. Kim¹, A. Kühnlein¹, D.A. Smith², B.D. Ho¹, A. Grunwald³, J.P. Beech¹, R.K. Neely², Y. Ebenstein³, and J.O. Tegenfeldt¹
¹*Lund University, SWEDEN*, ²*University of Birmingham, UK*, and
³*Tel Aviv University, ISRAEL*
- T216i** **FOCUSING BEHAVIOR OF MICROPARTICLES BY MEANS OF INERTIAL MICROFLUIDICS IN A SYMMETRICAL CURVILINEAR MICROCHANNEL**
A. Özbey, M. Karimzadehkhoei, S. Akgönül, D. Gözüağç, and A. Koşar
Sabancı University, TURKEY
- T217i** **INERTIAL FOCUSING IN TRIANGULAR CHANNELS AND SIZE-BASED PARTICLE SEPARATION**
J.A. Kim¹, J.R. Lee², E.C. Jeon², and W. Lee¹
¹*Korea Advanced Institute of Science and Technology (KAIST), KOREA* and
²*Korea Institute of Machinery & Materials (KIMM), KOREA*

Particle Separations

- T218i** **MULTIFUNCTIONAL BUBBLE BASED HIGH THROUGHPUT MICROCHIP TO ISOLATE CIRCULATING TUMOR CELLS AND PLASMA**
Sh. Karimi¹, M. Mohammadi², J. Farré-Lladós¹, and J. Casals-Terré¹
¹Universitat Politècnica de Catalunya, SPAIN and
²Dublin City University, IRELAND
- T219i** **VIRUS PURIFICATION BY BEAD-BASED IMMUNOREACTION AND RAPID ELECTROKINETIC PATTERNING**
A.Y. Chen and H.S. Chuang
National Cheng Kung University, TAIWAN
- W211i** **CELL SWEEPER FOR MICROFLUIDIC CAVITY**
C.-H.D. Tsai and M. Kaneko
Osaka University, JAPAN
- W212i** **FLOW ENHANCED NON-LINEAR MAGNETOPHORESIS FOR BEADS AND BIO-SEPARATION**
P. Li, S. Rampini, A. Lesniak-Padsiadlo, and G.U. Lee
University College Dublin, IRELAND
- W213i** **IN-SITU PARTICLE SEPERATIONS USING INERTIAL MICROFLUIDICS COMBINED WITH TANGENTIAL FLOW FILTRATION**
M. Garcia and S. Pennathur
University of California, Santa Barbara, USA
- W214i** **INERTIAL MICROFLUIDIC PARTICLE SEPARATION IN CO-FLOW SYSTEM AND TUNING OF SEPARATION THRESHOLD**
D. Lee, S.M. Nam, J. Kim, and W. Lee
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- W215i** **PARTICLE SEPARATION AND DIFFUSION BASED LIMITATION**
T.S.H. Tran, A.D. Andres, J.P. Beech, and J.O. Tegenfeldt
Lund University, SWEDEN
- W216i** **TUNABLE SIZE- AND CHARGE-BASED PARTICLE CHROMATOGRAPHY USING TIME-VARYING VOLTAGE GRADIENTS**
S. Fernandez-Poza, P.P.M.F.A. Mulder, and E. Verpoorte
University of Groningen, NETHERLANDS



Jeanie Johnston, River Liffey, Dublin

- M216j 3D MODELING OF ON-CHIP ACOUSTOPHORETIC PARTICLE MANIPULATION IN A POLYMER MICROFLUIDIC DEVICE**
E. Çağatay¹, M.B. Özer¹, B. Çetin²
¹TOBB University of Economics and Technology, TURKEY and
²Bilkent University, TURKEY
- M217j A RECONFIGURABLE STICK-N-PLAY MODULAR MICROFLUIDIC SYSTEM USING MAGNETIC INTERCONNECTS**
P.K. Yuen
Corning Incorporated, USA
- M218j ONE STOP LAB ON CHIP PLATFORM FOR TISSUE PROCESSING AND CELL SAMPLE PREPARATION**
S. Al-Mofty^{1,3}, N. Elbadri^{1,3}, A. Altayyeb¹, O. Omar², M. Elsayed⁴,
A. Wahbi², H. Ali², M. Abdelgawad^{1,2}, and N. Mousa¹
¹Zewail City of Science and Technology, EGYPT, ²Assiut University, EGYPT,
³Center of Excellence for Stem Cells and Regenerative Medicine (CESC),
EGYPT, and ⁴American University, Cairo, EGYPT
- M219j ARE 3D SPHEROIDS ALWAYS MORE RESISTANT TO CHEMOTHERAPY THAN 2D CULTURES? A CHIP-BASED SURVEY USING OVARIAN CANCER CELL LINES**
B. Patra^{1,2}, E. Carmona², M.A. Lateef², J. Kendall-Dupont², B. Peant²,
D. Provencher², A.M. Mes-Masson², and T. Gervais²
¹Ecole Polytechnique de Montréal, CANADA and
²Institut du Cancer de Montréal, CANADA
- M220j CHARACTERIZATION AND 3D-LOCALIZATION OF HUMAN WHITE BLOOD CELLS IN MICROFLUIDIC FLOWS**
D. Dannhauser¹, D. Rossi¹, P. Memmolo², A. Finizio²,
F. Causa^{1,3}, P. Ferraro², and P.A. Netti^{1,3}
¹Istituto Italiano di Tecnologia (IIT), ITALY, ²CNR-ISASI Institute of Applied Sciences & Intelligent Systems "E. Caianiello", ITALY, and
³Università degli Studi di Napoli "Federico II", ITALY
- M221j COMBINING ELECTROKINETICS WITH DETERMINISTIC LATERAL DISPLACEMENT**
B.D. Ho, J.P. Beech, and J.O. Tegenfeldt
Lund University, SWEDEN
- M222j DETAILED CHARACTERIZATION OF PLASMIDS CARRYING RESISTANCE GENES USING OPTICAL DNA MAPPING**
V. Müller¹, L.K. Nyberg¹, S. Quaderi^{1,2}, E. Kristiansson¹,
T. Ambjörnsson², L. Sandegren³, and F. Westerlund¹
¹Chalmers University of Technology, SWEDEN,
²University, SWEDEN, and
³Uppsala University, SWEDEN

j - Late News

- M223j DROPLET-BASED MICROFLUIDIC FOR HIGH-THROUGHPUT ENZYMATIC SCREENING OF L-ASPARAGINASE ACTIVITY**
A. Vigne¹, M. Morvan¹, T. Beneyton¹, J. Vrignon¹,
J. Lopez-Morales², M. Konrad², and J.-C. Baret^{1,2}
¹University of Bordeaux, FRANCE and
²Max Plank Institute for Dynamics and Self-Organization, GERMANY
- M224j ENGINEERING PDMS TOPOGRAPHY ON MICROGROOVED PARYLENE C**
I. Sanzari, M. Callisti, T. Polcar, and T. Prodromakis
University of Southampton, UK
- M225j FLEXIBLE AND TRANSPARENT GRAPHENE ELECTRODE ARRAY FOR RECORDING NEURAL ACTIVITY**
C.H. Moon, S.K. Ameri, M. Armbruster, R. Gill, C.G. Dulla,
and S.R. Sonkusale
Tufts University, USA
- M226j HIGHLY INTEGRATED SMART HYDROGELS AS VALVES IN CHAMBERS FOR BATCH CULTIVATION OF SACCHAROMYCES CEREVISIAE**
S. Haefner¹, P. Frank¹, C. Probst², M. Elstner³, and A. Richter^{1,3}
¹Technische Universität Dresden, GERMANY, ²Forschungszentrum Jülich GmbH, GERMANY, and ³Center for Advancing Electronics Dresden, GERMANY
- M227j INTEGRATED CELL CULTURE PLATFORM FOR REAL-TIME MONITORING OF ADHERENT CELL CULTURES**
M. Grajewski¹, T. Paul², E. Verpoorte¹, and D. Kashanin²
¹University of Groningen, NETHERLANDS and ²Cellix Ltd, IRELAND
- M228j LOW-COST AND EASY PRODUCIBLE PAPER-PRINTED DIGITAL MICROFLUIDIC CHIPS**
S. von der Ecken¹, D. Sánchez¹, P. Teunissen², H. Raat^{3,4},
R. Ahrens¹, and A.E. Guber¹
¹Karlsruher Institut für Technologie, GERMANY, ²Holst Centre - TNO, NETHERLANDS, ³Erasmus Medical Center, NETHERLANDS, and
⁴University of Pittsburgh, USA
- M229j MICROFLUIDIC APPROACH FOR TESTING CHEMICAL IRRITANTS MICROVESSELS NETWORK**
J.H. Ko¹, S. Oh², and N.L. Jeon¹
¹Seoul National University, KOREA and
²Amorepacific Corporation R&D Center, KOREA
- M230j MICROFLUIDIC RADIOLABELLING OF THE CHELATOR DOTA WITH GALLIUM-68 AT ROOM TEMPERATURE FOR USE IN PET IMAGING**
H.A. Bignell, M.D. Tarn, B.P. Burke, N. Pamme, and S.J. Archibald
University of Hull, UK
- M231j MICROFLUIDICS: WHICH TYPE OF 3D PRINTER?**
N.P. Macdonald, J.M. Cabot, P. Smjekal, R.M. Guijt,
M.C. Breadmore, and B. Paull
University of Tasmania, AUSTRALIA

j - Late News

- M232j** **MODEL-BASED DESIGN OF LATERAL FLOW BIOSENSORS**
C.L.A. Berli and P.A. Kler
Universidad Nacional del Litoral-CONICET, ARGENTINA
- M233j** **3D PARTICLE FOCUSING IN TIGHTLY CURVING HELICAL MICROCHANNELS**
P. Paié¹, F. Bragheri¹, D. Di Carlo², and R. Osellame¹
¹*Istituto di Fotonica e Nanotecnologia (IFN)-CNR, ITALY* and
²*University of California, Los Angeles, USA*
- M234j** **PHOTOAUTOTROPHIC CULTURE OF MICROALGAL STRAINS IN MICRODROPLETS WITH MICROFLUIDIC MICROPILLAR ARRAYS**
Y.J. Sung, J.Y.H. Kim, J.W. Choi, and S.J. Sim
Korea University, KOREA
- M235j** **SEPARATION OF SPERMATOOZOA WITH A COMBINATION OF PINCHED FLOW FRACTIONATION AND TANGENTIAL FILTRATION**
J.T.W. Berendsen, J.C.T. Eijkel, and L.I. Segerink
University of Twente, NETHERLANDS
- M236j** **SMALL-DRUG QUANTIFICATION WITHIN PAPER-BASED MICROSTRUCTURES FOR POINT-OF-CARE THERAPEUTIC DRUG MONITORING**
E.-D. Burgheslea, D. Prim, M. Pfeifer, and J.-M. Segura
University of Applied Sciences and Arts Western Switzerland, SWITZERLAND
- M237j** **SWITCHING CONCENTRATION/PARTITION BEHAVIOR OF MICRODROPLET CONTENTS BY USING FLOW RATE**
M. Fukuyama¹, Y. Yoshida¹, A. Hibara², and K. Maeda¹
¹*Kyoto Institute of Technology, JAPAN* and ²*Tohoku University, JAPAN*
- M238j** **THE MICROFLUIDIC MANUFACTURE OF ENCAPSULATED DROPLET INTERFACE BILAYERS USING A HYBRID 3D-PRINTED COAXIAL DEVICE**
D.K. Baxani, A.J. Morgan, J. Li, D.A. Barrow, and O.K. Castell
Cardiff University, UK
- M239j** **VERSATILE STRATEGIES FOR THE MICROFLUIDIC GENERATION OF LIPID-STABILISED DOUBLE EMULSIONS**
T. Trantidou, Y. Elani, and O. Ces
Imperial College London, UK
- M240j** **VISUALIZATION AND MODELING OF ACOUSTIC MICROFLUIDIC ENRICHMENT IN UNCONVENTIONAL GEOMETRIES**
M. Binkley, A. Ledbetter, C. Devaney, B. Efron, S. Shahan, and J.M. Meacham
Washington University, St. Louis, USA

j - Late News

- T220j 3D AND 2D FABRICATED MICROFLUIDIC BIOCULTIVATION DEVICE WITH INTEGRATED OPTICAL DENSITY AND GLUCOSE OXIDASE BIOSENSOR**
P. Panjan, V. Virtanen, and A.M. Sesay
University of Oulu, FINLAND
- T221j ON-CHIP LIQUID REAGENT STORAGE AND DISPENSING USING THERMOFORMED BLISTER TECHNOLOGY FOR LOW-COST POINT-OF-CARE APPLICATIONS**
R. Sewart¹, S. Smith², K. Land², P. Roux², and H. Becker¹
¹*microfluidic ChipShop GmbH, GERMANY and*
²*Council for Scientific and Industrial Research, SOUTH AFRICA*
- T222j A FULLY AUTOMATED 3D ELECTRODE-BASED ELECTROROTATION SETUP FOR FAST AND ACCURATE SPECTRUM ACQUISITION**
S.C. Kilchenmann, I.R. Benmessaoud, and C. Guiducci
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T223j A SOFT CONTACT LENS WITH INTEGRATED MICROFLUIDIC SYSTEM FOR TEAR COLLECTION**
O. Kim^{1,2}, Y. Song¹, and J. Kim¹
¹*Korea Institute of Science and Technology, KOREA and*
²*University of Science and Technology, KOREA*
- T224j AN ENABLING PLATFORM FOR DETECTING CIRCULATING MicroRNA BIOMARKERS IN LOW-RESOURCE SETTINGS**
M.J. Jebrail¹, M. Martick², N. Karathanasis², A. Molins², I.P. Hong¹, A. Cho¹, J. Terrijärvi¹, J. Soto², and F. Christodoulou¹
¹*Miroculus, CANADA and* ²*Miroculus, USA*
- T225j BATTERY-POWERED MICROCONTROLLER WITH WIRELESS COMMUNICATION FOR RANDOM, OHMIC ACTUATION OF NOVEL WAX VALVES ON A LAB-ON-A-DISC PLATFORM**
I. Maguire, B. Heery, B. Andlauer, S. Gribbin, C. Nwankire, J. Duce, A. Morrin, and F. Regan
Dublin City University, IRELAND
- T226j CHARACTERIZING STIFFNESS OF SICKLE CELL TRAIT RED BLOOD CELLS UNDER STRENUOUS EXERCISE CONDITIONS**
Z. Xu¹, Y. Zheng¹, C. Wang², and Y. Sun¹
¹*University of Toronto, CANADA and* ²*Mount Sinai Hospital, CANADA*
- T227j COMPARISON OF DIRECT LASER WRITING AND UV PHOTOLITHOGRAPHY TECHNIQUES FOR FABRICATION OF HIGH ASPECT RATIO HOLLOW MICROTUBES**
R. Mishra, T.K. Maiti, and T.K. Bhattacharyya
Indian Institute of Technology Kharagpur, INDIA
- T228j DIELECTRIC SPECTROSCOPY FOR CHARACTERIZING LIQUIDS USING INTERDIGITATED COPLANAR CAPACITOR**
X. Bao¹, I. Ocket^{1,2}, and B. Nauwelaers¹
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j - Late News

- T229j DYNAMIC ANALYSIS OF IN VITRO CYTOTOXICITY OF METHOTREXATE-LOADED LIPID NANOPARTICLES FOR OSTEOSARCOMA THERAPY**
O. Mitxelena-Iriabarren¹, C.L. Hisey^{1,2}, Y. González-Fernández¹, E. Imbuluzqueta¹, M. Mujika¹, M.J. Blanco-Prieto¹, and S. Arana¹
¹University of Navarra, SPAIN and ²Ohio State University, USA
- T230j FABRICATION OF POLYMER NANOSTRUCTURES FOR BIOMIMETICS USING NANOIMPRINT TECHNOLOGY**
Y. Okawa, S. Hatori, H. Fujita, and K. Fujimoto,
Dai Nippon Printing Co., Ltd., JAPAN
- T231j HANGING-DROP NETWORKS FOR IN VITRO DOSE-RESPONSE STUDIES ON 3D TUMOR MICROTISSUES**
P.M. Misun, F. Forschler, A. Hierlemann, and O. Frey
ETH Zurich, SWITZERLAND
- T232j HIGHLY SENSITIVE GAS SENSOR BASED ON SILICON FIELD EFFECT TRANSISTOR**
Y.P. Wu^{1,2}, X.Y. Li², P.H. Chen², and Y.J. Yang¹
¹National Taiwan University, TAIWAN and ²Academia Sinica, TAIWAN
- T233j INVESTIGATION OF METAL-BINDING PROPERTIES OF CLINICALLY SIGNIFICANT COMPOUNDS USING MAGNETIC BEAD-BASED AGGLUTINATION ASSAY**
R. Uddin¹, E. Hwu², G. Rena³, and A. Boisen¹
¹Technical University of Denmark, DENMARK,
²Academia Sinica, TAIWAN, and ³University of Dundee, UK
- T234j MEMBRANE-LESS MICROFLUIDIC FUEL CELL WITH MULTIPHASE STREAMS**
S.M.H. Hashemi, P. Hadikhani, M. Neuenschwander,
M.A. Modestino, and D. Psaltis
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
- T235j MICROFLUIDIC INERTIAL FOCUSING IN NON-RECTANGULAR CROSS-SECTION CURVING MICROCHANNELS**
B. Ngamsom, A. Iles, J. Orpen, J. Ingleston, Z.R.B.Z. Aalam,
C. Alves, S. Lawal, and N. Pamme
University of Hull, UK
- T236j MICROFLUIDIC-CHIP SYSTEM BASED ON μ EME AND μ LPME FOR BIOLOGICAL AND ENVIRONMENTAL APPLICATIONS**
M. Ramos-Payan^{1,2} and A. Llobera¹
¹Microelectroninc National Centre, SPAIN and ²University of Seville, SPAIN
- T237j MICROGEL-BARCODE READOUT FOR miRNA QUANTIFICATION IN MICROFLUIDIC FLOW**
D. Rossi¹, D. Dannhauser¹, F. Causa^{1,2}, and P.A. Netti^{1,2}
¹Istituto Italiano di Tecnologia (IIT), ITALY and
²Università degli Studi di Napoli, ITALY

j - Late News

- T238j** **NANO/MICROFLUIDIC DEVICES FOR WHOLE-CELL BIOCATALYST ANALYSIS BY UV/VIS SPECTROSCOPY**
M. Viefhues, L. Schlüter, S. Wedde, H. Gröger, and D. Anselmetti
Bielefeld University, GERMANY
- T239j** **ON-CHIP PRESSURE MEASUREMENT WITH ULTRA-THIN GLASS SHEET**
Y. Yalikun and Y. Tanaka
RIKEN, JAPAN
- T240j** **PAPER-BASED ARRAY OF ENZYMATIC GLUCOSE ELECTROCHEMICAL SENSORS WITH A MULTIFUNCTIONAL LOW-COST INTERFACE TO COMMERCIAL CONNECTORS**
O. Amor-Gutiérrez, E. Costa Rama, and M.T. Fernández-Abedul
Universidad de Oviedo, SPAIN
- T241j** **SILICON-GLASS LoC FOR RELIABLE MULTI-PARAMETRIC CELL CULTURE MONITORING AND ADVANCED IMAGING**
P. Gimenez-Gomez¹, R. Rodríguez- Rodríguez², X. Muñoz-Berbel¹, J.M. Rios¹, E. Gonzalez¹, J.A. Plaza¹, and C. Jimenez-Jorquera¹
¹Consejo Superior de Investigaciones Científicas (CSIC), SPAIN and
²Universitat Internacional de Catalunya, SPAIN
- T242j** **STREAMING DIRECTION AND MICROPARTICLE SIZE EFFECTS IN STANDING SURFACE ACOUSTIC WAVE (SAW) DEVICES**
R. Barnkob¹, N. Nama², L. Ren², T.J. Huang², F. Costanzo², and C.J. Kähler¹
¹Bundeswehr University Munich, GERMANY and
²Pennsylvania State University, USA
- T243j** **TEMPLATED ELECTROFORMATION OF MICROSIZED LIPOSOMES USING MICROPATTERNED SILICON SUBSTRATES**
T. Trantidou, K. Daskalakis, and O. Ces
Imperial College London, UK
- T244j** **USING DIGITAL MICROFLUIDICS TO STUDY IN VITRO INVASION OF BREAST CANCER CELLS**
B.B. Li, B.T.V. Duong, M.D. Chamberlain, and A.R. Wheeler
University of Toronto, CANADA
- W217j** **3D CAPILLARY VALVES FOR VERSATILE CAPILLARY PATTERNING OF CHANNEL WALLS**
V.A. Papadimitriou, A. van den Berg, and J.C.T. Eijkel
University of Twente, NETHERLANDS
- W218j** **3D PRINTED MICROFLUIDIC REACTOR FOR HIGH THROUGHPUT CHITOSAN NANOPARTICLE SYNTHESIS**
M.D. Aşık¹, B. Çetin², M. Kaplan¹, Y. Erdem², and N. Sağlam¹
¹Hacettepe University, TURKEY and ²Bilkent University, TURKEY
- W219j** **A MICROFLUIDIC DESIGN TO GENERATE TWO DIMENSIONAL CHEMICAL GRADIENTS**
M. Badv, N. Sun, and T. Didar
McMaster University, CANADA

j - Late News

- W220j ALL FIBER BASED MICRO-FLOW CYTOMETER BY COMBINING OPTICAL FIBER WITH INERTIAL FOCUSING**
S. Etcheverry^{1,2}, A. Faridi¹, H. Ramachandraiah¹, W. Margulis², F. Laurell¹, and A. Russom¹
¹KTH Royal Institute of Technology, SWEDEN and
²Acreo Swedish ICT AB, SWEDEN
- W221j AN INTEGRATED ACOUSTO- AND DIELECTROPHORESIS DEVICE FOR TUMOR CELL SEPARATION, CONCENTRATION, AND SINGLE-CELL TRAPPING**
M. Antfolk¹, S.H. Kim², K. Saori², S. Kaneda², T. Fuji², and T. Laurell¹
¹Lund University, SWEDEN and ²University of Tokyo, JAPAN
- W222j BROWNIAN MOTION ENABLED RAPID PATHOGENS SCREENING**
Y.-J. Chen and H.-S. Chuang
National Cheng Kung University, TAIWAN
- W223j CLOTTING BLOOD USING SURFACE ACOUSTIC WAVES**
M. Jimenez, M.A. Khalid, R. Wilson, M. Tassieri, J. Reboud, and J.M. Cooper
University of Glasgow, UK
- W224j CORNEA DYSTROPHY MODEL IN 3D MICROFLUIDIC CELL CULTURE SYSTEM**
J. Ju^{1,4}, K.-Y. Lee², and J. Kim³
¹Korea University, KOREA, ²Korea Institute of Industrial Technology (KITECH), KOREA, ³Dankook University, KOREA, and
⁴Advanced Bio Micro (ABM) Scientific, KOREA
- W225j DIRECT FABRICATION OF GRAPHENE MICROELECTRODES FOR AMPEROMETRIC BIOSENSING VIA MONOLAYER FLAKES OF GRAPHENE OXIDE**
Y. Li, J. Mirza, D. Bizzotto, and K.C. Cheung
University of British Columbia, CANADA
- W226j ELECTROCHEMICAL MICROFLUIDIC BIOSENSOR FOR THE PROTEIN-BASED QUANTIFICATION OF B-LACTAMS**
R. Bruch¹, C. Chatelle¹, A. Kling², C. Dincer¹, W. Weber¹, and G. Urban¹
¹University of Freiburg, GERMANY and
²Swiss Federal Institute of Technology Zurich, SWITZERLAND
- W227j FINE-TUNING ELECTRICAL FLOW RATE SENSING IN DEFORMABLE CHANNELS**
P. Niu, B. Nablo, K. Bhadriraju, and D.R. Reyes
National Institute of Standards and Technology (NIST), USA
- W228j HIGH-PERFORMANCE MICROFLUIDIC EXOSOME PROFILING USING SELF-FORMED NANOCOATING FOR NON-INVASIVE CANCER DIAGNOSIS**
P. Zhang¹, M. He², and Y. Zeng¹
¹University of Kansas, USA and ²Kansas State University, USA

j - Late News

- W229j** **HYBRID ANALYTICAL-NUMERICAL MODELING OF INERTIAL LATERAL MIGRATION IN CURVING CONFINED MICROFLUIDIC FLOWS**
L. Clime, X.D. Hoa, K.J. Morton, and T. Veres
National Research Council of Canada, CANADA
- W230j** **LOW COST, ULTRA-HIGH THROUGHPUT PARTICLE COUNTING USING INERTIAL MICROFLUIDICS**
B. Çetin¹, H. Kaplan², G. Durkaya², and H. Kurtuldu³
¹*Bilkent University, TURKEY*, ²*Atılım University, TURKEY*, and ³*Baskent University, TURKEY*
- W231j** **MICROBUBBLE ASSISTED CELL SORTING BY ACOUSTOPHORESIS**
M.A. Faridi, H. Ramachandraiah, I.S. Iranmanesh, D. Grishenkov, M. Wiklund, and A. Russom
KTH Royal Institute of Technology, SWEDEN
- W232j** **MICROFLUIDIC METHOD FOR THE ELECTROCHEMICAL DETERMINATION OF ENDOTHELIAL PERMEABILITY**
J.F. Wong^{1,2}, E.W.K. Young¹, and C.A. Simmons^{1,2}
¹*University of Toronto, CANADA* and ²*Ted Rogers Centre for Heart Research, CANADA*
- W233j** **MICROFLUIDICS PLATFORM FOR ANALYSIS OF PROTEIN-PROTEIN INTERACTIONS IN INDIVIDUAL CANCER CELLS**
J.Y. Ryu¹, J. Kim², M. Shon², K. Kim³, J. Sun⁴, X. Ziang⁴, W. Lee², and T.-Y. Yoon¹
¹*Yonsei University, KOREA*, ²*Korea Advanced Institute of Science and Technology, KOREA*, ³*Korea Brain Research Institute, KOREA*, and ⁴*National Center for Nanoscience and Technology, CHINA*
- W234j** **MIMICKING HEAD-TAIL FORMATION OF THE HUMAN EMBRYO IN AN ELONGATED MICROPERFUSION CULTURE SYSTEM**
S. Tashiro¹, Y. Kusama¹, E. Nakatani¹, T. Sato², S. Sugiura², T. Kanamori², and K. Ohnuma¹
¹*Nagaoka University of Technology, JAPAN* and ²*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*
- W235j** **NEW PHOTOIMAGEABLE BONDING ADHESIVES: OPTICAL PROPERTIES AND REAL APPLICATION**
W. Kubicki, R. Walczak, and J.A. Dziuban
Wrocław University of Science and Technology, POLAND
- W236j** **PROBING ENZYME-SUBSTRATE HYDROLYSIS USING SILICON NANOWIRE FIELD-EFFECT-TRANSISTOR**
Y.P. Wu^{1,2}, D. Huang², and Y.J. Yang¹
¹*National Taiwan University, TAIWAN* and ²*Academia Sinica, TAIWAN*

j - Late News

- W237j** **QUANTITATIVE ANALYSIS OF THE CHEMOTACTIC RESPONSE OF A MOTILE MICROALGA, CHLAMYDOMONAS REINHARDTII, TOWARDS BICARBONATE USING FLOW-FREE MICROFLUIDIC DEVICE**
H.I. Choi, J.Y.H. Kim, J.W. Choi, and S.J. Sim
Korea University, KOREA
- W238j** **SISAL-BASED PAPER MICROFLUIDICS FOR BLOOD TYPING ASSAYS THROUGH REP-RAP PRINTING**
J. Casals-Terré, J. Farré-Lladós, A. Zuñiga, B. Roncero, T. Vidal, A. Padrós, and G. Sòria
Technical University of Catalonia, SPAIN
- W239j** **SUPERHYDROPHOBIC NANOSTRUCTURED MICROCHANNEL FOR IMPROVED STREAMING CURRENT ENERGY HARVESTING**
F. Fouché, T. Dargent, Y. Coffinier, A. Treizebré, A. Vlandas, and V. Senez
University of Lille, FRANCE
- W240j** **THE AUTOMATION OF NANO PARTICLE SAMPLE DELIVERY FOR PROTEIN CRYSTALLOGRAPHY EXPERIMENTS USING AN EVANESCENT FIELD OPTICAL TWEETING TECHNIQUE**
A.J. Diaz¹, P. Docker², J. Kay², D. Axford², W. O'Neill¹, G. Evans², M. Sparkes¹, B. Cordovez³, S. Fuglerud⁴, and D. Stuart²
¹University of Cambridge, UK, ²Diamond Light Source, UK, ³Optofluidics, UK, and ⁴European XFEL, GERMANY
- W241j** **MOBILE PHONE BASED HEMATOCRIT MEASUREMENT ON A CENTRIFUGAL MICROFLUIDIC POINT-OF-CARE PLATFORM**
J. Barreira^{1,2}, M. Donolato¹, C. Nogueira^{1,2}, and R. Burguer¹
¹Blusense Diagnostics, DENMARK and ²Instituto Superior Técnico, PORTUGAL



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- a** Cell Separation and Analysis
- b** Cells, Organisms, and Organs on Chip
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- e** Fundamentals in Microfluidics and Nanofluidics
- f** Integrated Microfluidic Platforms
- g** Micro- and Nanoengineering
- h** Sensors & Actuators, and Detection Technologies
- i** Separations, Reactions, and Other Applications for Microfluidics
- j** Late News

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MONDAY

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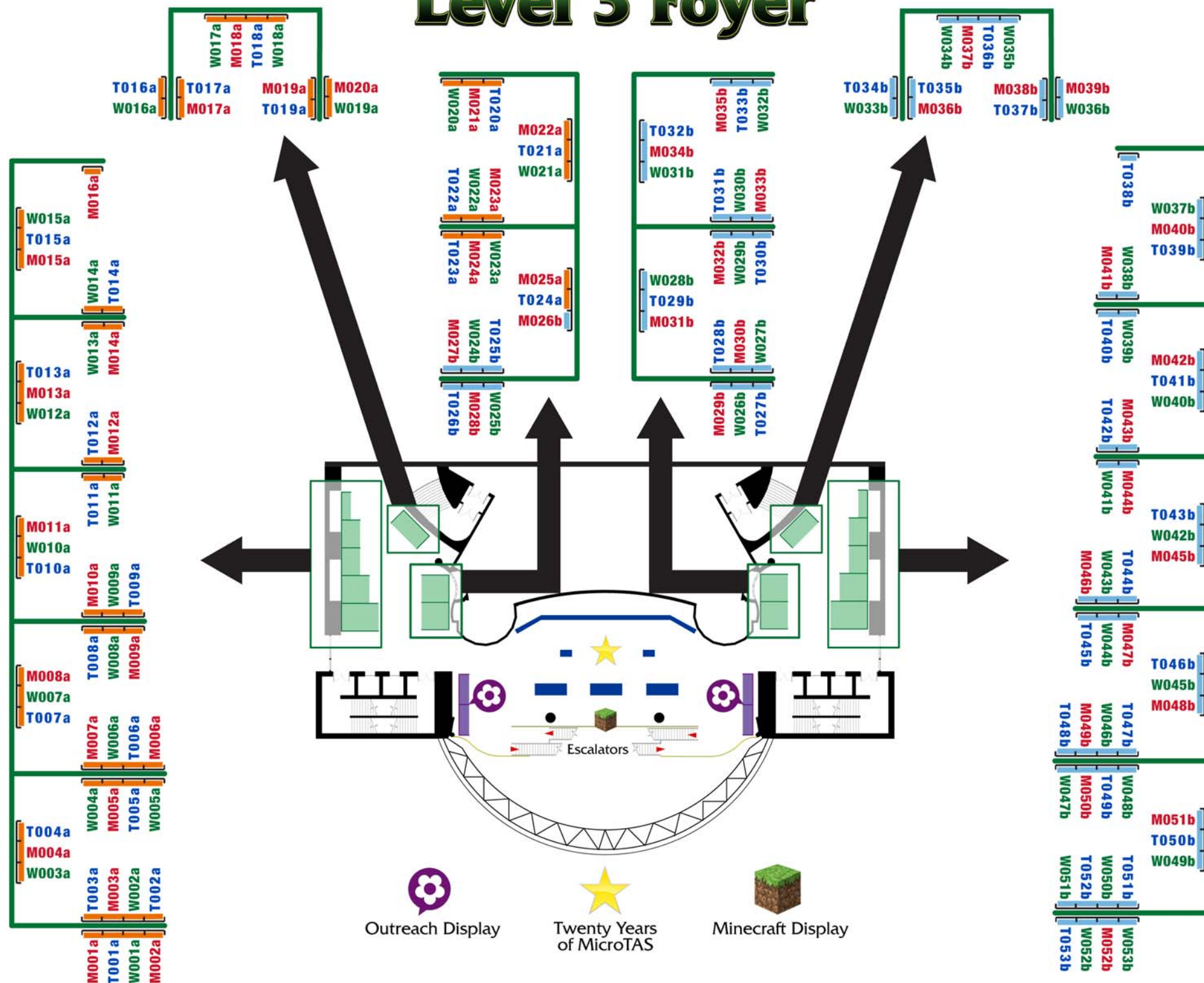
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