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

FINAL PROGRAM

SPONSORED BY:
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 Sponsored by ITRI

Monday November 12
08:00-18:00 Registration and Check-in
08:30-09:00 Opening Remarks
09:00-09:45 Plenary Presentation I
Chih-Ming Ho, University of California, Los Angeles (UCLA), USA Room 301
09:45-10:15 Break - Exhibit and Poster Inspection
10:15-11:35 Session 1A1: Separation Techniques Room 301
Session 1B1: DNA Room 304
Session 1C1: Self Assembly Room 305
11:35-12:35 Lunch - Sponsored by Zeon Corporation
12:35-14:05 Session 1A2: Dielectrophoresis Room 301
Session 1B2: Infectious Disease/POC Diagnostics Room 304
KEYNOTE PRESENTATION 12:35-13:05 C. Chou
12:35-13:05 Plenary Presentation II
C. Chou KEYNOTE PRESENTATION 12:35-13:05 J. Cooper
12:35-13:05 J. Cooper
12:35-13:05 P. Doyle
12:35-13:05 Session 1C2: Microfluidic Technology Room 305
KEYNOTE PRESENTATION 12:35-13:05 P. Doyle
14:05-16:05 Poster Session 1
14:05-16:05 Exhibitor Industrial Stage 1 – Micronit Microtechnologies, ASE Group, Fluigent, RITEK Corporation, Cellix Tech, Ltd., EV Group (EVG)
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 Arumi® 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
13:20-13:50 Session 2C2: Serology/Immunization Room 305
14:50-16:50 Poster Session 2
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<td>Announcements</td>
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<td>Analytical Chemistry Young Innovator Award and Presentation</td>
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<td>Lab on a Chip and Dolomite - Pioneers in Miniaturization Prize and Presentation</td>
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<td>Session 3C1: Particle Preparation Room 305</td>
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<td>Lunch - Sponsored by QuantaMatrix, Inc.</td>
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<td>Plenary Presentation V Tomokazu Matsue, Tohoku University, Japan Room 301</td>
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<td>14:05-14:15</td>
<td>MicroTAS 2019 Announcement</td>
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<td>Art in Science Award (at RSC booth)</td>
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<td>Transition to Banquet</td>
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<td>Conference Banquet - Sponsored by ASE Group</td>
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<td>Session 4B1: Fluid Manipulation Room 304</td>
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<td>Session 4C1: Droplet Application: Manufacturing/Analytics Room 305</td>
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<td>10:00-10:30</td>
<td>Coffee Break</td>
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<td>10:30-11:30</td>
<td>Session 4A2: Cell Assay / Phenotyping Room 301</td>
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<td>Session 4B2: Droplet Motion &amp; Manipulation Room 304</td>
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<td>Session 4C2: Mechanobiology Room 305</td>
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<td>11:30-11:40</td>
<td>Transition</td>
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<tr>
<td>11:40-12:20</td>
<td>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</td>
</tr>
<tr>
<td>12:20</td>
<td>Closing Remarks - Conference Adjourns Room 301</td>
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</table>
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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μTAS2018
Kaohsiung, Taiwan • 11-15 November 2018
The 22nd International Conference on Miniaturized Systems for Chemistry and Life Sciences
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.
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
Gwo-Bin “Vincent” Lee
National Tsing Hua University, Taiwan
Co-Chair of MicroTAS 2018
National Tsing Hua University, Taiwan
Co-Chair of MicroTAS 2018
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)

Transportation
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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www.micronit.de

Micronit provides innovative lab-on-a-chip and MEMS solutions. Their unique combination of micro- and nanotechnologies, different materials, microfluidics and MEMS knowledge and customer application knowhow, enables Micronit to provide their customers with the innovative and sustainable solution they are looking for.

Industrial Stage 1b  
14:30 – 14:50
A NOVEL WAFER-LEVEL PACKAGE FOR NEW WAVE MEMS
Jeff Kuo, Deputy Technical Manager
ASE Group
www.aseglobal.com

ASE offers complete turnkey solutions covering front-end engineering, wafer probing and final test, as well as IC packaging, materials and electronic manufacturing services through USI. By integrating the resources of each business entity, we remain committed to long term partnerships for a win-win future.

Industrial Stage 1c  
14:50 – 15:10
NEW DEVELOPMENTS IN MICROFLUIDICS APPLICATION-ORIENTED SOLUTIONS
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.
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.

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.

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 PROFLM3D
Jack Yen, Senior Application Engineer
Filmetrics, Inc.

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 1nm to 13mm, 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 Tsai1, Stefan Zimmermann1, Roland Zengerle1,2, and Peter Koltay1,2
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 (MMD)- 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 Eletrochemical 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
Plenary and Keynote Information

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

On-chip Vascular Network for Three-Dimensional Tissue Models and Organ-on-a-Chip Applications
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
2 = Tuesday
3 = Wednesday
4 = Thursday

The second character (i.e., A) indicates which room the session is held in:
A = Room 301
B = Room 304
C = Room 305

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. Poster 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)

- **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 Organs 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
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, Ecole 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. Shuich Takayama, Georgia Institute of Technology / Emory University, USA
Dr. Yi-Chung Tung, Academia Sinica, TAIWAN

Workshop 7  Thin Film Acoustofludics 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 Toyoda, 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. Saccà², 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 BIOASSAY 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
<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1A2: Dielectrophoresis</th>
<th>Session 1B2: Infectious Disease / POC Diagnostics</th>
<th>Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:35 – 13:05</td>
<td><strong>KEYNOTE 1: PRESENTATION</strong> NANOFLUIDICS AND DIELECTROPHORESIS BASED BIOSENSORS AND ANALYTICAL PLATFORM: CHALLENGES AND OPPORTUNITIES** Chia-Fu Chou Academia Sinica, Taiwan</td>
<td><strong>KEYNOTE 2: PAPER ORIGAMI DNA DIAGNOSTICS FOR INFECTIOUS DISEASES</strong> Julien Reboud, Gaolian Xu, Zhugen Yang, Alice Garrett, Weronika Witkowska, Emma Thomson, Poppy Lamberton, Jonathan Cooper The University of Glasgow, UK</td>
<td>Yi-Chin Toh, National University of Singapore, SINGAPORE Chang-Soo Lee, Chungnam National University, SOUTH KOREA</td>
</tr>
<tr>
<td>13:05-13:25</td>
<td>MICROFLUIDIC DIELECTROPHORESIS ENABLES RAPID CHARACTERIZATION OF LIPOPOLYSACCHARIDE MODIFICATION IN GRAM-NEGATIVE BACTERIA Qianru Wang, Hyungseok Kim, Cullen R. Buie Massachusetts Institute of Technology, USA</td>
<td>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</td>
<td>Chang-Soo Lee, Chungnam National University, SOUTH KOREA</td>
</tr>
<tr>
<td>13:25-13:45</td>
<td>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</td>
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<tr>
<td>13:45-14:05</td>
<td>DIELECTROPHORETIC MANIPULATION FOR ROBUST LIQUID MARBLE-BASED DIGITAL MICROFLUIDICS Nam-Trung Nguyen, Chin Hong Ooi, Jing Jin, Sreejith K.R. Griffith University, Australia</td>
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Room 301
Room 304
13:25-13:45  AN ELECTROKENETIC PCR CHIP WITH IN SITU ELECTROCHEMICAL AMPLICON 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

12:35 – 13:05  KEYNOTE 3: MICROFLUIDIC TECHNOLOGIES TO MANUFACTURE SOFT MATTER MATERIALS
Sarah Shapiro¹, Dhananjay Denukuri², 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 Boulais¹, Frédéric Normandeau², Gabriel Laberge¹, David Juncker², Thomas Gervais¹,²
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 Schraml², 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.
Monday Program

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

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

16:50 - 17:00  Transition

**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, Ryochi Horisaki³, Issei Sato¹,², Sadao Ota¹
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
**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 Niu¹,²  
¹University of Southampton, UK, ²SouthWestSensor Limited, UK

17:20-17:40  
*STRUCTURAL SMART MICROGELS – ENHANCING THE SENSITIVITY FOR SINGLE-CELL SECRETOMIC ANALYSIS*  
Myat Noe Hsu¹,², Yong Zhang¹,², Chia-Hung Chen¹,²  
¹National University of Singapore, Singapore, ²Biomedical Institute for Global Health Research and Technology, Singapore

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**Session 1C3: Capacitance / Impedance Measurement**

**Chair:** Hugh Fan, *University of Florida, USA*

**Room 305**

17:00-17:20  
*GRADUAL CAPACITANCE FOR PARTICLE TRACKING IN MICRO-CHANNELS*  
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 Anwar²,³, 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
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, 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 ORGANOID 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, Chihiro 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 Kubiseski1, 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 ANTIBIOTICS RESISTANCE SCREENING ON A SINGLE CELL LEVEL
Martin Schulz¹, Nadine Borst¹, Mara Specht¹, Silvia Calabrese¹, 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
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, 1Temasek 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 Wetzel³, Hansang Cho³, 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

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 Liu2, Fu-Rong Chen2, Fan-Gang Tseng1,2  
1National Tsing Hua University, Taiwan, 2City University of Hong Kong, China
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
<th>Institution</th>
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<tbody>
<tr>
<td>17:35 – 17:55</td>
<td>SMART CONTACT LENS FOR CONTINUOUS COLORIMETRIC INTRAOCULAR PRESSURE MONITORING</td>
<td>Bohee Maeng, Jungyul Park</td>
<td>Sogang University, Republic of Korea</td>
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<td>17:55-18:15</td>
<td>DEEP LEARNING ASSISTED ANALYSIS OF MULTIPLE INDIVIDUAL RED BLOOD CELLS IN BLOOD FLOW</td>
<td>Takayuki Akai, Hiroaki Ito, Makoto Kaneko</td>
<td>Osaka University, Japan</td>
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<td>18:15-18:35</td>
<td>LARGE-AREA CELL-TRACKING INTRINSIC CYTOMETRY WITH DIGITAL HOLOGRAPHIC IMAGING</td>
<td>Nicha Apichitsopa, Joel Voldman</td>
<td>Massachusetts Institute of Technology, USA</td>
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<td>18:35</td>
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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 $\beta$-SHEET PEPTIDES
K. Shimizu¹, N. Saigo¹, S. Sakashita², Y. Hamada², K. Usui², B. Mijiddorj³, I. Kawamura³, R. Kawano³
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 NANOFLUIDIC 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 Shì¹, 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  FLOWSCLUP: SOFTWARE FOR EFFICIENTLY DESIGNING INERTIAL FLOW SCULPTING DEVICES
Daniel Stoecklein1, Michael Davies2, Joseph de Rutte1, Chueh-Yu Wu1, Baskar Ganapathysubramanian2, 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. Paulsen1,2, Yanxiang Deng3, Aram J. Chung4
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 Kim, Mina Yoshida, Saori Tago, Teruo Fujii  
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, Kyuwhan 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 Li, Lianqing Liu, Yuzhao Zhang, Haibo Yu, Gwo-Bin Lee, Yuechao Wang, Wen Jung Li  
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. Zeming, Yuko Sato, Yin Lu, Chia-Hung Chen, Jianzhu Chen, Peter Preiser, Jongyoon Han  
1Singapore-MIT Alliance for Research and Technology, Singapore, 2National University of Singapore, Singapore, 3National University of Singapore, Singapore, 4Massachusetts Institute of Technology, USA
REAL-TIME OPTOFUIDIC DIFFRACTIVE “IMAGING” CELL ANALYZER
Masachi Ugawa1,2,3, Yoko Kawamura1,2, Ryoichi Horisaki4,5, Issei Sato1,2,3, Hiroyuki Noji2,6, Sadao Ota1,2
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, Dawn Cai, Katsuo Kurabayashi
University of Michigan, Ann Arbor, USA

PLENARY PRESENTATION V
CHAIR: Teruo Fujii, IIS, The University of Tokyo, JAPAN
Room 301
13:20 – 14:05
RECENT PROGRESS OF NANOSCALE ELECTROCHEMICAL IMAGING
Tomokazu Matsue
Tohoku University, Japan

14:25 – 14:55
KEYNOTE 7: TOWARDS 3D BIOELECTRONICS: INTEGRATION OF CONDUCTING POLYMER DEVICES WITH 3D MODELS OF CELLS IN VITRO
Charalampos Pitsalidis1, Chrysanthie Moysidou1, Janire Saez1, Donata Iandolo1, Magali Ferro2, Roisin M. Owens1
1University of Cambridge, UK, 2Ecole 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 Shimada1, Hirotoshi Yasaki1, Takao Yasui1,2, Akihide Hibara1, Takeshi Yanagida1, Noritada Kaji1, Masaki Kanai4, Kazuki Nagashima1, Tomoji Kawai1, Yoshinobu Baba1,6
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 NANO PARTICLE 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 Pirč², 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

14:55-15:15  **DEVELOPMENT OF A HIGH-THROUGHPUT MICRO-NEUROCIRCUITY PLATFORM FOR DRUG SCREENING STUDIES**
Joseph A. Fantuzzo¹², Vincent R. Mirabella²³, Ronald P. Hart⁷, Zhiping P. Pang¹², Jeffrey D. Zahn¹
¹Rutgers University, USA, ²Robert Wood Johnson Medical School, USA

15:15-15:35  **MICROFLUIDIC MULTI-ORGAN PLATFORM TO STUDY THE EFFECTS OF PRODRUGS ON EARLY EMBRYONIC DEVELOPMENT**
Julia A. Booss¹, Mario M. Modena¹, Patrick M. Misun¹, Kasper Renggli¹, Olivier Frey², 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

技術介紹

24 GHz FMCW(變頻式)系統：高指向性4x4天線極端，距離測量精度1.5 mm。

24 GHz FMCW(變頻式)系統：高指向性4x4天線極端，距離測量精度1.5 mm。

24 GHz FMCW(變頻式)系統：高指向性4x4天線極端，距離測量精度1.5 mm。
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 Takeuchi1,2
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. Zenobi2, P.S. Dittrich1
1ETH Zürich, Germany, 2RWTH Aachen, Germany

09:20-09:40  A PARALLELIZED DROPLET MAGNETOFUIDIC 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 Buser⁷, David Issadore¹
¹University of Pennsylvania, USA, ⁷Chip 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. Leong², 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
Rapid screening, identification and isolation of rare cell variants.

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CytoMine® is the next generation platform that will transform biopharmaceutical discovery and cell line development workflows. It is specifically designed to automatically perform:

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- incubation then protein secretion assays
- rapid cell sorting dispensing of ‘hit’ single cells into individual wells of 96- or 384-well MTPs
- imaging and monoclonality verification

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**  
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#### 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 BIOPATATIBLE 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 EMLUSIFICATION 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, Séverine 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 Tsujikawa1, 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 Muñoz 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. Davies1, 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 Um1, Sungyoung Choi2, Joo H. Kang1
1UNIST, Republic of Korea, 2DGIST, Republic of Korea, 3Kyung Hee University, Republic of Korea
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<td>1National Tsing Hua University, Taiwan, 2MacKay Memorial Hospital, Taiwan</td>
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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 Abelmann¹², Andreas Manz², Levent Yobas¹²
¹The Hong Kong University of Science and Technology, China, ²Korea Institute of Science and Technology - Europe, Germany

W014a  BIT ERROR RATE ANALYSIS OF CODE-MULTIPLEXED COULTER SENSOR NETWORKS
Ruxiu Liu, Ningquan Wang, A. Fatih Sarioglu
Georgia Institute of Technology, USA

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
Modeling / Numerical Simulation

M014a  UNDERSTANDING CONVECTION-DIFFUSION IN OPEN-SPACE MICROFLUIDICS VIA CONFORMAL MAPPING
Etienne Boulais¹, Pierre-Alexandre Goyette¹, Thomas Gervais¹²
¹École Polytechnique de Montréal, Canada, ²Institut du Cancer de Montréal, Canada

M015a  A NUMERICAL MODEL FOR THREE-DIMENSIONAL ANALYSIS OF VIBRATION-INDUCED FLOW
Kanji Kaneko¹, Takayuki Osawa², Yukinori Kametani², Yosuke Hasegawa², Hiroaki Suzuki³
¹Chuo University, Japan, ²The University of Tokyo, Japan

T014a  EXPERIMENTAL AND NUMERICAL STUDY OF VISCOELASTICITY EFFECTS ON PARTICLE FOCUSING WITHIN A STRAIGHT TRAPEZOIDAL CHANNEL
Mohammad Amin Raoufi¹, Ali Mashhadian², Mohsen Asadnia¹, Majid Ebrahimi Warkiani³
¹Macquarie University, Australia, ²Sharif University, Iran, ³University of Technology Sydney, Australia

T015a  PARTICLE FOCUSING DYNAMICS IN EXTENDED ELASTO INERTIAL FLOW
Indradumna Banerjee¹, Marco E. Rosti², Tharagan Kumar¹, Luca Brandt², Aman Russom²
¹KTH Royal Institute of Technology, Sweden, ²KTH Mechanics, Sweden
### a - Fundamentals in Microfluidics and Nanofluidics

#### M016a
**Bubble Generation and Removal for Simple Method of Flow Control in Extended-Nano Channel**
Shun Furukawa, Kazuma Mawatari, Takehiko Kitamori  
The University of Tokyo, Japan

#### T016a
**Push/Pull Inequality Based on-Chip Density Mixer with Active Enhancer**
Toshibo Takayama¹, Mitsuhiro Horade¹, Chia-Hung Dylan Tsai², Makoto Kaneko³  
¹Osaka University, Japan, ²National Chiao Tung University, Japan

#### W016a
**On-Chip Super High Speed Mixer**
Toshibo Takayama¹, Naoya Hosokawa¹, Chia-Hung Dylan Tsai², Makoto Kaneko³  
¹Osaka University, Japan, ²National Chiao Tung University, Japan

### Others

### b - Micro- and Nano-Engineering

#### M019b
**Programmed Micro pore Fabrication Technique Utilizing Non-Focus Area Photocuring Process**
Jinsik Yoon, Wook Park  
Kyung Hee University, Republic of Korea

#### M020b
**Multi-Branched Alginate Hydrogel Microfibers Formed by Parallel Microfluidic Spinning**
Keigo Nishimura, Shoji Takeuchi  
The University of Tokyo, Japan

#### M021b
**An Ultra-Thin Highly Flexible Microfluidic Device for Artificial Placenta Type Microfluidic Blood Oxygenator Application**
Mohammadhossein Dabaghi¹, Neda Saraei¹, Gerhard Fusch¹, Niels Rochow¹, John L. Brash¹, Christoph Fusch¹,², P. Ravi Selvaganapathy¹  
¹McMaster University, Canada, ²University Hospital Nuremberg, Germany

#### M022b
**4-Step Micro Glass Blowing Method for All Glass Lens Array Fabrication**
Yusufu Aishan¹,², Yaxiaer Yalikun¹, Yo Tanaka  
¹RIKEN, Japan, ²Osaka University, Japan

#### M023b
**Roll-Printed Silver Nanowires Microelectrodes on Silicone Rubber for Ultraflexible Electronic Sensing**
Zong-Qin Zhou, Chien-Chong Hong, Tong-Miin Liou  
National Tsing Hua University, Taiwan

#### M024b
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Philip J. Schneider, Liam Christie, Anyang Wang, Domin Koh, Kwang W. Oh  
University at Buffalo, USA
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<td>¹École Polytechnique de Montréal, Canada, ²Centre Hospitalier de l'Université de Montréal, Canada</td>
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<td>Kazuki Tokumaru¹², Simon Hunt¹, Fujiu Tsumori¹</td>
<td>¹Kyushu University, Japan, ²JSPS Research Fellow, Japan</td>
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<td>¹The University of Tokyo, Japan, ²Innovation Center of NanoMedicine, Japan</td>
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1Tohoku University, Japan, 2Tohoku Gakuin University, Japan

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1Northwestern Polytechnical University, China, 2Griffith University, Australia, 3Universidad de Sevilla, Spain, 4China University of Geosciences, China

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1University of Maryland, College Park, USA, 2Bioinspired Advanced Manufacturing Laboratory, USA
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Natsumi Takai¹, Masaki Matsushita¹, Kan Shoiji¹, Tei Maki¹,², Ryuji Kawano¹  
¹Tokyo University of Agriculture and Technology, Japan, ²JEOL Ltd., Japan  

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¹University of Twente, The Netherlands, ²Ton Duc Thang University, Vietnam  

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Dae-Sik Lee¹, Seokhan Park², Yong Duk Han², Jae Eun Lee², Hu Young Jeong², Hyun C. Yoon², Sang Ouk Kim², Sung-Yool Choi¹,²  
¹ETRI, Republic of Korea, ²KAIST, Republic of Korea, ³Ajou University, Republic of Korea, ⁴UNIST, Republic of Korea  

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Maïwenn Kersaudy-Kerhoas⁴,⁵  
¹Heriot-Watt University, UK, ²University of Edinburgh, UK, ³University of Palermo, Italy
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Xin Xie1,2, Sanwei Liu1, Carol Livermore1
1Northeastern University, USA, 2Harvard University, USA

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

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

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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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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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1Chinese Academy of Sciences, China, 2KAIST, Republic of Korea

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Lei Li, Jie Zhang, Yong Nie, Cheng Wang, Huan Hu  
1Chinese Academy of Sciences, China, 2Missouri University of Science & Technology, USA, 3Peking University, China, 4Zhejiang University, China

### W034b  USING NANOMATERIALS ASSISTED REAL TIME PCR IN THE ENHANCEMENT OF BACTERIAL PATHGEN DETECTION

Ruba Khnouf, Farah Al Shami, Nida Salim, Borhan Al Biss  
1Jordan University of Science and Technology, Jordan, 2University of Jordan, Jordan

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Juan Wang, Loes I. Segerink, Jan Eijkel, Lingling Shui  
1South China Normal University, China, 2University of Twente, The Netherlands

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Masafumi Horiuchi, Takao Yasui, Kazuki Nagashima, Takeshi Yanagida, Yoshinobu Baba  
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Terry Ching, Akihiro Ohno, Rahul Karyappa, Toh Yi-Chin, Michinao Hashimoto  
1Singapore University of Technology and Design, Singapore, 2National University of Singapore, Singapore

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Terry Ching, Toh Yi-Chin, Michinao Hashimoto  
1Singapore University of Technology and Design, Singapore, 2National University of Singapore, Singapore

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1Duke University, USA, 2The Pennsylvania State University, USA

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1USI Corporation, Taiwan, 2National Central University, Taiwan

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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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1Fraunhofer Institute for Photonic Microsystems, IPMS, Germany, 2Brandenburg University of Technology, Germany

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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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1University of the Basque Country, Spain, 2Basque Foundation of Science, Spain

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1RIKEN, Japan, 2Tokyo Denki University, Japan

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Byunghak Jung1,2, Kyeong-Sik Shin1, Suk Jeong3, Kyung Jin Moon3, Ji Yoon Kang1
1Korea Institute of Science and Technology, Republic of Korea, 2Korea University, Republic of Korea, 3Dreamcon, Republic of Korea
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Zhangdi Lu¹, Yuan Xiong², Yanxiu Li², Wenting Qiu¹, Andrey L. Rogach², Stefan Nagl¹
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
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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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Krzysztof Adamski, Bartosz Kawa, Rafal Walczak
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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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Tianjin University, China

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Yusuke Hirata, Yuya Morimoto, Shoji Takeuchi
The University of Tokyo, Japan

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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 Lang³
¹University of Bremen, Germany, ²University of Applied Sciences Bremerhaven, Germany

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1National Tsing Hua University, Taiwan, 2National Taiwan University, Taiwan, 3Université Paris Saclay, France

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Ajou University, Republic of Korea

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Jongmin Lee, Deepti Sharma, Heungjoo Shin
UNIST, Republic of Korea

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Ruxiu Liu, Chia-Heng Chu, Mert Boya, Ozgun Civelekoglu, Hang Chen, A. Fatih Sarioglu
Georgia Institute of Technology, USA

T055c  LAYER-BY-LAYER SELF-ASSEMBLY OF CHARGED POLYMERS ON AL-MIRROR AND AL FOIL FOR THROMBIN ASSAY/DETECTION
Venkanagouda S. Goudar1, Gurusiddappa R. Prashant1, Manoj M. Varma2, Fan-Gang Tseng1,2
1National Tsing Hua University, Taiwan, 2Academia Sinica, Taiwan

T056c  NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN PROTEIN BIOSENSORS BASED ON ARTIFICIALLY-MADE RECOGNITION ELEMENTS FOR RAPID DIAGNOSTICS OF ACUTE KIDNEY INJURY
Ting-Hsu Chen1, Chien-Chong Hong1, Tong-Min Liu1, Chian-Lang Hong2, Chung-Hang Wang2, Chih-Chung Lin2, Yun-Ching Huang2
1National Tsing Hua University, Taiwan, 2Chang Gung Memorial Hospital, Taiwan
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Bo Ma, Steve Tung
University of Arkansas, USA

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Mengxing Ouyang, Dino Di Carlo
UCLA, USA

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Pengfei Song1,2, Hao Fu1,2, Yongjie Wang1, Cheng Chen1, Zetian Mi1, Jun Song1, Xinyu Liu1
1University of Toronto, Canada, 2McGill University, Canada

W049c  CHARACTERIZING CONTRACTILE STRESS OF hiPSC-CARDIOMYOCYTES VIA ELECTRICAL IMPEDANCE MEASUREMENT
Li Wang1, Xian Wang1, Wenkun Dou1, Qili Zhao1, Manpreet Malhi2, Teng Cui1, Zhuoran Zhang1, Jason T. Maynes2, Yu Sun1
1University of Toronto, Canada, 2Hospital for Sick Children, Canada

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Akihide Arima1, Yukich Horiguchi2, Makus Tsutsui1, Wataru Tonomura1, Kazumich Yokota1, Masateru Taniguchi1, Yuji Miyahara2, Tomoji 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

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Jun Sawayama, Shoji Takeuchi
The University of Tokyo, Japan

W053c  DEVELOPEMENT OF VALVE-INTEGRATED NANOFLUIDIC PRECONCENTRATOR FOR LOW-ABUNDANCE PROTEIN DETECTION
Chih-Zong Deng1,2, Yu-Jui Fan3, 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 Brioude1, Hiroaki 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, Jihye Nam, Sunga Song, Sumi Yoon, Dong-Ik 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 CONstrictions, USING IMPEDANCE MEASUREMENT  
Xu Tieying¹, Maria Lizarralde², Wassim El Nemer², Bruno Le Pioufle¹, Olivier Français¹,³  
¹ENS Paris Saclay, France, ²INTS, France, ³ESYCOM, France

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**c - Sensors and Actuators, Detection Technologies**

**Chemical and Electrochemical Sensors**

**M060c** OPTIMIZED ELECTRODE ARRAY FOR ENHANCED PROTEIN BINDING BY ELECTROTHERMAL FLOW MODULATION  
Tomoka Higaki, Motoki Hino, Ken Yamamoto, Masahiro Motosuke  
*Tokyo University of Science, Japan*

**M061c** A CMOS-BASED DIAGNOSTIC SYSTEM FOR DETECTION OF ARTEMISININ-RESISTANT MALARIA  
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 Illes, Jeanette M. Rotchell, Mark Lorch, Nicole Pamme  
*University of Hull, UK*

**M063c** ULTRAVIOLET LIGHT-GATING MoS₂ FLAKE FIELD-EFFECT TRANSISTORS FOR PH SENSING  
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

T060c REAL-TIME IMPEDIMETRIC MUC1 APTASENSOR USING MICROFLUIDIC SYMMETRICAL AI ELECTRODES  
Chih-Yu Lai, Jui-Hong Weng, Lin-Chi Chen  
National Taiwan University, Taiwan

T061c A MINIATURIZED CLARK OXYGEN SENSOR FOR ORGAN-ON-CHIP DEVICES  
Elsbeth G.B.M. Bossink1, Olivier Y.F. Henry2, Maximilian A. Benz2, Loes I. Segerink1, Donald E. Ingber234, 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

T062c SMART SENSOR PATCH OF IN-SITU POLARIZED Ba0.95Sr0.05TiO3/POLY (VINYLIDENE FLUORIDE) PIEZOELECTRIC FIBERS BY NEAR FIELD ELECTROSPINNING  
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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  
Prasongporn Ruengpirasiri1, Phan Trong Tue1, Akitoshi Okino2, Hidekazu Miyahara1, Yuzuru Takamura1  
1JAIST, Japan, 2Tokyo Institute of Technology, Japan, 3The University of Tokyo, Japan

T064c RAPID HEAVY METAL ION SCREENING USING EXTENDED GATE MERCURY ION SELECTIVE FIELD EFFECT TRANSISTOR  
Revathi Sukesan, Suman Shahim, Ching-Yen Hseih, Yu-Lin Wang  
National Tsing Hua University, Taiwan

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Md. Abu Zahed, Sharat Chandra Barman, Jae Yeong Park  
Kwangwoon University, Republic of Korea

W058c FLEXIBLE INKJET-PRINTED MULTI-IONIC SENSOR TAPE FOR BIOMEDICAL APPLICATIONS  
National Chiao Tung University, Taiwan
W059c  ONE HOUR-LONG PUMPLESS FLUSHING DEVICE FOR LATERAL FLOW SENSOR
Tetsuya Yamada1, Koki Kamiya1, Yoshihisa Osaki1, Shoji Takeuchi1,2
1Kanagawa Institute of Industrial Science and Technology, Japan, 2University of Tokyo, Japan

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Shunbo Li, Xiang He, Yang Xiao, Yi Xu
Chongqing University, China

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Martin Langer, Kai Sachsenheimer, Tobias M. Nargang, Bastian E. Rapp
Karlsruhe Institute of Technology, Germany

W062c  FEASIBILITY OF A THERMAL CONDUCTIVITY BASED CO2 AND HUMIDITY LOW COST SENSOR
Bertrand Bourlon, Bao-An Pham-Ho, Jean-François Beche, Olivier Constantin
Université Grenoble Alpes, France

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Stéphane Le Calvé1,2, Claire Troquet1,2, Pierre Bernhardt1, Maud Guglielmino1, Christina Andrikopoulou1
1University of Strasbourg, France, 2In’Air Solutions, France

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Masayoshi Nakano1, Seigo Araki1, Mamiko Tsugane1,2, Fumiko Sunaga1, Hiroaki Suzuki1
1Chuo University, Japan, 2Japan Society for the Promotion of Science, Japan

W064c  FLEXIBLE ALL-SOLID-STATE ELECTRICALLY TUNABLE PHOTONIC CRYSTALS FOR CHAMELEON-INSPIRED ARTIFICIAL SKIN
Hyung-Kwan Chang, Jungyul Park
Sogang University, Republic of Korea

W065c  VISUALIZATION OF BIOLOGICAL CELLS IN MICROCHANNEL BY USING MICRO ELECTRICAL IMPEDANCE TOMOGRAPHY WITH TWO-WIRE MEASUREMENT METHOD
Daisuke Kawashima, Xiayi Liu, Michiko Sugawara, Hiromichi Obara, Masahiro Takei
1Chiba University, Japan, 2Tokyo Metropolitan University, Japan
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**SURFACE-ENHANCED RAMAN SPECTROSCOPY BASED ULTRAFAST DNA ASSAYS USING PHOTOTHERMAL PCR CHIP WITH PLASMONIC NANOPILLAR ARRAYS**  
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

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Byeongyeon Kim, Suyeon Shin, Sungyoung Choi  
Kyung Hee University, Republic of Korea

**M071c**  
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Yoshiyuki Tsuyama, Kazuma Mawatari, Takehiko Kitamori  
The University of Tokyo, Japan

**T067c**  
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Jia Zhu¹, Guanzhou Lin¹,², Yun Huang¹, Meizhang Wu³, Zhuojie Chen¹, Xiaoyu Chen¹, Peimin Lu², Wengang Wu¹  
¹Peking University, China, ²Fuzhou University, China, ³The Affiliated High School of Peking University, China

**T068c**  
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Masumi Serita, Daiki Sakai, Ken Yamamoto, Masahiro Motosuke  
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

T070c  PHOTOTHERMAL OPTICAL PHASE SHIFT DETECTION USING OPTICAL FIBER
Naoki Wada, Hisashi Shimizu, Kazuma Mawatari, Takehiko Kitamori
The University of Tokyo, Japan

T071c  SERS SIGNAL ENHANCEMENT ON NANO-MUSHROOM JANUS-BIOSENSORS THROUGH CARBOXYLATED NANOMASKING MECHANISM
Meng-Ju Pan1, Chun-Wei Lee1, Fan-Gang Tseng1,2
1National Tsing Hua University, Taiwan, 2Academia Sinica, Taiwan

W066c  ROLLED-UP SiO2/SiN MICROTUBES MADE BY PECVD FOR SENSITIVE SOLVENT DETECTION
Pengfei Song1,2, Cheng Chen2, Juntian Qu1,2, Pengfei Ou2, M.H.T. Dastjerdi2, Hao Fu1,2, Zetian Mi2, Jun Song2, Xinyu Liu1
1University of Toronto, Canada, 2McGill University, Canada, 3Massachusetts Institute of Technology, USA, 4University of Michigan, USA

W067c  ULTRASENSITIVE DETECTION OF NONLABELED PROTEIN USING UV PHOTOTHERMAL OPTICAL PHASE SHIFT DETECTION
Hisashi Shimizu, Shigenori Takeda, Kazuma Mawatari, Takehiko Kitamori
The University of Tokyo, Japan

W068c  PORTABLE SMARTPHONE-ENABLED CAPILLARY-BASED VISCOMETER
Jose C. Contreras-Naranjo, Vijetha Nagendra, Xiaorui Dong, Victor M. Ugaz
Texas A&M University, USA

W069c  PLASMONIC AGAROSE GEL DROPLETS FOR SERS DETECTION OF MOLECULES IN COMPLEX FLUIDS AND CELL CULTURE MEDIUM
Yun-Chu Chen, Kuan-Ying Chen, Yi-H-Fan Chen
National Yang-Ming University, Taiwan

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Han-Sheng Chuang, Hsiao-Neng Lin, Jen-Yi Wang
National Cheng Kung University, Taiwan

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W. Knoben1, G. Besselink2, E. Roeven1,3, H. Zuilhof1, A. Schütz-Trilling1, A. van der Meer1, L. Schers1, H. Leeuwis2, F. Falke1, F. Schreuder1, R. Heideman1, H. van den Vlekkert2
1Surfix BV, The Netherlands, 2Lionix International BV, The Netherlands, 3Wageningen University, The Netherlands
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#### W072c

**WAVELENGTH-TUNABLE NEAR-INFRARED SENSOR WITH COLORIMETRIC READOUT**

P. Güell-Grau, P. Escudero, R. Villa, B. Sepulveda, M. Alvarez  
*Universitat Autònoma de Barcelona, Spain*

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1 The University of Tokyo, Japan, 2 Hitachi High-Technologies Corporation, Japan | |
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Mitsuhiro Horade1, Osamu Tabata2, Hiroaki Ito1, Toshio Takayama1, Dylan Tsai2, Makoto Kaneko1
1Osaka University, Japan, 2Kyoto University, Japan, 3National Chiao Tung University, Taiwan

**W073c** SIMPLE ISOLATION OF SINGLE CELL: THIN GLASS MICROFLUIDICS FOR OBSERVATION OF ISOLATED SINGLE EUGLENA GRACILIS
Nobutoshi Ota1, Yaxiaer Yalikun1, Nobuyuki Tanaka1, Yuki Nagahama2, Minoru Oikawa2, Yo Tanaka1
1RIKEN, Japan, 2Chiba University, Japan

**W074c** EARTHWORM MUSCLE-TISSUE ACTUATED ATMOSPHERIC-OPERABLE 3D PRINTED WHEEL RUNNER
Yaxiaer Yalikun1, Yuji Noguchi2, Norihiro Kamamichi2, Yo Tanaka1
1RIKEN, Japan, 2Tokyo Denki University, Japan

**W075c** AIR FINE DUST MONITORING UTILIZING QUARTZ CRYSTAL MICROBALANCE (QCM) RESONATOR
Sumi Yoon, Dong-Ki Hong, Hye-Lim Kang, Seong-Eun Kim, Won-Hyo Kim, WooKyeong Seong, Kook-Nyung Lee
Korea Electronics Technology Institute, Republic of Korea

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**d - Integrated Microfluidic Platforms**

Platforms based on Capillary Forces
(Paper-Based Microfluidics, Lateral Flow Tests)

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Kosuke Tomimuro1, Keisuke Tenda1, Yuki Hiruta1, Maarten Merkx2, Daniel Citterio
1Keio University, Japan, 2Eindhoven University of Technology, The Netherlands

**M077d** TEXT-DISPLAYING COMPETITIVE IMMUNOCHEMATOGRAPHIC STRIPS ENABLING NAKED-EYE SEMI-QUANTITATIVE ANALYSIS
Kazushi Misawa1, Tomohiro Yamamoto2, Daiki Watanabe1, Yuki Hiruta1, Hiroki Yamazaki2, Daniel Citterio1
1Keio University, Japan, 2Techno Medica Co., Ltd., Japan

**M078d** ROTATIONAL MANIFOLD FOR SEQUENTIAL REAGENT DELIVERY IN A PAPER-BASED SALMONELLA ASSAY
Cody S. Carrell, Rachel M. Feeny, Katherine E. Boehle, Brian Geiss, Charles S. Henry
Colorado State University, USA

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KU Leuven, Belgium
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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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University at Buffalo, USA

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McGill University, Canada

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Binbin Ying1,2, Xinyu Liu1
1University of Toronto, Canada, 2McGill University, Canada

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Lei Zhang, Rita Vos, Tim Steyelaerts, Federico Buja, Gabrielle Woronoff, Tim Stakenborg
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Dries Vloemans, Francesco Dal Dosso, Pieter Verboven, Bart Nicolai, Jeroen Lammertyn
KU Leuven, Belgium

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P.P. Galanis1, P.J.W. He1, I.N. Katis1, M.R. Thomas2, Y. Xianyu2, M.M. Stevens3, R.W. Eason2, C.L. Sones1
1University of Southampton, UK, 2Imperial College London, UK

W080d  LATERAL FLOW IMMUNOASSAY WITH STACKING EFFECT FOR THE HIGH SENSITIVE STAPHYLOCOCCUS AUREUS DETECTION
Hsin-Po Wang1, Tsung-Ting Tsai2, Tse-Hao Huang2, Chien-Fu Chen1
1National Taiwan University, Taiwan, 2Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Taiwan

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I.N. Katis, P.J.W. He, P.P. Galanis, R.W. Eason, C.L. Sones
University of Southampton, UK
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¹Fraunhofer Institute for Production Technology, Germany, ²Dublin City University, Ireland

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1University of Leeds, UK, 2LightOx Limited, UK, 3Durham University, UK

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1Osaka University, Japan, 2AIST PhotoBIO-OIL, Japan

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1Kagawa University, Japan, 2YODAKA Co., Ltd., Japan
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¹Osaka University, Japan, ²AIST PhotoBIO-OIL, Japan |
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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 Shih¹, Chia-Hung Chen¹,²,³  
¹Biomedical Institute for Global Health Research and Technology, Singapore, ²National University of Singapore, Singapore, ³University of Houston, USA, ²Singapore Institute for Neurotechnology, Singapore |
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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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John A. Moore, Ali Rohani, Yi-Hsuan Su, Cirle A. Warren, Nathan S. Swami
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W116e  IMPEDANCE MEASUREMENTS OF IGE-MEDIATED SINGLE BASOPHILS FOR ALLERGIC REACTION IN A MICROELECTRODE DEVICE
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Riccardo Reale1, Adele De Ninno2, Luca Businaro2, Paolo Bisegna1, Federica Caselli1
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 Caselli2, Riccardo Reale1, Adele De Ninno1, Luca Businaro2, Paolo Bisegna1
1University of Rome Tor Vergata, Italy, 2Italian National Research Council, Italy
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\textsuperscript{1}University of Bremen, Germany, \textsuperscript{2}Ionovation GmbH, Germany

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\textsuperscript{1}National University of Singapore, Singapore, \textsuperscript{2}New York University Abu Dhabi, UAE, \textsuperscript{3}A*STAR, Singapore

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\textsuperscript{1}Hitachi, Ltd., Japan, \textsuperscript{2}The University of Tokyo, Japan, \textsuperscript{3}Kyoto University, Japan, \textsuperscript{4}RIKEN, Japan

M121e  FABRICATION OF MICROCHANNEL NETWORK-EMBEDDING HYDROGEL SPONGES FOR 3D PERFUSION CULTURE OF MAMMALIAN CELLS
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Chiba University, Japan

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Christian Lohasz\textsuperscript{1}, Paul Argast\textsuperscript{2}, Martin Rausch\textsuperscript{1}, Markus Warthmann\textsuperscript{1}, Jacqueline Loretan\textsuperscript{2}, Olivier Frey\textsuperscript{2}, Kasper Renggli\textsuperscript{2}, Andreas Hierlemann\textsuperscript{1}
\textsuperscript{1}ETH Zürich, Switzerland, \textsuperscript{2}Friedrich Miescher Institute for Biomedical Research, Switzerland, \textsuperscript{3}Novartis Institutes for BioMedical Research, Switzerland, \textsuperscript{4}InSphero AG, Switzerland
M123e  HIGH-CONTENT NUCLEUS BASED 3D IMAGE CYTOMETRY OF WHOLE MULTICELLULAR TUMOUR SPHEROIDS
Karl Olofsson¹, Valentina Carannante¹, Björn Önfelt¹,², MartinWiklund¹
¹KTH Royal Institute of Technology, Sweden, ²Karolinska Institutet, Sweden

M124e  A STRETCHABLE 3D CELLULAR MICROARRAY FOR MECHANOBIOLOGY STUDY KABILAN
Sakthivel, Grant Sonnenberg, Lukas Stracovsky, Mark Verhalle, Andrew Reed, Homayoun Najjaran, Mina Hoorfar, Kee young Kim
University of British Columbia, Canada

M125e  QUANTIFYING PARPi-RESISTANT SUBPOPULATIONS AFTER TREATMENT IN CO-CULTURE SPHEROIDS USING HYPERSPECTRAL IMAGING
Amélie St-Georges-Robillard¹,²,³, Maxime Cahuzac²,³, Alexandre Saudrio²,³, Benjamin Péant²,³, Anne-Marie Mes-Masson²,³, Frédéric Leblond¹,², Thomas Gervais¹,²,³
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

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Tohoku University, Japan

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C.-H. Tsai¹,²,³, D.-H. Kuan², S. Zimmermann¹, J. Schoendube², A. Gross², R. Zengerle²,³, P. Koltay¹,³,⁴
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
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¹Warsaw University of Technology, Poland, ²Wroclaw University of Technology, Poland

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National Cheng Kung University, Taiwan
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Artur Ruszczak¹, Ott Scheler¹,², Paweł Jankowski¹, Michal Horka¹, Ladislav Derzsi¹, David Wareham³, Piotr Garstecki¹
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
Elisa M. Wasson¹,⁴, Melinda G. Simon², Monica L. Moya³, Rafael V. Davalos¹,², Elizabeth K. Wheeler⁴
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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Shogo Nagata, Fumisato Ozawa, Shoji Takeuchi
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T132e CUSTOM MICROFLUIDIC PRINTHEAD FOR 3D BIOPRINTING OF BI- AND TRI-LAYERED HOLLOW MICROCHANNELS IN GELS
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McMaster University, Canada

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Junyi Yao¹, Sangil Han², Hyun Soo Kim³, Younghak Cho⁴, Yoon-E Choi⁵, 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, Mabiro Kiyosawa¹, Midori Kato-Negishi², Shoji Takeuchi¹
¹The University of Tokyo, Japan, ²Musashino University, Japan
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| **M131e** | **SEPARATING CELL SUBPOPULATIONS IN 3-DIMENSIONAL INVASION ASSAYS ON DIGITAL MICROFLUIDICS FOR GENE EXPRESSION ANALYSIS** |
| | 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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Sheng-Han Chu¹, Li-Lun Lo¹, Richard Lee Lai¹, T. Tony Yang², Jung-Chi Liao², 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. Sleebboom¹, Cecilia M. Sahlgren¹,², Jaap M. J. den Toonder¹
¹Eindhoven University of Technology, The Netherlands, ²Åbo Akademi University, Finland

**T135e**
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Mcolisi Dlamini, Timothy E. Kennedy, David Juncker
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Marika Sugimoto, Fuka Nagatomi, Naoki Sasaki
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Academia Sinica, Taiwan

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Keiichiro Kushiro¹, Akhide Ryo², Madoka Takai¹
¹The University of Tokyo, Japan, ²Yokohama City University, Japan

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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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York University, Canada

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

M137e  MICROFLUIDIC BIOPRINTER FOR IN-SITU FORMATION OF ENGINEERED SKIN GRAFTS FOR BURN WOUND TREATMENT  
Richard Cheng, Gertraud Eylert, Siijn He, Jean-Michel Gariepy, Navid Hakimi, Marc Jeschke, Axel Guenther  
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  
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1University of California, Irvine, USA, 2Shanghai Jiao Tong University, China
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¹National Tsing Hua University, Taiwan, ²Taipei Medical University Hospital, Taiwan, ³Academia Sinica, Taiwan

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¹University of Toronto, Canada, ²Hospital for Sick Children, Canada

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A. Nicolas¹,², H. Lanz³, S.J. Trietsch¹, T. Hankemeier², J. Joore³, P. Vulto³
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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**T142e** MULTITUBE BIOMIMETIC SYSTEM FOR THE STUDY OF INTERTUBULAR CROSS-TALKS IN CHRONIC RENAL DISEASES
Sarah Myram, Bastien Venzac, Sylvie Coscoy, Stéphanie Descroix
1Université UPMC Paris Sorbonne, France, 2PSL Research University, France

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1University of Hull, UK, 2Hull and East Yorkshire Hospitals NHS Trust, UK

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The Ohio State University, USA

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1University of Toronto, Canada, 2Ted Rogers Centre for Heart Research, Canada

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1University of Twente, The Netherlands, 2Ghent University, Belgium

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1Japan Women's University, Japan, 2The University of Tokyo, Japan
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\(^1\)Albert-Ludwigs-Universität Freiburg, Germany, \(^2\)University Hospital Aachen, Germany

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\(^1\)Kyoto University, Japan, \(^2\)RIKEN, Japan, \(^3\)CiRA, Japan, \(^4\)Takara Bio Inc., Japan

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DGIST, Republic of Korea

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\(^1\)AIST, Japan, \(^2\)Stem Cell Evaluation Technology Research Association, Japan

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\(^1\)University of British Columbia, Canada, \(^2\)Tufts University, USA, \(^3\)University of California, San Diego, USA, \(^4\)Massachusetts Institute of Technology, USA

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\(^1\)The University of Tokyo, Japan, \(^2\)University of Bordeaux, France, \(^3\)Microfluidic System Works Inc., Japan

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1Singapore-MIT Alliance for Research and Technology, Singapore, 2National University of Singapore, Singapore, 3National University Health System, Singapore, 4Massachusetts Institute of Technology, USA

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1University of Groningen, The Netherlands, 2Universiti Malaysia Pahang, Malaysia

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1National University of Singapore, Singapore, 2Biomedical Institute for Global Health Research & Technology, Singapore, 3A*STAR, Singapore

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1PSL University, France, 2Institut Pasteur, France

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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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Gachon University, Republic of Korea

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1KTH Royal Institute of Technology, Sweden, 2Karolinska Institutet, Sweden

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

T168f  PHOTOTHERMAL PCR CHIP WITH PLASMONIC GLASS NANOPILLAR ARRAYS
Youngseop Lee1, Byoung-Hoon Kang1, Minhee Kang2, Luke P. Lee3, Ki-Hun Jeong1
1KAIST, Republic of Korea, 2Samsung Medical Center, Republic of Korea, 3University of California, Berkeley, USA

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Intellectual Ventures Laboratory, USA

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University of Texas at El Paso, USA

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Yii-Lih Lin1, Tsgeayew Sewunet2,3, SriRam KK2, Christian G. Giske3,4, Fredrik Westerlund1
1Chalmers University of Technology, Sweden, 2Jimma University, Ethiopia, 3Karolinska Institutet, Sweden, 4Karolinska University Hospital, Sweden

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The Hong Kong University of Science and Technology, China
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Yongfeng Ning¹, Fengxiang Jing², Gang Li
¹Chongqing University, China, ²Shanghai Turtle Technology Company Limited, China

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Li Fan, Shengquan Liu, Nana Wang, Fangzhou Zhang, Xiongdong Ma, Jiong Li, Hong Wang
Chinese Academy of Sciences, China

**W168f**  STAPHYLOCOCCUS AUREUS SUB-TYPING AND DETECTION OF MRSA ON A MICROFLUIDIC LAB-ON-FOIL DEVICE
Anna Ohlander¹,², Sergey Zelenin¹, Flavia Huygens², Christoph Kutter³, Aman Russom¹
¹KTH Royal Institute of Technology, Sweden, ²Queensland University of Technology, Australia, ³Fraunhofer EMFT, Germany

**M168f**  FAST ALGORITHMIC OPTIMIZATION FOR PROTEIN CRYSTAL QUALITY
Sankhya Bhattacharya, Pijus Kundu, Fan-Gang Tseng
¹National Tsing Hua University, Taiwan, ²Academia Sinica, Taiwan

**M169f**  A MICROFLUIDIC WHOLE BLOOD PROCESSING PLATFORM INTEGRATING ION-SENSITIVE FIELD-EFFECT TRANSISTOR SENSOR FOR GLYCATED HEMOGLOBIN DETECTION
Yu-Hao Huang¹, Yu-Hao Chang¹, Da-Han Kuan¹, Jui-Cheng Huang², Yu-Jie Huang², Chih-Ting Lin¹, Nien-Tsu Huang¹
¹National Taiwan University, Taiwan, ²Taiwan Semiconductor Manufacturing Company, Taiwan

**M170f**  QUANTITATIVE MICROPADS: A PAPER-BASED POINT-OF-CARE DIAGNOSTIC DEVICE FOR THE DETECTION OF HUMAN IMMUNODEFICIENCY VIRUS (HIV)
E. Brandon Strong, Brittany A. Lore, Nicholas J. Tod, Emiliano Escamilla, Oscar Mercado, Robert Thiel, Andres W. Martinez, Nathaniel W. Martinez
California Polytechnic State University, San Luis Obispo, USA

**T170f**  WASH-FREE DIGITAL PROTEIN DETECTION SYSTEM BASED ON NANOPIERCLE MOTION ANALYSIS
Kenji Akama¹,², Hiroyuki Noji¹
¹The University of Tokyo, Japan, ²Sysmex Corporation, Japan

**T171f**  MICROFLUIDIC ASSISTED SAMPLE PREPARATION FOR THE ANALYSIS OF BIMOLECULAR STRUCTURE IN CRYO-ELECTRON MICROSCOPY
Byungjin Lee¹, Radoslav Ivanov Enchev², Sung Sik Lee³, Matthias Peter², Chang-Soo Lee¹
¹Chungnam National University, Republic of Korea, ²ETH Zürich, Switzerland
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Alejandro Martínez-Brenes1,3, Andrés Hernández-Jiménez1, Jeremy Caldwell-Chacón1, Katrin Vu2, Gerhard Blankenburg2, Li-Ling Yang2, Ming-Lee Chu1, Chia-Fu Chou1, Leonardo Lesser-Rojas1
1Universidad de Costa Rica, Costa Rica, 2Instituto Tecnológico de Costa Rica, Costa Rica, 3Academia Sinica, Taiwan

**W170f**  FAST ANTIMICROBIAL ENZYMATIC ASSAY BY NANOPLASMONICS-BASED OPTOFLUIDIC SYSTEM
Jong-Hwan Lee1, Tiffany Wu1, SoonGweon Hong1, MinSun Song1, ByungRae Cho1, Doyeon Bang1, Lee W. Riley1, Luke P. Lee1,2,3
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

**W172f**  A MICROFLUIDICS BASED PLATFORM FOR THE RAPID, MULTIPLEXED, FULLY-AUTOMATED DETECTION SYSTEM FOR MALARIA AND DENGUE FEVER USING EMBEDDED HYDROGEL SENSORS
Bhuvana Goyal, Dhananjaya Dendukuri
Achira Labs Private Limited, India

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Fan-En Chen, Emily Chang, Dong Jin Shin, Liben Chen, Tza-Huei Wang
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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National Tsing Hua University, Taiwan

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Akihiro Shirai, Kenji Sueyoshi, Tatsuro Endo, Hideaki Hisamoto
Osaka Prefecture University, Japan
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Yi-Da Chung1, Anirban Sinha1, Priya Gopinathan1, Hsin-Ying Lin1, Shu-Chu Shieh2, Gwo-Bin Lee1  
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, 4AIST, Japan

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Thomas R. Carey, Connie W. Yu, Jennifer Hall, Lydia L. Sohn  
University of California, Berkeley, USA

**M176f**  RESOURCE-FREE EXOSOMAL MIRNA DETECTION IN LIQUID BIOPSY  
Minjeong Jang1, Jae-Ho Cheong2, Pilnam Kim1  
1KAIST, Republic of Korea, 2Yonsei University, Republic of Korea

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Junghwa Cha, Pilnam Kim  
KAIST, Republic of Korea

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

**W175f**  AN AUTOMATIC MICROFLUIDIC SYSTEM FOR CONTINUOUS SELECTION OF APTAMERS TARGETING SURFACE PROTEIN BY USING CANCER TISSUE SAMPLES  
Wei-Ting Liu1, Yi-Cheng Tsai1, Wen-Bin Lee1, Chien-Yu Fu1, Yuan-Jhe Chuang2, Keng-Fu Hsu2, Gwo-Bin Lee1  
1National Tsing Hua University, Taiwan, 2National Cheng Kung University, Taiwan
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José Juan-Colás1, Ian S. Hitchcock1, Mark Coles2, Steven Johnson1, Thomas F. Krauss1
1University of York, UK, 2University of Oxford, UK

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M177f MICRO-DISSECTED TISSUE MICROARRAYS FOR DRUG DISCOVERY AND THERAPEUTIC RESPONSE ASSAYS ON EX VIVO TUMOR SAMPLES
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1Université de Montréal, Canada, 2Institut du Cancer de Montréal, Canada, 3Polytechnique de Montréal, Canada

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T178f THERAPEUTIC AGENT SCREENING MICROFLUIDIC ELECTROPORATOR (THEME) FOR PRECISION MEDICINE
Sung-Eun Choi, Chris H. Choi, Mengxing Ouyang, Nathan Scott, Soojung Claire Hur
1Johns Hopkins University, USA, 2Harvard University, USA, 3UCLA, USA

T179f SINGLE-CELL FUNCTIONAL PROTEOMICS MICROCHIP FOR PROFILING CIRCULATING HEMATOPOIETIC STEM/PROGENITOR CELLS AND EARLY DETECTION OF MYELOFIBROSIS
Jonathan Chen1, Dongjoo Kim1, Zhuo Chen1, Maria Kleppe2, Ross Levine3, Rong Fan1
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

W178f AUTOMATED MICROFLUIDIC SYSTEMS OF BEAMing (BEADS, EMULSION, AMPIFICATION, AND MAGNETICS) FOR CLINICAL DIAGNOSIS
Sysmex Corporation, Japan

W179f AN ADAPTIVE MICROFLUIDIC DEVICE FOR REAL-TIME MONITORING OF CYTOKINE TRIGGERED DRUG DELIVERY TOWARDS PRECISION BIOELECTRONIC MEDICINE IN INFLAMMATION
Guozhen Liu1,2, Chaomin Cao2
1The University of New South Wales, Australia, 2Central China Normal University, China
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**M179f** DEVELOPMENT OF A BIOASSAY SYSTEM TO EVALUATE THE PULSATILE FUNCTION OF HUMAN HEART TISSUE USING A CELLULAR MICROPUMP ON-CHIP AND A BIOMIMETIC HUMAN IPS CELL-DERIVED HEART TISSUE SHEET TECHNOLOGY
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RIKEN, Japan

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Jin Jeon, Hee Seok Yang
Dankook University, Republic of Korea

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Mohamed Gamaleldin, Sina Kheiri, Saidul Islam, Keekyoung Kim
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Min Suk Lee, Hee Seok Yang
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Cong Wang1, Seung-Jun Seo2, Jin-Seong Kim1, Ki-Hong Kim2, Jong-Ki Kim2, Jungyul Park1
1Sogang University, Republic of Korea, 2Catholic University of Daegu, Republic of Korea

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| Ida Iranmanesh¹, Shamit Shrivastava¹, Richard Browning¹, Dario Carugo¹,², Eleanor Stride¹ |
| ¹University of Oxford, UK, ²University of Southampton, UK |

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| Timothy S. Frost, Victor Estrada, Linan Jiang, Yitshak Zohar |
| University of Arizona, USA |

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| Lucas Armbrecht¹, Martin Schmid², Andre Kling¹, Petra S. Dittrich¹ |
| 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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1 Polish Academy of Sciences, Poland, 2 Albert-Ludwigs-Universität Freiburg, Germany

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

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¹The University of Tokyo, Japan, ²Hitachi High-Technologies Corporation, Japan

**M191g** CULTURE- AND PCR-FREE DETECTION OF LOW ABUNDANCE BACTERIA FROM BLOOD WITHIN AN HOUR
Kyungyong Choi, Wei Ouyang, Hyunryul Ryu, Jongyoon Han
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Federico Paratore¹,², Vesna Bacheva¹, Shimon Rubin², Moran Bercovici², Govind V. Kaigala¹
¹IBM Research, Switzerland, ²Technion − Israel Institute of Technology, Israel

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E. Guzniczak¹, M. Jimenez², O. Otto², N. Willoughby³, H. Bridle¹
¹Heriot-Watt University, UK, ²University of Glasgow, UK, ³University of Greifswald, Germany

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Bo Hoon Han¹,², Seok Chung¹, Ji Yoon Kang²
¹Korea Institute of Science and Technology, Republic of Korea, ²Korea University, Republic of Korea

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Dongwoo Lee, Wonhee Lee
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Nitipong Panklang¹, Boonchai Techammat¹, Anurat Wisitsoraat¹, Yuji Suzuki³
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Alexander R. Jafek¹, Haidong Feng¹, Dallin S. Broberg², Timothy G. Jenkins², Kenneth I. Aston², Bruce K. Gale¹, Raheel Samuel¹ ²
¹University of Utah, USA, ²University of Utah School of Medicine, USA

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Reza Moloudi¹ ², Steve Oh³, Chun Yang³, Kim Leng Teo³, Alan Tin-Lun Lam³, Majid Ebrahimi Warkiani⁴, May Win Naing⁴
¹Nanyang Technological University, Singapore, ²Singapore Institute of Manufacturing Technology, Singapore, ³Bioprocessing Technology Institute, Singapore, ⁴University of Technology Sydney, Australia

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Ming Li¹ ², Mark van Zee¹, Robert Damoiseaux¹, Keisuke Goda³, Dino Di Carlo³
¹UCLA, USA, ²Macquarie University, Australia, ³The University of Tokyo, Japan

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Jason P. Beech¹, Kevin Keim², Bao Dang Ho¹, Oskar Ström¹, Carlotta Guiducci², Jonas O. Tegenfeldt¹  
¹Lund University, Sweden, ²EPFL, Switzerland

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Jian Zhou, Ian Papautsky  
University of Illinois at Chicago, USA

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Jian Zhou, Ian Papautsky  
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Szu-I Yeh¹, Wei-Chun Ho², Jing-Tang Yang²  
¹National Cheng-Kung University, Taiwan, ²National Taiwan University, Taiwan

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Arsalan Nikdoost, Pouya Rezai  
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1University of Helsinki, Finland, 2Aalto University, Finland

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1University of New South Wales, Australia, 2University of Technology Sydney, Australia

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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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¹AIST, Japan, ²TECNISCO Ltd., Japan

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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-Cuevas2, Christina Andrikopoulou1, Ali Ahmad Kassir1, Racha Kassem1, Lucien Baldas1, Stéphane Colín2, 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 Hao1, Laura Ha1,2, Gong Cheng1, Yuan Wan1, Yiqiu Xia1, Donna M. Sosnoski1, Andrea M. Mastro1, Si-Yang Zheng1
1The Pennsylvania State University, USA, 2POSTECH, Republic of Korea

T221j  IFAST/ATP ASSAYS FOR ON-CHIP DETECTION OF GROUP B STREPTOCOCCUS IN URINE SAMPLES
Bongkot Ngamsom1, Alexander Iles1, Ernest Wandera2, Racheal Kimani2, Francis Muregi2, Jesse Gitaka2, Nicole Pamme1
1University of Hull, UK, 2Mount 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 Liu1, Neha Garg2, Abraham Lee2
1Arcadia High School, USA, 2University of California, Irvine, USA

T224j  ANALYSIS OF MORPHOLOGICAL ANOMALIES AT CELLULAR LEVEL USING IMAGE PROCESSING AND COMPUTATIONAL TECHNIQUES
Mukta Sharma1, Venkanagouda S. Goudar2, Bhakti M. Netke1, Fan-Gang Tseng1,2, Mahua Bhattacharya1
1Indian Institute of Information Technology & Management, India, 2National Tsing Hua University, Taiwan, 3Academia Sinica, Taiwan

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

T226j  INTRODUCTION OF POLYETHYLENE TEREPHTALATE (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. Ravaynia1, Ketki Chawla1, Mario M. Modena1, Flavio Lombardo2, Jennifer Keiser2, Andreas Hierlemann1
1ETH Zürich, Germany, 2Swiss Tropical and Public Health Institute, Switzerland
T228j  DEVELOPMENT OF CENTRIFUGAL MICROFLUIDIC DEVICE FOR LYMHPOCYTES CHEMOTAXIS
Tsugunao Toma1, Wilfred Villariza Espulgar1, Masato Saito1,2, Hiroyuki Yoshikawa1, Shohei Koyama1, Hyota Takamatsu1, Eiichi Tamiya1
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 Sukesan, 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. Orlova2, Andries D. van der Meer1
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 NANOPIRCE 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-Dabrowska3, 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 CHARACTERIZED BY NOVEL MEMS-TYPE MICROCYTOMETER
Aleksandra Pokrzywnicka1, Danylo Lisanets1, Patrycja Śniadek2, Natalia Małyszka2, Rafał Walczak1
1Wrocław University of Science and Technology, Poland, 2Poznan University of Life Sciences, Poland
Poster Presentations

**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
Koaru Uesugi1, Hiroyuki Mayama1, 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 Vrouwes1, Martina Viefhues1, Dario Anselmetti1, Karsten Gall2
1Bielefeld University, Germany, 2Ionovation GmbH, Germany, 3Ruhr University of Bochum, Germany, 4University of Twente, 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 MICROPYHYSIOLOGICAL SYSTEMS
Stefan Schneider¹, Florian Erdeßmann¹, 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 MICORNAS
H. Kutluk¹, R. Bruch¹,², M. Meirlich¹, S. Partel², 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, Chi-h Ting Lin, Nien-Tsu Huang
National Taiwan University, Taiwan

W234j  POLYMER NANSENSORS USING ELECTROPHORETIC IDENTIFICATION OF NUCLEOTIDES FOR SINGLE-MOLECULE SEQUENCING
Charuni Amarasekara¹, Junseo Choi², Zheng Jia³, 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 Curran3, 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 Funakoshi3, 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
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