22nd International Conference on Miniaturized Systems for Chemistry and Life Sciences

FINAL PROGRAM
Sunday November 11

08:00-09:00 Workshop Registration
09:00-12:00 Morning Workshops (10:30 Break)
13:30-14:00 Workshop Registration
14:00-17:00 Afternoon Workshops (15:30 Break)
17:00-19:00 Conference Registration and Check-in, Kaohsiung Exhibition Center
17:00-19:00 Welcome Reception Dinner Buffet - Kaohsiung Exhibition Center

Monday November 12

08:00-18:00 Registration and Check-in
08:30-09:00 Opening Remarks
09:00-17:00 Plenary Presentation I
Chih-Ming Ho, University of California, Los Angeles (UCLA), USA
Room 301
09:45-10:15 Break - Exhibit and Poster Inspection
10:15-17:00 Session 1A1: Separation Techniques
Room 301
Session 1B1: DNA Diagnostics
Room 304
Session 1C1: Self Assembly
Room 305
11:30-12:30 Lunch - Sponsored by Zeon Corporation
12:35-13:05 KEYNOTE PRESENTATION
C. Chou
12:35-13:05 KEYNOTE PRESENTATION
J. COOPER
13:05-14:05 Session 1A1: Separation Techniques
Room 301
Session 1B1: DNA Diagnostics
Room 304
Session 1C1: Self Assembly
Room 305
14:05-16:05 Poster Session 1
14:05-16:05 Plenary Presentation II
Uwe Marx, TissUse GmbH, Germany
Room 301
16:50-17:00 Transition
17:00-17:40 Session 1A3: Imaging Techniques
Room 301
Session 1B3: Advanced Droplets
Room 304
Session 1C3: Capacitance/Impedance Measurement
Room 305
18:30-22:00 Student Mixer – MLD Arumi8 Bar
19:30-22:00 Woman Night Out - MLD Seafood Restaurant

Tuesday November 13

08:00-18:00 Registration
08:30-08:35 Announcements
08:35-09:20 Plenary Presentation III
Luke Lee, University of California, Berkeley, USA
Room 301
09:20-09:30 Transition
09:30-10:30 Session 2A1: Vascular Systems
Room 301
Session 2B1: C. Elegans
Room 304
Session 2C1: Single-Cell Biomolecular Analysis
Room 305
10:30-11:00 Break - Exhibit and Poster Inspection - Sponsored by Graduate Institute of Biomedical Engineering, Chang Gung University
11:00-12:20 MicroTAS 2018 Shark Tank Competition – Room 301
12:20-13:20 Lunch - Sponsored by MIRDC
13:20-14:50 Session 2A2: Centrifugal platform/ Blood Analysis
Room 301
Session 2B2: Organ-on-a-Chip
Room 304
Session 2C2: Serology/Immunization
Room 305
14:50-16:50 Poster Session 2
Conference-at-a-Glance

Wednesday November 14

08:30-18:00 Registration
08:30-08:40 Announcements
08:40-09:00 Analytical Chemistry Young Innovator Award and Presentation
09:00-09:20 Lab on a Chip and Dolomite - Pioneers in Miniaturization Prize and Presentation

09:20-09:30 Transition

09:30-10:50
<table>
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<th>Session 3A1: Nano-Fluidics / Nano-Pores</th>
<th>Session 3B1: Droplet Generation &amp; Manipulation</th>
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10:50-11:20 Break - Exhibit and Poster Inspection

11:20-12:20
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<tr>
<th>Session 3A2: Cell Arrays</th>
<th>Session 3B2: Tumor-on-a-Chip</th>
<th>Session 3C2: Single Cell Sorting and Separation</th>
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13:20-14:05 Plenary Presentation V
Tomokazu Matsue, Tohoku University, Japan
Room 301

14:05-14:15 MicroTAS 2019 Announcement

14:15-14:25 Transition

14:25-15:35
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<th>Session 3B3: Sorting / Cell Separation</th>
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<tr>
<td>KEYNOTE PRESENTATION 14:25-14:55 R. M. Owens</td>
<td>KEYNOTE PRESENTATION 14:25-14:55 N. Pamme</td>
<td></td>
</tr>
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15:35-17:35 Poster Session

16:00-17:35 Art in Science Award (at RSC booth)

17:35-18:35 Transition to Banquet

18:35-21:35 Conference Banquet - Sponsored by ASE Group

Thursday November 15

08:00-11:00 Registration
08:00-08:05 Announcements
08:05-08:50 Plenary Presentation VI
Evi Lianidou, University of Athens, Greece
Room 301

08:50-09:00 Transition

09:00-10:00
<table>
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<tr>
<th>Session 4A1: Genetics / DNA</th>
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<th>Session 4C1: Droplet Application: Manufacturing/Analytics</th>
</tr>
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10:00-10:30 Coffee Break

10:30-11:30
<table>
<thead>
<tr>
<th>Session 4A2: Cell Assay / Phenotyping</th>
<th>Session 4B2: Droplet Motion &amp; Manipulation</th>
<th>Session 4C2: Mechanobiology</th>
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<tbody>
<tr>
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</table>

11:30-11:40 Transition

11:40-12:20 CHEMINAS - Young Researcher Poster Awards Lab on a Chip – Widmer Poster Awards Microfluidics on Glass Award sponsored by IMT Masken und Teilungen AG
Room 301

12:20 Closing Remarks - Conference Adjourns Room 301
Internet Service

Internet

MicroTAS internet is available on 3rd floor only. For South Hall on 1st floor, please connect to the venue's Wi-Fi by searching Kaohsiung Exhibition Center (KEC).

Internet Wi-Fi:
Select "microtas" from the list of available networks.
Once prompted, the password is: 2018111115.

Conference App

Get instant access to all the program details!

Download the meeting app from the Apple App Store or Google Play by searching for "MicroTAS" or "MicroTAS Conferences".

MicroTAS on Twitter

Tweet your way through the Conference by using #microTAS2018.
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Welcome to the 22nd International Conference on Miniaturized Systems for Chemistry and Life Sciences

PREFACE

Welcome to MicroTAS 2018, the 22nd International Conference on Miniaturized Systems for Chemistry and Life Sciences. Following its rotation through the Americas (Savannah, USA in 2017), Europe (Dublin, Ireland in 2016), and even elsewhere in East Asia (Gyeongju, Korea in 2015), we are pleased to welcome you to this year’s meeting in Kaohsiung, Taiwan. MicroTAS continues to be the flagship international forum for reporting the latest research results in microfluidics, biosensing, and lab-on-a-chip (LOC) technologies, including related aspects of microfabrication, nanotechnology, integration, materials, surface modification, analysis and synthesis, and detection capacities for the life sciences and chemistry. The four-day meeting brings together researchers from the fields of engineering, chemistry, physics, and biology, with more than 1,100 researchers in attendance from universities and industrial partners worldwide.

The most exciting part of the meeting to us is the “Technical Program.” This year, abstract submissions were solicited within 10 core topic areas reflective of the scope of this growing field, spanning a range of interests from fundamental physics and chemistry, to systems-level integration, and then to clinical applications of microfluidic and LOC technologies in the biological and analytical sciences. In order to ensure the high quality of abstracts accepted at MicroTAS 2018, a Technical Program Committee (TPC) consisting of 60 of your colleagues from across the globe contributed significant time and energy towards evaluating all abstract submissions. Following the TPC’s evaluation, the 25-member Executive Technical Program Committee (ETPC) gathered at the end of June 2018 in Hsinchu, Taiwan to finalize decisions on paper acceptance, as well as the selection of oral presentations. At the end of the two-day process, ETPC members worked together to assemble a draft of the oral program, which has evolved into the final program featured herein. For the 2018 meeting, a total of 1022 abstract submissions were received, of which 759 were accepted; this included 99 oral presentations. Furthermore, we also accepted poster papers highlighting recent findings as late-news papers, as we did in the past few years. The importance of the contributions made by the TPC and ETPC members in maintaining the scientific quality of the meeting and ensuring that the best and the most exciting work emerges in both the poster and oral presentations cannot be over-emphasized. Finally, the MicroTAS 2018 oral program includes six extraordinary plenary speakers and nine keynote speakers.

Per the example set by the past few meetings, we have also arranged 10 workshops to be held on Sunday (11 November 2018). These will cover a wide range of emerging topics related to microfluidics and LOC technologies that we feel will be highly beneficial to our attendees (and especially early-stage researchers).

In addition, the meeting will continue with the popular “Shark Tank” Entrepreneurship Competition, which will be held on Tuesday (13 November 2018) before lunch. This event features pitches for pioneering companies and aspirational startups who will compete for cash and other awards. The Shark Tank competition will continue to be a unique addition to the MicroTAS meeting and reflects the maturing entrepreneurship and commercialization landscape of the microfluidics and LOC communities.
Welcome Letter

The list of individuals involved in making MicroTAS 2018 a success is extensive. We would like to again thank the members of the TPC and ETPC for helping to develop a strong technical program, and particularly the ETPC group leaders who were central to this process (Petra Dittrich, Jan Eijkel, Noritada Kaji, and Abe Lee). We greatly appreciate the efforts of all conference committee members, with particular thanks to the committee Chairs: Min-Hsien Wu and Cheng-Hsin Chuang (Sponsorship and Exhibition), Pak Kim Wong (Professional Development and Networking), Ashleigh Theberge and Yi-Chin Toh (Poster Awards), Hsiang-Yu Wang and Ya-Yu Chiang (Sunday Workshops), Eric Chiou and Jeff Wang (Promotion), Shih-Kang Fan (Connections), and Che-Hsin Lin (Industrial Stage and Local Arrangements). We also thank the Shark Tank committee Chair, Da-Jeng Yao, as well as the judges (Allen Northrup, Peter H. Hsieh, and Brian Yenyi Ho). We are grateful to CBMS and its board members, who have guided the growth of MicroTAS over the years and provided valuable feedback during the development of this year’s meeting. In particular, we thank the CBMS President Teruo Fujii and the head of the TPC Nicole Pamme for their support in overseeing the meeting administration and program organization. We also thank Amy Herr, head of the Awards Committee and Stephen Jacobson, Treasurer of CBMS, for their organizational assistance. Certainly, we also thank all sponsors who generously contributed financial support to the conference, as well as all exhibitors who will demonstrate their products and services in this meeting. We also thank all attendees for their continuous and active participation in this conference and for making positive impacts on their own scientific communities. Last but not least, we would like to express our most sincere appreciation to Mr. Adam Thocher and his team at Kellen Inc. and Miss Amy Lin with her team at Ellite Inc. for providing their professional conference organization services. Without their expertise and deep knowledge of the MicroTAS community, not to mention their monumental efforts in conference coordination and organization, the meeting would not be as successful as we hope (and believe) it will be.

Once again, we thank all of you for assisting/joining us and look forward to seeing all of you in Kaohsiung, Taiwan for MicroTAS 2018.

Sincerely yours,

Fan-Gang “Kevin” Tseng
National Tsing Hua University, Taiwan
Co-Chair of MicroTAS 2018

Gwo-Bin “Vincent” Lee
National Tsing Hua University, Taiwan
Co-Chair of MicroTAS 2018
General Information

Registration & Information Desk
The registration and information desk located in Corridor, 3F will be open during the following times:
- Sunday, 11 November . . . . . . . . . . . . . . . . . . . . 17:00 – 19:00
- Monday, 12 November . . . . . . . . . . . . . . . . . . . . 08:00 – 18:00
- Tuesday, 13 November . . . . . . . . . . . . . . . . . . . . 08:00 – 18:00
- Wednesday, 14 November . . . . . . . . . . . . . . . . . . . 08:30 – 18:00
- Thursday, 15 November . . . . . . . . . . . . . . . . . . . . 08:00 – 11:00

Breaks
All scheduled breaks will be held in the Exhibition Hall. Coffee will be served during scheduled mid-morning and afternoon breaks only. The Kaohsiung Exhibition Center does not allow any food or beverage inside the Auditorium.

Chimes
The chimes will ring five minutes before the end of each scheduled break. The sessions will begin on time, so please return to the session when you hear the chimes.

Grab ‘n Go Lunch
Lunch will be distributed inside South Hall, 1F, KEC. Limited seating is available in South Hall.

Important Note: Box lunches are not allowed in session rooms.

Name Badges
All attendee must wear their name badge at all times to gain admission to all session, exhibits, and social functions.

Job and Future Event Board
The Job Board will be located in South Hall, 1F.

Cellular phones and Alarms
As a courtesy to our speakers and other attendees, please turn off any cellular phones and alarms during sessions.

Video Recording
Video recordings are strictly prohibited in the sessions, poster presentations and the exhibit area.

Smoking
All meeting rooms and seated functions are smoke free. Please adhere to the smoking policy of the Kaohsiung Exhibition Center.

Evaluation
A Workshop Evaluation can be found on the homepage of the MicroTAS 2018 website. Your feedback is very important to the improvement and development of this Conference.
Social Events

**Sunday, 11 November**

**Welcome Reception**
The reception will be a casual buffet dinner which will also include a live music performance.
*Time*: 17:00 - 19:00
*Location*: Room 305 of the Kaohsiung Convention Center

**Monday, 12 November**

**Student Mixer**
*(Please sign up at the registration counter by 14:00, 12 November)*
*Time*: 18:30 - 22:00
*Location*: MLD Arumi8 Bar

**Women Night Out**
*(Please sign up at the registration counter by 14:00, 12 November)*
*Time*: 19:30 - 22:00
*Location*: MLD Seafood Restaurant

**Wednesday, 14 November**

**Banquet**
*Time*: 18:35 - 21:35
*Location*: Hi-Lai (9F Hanshin Arena)

**Transport**

We will offer transportation between KEC and Hanshin Arena (Banquet on Wednesday) from 18:00. Meeting point: KEC 1st floor lobby.
After the banquet, there will be buses traveling back to KEC as well.
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France Hambler, CEO & Lionel Matthys, CTO/Product Manager
Fluigent

Fluigent is an international company which develops, manufactures and supports the most advanced microfluidic systems available. Whether your application is with droplets, cell biology, particle studies, or in other research areas, we have the expertise and knowledge to provide the most cost effective and technically advanced solutions to your fluid control needs.

Industrial Stage 1d  15:10 – 15:30
HIGH ASPECT RATIO PLASTIC MICROFLUIDICS SUBSTRATE (CHIP) MANUFACTURING SKILL INTRODUCTION
Hank Wu, PhD, Division Manager
RiTEK Corporation

RiTEK group’s core businesses includes: (1) Optical storage media including CD, DVD, Blu-ray discs, and Archive discs. (2) Electronic storage media including flash memory cards, USB drives, SSD and Portable HDD, etc. (3) Flat panel display industry includes OLED display panel and ITO conductive glass (4) Green energy industry includes twin crystal solar module and solar system integration construction service (5) Micro technology includes PSS, Bio-disc and Metal Mask.
Industrial Stage 1e  15:30 – 15:50

MICROFLUIDICS AND HIGH-THROUGHPUT CELL ANALYSIS: FROM QC IN THE BEVERAGE INDUSTRY TO AUTOMATION OF CELL MANUFACTURING IN GENE THERAPY
Vivienne Williams, CEO
Cellix Tech, Ltd.
www.wearecellixltd.com

Cellix Ltd. is a patent-protected technology portfolio positioning Cellix as the go-to microfluidic company in high-throughput cell analysis via on-chip label-free cell detection and cell sorting techniques using impedance spectroscopy. Customized solutions include applications in Food & Beverage, personalized medicine and the Agri-biotech sector.

Industrial Stage 1f  15:50 – 16:10

MICROFLUIDIC VOLUME MANUFACTURING ON LEADING-EDGE IMPRINT AND BONDING EQUIPMENT
Berd Dielacher, Business Development Manager
EV Group (EVG)
www.EVGroup.com

EV Group (EVG) is a leading supplier of equipment and process solutions for the manufacture of semiconductors, microelectromechanical systems (MEMS), compound semiconductors, power devices, nanotechnology devices and bio- and medical devices. Key products include wafer bonding, thin-wafer processing, lithography, hot embossing / UV-nanoimprint lithography (NIL) and metrology equipment, as well as photoresist coaters, cleaners and inspection systems. EVG can thus provide customers with a total solution for microfluidic device fabrication on leading-edge semiconductor equipment with system configurations for R&D as well as high-volume production. Founded in 1980, EV Group services and supports an elaborate network of global customers and partners all over the world. More information about EVG is available at www.EVGroup.com.

Tuesday, 13 November 2018

15:00 – 16:40
Chair: Prof. Che-Hsin Lin, National Sun Yat-sen University, TAIWAN

Industrial Stage 2a  15:00 – 15:20

NEW TECHNOLOGIES ENABLING HIGH-QUALITY GLASS-BASED CONSUMABLE MANUFACTURING
Iris Weinreich, Product Manager, Schott Nexterion
Schott Technical Glas Solutions GmbH
http://www.schott.com/nexterion

SCHOTT NEXTERION®, the leading supplier of cleaned and coated substrates for research, diagnostics and life science applications. We offer an extensive range of standard products and functional coatings for DNA, protein and cell applications. To meet special customer requirements for unique formats, materials, coatings and
markings the substrates can be customized.

**Industrial Stage 2b** 15:20 – 15:40

**ADVANCING STANDARDIZATION IN MICROFLUIDICS**

*Dr. Darwin Reyes*

*NIST/Microfluidics Association (MFA)*

The Microfluidics Association exists to encourage the development, coordination, and dissemination of engineering knowledge as well as market and technical information on microfluidics. It will foster the education of people for the purpose of implementing the defined standards and processes facilitating the growth of the global Microfluidics Industry Supply Chain.

**Industrial Stage 2c** 15:40 – 16:00

**HIGH-PRECISION INJECTION MOLD FOR THE MASS PRODUCTION OF MICROFLUIDICS CHIPS**

*Peter Lai, PhD, CEO*

*WinMEMS Technologies Co., Ltd.*

WinMEMS offers unique MEMS foundry services to our customers. Our state-of-the-art technology is based on LIGA-like process which enables fabrication of complex 3-dimensional micro-structures through the advanced stack-up techniques. WinMEMS can fabricate various geometries designed by the customers. We further use this "Micro 3D Printing Technology" to fabricate plastic injection mold for microfluidics chips.

**Industrial Stage 2d** 16:00 – 16:20

**INTRODUCTION OF COMPACT POLYMER BONDER – A NANOIMPRINT TOOL**

*Jesper Fly Hansen, R&D Engineer*

*NIL Technology*


NIL Technology provides masters for replication of micro- and nanostructures and machines for nanoimprint. Masters are made with features from below 20 nm up to micrometers. Masters support replication by nanoimprint, embossing, UV-replication, roll printing and injection molding. Masters are made from silicon, glass, nickel, steel and polymers.

**Industrial Stage 2e** 16:20 – 16:40

**OPTICAL PROFILOMETRY OF MICROFLUIDICS USING THE FILMETRICS PROFILM3D**

*Jack Yen, Senior Application Engineer*

*Filmetrics, Inc.*

[www.filmetrics.com](http://www.filmetrics.com)

Founded in 1995 in San Diego, CA, Filmetrics has installed more than 5000 systems worldwide. Specialized in measuring film coatings and precision engineered structures in hundreds of industrial applications, including semiconductor, medical devices, consumer electronics, optics, and eyeglass industries, Filmetrics features a complete line of affordable UV to NIR spectrometer systems for measuring thin film thickness from 1 nm to 13 nm, optical constants, and deposition rates of thin films. For applications requiring measurement of sub-nanometer surface roughness and/or precision step heights, Filmetrics offers the Profilm3D – an easy-to-use, full-featured profilometer at a fraction of the cost of competitive systems.
Shark Tank Workshop
November 11, 2018
Room 302e

Shark Tank Competition
November 13, 2018
Room 301
11:00 – 12:20

Chair: Prof. Da-Jen Yao, NTHU, TAIWAN
Judges:
Allen Northrup, PhD, Founder of Cepheid and Microfluidic Systems, USA
Peter H. Hsieh, GM, Arm Taiwan Limited, Taiwan
Brian Yenyi Ho, MD, TWEMBA Founder, Taiwan
Mark Gilligan, Chairman & CEO Blacktrace Holdings Ltd., UK

Finalists will present their final pitches and win cash awards.

1001
AUTOMATED, HIGH-THROUGHPUT MICROFLUIDIC EXOSOME SUBTYPING SYSTEM
Augusto Tentori, Jim West, Mei He, Yong Zeng
Clara Diagnostics Inc., USA

1002
DIY QUALITY CONTROL IN THE RENAISSANCE OF ARTISANSHIP AND CRAFTSMANSHIP
Maciej Grajewski
SG Papertronics B.V., THE NETHERLANDS

1003
MOBILE DIAGNOSTICS WITH SINGLE DROP OF BLOOD FOR ANYONE, ANYWHERE AND ANYTIME
Yu-Lin Wang
National Tsing Hua University, TAIWAN

1004
C.BIRD: BRINGING BIOLOGICS FASTER TO PATIENTS
Cheng-Han Tsai, Stefan Zimmermann, Roland Zengerle, and Peter Koltay
1Laboratory for MEMS Applications, IMTEK, University of Freiburg;
2Hahn-Schickard-Gesellschaft für angewandte Forschung e.V., GERMANY

1005
DRUG SCREENING SERVICE TARGETING FOR ORGANELLE ION CHANNELS
Toshihisa Osaki, Koki Kamiya, and Shoji Takeuchi
University of Tokyo, JAPAN

1006
NOVEL BLADDER IRRIGATION SOLUTION
Ming-Chien Hung, Bi-Fang Fang, Chen-HsunWeng, Sheng-Yang Huang
National Cheng Kung University, TAIWAN
1007
REVERTOME
Richard Cheng and Navid Hakimi

1008
TECHNOLOGY OF PAPER-BASED CRYOPRESERVATION
Roaa Alnemari¹ and Mohammad A. Qasaimeh¹,²
¹Division of Engineering, New York University Abu Dhabi, UAE
²Department of Mechanical and Aerospace Engineering, New York University, USA

1009
SMART PATCH TRANSDERMAL DRUG DELIVERY
Yen-Wen Lu National Taiwan University, TAIWAN

1010
MICROFLUIDIC DEVICE FOR RAPID DRUG SCREENING
Wen-Bin Lee, Terry Juang, Kuo-Wei Hsu
National Tsing Hua University, TAIWAN

1011
RARE CELL SCREENING CHIP AND AUTOMATIC IMAGE ANALYSIS SYSTEM
Han Lin Cho, Jen-Kuei Wu, Chun-Wei Lee, Yu-Chia Kan and Fan-Gang Tseng
National Tsing Hua University, TAIWAN

1012
MICROMOBILE DROPLET DETECTOR (ΜMD)- MOBILE PLATFORM FOR RAPID SUB
PG/ML, MULTIPLEXED, DIGITAL DROPLET DETECTION OF PROTEINS
Venkata Telleswarapu and David Issadore
University of Pennsylvania, USA
Plenary and Keynote Information

Plenary Speakers

Monday, 12 November
09:00 – 09:45  
AI Based Personalized Theranostics  
Chih-Ming Ho, University of California, Los Angeles (UCLA), USA

16:05 – 16:50  
From Organ-on-a-Chip Tools Towards Patients on Chips – Enforcing a Paradigm Shift in Drug Development  
Uwe Marx, TissUse GmbH, GERMANY

Tuesday, 13 November
08:35 – 09:20  
Ultrafast Photonic PCR and Organoids on Chip  
Luke Lee, University of California, Berkeley, USA

16:50 – 17:35  
Enabling Clinical Precision Medicine by Optoelectronic Single-Molecule Sequencing  
Johnsee Lee, Personal Genomics Inc., TAIWAN

Wednesday, 14 November
13:20 – 14:05  
Recent Progress of Nanoscale Electrochemical Imaging  
Tomokazu Matsue, Tohoku University, JAPAN

Thursday, 15 November
08:05 – 08:50  
CTC Characterization and Applications  
Evi Lianidou, University of Athens, GREECE

Keynote Speakers

Monday, 12 November
12:35 – 13:05  
Session 1A2 – Nanofluidics and Dielectrophoresis Based Biosensors and Analytical Platforms: Challenges and Opportunities  
Chiafu Chou, Academia Sinica, TAIWAN

12:35 – 13:05  
Session 1B2 – Paper Origami DNA Diagnostics for Infectious Diseases  
Jonathan Cooper, University of Glasgow, SCOTLAND

12:35 – 13:05  
Session 1C2 – Microfluidic Technologies to Manufacture Soft Matter Materials  
Patrick Doyle, Massachusetts Institute of Technology (MIT), USA
Tuesday, 13 November
13:20 – 13:50  Session 2A2 – Lab-on-a-disc for Personalized Medicine  
Yoon-Kyoung Cho, UNIST (Ulsan National Institute of Science & Technology), SOUTH KOREA

Ryuji Yokokawa, Kyoto University, JAPAN

13:20 – 13:50  Session 2C2 – Nanoplasmonic Platform for Multiple Biosensing Applications  
Amy Shen, Okinawa Institute of Technology Graduate University, USA

Wednesday, 14 November
14:25 – 14:55  Session 3A3 – Towards 3D Bioelectronics: Integration of Conducting Polymer Devices with 3D Models of Cells In Vitro  
Róisín M. Owens, University of Cambridge, UNITED KINGDOM

14:25 – 14:55  Session 3B3 – Microfluidic Approaches to Particle and Cell Separation  
Nicole Pamme, University of Hull, UNITED KINGDOM

14:25 – 14:55  Session 3C3 – A Single Cell Biosensor for Probing Bladder Cancer Heterogeneity  
Pak Kin Wong, Pennsylvania State University, USA
Parallel Oral Sessions
Each day papers will be presented in three parallel sessions. There will be a total of 99 orals in 33 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 = Room 301 C = Room 305
B = Room 304
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 or early afternoon
3 = Concurrent Session 3 – afternoon

Posters
Three poster sessions will be held in 1F, South Hall 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.

(Items below are a Chart with added color codes)

<table>
<thead>
<tr>
<th>Color</th>
<th>Category</th>
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</thead>
<tbody>
<tr>
<td>Red</td>
<td>a Fundamentals in Microfluidics and Nanofluidics</td>
</tr>
<tr>
<td>Blue</td>
<td>b Micro- and Nano-Engineering</td>
</tr>
<tr>
<td>Green</td>
<td>c Sensors &amp; Actuators, and Detection Technologies</td>
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<td>Turquoise</td>
<td>d Integrated Microfluidic Platforms</td>
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<td>Purple</td>
<td>e Cells, Organisms and Organs on Chip</td>
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<td>Pink</td>
<td>f Diagnostics, Theranostics, and Medical Research</td>
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<td>Orange</td>
<td>g Separations and Reactions</td>
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<tr>
<td>Cyan</td>
<td>i Microfluidics in Biology</td>
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<td>Lime</td>
<td>j MicroTAS for Other Applications</td>
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<tr>
<td>Yellow</td>
<td>k Late News</td>
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</tbody>
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Sunday Workshop

Sunday, 11 November

08:00 – 09:00 Morning Workshop Registration

09:00 – 12:00 Morning Workshops (10:30 break)

Workshop 1  How To Do 3D Particle Tracking in Microfluidics
Dr. Rune Barnkob, Technical University of Munich, GERMANY
Dr. Massimiliano Rossi, Bundeswehr University Munich, GERMANY

Workshop 2  Microfluidics For Genome-Wide Analysis
Chang Lu, Virginia Tech, USA
Travis W. Murphy, Virginia Tech, USA

Workshop 3  Electrical or Mechanical Characterization of Single Cells on Microfluidic Devices
Bruno Le Pioufle, École Normale Supérieure Paris-Saclay, FRANCE

Workshop 4  Commercialization of Microfluidic Devices and Systems
Dr. Holger Becker, microfluidic ChipShop GmbH, GERMANY

Workshop 5  Incorporating the Needs of Users into Point-Of-Care Diagnostics
Dr. Jacqueline Linnes, Purdue University, USA

13:30 – 14:00 Afternoon Workshop Registration

14:00 – 17:00 Afternoon Workshops (15:30 break)

Workshop 6  Bioengineering Microscale Disease Models In Vitro
Dr. Shuichi Takayama, Georgia Institute of Technology / Emory University, USA
Dr. Yi-Chung Tung, Academia Sinica, TAIWAN

Workshop 7  Thin Film Acoustofluidics and Lab-on-a-chip
Prof. Richard Fu, Northumbria University, UNITED KINGDOM

Workshop 8  Electrochemical detection in micro/nano-systems: from cell analysis to characterization of energy materials
Dr. Kosuke Ino, Tohoku University, JAPAN
Prof. Akichika Kumatani, Tohoku University, JAPAN
Dr. Yuji Nashimoto, Tohoku University, JAPAN
Dr. Hiroyuki Kai, Tohoku University, JAPAN

Workshop 9  Caring for cells in microsystems: ensuring cell-safe device design and operation
Dr. Joel Voldman, Massachusetts Institute of Technology, USA
Dr. Sarvesh Varma, Massachusetts Institute of Technology, USA

Workshop 10  Introduction of Bioprocessing Microfluidics and System Integration
Prof. Ya-Yu Chiang, National Chung-Hsing University, TAIWAN
Prof. Nicolas Szita, University College London, UNITED KINGDOM
Prof. Daniel McCluskey, University of Hertfordshire, UNITED KINGDOM
Dr. Nikolay Dimov, University of Hertfordshire, UNITED KINGDOM

17:00 – 19:00 Conference Registration and Check-in
17:00 – 19:00 Welcome Reception
Monday Program

Monday, 12 November

08:00 – 18:00 Conference Registration and Check-in – Corridor, 3F
08:30 – 09:00 Opening Remarks

PLENARY PRESENTATION I
Chair: Gwo-Bin Lee, National Tsing Hua University, TAIWAN
Room 301

09:00 – 09:45 AI Based Personalized Theranostics
Chih-Ming Ho, UCLA, USA

09:45 – 10:15 Break – Exhibit and Poster Inspection

Session 1A1: Separation Techniques
Chair: Da-Jeng Yao, National Tsing Hua University, TAIWAN
Room 301

10:15 – 10:35 TUNABLE 3D HELICAL INERTIAL MICROFLUIDICS CONSTRUCTED WITH PDMS-PARYLENE FLEXIBLE MICROFLUIDIC SYSTEM
Bum-Joon Jung, Jihye Kim, Jeong-Ah Kim, Hansol Jang, Sumin Seo, Wonhee Lee
KAIST, Republic of Korea

10:35 – 10:55 ELECTROPHORETIC CYTOMETRY: SINGLE-CELL SEPARATIONS ON MICROPARTICLES TO ELUCIDATE BIOLOGICAL VARIATION
Burcu Gumuscu, Amy E. Herr
University of California, Berkeley, USA

10:55-11:15 RAPID AND DYNAMIC SWITCHING OF PHYSICAL ENVIRONMENTS FOR DIFFUSIOPHORETIC PARTICLE MANIPULATION AND SEPARATION
Dogyeong Ha, Sang Jin Seo, Taesung Kim
UNIST, Republic of Korea

11:15-11:35 GRADIENT ELUTION CHROMATOGRAPHY OF FEMTOLITER SAMPLES UTILIZING EXTENDED-NANO FLUIDICS
Hisashi Shimizu, Kouto Toyota, Kazuma Mawatari, Takehiko Kitamori
The University of Tokyo, Japan

Session 1B1: DNA
Chair: Pak Kin Wong, The Pennsylvania State University, USA
Room 304

10:15 – 10:35 DNA ORIGAMI NANOSTRUCTURED SURFACES FOR ENHANCED DETECTION OF MOLECULAR INTERACTIONS
D. Daems1, I. Rutten1, W. Pfeifer2, D. Decrop1, D. Spasic1, J. Bath1, B. Saccà3, A. Turberfield3, J. Lammertyn1
1KU Leuven, Belgium, 2University of Duisburg-Essen, Germany, 3Oxford University, UK
Monday Program

10:35 – 10:55  QUANTIFYING THE DNA HYBRIDIZATION KINETICS IN LIVE CELLS USING A 3D SINGLE-MOLECULE TRACKING TECHNIQUE
Yuan-I Chen, Yin-Jui Chang, Cong Liu, Trung D. Nguyen, Yen-Liang Liu, Yu-An Kuo, Stephanie Phillion, Angela Liu, Hsin-Chih Yeh
University of Texas at Austin, USA

10:55-11:15  HACKING DNA FOR DNA-POWERED DIGITAL BIOASSY USING NAZYMES
Saba Safdar, Karen Ven, Annelies Dillen, Jeroen Lammertyn, Dragana Spasic
KU Leuven, Belgium

11:15-11:35  TOEHOLD-MEDIATED DNA STRAND DISPLACEMENT REACTIONS FOR QUANTITATIVE PAPER-BASED DIAGNOSTICS
Elizabeth A. Phillips, Taylor J. Moehling, Jacqueline C. Linnes
Purdue University, USA

Session 1C1: Self Assembly
Chair: Ya-Yu Chiang, National Chung Hsing University, TAIWAN
Room 305

10:15 – 10:35  IGLOO-STOCK PATTERNING FOR DOMAIN SEPARATION OF SURFACE ON MICROPARTICLE BY DEHYDRATION AND REHYDRATION PROCESS
Cheolheon Park, Jinsik Yoon, Wook Park
Kyung Hee University, Republic of Korea

10:35 – 10:55  GRAYSCALE LITHOGRAPHY SYSTEM AND WATER TRANSFER PRINTING METHOD FOR FABRICATING AND PRINTING BIOMIMETIC STRUCTURES
Kibeom Kim, Wook Park
Kyung Hee University, Republic of Korea

10:55-11:15  ENTROPY-DRIVEN SELF-ASSEMBLY OF MESOSCALE THREE-DIMENSIONAL OBJECTS
Ryota Kawai, Yaoki Mori, Hiroaki Suzuki
Chuo University, Japan

11:15-11:35  EFFECT OF TEMPERATURE DISTRIBUTION IN MICROTUBE AND MICROFLUIDIC CHANNEL FOR DNA ORIGAMI ASSEMBLY
Keita Hara1, Tatsuya Inagaki2, Naoki Yamashita2, Kenta Arima1, Kazuya Yamamura1, Osamu Tabata2, Kentaro Kawai1
1Osaka University, Japan, 2Kyoto University, Japan

11:35 – 12:35 Lunch Break
Monday Program

Session 1A2: Dielectrophoresis
Chair: Yi-Chin Toh, National University of Singapore, SINGAPORE
Room 301

12:35 – 13:05 KEYNOTE 1: PRESENTATION NANOFLUIDICS AND DIELECTROPHORESIS BASED BIOSENSORS AND ANALYTICAL PLATFORM: CHALLENGES AND OPPORTUNITIES
Chia-Fu Chou
Academia Sinica, Taiwan

13:05-13:25 MICROFLUIDIC DIELECTROPHORESIS ENABLES RAPID CHARACTERIZATION OF LIPOPOLYSACCHARIDE MODIFICATION IN GRAM-NEGATIVE BACTERIA
Qianru Wang, Hyungseok Kim, Cullen R. Buie
Massachusetts Institute of Technology, USA

13:25-13:45 DIELECTROPHORETICALLY ORIENTED POROUS MICROCAPSULE TO MODULATE MECHANICAL PROPERTY OF HYDROGEL AND SPATIAL DRUG DELIVERY FOR FACILITATING NEURAL STEM CELL DIFFERENTIATION
Min-Yu Chiang, Yu-Chih Lo, Yi-Zhen Lin, San-Yuan Chen
National Chiao Tung University, Taiwan

13:45-14:05 DIELECTROPHORETIC MANIPULATION FOR ROBUST LIQUID MARBLE-BASED DIGITAL MICROFLUIDICS
Nam-Trung Nguyen, Chin Hong Ooi, Jing Jin, Sreejith K.R.
Griffith University, Australia

Session 1B2: Infectious Disease / POC Diagnostics
Chair: Chang-Soo Lee, Chungnam National University, SOUTH KOREA
Room 304

12:35 – 13:05 KEYNOTE 2: PAPER ORIGAMI DNA DIAGNOSTICS FOR INFECTIOUS DISEASES
Julien Reboud, Gaolian Xu, Zhugen Yang, Alice Garrett, Weronika Witkowska, Emma Thomson, Poppy Lamberton, Jonathan Cooper
The University of Glasgow, UK

13:05-13:25 MULTIPLEXED INSTRUMENT-FREE BAR-CHART SPINCHIP INTEGRATED WITH NANOPARTICLE-MEDIATED MAGNETIC APTASENSORS FOR VISUAL QUANTITATIVE DETECTION OF MULTIPLE PATHOGENS
Xiaofeng Wei, XiuJun Li
University of Texas at El Paso, USA
13:25-13:45  AN ELECTROKENETIC PCR CHIP WITH IN SITU ELECTROCHEMICAL AMPICLON DETECTION FOR COMPREHENSIVE MICROBIOLOGICAL ANALYSIS OF HOSPITAL ACQUIRED INFECTIONS
Tingting Liu1, Yi Lu1,2, Yujie Sun3, Pak Kin Wong1,2
1University of Arizona, USA, 2The Pennsylvania State University, USA, 3University of Cincinnati, USA

13:45-14:05  AN ARRAY-TYPE MICROFLUIDIC CHIP FOR MULTIPLE SUBTYPING OF INFLUENZA A VIRUSES BY USING CHEMICALLY SYNTHESIZED PENTASACCHARIDE-COATED MAGNETIC BEADS AND RT-PCR
Kao-Mai Shen1, Narayana Murthy Sabbavarapu2, Chien-Yu Fu1, Shang-Cheng Hung2, Gwo-Bin Lee1,2
1National Tsing Hua University, Taiwan, 2Academia Sinica, Taiwan

Session 1C2: Microfluidic Technology
Chair: Tza-Huei (Jeff) Wang, Johns Hopkins University, USA
Room 305

12:35 – 13:05  KEYNOTE 3: MICROFLUIDIC TECHNOLOGIES TO MANUFACTURE SOFT MATTER MATERIALS
Sarah Shapiro1, Dhananjay Denukur1, Rodger Yuan1, Maxwell Nagarajan1, Yoel Fink2, Patrick S. Doyle2
1Massachusetts Institute of Technology, USA, 2Achira Labs, India

13:05-13:25  BARCODE IMMUNOHISTOCHEMISTRY: MULTIPLEXED MICROFLUIDIC IMMUNOHISTOCHEMISTRY ON TISSUE MICROARRAY
Chang Hyun Cho, Je-Kyun Park
KAIST, Republic of Korea

13:25-13:45  RECONFIGURABLE MULTIPOLAR OPEN-SPACE MICROFLUIDICS
Pierre-Alexandre Goyette1, Étienne Boualt1, Frédéric Normandeau2, Gabriel Laberge1, David Juncker2, Thomas Gervais1,3
1École Polytechnique de Montréal, Canada, 2McGill University, Canada, 3Université de Montréal, Canada

13:45-14:05  QUANTITATIVE MICROIMMUNOHISTOCHEMISTRY (qμIC)
Anna Fomitcheva Khartchenko1,2, Aditya Kashyap1,2, Pushpak Pati1,2, Maria Gabrani2, Peter Schrami1, Govind V. Kaigala2
1ETH Zürich, Switzerland, 2IBM Research, Switzerland, 3University Hospital Zurich, Switzerland

14:05 – 16:05  Poster Session 1
Poster presentations are listed by topic category with their assigned number starting on page 69.
14:05 – 16:05  
**Exhibitor Industrial Stage 1**

1a – Recent Developments in Microfluidics and Microtechnologies for Applications in Life Science Research, in vitro Diagnostics and Medical Devices

1b – A Novel Wafer-level Package for New Wave MEMS

1c – New Developments in Microfluidics Application-oriented Solutions

1d – High aspect ratio plastic microfluidics substrate (chip) manufacturing skill introduction

1e – Microfluidics and High-throughput Cell Analysis: From QC in the Beverage Industry to Automation of Cell

1f – Microfluidic Volume Manufacturing on Leading-Edge Imprint and Bonding Equipment

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**PLENARY PRESENTATION II**

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

*Room 301*

16:05 – 16:50  
**FROM ORGAN-ON-A-CHIP TOOLS TOWARDS "PATIENTS" ON CHIPS – ENFORCING A PARADIGM SHIFT IN DRUG DEVELOPMENT**

Uwe Marx

*TissUse GmbH, Germany*

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16:50 - 17:00 Transition

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**Session 1A3: Imaging Techniques**

*Chair: Roland Zengerle, Hahn-Schickard, GERMANY*

*Room 301*

17:00-17:20  
**FLUORESCENCE GHOST IMAGING-ACTIVATED CELL SORTER**

Yoko Kawamura1,2, Masashi Ugawa1, Ryochichi Horisaki1,5, Issei Sato1,2,5, Sadao Ota1,2

1Thinkcyte Inc., Japan, 2The University of Tokyo, Japan, 3Osaka University, Japan, 4PRESTO, Japan Science and Technology Agency, Japan, 5RIKEN, Japan

17:20-17:40  
**HIGHLY MULTIPLEXED DETECTION OF FLUORESCENT DROPLETS ON A CELL PHONE USING TIME DOMAIN ENCODED OPTOFLUIDICS USING ONLY THREE EXCITATION SOURCES**

Venkata Yelleswarapu, David Issadore

*University of Pennsylvania, USA*
Monday Program

Session 1B3: Advanced Droplets
Chair: Cheng-Hsin Chuang, National Sun Yat-sen University, TAIWAN
Room 304

17:00-17:20  C.H.A.D.: CONTINUOUS HETEROGENEOUS ASSAY IN DROPLETS FOR THE MEASUREMENT OF CORTISOL
Gareth Evans¹, Wahida Bhuiyan¹, Sammer-Ul Hassan², Brett Warren², Sharon Coleman², Xize Niu¹²
¹University of Southampton, UK, ²SouthWestSensor Limited, UK

17:20-17:40  STRUCTURAL SMART MICROGELS – ENHANCING THE SENSITIVITY FOR SINGLE-CELL SECRETOMIC ANALYSIS
Myat Noe Hsu¹², Yong Zhang¹², Chia-Hung Chen¹² ¹National University of Singapore, Singapore, ²Biomedical Institute for Global Health Research and Technology, Singapore

Session 1C3: Capacitance / Impedance Measurement
Chair: Hugh Fan, University of Florida, USA
Room 305

17:00-17:20  GRADUAL CAPACITANCE FOR PARTICLE TRACKING IN MICROCHANNELS
Miguel Solsona, Eiko Westerbeek, Wouter Olthuis, Albert van den Berg
University of Twente, The Netherlands

17:20-17:40  A CMOS/MICROFLUIDICS INTEGRATION TECHNIQUE WITH 3-D HYDRODYNAMIC FOCUSING FOR CHIP-SCALE GHZ-FREQUENCIES DIELECTRIC-BASED FLOW CYTOMETRY
Jun-Chau Chien¹, Mekhail Anwar²³, Ali M. Niknejad³ ¹Stanford University, USA, ²University of California, Berkeley, USA, ³University of California, San Francisco, USA

17:40 – 18:50  Social Events

18:50  Adjourn for the Day
FEATURES
- Quick: without centrifugation, clear interface
- High specificity: low sample loss and high yield
- Small and large scale: trace endogenous protein vs. over-expressed protein
- Automation

SPECIFICATIONS
- Dextran-coated Fe₃O₄ magnetic particles, highly hydrophilic, highly biocompatible
- Various choices of surface ligands: -OH, -COOH, -NH₂
- Protein A, protein G, streptavidin, NTA-Ni, silica...
- Particle sizes: ~1 μm
- Customized service: Let us conjugate your biomolecules on the magnetic particles!

APPLICATIONS
- DNA/RNA extraction
- Purification of biomolecules
- Depletion of biomolecules
- Immunoprecipitation
- Chromatin immunoprecipitation, ChIP
- Pull-down assay
- Isolation of pathogens
- Micro-fluidic chip/biochip

SERIES
- Qbeads-Silica
- Qbeads-Protein A
- Qbeads-Protein G
- Qbeads-NTA-Ni
- Qbeads-Streptavidin
- Qbeads-Hydroxyl
- Qbeads-Carboxyl
- Qbeads-Amine
- Qbeads-Customized

Example 1
Immunoprecipitation of protein from cell lysate by Qbeads-NTA-Ni

Example 2
Purification of HATagged protein from E. coli lysate by Qbeads-NTA-Ni
Improvements in medical care quality and healthy lifestyles are fundamental to a happy society. They are also indicators of a nation’s competitiveness. ITRI combines its resources and capabilities for cross-disciplinary efforts in the fields of mechanical engineering, precision measurement, material science, and ICT, and is devoted to R&D in advanced biomedicine and innovative medical materials.

The goal is to safeguard and improve citizen’s health via developments in technologies for combination drugs, mobile medical devices, disease prevention, medical diagnosis, rehabilitation instruments, and healthcare assistance. Service system technologies are also employed to assist the development of healthcare service solutions and fitness services.
Tuesday Program

Tuesday, 13 November

08:00 – 18:00  Registration – Corridor, 3F
08:30 – 08:35  Announcements

PLENARY PRESENTATION III
CHAIR: Amy Herr, University of California, Berkeley, USA
Room 301

08:35 – 09:20  ULTRAFAST PHOTONIC PCR AND ORGANOIDs ON CHiP
Luke Lee
University of California, Berkeley, USA

09:20 – 09:30  Transition

Session 2A1: Vascular Systems
Chair: Che-Hsin Lin, National Sun Yat-sen University, TAIWAN
Room 301

09:30 – 9:50  ENGINEERING OF A 3D VASCULARIZED TISSUE-ON-A-CHIP USING HUMAN IPSC-DERIVED CELLS
Yu-suke Torisawa, Yuta Mishima, Emi Sano, Hitomi Takakubo, Chiiro Mori, Shin Kaneko
Kyoto University, Japan

09:50 - 10:10  UNRAVELING ENDOTHELIAL CELL PHENOTYPIC REGULATION BY SPARTIAL HEMODYNAMIC FLOWS WITH MICROFLUIDICS
Sarvesh Varma1,2, Guillermo Garcia-Cardenas2, Joel Voldman1
1Massachusetts Institute of Technology, USA, 2Harvard Medical School, USA

10:10-10:30  NON-UNIFORM VASCULAR NETWORKS GENERATED BY NON-UNIFORM FLOW VELOCITY DISTRIBUTION FOR AN ON-CHIP HEREDITARY HEMORRHAGIC TELANGIECTASIA MODEL
Da Shao, Tao Yue, Jennifer S. Fang, Jillian Andrejcsik, Christopher C.W. Hughes, Abraham P. Lee
University of California, Irvine, USA

Session 2B1: C. Elegans
Chair: Stephanie Descroix, Institute Curie, FRANCE
Room 304

09:30 – 9:50  NEURONAL AND BEHAVIOURAL EFFECTS OF ALPHA-SYNUCLEIN PROTEIN AND 6-OHDA NEUROTOXIN IN PARKINSON’S DISEASE INVESTIGATED WITH A C. ELEGANS ELECTROTAXIS MICROFLUIDIC ASSAY
Khaled Youssef1, Daphne Archonta2, Anurag Tandon2, Terry Kubiselski1, Pouya Rezai1
1York University, Canada, 2University of Toronto, Canada
09:50 - 10:10  AUTOMATED ON-CHIP PHENOTYPING OF CAENORHABDITIS ELEGANS EMBYOS: A DEVELOPMENTAL STUDY AS FUNCTION OF EXPOSURE TO VARIOUS COMPOUNDS
H.B. Atakan¹, M. Cornaglia¹, T. Alkanat², R. Trouillon¹, M.A.M. Gijs¹
¹EPFL, Switzerland, ²Middle East Technical University, Turkey

10:10-10:30  QUANTITATIVE ANALYSIS OF MUSCLE ATROPHY UNDER HYPERGLYCEMIC CONDITIONS USING C. ELEGANS MODEL IN A SCALEABLE MICROFLUIDIC DEVICE
Samuel Sofela¹,², Ajymurat Orozaliev¹, Sarah Sahloul¹, Nandita Chaturvedi¹, Davood Shahjerdi², Yong-Ak Song¹,²
¹New York University Abu Dhabi, UAE, ²New York University, USA

Session 2C1: Single-Cell Biomolecular Analysis
Chair: Petra Dittrich, ETH Zurich, SWITZERLAND
Room 305

09:30 – 9:50   FROM NASAL SWAB TO DIGITAL ANSWER: UNIT OPERATIONS FOR ANTIBIOTIS RESISTANCE SCREENING ON A SINGLE CELL LEVEL
Martin Schulz¹, Nadine Borst¹, Mara Specht¹, Silvia Cabalrese¹, Felix von Stetten¹,², Roland Zengerle¹,², Nils Paust¹,²
¹Hahn-Schickard, Germany, ²Albert-Ludwigs-Universität Freiburg, Germany

09:50 - 10:10  SINGLE-CELL RNA-SEQUENCING OF MIGRATORY CANCER CELLS SORTED BY MICROFLUIDICS: DISCOVERING DRIVERS OF CANCER METASTASIS
Yu-Chih Chen, Riley Brien, Saswat Sahoo, Woncheol Lee, Yu-Heng Cheng, Seungwon Jung, Henry Haley, Kathryn Luker, Gary Luker, Euisik Yoon
University of Michigan, USA

10:10-10:30  MICRO/NANO-INTEGRATED FLUIDIC DEVICE FOR LIVING SINGLE-CELL PROTEIN ANALYSIS
Tatsuro Nakao¹, Yutaka Kazoe¹, Kyojiro Morikawa¹, Ayumi Yoshizaki², Kazuma Mawatari¹, Takehiko Kitamori¹
¹The University of Tokyo, Japan, ²The University of Tokyo Hospital, Japan

10:30 – 11:00  Break – Exhibit and Poster Inspection
11:00 – 12:20  MicroTAS 2018 Shark Tank Competition
12:20 – 13:20  Lunch

Session 2A2: Centrifugal Platform / Blood Analysis
Chair: Don DeVoe, University of Maryland, College Park, USA
Room 301

Hyun-Kyung Woo¹, Minji Lim¹, Chi-Ju Kim¹,², Vijaya Sunkara¹, Juhee Park², Yoon-Kyoung Cho¹,²
¹UNIST, Republic of Korea, ²Institute for Basic Science, Republic of Korea
Tuesday Program

13:50-14:10 LAB-ON-A-DISC FOR FULLY AUTOMATED ISOLATION OF EXTRACELLULAR VESICLES FROM WHOLE BLOOD OF CANCER PATIENTS
Chi-Ju Kim¹,², Vijaya Sunkara¹, Juhee Park¹, Hyun-Kyung Woo¹, Yoon-Kyoung Cho¹,²
¹UNIST, Republic of Korea, ²Institute for Basic Science, Republic of Korea

14:10-14:30 HIGH-YIELD AUTOMATED EXTRACTION OF NUCLEIC ACIDS FROM WHOLE BLOOD USING CENTRIFUGAL MICROFLUIDIC PLATFORM WITH ACTIVE PNEUMATIC PUMPING
Daniel Brassard¹, Matthias Geissler¹, Liviu Clime¹, Jamal Daoud¹, Denis Charlebois², Teodor Veres¹
¹National Research Council, Canada, ²Canadian Space Agency, Canada

14:30-14:50 MULTI-STAGED INERTIAL AND IMPEDANCE CYTOMETER FOR DIRECT LABEL-FREE LEUKOCYTE SORTING AND PROFILING FROM WHOLE BLOOD
Chaykorn Petchakup, Hui Min Tay, King Ho Holden Li, Han Wei Hou
Nanyang Technical University, Singapore

Session 2B2: Organ-on-a-Chip
Chair: Hang Lu, Georgia Institute of Technology, USA
Room 304

Ryuji Yokokawa
Kyoto University, Japan

13:50-14:10 A BIOMIMETIC CIRCULAR 3D STENOSIS MODEL FOR WHOLE BLOOD PERFUSION AND DIRECT PLATELET MONITORING IN ASPIRIN THERAPY
Nishanth Venugopal Menon, Phua Zhai Juan, King Ho Holden Li, Han Wei Hou
Nanyang Technological University, Singapore

14:10-14:30 EXPLORING THE CHEMORESISTANCE MECHANISMS OF LEUKEMIA IN A BIOMIMETIC 'LEUKEMIA-ON-A-CHIP MICROSYSTEM
Chao Ma, Weiqiang Chen
New York University, USA

14:30-14:50 A TETRIS-LIKE (TILE) MODULAR MICROFLUIDIC PLATFORM FOR MIMICKING MULTI-ORGAN INTERACTIONS
Louis Ong Jun Ye¹, Terry Chng², Chong Lor Huai¹, Seep Li Huan¹, Toh Yi-Chin¹
¹National University of Singapore, Singapore, ²Singapore University of Technology and Design, Singapore, ³Temasek Polytechnic, Singapore
Tuesday Program

Session 2C2: Serology / Immunization
Chair: David Juncker, McGill University, CANADA
Room 305

13:20 – 13:50  **KEYNOTE 6: NANOPLASMONIC PLATFORM FOR MULTIPLE BIOSENSING APPLICATIONS**
Nikhil Bhalla, Riccardo Funari, Amy Q. Shen
OIST, Japan

13:50-14:10  **MEASLES IMMUNIZATION STATUS TEST USING 3D-PRINTED CAPILLARIC CIRCUITS**
Arya Tavakoli, Li Xing, Brian Ward, David Juncker
McGill University, Canada

14:10-14:30  **LAB IN A BACKPACK: PORTABLE DIGITAL MICROFLUIDICS FOR SEROSURVEILLANCE IN RESOURCE-LIMITED SETTINGS**
University of Toronto, Canada

14:30-14:50  **LIVER-IMMUNE COCULTURE ARRAY PREDICTS DRUG-METABOLISM-INDUCED SKIN SENSITIZATION**
Lor Huai Chong1, Huan Li2, Isaac Wetzel2, Hansang Cho2, Yi-Chin Toh1
1National University of Singapore, Singapore, 2Temasek Polytechnique, Singapore, 3University of North Carolina at Charlotte, USA

14:50 – 16:50  **Poster Session 2**
Poster presentations are listed by topic category with their assigned number starting on page 69

14:50 – 16:50  **Exhibitor Industrial Stage 2**
2a – New Technologies Enabling High-quality Glass-based Consumable Manufacturing
2b – Advancing Standardization in Microfluidics
2c – High-precision Injection Mold for the Mass Production of Microfluidics Chips
2d – Introduction of Compact Polymer Bonder – A Nanoimprint Tool
2e – Optical Profilometry of Microfluidics using the Filmetrics Profilm3D
PLENARY PRESENTATION IV
Chair: Stephen Jacobson, Indiana University, USA
Room 301

16:50 – 17:35  
ENABLING CLINICAL PRECISION MEDICINE BY OPTOELECTRONIC SINGLE-MOLECULE SEQUENCING
Johnsee Lee
Personal Genomics, Inc., USA

Session 2A3: Cellular Metabolism
Chair: Noritada Kaji, Kyushu University, JAPAN
Room 301

17:35 – 17:55  
CIRCULATING TUMOR CELLS ISOLATION BASED ON THEIR ALTERED METABOLISM WITH DROPLET MICROFLUIDICS
Francesca Rivello¹, Aigars Piruska¹, Kinga Matula¹, Fabio Del Ben¹,², Matteo Turetta¹,², Wilhelm Huck¹
¹Radboud University, The Netherlands, ²C.R.O. Aviano, Italy, ³University of Udine, Italy

17:55-18:15  
METABOLOMIC COMPARISON OF ADHERENT VS SPHEROID CELL CULTURE VIA MICROFLUIDIC NMR
Bishnubrata Patra, Manvendra Sharma, William G. Hale, Marcel Utz
University of Southampton, UK

18:15-18:35  
HIGH-SENSITIVITY CHIP CALORIMETER BASED ON PARYLENE MICROFLUIDICS FOR MEASUREMENT OF CELLULAR METABOLIC RATE
Jihye Kim, Sung Min Nam, Jonghyun Kim, Sumin Seo, Wonhee Lee
KAIST, Republic of Korea

Session 2B3: Droplets – Interesting Mechanisms
Chair: Jan Eijkel, Twente University, THE NETHERLANDS
Room 304

17:35 – 17:55  
NAVIGATION OF DROPLETS THROUGH MICROPILLARS USING AN AC ELECTRIC FIELD
Adrian J.T. Teo, Chee Meng Benjamin Ho, Yongsheng Gao, Nam-Trung Nguyen, Say Hwa Tan
Griffith University, Australia

17:55-18:15  
GAS-MEDIATED CROSSTALK IN DROPLET FLOW – CHARACTERISATION AND CORRECTION
Adrian M. Nightingale, Sammer-ul Hassan, Gareth W.H. Evans, Sharon Coleman, Xize Niu
University of Southampton, UK

18:15-18:35  
DYNAMICS OF HYBRID NANO-STRUCTURED AU PARTICLES/NANOBUBBLE IN A QUASI 2D LIQUID ENVIRONMENT
Pijus Kundu¹, Shih-Yi Liu¹, Fu-Rong Chen², Fan-Gang Tseng¹,³
¹National Tsing Hua University, Taiwan, ²City University of Hong Kong, China, ³Academia Sinica, Taiwan
Tuesday Program

Session 2C3: Cytometry / Sensors
Chair: Jacqueline Linnes, Purdue University, USA
Room 305

17:35 – 17:55  SMART CONTACT LENS FOR CONTINUOUS COLORIMETRIC INTRAOCULAR PRESSURE MONITORING
Bohee Maeng, Jungyul Park
Sogang University, Republic of Korea

17:55-18:15  DEEP LEARNING ASSISTED ANALYSIS OF MULTIPLE INDIVIDUAL RED BLOOD CELLS IN BLOOD FLOW
Takayuki Akai, Hiroaki Ito, Makoto Kaneko
Osaka University, Japan

18:15-18:35  LARGE-AREA CELL-TRACKING INTRINSIC CYTOMETRY WITH DIGITAL HOLOGRAPHIC IMAGING
Nichit Apichitsopa, Joel Voldman
Massachusetts Institute of Technology, USA

18:35   Adjourn for the Day
Wednesday Program

Wednesday, 14 November

08:30 – 18:00  Registration – Corridor, 3F
08:30 – 08:40  Announcements
08:40 – 09:00  Analytical Chemistry Young Innovator Award and Presentation
09:00 – 09:20  Lab on a Chip and Dolomite - Pioneers in Miniaturization Prize and Presentation
09:20 – 09:30  Transition

Session 3A1: Nano-Fluidics / Nano-Pores
Chair: Sal Peyman, University of Leeds, UNITED KINGDOM
Room 301

09:30 – 09:50  CONSTRUCTION OF PROGRAMMABLE NANOPORE USING β-SHEET PEPTIDES
K. Shimizu1, N. Saigo1, S. Sakashita2, Y. Hamada2, K. Usui2, B. Mijiddorj3, I. Kawamura4, R. Kawano1
1Tokyo University of Agriculture and Technology, Japan, 2Konan University, Japan, 3Yokohama National university, Japan

09:50-10:10  LONG-TERM CONTINUOUS ONLINE MONITORING OF ANTIBODY PURITY USING A NANOFUIDIC DEVICE DURING HIGH-CONCENTRATION PERFUSION CULTURE
Taehong Kwon1, Sung Hee Ko1, Jean-François. P. Hamel1, Jongyoon Han1,2
1Massachusetts Institute of Technology, USA, 2Singapore-MIT Alliance for Research and Technology, Singapore

10:10-10:30  PROTON TRANSFER MECHANISM IN EXTENDED-NANO SPACE INVESTIGATED BY H+/D+ ISOTOPE EFFECT
Kazuma Mawatari, Kohei Isogai, Takehiko Kitamori
The University of Tokyo, Japan

10:30-10:50  A SELF-POWERED ENZYMATIC MICROTUBULAR SENSOR BASED ON STREAMING CURRENT
Longteng Yu1, Chen Shi1, Wang Xi1, Ren Hao Soon1, Peiyi Song1, Chwee Teck Lim1
1National University of Singapore, Singapore, 2Huazhong University of Science and Technology, China

Session 3B1: Droplet Generation and Manipulation
Chair: Darwin Reyes, NIST, USA
Room 304

09:30 – 09:50  INTEGRATED DROPLET GENERATION AND ASSEMBLY PLATFORM WITH PRECISELY CONTROLLED DROPLET CONTENTS AND UNIFORM DROPLET INCUBATION DURATION
Pengfei Zhang, Aniruddha Kaushik, Kuangwen Hsieh, Tza-Huei Wang
Johns Hopkins University, USA

09:50-10:10  MECHANICALLY AND DIRECTIONALLY TUNABLE SOFT STEP EMULSIFICATION
Seungman Choi, Naotomo Tottori, Takasi Nisisako
Tokyo Institute of Technology, Japan
Wednesday Program

10:10-10:30 PLUG-N-PLAY BIOSENSORS FOR MULTI-MODAL DIGITAL MICROFLUIDIC ANALYTICS
Richard P.S. de Campos, Darius G. Rackus, Roger Shih, Aaron R. Wheeler
University of Toronto, Canada

10:30-10:50 SELF-CONSTRUCTION OF EIFFEL TOWER-INSPIRED TIP-MERGED POLYMERIC MICRONEEDLE WITH VARYING STRUCTURES USING PHOTOLITHOGRAPHY
Jungeun Lim, Dongha Tahk, Noo Li Jeon
Seoul National University, Republic of Korea

Session 3C1: Particle Preparation
Chair: Jonas Tegenfeldt, Lund University, SWEDEN
Room 305

09:30 – 09:50 FLOWSCLULT: SOFTWARE FOR EFFICIENTLY DESIGNING INERTIAL FLOW SCULPTING DEVICES
Daniel Stoecklein1, Michael Davies2, Joseph de Rutte1, Chueh-Yu Wu1, Baskar Ganapathysubramanian1, Dino Di Carlo1
1University of California, Los Angeles, USA, 2Iowa State University, USA

09:50-10:10 DEVICE-FREE MONDISPERSE DROPLET GENERATION USING 3D-STRUCTURED JANUS MICROPARTICLES
Chueh-Yu Wu, Joe de Rutte, Bao Wang, Matthew Jacobs, Andrea Bertozzi, Dino Di Carlo
UCLA, USA

10:10-10:30 NEXT GENERATION OPTOFLUIDIC FABRICATION FOR SUB-100 MICRON PARTICLES
Kevin S. Paulsen12, Yanxiang Deng13, Aram J. Chung14
1Rensselaer Polytechnic Institute, USA, 2Lawrence Livermore National Laboratory, USA, 3Yale University, USA, 4Korea University, Republic of Korea

10:30-10:50 CLOAKED EXOSOMES: BIOCOMPATIBLE, DURABLE, AND DEGRADABLE ENCAPSULATION THROUGH MICROFLUIDIC RAPID MIXING
Sumit Kumar, Issac. J. Michael, Juhee Park, Steve Granick, Yoon-Kyoung Cho
UNIST, Republic of Korea

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

Session 3A2: Cell Arrays
Chair: Marcel Utz, University of Southampton, UNITED KINGDOM
Room 301

11:20 – 11:40 FABRICATION OF CELL-BASED SENSOR ARRAY FOR MULTICHEMICAL DETECTION
Haruka Oda, Ai Shima, Shoji Takeuchi
The University of Tokyo, Japan
**Wednesday Program**

11:40-12:00  **A MICROFLUIDIC SINGLE-CELL PARING ARRAY FOR STUDYING CELL-CELL INTERACTIONS IN ISOLATED COMPARTMENTS**  
Xuan Li, Kevin P. Jitsiripol, Abraham P. Lee  
*University of California, Irvine, USA*

12:00-12:20  **EFFICIENT PAIRING OF SINGLE CELLS USING TRAP-AND-DROP MICROWELL ARRAY**  
Soo Hyeon Kim¹,², Mina Yoshida¹, Saori Tago¹, Teruo Fujii¹  
¹The University of Tokyo, Japan, ²PRESTO, Japan Science and Technology Agency, Japan

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**Session 3B2: Tumor-on-a-Chip**  
**Chair:** Joel Voldman, *MIT, USA*  
**Room 304**

11:20 – 11:40  **A THREE-DIMENSIONAL IN VITRO MODEL OF LYMPHANGIOGENESIS IN TUMOR MICROENVIRONMENT**  
Youngkyu Cho, Kyuwan Na, Jihee Won, Yesl Jun, Ji Hun Yang, Seok Chung  
*Korea University, Republic of Korea*

11:40-12:00  **MULTIPLEXED CO-CULTURE PATTERNING IN 2D AND 3D USING LOW-COST 3D-PRINTED MONOLITHIC PIN-HEADS**  
Grant Ongo, David Juncker  
*McGill University, Canada*

12:00-12:20  **CELL CULTURING IN ELECTROPOLYMERIZED HYDROGEL MULTI-LAYER NETS FABRICATED IN AN ELECTROKINETICS MICROFLUIDIC CHIP**  
Pan Li¹,², Lianqing Liu¹, Yuzhao Zhang¹,², Haibo Yu¹, Gwo-Bin Lee³, Yuechao Wang¹, Wen Jung Li⁴  
¹Chinese Academy of Sciences, China, ²University of the Chinese Academy of Sciences, China, ³National Tsinghua University, Taiwan, ⁴City University of Hong Kong, China

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**Session 3C2: Single Cell Sorting and Separation**  
**Chair:** Manabu Tokeshi, *Hokkaido University, JAPAN*  
**Room 305**

11:20 – 11:40  **LABEL-FREE PURIFICATION OF HEMATOPOIETIC STEM CELL (HSC) DERIVED RETICULOCYTES FOR RED BLOOD CELL PRODUCTION**  
Kerwin K. Zeming¹, Yuko Sato¹,², Yin Lu³, Chia-Hung Chen¹,³, Jianzhu Chen¹,³, Peter Preiser¹,², Jongyoon Han¹,²  
¹Singapore-MIT Alliance for Research and Technology, Singapore, ²Nanyang Technological University, Singapore, ³National University of Singapore, Singapore, ⁴Massachusetts Institute of Technology, USA
# Wednesday Program

**11:40-12:00**  
**REAL-TIME OPTOFLUIDIC DIFRACTIVE “IMAGING” CELL ANALYZER**  
Masachi Ugawa, Yoko Kawamura, Ryoichi Horisaki, Issei Sato, Hiroyuki Noji, Sadao Ota  

1ThinkCyte Inc., Japan, 2The University of Tokyo, Japan, 3RIKEN, Japan, 4Osaka University, Japan, 5PRESTO, Japan Science and Technology Agency, Japan, 6ImPACT Program, Government of Japan, Japan

**12:00-12:20**  
**A DROPLET BASED SINGLE-CELL RNA-SEQ PLATFORM USING ACTIVE SORTING AND DOWNSTREAM MERGING**  
Meng Ting Chung, Daniel Nunez, Dawen Cai, Katsuo Kurabayashi  
University of Michigan, Ann Arbor, USA

**12:20 – 13:20**  
Lunch

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**PLENARY PRESENTATION V**  
**CHAIR:** Teruo Fujii, IIS, The University of Tokyo, JAPAN  
**Room 301**

**13:20 – 14:05**  
**RECENT PROGRESS OF NANOSCALE ELETROCHEMICAL IMAGING**  
Tomokazu Matsue  
Tohoku University, Japan

14:05 – 14:15  
MicroTAS 2019 Announcement

14:15 – 14:25  
Transition

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**Session 3A3: Flexible / Wearable and Environment Applications**  
**Chair:** Je-Kyun Park, KAIST, SOUTH KOREA  
**Room 301**

**14:25 – 14:55**  
**KEYNOTE 7: TOWARDS 3D BIOELECTRONICS: INTEGRATION OF CONDUCTING POLYMER DEVICES WITH 3D MODELS OF CELLS IN VITRO**  
Charalampos Pitsalidis, Chrysanthie Moysidou, Janire Saez, Donata Iandolo, Magali Ferro, Roisin M. Owens  
1University of Cambridge, UK, 2École des Mines de St. Etienne, France

14:55-15:15  
**PM2.5 ANALYSIS IN LIQUID PHASE VIA WATER FILM-BASED COLLECTION AND MICROFLUIDICS-BASED ELECTRICAL DETECTION**  
Taisuke Shimada, Hirotoshi Yasaki, Takao Yasui, Akihide Hibara, Takeshi Yanagida, Noritada Kaji, Masaki Kanai, Kazuki Nagashima, Tomoji Kawai, Yoshinobu Baba  
1Nagoya University, Japan, 2PRESTO, Japan Science and Technology Agency, Japan, 3Tohoku University, Japan, 4Kyushu University, Japan, 5Osaka University, Japan, 6AIST, Japan

15:15-15:35  
**WIRING ON STRETCHABLE MATERIAL BY AGGLUTINATION AND ADHESION OF METALLIC NANOPARTICLE USING ELECTRICALLY INDUCED MICROBUBBLES**  
R. Masuda, K. Ichikawa, Y. Fukuyama, Y. Yamashita, Y. Yamanishi  
Kyushu University, Japan
Wednesday Program

Session 3B3: Sorting / Cell Separation
Chair: Severine Le Gac, University of Twente, THE NETHERLANDS
Room 304

14:25 – 14:55 KEYNOTE 8: MICROFLUIDIC APPROACHES TO PARTICLE AND CELL SEPARATION
Bongkot Ngamsom, Nicole Pamme
University of Hull, UK

14:55-15:15 ACOUWASH: A STANDALONE INSTRUMENT FOR THE WASHING, SEPARATION AND ENRICHMENT OF CELLS
Jay Mallinson¹, Oskar Linander¹, Cecilia Magnusson¹², Karolina Pircs², Per Augustsson¹²
¹AcouSort AB, Sweden, ²Lund University, Sweden

15:15-15:35 METHOD FOR SELECTING OPTIMAL OPERATION FREQUENCIES IN BULK ACOUSTOPHORETIC DEVICE
Giulia Core, Valentina Vitali, Fabio Garofalo, Thomas Laurell, Andreas Lenshof
Lund University, Sweden

Session 3C3: Drug Screening
Chair: Yi-Chung Tung, Academia Sinica, TAIWAN
Room 305

14:25 – 14:55 KEYNOTE 9: A SINGLE CELL BIOSENSOR FOR PROBING BLADDER CANCER HETEROGENEITY
Peter Torab, Yue Yan, Pak Kin Wong
The Pennsylvania State University, USA

DEVELOPMENT OF A HIGH-THROUGHPUT MICRO-NEUROCIRCUITRY PLATFORM FOR DRUG SCREENING STUDIES
Joseph A. Fantuzzo¹², Vincent R. Mirabella²³, Ronald P. Hart¹, Zhiping P. Pang¹², Jeffrey D. Zahn¹
¹Rutgers University, USA, ²Robert Wood Johnson Medical School, USA

MICROFLUIDIC MULTI-ORGAN PLATFORM TO STUDY THE EFFECTS OF PRODRUGS ON EARLY EMBRYONIC DEVELOPMENT
Julia A. Boos¹, Mario M. Modena¹, Patrick M. Misun¹, Kasper Renggli¹, Olivier Frey³, Andreas Hierlemann¹
¹ETH Zürich, Switzerland, ²InSphero AG, Switzerland

15:35 – 17:35 Poster Session 3
Poster presentations are listed by topic category with their assigned number starting on page 69

16:00 – 17:35 Art in Science Award session (at RSC booth)
17:35 – 18:35 Transition to Banquet (by bus or MRT)
18:35 – 21:35 Conference Banquet
金屬中心-脊椎微創手術輔助調頻式射頻定位系統

計劃介紹

電磁微創手術技術（FMCW, Frequency Modulation Continuous Wave）是近年來發展較快的一種微創手術技術，具有準確度高、損傷小等優點。本項目將進一步探索和開發調頻式射頻定位技術，用於不同組織的微創手術定位。

技術發展現況

FMCW射頻系統：
- 射頻頻率：24GHz
- 射頻功率：0.5W
- 射頻信號：正弦波
- 射頻脈沖：100ns
- 射頻位移精度：±0.1mm
- 射頻定位精度：±0.5mm

應用範圍：
- 微創手術定位
- 診斷
- 數據採集
- 病理分析

合作伙伴：
- 國立臺灣大學
- 國立台北醫學大學
- 國立陽明大學

聯絡人：
- 林信傑博士
- 電話：+886-2-2714-0672
- 電子郵件：linx@nmrc.org.tw

單位：財團法人金屬中心

Thursday Program

Thursday, 15 November

08:00 – 11:00  Registration – Corridor, 3F
08:00 – 08:05  Announcements

PLENARY PRESENTATION VI
Chair: Abraham Lee, University of California, Irvine, USA
Room 301

08:05 – 08:50  CTC CHARACTERIZATION AND APPLICATIONS
Evi Lianidou
University of Athens, Greece

08:50 – 09:00  Transition

Session 4A1: Genetics / DNA
Chair: Chien-Fu Chen, National Taiwan University, TAIWAN
Room 301

09:00 – 09:20   AN AUTOMATED MICROFLUIDIC GENE-EDITING PLATFORM FOR
DECIPHERING CANCER GENES
Hugo Sinha, Angela B.V. Quach, Philippe Q.N. Vo, Steve C.C. Shih
Concordia University, Canada

09:20-09:40  A CMOS BASED LAB-ON-CHIP DIAGNOSTIC SYSTEM FOR RAPID
DETECTION AND SEROTYPING OF THE DENGUE VIRUS
Ling-Shan Yu1,2, Nicolas Moser1, Anselm Au1, Kenny Malpartida-
Cardenas1, Sheng-Fan Wang2, Yen-Hsu Chen2, Jesus Rodriguez-
Manzano1, Pantelis Georgiou1
1Imperial College London, UK, 2Kaohsiung Medical University, Taiwan

09:40-10:00  PLASMON RESONANCE ENERGY TRANSFER-BASED ULTRAFAST
PCR
Doyeon Bang1, Jonghwan Lee1, Luke P. Lee1,2,3
1University of California, Berkeley, USA, 2Biomedical Institute for
Global Health Research & Technology, Singapore, 3Harvard Medical
School, USA

Session 4B1: Fluid Manipulation
Chair: Hsiang-Yu Angie Wang, National Tsing Hua University, TAIWAN
Room 304

09:00 – 09:20   A STUDY OF ION WIND GENERATOR USING PARALLEL ARRANGED
ELECTRODE CONFIGURATION FOR CENTRIFUGAL FLOW MIXER
Tung Thanh Bui1, Thien Xuan Dinh2, Canh-Dung Tran3, Trinh Chu
Duc1, Van Thanh Dau1
1Vietnam National University, Vietnam, 2Ritsumeikan University,
Japan, 3University of Southern Queensland, Australia, 4Griffith
University, Australia
Thursday Program

09:20-09:40  THREE-DIMENSIONAL ROTATION/TRANSLATION MICROFLUIDIC DEVICES FOR SEQUENTIAL MIXING
Takeshi Tachibana1,3, Koki Kamiya1, Toshihisa Osaki1, Nobuo Misawa1, Satoshi Fujii1, Norihisa Miki1,3, Shoji Takeuchi1,3
1Kanagawa Institute of Industrial Science and Technology, Japan, 2The University of Tokyo, Japan, 3Keio University, Japan

09:40-10:00  MICROFLUIDIC STANDING AIR BUBBLES (MSABS)
Jixiao Liu, Yidi Zhou, Bowen Li, Tong Zhu, Shijie Guo, Tiejun Li
Hebei University of Technology, China

Session 4C1: Droplet Application: Manufacturing / Analytics
Chair: Yu-Chuan Su, National Tsing Hua University, TAIWAN
Room 305

09:00 – 09:20  MULTIMODAL ANALYSIS OF PHYTASE-PRODUCING YEAST IN NANOLITER DROPLET ARRAYS
D. Hümmer1, S. Bachler1, M. Köhler1, S. Schulte2, L. Blank2, R. Zenobi1, P.S. Dittrich1
1ETH Zürich, Germany, 2RWTH Aachen, Germany

09:20-09:40  A PARALLELIZED DROPLET MAGNETOFLUIDIC PLATFORM FOR AUTOMATED DETECTION OF CANCER METHYLATION BIOMARKERS
Alexander Y. Trick, Alejandro Stark, Dong Jin Shin, Tza-Huei Wang
Johns Hopkins University, USA

09:40-10:00  ON-CHIP MANUFACTURING OF SYNTHETIC PROTEINS FOR POINT-OF-CARE THERAPEUTICS
Travis W. Murphy, Jiayuan Sheng, Xueyang Feng, Chang Lu
Virginia Polytechnic Institute and State University, USA

10:00 – 10:30 Coffee Break

Session 4A2: Cell Assay / Phenotyping
Chair: Ashleigh Theberge, University of Washington, USA
Room 301

10:30 – 10:50  EFFECTS OF OBTUSE AND ACUTE WALL ANGLES OF 3D MICROGROOVE TOPOGRAPHY ON CANCER CELL MIGRATION
Tomohiro Yaginuma, Keiichiro Kushiro, Madoka Takai
The University of Tokyo, Japan

10:50-11:10  QUANTITATIVE LABEL-FREE DYNAMIC PHENOTYPING OF HIGHLY METASTATIC CANCER CELLS
Jose C. Contreras-Naranjo, Arul Jayaraman, Victor M. Ugaz
Texas A&M University, USA

11:10-11:30  DEEP LEARNING CORRELATES SINGLE-CELL MORPHOLOGY WITH MIGRATORY BEHAVIORS IN MICROFLUIDICS
Zhixiong Zhang, Lili Chen, Yu-Chih Chen, Euisik Yoon
University of Michigan, USA
Thursday Program

Session 4B2: Droplet Motion and Manipulation
Chair: Han-Sheng Chuang, National Cheng Kung University, TAIWAN
Room 304

10:30 – 10:50  SUB-PG/ML, MULTIPLEXED DETECTION OF CYTOKINES ON A MOBILE-PHONE, HIGH THROUGHPUT DIGITAL DROPLET ELISA
Venkata Yelleswarapu¹, Jonathan Baron¹, Eshwar Inapuri¹, Joshua Buser², David Issadore¹
¹University of Pennsylvania, USA, ²Chip Diagnostics, USA

10:50-11:10  TOWARDS DEVELOPING A "DROPLET MOTOR" DRIVEN BY THE BELOUSOV-ZHABOTINSKY REACTION: CONTROL OF SELF-PROPELLED MOTION USING A RATCHET MICROCHANNEL
Taiji Okano, Kazuki Otsubo, Junya Wada, Hiroaki Suzuki
Chuo University, Japan

11:10-11:30  A MAGNETO-SWITCHABLE SUPERHYDROPHOBIC SURFACE FOR DROPLET MANIPULATION
Chao Yang, Gang Li
Chongqing University, China

Session 4C2: Mechanobiology
Chair: Nien-Tsu Huang, National Taiwan University, TAIWAN
Room 305

10:30 – 10:50  DEVELOPMENT-INSPIRED ENGINEERING OF FOLDED MUCOSA
Hon Fai Chan¹²³, Ruike Zhao¹, German Parada¹, Kam W. Leong³, Linda Griffith¹, Xuanhe Zhao¹
¹Massachusetts Institute of Technology, USA, ²The Chinese University of Hong Kong, China, ³Columbia University, USA

10:50-11:10  CELL DEFORMABILITY MEASUREMENT DEVICE FOR LABELED-FREE CANCER CELLS DISCRIMINATING USING IONIC CURRENT DETECTION
T. Suzuki¹, N. Kaji²³, H. Yasaki¹, T. Yasui¹, Y. Baba¹⁴
¹Nagoya University, Japan, ²Kyushu University, Japan, ³PRESTO, Japan Science and Technology Agency, Japan, ⁴AIST, Japan

11:10-11:30  INTEGRATIVE PLATFORM FOR ULTRAHIGH THROUGHPUT QUANTITATIVE MECHANORESPONSE OF ADHERED SINGLE CELLS
Ming Wang¹², Hwa Liang Leo¹, Chwee Teck Lim¹, Chia-Hung Chen¹²
¹National University of Singapore, Singapore, ²Biomedical Institute for Global Healthcare Research & Technology, Singapore

11:30 – 11:40 Transition

11:40 – 12:20  CHEMINAS - Young Researcher Poster Awards
Lab on a Chip - Widmer Poster Awards
NIST and Lab on a Chip - Art in Science Award
Microfluidics on Glass Award sponsored by IMT Masken und Teilungen AG

12:20 Closing Remarks – Conference Adjourns
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2018年11月29日(四) 至12月02日(日) 10:00-17:30
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Poster Presentations

Monday 14:05 – 16:05
Tuesday 14:50 – 16:50
Wednesday 15:35 – 17:35

Track/Classification

- **a** Fundamentals in Microfluidics and Nanofluidics
- **b** Micro- and Nano-Engineering
- **c** Sensors & Actuators, and Detection Technologies
- **d** Integrated Microfluidic Platforms
- **e** Cells, Organisms and Organ on Chip
- **f** Diagnostics, Theranostics, and Medical Research
- **g** Separations and Reactions
- **h** Commercialization
- **i** Microfluidics in Biology
- **j** MicroTAS for Other Applications
- **k** Late News

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

### a - Fundamentals in Microfluidics and Nanofluidics
#### Electrokinetic Phenomena

**M001a** ELECTRIC CONTROL OF MICROPARTICLES BASED ON SURFACTANT ADSORPTION: PROSPECTIVE ACTUATION OF SOFT ROBOTS
Marcos K. Masukawa, Masayuki Hayakwa, Masahiro Takinoue
Tokyo Institute of Technology, Japan

**M002a** MULTI-LAYERED MICRO-NANOFLUIDIC DEVICE USING A FREE-STANDING NAFION-PVDF NANOFIBER MEMBRANE
Junhyun Kim, Sang Min Park, Dongwhi Choi, Dong Sung Kim
POSTECH, Republic of Korea

**T001a** HIGHLY SENSITIVE IMMUNOASSAYS THROUGH DIELECTROPHORESIS-BASED PROTEIN ENRICHMENT USING INTEGRATED NANORODS
Zhen Cao¹, Jiongdong Zhao¹, Yang Liu¹, Junxue Fu²
¹Zhejiang University, China, ²Hong Kong Baptist University, China

**T002a** ION CONCENTRATION POLARIZATION CHARACTERISTICS OF A SINGLE GLASS NANOPORE IN AN ARRAY INTEGRATED ON SILICON THROUGH LOW-RESOLUTION PHOTOLITHOGRAPHY
Lian Duan, Zisun Ahmed, Levent Yobas
The Hong Kong University of Science and Technology, China

**W001a** A HYDRODYNAMIC FLOW ENHANCED DIGITAL MICROFLUIDIC SYSTEM FOR SINGLE-ELECTRODE RAPID MIXING OF STATIONARY DROPLETS
Mingzhong Li¹, Cheng Dong¹, Man-Kay Law¹, Yanwei Jia¹, Pui-In Mak¹, Rui P. Martins¹²
¹University of Macau, China, ²Universidade de Lisboa, Portugal

**W002a** AC ELECTROWETTING ENHANCED BY A HIGH-CAPACITANCE ION GEL DIELECTRIC
Hendry Rusli, Sung-Yong Park
National University of Singapore, Singapore
M003a  CONCENTRATION CONTROL OF AQUEOUS MICRODROPLETS BY FLOWING NANODROPLETS
Lin Zhou¹, Mao Fukuyama²,³, Mikhail Proskurnin⁴, Akihide Hibara²
¹Tokyo Institute of Technology, Japan, ²Tohoku University, Japan, ³PRESTO, Japan Science and Technology Agency, Japan, ⁴Lomonosov Moscow State University, Russia

M004a  MANIPULATING DROPLET MOTION WITHOUT EMBEDDED ROUTE BY VIBRATION
Chung-Hao Wang, Pei-Hsun Tsai, An-Bang Wang
National Taiwan University, Taiwan

M005a  HIGH THROUGHPUT MINIATURIZED PROTEIN CRYSTALLIZATION IN LARGE-SCALE MICROFLUIDIC DROPLET ARRAY
Jian-Wei Wang, Jie Gao, Hui-Feng Wang, Qiu-Heng Jin, Sheng Ye, Qun Fang
Zhejiang University, China

M007a  FABRICATION OF ATTOLITER DROPLETS BY HYDROPHILIC/HYDROPHOBIC NANO-IN-NANO INTEGRATED STRUCTURES
Hiroto Kawagishi, Shuichi Kawamata, Yan Xu
Osaka Prefecture University, Japan

T003a  PRODUCTION OF MICRON AND SUB MICRON-SIZED PARTICLES BY COMBINING IMMISCIBLE LIQUIDS
Yo Han Choi, Kwang Hyo Chung, Chang Beom Kim
ETRI, Republic of Korea

T004a  A MICROFLUIDIC STRATEGY FOR CONTROLLABLE GENERATION OF WATER-IN-WATER DROPLETS AS BIOMpatible MICROCARRIERS
Hai-Tao Liu, Hui Wang, Wen-Bo Wei, Hui Liu, Lei Jiang, JIan-Hua Qin
¹Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China

T005a  BARCODE-LIKE PATTERN GENERATION WITH DROPLETS OF DIFFERENT VISCOSITY IN A CROSS JUNCTION MICROFLUIDIC DEVICE
Muhammad Saqib¹, E. Yegan Erdem¹,²
¹Bilkent University, Turkey, ²National Nanotechnology Research Center, Turkey

T006a  OIL-IN-WATER DROPLET FORMATION IN HYDROPHOBIC PDMS DEVICE USING THREE-DIMENSIONAL PROTRUDED TAPER CHANNEL
Chenwei Tang, Dong Hyun Yoon, Tetsushi Sekiguchi, Shuichi Shoji
Waseda University, Japan

T007a  THE NOVEL STEP EMULSIFICATION GEOMETRY FOR PASSIVE GENERATION OF MONODISPERSE EMULSIONS
Adam S. Opalski, Karol Makuch, Yu-Kai Lai, Piotr Garstecki
Institute of Physical Chemistry of Polish Academy of Sciences, Poland
W003a  EVAPORATION KINETICS AND MORPHOLOGICAL PATTERNS OF A BI-DISPERSED DROPLET ON A HYDROPHOBIC SUBSTRATE
R. Iqbal1, Amy Q. Shen2, A.K. Sen1
1Indian Institute of Technology Madras, India, 2Okinawa Institute of Science and Technology Graduate University, Japan

W004a  FABRICATION OF METAL COATED CORE-SHELL RUBBER BALL USING MICROFLUIDIC DROPLET FORMATION TECHNIQUE
M. Shimanuki, Y. Komazaki, T. Torii
The University of Tokyo, Japan

W005a  CONTROLLED BUBBLE NUCLEATION IN GAS-LIQUID-SOLID CATALYTIC MICROSYSTEMS FOR ENHANCED MASS TRANSFER
Renée M. Ripken1, Jeffery A. Wood1, Stefan Schlautmann1, Axel Guenther2, Johannes G.E. Gardeniers1, Séréline Le Gac1
1University of Twente, The Netherlands, 2University of Toronto, Canada

W006a  A NOVEL SELF-ACTIVATED MECHANISM FOR HIGHLY-STABLE, LONG-TERMED AND LARGE VOLUME OF DROPLET GENERATION/TRANSPORT INSIDE 3D MICROCHANNEL CAPABLE OF PROGRAMMABLE CONTROL
Y. Jiang1, L. Du2, W. Wu1
1Chinese Academy of Sciences, China, 2Fudan University, China

a - Fundamentals in Microfluidics and Nanofluidics
Optofluidics

M008a  CREATION OF NANOPARTICLE ARRAYS BY INTEGRATION OF NANOFLUIDICS AND OPTICAL FORCES
Satoshi Nishioka1, Tatsunori Kishimoto2,3, Chie Hosokawa2, Toshiyuki Kawabata1, Takehiro Tsukikawa1, Toshiyuki Nomura1, Suguru N. Kudoh3, Yan Xu1
1Osaka Prefecture University, Japan, 2AIST, Japan, 3Gakuin University, Japan

T008a  MICROFLUIDIC-CONTROLLED OPTICAL ROUTER FOR LAB ON A CHIP
Jiri Dietvorst, Jeroen Goyvaerts, Tobias Nils Ackermann, Erica Alvarez, Xavier Munoz Berbel, Andreu Llobera
IMB-CNM, CSIC, Spain

a - Fundamentals in Microfluidics and Nanofluidics
Magnetofluidics (Magnetic Particles and Related Phenomena)

M009a  DROPLET ACTUATION ACTION USING MAGNETOTACTIC BACTERIA
Prashant Agrawal1, Saeed Rismani Yazdi1, Erick Morales2, Corey A. Stevens1, Laura Oropeza2, Peter L. Davies3, Carlos Escobedo1, Richard D. Oleschuk1
1Queen's University, Canada, 2UNAM, Mexico

T009a  IMPROVED MAGNETIC SEPARATION ASSISTED WITH CHAOTIC ADECTION FLOWS IN MICROFLUIDIC CHANNELS
Su Hyun Jung1, Young Ki Hahn2, Sein Oh3, Seyong Kwon1, Eujin Um3, Sungyoung Choi2, Joo H. Kang1
1UNIST, Republic of Korea, 2DGIST, Republic of Korea, 3Kyung Hee University, Republic of Korea
W009a  POINT-OF-CARE DIAGNOSTICS ON MAGNETIC DIGITAL MICROFLUIDIC PLATFORM WITH A MUSSEL-INSPIRED SUBSTRATE
Pojchanun Kanitthamniyom, Zhang Yi
Nanyang Technological University, Singapore

T010a  MEASURING CANCER CELL COMPRESSION BY ACOUSTOPHORESIS SEPARATION EXPERIMENTS
Andreas Lenshof, Fabio Garofalo, Sander Bonestroo, Thomas Laurell
1Lund University, Sweden, 2University of Twente, The Netherlands

W010a  ENHANCED ACOUSTIC FOCUSING OF NANO/MICROPARTICLES IN THIN GLASS MICROFLUIDIC DEVICES
Nobutoshi Ota, Yaxiaer Yalikun, SangWook Lee, Keisuke Goda, Yo Tanaka
1RIKEN, Japan, 2The University of Tokyo, Japan

M011a  PRESSURE-DRIVEN INJECTION OF CHARGED SOLUTE MOLECULES FROM MICRO TO NANOCHEL
Kazuma Okamoto, Yutaka Kazoe, Kazuma Mawatari, Takehiko Kitamori
The University of Tokyo, Japan

M012a  IONIC LIQUID BLOCKING AND GATING THROUGH MoS2, NANOPORES EMBEDDED IN POLYMER MICROFLUIDIC CHIPS
Min Xuan Wu, Shih-Pang Wang, Chien-Chong Hong, Kuo Chu Hwang, Chie-Pein Chen
1National Tsing Hua University, Taiwan, 2MacKay Memorial Hospital, Taiwan

M013a  TWO DIMENSIONAL CONFINEMENT IN NANOCAPILLARIES AND CONSEQUENT SUPPRESSION OF OVERLIMITING CURRENT
Zisun Ahmed, Duan Lian, Levent Yobas
The Hong Kong University of Science and Technology, China

T012a  ANALYSIS OF STREAMLINES IN NANOCHELLES BY FLUORESCENCE IMAGING METHOD
Haruka Ishibashi, Taichi Nakajima, Kazuo Satoh, Yan Xu
1Osaka Prefecture University, Japan, 2Osaka Research Institute of Industrial Science and Technology, Japan

T013a  THERMAL DIFFUSIVITY OF WATER CONFINED IN EXTENDED-NANO SPACE: MEASUREMENT OF EXTENDED-NANO CHANNELS
T. Sato, K. Mawatari, H. Shimizu, T. Kitamori
The University of Tokyo, Japan

W011a  A HIGH EFFICIENT FLUIDIC MICROCHANNEL FOR CELL IMMOBILIZATION WITH CONTROLLABLE QUANTITY
Tang Xiaqing, Liu Xiaoming, Li Pengyun, Lin Yuqin, Masaru Kojima, Huang Qiang, Tatsuo Arii
1Beijing Institute of Technology, China, 2Osaka University, Japan
W012a  CLARIFYING THE BEHAVIORS OF THE NANOPARTICLE TRAPPED WITH AN AIFA DEVICE
Toshiyuki Kawabata, Yan Xu
Osaka Prefecture University, Japan

W013a  DIRECT OBSERVATION OF ELECTROSPRAYING DROPLETS FROM SELF-ENCLOSED GLASS NANONOZZLE EMITTERS INTEGRATED ON SILICON
Lian Duan¹, Xiaomin Huang¹, Irving Djuemo², Leon Abelmann¹,², Andreas Manz², Levent Yobas¹,²
¹The Hong Kong University of Science and Technology, China, ²Korea Institute of Science and Technology - Europe, Germany

W014a  UNDERSTANDING CONVECTION-DIFFUSION IN OPEN-SPACE MICROFLUIDICS VIA CONFORMAL MAPPING
Etienne Boulais¹, Pierre-Alexandre Goyette¹, Thomas Gervais¹,²
¹École Polytechnique de Montréal, Canada, ²Institut du Cancer de Montréal, Canada

W015a  UNDERSTANDING AND MODELLING RAPID FLOW IN MULTILAYERED PAPER-BASED DEVICES
Robert B. Channon, Michael P. Nguyen, David S. Dandy, Charles S. Henry
Colorado State University, USA
### a - Fundamentals in Microfluidics and Nanofluidics

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<td>BUBBLE GENERATION AND REMOVAL FOR SIMPLE METHOD OF FLOW CONTROL IN EXTENDED-NANO CHANNEL</td>
<td>Shun Furukawa, Kazuma Mawatari, Takehiko Kitamori</td>
<td>The University of Tokyo, Japan</td>
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<td>T016a</td>
<td>PUSH/PULL INEQUALITY BASED ON-CHIP DENSITY MIXER WITH ACTIVE ENHANCER</td>
<td>Toshio Takayama¹, Mitsuhiro Horade¹, Chia-Hung Dylan Tsai², Makoto Kaneko¹</td>
<td>¹Osaka University, Japan, ²National Chiao Tung University, Japan</td>
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<td>W016a</td>
<td>ON-CHIP SUPER HIGH SPEED MIXER</td>
<td>Toshio Takayama¹, Naoya Hosokawa¹, Chia-Hung Dylan Tsai², Makoto Kaneko¹</td>
<td>¹Osaka University, Japan, ²National Chiao Tung University, Japan</td>
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### Others

### b - Micro- and Nano-Engineering

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<td>Jinsik Yoon, Wook Park</td>
<td>Kyung Hee University, Republic of Korea</td>
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<td>Keigo Nishimura, Shoji Takeuchi</td>
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<td>AN ULTRA-THIN HIGHLY FLEXIBLE MICROFLUIDIC DEVICE FOR ARTIFICIAL PLACENTA TYPE MICROFLUIDIC BLOOD OXYGENATOR APPLICATION</td>
<td>Mohammadhossein Dabaghi², Neda Saraei¹, Gerhard Fusch¹, Niels Rochow¹, John L. Brash¹, Christoph Fusch¹, P. Ravi Selvaganapathy¹</td>
<td>¹McMaster University, Canada, ²University Hospital Nuremberg, Germany</td>
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<td>M022b</td>
<td>4-STEP MICRO GLASS BLOWING METHOD FOR ALL GLASS LENS ARRAY FABRICATION</td>
<td>Yusufu Aishan¹,², Yaxiaer Yalikun¹, Yo Tanaka</td>
<td>¹RIKEN, Japan, ²Osaka University, Japan</td>
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<td>M023b</td>
<td>ROLL-PRINTED SILVER NANOWIRES MICROELECTRODES ON SILICONE RUBBER FOR ULTRAFLEXIBLE ELECTRONIC SENSING</td>
<td>Zong-Qin Zhou, Chien-Chong Hong, Tong-Miin Liou</td>
<td>National Tsing Hua University, Taiwan</td>
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<td>M024b</td>
<td>TECHNOLOGY INNOVATIONS IN 3-D WAX BASED MICROFLUIDIC DEVICE FABRICATION</td>
<td>Philip J. Schneider, Liam Christie, Anyang Wang, Domin Koh, Kwang W. Oh</td>
<td>Univeristy at Buffalo, USA</td>
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M025b  DIGITAL-MASK SHIFTING TECHNIQUE TO PREVENT MOTION BLUR EFFECT ON MOVING SUBSTRATE
Junghyun Bae, Jiyoung Jung, Wook Park
Kyung Hee University, Republic of Korea

M026b  3D INKJET PRINTING METHOD WITH FREE SPACE DROPLET MERGING FOR LOW VISCOSITY AND HIGHLY REACTIVE MATERIALS
Monika Śliwiak, Robert Bui, Michael A. Brook, Ponnambalam R. Selvaganapathy
McMaster University, Canada

M027b  3D PRINTED MICROFLUIDIC PROBES AND STREAMING DISPLAYS
Pierre-Alexandre Goyette¹, Thomas Gervais²³
¹École Polytechnique de Montréal, Canada, ²Centre Hospitalier de l'Université de Montréal, Canada

M028b  HIGH-EFFICIENCY MICROBEADS ARRAY BASED ON BIOMIMETIC STRUCTURE OF NEPENTHES PERISTOME SURFACES
Zhiting Peng, Tianzhun Wu, Hui Yang
Chinese Academy of Sciences, China

T017b  FABRICATION OF 3D CERAMIC MICROCHANNELS BY IMPRINTING METHOD
Kazuki Tokumaru¹², Simon Hunt¹, Fujio Tsumori¹
¹Kyushu University, Japan, ²JSPS Research Fellow, Japan

T018b  3-D CONICAL MICROCHANNEL FABRICATED BY WET ETCHING USING Ti/Au SACRIFICIAL LAYER
Hirotaka Sugiura, Shinya Sakuma, Fumihiro Arai
Nagoya University, Japan

T019b  DIRECT WRITING OF 3D STIMULI-RESPONSIVE HYDROGEL MICROSTRUCTURES IN SUPPORTING VISCous LIQUID
Takuya Uchida, Hiroaki Onoe
Keio University, Japan

T020b  STICKY PARTICLE TO CARRY MULTIPLE MICROBEADS FOR BATCH MANIPULATION
Seojoo Kim, Junghyun Bae, Wook Park
Kyung Hee University, Republic of Korea

T021b  HIGH ASPECT RATIO MICRONEEDLES OF BIOABSORBABLE POLYMER FABRICATED BY MICROMOLDING
Yukihiro Kanda¹, Hiroaki Takehara¹², Takanori Ichiki¹²
¹The University of Tokyo, Japan, ²Innovation Center of NanoMedicine, Japan

T022b  GLASS MICROCHANNELS FABRICATED BY LIVE PLANT ROOT
Shota Nakashima, Kazuki Tokumaru, Fujio Tsumori
Kyushu University, Japan

T023b  3D PRINTING HYDROGELS USING OPEN MICROFLUIDICS
University of Washington, USA
T024b  FREEZING Na-ALGINATE SOLUTION TO FORM ALGINATE HYDROGEL MICROSTRUCTURE ON GLASS
Ryutaro Soda, Keigo Nishimura, Shoji Takeuchi
The University of Tokyo, Japan

T025b  BIOMIMETIC PDMS-GUM ARABIC HYBRID BIOPOLYMER ADHESIVE FOR DRUG DELIVERY
P.-H. Wang, Y.-W. Lu
National Taiwan University, Taiwan

T026b  PHOTOPOLYMERIZED HYDROGEL MICROBEADS GENERATED BY SIMULTANEOUS UV IRRADIATION WITH CENTRIFUGE
Yuta Kurashina, Hiroaki Onoe
Keio University, Japan

T027b  SERIALLY ENCODED “CORE-SHELL” MICROFIBERS USING 3D-PRINTED MICROFLUIDIC DEVICES
Minghao Nie, Shoji Takeuchi
The University of Tokyo, Japan

T028b  RAPID PROTOTYPING OF MICROFLUIDIC CHANNEL USING ATMOSPHERIC PRESSURE PLASMA JET
Ya-Shen Yu, Mu-Chien Wu, Jong-Shinn Wu, Chia-Hung Dylan Tsai
National Chiao Tung University, Taiwan

W017b  FREESTANDING MULTIFUNCTIONAL MICRO FLUIDIC SYSTEM FOR HIGHLY SENSITIVE THERMAL DETECTION
Zhuqing Wang1, Mitsuteru Kimura2, Takahito Ono3
1Tohoku University, Japan, 2Tohoku Gakuin University, Japan

W018b  COMPLETE FILLING OF LIQUID METAL IN COMB-SHAPED TRANSDUCERS FOR ACOUSTOFLUIDICS
Wei Guo1, Adrian J.T. Teo2, Alfonso M. Ganan-Calvo3, Chaolong Song4, Nam-Trung Nguyen5, Heng-Dong Xi1, Say Hwa Tan2
1Northwestern Polytechnical University, China, 2Griffith University, Australia, 3Universidad de Sevilla, Spain, 4China University of Geosciences, China

W019b  LOW COST INJECTION MOULDING STRATEGIES FOR THE FABRICATION OF MICROFLUIDIC DEVICES
B.J. Middleton, V. Goodship, R. Dallmann, J. Charmet
University of Warwick, UK

b - Micro- and Nano-Engineering
Nanoscale Fabrication, Patterning, and Integration

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Katherine E. Jones1, Morgan Janes1, Cara Brainerd1, Megan Donovan1, Viswanath Gorti1, Shireen Khayat1, Andrew Liu1, Madeleine Noonan-Shueh1, Sahana Rao1, Ryan D. Socho1
1University of Maryland, College Park, USA, 2Bioinspired Advanced Manufacturing Laboratory, USA
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Natsumi Takai¹, Masaki Matsushita¹, Kan Shoji¹, Tei Maki¹,², Ryuji Kawano¹  
¹Tokyo University of Agriculture and Technology, Japan, ²JEOL Ltd., Japan

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The University of Tokyo, Japan

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Hai Le-The¹, Jasper J.A. Lozeman¹, Johan G. Bomer¹, Hien Duy-Tong², Erwin Berenschot¹, Albert van den Berg¹, Mathieu Odijk¹, Jan C.T. Eijkel¹  
¹University of Twente, The Netherlands, ²Ton Duc Thang University, Vietnam

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University of Central Florida, USA

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Chonnam National University, Republic of Korea

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¹ETRI, Republic of Korea, ²KAIST, Republic of Korea, ³Ajou University, Republic of Korea, ⁴UNIST, Republic of Korea

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Alfredo Edoardo Ongaro¹,², Nicola M. Howarth¹, Vincenzo La Carrubba³, Maiwenn Kersaudy-Kerhoas⁴,²  
¹Heriot-Watt University, UK, ²University of Edinburgh, UK, ³University of Palermo, Italy
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Hyeli Kim, Jinsik Yoon, Wook Park
Kyung Hee University, Republic of Korea

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Xin Xie1,2, Sanwei Liu3, Carol Livermore1
1Northeastern University, USA, 2Harvard University, USA

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National Central University, Taiwan

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1RIKEN, Japan, 2Nara Institute of Science and Technology, Japan

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POSTECH, Republic of Korea

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Karlsruhe Institute of Technology, Germany

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1McGill University, Canada, 2University of Toronto, Canada, 3Alentic Microscience Inc., Canada

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Indian Institute of Science, India
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¹National Tsing Hua University, Taiwan, ²Academia Sinica, Taiwan

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¹Queen’s University, Canada, ²CMC Microsystems, Canada

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EPFL, Switzerland

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Xuting Yang¹, Yanping Du², Clifford Shum³, Min Gu³, Yonggang Zhu¹,³
¹Harbin Institute of Technology, China, ²Shanghai Jiao Tong University, China, ³RMIT University, Australia

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The University of Tokyo, Japan

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Norwegian University of Science and Technology, Norway
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1Chinese Academy of Sciences, China, 2KAIST, Republic of Korea

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1Chinese Academy of Sciences, China, 2Missouri University of Science & Technology, USA, 3Peking University, China, 4Zhejiang University, China

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1South China Normal University, China, 2University of Twente, The Netherlands

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1Nagoya University, Japan, 2PRESTO, Japan Science and Technology Agency, Japan, 3Kyushu University, Japan, 4AIST, Japan

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1Singapore University of Technology and Design, Singapore, 2National University of Singapore, Singapore

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1Singapore University of Technology and Design, Singapore, 2National University of Singapore, Singapore

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Po-Hsun Huang¹, Marten Darmawan², NiteshNama², Tony Jun Huang¹
¹Duke University, USA, ²The Pennsylvania State University, USA

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Zong-Fu Shih¹, Chia-Wen Tsao², Chia-Yi Yen², Chang-Hsuan Tsai²
¹USI Corporation, Taiwan, ²National Central University, Taiwan

M039c  IMPACT OF METACHRONAL WAVE OF MAGNETIC ARTIFICIAL CILIA ON MICRO-PUMP EFFICIENCY
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Cuong Nguyen Nhu¹, Luan Le Van², An Nguyen Ngoc¹, Lam Dang Bao³, Trinh Chu Duc¹, Van thanh Dau¹, Tung Bui Thanh¹
¹Vietnam National University, Vietnam, ²Vietnam Academy of Science and Technology, Vietnam, ³Hanoi University of Science and Technology, Vietnam, ⁴Griffith University, Australia

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The University of Tokyo, Japan

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Yoshiharu Bessho, Yingzhe Wang, Kaoru Uesugi, Keisuke Morishima
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S. Uhlig¹,², M. Gaudet¹,², S. Langa¹,², H. Conrad¹, B. Kaiser¹, M. Stolz¹, H. Schenk¹,²
¹Fraunhofer Institute for Photonic Microsystems, IPMS, Germany, ²Brandenburg University of Technology, Germany

T040c  3D INTEGRATED FLUIDIC OSCILLATORS FOR TIMING AND CONTROL OF AUTONOMOUS MICROFLUIDICS
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Rui Rijo Carvalho1, Aliki Tsopela2, Wout Knoben1, Luc Scheres1, Elwin Vrouwe3, Marko Blom3, Monica Brivio2
1Surfix BV, The Netherlands, 2Micronit Microtechnologies B.V., The Netherlands

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1AIST, Japan, 2Kumamoto University, Japan, 3Hokkaido University, Japan, 4Kyushu Institute of Technology, Japan

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J. Etxebarria-Elezgarai1, F. Benito-Lopez1, L. Basabe-Desmonts1,2
1University of the Basque Country, Spain, 2Basque Foundation of Science, Spain

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Yo Tanaka1, Shun-ichi Funano1, Yuji Noguchi1,2, Yaxiaer Yalikun1, Norihiro Kamamichi2
1RIKEN, Japan, 2Tokyo Denki University, Japan

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Myongji University, Republic of Korea

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1Korea Institute of Science and Technology, Republic of Korea, 2Korea University, Republic of Korea, 3Dreamcon, Republic of Korea
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1The Hong Kong University of Science and Technology, China, 2City University of Hong Kong, China

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William Hale, James Eills, Manvendra Sharma, Matheus Rossetto, Malcolm Levitt, Marcel Utz
University of Southampton, UK

T043c  INKJET 3D PRINTED MICROPOT WITH INTEGRATED CANTILEVER-LIKE FORCE SENSOR FOR GROWING PLANT BIOLOGICAL POTENTIAL MEASUREMENT
Bartosz Kawa, Krzysztof Adamski, Danylo Lizanets, Rafal Walczak
Wroclaw University of Science and Technology, Poland

T044c  DESIGN AND IMPLEMENTATION OF A PASSIVE C4D SENSOR FOR MICROFLUIDIC CHANNEL
Loc Quang Do1, Tung Thanh Bui2, Thanh Van Pham1, Chun-Ping Jen3, Trinh Chu Duc2
1Vietnam National University of Science, Vietnam, 2Vietnam National University of Engineering and Technology, Vietnam, 3National Chung Cheng University, Taiwan

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Wroclaw University of Science and Technology, Poland

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Gregory A. Cooksey, Paul N. Patrone, James R. Hands, Stephen Meek, Anthony Kearsley
NIST, USA

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Hande Aydogmus, Arda Secme, Hadi S. Pishe, Mehmet Kelleci, M. Selim Hanay
Bilkent University, Turkey

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Rahul Kishor1, Yen P. Seah2, Haijing Lu2, S. Sreejith3, Yuanjin Zheng1, Zhenfeng Wang2
1Nanyang Technological University, Singapore, 2Singapore Institute of Manufacturing Technology, Singapore, 3National University of Singapore, Singapore
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¹Osaka University, Japan, ²Tokyo Institute of Technology, Japan |
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¹CSEM SA, Switzerland, ²EPFL, Switzerland |
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¹JAIST, Japan, ²Hanoi University of Science and Technology, Vietnam, ³Tokushima University, Japan, ⁴Tokyo University of Agriculture and Technology, Japan, ⁵Osaka University, Japan

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Jorge Prada¹, Christina Cordes², Carsten Harms², Walter Lang¹
¹University of Bremen, Germany, ²University of Applied Sciences Bremerhaven, Germany

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¹National Tsing Hua University, Taiwan, ²Academia Sinica, Taiwan, ³Indian Institute of Science Bangalore, India, ⁴National Institute of Technology, India

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1University of Toronto, Canada, 2McGill University, Canada, 3University of Michigan, USA

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Li Wang1, Xian Wang1, Wenkun Dou1, Qili Zhao1, Manpreet Malhi2, Teng Cui1, Zhuroan Zhang1, Jason T. Maynes3, Yu Sun1  
1University of Toronto, Canada, 2Hospital for Sick Children, Canada

W050c  CHARACTERIZATION OF SINGLE-VIRUSES AT A SINGLE-PARTICLE LEVEL USING A NANOPORE MODIFIED WITH SUGAR CHAINS  
Akihide Arima1, Yukich Horiguchi2, Makusu Tsutsui1, Wataru Tonomura1, Kazumich Yoko1, Masateru Taniguchi1, Yuji Miyahara2, Tomo Kawai1  
1Osaka University, Japan, 2Tokyo Medical and Dental University, Japan

W051c  ULTRASENSITIVE miRNA DETECTION BASED ON TARGET-ASSISTED FLUORESCENCE RESONANCE ENERGY TRANSFER SIGNAL AMPLIFICATION  
Bin Wang, Dahai Ren, Zheng You  
Tsinghua University, China

W052c  URINE GLUCOSE SENSOR FOR DETECTION OF PET DIABETES IN EARLY STAGE  
Jun Sawayama, Shoji Takeuchi  
The University of Tokyo, Japan

W053c  DEVELOPEMENT OF VALVE-INTEGRATED MICROFLUIDIC PRECONCENTRATOR FOR LOW-ABUNDANCE PROTEIN DETECTION  
Chih-Zong Deng1,2, Yu-Jui Fan1, Horn-Jiunn Sheen2  
1Taipei Medical University, Taiwan, 2National Taiwan University, Taiwan

W054c  MECHANICAL EFFECTS OF A TYPE 2 ENDONUCLEASE ON DNA TRAPPED BY SILICON NANO TWEEZERS AT HIGH MOLECULAR DENSITY  
Yannick Tauran1,2, Grégoire Perret1, Laurent Jalabert2, Momoko Kumemura1, Arnaud Brioud1, Hiroyuki Fujita2, Dominique Collard3  
1University of Lyon, France, 2The University of Tokyo, Japan, 3CNRS/IIS/COL/Lille, France, 4Kyushu Institute of Technology, Japan
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**W055c** DEVELOPMENT OF GAS PRECONCENTRATOR FILLED WITH CARBON ADSORBENT INCORPORATED INTO MESH-TYPE MEMBRANE HEATER
Hye-Lim Kang, Young joo Kim, Ji hye Nam, Sunga Song, Sumi Yoon, Dong-Ki Hong, Seong-Eun Kim, Won-Hyo Kim, Woo Kyeong Seong, Kook-Nyeong Lee  
*Korea Electronics Technology Institute, Republic of Korea*

**W056c** ELECTROCHEMICAL IMMUNOSENSOR USING POLYANILINE/GOLD NANOCRYSTALS FOR POINT OF DETECTION OF CHRONIC KIDNEY DISEASE
Muhammad Omar Shaikh, Boyanagunta Srikanth, Pei-Yu Zhu, Cheng-Hsin Chuang  
*Southern Taiwan University of Science and Technology, Taiwan*

**W057c** MICROFLUIDIC DEVICE USING REUSABLE PARYLEN-PDMS PACKAGING FOR THE RED BLOOD CELL TRANSIT TIME ANALYSIS IN MECHANICAL CONSTRUCTIONS, USING IMPEDANCE MEASUREMENT
Xu Tieying, Maria Lizarralde, Wassim El Nemer, Bruno Le Pioufle, Olivier François  
1ENS Paris Saclay, France, 2INTS, France, 3ESYCOM, France

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Tomoka Higaki, Motoki Hino, Ken Yamamoto, Masahiro Motosuke  
*Tokyo University of Science, Japan*

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Kenny Malpartida-Cardenas, Nicholas Miscourides, Ling-Shan Yu, Jake Baum, Jesus Rodriguez-Manzano, Pantelis Georgiou  
*Imperial College London, UK*

**M062c** DETECTION OF POLLUTANTS FOR ENVIRONMENTAL ANALYSIS OF RIVER WATER BY A LAY-PERSON USING PAPER BASED DEVICES
Samantha Richardson, Emily G. Wright, Alexander Iles, Jeanette M. Rotchell, Mark Lorch, Nicole Pamme  
*University of Hull, UK*

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Hsiu-Cheng Chang, Chien-Chong Hong  
*National Tsing Hua University, Taiwan*

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*The Hong Kong University of Science and Technology, China*
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Toshiki Nishihata, Tatsumi Mizuta, Kenji Sueyoshi, Tatsuro Endo, Hideaki Hisamoto
Osaka Prefecture University, Japan

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Elsbeth G.B.M. Bossink1, Olivier Y.F. Henry2, Maximilian A. Benz2, Loes I. Segerink1, Donald E. Ingber2,3,4, Mathieu Odijk1
1University of Twente, The Netherlands, 2Harvard University, USA, 3Harvard John A. Paulson School of Engineering and Applied Sciences, USA, 4Boston Children's Hospital and Harvard Medical School, USA

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1National Sun Yat-sen University, Taiwan, 2National Pingtung University, Taiwan, 3Green Epoxy Technology Inc., USA, 4National Nano Device Laboratories, Taiwan

T063c  IMPROVEMENT OF CHANNEL DAMAGE AND ITS MECHANISM IN ALTERNATING CURRENT LIQUID ELECTRODE PLASMA ATOMIC EMISSION SPECTROMETRY
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1JAIST, Japan, 2Tokyo Institute of Technology, Japan, 3The University of Tokyo, Japan

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National Tsing Hua University, Taiwan

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Kwangwoon University, Republic of Korea

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National Chiao Tung University, Taiwan
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Tetsuya Yamada1, Koki Kamiya1, Toshihisa Osaki1, Shoji Takeuchi1,2
1Kanagawa Institute of Industrial Science and Technology, Japan, 2The University of Tokyo, Japan

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Chongqing University, China

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Karlsruhe Institute of Technology, Germany

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Bertrand Bourlon, Bao-An Pham-Ho, Jean-François Beche, Olivier Constantin
Université Grenoble Alpes, France

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1University of Strasbourg, France, 2In’Air Solutions, France

M065c  HIGH-RESOLUTION LIVE IMAGING OF THE VERTICAL SECTION OF ADHERENT CELLS USING A MICROFLUIDIC DEVICE
Masayoshi Nakano1, Seigo Araki1, Mamiko Tsugane1,2, Fumiko Sunaga1, Hiroaki Suzuki1
1Chuo University, Japan, 2Japan Society for the Promotion of Science, Japan

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1Chiba University, Japan, 2Tokyo Metropolitan University, Japan
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Byoung-Hoon Kang¹, Youngseop Lee¹, Jinhyo Kim¹, Minhee Kang², Luke P. Lee³, Ki-Hun Jeong¹
¹KAIST, Republic of Korea, ²Samsung Medical Center, Republic of Korea, ³University of California, Berkeley, USA

M067c  LABEL FREE LEAKY-WAVEGUIDE OPTICAL BIOSENSOR FOR VEGF DETECTION
Beverly R. Andrew¹, Nicole Pamme¹, Leigh A. Madden¹, Ruchi Gupta²
¹University of Hull, UK, ²University of Birmingham, UK

M068c  A LABEL-FREE OPTICAL APTASENSOR BASED ON DYE-DOPED LEAKY WAVEGUIDE (DDLW) FOR BIOMARKER DETECTION
Nasser A. Alamrani¹, Nicole Pamme¹, Gillian M. Greenway¹, Ruchi Gupta²
¹University of Hull, UK, ²University of Birmingham, UK

M069c  CALCIUM-SELECTIVE “DYED PLASTICIZER” ON PDMS MICROCHIP: RAPID AND HIGHLY SENSITIVE NAKED EYE-BASED QUANTIZATION OF CALCIUM ION
Y. Niwa, T. Mizuta, K. Sueyoshi, T. Endo, H. Hisamoto
Osaka Prefecture University, Japan

M070c  PUMPLESS MICROFLOW CYTOMETRY FOR IMMUNOPHENOTYPING OF CANCER CELLS
Byeongyeon Kim, Suyeon Shin, Sungyoung Choi
Kyung Hee University, Republic of Korea

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¹Peking University, China, ²Fuzhou University, China, ³The Affiliated High School of Peking University, China

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Masumi Serita, Daiki Sakai, Ken Yamamoto, Masahiro Motosuken
Tokyo University of Science, Japan
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Foelke Purr1,2, Margherita Bassu2, Rachel D. Lowe2, Thomas P. Burg2, Andreas Dietzel1
1Technical University Braunschweig, Germany, 2Max-Planck-Institute for Biochemical Physics, Germany

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Naoki Wada, Hisashi Shimizu, Kazuma Mawatari, Takehiko Kitamori
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T071c  SERS SIGNAL ENHANCEMENT ON NANO-MUSHROOM JANUS-BIOSENSORS THROUGH CARBOXYLATED NANOMASKING MECHANISM
Meng-Ju Pan1, Chun-Wei Lee1, Fan-Gang Tseng2
1National Tsing Hua University, Taiwan, 2Academia Sinica, Taiwan

W066c  ROLLED-UP SiOx/SiN Microtubes Made by PECVD for Sensitive Solvent Detection
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1University of Toronto, Canada, 2McGill University, Canada, 3Massachusetts Institute of Technology, USA, 4University of Michigan, USA

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Hisashi Shimizu, Shigenori Takeda, Kazuma Mawatari, Takehiko Kitamori
The University of Tokyo, Japan

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Jose C. Contreras-Naranjo, Vijetha Nagendra, Xiaorui Dong, Victor M. Ugaz
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National Cheng Kung University, Taiwan

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1Surfix BV, The Netherlands, 2Lionix International BV, The Netherlands, 3Wageningen University, The Netherlands
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<td>¹The University of Tokyo, Japan, ²Hitachi High-Technologies Corporation, Japan</td>
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1RIKEN, Japan, 2Chiba University, Japan

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1RIKEN, Japan, 2Tokyo Denki University, Japan

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1Keio University, Japan, 2Eindhoven University of Technology, The Netherlands

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1Keio University, Japan, 2Techno Medica Co., Ltd., Japan

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M079d  3D-PRINTED AUTONOMOUS MICROFLUIDICS: BIOASSAY DEVELOPMENT TOWARDS THE POINT OF CARE
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1Council for Science and Industrial Research, South Africa, 2University of the Western Cape, South Africa, 3University of Pretoria, South Africa

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1University of Toronto, Canada, 2McGill University, Canada

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W076d SELF-POWERED AND EASY-TO-INTEGRATE HEATING SYSTEM FOR ON-CHIP TEMPERATURE DEPENDENT BIOASSAYS IN LOW-RESOURCE SETTINGS
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1University of Southampton, UK, 2Imperial College London, UK

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1National Taiwan University, Taiwan, 2Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Taiwan

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Mohamed Z. Rashed, Clinton J. Belott, Michael A. Menze, Stuart J. Williams  
University of Louisville, USA

T117e  SINGLE BACTERIA DETECTION ON A PIECE OF MICRO/NANOCHANNELS MEMBRANE  
Xingyu Lin, Xiao Huang, Yanzhe Zhu, Michael R. Hoffmann  
California Institute of Technology, USA

T118e  HYDRODYNAMIC STRETCHING OF SINGLE CELLS FOR HIGH-THROUGHPUT VECTOR-FREE INTRACELLULAR DELIVERY OF MACROMOLECULES  
Yanxiang Deng1,2, Megan Kizer1, Xing Wang1, Aram J. Chung1,3  
1Rensselaer Polytechnic Institute, USA, 2Yale University, USA, 3Korea University, Republic of Korea

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1National University of Singapore, Singapore, 2Biomedical Institute for Global Health Research and Technology, Singapore, 3Singapore Institute for Neurotechnology, Singapore

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Shih-Chung Wei1, Myat Noe Hsu2, Wei-Chuan Shih3, Chia-Hung Chen1,2,4  
1Biomedical Institute for Global Health Research and Technology, Singapore, 2National University of Singapore, Singapore, 3University of Houston, USA, 4Singapore Institute for Neurotechnology, Singapore

W110e  3D MASSIVELY PARALLEL HIGH THROUGHPUT SINGLE CELL ELECTROPORATION  
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1Indian Institute of Technology Madras, India, 2UCLA, USA
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¹Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China, ³University of Colorado, USA, ⁴University of Science and Technology of China, China

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**W115e FLUORESCENCE IMAGE MORPHOLOGY ACTIVATED CELL SORTING (FIMACS)**  
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National Chung Hsing University, Taiwan

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Riccardo Reale¹, Adele De Ninno¹, Luca Businaro², Paolo Bisegna¹, Federica Caselli³  
¹University of Rome Tor Vergata, Italy, ²Italian National Research Council, Italy

**W118e MODELING AND EXPERIMENTAL STUDY OF RED BLOOD CELL CHARACTERIZATION IN A COPLANAR-ELECTRODE MICROFLUIDIC IMPEDANCE CHIP**  
Federica Caselli¹, Riccardo Reale¹, Adele De Ninno¹, Luca Businaro², Paolo Bisegna³  
¹University of Rome Tor Vergata, Italy, ²Italian National Research Council, Italy
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<td>(^1)Nagoya University, Japan, (^2)AGC Inc., Japan</td>
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1University of Bremen, Germany, 2Ionovation GmbH, Germany, 3Jacobs University, Germany

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1Hitachi, Ltd., Japan, 2The University of Tokyo, Japan, 3Kyoto University, Japan, 4RIKEN, Japan

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1ETH Zürich, Switzerland, 2Friedrich Miescher Institute for Biomedical Research, Switzerland, 3Novartis Institutes for BioMedical Research, Switzerland, 4InSphero AG, Switzerland
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Karl Olofsson¹, Valentina Carannante², Björn Önfelt¹ ², Martin Wiklund¹
¹KTH Royal Institute of Technology, Sweden, ²Karolinska Institutet, Sweden

M124e  A STRETCHABLE 3D CELLULAR MICROARRAY FOR MECHANOBIOLOGY STUDY KABILAN
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University of British Columbia, Canada

M125e  QUANTIFYING PARPi-RESISTANT SUBPOPULATIONS AFTER TREATMENT IN CO-CULTURE SPHEROIDS USING HYPERSPECTRAL IMAGING
Amélie St-Georges-Robillard¹ ², Maxime Cahuzac³ ², Alexandre Sauriol² ³, Benjamin Péant² ³, Anne-Marie Mes-Masson² ³, Frédéric Leblond¹ ², Thomas Gervais² ³
1École Polytechnique de Montréal, Canada, 2Université de Montréal, Canada, 3Institut du cancer de Montreal, Canada

M126e  WRAPPING OF LINEAR CELL ASSEMBLIES WITH TUBULAR COLLAGEN MEMBRANES USING MULTILAYERED MICROFLUIDIC DEVICES
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Chiba University, Japan

M127e  HYDROGEL CULTURE DISH INTEGRATED WITH ORGANIC ELECTRODES FOR EFFICIENT STIMULATION OF hiPSC-DERIVED CARDIOMYOCYTES
Kensuke Somomozawa, Kuniaki Nagamine, Hirokazu Kai, Shotaro Yoshida, Hirokazu Kaji, Matsuhiko Nishizawa
Tohoku University, Japan

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C.-H. Tsai¹ ², D.-H. Kuan², S. Zimmermann¹, J. Schoendube², A. Gross², R. Zengerle³ ⁴, P. Koltay³ ⁴
1Albert-Ludwigs-Universität Freiburg, Germany, 2National Taiwan University, Taiwan, 3cytena GmbH, Germany, 4Hahn-Schickard-Gesellschaft für angewandte Forschung e.V., Germany

M129e  A MICROFLUIDIC SYSTEM TO EVALUATE THE EFFECTIVENESS OF NEW-GENERATION DRUGS IN COMBINATION THERAPY ON OVARIAN CANCER
Magdalena Bulka¹, Urszula Bazylnska², Elzbieta Jastrzebska¹, Michal Chudy³, Artur Dybko¹, Kazimiera A. Wilk², Zbigniew Brzozka¹
1Warsaw University of Technology, Poland, 2Wroclaw University of Technology, Poland

M130e  ULTRA-STABLE AND ULTRA-FAST FABRICATION OF MICROWELLS USING LASER ABLATION IN PLANE PS FOR THE FORMATION OF SIZE-CONTROLLED HEPATIC TUMOR SPHEROIDS
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National Cheng Kung University, Taiwan
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1Polish Academy of Sciences, Poland, 2University of Tartu, Estonia, 3Queen Mary University of London, UK

T127e MECHANISTICALLY MODULATED CARDIOMYOCYTE ALIGNMENT
Carina J. Lee, William J. Agnew, William C. Tang
University of California, Irvine, USA

T128e ENCAPSULATING CANCER CELLS IN FIBRIN MICROGELS FOR TISSUE ENGINEERING APPLICATIONS
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1Virginia Polytechnic Institute and State University, USA, 2San Jose State University, USA, 3Virginia-Tech Wake Forest University, USA, 4Lawrence Livermore National Laboratory, USA

T129e CELL PROLIFERATION ON COMMON 3D PRINTING MATERIALS USED IN STEREOLITHOGRAPHIC PATTERNING OF MICROFLUIDIC DEVICES
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University of Helsinki, Finland

T130e PHOTOLITHOGRAPHY-FREE TUMOR-ON-A-CHIP TO STUDY NANOPARTICLE EXTRAVASATION
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Toyo University, Japan

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The University of Tokyo, Japan

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McMaster University, Canada

W124e MECHANICAL STRESS INDUCED ASTAXANTHIN PRODUCTION ON A CHIP
Junyi Yao1, Sangil Han2, Hyun Soo Kim3, Younghak Cho4, Yoon-E Choi4, Jaewon Park1
1Southern University of Science and Technology, China, 2Korea University, Republic of Korea, 3Korea Institute of Machinery & Materials, Republic of Korea, 4Seoul National University of Science and Technology, Republic of Korea

W125e FORMATION OF COAXIAL HIERARCHICAL-LAYERED CELL-LADEN FIBER
Yuya Morimoto1, Mahiro Kiyosawa1, Midori Kato-Negishi1, Shoji Takeuchi1
1The University of Tokyo, Japan, 2Musashino University, Japan
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Roaa Alnemari¹, Pavithra Sukumar¹, Muhammeden Deliorman¹, Mohammad A. Qasaimeh¹²  
¹New York University Abu Dhabi, UAE, ²New York University, USA

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Fumisato Ozawa, Jun Sawayaama, Shoji Takeuchi  
The University of Tokyo, Japan

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Yu-Chen Ho¹², Kin Fong Lei¹², Yun-Ju Chuang¹  
¹Ming Chuan University, Taiwan, ²Chang Gung University, Taiwan, ³Chang Gung Memorial Hospital, Taiwan

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Raja Vadivelu, Navid Kashaninejadand, Nam-Trung Nguyen  
Griffith University, Australia

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¹Technical University of Denmark, Denmark, ²University of Pretoria, South Africa

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Sönke Schmidt¹, Julia Bruchmann², Christiane Richter², Martin Schüßler¹, Rolf Jakoby¹, Thomas Schwartz², Bastian E. Rapp²  
¹Technische Universität Darmstadt, Germany, ²Karlsruhe Institute of Technology, Germany

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**e - Cells, Organisms, and Organs on Chip**  
**Inter- and Intra-Cellular Signaling, Cell Migration**

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Bingyu B. Li, Shuailong Zhang, Erica Y. Scott, M. Dean Chamberlain, Aaron R. Wheeler  
University of Toronto, Canada

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Hyung Woo Kim, Jiwon Lim, Andrew Choi, Dong Sung Kim  
POSTECH, Republic of Korea

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KAIST, Republic of Korea
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Sheng-Han Chu1, Li-Lun Lo1, Richard Lee Lai1, T. Tony Yang2, Jung-Chi Liao3, Nien-Tsu Huang1
1National Taiwan University, Taiwan, 2Academia Sinica, Taiwan

T134e  CANCER STEM CELL MIGRATION IN AN OXYGEN GRADIENT CHARACTERIZED USING A MICROFLUIDIC DEVICE
Jelle J.F. Sleeboom1, Cecilia M. Sahlgren1,2, Jaap M.J. den Toonder1
1Eindhoven University of Technology, The Netherlands, 2Åbo Akademi University, Finland

T135e  DIFFERENTIAL BINARY HAPTOTAXIS CHOICE ASSAYS OF MYOBLASTS ON ALTERNATING NANODOT ARRAYS OF NETRIN-1
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McGill University, Canada

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Marika Sugimoto, Fuka Nagatomi, Naoki Sasaki
Toyo University, Japan

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Academia Sinica, Taiwan

W133e  EFFECTS OF HYPOXIA ON EPITHELIAL CANCER CELL MOTILITY ON TOPOGRAPHY-BASED MICROSYSTEMS
Keiichiro Kushiro1, Akhide Ryo2, Madoka Takai1
1The University of Tokyo, Japan, 2Yokohama City University, Japan

W134e  CIGARETTE SMOKE EXTRACT ENHANCES THE INVASION OF LUNG CANCER CELLS CO-CULTURED WITH FIBROBLASTS IN 3D CELLULAR SPHEROIDS
Huei-Jyuan Pan1, Hsin-Han Hou2, Yun-Ching Hung3, Wei-Yu Liao2, Chong-Jen Yu1, Chau-Hwang Lee1,3
1Academia Sinica, Taiwan, 2National Taiwan University Hospital, Taiwan, 3National Yang-Ming University, Taiwan

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**e - Cells, Organisms, and Organs on Chip**
Organisms on Chip (C. Elegans, Zebrafish, Arabidopsis, etc.)

M135e  AUTOMATED MICROFLUIDIC-BASED PLATFORM FOR LONGITUDINAL HEALTHSPAN TRACKING OF CAENORHABDITIS ELEGANS
Kim Le, Yongmin Cho, Mei Zhan, Dhaval Patel, Hang Lu
Georgia Institute of Technology, USA

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V. Viri, M. Cornaglia, M.A.M. Gijs
EPFL, Switzerland
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EPFL, Switzerland

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Alireza Zabihihesari, Tanveer Akbar, Arthur J. Hilliker, Pouya Rezai
York University, Canada

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National Taiwan Ocean University, Taiwan

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Arezoo Khalili, Khaled Youssef, Georg Zoidl, Pouya Rezai
York University, Canada

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Nandita Chaturvedi1, Navajit S. Baban1,2, Samuel O. Sofela1,2, Ajymurat Orozaliev1, Nikolas Giakoumidis1, Jongmin Kim1, Kristin C. Gunsalus1,2, Yong-Ak Song1,2
1New York University Abu Dhabi, UAE, 2New York University, USA

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**M137e**  MICROFLUIDIC BIOPRINTER FOR IN-SITU FORMATION OF ENGINEERED SKIN GRAFTS FOR BURN WOUND TREATMENT
Richard Cheng1, Gertraud Eylert1, Sijin He1, Jean-Michel Gariepy1, Navid Hakimi1, Marc Jeschke1,2, Axel Guenther1
1University of Toronto, Canada, 2Sunnybrook Research Institute, Canada

**M138e**  3D FAT FIBER ON A CHIP
Akiyo Yokomizo, Yuya Morimoto, Shoji Takeuchi
The University of Tokyo, Japan

**M139e**  ANGIOGENESIS INDUCED BY LOW OXYGEN TENSION IN A VASCULARIZED TISSUE-ON-CHIP DEVICE
Da Zhao1, Tao Yue1, Duc T.T. Phan1, Xiaolin Wang1, Christopher C.W. Hughes1, Abraham P. Lee1
1University of California, Irvine, USA, 2Shanghai Jiao Tong University, China
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Cong Xu, Min Zhang, Lei Jiang, Jianhua Qin
Chinese Academy of Sciences, China

M141e  RECAPITULATION OF RAT HEPATOCYTOPLASMIC FUNCTION FORMING OXYGEN GRADIENT IN A MICROFLUIDIC CELL CULTURE DEVICE
Satomi Matsumoto1, Eric Leclerc2, Astia Rizki Safitri1, Mathieu Danoy1, Toshiro Maekawa1, Haruyuki Kinoshita1, Marie Shinohara1, Kikuo Komori1, Yasuuki Sakai1, Teruo Fujii1
1The University of Tokyo, Japan, 2LIMMS/ CNRS-IIS, Japan

M142e  MICROFLUIDIC MODEL OF THE OUTER BLOOD-RETINA-BARRIER
Li-Jiun Chen, Shun Ito, Nobuhiro Nagai, Toshiaki Abe, Hirokazu Kaji
Tohoku University, Japan

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Chun-Wei Lee1, Hsueh-Yao Chu1, Ming-Hsuan Chiu1, Yin-Ju Chen1, Long-Sheng Lu1, Fan-Gang Tseng1,2
1National Tsing Hua University, Taiwan, 2Taipei Medical University Hospital, Taiwan

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Wen-Chih Yang, Tung-Han Wu, Yu-Hsiang Hsu
National Taiwan University, Taiwan

M145e  A MICRO DEVICE ARRAY FOR MECHANICAL STIMULATION AND CONTRACTILITY MEASUREMENT OF hiPSC-CARDIOMYOCYTES
Wenkun Dou1, Li Wang1, Manpreet Malhi2, Zhenhong Xu1, Haijiao Liu1, Julia Plakhotnik2, Jason T. Maynes3, Yu Sun1
1University of Toronto, Canada, 2Hospital for Sick Children, Canada

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1Mimetas B.V., The Netherlands, 2Leiden University, The Netherlands

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1Institut Curie, France, 2Sorbonne-Universités, France

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1Chinese Academy of Sciences, China, 2Dalian University of Technology, China
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1Eindhoven University of Technology, The Netherlands, 2Erasmus University Medical Center, The Netherlands

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1Peking University, China, 2Peking University First Hospital, China, 3DGIST, Republic of Korea, 4National Key Laboratory of Science and Technology on Micro/Nano Fabrication, China

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¹Albert-Ludwigs-Universität Freiburg, Germany, ²Hahn-Schickard, Germany, ³Mast Diagnostica GmbH, Germany, ⁴E.L.T. Kunststofftechnik & Werkzeugbau GmbH, Austria

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1National Tsing Hua University, Taiwan, 2Academia Sinica, Taiwan

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1National Taiwan University, Taiwan, 2Taiwan Semiconductor Manufacturing Company, Taiwan

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California Polytechnic State University, San Luis Obispo, USA

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Kenji Akama1,2, Hiroyuki Noji3
1The University of Tokyo, Japan, 2Sysmex Corporation, Japan

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1Chungnam National University, Republic of Korea, 2ETH Zürich, Switzerland
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1Universidad de Costa Rica, Costa Rica, 2Instituto Tecnológico de Costa Rica, Costa Rica, 3Academia Sinica, Taiwan

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1University of California, Berkeley, USA, 2Biomedical Institute for Global Health Research & Technology, Singapore, 3Harvard Medical School, USA

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1Chang Gung University, Taiwan, 2Chang Gung Memorial Hospital, Taiwan

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Johns Hopkins University, USA

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Zhensong Xu1, Wenkun Dou1, Chen Wang2, Yu Sun1
1University of Toronto, Canada, 2Mount Sinai Hospital, Canada

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¹National Tsing Hua University, Taiwan, ²National Cheng Kung University, Taiwan

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¹Nagoya University, Japan, ²PRESTO, Japan Science and Technology Agency, Japan, ³The University of Tokyo, Japan

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¹KAIST, Republic of Korea, ³Yonsei University, Republic of Korea

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¹Massachusetts Institute of Technology, USA, ²Harvard Medical School, USA

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¹National Tsing Hua University, Taiwan, ²National Cheng Kung University, Taiwan
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¹University of York, UK, ²University of Oxford, UK

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¹Université de Montréal, Canada, ²Institut du Cancer de Montréal, Canada, ³Polytechnique de Montréal, Canada

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¹Johns Hopkins University, USA, ²Harvard University, USA, ³UCLA, USA

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¹Yale University, USA, ²Memorial Sloan Kettering Cancer Center, USA

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¹National Taiwan University, Taiwan, ²National Taiwan University Hospital and National Taiwan University College of Medicine, Taiwan, ³University of Texas Southwestern Medical Center, USA

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¹The University of New South Wales, Australia, ²Central China Normal University, China
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¹University of Oxford, UK, ²University of Southampton, UK

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¹ETH Zürich, Switzerland, ²Scrona AG, Switzerland

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¹Institute for Basic Science, Republic of Korea, ²UNIST, Republic of Korea

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¹Kyushu University, Japan, ²BEX Co., Ltd., Japan, ³Hyogo Prefectural Amagasaki General Medical Center, Japan
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1Institut Curie, France, 2Sorbonne Universités, France, 3Institut Pierre Gilles de Gennes, France, 4Université Paris Descartes, France, 5Groupe Hospitalier Universitaire Ouest, France, 6LAAS-CNRS, France

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1Polish Academy of Sciences, Poland, 2Albert-Ludwigs-Universität Freiburg, Germany

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1Albert-Ludwigs-Universität Freiburg, Germany, 2Freiburg Center for Interactive Materials and Bioinspired Technologies, Germany, 3Jobst Technologies GmbH, Germany, 4Max Planck Institute for Ornithology, Germany, 5Royal School of Mines Imperial College London, UK

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1University of Utah, USA, 2University of Utah School of Medicine, USA

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Yuan Nie, John X.J. Zhang  
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Iiro Kiiski¹, Tea Pihlaja¹, Lauri Urvas¹, Ville Jokinen², Tiina Sikanen¹
¹University of Helsinki, Finland, ²Aalto University, Finland

M202g  A SYSTEMATIC INVESTIGATION OF 3D-PRINTED MICROMIXERS, APPLIED TO RED BLOOD CELL LYSIS
Fangxu Du¹, Mehdi Rafeie¹, Majid Ebrahimia Warkiani², Tracie Barber¹
¹University of New South Wales, Australia, ²University of Technology Sydney, Australia

M203g  SPECTROELECTROCHEMICAL DETECTION OF P-BENZOQUINONE AND HYDROQUINONE IN AN ELECTROCHEMICAL MICROREACTOR WITH AN INTEGRATED ATR-IR IRE
P. Führer, J.J.A. Lozeman, H.L. de Boer, J.G. Bomer, W. Olthuis, M. Odijk
University of Twente, The Netherlands

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¹University of Twente, The Netherlands, ²Utrecht University, The Netherlands

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¹Albert-Ludwigs-Universität Freiburg, Germany, ²Karlsruhe Institute of Technology, Germany

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Yu-Lung Chang, Zheng-Xin Yu, Ya-Yu Chiang
National Chung Hsing University, Taiwan

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

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¹University of Twente, The Netherlands, ²Maastricht University, The Netherlands, ³Micronit Technologies BV, The Netherlands

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Toshihisa Osaki¹,², Koki Kamiya¹, Satoshi Fujii¹, Nobuo Misawa¹, Shoji Takeuchi¹
¹Kanagawa Institute of Industrial Science and Technology, Japan, ²The University of Tokyo, Japan

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¹National Tsing Hua University, Taiwan, ²Academia Sinica, Taiwan

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

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¹Singapore Institute of Manufacturing Technology, Singapore, ²Nanyang Technological University, Singapore

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L. Patinglag¹, D. Sawtell¹, A. Iles², L. Melling¹, K. Whitehead¹, K.J. Shaw¹
¹Manchester Metropolitan University, UK, ²University of Hull, UK

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¹The University of Tokyo, Japan, ²Hiroshima University, Japan, ³Akita Prefectural University, Japan, ⁴Japan Science and Technology Agency, Japan

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T. Fukuba¹, A. Nakasa², O. Tsukada², Teruo Fuji³
¹Japan Agency for Marine-Earth Science and Technology, Japan, ²Tsukada Medical Research Co., Ltd., Japan, ³The University of Tokyo, Japan

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1University of Ulsan, Republic of Korea, 2University of Ulsan College of Medicine, Republic of Korea

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1Industrial Technology Research Institute, Taiwan, 2National Cheng Kung University, Taiwan

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¹Polish Academy of Sciences, Poland, ²University of Tartu, Estonia, ³Jagiellonian University, Poland

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Sheng Yan¹, Yonggang Zhu², Weihua Li³
¹University of Wollongong, Australia, ²Harbin Institute of Technology, China

M236j  LABEL-FREE COLORIMETRIC DETECTION OF NANOMECHANICAL BENDING FOR HIGH-THROUGHPUT SENSING
P. Escudero¹, J. Yeste¹, C. Pascual-Izarra², R. Villa¹³, M. Alvarez¹
¹IMB-CNMT, Spain, ²ALBA Synchrotron, Spain, ³CIBER-BBN, Spain

M237j  MAG-CENTRIFUGAL MICROFLUIDIC SEPARATION FOR RAPID PURIFICATION OF DORSAL ROOT GANGLION NEURONS
Hee Jae Lee¹, Ji Hoon Kim¹, Woon-Hae Kim¹, Hyun Young Shin¹, Seung Joon Lee¹², Joseph Sunoo², Yun Jeong Mo¹, Yu Seon Kim¹, Yun-II Lee¹, Minseok S. Kim¹
¹DGIST, Republic of Korea, ²CytoDx Co., Republic of Korea

M238j  AUTOMATED VISCOSITY MEASUREMENT IN MICROFLUIDIC CHANNEL USING AMPEROMETRY: AN APPROACH USING FDM 3D PRINTER
Puneeth S.B., Sanket Goel
Birla Institute of Technology and Science, India
M239j  DYNAMIC MANIPULATION OF MICRO-PARTICLES USING SINGLE ACOUSTIC BEAM
Shih-Jui Chen, Tai-Yi Yeh, You-Lin Tu, Ping-Hsun Hsieh, Cho-Yu Chang
National Central University, Taiwan

M240j  PULSED-ELECTROMAGNETIC FIELD-ASSISTED REDUCED GRAPHENE OXIDE SUBSTRATES FOR MULTIDIFFERENTIATION OF HUMAN MESENCHYMAL STEM CELLS
Min-Hyeok Kim¹, Sun Min Park², Yonghyun Gwan², Jangho Kim², Ki-Taek Lim¹
¹Kangwon National University, Republic of Korea, ²Chonnam National University, Republic of Korea

M241j  STUDY OF ALTERNATIVE ADSORBENTS FOR PRECONCENTRATION OF BENZENE AND TOLUENE: IMPROVING THE SENSITIVITY OF A MINIATURIZED GC TO PPT LEVELS
Irene Lara-Ibeas¹, Alberto Rodriguez-Cuevas¹, Christina Andrikopoulou¹, Ali Ahmad Kassir¹, Racha Kassem¹, Lucien Baldas², Stéphane Colin², Stéphane Le Calvé¹,²
¹University of Strasbourg, France, ²In’Air Solutions, France, ³Université de Toulouse, France

M242j  STUDY FOR ENHANCEMENT OF SAMPLE METERING IN AN INNOVATIVE ASSAY CARTRIDGE WITH PLASMA SEPARATION INTEGRATED
Yongjian Yang, Tomoyuki Nose, Govil Pratiksha
Sysmex Corporation, Japan

M243j  GREEN SYNTHESIS OF REDUCED GRAPHENE OXIDE SUPPORTED BY CORE-SHELL Au@Pt@Pd TRIMETALLIC NANOPARTICLES FOR ELECTROCHEMICAL PSA DETECTION
Md. Sharifuzzaman, S.C. Barman, J.Y. Park
Kwangwoon University, Republic of Korea

M244j  APPLICATION OF TAYLOR VORTEX TO ENHANCE PLATELETS SEPARATION
Y. Chang, S.-R. Chen, Y.-W. Lu
National Taiwan University, Taiwan

M245j  PORTABLE PLASMONIC HEATING DEVICE FOR DIGITAL POLYMERASE CHAIN REACTION
Christian D. Ahrberg, Jong Min Lee, Bong Geun Chung
Sogang University, Republic of Korea

M246j  CAPILLARY DROPLET REACTOR FOR THE SYNTHESIS OF MAGNETIC IRONOXIDE NANOPARTICLES
Christian D. Ahrberg, Ji Wook Choi, Bong Geun Chung
Sogang University, Republic of Korea

M247j  AN OPTICAL LABEL-FREE BIOSENSOR BASED ON DYE-DOPED LEAKY WAVEGUIDES (DDLW) FOR TISSUE FACTOR ANALYSIS
Rana Al-Shemary¹, Leigh Madden¹, Nasser Alamrani¹, Nicole Pamme¹, Gillian M. Greenway¹, Ruchi Gupta²
¹University of Hull, UK, ²University of Birmingham, UK
M248j  LIBRARY PREPARATION FOR NEXT-GENERATION SEQUENCING USING A MULTIPLEX MICROFLUIDIC CHIP
Po-Wei Hsu, Chen-Lin Chen, Hua-Wei Tseng, Andrew M. Wo
National Taiwan University, Taiwan

T220j  A SPONTANEOUS 3D BONE-ON-A-CHIP FOR BONE METASTASIS STUDY
Sijie Hao, Laura Ha, Gong Cheng, Yuan Wan, Yiqiu Xia, Donna M. Sosnoski, Andrea M. Mastro, Si-Yang Zheng
The Pennsylvania State University, USA, POSTECH, Republic of Korea

T221j  IFAST/ATP ASSAYS FOR ON-CHIP DETECTION OF GROUP B STREPTOCOCCUS IN URINE SAMPLES
Bongkot Ngamsom, Alexander Iles, Ernest Wandera, Racheal Kimani, Francis Muregi, Jesse Gitaka, Nicole Pamme
University of Hull, UK, Mount Kenya University, Kenya

T222j  PAPER-BASED ANALYTICAL DEVICE FOR CITIZEN-LED, POINT-OF-NEED SENSING OF Cr(VI) AND Ni(II)
Bongkot Ngamsom, Samantha Richardson, Xavier Torres, Isabel R. Stacey, Mark Lorch, Alexander Iles, William M. Mayes, Nicole Pamme
University of Hull, UK

T223j  A MICROFLUIDIC DEVICE FOR PLASMA SEPARATION FROM WHOLE BLOOD SAMPLES USING BUBBLE-INDUCED ACOUSTIC MICROVORTEX
Stanley Liu, Neha Garg, Abraham Lee
Arcadia High School, USA, University of California, Irvine, USA

T224j  ANALYSIS OF MORPHOLOGICAL ANOMALIES AT CELLULAR LEVEL USING IMAGE PROCESSING AND COMPUTATIONAL TECHNIQUES
Mukta Sharma, Venkanagouda S. Goudar, Bhakti M. Netke, Fan-Gang Tseng, Mahua Bhattacharya
Indian Institute of Information Technology & Management, India, National Tsing Hua University, Taiwan, Academia Sinica, Taiwan

T225j  AUTONOMOUS CAPILLARY-FLOW IMMUNO-SENSOR FOR SENSITIVE DETECTION OF INTERFERON GAMMA
Industrial Technology Research Institute, Taiwan

T226j  INTRODUCTION OF POLYETHYLENE TEREPTHALATE (PET) ENABLING THE FABRICATION OF IN VITRO MODELS FOR MEDICAL OR PHARMACEUTICAL APPLICATIONS
Taleieh Rajabi, Tim Finkbeiner, Ralf Ahrens, Ruben Garschagen, Andreas E. Guber
Karlsruhe Institute of Technology, Germany

T227j  MICROFLUIDIC IMPEDANCE PLATFORM FOR LONG-TERM DETECTION OF PARASITE VIABILITY
Paolo S. Ravaynia, Ketki Chawla, Mario M. Modena, Flavio Lombardo, Jennifer Keiser, Andreas Hierlemann
ETH Zürich, Switzerland, Swiss Tropical and Public Health Institute, Switzerland
T228j  DEVELOPMENT OF CENTRIFUGAL MICROFLUIDIC DEVICE FOR LYMPHOCYTES CHEMOTAXIS
Tsugunao Toma1, Wilfred Villariza Estupigar1, Masato Saito1,2, Hiroyuki Yoshikawa1, Shohai Koyama1, Hyota Takamatsu1, Eiichi Tamaya1
1Osaka University, Japan, 2AIST PhotoBIO-OIL, Japan

T229j  RBC DEFORMABILITY MEASUREMENT USING CELL-TO-LIQUID INTERFACE AS A PRESSURE SENSOR
Yang Jun Kang
Chosun University, Republic of Korea

T230j  ULTRA-SENSITIVE CHROMIUM(III) DETECTION BY ION SELECTIVE MEMBRANE IMMOBILIZED ON FIELD EFFECT TRANSISTOR
Suman Shahim, Revathi Suken, Ching-Yen Hseih, Shin-Li Wang, Yu-Lin Wang
National Tsing Hua University, Taiwan

T231j  DEVELOPMENT OF DEOXYRIBONUCLEASE SENSOR USING DNA MOLECULES IMMOBILIZED BETWEEN MICROELECTRODES
Takahiro Himuro, Shota Tsukamoto, Yoji Saito
Seikei University, Japan

T232j  LABDISK FOR FULLY AUTOMATED QUANTIFICATION OF TWO LEUKEMIA ASSOCIATED GENE TARGETS
Peter Juelg1, Mara Specht1, Elena Kipf1,2, Michael Lehnert2, Cornelia Eckert2, Nils Paust1,2, Roland Zengerle1,2, Tobias Hutzenlaub1,2
1Hahn-Schickard, Germany, 2Albert-Ludwigs-Universität Freiburg, Germany

T233j  CAPILLARY VALVE FOR MICROFLUIDIC FOIL CHIPS FABRICATED BY MICROMILLED METAL MASTER TOOLS
Jacob Hess1, Seyit Yazar2, Nils Paust1,2, Roland Zengerle1,2, Tobias Hutzenlaub1,2
1Albert-Ludwigs-Universität Freiburg, Germany, 2Hahn-Schickard, Germany

T234j  HUMAN INDUCED PLURIPOTENT STEM CELL-DERIVED ENDOTHELIAL CELLS IN THROMBOSIS-ON-A-CHIP DEVICES
Hugo J. Albers1, João P. da Silva Simão1, Heleen H.T. Middelkamp2, Christine L. Mummery1,2, Robert Passier1, Albert van den Berg1, Valeria V. Orlova3, Andries D. van der Meer4
1University of Twente, The Netherlands, 2Leiden University Medical Center, The Netherlands

T235j  3D ELECTRODE ARRAYS FOR TRAPPING, ANALYSIS AND SELECTIVE RELEASE OF SINGLE CELLS USING DEP
Kevin Keim, Paul Éry, Aurélien Delattre, Carlotta Guiducci
EPFL, Switzerland

T236j  ADAPTIVE STITCHING FOR IMPROVING THE MANUFACTURING TIME OF MICROFLUIDIC CHANNELS WITH TWO-PHOTON LITHOGRAPHY
Sam Dehaeck, Benoît Scheid, Pierre Lambert
Université Libre de Bruxelles, Belgium
T237j  ELECTROSTATIC FIELDS ANALYSIS FOR UNIFORM THICKNESS ELECTROSPUN FILM FABRICATION WITH CIRCULAR ELECTRODE FOR MICROFLUIDIC FILTER APPLICATION
Dong Hee Kang, Na Kyong Kim, Hyun Wook Kang
Chonnam National University, Republic of Korea

T238j  IMMUNOCAPTURING OF EXTRACELLULAR VESICLES ON STAINLESS STEEL FOR MULTI-MODAL INDIVIDUAL CHARACTERIZATION WITH CORRELATIVE LIGHT, ELECTRON AND PROBE MICROSCOPY
Pepijn Beekman1,2, Agustin Enciso Martinez1, Leon Terstappen1, Cees Otto1, Séverine Le Gac1
1University of Twente, The Netherlands, 2Wageningen University, The Netherlands

T239j  A CHEMICAL-PHOTO RECONFIGURABLE SENSOR BY DUAL-GATE ISFET
Yu-Hao Chang1, Wei-En Hsu1, Jui-Cheng Huang2, Yu-Jie Huang2, Chih-Ting Lin1
1National Taiwan University, Taiwan, 2Taiwan Semiconductor Manufacturing Company, Taiwan

T240j  A MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE FOR SIMULATING NANOPICTURE EXTRAVASATION IN TUMOR MICROENVIRONMENT
Yumi Moriya, Naoki Sasaki
Toyo University, Japan

T241j  NEURONAL GROWTH FROM A VOLUME PERSPECTIVE
Céline Braïni, Angelo Mottolese, Catherine Villard
Institut Curie, France

T242j  BLOOD FLOW DYNAMICS HAS A MAJOR INFLUENCE ON THE STATE OF CIRCULATING TUMOUR CELLS
Hamizah Cognart, Jean-Louis Viovy, Catherine Villard
Institut Curie, France

T243j  C. ALBICANS ON A CHIP: BENDING STIFFNESS MEASUREMENT
Elodie Couttenier1,2, Sophie Bachellier-Bassi2, Christophe d’Enfert2, Catherine Villard1
1Institut Curie, France, 2Institut Pasteur, France

T244j  STEM CELL DIFFERENTIATION INTO HEART CELLS USING A MICROCHIP INTEGRATED WITH A DIGITALLY CONTROLLED MICRODISPENSER
Patrycja Sokolowska1,2, Iwona Jesion1, Lidia Szulc-Dąbrowska3, Kamil Zukowski1, Elżbieta Jastrzębska1, Zbigniew Brzozka1
1Warsaw University of Technology, Poland, 2Nencki Institute of Experimental Biology, Poland, 3Warsaw University of Life Sciences, Poland

T245j  MULTIPARAMETRIC PORCINE OOCYTE DEFORMATION CHARACTERIZATION BY NOVEL MEMS-TYPE MICROCYTOMETER
Aleksandra Pokrzywnicka1, Danyło Lizanets1, Patrycja Śniadek2, Natalia Małyszk2, Rafał Walczak1
1Wrocław University of Science and Technology, Poland, 2Poznan University of Life Sciences, Poland
T246j 3D MICROSTRUCTURES TO REALIZE SINGLE CELL CULTURE ON DIGITAL MICROFLUIDIC CHIP FOR PRECISE MEDICINE
Jiao Zhai1, Yunyi Li1, Cheng Dong1, Haoran Li1, Yanwei Jia1, Pui-in Mak1, Rui P. Martins1,2
1University of Macau, China, 2Universidade de Lisboa, Portugal

T247j AUTOMATED MICROCHANNEL ALIGNMENT USING INNATE LASER INDUCED FLUORESCENCE SIGNATURE FOR MICROCHIP ELECTROPHORESIS
An-Chi Tsuei1, Daniel Mills2, Satvinder Panesar2, Chris Birch1, Jingyi Li2, Dan Nelson1, Margarita Startseva1, Brian Root1, James Landers1
1University of Virginia, USA, 2TeGreX Technologies, USA

W219j WATER-REPELLENCY BY NANO-METER SCALE TACK STRUCTURES OF INFANT WATER STRIDER’S LEG SURFACE
Kaoru Uesugi1, Hiroyuki Mayama2, Keisuke Morishima1
1Osaka University, Japan, 2Asahikawa Medical University, Japan

W220j DNA STRETCHING INDUCED BY POLYMER SOLUTION STREAM IN 1-MM CHANNEL
Ken Hirano1, Takashi Iwaki2, Kenichi Yoshikawa1,3
1AIST, Japan, 2Oita University, Japan, 3Doshisha University, Japan

W221j ELASTO-TWEEZERS: A NOVEL PLATFORM FOR HIGH-PRECISION CELL ELASTICITY MEASUREMENTS
Sebastian Knust1, Andy Sischka2, Hendrik Milting3, Bastien Venzac4, Séverine Le Gac4, Elwin Vrouwe5, Martina Viefhues1, Dario Anselmetti1, Karsten Gall2
1Bielefeld University, Germany, 2Ionovation GmbH, Germany, 3Ruhr University of Bochum, Germany, 4University of Twente, The Netherlands, 5Micronit Microtechnologies B.V., The Netherlands

W222j IN-VITRO SPERMATOGENESIS STUDY USING TESTIS-ON-CHIP MODELS
Bastien Venzac1, Swati Sharma2, Hoon Suk Rho1, Naere Ghazarian1, Stefan Schlatt2, Séverine Le Gac1
1Twente University, The Netherlands, 2University of Münster, Germany

W223j MIMICKING ARTICULAR MOTION IN A CARTILAGE-ON-A-CHIP MODEL
Carlo Alberto Paggi, Bastien Venzac, Jeroen Leijten, Séverine Le Gac
Twente University, The Netherlands

W224j APPLICATION OF A THERMAL SENSOR SYSTEM FOR THE MEASUREMENT AND CHARACTERIZATION OF BIOFILM REMOVAL BY THE DISINFECTANTS ETHANOL, PERACETIC ACID AND SODIUM HYPOCHLORITE IN REAL-TIME
Tobias Wieland1, Jan K. Kotthaus1, Matthias Hügle1,2, Michael Bergmann1, Gerald A. Urban1
1Albert-Ludwigs-Universität Freiburg, Germany, 2Brandenburg Medical School Theodor Fontane, Germany

W225j MANUFACTURABLE SYSTEM FOR ZOONOTIC DISEASE DETECTION
Egan H. Doeven, Yi Heng Nai, Richard Alexander, Steven Haswell, Rosanne Guijt
Deakin University, Australia
W226j  DROPLET-ON-DEMAND FOR REALIZING FLEXIBLE AND PROGRAMMABLE LAB-ON-CHIP-DEVICES  
Medina Hamidović, Werner Haselmayr, Andreas Grimmer, Robert Wille  
Johannes Kepler University Linz, Austria

W227j  3D-PRINTED HERRINGBONE MICRO-MIXERS FOR IMMUNO-CAPTURE OF CANCER CELLS  
Pavithra Sukumar1, Muhammedin Deliorman1, Ayoola Brimmo1,2, Roaa Alnemari1, Mohammad A. Qasaimeh1,2  
1New York University Abu Dhabi, UAE, 2New York University, USA

W228j  ORGAN-ON-A-DISC – ENABLING TECHNOLOGY FOR THE PARALLELIZATION AND AUTOMATION OF MICROPHYSIOLOGICAL SYSTEMS  
Stefan Schneider1, Florian Erdemann1, Oliver Schneider1, Christopher Probst1, Peter Loskill1,2  
1Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB, Germany, 2Eberhard Karls University, Germany

W229j  MICROFLUIDIC BIOSENSOR FOR THE ELECTROCHEMICAL ON-SITE DETECTION OF MICRORNAS  
H. Kutluk1, R. Bruch1,2, M. Meirich1, S. Partel4, G. Urban1, C. Dincer1,2,3  
1Albert-Ludwigs-Universität Freiburg, Germany, 2Freiburg Center for Interactive Materials and Bioinspired Technologies, Germany, 3Royal School of Mines Imperial College London, UK, 4Vorarlberg University of Applied Sciences, Austria

W230j  DETECTION OF AIRBORNE VIRUSES USING AN ELECTROSTATIC PARTICLE CONCENTRATOR AND PAPER SENSORS  
Jyoti Bhardwaj, Myeong-Woo Kim, Jaesung Jang  
UNIST, Republic of Korea

W231j  RAPID AND LABEL-FREE OPTICAL DISCRIMINATION OF HEALTHY AND SPIKED URINE SAMPLES  
Muhammedin Deliorman1, Roaa Alnemari1, Mohammad A. Qasaimeh1,2  
1New York University Abu Dhabi, UAE, 2New York University, USA

W232j  MINERAL FLOTATION BY MICROFLUIDICS-GENERATED REACTIVE OILY MICROBUBBLES  
Hanrui Zheng, Qingxia Liu, Neda Nazemifard  
University of Alberta, Canada

W233j  A MICROFLUIDIC PLATFORM FOR WHOLE BLOOD COLLECTION AND ON-CHIP PLASMA EXTRACTION  
Da-Han Kuan, Chia-Chien Wu, Ting-Wei Lin, Chih-Ting Lin, Nien-Tsu Huang  
National Taiwan University, Taiwan

W234j  POLYMER NANOSENSORS USING ELECTROPHORETIC IDENTIFICATION OF NUCLEOTIDES FOR SINGLE-MOLECULE SEQUENCING  
Charuni Amarasekara1, Junseo Choi2, Zheng Jia2, Steven A. Soper1, Sunggook Park2  
1University of Kansas, USA, 2Louisiana State University, USA
W235j  SURFACE TENSION ASSISTED DYNAMIC AND UNIFORM SIZE GENERATION OF 3D SPHERICAL HYDROGELS (STA-DUH)
Manohar Prasad Koduri1,2, Tom Garden1, John A. Hunt3, James Henstock2, Judith Curran2, Fan-Gang Tseng1
1National Tsing Hua University, Taiwan, 2University of Liverpool, UK, 3Nottingham Trent University, UK

W236j  SELF-ASSEMBLE NANO PARTICLE ARRAY ON TRANSPARENT GLASS AS SELECTIVE ABSORPTION SPECTRA (SANP-GTAS)
Manohar Prasad Koduri1, Ashish Kumar1, Venkanagouda Goudar1, Fan Gang Tseng1,2
1National Tsing Hua University, Taiwan, 2Academia Sinica, Taiwan

W237j  ELECTROACTIVE MICROWELL ARRAY FOR SEPARATE TRAPPING OF SINGLE CELLS AND CLUSTERS
Chi Je Park1, Soo Hyeon Kim1,2, Teruo Fujii1
1The University of Tokyo, Japan, 2PRESTO, Japan Science and Technology Agency, Japan

W238j  CELL ISOLATION IN OPEN MICROFLUIDICS: MICROFLUIDIC PROBES INTEGRATED WITH DIELECTROPHORESIS
Ayoola T. Brimmo1,2, Anoop Menachery1, Mohammad A. Qasaimeh1,2
1New York University Abu Dhabi, UAE, 2New York University, USA

W239j  TRAPPING AND MEASUREMENT OF BIOLOGICAL CELLS USING A MICROFLUIDIC CHIP WITH SELF-ALIGNED DIELECTROPHORESIS (DEP) ELECTRODES
Hamideh Sharifi Noghabi1, Adrian J.T. Teo2, Say Hwa Tan2, Nam-Trung Nguyen2, Paul C.H. Li3
1Simon Fraser University, Canada, 2Griffith University, Australia

W240j  DNA ANALYSIS USING A NANOBIOARRAY CHIP BASED ON CENTRIFUGAL FORCE
Christopher Oberc, Paul C.H. Li
Simon Fraser University, Canada

W241j  CELLULAR ANTI-ADHESIVE NANOPILLAR PATTERNS USING NANOIMPRINT TECHNOLOGY
Y. Okawa, T. Kakegawa, K. Fujimoto
Dai Nippon Printing Co., Ltd., Japan

W242j  QUANTITATIVE ANALYSIS OF CELL ADHESION UNDER SHEAR STRESS USING MICROFLUIDIC DEVICES
Koji Fujimoto1, Yasuhiro Okawa1, Yoshiomi Hiroi2, Junko Katayama1,2, Takashi Funakoshi2, Yasuko Yanagida1, Takayuki Ohba1
1Tokyo Institute of Technology, Japan, 2Nissan Chemical Industries, Ltd., Japan, 3Fujikin Inc., Japan

W243j  MICROFLUIDIC SYNTHESIS OF MONODISPERSE ORGANIC-INORGANIC HYBRID PARTICLES
Dong-Yeong Kim, Si-Hyung Jin, Byungjin Lee, Kyoung-Ku Kang, Chang-Soo Lee
Chungnam National University, Republic of Korea
W244j  AN INTEGRATED LATERAL FLOW IMMUNOASSAY OPTIMIZATION SYSTEM
David Gasperino, Toan Huynh, Bernhard Weigl
Intellectual Ventures Laboratory, USA

W245j  SIMBA: STIFFNESS-TUNABLE INTEGRATED MAGNETIC BUOYANT AIR-LIQUID INTERFACE PLATFORMS FOR HIGH THROUGHPUT SCALABLE CULTURES
Arvind Chandrasekaran, Sonya Kouthouridis, Zhenwei Ma, Nicholas Lin, Wontae Lee, Mark Turner, John Hanrahan, Christopher Moraes
McGill University, Canada

W246j  RAPID CARDIAC TROPONIN I DIAGNOSTICS USING FIELD EFFECT TRANSISTOR BASED HAND-HELD BIOMEDICAL SENSOR
Shu-Wen Huang, Indu Sarangadharan, Po-Hsuan Chen, Wen-Che Kuo, Yu-Lin Wang
National Tsing Hua University, Taiwan