

# μTAS 2022



Hangzhou · China

23-27 · October

In-Person

Hybrid

Virtual

The 26th International Conference on Miniaturized Systems  
for Chemistry and Life Sciences

# FINAL PROGRAM

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# CONFERENCE AT A GLANCE

## MONDAY, 24 OCTOBER

08:30-09:00	Opening Remarks		
09:00-09:45	Plenary Presentation I <i>Xiaoliang Xie – Peking University, CHINA</i>		
09:45-10:00	Transition		
10:00-11:10	Session 1A1 Single Cell Analysis and Sequencing	Session 1B1 Extracellular Vesicles	Session 1C1 Organ-on-a-Chip I
	KEYNOTE Xingyu Jiang	KEYNOTE Huilin Shao	KEYNOTE S��verine Le Gac
11:10-11:40	Break and Virtual Exhibit Inspection – Gather.Town		
11:40-12:40	Session 1A2 Cell Imaging	Session 1B2 Imaging	Session 1C2 Organ-on-a-Chip II
12:40-13:40	Lunch on Own		
13:05-13:25	Industrial Stage 1 – Heidelberg Instruments		
13:40-14:25	Plenary Presentation II <i>Hiroyuki Noji – University of Tokyo, JAPAN</i>		
15:25-16:35	Session 1A3 Organ-on-a-Chip III	Session 1B3 Cell Assay and Co-Culture	Session 1C3 Microfluidics I
	KEYNOTE Zhongze Gu	KEYNOTE Amy Q. Shen	KEYNOTE Andrew de Mello
16:35-17:05	Break and Virtual Exhibit Inspection – Gather.Town		
17:05-18:05	Session 1A4 Organ-on-a-Chip IV	Session 1B4 Wearable Devices	Session 1C4 3D Printing
22:00-23:30	Virtual Poster Session 1 – Gather.Town		

## TUESDAY, 25 OCTOBER

05:00-06:30	Virtual Poster Session 2 – Gather.Town		
08:45-09:05	Analytical Chemistry - Young Innovator Award Presentation		
09:05-09:50	Plenary Presentation III <i>David A. Weitz – Harvard University, USA</i>		
09:50-10:05	Transition		
10:05-11:15	Session 2A1 Micromanipulation	Session 2B1 Cell Analysis I	Session 2C1 Nuclear Acid Analysis
	KEYNOTE Bifeng Liu	KEYNOTE Rong Fan	KEYNOTE Aaron Streets
11:15-11:45	Break and Virtual Exhibit Inspection – Gather.Town		
11:45-12:45	Session 2A2 Biosensing I	Session 2B2 Microfluidics I	Session 2C2 Flow Cytometry
12:45-13:45	Lunch on Own		
13:45-14:30	Plenary Presentation IV <i>Lyd��ric Bocquet – Ecole Normale Sup��rieure, FRANCE</i>		

# CONFERENCE AT A GLANCE

## TUESDAY (continued)

15:30-16:40	<b>Session 2A3 Droplet-Based Microfluidics I</b>	<b>Session 2B3 Cell Analysis II</b>	<b>Session 2C3 Biomolecular Assay I</b>
	<b>KEYNOTE</b> Lingling Shui	<b>KEYNOTE</b> ebastian Maerkl	<b>KEYNOTE</b> Sunitha Nagrath
16:40-17:10	<b>Break and Virtual Exhibit Inspection – Gather.Town</b>		
17:10-18:10	<b>Session 2A4 Droplet-Based Microfluidics II</b>	<b>Session 2B4 Particle Manipulation</b>	<b>Session 2C4 Flow Chemistry</b>

## WEDNESDAY, 26 OCTOBER

08:45-09:05	<b>Lab on a Chip and Dolomite Pioneers in Miniaturization Lectureship Prize and Presentation</b>		
09:05-09:50	<b>Plenary Presentation V</b> Amy E. Herr – <i>University of California, Berkeley, USA</i>		
09:50-10:00	<b>MicroTAS 2023 Announcement</b>		
10:00-10:30	<b>Break and Virtual Exhibit Inspection – Gather.Town</b>		
10:30-12:00	<b>Session 3A1 Cell Analysis III</b>	<b>Session 3B1 Organ-on-a-Chip V</b>	<b>Session 3C1 Cell Analysis IV</b>
	<b>KEYNOTE</b> Jin-Ming Lin	<b>KEYNOTE</b> Shoji Takeuchi	<b>KEYNOTE</b> Z. Hugh Fan
12:00-13:00	<b>Lunch on Own</b>		
12:25-12:45	<b>Industrial Stage 3 – Acxel Micro &amp; Nano Tech (Guangdong) Co., Ltd.</b>		
14:00-15:50	<b>Session 3A2 MEMS I</b>	<b>Session 3B2 Biochemical Analysis I</b>	<b>Session 3C2 Microfluidics III</b>
	<b>KEYNOTE</b> Xinxin Li	<b>KEYNOTE</b> Michael Breadmore	<b>KEYNOTE</b> Shuhuai Yao
15:50-16:20	<b>Break and Virtual Exhibit Inspection – Gather.Town</b>		
16:20-17:40	<b>Session 3A3 Biochemical Analysis II</b>	<b>Session 3B3 Sensing</b>	<b>Session 3C3 Biochemical Analysis III</b>
22:00-23:30	<b>Virtual Poster Session 3 – Gather.Town</b>		

## THURSDAY, 27 OCTOBER

08:45-09:05	<b>Microsystems &amp; Nanoengineering/Springer Nature Test of Time Award</b>		
09:05-09:50	<b>Plenary Presentation VI</b> Joyce Poon – <i>University of Toronto, CANADA</i>		
09:50-10:05	<b>Transition</b>		
10:05-11:35	<b>Session 4A1 Biosensing II and MEMS II</b>	<b>Session 4B1 Droplet-Based Microfluidics III</b>	<b>Session 4C1 MEMS III</b>
	<b>KEYNOTE</b> Xiaojie Duan	<b>KEYNOTE</b> Dong Pyo Kim	<b>KEYNOTE</b> Itai Cohen
11:35-12:05	<b>Break and Virtual Exhibit Inspection – Gather.Town</b>		
12:05-12:45	<b>Awards Ceremony</b>		
12:45-13:00	<b>Closing Remarks</b>		
13:00	<b>Conference Adjourns</b>		

# MicroTAS 2022



## Welcome to the 26th International Conference on Miniaturized Systems for Chemistry and Life Sciences!

**Welcome** to MicroTAS 2022, the 26th International Conference on Miniaturized Systems for Chemistry and Life Sciences. Due to the impact of the COVID-19 pandemic, the MicroTAS 2022 conference will be held in a virtual mode. It is our distinct pleasure to welcome you remotely from around the world. In this meeting, we will continue to be guided by the core spirit of MicroTAS: (1) to deliver a high-quality scientific program; (2) to create a forum for cutting edge and even unpublished work; (3) to facilitate scientific engagement across a spectrum of subject areas; (4) to foster connections among researchers of all career stages from across the international community; and (5) to grow and strengthen our community by including emerging scientific directions and diverse researchers.

**We** are pleased to welcome a community of over 800 individuals to this virtual MicroTAS. We thank each of you for joining us, and sharing your research here. It is you, our community, that makes MicroTAS the world's premier microfluidics conference.

**Our** 2022 conference design is a continuation of the successful virtual portion of MicroTAS 2021. We have done our best to have the program so presenters from around the world are able to join during waking hours. Our goal was to have a true international conference without us all being together in one place. For everyone delivering their talk remotely from their home or lab, you will be able to easily find and view that presentation, no matter where you are in the world.

**Poster** presentations are core to the excellence of MicroTAS. In 2022 we are arranging a virtual presentation of all the posters in Gather Town. The poster sessions are scheduled to be convenient to different regions of the world.

**Similar** to previous MicroTAS conferences, a series of workshops (8) have been organized. Educational material will be available online before the conference, and workshop attendees and our expert instructors will meet online for in-depth discussion during the weekend preceding the conference.

**We** are delighted to showcase 6 pioneering Plenary Speakers and 21 engaging Keynote Speakers, along with a slate of 102 exceptional submitted oral presentations. In addition, as with previous MicroTAS, the recipients of the Young Innovator Award, co-sponsored by the ACS Analytical Chemistry and CBMS, the Pioneers in Miniaturization sponsored by the Lab on a Chip and Dolomite, and the Test of Time Award sponsored by Springer Nature Microsystems & Nanoengineering will give short overviews of their latest research results. In each case, we sincerely hope that the scientific content and the presenter will inspire you to reflect the capabilities and understanding that can be unlocked by microfluidic systems.

**There** will also be a series of awards to be presented in MicroTAS 2022, including: CHEMINAS (Society for Chemistry and Micro-Nano Systems) daily Best Poster Award, Lab on a Chip Widmer Poster Award, IMT Masken and Teilungen AG Microfluidics on Glass Poster Award, MDPI micromachines Outstanding Tissue or Organ on Chip Microsystems Poster Award, MDPI sensors Outstanding Sensors and Actuators, Detection Technologies Poster Award, NIST and Lab on a Chip Art in Science Award, Elsevier Sensors and Actuators B.

# MicroTAS 2022



Chemical Best Paper Award, Microsystems & Nanoengineering/Springer Nature Best Talk Award, and the AIP Publishing Biomicrofluidics Best Paper Award.

**We** would like to sincerely thank the diligent, dedicated, and unbiased work of the volunteer experts in our Technical Program Committee (TPC) and Executive Technical Program Committee (ETPC). The TPC and ETPC are composed of, respectively, 24 and 61 of accomplished researchers and leaders in our field. They dedicate late nights and weekends to our community to ensure the best and most exciting work is accepted. Together these volunteers evaluated 703 submissions in June. In addition to the regular submissions, we allowed for late-breaking results with a Late News poster submission deadline, to reach a grand total of 498 poster presentations in 2022.

**We** would like to thank deeply all our sponsors and exhibitors who supported MicroTAS 2022.

**We** are grateful for the valuable support of CBMS, including the current and past Boards of Directors and Executive Boards (Current President Amy Herr and Past President Nicole Pamme), as well as CBMS Founders and previous MicroTAS conference chairs. It was your trust that made it possible to host this top-level, virtual conference for the first time from mainland China.

**We** would also like to thank the poster awards chairs (Lourdes Basabe and Tae-Eun Park) and all poster judges, the workshop chairs (Rebecca Pompano and Jiashu Sun) and all workshop instructors, the exhibit & sponsorship committee (co-chaired by Chaoyong Yang and Bifeng Liu), the promotion committee (chaired by Xingyu Jiang). We also would like to thank Lourdes Basabe and Tae-Eun Park for their support as the awards chairs.

**We** express our deepest gratitude towards Sara Stearns, Shirley Galloway, and their team at Preferred Meeting Management Inc. (PMMI), who have patiently guided us through this process and assisted us on virtually everything.

**We** offer our gratitude to our partners in ZJU Tongli Conference Service Co., as well as the local organizing team in Chemistry Department, Zhejiang University and ZJU-Hangzhou Global Scientific and Technological Innovation Center, for their great support and dedication in the conference preparation and organization.

**Finally, thank you all for joining us at this virtual MicroTAS conference and for contributing to the success and scientific quality of the conference!**

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As a scientific society, **CBMS** fully supports and values our community having collegial interactions that yield interpersonal connections, as well as intellectual outcomes: discussions, differing viewpoints, and scientific debates. Our events and activities are held in the spirit of free inquiry and free expression, which is important and necessary for advancing the field. We pride ourselves on our professionalism and our respect for others.

**CBMS** is committed to providing a safe and welcoming environment for everyone attending or associated with our events and activities including **CBMS** community, guests, staff, vendors, exhibitors, contractors, as well as venue staff. We are committed to providing an environment that is free from harassment and discrimination, whether sexual or otherwise, based on age, race, ethnicity, national origin, religion, language, sexual orientation, gender identity or expression, disability, health, socioeconomic status, marital status, domestic status, or parental status. Harassment and discrimination undermine the principle of equality and respect, and are serious forms of professional misconduct. **CBMS** community members who violate this policy will be subject to discipline.

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<https://cbmsociety.org/conduct-policy>



City Skyline in Hangzhou. By THINK B

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West Lake in Hangzhou. By Haoran Deng from Pixabay.

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Lingyin Temple in Hangzhou. By daniels1031 from Pixabay.

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## AWARDS

### Analytical Chemistry Young Innovator Award

This award, sponsored by the Journal of Analytical Chemistry and Chemical and Biological Microsystems Society (CBMS), recognizes the contributions of an individual who has demonstrated exceptional technical advancement and innovation in the field of micro- or nanofluidics in his or her early career.

**analytical  
chemistry**



### Lab on a Chip and Dolomite Pioneers in Miniaturization Prize

An award given for young-to-mid-career scientists, the prize recognizes outstanding contributions to the understanding and development of miniaturized systems. Sponsored by Lab on a Chip, Dolomite, and Chemical and Biological Microsystems Society (CBMS).



dolomite





## AWARDS

### **Springer Nature Test of Time Award**

The Microsystems & Nanoengineering/Springer Nature Test of Time Award recognizes research that was presented at MicroTAS within the last 10-15 years that is still impacting today's research in the field of microfluidics.

**Microsystems &  
Nanoengineering**  
[www.nature.com/micronano](http://www.nature.com/micronano)

### **NIST and Lab on a Chip Art in Science Award**

To draw attention to the aesthetic value in scientific illustrations while still conveying scientific merit, the MicroTAS Conference features an award titled, "Under the Looking Glass: Art from the World of Small Science" sponsored by NIST and Lab on a Chip. Applications are encouraged from any person attending the MicroTAS Conference and the winner will be selected by a panel of senior scientists in the field of MicroTAS.

**NIST**



**Lab on a Chip**



**ROYAL SOCIETY  
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### **Biomicrofluidics Best Paper Award**

The Biomicrofluidics Best Paper Award, sponsored by AIP Publishing, is an award given to recognize excellence in the proceedings submitted to the MicroTAS Conference by PhD students and young researchers. This year, a review committee will select the three best papers from the submitted abstracts. The winners will be announced and recognized at the MicroTAS meeting during the Award Ceremony.

# **Biomicrofluidics**





## AWARDS

### **Elsevier Sensors and Actuators B. Chemical-MicroTAS Best Paper Award**

The Best Paper Award, sponsored by Elsevier, is an award given to recognize excellence in the proceedings submitted to the MicroTAS Conference by PhD students and young researchers. This year, a review committee will select the three best papers from the submitted abstracts. The winners will be announced and recognized at the MicroTAS meeting during the Award Ceremony.



ELSEVIER

### **Springer Nature Best Oral Award**

The Microsystems & Nanoengineering/Springer Nature Best Oral Award is an award to recognize excellence in Oral presentation given at the MicroTAS Conference by Ph.D. students and young researchers. This year, a review committee will select the 4 best oral presentations from the submitted papers. The winners will be announced and recognized at the MicroTAS meeting during the Award Ceremony.

**Microsystems & Nanoengineering**  
[www.nature.com/micronano](http://www.nature.com/micronano)

### **Lab on a Chip Widmer Poster Award**

The Widmer Poster Award Competition sponsored by Lab on a Chip is an award given to recognize excellence amongst the annual MicroTAS Conference poster presenters. This year, a review committee will select the overall best poster from the virtual poster session and all posters will be reviewed for this honor. The winner and award will be announced at the MicroTAS virtual meeting.



**Lab on a Chip**

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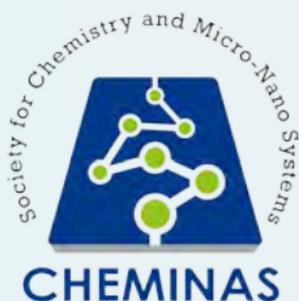




## AWARDS

### CHEMINAS Young Researcher Poster Award

The Young Researcher Poster Award Competition sponsored by The Society for Chemistry and Micro-Nano Systems (CHEMINAS) to recognize excellence among its participants. A select group of poster judges will select, on a daily basis, the best presented posters from the poster session. The winners and awards will be announced during the Awards Ceremony at the MicroTAS Conference.



### IMT Masken und Teilungen AG Microfluidics on Glass Poster Award

To be relevant to the spirit and intent of this Microfluidics on Glass Award, the advancement considered must address at least one of the following:

- Use glass as a substrate material for a nano/microfluidic device where the unique optical, electrical, or surface properties of glass provide a profound advantage
- Demonstrate novel biosensing capabilities
- Exhibit hybridisation of glass with other materials (composites)
- Establish design for manufacturability with materials and processes that have the potential to be scaled up through transfer to industry

# IMT

PRECISION ON GLASS



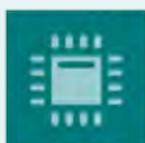
Flying Eaves (飞檐) on Black Tiled Roof. By 冬旭洪 from Pixabay.



## AWARDS

### **Sensors (MDPI) Outstanding Sensors and Actuators, Detection Technologies Poster Award**

The Outstanding Sensors and Actuators, Detection Technologies Poster Award Competition sponsored by Sensors (MDPI), is to recognize excellence among its participants. The winners and awards will be announced during the Awards Ceremony at the MicroTAS Conference.



*sensors*

an Open Access Journal by MDPI

### **Micromachines (MDPI) Outstanding Tissue or Organ on Chip Microsystems Poster Award**

The Outstanding Tissue or Organ on Chip Microsystems Poster Award Competition sponsored by Micromachines (MDPI), is to recognize excellence among its participants. The winners and awards will be announced during the Awards Ceremony at the MicroTAS Conference.



*micromachines*

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### **CBMS LMIC Student/Young Researcher Award**

The Chemical and Biological Microsystems Society (CBMS) is offering awards to offset registration fees, on a competitive basis, for virtual or in-person MicroTAS 2021 conference attendees who are working at institutions located in Low and Middle Income Countries (LMICs). Students and young researchers ( $\leq 3$  years after obtaining their PhD degree) who have been successful in being accepted for an oral or poster presentation at the upcoming MicroTAS conference are eligible and "accepting" the invitation to attend will be your application to receive this award.



**CBMS** Chemical and Biological  
Microsystems Society



## EXHIBITORS

### Exhibitor

### Booth

**ACXEL Micro & Nano Tech (Guangdong) Co., Ltd. . . . . . VIRTUAL**

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

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pwang@cn.chroma.com

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

Founded in 1991 as a 100% employee-owned company, Chroma is a leading manufacturer of highly precise optical filters using thin-film coating technology. Chroma provides filter solutions for life sciences, agriculture, manufacturing, inspection, security and aerospace. The broad array of applications served include fluorescence microscopy, cytometry, biomedical instrumentation and surgical devices, machine vision, multi spectral imaging, remote sensing, colorimetry and astronomy.

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

Digifluidic develops platforms for life-science analytical operations using Digital Microfluidic technology as its foundation. Based on the technology created on the microfluidic panel platform, the product application direction of Digifluidic covers in vitro diagnostic nucleic acid analysis, cancer cell culture drug sensitivity analysis, protein expression vector construction, single cell analysis, and many other fields.

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info@szdrawray.com

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

The microfluidic chemiluminescence analyzer, which developed by Drawray, is a highly automated analyzer with compact and integrated design, ideal choice for clinical labs. • 7" touch screen • plasma/ serum/whole blood sample type option • no liquid system, maintenance free • independent channels to avoid contamination • up to 24 different reagents integrating in one chip, test result comes in 35 mins

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

Wuhan EasyDiagnosis Biomedicine Co., Ltd. as an IVD reagents, devices and solutions provider with a deep focus on healthcare, EasyDiagnosis was founded in 2008 and went public in Shenzhen Stock Exchange in 2018. EasyDiagnosis strives to develop and share medical technologies in 5 categories: Molecular Diagnosis, Chemiluminescence, Immunochromatography, Blood Gas and COVID-19 solution.

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Elveflow develops state-of-the-art microfluidic equipment so scientists can focus on the science while we take care of the instruments. We specialize in accurate and high-performance pressure, flow control, and automation, and have strong expertise in system design for countless applications. Our "plug and play" microfluidic packs also provide easy access to microfluidics for non-specialists.



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## Booth

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Emulseo develops surfactants, oils and surface treatments that have been specifically designed to ensure reproducible experiments and reliable results. • Fluorinated surfactants: specially designed to stabilize microfluidic emulsions, our biocompatible fluorinated surfactants allow efficient and reproducible droplet generation. • Fluorinated oils • Hydrophobic surface treatments for efficient coating of a wide range of chip materials (glass, PDMS, COC, PC, PMMA, etc...) • Emulsion breakers.

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Labyrinth-CE01 is an innovative CTC detection system developed by Suzhou Labyrinth Biotech. It adopts the leading "label-free" microfluidic enrichment principle, and has the characteristic of high-throughput, intact, automation, and efficiency. It can be integrated into a myriad of downstream applications. Labyrinth Biotech's goal is to create cutting edge microfluidics solutions to impact medicine and life sciences.

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Micro-blox Technologies (Beijing) Co., Ltd (Micro-blox) is committed to provide our customer with over-all solutions of microfluidics or Lab-on-a-chip. We make idea or data into products and bring the products to labs in academic organizations and companies for researching or to hospitals and households for daily health care.





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Microsystems & Nanoengineering is an open access and fully peer-reviewed journal which publishes original articles and reviews on cutting-edge and emerging topics related to MEMS/ NEMS and nanotechnology, and it is the first engineering journal initiated by Nature Publishing Group (now part of Springer Nature) and Chinese Academy of Sciences in 2014. Microsystems & Nanoengineering is abstracted & indexed by SCIE, Ei, PubMed Central, Scopus, DOAJ, etc. The 2021 impact factor is 8.006 (Q1 in the catalogue of "Instruments & Instrumentation").

### **Phenom Scientific Instrument (Shanghai) Co., Ltd. . . . . VIRTUAL**

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[www.cytosmart.cn](http://www.cytosmart.cn)

CytoSMART is an innovator in kinetic live-cell imaging, combining compact, fast imaging hardware with powerful image analysis algorithms supported by cloud computing. Our systems use automated time-lapse microscopy and image-based cell counting to generate robust, high-quality data. CytoSMART provides a series live-cell analysis with brightfield and fluorescent imaging from your incubator, and automated cell counting.

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

### **Premedical Laboratories, Inc. . . . . VIRTUAL**

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phone: +86-10-5166-8388  
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Headquartered in Beijing, Premedical Laboratories Inc. is a national high-tech enterprise committed to the overall solution of life science laboratory. The company integrates independent research and development and the introduction of international top technology products. Its main products include high-end instruments and reagents in the fields of life science, medicine, environmental biology and chemistry.

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sale@fluidiclab.com

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## Exhibitor

## Booth

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RAN Biotechnologies supplies smart materials for next generation science:  
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At Emulate, we understand that animal studies and reductionist models are limited because they are not based on integrated human biology. By leveraging 21st century technologies, we are able to overcome these limitations with living human in vitro models that empower researchers to explore the biological mechanisms of health and disease. These microphysiological systems (MPS), commonly known as Organ-Chips, are setting a new standard for how we study biology and develop drugs, therapies, and cures for those who need them most.

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zhangzhe@refresh.net.cn

[www.refresh.cc](http://www.refresh.cc)

The eBiosys system of Refresh is a digital microfluidics system based on electrowetting-on-dielectric combined with an electrochemical detection system, which integrates technologies of automatic nucleic acid extraction, amplification and electrochemical detection to achieve "lab on a chip" rapid gene detection.

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RENX Co. is a company specialized in Digital Microfluidic (DMF) technology. With our innovative fabrication technique, RENX's DMF chip's performance is comparable to chip made with MEMS technology but only at a fraction of cost. RENX provides specialized DMF design and fabrication services and off-the-shelf DMF chip for research and industrial purposes.

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Established in 2015, Suzhou research materials Microtech Co., Ltd. is a scientific and technological innovation company specializing in semiconductor, MEMS, biochip and other consumables and commissioned processing business. At present, our products include all kinds of substrates, photoresist, photoengraving plate, ultra-clean consumables, MEMS equipment and so on.



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SINSAGE Technology is the collection independent research and development of science and technology, overseas advanced technology integration transformation and the introduction of domestic overseas frontier products, professional services as one of the life science instrument platform, product line covers molecules, proteins, cells, tissues, small animals, biological technology and automation in areas.

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## INDUSTRIAL STAGE

All times listed in this program are Chinese Standard Time (CST).

### MONDAY, 24 OCTOBER

13:05 - 13:25

#### INDUSTRIAL STAGE 1

##### NANOFABRICATION SOLUTIONS FOR 2D & 3D

*Presenter: Zheng Ming Wu and Benedikt Stender*

**Heidelberg Instruments**

[www.heidelberg-instruments.com](http://www.heidelberg-instruments.com)

##### Part 1 - Nanofrazor

Nanofrazor can realize the direct writing of nanostructures on various polymer surfaces by using the thermal scanning probe technology. The equipment uses a nano probe that can accurately control the displacement and can be heated to 1300 °C to contact the specific area of the polymer film to decompose the polymer in the area, thereby obtaining a desired structure. The equipment can realize the processing accuracy of up to 10nm in the XY direction and up to 1nm in the Z direction, and can realize the real-time monitoring of the written structure. At the same time, the equipment can also realize the one-step direct writing of 3D, nested and spliced structures that are difficult to be realized by other micro processing technologies.

##### Part 2 - MPO

The new two-photon polymerization platform MPO 100 is a multi-user tool for microfabrication combining both the requirements of 3D lithography with highest resolutions among additive manufacturing processes in the 100 nm range and 3D microprinting with structure heights of over one centimeter, all in one device. Users at the universities and research and development institutes, as well as operators in the industry are offered significant advantages for the development of novel products in application fields such as micro-optics, microfluidics, and biomedical technology.

### TUESDAY, 25 OCTOBER

13:10 - 13:30

#### INDUSTRIAL STAGE 2

##### MULTI-SCALE ULTRA-HIGH RESOLUTION P $\mu$ SL 3D PRINTING AND ITS APPLICATION IN RESEARCHES

*Presenter: Ying Peng*

**BMF Nano Material Technology Co., Ltd.**

[www.bmftec.cn](http://www.bmftec.cn)

Attributed to the rapid and economical in low-volume production, 3D printing has been rapidly developed and well accepted in researches and industries. Among kinds of 3D printing, high-resolution printing is quite attractive. Projection Micro Stereolithography technology (P $\mu$ SL), with ground-breaking 2 $\mu$ m/10 $\mu$ m resolution, has been increasingly applied in both scientific researches and new product development process. Combining the nature of 3D printing and its outstanding precision, P $\mu$ SL can easily fabricate parts which are beyond the capacity edge of other technologies. This report describes the principle and advantages of P $\mu$ SL, then provides some case studies of its applications in different researches, such as metamaterials, biomimetics, microfluidics, micromachines, biomedicine, and so on.



**WEDNESDAY, 26 OCTOBER**

**12:25 - 12:45**

## **INDUSTRIAL STAGE 3**

### **ACTIVE-MATRIX DIGITAL MICROFLUIDICS PLATFORM FOR HIGH-THROUGHPUT SAMPLE HANDLING**

*Presenter: Hanbin Ma*

**Acxel Micro & Nano Tech (Guangdong) Co., Ltd.**  
**[www.acxel.com](http://www.acxel.com)**

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Jixian Pavilion in Hangzhou. By Govan

# UTAS 2022



## PLENARY SPEAKERS

### MONDAY, 24 OCTOBER

09:00 - 09:45



#### Plenary Presentation I

**SINGLE-CELL GENOMICS: ITS COMING OF AGE IN BIOLOGY AND MEDICINE**

**Xiaoliang Sunney Xie**

*Peking University, CHINA*

13:40 - 14:25



#### Plenary Presentation II

**ACTIVE FEMTO REACTOR TECHNOLOGY**

**Hiroyuki Noji**

*University of Tokyo, JAPAN*

### TUESDAY, 25 OCTOBER

09:05 - 09:50



#### Plenary Presentation III

**DROP-BASED MICROFLUIDICS FOR PATHOGEN DETECTION AND ANALYSIS**

**David A. Weitz**

*Harvard University, USA*

13:45 - 14:30



#### Plenary Presentation IV

**NANOFUIDICS COMING OF AGE**

**Lyderic Bocquet**

*École Normale Supérieure, FRANCE*

### WEDNESDAY, 26 OCTOBER

09:05 - 09:50



#### Plenary Presentation V

**UNLOCKING THE NATURE OF DISEASE WITH SINGLE-CELL PROTEFORM PROFILING**

**Amy E. Herr**

*University of California, Berkeley, USA*

### THURSDAY, 27 OCTOBER

09:05 - 09:50



#### Plenary Presentation VI

**INTEGRATED PHOTONICS FOR NEUROTECHNOLOGIES**

**Joyce Poon**

*University of Toronto, CANADA and Max Planck Institute of Microstructure Physics, GERMANY*





## KEYNOTE SPEAKERS

**MONDAY, 24 OCTOBER**

10:00 - 10:30



### Session 1A1 - Single Cell Analysis and Sequencing

**LIQUID METAL/POLYMER-BASED MICROFLUIDICS  
AS FLEXIBLE BIOMEDICAL DEVICES**

**Xingyu Jiang**

*Southern University of Science and Technology  
(SUSTech), CHINA*



### Session 1B1 - Extracellular Vesicles

**INTEGRATED TECHNOLOGIES FOR MOLECULAR  
ANALYSES OF CIRCULATING BIOMARKERS**

**Huilin Shao**

*National University of Singapore, SINGAPORE*



### Session 1C1 - Organ-on-a-Chip I

**ORGANS-ON-CHIP FOR ASSISTED REPRODUCTIVE  
TECHNOLOGIES**

**Séverine Le Gac**

*University of Twente, NETHERLANDS*

**MONDAY, 24 OCTOBER**

15:25 - 15:55



### Session 1A3 - Organ-on-a-Chip III

**THE FABRICATION AND MEASUREMENT OF  
ORGANS-ON-A-CHIP AS ALTERNATIVES TO  
ANIMAL TESTS**

**Zhongze Gu**

*Southeast University, CHINA*



### Session 1B3 - Cell Assay and Co-Culture

**NEW OPPORTUNITIES TO PROBE MICROBIAL  
POPULATION GENETICS BY LAB-ON-A-CHIP  
DEVICES**

**Amy Q. Shen**

*Okinawa Institute of Science and Technology  
Graduate University, JAPAN*



### Session 1C3 - Microfluidics I

**IMAGING FLOW CYTOMETRY-BASED  
BLOOD DIAGNOSTICS**

**Andrew de Mello**

*ETH Zürich, SWITZERLAND*





## KEYNOTE SPEAKERS

**TUESDAY, 25 OCTOBER**

10:05 - 10:35

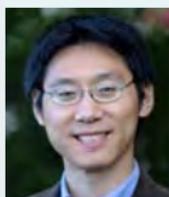


### Session 2A1 - Micromanipulation

**MICROFLUIDICS FOR PRODUCTION OF INTELLECTUAL MICRO/NANOROBOTS**

**Bi-Feng Liu**

*Huazhong University of Science and Technology, CHINA*



### Session 2B1 - Cell Analysis I

**SPATIAL MULTI-OMICS SEQUENCING ENABLED BY MICROFLUIDICS DETERMINISTIC BARCODING**

**Rong Fan**

*Yale University, USA*



### Session 2C1 - Nuclear Acid Analysis

**MICROFLUIDIC TOOLS FOR MULTI-MODAL PRECISION MEASUREMENT OF SINGLE CELLS**

**Aaron Streets**

*University of California, Berkeley, USA and  
Chan Zuckerberg Biohub, San Francisco, USA*

**TUESDAY, 25 OCTOBER**

15:30 - 16:00



### Session 2A3 - Droplet-Based Microfluidics I

**DROPLET CONFINEMENT INDUCED ASSEMBLY AND APPLICATION**

**Lingling Shui**

*South China Advanced Normal University, CHINA*



### Session 2B3 - Cell Analysis II

**ON BIOCHEMICAL CONSTRUCTORS AND SYNTHETIC CELLS**

**Sebastian Maerkl**

*Swiss Federal Institute of Technology Lausanne (EPFL), SWITZERLAND*



### Session 2C3 - Biomolecular Assay I

**MICROFLUIDIC LABYRINTH FOR LABEL FREE ISOLATION AND SINGLE CELL ANALYSIS OF CIRCULATING TUMOR CELLS**

**Sunitha Nagrath**

*University of Michigan, USA*





## KEYNOTE SPEAKERS

WEDNESDAY, 26 OCTOBER

10:30 - 11:00



### Session 3A1 - Cell Analysis III

#### OPEN MICROFLUIDICS FOR SINGLE CELL ANALYSIS

**Jin-Ming Lin**

*Tsinghua University, CHINA*



### Session 3B1 - Organ-on-a-Chip V

#### EMERGING MICROFLUIDIC TECHNOLOGIES FOR BIOHYBRID DEVICES

**Shoji Takeuchi**

*University of Tokyo, JAPAN and  
and Kanagawa Institute of Industrial Science and  
Technology (KISTEC), JAPAN*



### Session 3C1 - Cell Analysis IV

#### LONGITUDINAL STUDY OF CIRCULATING TUMOR CELLS AND DNA IN PANCREATIC CANCER PATIENTS

**Z. Hugh Fan**

*University of Florida, USA*

WEDNESDAY, 26 OCTOBER

14:00 - 14:30



### Session 3A2 - MEMS I

#### ADVANCED MATERIAL THERMAL ANALYSIS WITH TEMPERATURE-PROGRAMMED RESONANT MICRO-CANTILEVER

**Xinxin Li**

*Chinese Academy of Sciences, CHINA*



### Session 3B2 - Biochemical Analysis I

#### MICROFLUIDIC FILTERS FOR HIGH-FREQUENCY OUT-OF-LAB MEASUREMENTS

**Michael Breadmore**

*University of Tasmania, AUSTRALIA*



### Session 3C2 - Microfluidics III

#### DROPLET DIGITAL IMMUNO-PCR FOR PROFILING PROTEIN-SPECIFIC EXTRACELLULAR VESICLES

**Shuhuai Yao**

*Hong Kong University of Science and Technology (HKUST), HONG KONG*





## KEYNOTE SPEAKERS

THURSDAY, 27 OCTOBER

10:05 - 10:35



Session 4A1 - Biosensing II and MEMS II

**MICROELECTRODE TECHNOLOGIES FOR  
BIOCOMPATIBLE AND MULTI-FUNCTIONAL  
NEURAL INTERFACING**

**Xiaojie Duan**

*Peking University, CHINA*



Session 4B1 - Droplet-Based Microfluidics III

**NANOSTRUCTURED APPROACHES FOR  
ENCAPSULATION OF ENZYME AND DRUG ON  
NANOPARTICLE AND CELL-BASED CARRIERS**

**Dong-Pyo Kim**

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



Session 4C1 - MEMS III

**ELECTRONICALLY INTEGRATED MICROSCOPIC  
ROBOTS**

**Itai Cohen**

*Cornell University, USA*



Hangzhou lake bridge. Image By Christel SAGNIEZ from Pixabay



**SUNDAY, 23 OCTOBER**

Please refer to the Conference website for specific times.

## WORKSHOP 1 TISSUE AND ORGAN-ON-CHIP MICROSYSTEMS

### Classifications of Organ-On-Chip and Multi-Organ Chips

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

### Modeling Organs with a Barrier in a Two-Compartment Model

**Tae-Eun Park**, *Ulsan National Institute of Science and Technology (UNIST), KOREA*

### Organs on a Chip for Women's Health: Placenta-on-a-Chip

**Nicole Hashemi**, *Iowa State University, USA*

### Scaling Engineered Disease Models for Drug Development

**Alison P. McGuigan**, *University of Toronto, CANADA*

## WORKSHOP 2 TECHNOLOGIES FOR GLOBAL HEALTH AND RESOURCE-POOR SETTINGS

### Analyzing at the Point-of-Use by Centrifugal Microfluidics: Viral Infection, Drugs of Abuse, and Explosives

**James Landers**, *University of Virginia, USA*

**Killian O'Connell**, *University of Virginia, USA*

**Renna Nouwairi**, *University of Virginia, USA*

### Citizen Sampling and Paper-Based Microfluidics;

#### Covid-19 Analysis

**Nicole Pamme**, *Stockholm University, SWEDEN*

### Wearable Sensors for Point-of-Care Diagnostics

**Ala'aldeen Al-Halhoul**, *German Jordanian University, JORDAN*

## WORKSHOP 3 SENSOR INTEGRATION FOR MICROSYSTEMS

### Automating Classification of Cellular Phenotypes by Coupling Impedance Cytometry with Supervised Machine Learning

**Nathan Swami**, *University of Virginia, USA*

### Liquid Metal-Enabled Soft Electromechanical Actuators in Microchannels

**Shi-Yang Tang**, *University of Birmingham, UK*

### Immunoassay Biosensors Based on Mechanically Induced Trapping of Molecular Interactions (MITOMI)

**Jose L Garcia-Cordero**, *Roche Institute for Translational Bioengineering, SWITZERLAND*

### Liquid Metal-Based Composites for Sensing in Microchannels

**Xuechang Zhou**, *Shenzhen University, CHINA*



## SUNDAY WORKSHOPS (continued)

### WORKSHOP 4 CONTROL OF SURFACE CHEMISTRY AND WETTING (NEW)

**Feng Shen**, *Shanghai Jiao Ton University, CHINA*

**Stefano Begolo**, *ALine, Inc, USA*

**Ya-Yu Chiang**, *National Chung Hsing University, TAIWAN*

### WORKSHOP 5 FLOW MODELING AND VISUALIZATION IN MICROFLUIDICS

**Numerical Simulation for Microfluidic Manipulation of Particles**

**Guoqing Hu**, *Zhejiang University, CHINA*

**Particle-Based Simulation for Complex Biofluids at Microscale**

**Xuejin Li**, *Zhejiang University, CHINA*

**Multiscale Simulation for Microfluidics**

**Xin Bian**, *Zhejiang University, CHINA*

**Flow Visualization of Micro-/Nanoparticles**

**Xu Zheng**, *Institute of Mechanics, Chinese Academy of Sciences, CHINA*

### WORKSHOP 6 3D PRINTING AND 3D BIOPRINTING

**Hydrogel Materials for 3D Printing**

**Xuetao Shi**, *South China University of Technology, CHINA*

**3D Printing in Glass and Polymers**

**Dorothea Helmer**, *University of Freiburg, GERMANY*

**Stereolithography Printing with Common Acrylate-Based Resins, including Printing Master Molds and Devices**

**Bastien Venzac**, *Laboratory for Analysis and Architecture of Systems, French National Centre for Scientific Research, FRANCE*

**Designing and Applying 3D Printed Systems for Cell and Tissue Culture**

**Yi-Chin Toh**, *University of Queensland, AUSTRALIA*





SUNDAY WORKSHOPS *(continued)*

## WORKSHOP 7 MICROFLUIDICS FOR IMMUNOLOGY

**Immune-Competent Microphysiological Models; Profiling of Immunometabolism and Inflammation On-Chip**

**Qasem Ramadan**, *Alfaisal University, SAUDI ARABIA*

**Microscale Models of Lymphatics and Immunity**

**Katharina Maisel**, *University of Maryland, USA*

**Microfluidic Analysis of Immune Cell Signalling**

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

**Microfluidics for Single Cell Analysis of Immune Cells**

**Jurgen Tel**, *Eindhoven Institute of Technology, NETHERLANDS*

## WORKSHOP 8 LIQUID BIOPSIES

**Yao Lu**, *Dalian Institute of Chemical Physics, Chinese Academy of Sciences, CHINA*

**Qihui Shi**, *Fudan University, CHINA*

**Rongke Gao**, *China University of Petroleum (Huadong), CHINA*

**Yanling Song**, *Xiamen University, CHINA*



Traditional Chinese Architecture by Water in Park by West Lake. By Mark Zhu



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## MONDAY AT A GLANCE

### MONDAY, 24 OCTOBER

08:30-09:00	Opening Remarks		
09:00-09:45	Plenary Presentation I Xiaoliang Xie – Peking University, CHINA		
09:45-10:00	Transition		
10:00-11:10	Session 1A1 Single Cell Analysis and Sequencing	Session 1B1 Extracellular Vesicles	Session 1C1 Organ-on-a-Chip I
	KEYNOTE Xingyu Jiang	KEYNOTE Huilin Shao	KEYNOTE Séverine Le Gac
11:10-11:40	Break and Virtual Exhibit Inspection – Gather.Town		
11:40-12:40	Session 1A2 Cell Imaging	Session 1B2 Imaging	Session 1C2 Organ-on-a-Chip II
12:40-13:40	Lunch on Own		
13:05-13:25	Industrial Stage 1 – Heidelberg Instruments		
13:40-14:25	Plenary Presentation II Hiroyuki Noji – University of Tokyo, JAPAN		
15:25-16:35	Session 1A3 Organ-on-a-Chip III	Session 1B3 Cell Assay and Co-Culture	Session 1C3 Microfluidics I
	KEYNOTE Zhongze Gu	KEYNOTE Amy Q. Shen	KEYNOTE Andrew de Mello
16:35-17:05	Break and Virtual Exhibit Inspection – Gather.Town		
17:05-18:05	Session 1A4 Organ-on-a-Chip IV	Session 1B4 Wearable Devices	Session 1C4 3D Printing
22:00-23:30	Virtual Poster Session 1 – Gather.Town		

## MONDAY, 24 OCTOBER

### OPENING REMARKS

- 18:00 - 20:00**    **MicroTAS 2022 Conference Chairs**  
**Chair:** Qun Fang, *Zhejiang University, CHINA*  
**Co-Chair:** Xing-Hua Xia, *Nanjing University, CHINA*  
**Co-Chair:** Jian-Hua Qin, *Dalian Institute of Chemical Physics, CHINA*  
**Co-Chair:** Yan-Yi Huang, *Peking University, CHINA*  
**Co-Chair:** Zhi-Hong Li, *Peking University, CHINA*  
**Honorary Chair:** Hong-Yuan Chen, *Nanjing University, CHINA*

### PLENARY PRESENTATION I

09:00 - 09:45

- 1PL-1**    **SINGLE-CELL GENOMICS: ITS COMING OF AGE IN BIOLOGY AND MEDICINE**  
**Xiaoliang Sunney Xie**  
*Peking University, CHINA*



09:45 - 10:00 Transition

## Session 1A1 - Single Cell Analysis and Sequencing

10:00 - 10:30

- 1A1-1** **KEYNOTE PRESENTATION**  
**LIQUID METAL/POLYMER-BASED MICROFLUIDICS AS FLEXIBLE BIOMEDICAL DEVICES**  
**Xingyu Jiang**  
*Southern University of Science and Technology (SUSTech), CHINA*

10:30 - 10:50

- 1A1-2** **RAPID-SEQ: SINGLE-CELL GENOME SEQUENCING BY DIRECTED Tn5 TAGMENTATION**  
Huimin Zhang, Xiyuan Yu, Wei Lin, and Chaoyong Yang  
*Xiamen University, CHINA*

10:50 - 11:10

- 1A1-3** **FAST AND LARGE-FIELD SPATIALLY-RESOLVED RNA PROFILING THROUGH AUTOMATED IN-SITU SEQUENCING**  
Tianyi Chang, Wuji Han, Mengcheng Jiang, and Yanyi Huang  
*Peking University, CHINA*

## Session 1B1 - Extracellular Vesicles

10:00 - 10:30

- 1B1-1** **KEYNOTE PRESENTATION**  
**INTEGRATED TECHNOLOGIES FOR MOLECULAR ANALYSES OF CIRCULATING BIOMARKERS**  
**Huilin Shao**  
*National University of Singapore, SINGAPORE*

10:30 - 10:50

- 1B1-2** **CST-II-ASSISTED EXOSOME LABELING STRATEGY ON A MICROFLUIDIC PLATFORM**  
Xin Zhou<sup>1</sup>, Mohit Jaiswal<sup>1</sup>, Sayan Kundu<sup>1</sup>, Jingzhu Shi<sup>1</sup>, Zhongwu Guo<sup>1</sup>, and Yong Zeng<sup>1,2</sup>  
*<sup>1</sup>University of Florida, USA and <sup>2</sup>University of Florida Health Cancer Center, USA*

10:50 - 11:10

- 1B1-3** **INTERFERENCE IMAGING AND HIGHLY MULTIPLEXED AFFINITY PROTEOMICS OF SINGLE EXTRACELLULAR VESICLES**  
Andreas Wallucks, Philippe DeCorwin-Martin, Lucile Alexandre, Johan Renault, Andy Ng, and David Juncker  
*McGill University, CANADA*



## Session 1C1 - Organ-on-a-Chip I

10:00 - 10:30

- 1C1-1 KEYNOTE PRESENTATION**  
**ORGANS-ON-CHIP FOR ASSISTED REPRODUCTIVE TECHNOLOGIES**  
Séverine Le Gac  
*University of Twente, NETHERLANDS*

10:30 - 10:50

- 1C1-2 A THREE-DIMENSIONAL ARTIFICIAL INTESTINAL TUBE WITH A CRYPT-LIKE INNER SURFACE FORMED BY ELECTROLYTIC MICROBUBBLES**  
Shuma Tanaka<sup>1</sup>, Shun Itai<sup>2</sup>, and Hiroaki Onoe<sup>1</sup>  
*<sup>1</sup>Keio University, JAPAN and <sup>2</sup>Tohoku University, JAPAN*

10:50 - 11:10

- 1C1-3 BIO-ENGINEERED HUMAN STOMACH MICRO-PHYSIOLOGICAL SYSTEM FOR MODELLING HELICOBACTER PYLORI PATHOGENESIS**  
Hye-Jin Jeong<sup>1</sup>, Ji-Hyeon Park<sup>2</sup>, Joo H. Kang<sup>1</sup>, Seong-Ho Kong<sup>2</sup>, and Tae-Eun Park<sup>1</sup>  
*<sup>1</sup>Ulsan National Institute of Science and Technology (UNIST), KOREA and <sup>2</sup>Seoul National University College of Medicine, KOREA*

11:10 - 11:40 Break and Virtual Exhibit Inspection – Gather.Town

## Session 1A2 - Cell Imaging

11:40 - 12:00

- 1A2-1 TWO-STEP & CONSTRAIN-FREE 3D RECONSTRUCTION OF ZEBRAFISH EMBRYOS THROUGH CONTROLLABLE BUBBLE-BASED MICROMA-NIPULATION**  
Dunqing Hong, Yidi Zhou, and Jixiao Liu  
*Hebei University of Technology, CHINA*

12:00 - 12:20

- 1A2-2 ON-CHIP AND LONG-TERM OBSERVATION OF CELL FATE ENABLED BY LABEL-FREE 3D REFRACTIVE-INDEX IMAGING**  
Fei Liang, Peng Zhao, Yongxiang Feng, Huichao Chai, Weihua He, Junwen Zhu, and Wenhui Wang  
*Tsinghua University, CHINA*

12:20 - 12:40

- 1A2-3 HIGHLY SENSITIVE MONITORING OF TELOMERASE ACTIVITY IN LIVING CELLS BASED ON RAPIDLY TRIGGERED CASCADE AMPLIFICATION USING A MICROFLUIDIC CHIP**  
Jie Wang, Xiao-Peng Liu, Wan-Yi Xue, Yun-Yun Wei, and Zhang-Run Xu  
*Northeastern University, CHINA*



## Session 1B2 - Imaging

11:40 - 12:00

**1B2-1 SIMULTANEOUS RECORDING OF NEURAL ACTIVITY AND BEHAVIOR IN C. ELEGANS ENABLED BY ON-DEMAND HYDROGEL LOCALIZATION**

Hyun Jee Lee, Julia Vallier, and Hang Lu  
*Georgia Institute of Technology, USA*

12:00 - 12:20

**1B2-2 HIGH-THROUGHPUT PARALLEL OPTOFLUIDIC 3D-IMAGING OF ADHERENT CELLS IN ADHERENT STATE**

Minato Yamashita, Kazuki Hattori, Hiromi Kirisako, Xiaoyao Chen, Masashi Ugawa, and Sadao Ota  
*University of Tokyo, JAPAN*

12:20 - 12:40

**1B2-3 LABEL-FREE DROPLET SCREENING THROUGH MASS SPECTROMETRY IMAGING**

Linfeng Xu and Adam R. Abate  
*University of California, San Francisco, USA*

## Session 1C2 - Organ-on-a-Chip II

11:40 - 12:00

**1C2-1 AC ELECTRIC FIELD-ASSISTED GENERATION OF 3D FREESTANDING LIPID BILAYER ARRAY WITH CONTROLLED MEMBRANE FUSION IN PHYSIOLOGICAL CONDITIONS**

Bong Kyu Kim<sup>1,2</sup>, Dong-Hyun Kang<sup>1</sup>, Seok Chung<sup>2</sup>, and Tae Song Kim<sup>1</sup>  
<sup>1</sup>*Korea Institute of Science and Technology (KIST), KOREA and*  
<sup>2</sup>*Korea University, KOREA*

12:00 - 12:20

**1C2-2 A 3D-PRINTED ORGAN-ON-CHIP PLATFORM AND IMPELLER PUMP TO MODEL INTER-ORGAN COMMUNICATION WITH THE LYMPH NODE**

Sophie R. Cook, Geane A. Miranda, and Rebecca R. Pompano  
*University of Virginia, USA*

12:20 - 12:40

**1C2-3 A BIOMIMETIC JOINT MODEL WITH HETEROGENOUS OXYGEN ENVIRONMENTS**

Louis Jun Ye Ong, Indira Prasadam, and Yi-Chin Toh  
*Queensland University of Technology, AUSTRALIA*

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12:40 - 13:40 Lunch on Own

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## Industrial Stage 1

**13:05 NANOFABRICATION SOLUTIONS FOR 2D & 3D**

Zheng Ming Wu and Benedikt Stender  
*Heidelberg Instruments*



## PLENARY PRESENTATION II

13:40 - 14:25

### 1PL-2 ACTIVE FEMTO REACTOR TECHNOLOGY

Hiroyuki Noji

*University of Tokyo, JAPAN*

## Session 1A3 - Organ-on-a-Chip III

15:25 - 15:55

### 1A3-1 KEYNOTE PRESENTATION

**THE FABRICATION AND MEASUREMENT OF ORGANS-ON-A-CHIP AS ALTERNATIVES TO ANIMAL TESTS**

Zhongze Gu

*Southeast University, CHINA*

15:55 - 16:15

### 1A3-2 DROPLET-BASED MICROFLUIDIC SYNTHESIS OF FUNCTIONAL VASCULARIZED HYDROGEL MICROSPHERES

Zhen Zhan, Zeyang Liu, Jianjie Li, Wenxuan Zhang, and Chengzhi Hu

*Southern University of Science and Technology (SUSTech), CHINA*

16:15 - 16:35

### 1A3-3 VASCULOGENESIS OF ENDOTHELIAL CELLS WITHIN COMPLEX CONSTRUCTS BIOPRINTED ON A MICROSTRUCTURED SUBSTRATE

Soo Jee Kim, Gihyun Lee, and Je-Kyun Park

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

## Session 1B3 - Cell Assay and Co-Culture

15:25 - 15:55

### 1B3-1 KEYNOTE PRESENTATION

**NEW OPPORTUNITIES TO PROBE MICROBIAL POPULATION GENETICS BY LAB-ON-A-CHIP DEVICES**

Anzhelika Koldaeva, Paul Hsieh-Fu Tsai, Simone Pigolotti, and Amy Q. Shen

*Okinawa Institute of Science and Technology Graduate University, JAPAN*

15:55 - 16:15

### 1B3-2 MEMBRANE TRAP ARRAYS FOR T CELL/TUMOR CO-CULTURE

Michael Yeh<sup>1,2</sup>, Emanuel Salazar Cavazos<sup>2</sup>, Grégoire Altan-Bonnet<sup>2</sup>, and Don L. DeVoe<sup>1</sup>

*<sup>1</sup>University of Maryland, USA and <sup>2</sup>National Cancer Institute, USA*

16:15 - 16:35

### 1B3-3 ASTROCYTES TRANSFER KA-INDUCED EXCITOTOXICITY PATHOLOGY BETWEEN SYNAPTICALLY SEPARATED NEURON POPULATIONS IN A NOVEL MICROFLUIDIC MAZE DEVICE

Yiing C. Yap<sup>1</sup>, Ruth E. Musgrove<sup>1</sup>, Tracey C. Dickson<sup>1</sup>, Anna E. King<sup>1</sup>, Rosanne M. Guijt<sup>2</sup>, Graeme Wertheimer<sup>3</sup>, and Michael C. Breadmore<sup>1</sup>

*<sup>1</sup>University of Tasmania (UTAS), AUSTRALIA, <sup>2</sup>Deakin University, AUSTRALIA, and <sup>3</sup>University of Newcastle, AUSTRALIA*



## Session 1C3 - Microfluidics I

15:25 - 15:55

- 1C3-1 KEYNOTE PRESENTATION**  
**IMAGING FLOW CYTOMETRY-BASED BLOOD DIAGNOSTICS**  
Andrew de Mello  
*ETH Zürich, SWITZERLAND*

15:55 - 16:15

- 1C3-2 MULTIPHASE FLOW CONTROL IN CAPILLARIC CIRCUITS AND MICROFLUIDIC CHAIN REACTIONS**  
Geunyoung Kim, Andy Ng, and David Juncker  
*McGill University, CANADA*

16:15 - 16:35

- 1C3-3 ELECTROSMOTIC PUMPING VALVE FOR AUTOMATION OF MULTI-STEP PAPER-BASED ASSAYS**  
Baruch Rofman<sup>1</sup>, Rawi Naddaf<sup>1</sup>, Maya Bar-Dolev<sup>1</sup>, Tal Gefen<sup>1</sup>, Nadav Ben-Assa<sup>1</sup>, Naama Geva-Zatorsky<sup>1,2</sup>, and Moran Bercovici<sup>1</sup>  
<sup>1</sup>*Technion - Israel Institute of Technology, ISRAEL* and  
<sup>2</sup>*Canadian Institute for Advanced Research (CIFAR), CANADA*

16:35 - 17:05 Break and Virtual Exhibit Inspection – Gather.Town

## Session 1A4 - Organ-on-a-Chip IV

17:05 - 17:25

- 1A4-1 THREE-DIMENSIONAL MICROCAGE FOR MATURATION OF HPSC-DERIVED CARDIAC-SPHEROIDS BY ELECTRICAL STIMULATION**  
Zetian Wang, Feixiang Ge, Meixuan Zhang, Jianzhong Xi, Wei Wang, and Mengdi Han  
*Peking University, CHINA*

17:25 - 17:45

- 1A4-2 A MICROFLUIDIC-BASED PLATFORM FOR BACTERIAL TARGETED PHOTOSENSITIZERS WITH AGGREGATION-INDUCED EMISSION TO PROMOTE CHEMOTHERAPY FOR THE TREATMENT OF CANCER INFLAMMATORY**  
Yanlin Deng<sup>1</sup>, Tianfu Zhang<sup>2</sup>, Song Lin Chua<sup>3</sup>, Ben Zhong Tang<sup>4</sup>, and Bee Luan Khoo<sup>1,2</sup>  
<sup>1</sup>*City University of Hong Kong, HONG KONG*, <sup>2</sup>*Hong Kong Centre for Cerebro-Cardiovascular Health Engineering (COCHE), HONG KONG*,  
<sup>3</sup>*Hong Kong Polytechnic University, HONG KONG*, and  
<sup>4</sup>*Chinese University of Hong Kong, HONG KONG*

17:45 - 18:05

- 1A4-3 FAST AND ROBUST TRANSPORT OF MAGNETIC MICROPARTICLES ON ARTIFICIAL MICROTUBULES**  
Hongri Gu<sup>1</sup>, Emre Hanedan<sup>1</sup>, Quentin Boehler<sup>1</sup>, Tian-Yun Huang<sup>1</sup>, Arnold J.T.M. Mathijssen<sup>2</sup>, and Bradley J. Nelson<sup>1</sup>  
<sup>1</sup>*ETH Zürich, SWITZERLAND* and <sup>2</sup>*University of Pennsylvania, USA*



## Session 1B4 - Wearable Devices

17:05 - 17:25

**1B4-1 3D CO-PRINTING OF IONIC HYDROGEL AND ELASTOMER FOR FABRICATION OF WEARABLE SENSORS**

Shaojia Wang, Pengfei Xu, and Xinyu Liu  
*University of Toronto, CANADA*

17:25 - 17:45

**1B4-2 BATTERY-LESS SMART MASK FOR LUNG HEALTH MONITORING**

Harikrishnan Muraleedharan Jalajamony  
and Renny Edwin Fernandez  
*Norfolk State University, USA*

17:45 - 18:05

**1B4-3 MAGNETICALLY ACTUATED GLAUCOMA DRAINAGE DEVICE FOR REGULATING INTRAOCULAR PRESSURE AFTER IMPLANTATION**

Inês C.F. Pereira<sup>1</sup>, Hans M. Wyss<sup>1</sup>, Henny J.M. Beckers<sup>2</sup>,  
and Jaap M.J. den Toonder<sup>1</sup>

<sup>1</sup>*Eindhoven University of Technology, NETHERLANDS and*

<sup>2</sup>*Maastricht University Medical Centre+ (MUMC+), NETHERLANDS*

## Session 1C4 - 3D Printing

17:05 - 17:25

**1C4-1 DEVELOPMENT OF MIST-BASED PRINTHEAD TECHNOLOGY FOR EXTRUSION-BASED, DROPLET-BASED AND CO-AXIAL BIOPRINTING**

Sara Badr<sup>1,2</sup>, Elias Madadian<sup>1,2</sup>, Ben MacCallum<sup>1</sup>, Emad Naseri<sup>1</sup>,  
Debra MacDonald<sup>1</sup>, R. Andrew Tasker<sup>1</sup>, and Ali Ahmadi<sup>1,2</sup>

<sup>1</sup>*University of Prince Edward Island, CANADA and*

<sup>2</sup>*École de Technologie Supérieure, CANADA*

17:25 - 17:45

**1C4-2 SIMULTANEOUS FABRICATION OF DENSE AND MACRO POROUS DOMAINS BY GRAYSCALE 3D PRINTING FOR THE MANUFACTURE OF FUNCTIONALLY INTEGRATED FLUIDIC DEVICES**

Hari Kalathil Balakrishnan<sup>1</sup>, Ludovic F. Dumée<sup>2</sup>, Andrea Merenda<sup>3</sup>,  
Cyril Aubry<sup>2</sup>, Dan Yuan<sup>1</sup>, Egan H. Doeven<sup>1</sup>, and Rosanne M. Guijt<sup>1</sup>

<sup>1</sup>*Deakin University, AUSTRALIA, <sup>2</sup>Khalifa University, UAE, and*

<sup>3</sup>*MIT University, AUSTRALIA*

17:45 - 18:05

**1C4-3 ENGINEERING MULTILAYERED CO-AXIAL FLOW INSIDE MICROCHANNEL WITH 3D PRINTED NOZZLES**

Helen Werner<sup>1</sup>, Mehmet A. Sahin<sup>1</sup>, Peer Erfle<sup>2</sup>,  
Ebrahim TaiediNejad<sup>2</sup>, Andreas Dietzel<sup>2</sup>,  
and Ghulam Destgeer<sup>1</sup>

<sup>1</sup>*Technical University of Munich, GERMANY and*

<sup>2</sup>*Technical University of Braunschweig, GERMANY*

22:00 – 23:30

**Virtual Poster Session 1 Gather.Town** - Presentations are listed by topic category with their assigned number starting on page 68.



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## TUESDAY AT A GLANCE

### TUESDAY, 25 OCTOBER

05:00-06:30	Virtual Poster Session 2 – Gather.Town		
08:45-09:05	Analytical Chemistry - Young Innovator Award Presentation		
09:05-09:50	Plenary Presentation III David A. Weitz – <i>Harvard University, USA</i>		
09:50-10:05	Transition		
10:05-11:15	Session 2A1 Micromanipulation	Session 2B1 Cell Analysis I	Session 2C1 Nuclear Acid Analysis
	KEYNOTE Bifeng Liu	KEYNOTE Rong Fan	KEYNOTE Aaron Streets
11:15-11:45	Break and Virtual Exhibit Inspection – Gather.Town		
11:45-12:45	Session 2A2 Biosensing I	Session 2B2 Microfluidics I	Session 2C2 Flow Cytometry
12:45-13:45	Lunch on Own		
13:45-14:30	Plenary Presentation IV Lydéric Bocquet – <i>Ecole Normale Supérieure, FRANCE</i>		
15:30-16:40	Session 2A3 Droplet-Based Microfluidics I	Session 2B3 Cell Analysis II	Session 2C3 Biomolecular Assay I
	KEYNOTE Lingling Shui	KEYNOTE ebastian Maerkl	KEYNOTE Sunitha Nagrath
16:40-17:10	Break and Virtual Exhibit Inspection – Gather.Town		
17:10-18:10	Session 2A4 Droplet-Based Microfluidics II	Session 2B4 Particle Manipulation	Session 2C4 Flow Chemistry

## TUESDAY, 25 OCTOBER

05:00 – 06:30 Virtual Poster Session 2 Gather.Town - Presentations are listed by topic category with their assigned number starting on page 68.

### Analytical Chemistry Young Innovator Award Presentation

08:45 - 09:05

#### ANGSTROFLUIDICS: PRECISE PLATFORM FOR MOLECULAR TRANSPORT

Radha Boya

*University of Manchester, UK*

### PLENARY PRESENTATION III

09:05 - 09:50

#### 2PL-3 DROP-BASED MICROFLUIDICS FOR PATHOGEN DETECTION AND ANALYSIS

David A. Weitz

*Harvard University, USA*

09:50 - 10:05 Transition



## Session 2A1 - Micromanipulation

10:05 - 10:35

- 2A1-1** **KEYNOTE PRESENTATION**  
**MICROFLUIDICS FOR PRODUCTION OF INTELLECTUAL MICRO/NANOROBOTS**  
**Bi-Feng Liu**  
*Huazhong University of Science and Technology, CHINA*

10:35 - 10:55

- 2A1-2** **MANIPULATION OF OPTOELECTRONIC MICROMACHINES IN 3D**  
Gong Li<sup>1,2</sup>, Bingrui Xu<sup>1,2</sup>, Xiaopu Wang<sup>3,4</sup>, Aaron R. Wheeler<sup>5</sup>, and Shuailong Zhang<sup>1,2</sup>  
<sup>1</sup>*Beijing Institute of Technology, CHINA*, <sup>2</sup>*Beijing Advanced Innovation Center for Intelligent Robots and Systems, CHINA*, <sup>3</sup>*Shenzhen Institute of Artificial Intelligence and Robotics for Society (AIRS), CHINA*, <sup>4</sup>*Chinese University of Hong Kong, HONG KONG*, and <sup>5</sup>*University of Toronto, CANADA*

10:55 - 11:15

- 2A1-3** **RAPID TISSUE DISSOCIATION USING ON-CHIP ACOUSTIC STREAMING**  
Yang Bai<sup>1</sup>, Zhiwen Zheng<sup>2</sup>, Yang Yang<sup>1</sup>, Wei Wei<sup>1</sup>, Xianjie Shi<sup>1</sup>, Zhihong Zhang<sup>2</sup>, and Xuexin Duan<sup>1</sup>  
<sup>1</sup>*Tianjin University, CHINA* and <sup>2</sup>*Tianjin Medical University, CHINA*

## Session 2B1 - Cell Analysis I

10:05 - 10:35

- 2B1-1** **KEYNOTE PRESENTATION**  
**SPATIAL MULTI-OMICS SEQUENCING ENABLED BY MICROFLUIDICS DETERMINISTIC BARCODING**  
**Rong Fan**  
*Yale University, USA*

10:35 - 10:55

- 2B1-2** **SELF-ORGANIZED CANCER SPHEROID-VASCULAR BARRIER ON A MICROSTRUCTURED BIOPRINTING SUBSTRATE**  
Gihyun Lee, Soo Jee Kim, and Je-Kyun Park  
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

10:55 - 11:15

- 2B1-3** **A MICROFLUIDIC PLATFORM TO PRESERVE MICRO-DISSECTED TUMOR MICROVASCULATURE**  
Brandon Nguyen<sup>1</sup>, Tran N.H. Nguyen<sup>1</sup>, Lisa Horowitz<sup>1</sup>, Adán Rodríguez<sup>1</sup>, Cb Lim<sup>2</sup>, Mehdi Mehrabi<sup>3</sup>, Taranjit S. Gujral<sup>2</sup>, and Albert Folch<sup>1</sup>  
<sup>1</sup>*University of Washington, USA*, <sup>2</sup>*Fred Hutchinson Cancer Research Center, USA*, and <sup>3</sup>*University of Pretoria, SOUTH AFRICA*





## Session 2C1 - Nuclear Acid Analysis

10:05 - 10:35

- 2C1-1 KEYNOTE PRESENTATION**  
**MICROFLUIDIC TOOLS FOR MULTI-MODAL PRECISION MEASUREMENT OF SINGLE CELLS**

Aaron Streets<sup>1,2</sup>

<sup>1</sup>University of California, Berkeley, USA and

<sup>2</sup>Chan Zuckerberg Biohub, USA

10:35 - 10:55

- 2C1-2 A SMARTPHONE-BASED DIGITAL CRISPR PLATFORM FOR HIV VIRAL LOAD QUANTIFICATION**

Hoan T. Ngo, Patarajarin Akarapipad, Pei-Wei Lee, Joon Soo Park, Fan-En Chen, Alex Y. Trick, Kuangwen Hsieh, and Tza-Huei Wang  
Johns Hopkins University, USA

10:55 - 11:15

- 2C1-3 ONE-POT ENDONUCLEOLYTICALLY EXPONENTIATED ROLLING CIRCLE AMPLIFICATION BY CRISPR-Cas12a AFFORDS SENSITIVE, EXPEDITED ISOTHERMAL DETECTION OF MicroRNAs**

He Yan<sup>1</sup>, Xin Zhou<sup>1</sup>, Yunjie Wen<sup>1</sup>, Song Han<sup>2</sup>, Steven Hughes<sup>2</sup>, and Yong Zeng<sup>1</sup>

<sup>1</sup>University of Florida, USA and <sup>2</sup>University of Florida College of Medicine, USA

11:15 - 11:45 Break and Virtual Exhibit Inspection – Gather.Town

## Session 2A2 - Biosensing I

11:45 - 12:05

- 2A2-1 A RESPIRATORY SENSOR FABRICATED BY PERFORATED FLEXIBLE PRINTED CIRCUIT BOARD WITH SPUTTERED PLATINUM**

Lu Cao<sup>1,2</sup>, Zhitong Zhang<sup>1,2</sup>, Junshi Li<sup>1,2</sup>, Zhongyan Wang<sup>1,2</sup>, Yingjie Ren<sup>1,2</sup>, Dong Huang<sup>1,2</sup>, and Zhihong Li<sup>1,2</sup>

<sup>1</sup>Peking University, CHINA and <sup>2</sup>National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA

12:05 - 12:25

- 2A2-2 CONSTRUCTION OF LIQUID METAL-BASED SOFT MICROFLUIDIC SENSORS VIA SOFT LITHOGRAPHY**

Yang Zhang<sup>1</sup> and Sheng Yan<sup>2</sup>

<sup>1</sup>Macquarie University, AUSTRALIA and

<sup>2</sup>Shenzhen University, CHINA

12:25 - 12:45

- 2A2-3 A SHRINK POLYMER ELECTROCHEMICAL SENSOR FOR POINT-OF-CARE DETECTION OF PROSTATE CANCER**

Wenzheng He<sup>1</sup>, Qifu Zhang<sup>2</sup>, Changdong Zhou<sup>2</sup>, Yang Lin<sup>2</sup>, Xiongying Ye<sup>1</sup>, and Tianhong Cui<sup>3</sup>

<sup>1</sup>Tsinghua University, CHINA, <sup>2</sup>Jilin Cancer Hospital, CHINA, and <sup>3</sup>University of Minnesota, USA



## Session 2B2 - Microfluidics II

11:45 - 12:05

**2B2-1 SINGLE-CELL PROTEIN ISOFORMS ANALYSIS USING A HYBRID DROPLET-ELECTROPHORESIS PLATFORM**

Yang Liu and Amy E. Herr  
*University of California, Berkeley, USA*

12:05 - 12:25

**2B2-2 A LOW-COST PAPER-BASED SAMPLE PREPARATION MODULE TO LYSE BACTERIAL CELLS AND EXTRACT GENOMIC DNA USING ISOTACHOPHORESIS**

Shruti Soni and Bhushan J. Toley  
*Indian Institute of Science, Bangalore, INDIA*

12:25 - 12:45

**2B2-3 INTEGRATED AND MODULAR SYSTEM FOR MICROFLUIDIC AFFINITY ISOLATION AND LABEL-LESS ENUMERATION OF SARS-COV-2 FROM SALIVA SAMPLES**

Sachindra S.T. Gamage<sup>1</sup>, Swarnagowri Vaidyanathan<sup>1</sup>,  
Thilanga Pahattuge<sup>1</sup>, Katie Childers<sup>1</sup>, Harshani Wijerathne<sup>1</sup>,  
Matt Hupert<sup>2</sup>, Malgorzata Witek<sup>1</sup>, and Steven Soper<sup>1</sup>  
<sup>1</sup>*University of Kansas, USA and* <sup>2</sup>*BioFluidica Inc., USA*

## Session 2C2 - Flow Cytometry

11:45 - 12:05

**2C2-1 LABEL-FREE ISOLATION AND ELECTRO-MECHANOPHENOTYPING OF SINGLE LEUKOCYTES FOR POINT-OF-CARE IMMUNOPROFILING USING A DROP OF BLOOD**

Linwei He, Chayakorn Petchakup, Hui Min Tay,  
King Ho Holden Li, and Han Wei Hou  
*Nanyang Technological University, SINGAPORE*

12:05 - 12:25

**2C2-2 HIGH-SPEED 3D IMAGING FLOW CYTOMETRY**

Masashi Ugawa and Sadao Ota  
*University of Tokyo, JAPAN*

12:25 - 12:45

**2C2-3 MULTICHANNEL IMPEDANCE CYTOMETRY DOWNSTREAM OF CELL SEPARATION FOR QUANTIFYING ENRICHMENT OF ACTIVATED MACROPHAGE SUBPOPULATIONS**

Javad Jarmoshti<sup>1</sup>, Karina Torres-Castro<sup>1</sup>, Li Xiao<sup>1</sup>, Aditya Rane<sup>1</sup>,  
Armita Salah<sup>1</sup>, Li Jin<sup>1</sup>, Xudong Li<sup>1</sup>, Federica Caselli<sup>2</sup>,  
Carlos Honrado<sup>1</sup>, and Nathan Swami<sup>1</sup>  
<sup>1</sup>*University of Virginia, USA and* <sup>2</sup>*University of Rome Tor Vergata, ITALY*

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12:45 - 13:45 **Lunch on Own**

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## PLENARY PRESENTATION IV

13:45 - 14:30

- 2PL-4** **NANOFLUIDICS COMING OF AGE**  
**Lydéric Bocquet**  
*Ecole Normale Supérieure, FRANCE*

## Session 2A3 - Droplet-Based Microfluidics I

15:30 - 16:00

- 2A3-1** **KEYNOTE PRESENTATION**  
**DROPLET CONFINEMENT INDUCED ASSEMBLY AND APPLICATION**  
**Lingling Shui**<sup>1</sup>, Juan Wang<sup>1,2</sup>, Liping Mei<sup>1</sup>, Shuting Xie<sup>1</sup>, Zhibing Yan<sup>1</sup>, and Mingliang Jin<sup>1</sup>  
<sup>1</sup>South China Advanced Normal University, CHINA and  
<sup>2</sup>University of Twente, NETHERLANDS

16:00 - 16:20

- 2A3-2** **A SHAPE-RECONFIGURABLE, LIGHT AND MAGNETIC DUAL-RESPONSIVE SHAPE-MEMORY MICROPILLAR ARRAY CHIP FOR WATER-IN-OIL DROPLET MANIPULATION**  
Wen-Qi Ye, Wen-Xin Fu, Chun-Guang Yang, and Zhang-Run Xu  
*Northeastern University, CHINA*

16:20 - 16:40

- 2A3-3** **CHANNEL-INTEGRATED DIGITAL MICROFLUIDIC CHIP FOR NUCLEIC ACID EXTRACTION AND DIGITAL PCR DETECTION**  
Yu He<sup>1,3</sup>, Zefan Lu<sup>1</sup>, Ke Liu<sup>1</sup>, Hongliang Fan<sup>2</sup>, and Tao Zhang<sup>1</sup>  
<sup>1</sup>Zhejiang University, CHINA, <sup>2</sup>Hangzhou Medical College, CHINA, and <sup>3</sup>Huzhou Institute of Zhejiang University, CHINA

## Session 2B3 - Cell Analysis II

15:30 - 16:00

- 2B3-1** **KEYNOTE PRESENTATION**  
**ON BIOCHEMICAL CONSTRUCTORS AND SYNTHETIC CELLS**  
**Sebastian Maerkl**  
*Swiss Federal Institute of Technology Lausanne (EPFL), SWITZERLAND*

16:00 - 16:20

- 2B3-2** **OVERCOMING DOUBLE-POISSON LIMITATION FOR CO-ENCAPSULATION IN DROPLETS THROUGH HYDRODYNAMIC CLOSE PACKING OF CELLS**  
Xuhao Luo and Abraham Lee  
*University of California, Irvine, USA*

16:20 - 16:40

- 2B3-3** **PASSIVE AND DETERMINISTIC SINGLE CELL ENCAPSULATION WITH DROPLET BASED MICROFLUIDICS**  
Jiande Zhou, Arnaud Bertsch, and Philippe Renaud  
*Swiss Federal Institute of Technology Lausanne (EPFL), SWITZERLAND*





## Session 2C3 - Biomolecular Assay I

15:30 - 16:00

**2C3-1 KEYNOTE PRESENTATION**

**MICROFLUIDIC LABYRINTH FOR LABEL FREE ISOLATION AND SINGLE CELL ANALYSIS OF CIRCULATING TUMOR CELLS**

Brittany Rupp, Sarah Owen, Harrison Ball, Kaylee Judith Smith, Valerie Gunchick, Evan T. Keller, Vaibhav Sahai, and **Sunitha Nagrath**  
*University of Michigan, USA*

16:00 - 16:20

**2C3-2 A MICROFLUIDIC PLATFORM FOR QUANTITATIVE MULTIPLEX PROFILING OF DNA METHYLATION BIOMARKERS**

Yang Zhao<sup>1</sup>, Christine M. O'Keefe<sup>1</sup>, James G. Herman<sup>2</sup>, Thomas Pisanic<sup>1</sup>, and Tza-Huei Wang<sup>1</sup>

<sup>1</sup>*Johns Hopkins University, USA* and <sup>2</sup>*University of Pittsburgh, USA*

16:20 - 16:40

**2C3-3 A DIGITAL MICROFLUIDIC-BASED ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY FOR CELL-BASED IMMUNOASSAY IN A DYNAMIC MODE**

Yuqian Zhang and Yuguang Liu  
*Mayo Clinic, USA*

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**16:40 - 17:10 Break and Virtual Exhibit Inspection – Gather.Town**

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## Session 2A4 - Droplet-Based Microfluidics II

17:10 - 17:30

**2A4-1 HIGH RESOLUTION, MULTIPLEX ANTIBODY PATTERNING USING PIEZOELECTRIC DROPLET PRINTING AND MICROCONTACT PRINTING**

Meichi Jin, Kai Wu, and Zida Li  
*Shenzhen University, CHINA*

17:30 - 17:50

**2A4-2 BARCODED COMBINATORIAL SCREENING FOR HIGHLY EFFICIENT OPTIMIZATION OF CELL-FREE PROTEIN SYNTHESIS SYSTEMS IN DROPLETS**

Jiawei Zhu, Yaru Meng, Conghui Ma, Jian Li, and Yifan Liu  
*ShanghaiTech University, CHINA*

17:50 - 18:10

**2A4-3 SESSILE DROPLET DIFFERENTIAL SCANNING CALORIMETRY CHIP FOR LIQUID CRYSTAL SAMPLES**

Sheng Ni<sup>1</sup>, Yang Bu<sup>1</sup>, Hanliang Zhu<sup>2</sup>, Pavel Neuzil<sup>2,3</sup>, and Levent Yobas<sup>1</sup>

<sup>1</sup>*Hong Kong University of Science and Technology, HONG KONG,*

<sup>2</sup>*Northwestern Polytechnical University, CHINA, and*

<sup>3</sup>*Brno University of Technology, CZECH REPUBLIC*





## Session 2B4 - Particle Manipulation

17:10 - 17:30

**2B4-1 ELASTO-INERTIAL FOCUSING MECHANISMS OF PARTICLES IN SHEAR-THINNING VISCOELASTIC FLUID IN RECTANGULAR MICROCHANNELS**

Mohammad Moein Naderi, Ludovica Barilla, Jian Zhou, Ian Papautsky, and Zhangli Peng  
*University of Illinois, Chicago, USA*

17:30 - 17:50

**2B4-2 ROBOTIC ARM CONTROLLED ACOUSTOFLUIDIC END-EFFECTOR FOR PARTICLE MANIPULATION**

Jan Durrer, Prajwal Agrawal, and Daniel Ahmed  
*ETH Zürich, SWITZERLAND*

17:50 - 18:10

**2B4-3 EXPLOITING AXIAL PRIMARY RADIATION FORCE FOR ACOUSTOFLUIDIC PARTICLE TRAPPING**

Lokesh Malik<sup>1</sup>, Amal Nath<sup>1</sup>, Subhas Nandy<sup>1</sup>, Thomas Laurell<sup>2</sup>, and Ashis Kum Sen<sup>1</sup>  
<sup>1</sup>*Indian Institute of Technology, Madras, INDIA* and  
<sup>2</sup>*Lund University, SWEDEN*

## Session 2C4 - Flow Chemistry

17:10 - 17:30

**2C4-1 HIGHLY PARALLELIZED SILICON AND GLASS MICROFLUIDIC PLATFORM FOR ROBUST MANUFACTURING OF MRNA LIPID NANOPARTICLES FOR VACCINE APPLICATIONS**

Sarah J. Shepherd, Michael J. Mitchell, and David Issadore  
*University of Pennsylvania, USA*

17:30 - 17:50

**2C4-2 CONTINUOUS BIODIESEL PRODUCTION USING SERIES MICROREACTORS**

Cheng-Yu Wang, Po-Ying Chen, and Ya-Yu Chiang  
*National Chung Hsing University, TAIWAN*

17:50 - 18:10

**2C4-3 A MICROFLUIDIC PLATFORM FOR CONTINUOUS PRODUCTION OF <sup>13</sup>C – HYPERPOLARIZED METABOLITES**

Sylwia J. Barker<sup>1</sup>, Laurynas Dagys<sup>1</sup>, Manvendra Sharma<sup>1</sup>, James Eills<sup>2</sup>, Malcolm H. Levitt<sup>1</sup>, and Marcel Utz<sup>1</sup>  
<sup>1</sup>*University of Southampton, UK* and <sup>2</sup>*Barcelona Institute of Science and Technology, SPAIN*



## Wuhan EasyDiagnosis Biomedicine Co., Ltd.

As an IVD reagents, devices and solutions provider with a deep focus on healthcare, EasyDiagnosis was founded in 2008 and went public in Shenzhen Stock Exchange in 2018.

EasyDiagnosis strives to develop and share medical technologies in 5 categories: Molecular Diagnosis, Chemiluminescence, Immuno-chromatography, Blood Gas and COVID-19 solution.



Jixian Pavilion on West Lake in Hangzhou. By mackmacedo0266 from Pixabay.

## WEDNESDAY AT A GLANCE

### WEDNESDAY, 26 OCTOBER

08:45-09:05	<b>Lab on a Chip and Dolomite</b> Pioneers in Miniaturization Lectureship Prize and Presentation		
09:05-09:50	<b>Plenary Presentation V</b> Amy E. Herr – <i>University of California, Berkeley, USA</i>		
09:50-10:00	<b>MicroTAS 2023 Announcement</b>		
10:00-10:30	<b>Break and Virtual Exhibit Inspection – Gather.Town</b>		
10:30-12:00	<b>Session 3A1</b> Cell Analysis III	<b>Session 3B1</b> Organ-on-a-Chip V	<b>Session 3C1</b> Cell Analysis IV
	<b>KEYNOTE</b> Jin-Ming Lin	<b>KEYNOTE</b> Shoji Takeuchi	<b>KEYNOTE</b> Z. Hugh Fan
12:00-13:00	<b>Lunch on Own</b>		
12:25-12:45	<b>Industrial Stage 3 – Acxel Micro &amp; Nano Tech (Guangdong) Co., Ltd.</b>		
14:00-15:50	<b>Session 3A2</b> MEMS I	<b>Session 3B2</b> Biochemical Analysis I	<b>Session 3C2</b> Microfluidics III
	<b>KEYNOTE</b> Xinxin Li	<b>KEYNOTE</b> Michael Breadmore	<b>KEYNOTE</b> Shuhuai Yao
15:50-16:20	<b>Break and Virtual Exhibit Inspection – Gather.Town</b>		
16:20-17:40	<b>Session 3A3</b> Biochemical Analysis II	<b>Session 3B3</b> Sensing	<b>Session 3C3</b> Biochemical Analysis III
22:00-23:30	<b>Virtual Poster Session 3 – Gather.Town</b>		

## WEDNESDAY, 26 OCTOBER

### Lab on a Chip and Dolomite - Pioneers in Miniaturization Lectureship Prize and Presentation

08:45 - 09:05

#### ENGINEERING BIOLOGICAL COMPLEXITY IN PRACTICAL FORMATS

Yi-Chin Toh

*Queensland University of Technology, AUSTRALIA*

### PLENARY PRESENTATION V

09:05 - 09:50

#### 3PL-5 UNLOCKING THE NATURE OF DISEASE WITH SINGLE-CELL PROTEFORM PROFILING

**Amy E. Herr**<sup>1,2</sup>

<sup>1</sup>*University of California, Berkeley, USA and*

<sup>2</sup>*Chan Zuckerberg Biohub, USA*

### MicroTAS 2023 Announcement

09:50 - 10:00

#### MicroTAS 2023 Conference Chairs

- Zbigniew Brzózka

*Warsaw University of Technology, POLAND*

- Elżbieta Jastrzębska

*Warsaw University of Technology, POLAND*

11:10 - 11:40

#### Break and Virtual Exhibit Inspection – Gather.Town



## Session 3A1 - Cell Analysis III

10:30 - 11:00

- 3A1-1** **KEYNOTE PRESENTATION**  
**OPEN MICROFLUIDICS FOR SINGLE CELL ANALYSIS**  
Jin-Ming Lin, Qiang Zhang, and Shou Feng  
*Tsinghua University, CHINA*

11:00 - 11:20

- 3A1-2** **NEUROMORPHIC-ENABLED EVENT-BASED DEEP IMAGING FLOW CYTOMETRY**  
Weihua He, Yongxiang Feng, Junwen Zhu, Huichao Chai, and Wenhui Wang  
*Tsinghua University, CHINA*

11:20 - 11:40

- 3A1-3** **DEVELOPMENT OF A MICROFLUIDIC PLATFORM CAPABLE OF CHARACTERIZING SINGLE-CELL INTRINSIC STRUCTURAL AND ELECTRICAL PROPERTIES IN A HIGH-THROUGHPUT MANNER**  
Hongyan Liang<sup>1,2</sup>, Xiao Chen<sup>1,2</sup>, Deyong Chen<sup>1,2</sup>, Junbo Wang<sup>1,2</sup>, and Jian Chen<sup>1,2</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and  
<sup>2</sup>University of Chinese Academy of Sciences, CHINA

11:40 - 12:00

- 3A1-4** **AUTOMATIC MORPHOLOGICAL ANALYSIS AND REPLICATIVE LIFESPAN DETERMINATION OF DIPLOID BUDDING YEAST IN A HIGH-THROUGHPUT MICROFLUIDIC DEVICE**  
Yingying Wang<sup>1</sup>, Yuxin Zhang<sup>1</sup>, Ke Liu<sup>1</sup>, Qin Xiao<sup>1</sup>, Bailiang He<sup>1</sup>, Shuiping Ouyang<sup>2</sup>, Qing-an Huang<sup>1</sup>, and Zhen Zhu<sup>1</sup>  
<sup>1</sup>Southeast University, CHINA and  
<sup>2</sup>Nanjing Forestry University, CHINA

## Session 3B1 - Organ-on-a-Chip V

10:30 - 11:00

- 3B1-1** **KEYNOTE PRESENTATION**  
**EMERGING MICROFLUIDIC TECHNOLOGIES FOR BIOHYBRID DEVICES**  
Shoji Takeuchi<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kanagawa Institute of Industrial Science and Technology (KISTEC), JAPAN

11:00 - 11:20

- 3B1-2** **MULTILAYER ORGAN-ON-A-CHIP WITH REVERSIBLY BONDED LAYERS FOR PROBING GEL STIFFNESS IN A PANCREATIC CANCER MODEL**  
Michael D. Mohan, Neda Latifi, Craig A. Simmons, and Edmond W. K. Young  
*University of Toronto, CANADA*





## Session 3B1 - Organ-on-a-Chip V (continued)

11:20 - 11:40

**3B1-3 HIGH THROUGHPUT 3D PRINTING OF TUBULAR MICROSTRUCTURES FROM ELASTOMERIC POLYMERS FOR ORGAN-ON-A-CHIP APPLICATIONS**

Chuan Liu<sup>1</sup>, Scott B. Campbell<sup>1,2</sup>, Jianzhao Li<sup>1</sup>, Dawn Bannerman<sup>1,2</sup>, Simon Pascual-Gil<sup>2</sup>, Jennifer Kieda<sup>1</sup>, Peter R. Herman<sup>1</sup>, and Milica Radisic<sup>1,2</sup>

<sup>1</sup>University of Toronto, CANADA and

<sup>2</sup>University Health Network, CANADA

11:40 - 12:00

**3B1-4 PRECISE AND FAST CONTROL OF THE DISSOLVED OXYGEN LEVEL IN A TUMOR-ON-CHIP MODEL**

Charlotte Bouquerel<sup>1</sup>, William César<sup>2</sup>, Giacomo Groppero<sup>1</sup>, Fatima Mechta-Grigoriou<sup>3</sup>, Gérard Zalcmán<sup>3</sup>, Maria-Carla Parrini<sup>3</sup>, Marine Verhulsel<sup>2</sup>, and Stéphanie Descroix<sup>1</sup>

<sup>1</sup>Institut Curie, FRANCE, <sup>2</sup>Fluigent R&D, FRANCE, and

<sup>3</sup>Institut Curie, FRANCE

## Session 3C1 - Cell Analysis IV

10:30 - 11:00

**3C1-1 KEYNOTE PRESENTATION LONGITUDINAL STUDY OF CIRCULATING TUMOR CELLS AND DNA IN PANCREATIC CANCER PATIENTS**

**Z. Hugh Fan**<sup>1</sup>, Pablo J. Dopico<sup>1</sup>, Zhijie Yang<sup>2</sup>, Kangfu Chen<sup>1</sup>, Youxiang Wang<sup>2</sup>, Thomas J. George<sup>1</sup>

<sup>1</sup>University of Florida, USA and <sup>2</sup>Atila Biosystems, USA

11:00 - 11:20

**3C1-2 THE RELEASE OF NEUTROPHIL EXTRACELLULAR TRAPS: A SELF-AMPLIFIED PROCESS**

Pan Deng, Peter M. Grin, Kerryn Matthews, Simon Duffy, and Hongshen Ma

University of British Columbia, CANADA

11:20 - 11:40

**3C1-3 AVATAR CELLS: LIVING-CELLS GIFTED NANOFUNCTIONERS**

Niko Kimura, Yoko Yamanishi, and Shinya Sakuma

Kyushu University, JAPAN

11:40 - 12:00

**3C1-4 LIVE INTACT TUMOR "CUBOIDS" ANALYZED ON A VALVED 96-WELL MICROFLUIDIC PLATFORM**

Ethan J. Lockhart<sup>1</sup>, Lisa F. Horowitz<sup>1</sup>, Cb Lim<sup>2</sup>, Tran Nguyen<sup>1</sup>, Mehdi Mehrabi<sup>3</sup>, Taranjit S. Gujral<sup>2</sup>, and Albert Folch<sup>1</sup>

<sup>1</sup>University of Washington, USA, <sup>2</sup>Fred Hutchinson Cancer Research Center, USA, and <sup>3</sup>University of Pretoria, SOUTH AFRICA

12:00 - 13:00 Lunch on Own

## Industrial Stage 3

**12:25 ACTIVE-MATRIX DIGITAL MICROFLUIDICS PLATFORM FOR HIGH-THROUGHPUT BIOSAMPLE HANDLING**

Hanbin Ma

Acxel Micro & Nano Tech (Guangdong) Co., Ltd.



## Session 3A2 - MEMS I

14:00 - 14:30

- 3A2-1 KEYNOTE PRESENTATION**  
**ADVANCED MATERIAL THERMAL ANALYSIS WITH TEMPERATURE-PROGRAMMED RESONANT MICRO-CANTILEVER**  
Xinyu Li<sup>1</sup>, Pengcheng Xu<sup>1</sup>, Haitao Yu<sup>1,2</sup>, and **Xinxin Li<sup>1</sup>**  
<sup>1</sup>Chinese Academy of Sciences, CHINA and  
<sup>2</sup>Xiamen High-end MEMS Technology Co., Ltd. CHINA

14:30 - 14:50

- 3A2-2 MANIPULATION OF MICROPARTICLES USING LIGHT PATTERNS WITH DIFFERENT THICKNESS IN AN OPTOELECTRONIC TWEEZERS SYSTEM**  
Weibo Gao<sup>1,2</sup>, Shan Qin<sup>1,2</sup>, Fenggang Li<sup>1,2</sup>, Shenyan Qu<sup>1</sup>, Aaron R. Wheeler<sup>3</sup>, and Shuailong Zhang<sup>1,2</sup>  
<sup>1</sup>Beijing Institute of Technology, CHINA, <sup>2</sup>Beijing Advanced Innovation Center for Intelligent Robots and Systems (BAICIRS), CHINA, and <sup>3</sup>University of Toronto, CANADA

14:50 - 15:10

- 3A2-3 CONTINUOUS-FLOW DIELECTROPHORETIC SEPARATION OF SUBMICRON POLYSTYRENE PARTICLES WITH 200 NM RESOLUTION USING THREE-DIMENSIONAL MICROELECTRODES**  
Yang Bu, Zili Tang, Sheng Ni, and Levent Yobas  
Hong Kong University of Science and Technology, HONG KONG

15:10 - 15:30

- 3A2-4 MICROPATTERN EMBOSSING: A FACILE PROCESS FOR MICROCHANNEL FABRICATION ON NANOCELLULOSE-PAPER-BASED MICROFLUIDICS**  
Wenwen Yuan<sup>1</sup>, Longxin Zhang<sup>1</sup>, Yongjie Wang<sup>2</sup>, Yi Sun<sup>1</sup>, Xinyu Liu<sup>3</sup>, and Pengfei Song<sup>1</sup>  
<sup>1</sup>Xi'an Jiaotong – Liverpool University, CHINA, <sup>2</sup>Harbin Institute of Technology, CHINA, and <sup>3</sup>University of Toronto, CANADA

15:30 - 15:50

- 3A2-5 SUSPENDED MICROFLUIDIC RAILS FOR HYDROGEL PATTERNING**  
Lauren G. Brown, Amanda J. Haack, Ross C. Bretherton, Yuting Zeng, Aaliyah Wu, Alex Goldstein, Erwin Berthier, Nathan J. Sniadecki, Cole A. DeForest, and Ashleigh B. Theberge  
University of Washington, USA





## Session 3B2 - Biochemical Analysis I

14:00 - 14:30

**3B2-1 KEYNOTE PRESENTATION**

**MICROFLUIDIC FILTERS FOR HIGH-FREQUENCY  
OUT-OF-LAB MEASUREMENTS**

**Michael Breadmore**<sup>1</sup>, Maria Paniagua Cabarrus<sup>1</sup>, Aliaa Shallan<sup>2</sup>,  
Mostafa Atia<sup>1</sup>, Sepideh Keshan Balavandy<sup>1</sup>, Min Zhang<sup>1</sup>,  
Yakini Tavares<sup>2</sup>, Moein Navvab Kashani<sup>2</sup>, Rosanne Guijt<sup>3</sup>,  
and Craig Priest<sup>2</sup>

<sup>1</sup>University of Tasmania, AUSTRALIA, <sup>2</sup>University of South  
Australia, AUSTRALIA, and <sup>3</sup>Deakin University, AUSTRALIA

14:30 - 14:50

**3B2-2 ULTRA-RAPID ANTIBIOTIC SUSCEPTIBILITY TESTING OF  
MYCOBACTERIA USING A MICROCHAMBER ARRAY  
SYSTEM WITH METABOLIC ACTIVITY DETECTION**

Petra Jusková<sup>1</sup>, Steven Schmitt<sup>2</sup>, Illia Onipko<sup>1</sup>,  
and Petra S. Dittrich<sup>1</sup>

<sup>1</sup>ETH Zürich, SWITZERLAND and

<sup>2</sup>Myria Biosciences AG, SWITZERLAND

14:50 - 15:10

**3B2-3 A MICRO-ANALYTICAL PLATFORM COMBINING TUMOR  
TREATING FIELDS AND INTEGRATED  
CAPACITANCE SENSING**

Yann Gilpin and Marc Dandin  
Carnegie Mellon University, USA

15:10 - 15:30

**3B2-4 PHYSIOLOGICAL GLUCOSE SENSING IN IN-VITRO 3D  
SPHEROIDS USING SERS BASED NANOSENSORS**

Koyel Dey<sup>1,2</sup>, Venkanagouda S. Goudar<sup>1</sup>, Fan-Gang Tseng<sup>1</sup>,  
and Tuhin Subhra Santra<sup>2</sup>

<sup>1</sup>National Tsing Hua University, TAIWAN and

<sup>2</sup>Indian Institute of Technology, Madras, INDIA

15:30 - 15:50

**3B2-5 FLUIDOT: A CASE STUDY ON DRUG TOLERANCE SCREENING  
AND ANTIBODY MINING, ONE CELL AT A TIME**

Karen Ven<sup>1</sup>, Jolien Breukers<sup>1</sup>, Caroline Struyfs<sup>1</sup>, Louanne Ampofo<sup>1</sup>,  
Iene Rutten<sup>1</sup>, Maya Imbrechts<sup>1</sup>, Winnie Kerstens<sup>1</sup>, Sam Noppen<sup>1</sup>,  
Dominique Schols<sup>1</sup>, Paul De Munter<sup>1,2</sup>, Hendrik Jan Thibaut<sup>1</sup>,  
Karen Vanhoorelbeke<sup>1</sup>, Dragana Spasic<sup>1</sup>, Paul Declerck<sup>1</sup>,  
Bruno P.A. Cammue<sup>1</sup>, Nick Geukens<sup>1</sup>, Karin Thevissen<sup>1</sup>,  
and Jeroen Lammertyn<sup>1</sup>

<sup>1</sup>KU Leuven, BELGIUM and <sup>2</sup>University Hospitals Leuven, BELGIUM

## Session 3C2 - Microfluidics III

14:00 - 14:30

**3C2-1 KEYNOTE PRESENTATION**

**DROPLET DIGITAL IMMUNO-PCR FOR PROFILING  
PROTEIN-SPECIFIC EXTRACELLULAR VESICLES**

Chunchen Liu<sup>1</sup>, Huixian Lin<sup>1</sup>, and **Shuhuai Yao**<sup>2</sup>

<sup>1</sup>Nanfang Hospital, Southern Medical University, CHINA and

<sup>2</sup>Hong Kong University of Science and Technology, HONG KONG



## Session 3C2 - Microfluidics III (continued)

14:30 - 14:50

**3C2-2 INTEGRATED MICROFLUIDICS FOR IMPEDANCE-BASED CELLULAR MONITORING AND REAL-TIME ACTUATED SORTING OF SINGLE MICROCARRIERS**

Lingyan Gong, Chayakorn Petchakup, and Han Wei Hou  
*Nanyang Technological University, SINGAPORE*

14:50 - 15:10

**3C2-3 MEASURING STRAIN-DEPENDENT CELL MECHANICS WITH SEQUENTIAL-SQUEEZE NODE-PORE SENSING**

Rachel Rex, Sharicka Zutshi, and Lydia Sohn  
*University of California, Berkeley, USA*

15:10 - 15:30

**3C2-4 SHEATH FLOW GENERATOR IMPLEMENTING PDMS SPONGES FOR MICROFLUIDIC PARTICLE SORTING SYSTEMS**

Ayumi Hayashi, Runa Hemmi, Masumi Yamada, and Minoru Seki  
*Chiba University, JAPAN*

15:30 - 15:50

**3C2-5 ORDERING OF LARGE PARTICLES TO REGULATE EVENT INTERVALS BY UTILIZING HIGH-SPEED FLOW CONTROL**

Makoto Saito<sup>1</sup>, Yoko Yamanishi<sup>1</sup>, Fumihito Arai<sup>2</sup>,  
and Shinya Sakuma<sup>1</sup>  
<sup>1</sup>*Kyushu University, JAPAN* and <sup>2</sup>*University of Tokyo, JAPAN*

**15:50 - 16:20 Break and Virtual Exhibit Inspection – Gather.Town**

## Session 3A3 - Biochemical Analysis II

16:20 - 16:40

**3A3-1 FLUID MULTIVALENT MAGNETIC INTERFACE FOR HIGH-PERFORMANCE ISOLATION AND PROTEOMIC PROFILING OF TUMOR-DERIVED EXTRACELLULAR VESICLES**

Qi Niu<sup>1,2</sup>, Chaoyong Yang<sup>1,2</sup>, and Lingling Wu<sup>1</sup>  
<sup>1</sup>*Shanghai Jiao Tong University, CHINA* and  
<sup>2</sup>*Xiamen University, CHINA*

16:40 - 17:00

**3A3-2 A MICROFLUIDIC DEVICE TO PROMOTE EXOSOME SECRETION**

Rui Hao<sup>1,2</sup>, Shi Hu<sup>1</sup>, Xi Chen<sup>1</sup>, Huitao Zhang<sup>1</sup>, Zitong Yu<sup>1</sup>,  
Hang Guo<sup>2</sup>, and Hui Yang<sup>1</sup>  
<sup>1</sup>*Chinese Academy of Sciences, CHINA* and  
<sup>2</sup>*Xiamen University, CHINA*

17:00 - 17:20

**3A3-3 ADVANTAGE-COMPLEMENTARY-HETEROMULTIVALENCY ENGINEERING CAN FACILITATE TARGETED CELL CAPTURING ON MICROFLUIDIC AFFINITY CHIPS**

Jiajun Ling, Chaoyong Yang, and Yanling Song  
*Xiamen University, CHINA*

17:20 - 17:40

**3A3-4 A PORTABLE MICROFLUIDIC CHIP FOR RAPID AND SENSITIVE DRUG DETECTION USING COMPETITIVE IMMUNOASSAYS**

Fan Yang, Guangyang Li, Xiaozhi Wang, Shurong Dong,  
and Zhen Cao  
*Zhejiang University, CHINA*



## Session 3B3 - Sensing

16:20 - 16:40

**3B3-1 A TOUCH-BASED ALCOHOL INTAKE DETECTION SYSTEM FOR IN-VEHICLE BIO-AUTHENTICATION AND DUI PREVENTION**

Jialun Zhu, Shuyu Lin, Wenzhuo Yu, and Sam Emaminejad  
*University of California, Los Angeles, USA*

16:40 - 17:00

**3B3-2 WIRELESS SOIL PH SENSING IN OUTDOOR ENVIRONMENT WITH PH-SELECTIVE FULLY-DEGRADABLE METAMATERIAL ANTENNA**

Ken Sakabe<sup>1</sup>, Tetsuo Kan<sup>2</sup>, and Hiroaki Onoe<sup>1</sup>

<sup>1</sup>*Keio University, JAPAN and*

<sup>2</sup>*University of Electro-Communications, JAPAN*

17:00 - 17:20

**3B3-3 MULTIPLEX ANTIBIOTIC SUSCEPTIBILITY TESTING USING AN ELECTROCHEMICAL MICROFLUIDIC DEVICE**

Benjamin Crane<sup>1</sup>, Alex Iles<sup>2</sup>, Craig E. Banks<sup>1</sup>, Mamun Rashid<sup>1</sup>, Patricia E. Linton<sup>1</sup>, and Kirsty J. Shaw<sup>1</sup>

<sup>1</sup>*Manchester Metropolitan University, UK and*

<sup>2</sup>*University of Hull, UK*

17:20 - 17:40

**3B3-4 ELECTRODEIONIZATION WITH A POROUS ION EXCHANGE STRUCTURE FOR ULTRAHIGH SALINITY LIQUID DESICCANT REGENERATION**

Yeonuk Yu<sup>1</sup>, Sudong Park<sup>1</sup>, Jongyoon Han<sup>2</sup>, and Rhokyun Kwak<sup>1</sup>

<sup>1</sup>*Hanyang University, KOREA and*

<sup>2</sup>*Massachusetts Institute of Technology, USA*

## Session 3C3 - Biochemical Analysis III

16:20 - 16:40

**3C3-1 REMOTELY CONTROLLABLE DNA MICROFLOW**

Hirotake Udono<sup>1</sup>, Shin-ichiro M. Nomura<sup>2</sup>, and Masahiro Takinoue<sup>1</sup>

<sup>1</sup>*Tokyo Institute of Technology, JAPAN and*

<sup>2</sup>*Tohoku University, JAPAN*

16:40 - 17:00

**3C3-2 LAB-ON-A-PARTICLE ASSAY AND PORTABLE READER FOR ACCESSIBLE MONITORING OF HEART FAILURE**

Vishwesh Shah<sup>1</sup>, Xilin Yang<sup>1</sup>, Mengxing Ouyang<sup>1</sup>, Alyssa Arnheim<sup>1</sup>, Hatice Koydemir<sup>2</sup>, Derek Tseng<sup>1</sup>, Yi Luo<sup>1</sup>, Shreya Udani<sup>1</sup>, Ghulam Destgeer<sup>1</sup>, Aydogan Ozcan<sup>1</sup>, and Dino Di Carlo<sup>1</sup>

<sup>1</sup>*University of California, Los Angeles, USA and*

<sup>2</sup>*Texas A&M University, USA*





17:00 - 17:20

**3C3-3 INTEGRATED RNA EXTRACTION AND RT-LAMP FOR RAPID AND AUTOMATED DETECTION OF SARS-COV-2 USING CENTRIFUGAL MICROFLUIDIC SYSTEM**

Lidija Malic, Daniel Brassard, Dillon Da Fonte, Christina Nassif, Maxence Mounier, André Ponton, Matthias Geissler, Matthew Shiu, Keith J. Morton, and Teodor Veres

*National Research Council, CANADA*

17:20 - 17:40

**3C3-4 AN INTEGRATED MICROFLUIDIC DEVICE FOR AUTOMATED DETECTION OF CANCER CELLS FROM BILE FOR CHOLANGIOCARCINOMA PROGNOSIS**

Jui-Lin Chang<sup>1</sup>, Yi-Cheng Tsai<sup>1</sup>, Nai-Jung Chiang<sup>2,3,5</sup>, Chien-Jui Huang<sup>4</sup>, Yu-Shan Huang<sup>4</sup>, Shang-Cheng Hung<sup>6,7</sup>, Yan-Shen Shan<sup>4</sup>, and Gwo-Bin Lee<sup>1</sup>

<sup>1</sup>*National Tsing Hua University, TAIWAN,*

<sup>2</sup>*Taipei Veterans General Hospital, TAIWAN,*

<sup>3</sup>*National Yang Ming Chiao Tung University, TAIWAN,*

<sup>4</sup>*National Cheng Kung University, TAIWAN,*

<sup>5</sup>*National Health Research Institutes, TAIWAN,*

<sup>6</sup>*Academia Sinica, TAIWAN, and*

<sup>7</sup>*National Taitung University, TAIWAN*

22:00 – 23:30

**Virtual Poster Session 3 Gather.Town** - Presentations are listed by topic category with their assigned number starting on page 68.



Hangzhou - Umbrellas Hanging from Tree. By Peter Hempel from Pixabay.



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**8.006** Q1

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- ▶ 8-256 channels
- ▶ 100Hz-1MHz,
- ▶ Measure range: mOhm-GOhm
- ▶ Accuracy 0.1%
- ▶ Test speed of up to 100fps

## Bioimpedance analyzer EIS



- ▶ 10mHz-10MHz
- ▶ Measure range: mOhm-Gohm
- ▶ Accuracy 0.1%
- ▶ Can scan up to 2048 frequencies
- ▶ Current or voltage excitation, 2,3,4 electrode configuration is supported
- ▶ With single channel, double channel, multi - channel mode
- ▶ Support for EIT portfolio testing



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## THURSDAY AT A GLANCE

### THURSDAY, 27 OCTOBER

08:45-09:05	Microsystems & Nanoengineering/Springer Nature Test of Time Award		
09:05-09:50	Plenary Presentation VI Joyce Poon – <i>University of Toronto, CANADA</i>		
09:50-10:05	Transition		
10:05-11:35	Session 4A1 Biosensing II and MEMS II	Session 4B1 Droplet-Based Microfluidics III	Session 4C1 MEMS III
	KEYNOTE Xiaojie Duan	KEYNOTE Dong Pyo Kim	KEYNOTE Itai Cohen
11:35-12:05	Break and Virtual Exhibit Inspection – Gather.Town		
12:05-12:45	Awards Ceremony		
12:45-13:00	Closing Remarks		
13:00	Conference Adjourns		

## THURSDAY, 27 OCTOBER

### Microsystems and Nanoengineering/Springer Nature Test of Time Award

08:45 - 09:05

#### ACOUSTOFLUIDICS - FROM A FAILED EXPERIMENT TO A MICROFLUIDIC WORKHORSE

Thomas Laurell

*Lund University, SWEDEN*

### PLENARY PRESENTATION VI

09:05 - 09:50

#### 4PL-6 INTEGRATED PHOTONICS FOR NEUROTECHNOLOGIES Joyce Poon<sup>1,2</sup>

<sup>1</sup>*University of Toronto, CANADA and*

<sup>2</sup>*Max Planck Institute of Microstructure Physics, GERMANY*

09:50 - 10:05 Transition

### Session 4A1 - Biosensing II and MEMS II

10:05 - 10:35

#### 4A1-1 KEYNOTE PRESENTATION MICROELECTRODE TECHNOLOGIES FOR BIOCOMPATIBLE AND MULTI-FUNCTIONAL NEURAL INTERFACING Xiaojie Duan

*Peking University, CHINA*

10:35 - 10:55

#### 4A1-2 BARBED MICRONEEDLES ELECTRODE FOR HIGH-QUALITY SIGNAL DETECTION DURING HUMAN MOVEMENT Yingjie Ren, Junshi Li, Zhongyan Wang, Zhitong Zhang, and Zhihong Li

*Peking University, CHINA*



## Session 4A1 - Biosensing II and MEMS II (continued)

10:55 - 11:15

**4A1-3 MICROFLUIDIC VISCOMETER BASED ON SUSPENDED U-SHAPED ELECTRODE MADE OF CONDUCTING ELASTOMER**

Wei Guan, Tianyi Li, Duli Yu, and Xiaoxing Xing  
*Beijing University of Chemical Technology, CHINA*

11:15 - 11:35

**4A1-4 HYBRID MICROMOTOR POWERED BY TRIPLE ENERGY SOURCES**

Sankha Shuvra Das<sup>1</sup>, Shahar Erez<sup>1,2</sup>, Emil Karshalev<sup>2</sup>,  
Yue Wu<sup>1</sup>, Joseph Wang<sup>2</sup>, and Gilad Yossifon<sup>1</sup>  
<sup>1</sup>*Technion-Israel Institute of Technology, ISRAEL and*  
<sup>2</sup>*University of California, San Diego, USA*

## Session 4B1 - Droplet-Based Microfluidics III

10:05 - 10:35

**4B1-1 KEYNOTE PRESENTATION  
NANOSTRUCTURED APPROACHES FOR ENCAPSULATION OF ENZYME AND DRUG ON NANOPARTICLE AND CELL-BASED CARRIERS**

**Dong-Pyo Kim**

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

10:35 - 10:55

**4B1-2 OPTIMIZATION OF THE CELL-FREE PROTEIN SYNTHESIS IN MONODISPERSE LIPOSOMES PRODUCED BY MICROFLUIDICS**

Ryota Ushiyama<sup>1</sup>, Reiko Sato<sup>1</sup>, Mamiko Tsugane<sup>1</sup>,  
Tomoaki Matsuura<sup>2</sup>, and Hiroaki Suzuki<sup>1</sup>  
<sup>1</sup>*Chuo University, JAPAN and* <sup>2</sup>*Tokyo Institute of Technology, JAPAN*

10:55 - 11:15

**4B1-3 DROPLET DIGITAL MICROFLUIDIC SYSTEM FOR SCREENING FILAMENTOUS FUNGI BASED ON ENZYMATIC ACTIVITY**

Chiara Leal Alves, Kenza Samlali, and Steve C.C. Shih  
*Concordia University, CANADA*

11:15 - 11:35

**4B1-4 COMPUTATIONAL DNA DROPLETS BASED ON LIQUID-LIQUID PHASE SEPARATION FOR CANCER DIAGNOSIS**

Jing Gong<sup>1</sup>, Nozomi Tsumura<sup>1</sup>, Yusuke Sato<sup>2</sup>,  
and Masahiro Takinoue<sup>1</sup>  
<sup>1</sup>*Tokyo Institute of Technology, JAPAN and*  
<sup>2</sup>*Kyushu Institute of Technology, JAPAN*

## Session 4C1 - MEMS III

10:05 - 10:35

**4C1-1 KEYNOTE PRESENTATION  
ELECTRONICALLY INTEGRATED MICROSCOPIC ROBOTS**

**Itai Cohen**

*Cornell University, USA*





## Session 4C1 - MEMS III (continued)

10:35 - 10:55

**4C1-2 ELECTROSTATIC MICROFILTRATION ENRICHES LOW-ABUNDANCE BACTERIA AND IMPROVES DOWNSTREAM DETECTION**

Yaoping Liu<sup>1</sup>, Joshua Raymond<sup>1</sup>, Xiaolin Wu<sup>1</sup>, Stacy L. Springs<sup>1,2</sup>, Timothy K. Lu<sup>1,2</sup>, Hanry Yu<sup>1,3,4</sup>, and Jongyoon Han<sup>1,2</sup>

<sup>1</sup>Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE, <sup>2</sup>Massachusetts Institute of Technology (MIT), USA,

<sup>3</sup>Agency for Science, Technology and Research (A\*STAR), SINGAPORE, and <sup>4</sup>National University of Singapore, SINGAPORE

10:55 - 11:15

**4C1-3 SPIDER INSPIRED SILK FIBROIN FIBER ACTUATOR BY MICROFLUIDIC SPINNING**

Ronghui Wu, Juyeol Bae, and Taesung Kim

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

11:15 - 11:35

**4C1-4 HIGH-THROUGHPUT MICROFLUIDIC DROPLET GENERATOR IMPLEMENTING INVERSE OPAL STRUCTURE AS PARALLEL MICRNOZZLES**

Shota Mashiyama, Runa Hemmi, Takeru Sato, Masumi Yamada, and Minoru Seki

Chiba University, JAPAN

11:35 - 12:05 Break and Virtual Exhibit Inspection – Gather.Town

## Awards Ceremony and Closing Remarks

12:05 - 12:45 – AWARD CEREMONY

- **CHEMINAS**  
Young Researcher Poster Awards
- **Royal Society of Chemistry/Lab on a Chip**  
Widmer Poster Award
- **Sensors (MDPI)**  
Outstanding Sensors and Actuators, Detection Technologies Poster Award
- **IMT Masken und Teilungen AG**  
Microfluidics on Glass Poster Award
- **Micromachines (MDPI)**  
Outstanding Tissue or Organ on Chip Microsystems Poster Award
- **NIST and Lab on a Chip**  
Art in Science Award
- **Biomicrofluidics (AIP)**  
Best Paper Award
- **Elsevier Sensors and Actuators B. Chemical**  
Best Paper Award
- **Microsystems & Nanoengineering/Springer Nature**  
Best Talk Award

12:45 - 13:00 – CLOSING REMARKS

### MicroTAS 2022 Conference Chairs

**Chair:** Qun Fang, Zhejiang University, CHINA

**Co-Chair:** Xing-Hua Xia, Nanjing University, CHINA

**Co-Chair:** Jian-Hua Qin, Dalian Institute of Chemical Physics, CHINA

**Co-Chair:** Yan-Yi Huang, Peking University, CHINA

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**Honorary Chair:** Hong-Yuan Chen, Nanjing University, CHINA

13:00 – CONFERENCE ADJOURNS



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## POSTER PRESENTATIONS

**MONDAY**  
22:00 - 23:30

**TUESDAY**  
05:00 - 06:30

**WEDNESDAY**  
22:00 - 23:30

All times listed in this program are Chinese Standard Time (CST).

## CLASSIFICATION CHART

(last character of poster number)

<b>a</b>	<b>Cells, Organisms and Organs on a Chip</b>
<b>b</b>	<b>Diagnostics, Drug Testing and Personalized Medicine</b>
<b>c</b>	<b>Fundamentals in Microfluidics and Nanofluidics</b>
<b>d</b>	<b>Integrated Microfluidic Platforms</b>
<b>e</b>	<b>Micro- and Nanoengineering</b>
<b>f</b>	<b>Sensors and Detection Technologies</b>
<b>g</b>	<b>Other Applications of Microfluidics</b>
<b>h</b>	<b>Late News</b>

### a - Cells, Organisms and Organs on a Chip

#### Bioinspired, Biomimetic & Biohybrid Devices

- M001.a** **AN ARTIFICIAL BASEMENT MEMBRANE ENABLES TUMOR INTRAVASATION MICROENVIRONMENT REMODELING AND ANTI-METASTATIC DRUG SCREENING**  
Xin-Xin Xu<sup>1</sup>, Ya-Jun Wang<sup>1</sup>, Qi-Yuan Bao<sup>2</sup>, Wei Liu<sup>1</sup>, Yang Du<sup>1</sup>, Yu-Lian Zeng<sup>2</sup>, Yu-Chen Chen<sup>1</sup>, Sai-Xi Yu<sup>1</sup>, Hong Liang<sup>1</sup>, Yu-Hui Shen<sup>2</sup>, Jian Shi<sup>3</sup>, and Yan-Jun Liu<sup>1</sup>  
<sup>1</sup>Fudan University, CHINA, <sup>2</sup>Shanghai Jiaotong University School of Medicine, CHINA, and <sup>3</sup>MesoBioTech, FRANCE
- M002.a** **CB-PDMS BASED CELLULAR SENSOR ARRAY FOR HIGH LIGHT-SHIELDING SENSING APPLICATIONS**  
Yujia Lian, Haruka Oda, Minghao Nie, and Shoji Takeuchi  
University of Tokyo, JAPAN
- M003.a** **ESCAPING BEHAVIOR OF SPERM IN OVIDUCT CHIP**  
Sai-Xi Yu<sup>1</sup>, Yi Wu<sup>1</sup>, Hao Luo<sup>2</sup>, Yanan Liu<sup>2</sup>, Yu-Chen Chen<sup>1</sup>, Ya-Jun Wang<sup>1</sup>, Wei Liu<sup>1</sup>, Jianan Tang<sup>1</sup>, Huijuan Shi<sup>1</sup>, Hai Gao<sup>1</sup>, Guangyin Jing<sup>2</sup>, and Yan-Jun Liu<sup>1</sup>  
<sup>1</sup>Fudan University, CHINA and <sup>2</sup>Northwest University, CHINA
- M004.a** **TARGETED SYNTHESIS OF BIOMIMETIC CELL WALL FOR CIRCULATING TUMOR CELL IDENTIFICATION AND PROTECTION**  
Xiyuan Yu<sup>1,2</sup>, Wei Lin<sup>1,2</sup>, Zhi Zhu<sup>1</sup>, Huimin Zhang<sup>2</sup>, and Chaoyong Yang<sup>1,2</sup>  
<sup>1</sup>Xiamen University, CHINA and <sup>2</sup>Innovation Laboratory for Sciences and Technologies of Energy Materials of Fujian Province, CHINA
- M005.a** **TENSEGRITY ROBOT ACTUATED BY CULTURED SKELETAL MUSCLE TISSUE**  
Kazuma Morita, Yuya Morimoto, and Shoji Takeuchi  
University of Tokyo, JAPAN

- T001.a BIOENGINEERING HUMAN AIRWAY MIMETIC INTEGRATING AIRFLOW**  
Kayshani R. Kanagarajah<sup>1,2</sup>, Wuyang Gao<sup>2</sup>,  
Christine Bear<sup>1</sup>, Theo Moraes<sup>1</sup>, Keith Morton<sup>3</sup>,  
Teodor Veres<sup>3</sup>, Axel Guenther<sup>2</sup>, and Amy P. Wong<sup>1,2</sup>  
<sup>1</sup>Hospital for Sick Children, CANADA, <sup>2</sup>University of Toronto,  
CANADA, and <sup>3</sup>National Research Council Canada, CANADA
- T002.a BIOHYBRID DEVICE WITH YEAST AS A SENSOR ELEMENT EXPRESSING DRYING RESISTANCE**  
Kazuki Nishimoto, Haruka Oda, Yuya Morimoto,  
and Shoji Takeuchi  
*University of Tokyo, JAPAN*
- T003.a FORMATION OF LIPID BILAYER AT AN INTERFACE BETWEEN PARALLEL MICROCHANNELS BY OPERATION OF AQUEOUS/ORGANIC PARALLEL TWO-PHASE FLOW**  
Naoyuki Takezoe and Yutaka Kazoe  
*Keio University, JAPAN*
- T004.a MAGNETIC BLOOD VESSEL DEVICES AS VASCULARIZATION MODELS**  
Ana C. Manjua<sup>1,2</sup>, Joaquim M. S. Cabral<sup>2</sup>,  
Frederico Castelo Ferreira<sup>2</sup>, Han Gardeniers<sup>3</sup>,  
Carla A.M. Portugal<sup>1</sup>, and Burcu Gumuscu<sup>3,4</sup>  
<sup>1</sup>NOVA School of Science and Technology, PORTUGAL,  
<sup>2</sup>Universidade de Lisboa, PORTUGAL,  
<sup>3</sup>University of Twente, NETHERLANDS, and  
<sup>4</sup>Eindhoven University of Technology, NETHERLANDS
- W001.a BIOINSPIRED ORGAN-ON-A-CHIP COMPATIBLE FLOW SENSORS BASED ON MAGNETIC ARTIFICIAL CILIA**  
Bhavana B. Venkataramanachar, Max Verhoef,  
Tanveer ul Islam, and Jaap M.J. den Toonder  
*Eindhoven University of Technology, NETHERLANDS*
- W002.a BIOINSPIRED ROSE PETAL DERIVED ZnO MICRODEVICE FOR ENHANCED CAPTURE AND RELEASE OF CIRCULATING TUMOR CELLS**  
Le Wang, Song Huang, Qin-Ying Li, Ming Jiang,  
Xu Yu, and Li Xu  
*Huazhong University of Science and Technology, CHINA*
- W003.a EXPLORING THE MECHANISM OF COLORECTAL CANCER METASTASIS AND ITS MICROENVIRONMENT USING HYDROGEL INCORPORATED BIOMIMETIC CHIP**  
Yi-Hsuan Lin<sup>1</sup>, Long-Sheng Lu<sup>2</sup>, and Fan-Gang Tseng<sup>1,3</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN, <sup>2</sup>Taipei Medical  
University Hospital, TAIWAN, and <sup>3</sup>Academia Sinica, TAIWAN
- W004.a PILLAR ARRAY ELECTRODE FOR THE ELECTRICAL STIMULATION OF SKELETAL MUSCLE TISSUE**  
Tingyu Li<sup>1</sup>, Minghao Nie<sup>1</sup>, Yuya Morimoto<sup>1</sup>, Junshi Li<sup>2</sup>,  
Yingjie Ren<sup>2</sup>, Dong Huang<sup>2</sup>, Zhihong Li<sup>2</sup>, and Shoji Takeuchi<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Peking University, CHINA



## a - Cells, Organisms and Organs on a Chip

### Cell Capture, Counting, and Sorting

- M006.a** **COMBINED MOLECULAR AND MORPHOLOGICAL IMAGING OF CTCs FOR HER2-TARGETED CHEMOTHERAPY GUIDANCE**  
Haimeng Pei, Zhaojun Han, Chang Xu, Lu Li, and Bo Tang  
*Shandong Normal University, CHINA*
- M007.a** **COMPUTATIONAL STUDY OF INERTIAL MIGRATION OF PROLATE PARTICLES IN A STRAIGHT RECTANGULAR CHANNEL**  
Giuseppe Lauricella<sup>1,2</sup>, Jian Zhou<sup>2</sup>, Qiyue Luan<sup>2</sup>, Ian Papautsky<sup>2</sup>, and Zhangli Peng<sup>2</sup>  
<sup>1</sup>*University of Illinois, Chicago, USA* and <sup>2</sup>*Politecnico di Milano, ITALY*
- M008.a** **DONUT-STEP COMBINED MICROCHANNELS FOR HIGH-EFFICIENT INERTIAL PARTICLE FOCUSING**  
Yang Wang, Yang Lou, Shirong Chen, Gaobin Xu, and Jianguo Feng  
*Hefei University of Technology, CHINA*
- M009.a** **ENHANCED AND TUNABLE CELL ADHESION ON 3D-PATTERNED HIERARCHICAL NANOINTERFACE TO TRACK THE PHENOTYPIC DYNAMICS OF CIRCULATING TUMOR CELLS**  
Lianyu Lu<sup>1</sup>, Peng Zhang<sup>2</sup>, and Chaoyong Yang<sup>1,2</sup>  
<sup>1</sup>*Xiamen University, CHINA* and <sup>2</sup>*Shanghai Jiao Tong University, CHINA*
- M010.a** **HIGH-THROUGHPUT MICROFLUIDIC DEVICE FOR SPERM SORTING**  
Nian-Je Wu<sup>1</sup>, Hsien-Chih Peng<sup>1</sup>, I-Jui Chen<sup>1</sup>, Ren-Guei Wu<sup>1</sup>, and Fan-Gang Tseng<sup>1,2</sup>  
<sup>1</sup>*National Tsing Hua University, TAIWAN* and <sup>2</sup>*Academia Sinica, TAIWAN*
- M011.a** **LABEL-FREE SORTING OF ADIPOCYTES AT DIFFERENT STAGES OF DIFFERENTIATION BY PASSIVE MICROFLUIDICS**  
Gloria Porro<sup>1</sup>, Rita Sarkis<sup>2</sup>, Clara Orbeagozo<sup>2</sup>, Lucie M.D. Godot<sup>1</sup>, Olaia Naveiras<sup>2</sup>, and Carlotta Guiducci<sup>1</sup>  
<sup>1</sup>*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND* and <sup>2</sup>*Université de Lausanne (UNIL), SWITZERLAND*
- M012.a** **MACHINE LEARNING BASED CLASSIFICATION OF CELLS BY MECHANICAL PROPERTIES IN MICROFLUIDIC DEVICE**  
Ratul Paul, Shen Wang, Daniel Karkhut, Linxi Yang, Zach Laswick, Daolong Liu, Muyuan He, Joshua C. Agar, and Yaling Liu  
*Lehigh University, USA*
- M013.a** **MICROFLUIDIC PLATFORM FOR THE IDENTIFICATION OF MICROORGANISMS THAT PRODUCE METABOLITES WITH BIOLOGICAL ACTIVITY**  
Abraham Ochoa-Guerrero<sup>1</sup>, Gabriela Gastélum<sup>2</sup>, Jorge Rocha<sup>2</sup>, and Luis F. Olguin<sup>1</sup>  
<sup>1</sup>*Universidad Nacional Autónoma de México (UNAM), MEXICO* and <sup>2</sup>*Centro de Investigación en Alimentación y Desarrollo A.C., MEXICO*
- M014.a** **NUMERICAL OPTIMIZATION OF MICROFLUIDIC TRAPS FOR CAPTURE OF CIRCULATING TUMOR CELLS**  
Sara Cardona, Nima Mostafazadeh, Jian Zhou, Zhangli Peng, and Ian Papautsky  
*University of Illinois, Chicago, USA*



## Cell Capture, Counting, and Sorting

- M015.a ON-CHIP SINGLE CELL CHARACTERIZATION AND MANIPULATION FOR MASS SPECTROMETRY**  
Junwen Zhu, Yongxiang Feng, Peng Zhao, Huichao Chai, Fei Liang, and Wenhui Wang  
*Tsinghua University, CHINA*
- M016.a OPTICALLY-CONTROLLED MICROMANIPULATION USING VARIABLE STIFFNESS MICROGRIPPER COMPRISED OF PHOTOCROMIC MATERIAL**  
Hisataka Maruyama and Kazuya Honjo  
*Nagoya University, JAPAN*
- M017.a SEPARATION OF SINGLET AND CLUSTERS OF GROUP A STREPTOCOCCI USING DETERMINISTIC LATERAL DISPLACEMENT AND FILTER SONICATION**  
Elham Akbari, Jason P. Beech, Sebastian Wrighton, Pontus Nordenfelt, and Jonas O. Tegenfeldt  
*Lund University, SWEDEN*
- T005.a A SINGLE-CELL pDEP CAPTURE ARRAY FOR NANODIJECTION APPLICATIONS**  
Marc S. Chooljian, Amir Tahmasebipour, Lewis Pietropaoli, and Yu Ting Chow  
*Mekonos Inc., USA*
- T006.a ADVANCED SPERMATOZOA TRACKING IN MICROFLUIDICS AS PRECISE TOOL FOR LABEL-FREE SEMEN CLASSIFICATION**  
David Dannhauser<sup>1</sup>, Luigi F. Canonico<sup>1</sup>, Claudia De Clemente<sup>1</sup>, Maria I. Maremonti<sup>1</sup>, Filippo Causa<sup>1</sup>, and Paolo A. Netti<sup>1,2</sup>  
<sup>1</sup>University of Naples, ITALY and <sup>2</sup>Istituto Italiano di Tecnologia, ITALY
- T007.a CONTINUOUS RAMAN ACTIVATED CELL SORTING WITH MACHINE LEARNING**  
Yecang Chen, Yuchen Fu, Xiaofei Yuan, Andrew Glidle, Umer Ijaz, and Huabing Yin  
*University of Glasgow, UK*
- T008.a THE DEVELOPMENT OF A 3-DIMENSIONAL HYDRODYNAMIC FOCUSING IMPEDANCE CYTOMETER**  
Yang Zhou<sup>1,2</sup>, Man Wu<sup>1</sup>, Yaru Huang<sup>3</sup>, Tong Qi<sup>1</sup>, Weihang Fang<sup>4</sup>, Chunping Jia<sup>1</sup>, and Jianlong Zhao<sup>1,2</sup>  
<sup>1</sup>Shanghai Institute of Microsystem and Information Technology, CHINA, <sup>2</sup>University of Chinese Academy of Sciences, CHINA, <sup>3</sup>Shanghai Normal University, CHINA, and <sup>4</sup>Shanghai Pinghe School, CHINA
- W005.a 3D-STACKED MULTI-STAGE INERTIAL MICROFLUIDIC CHIP FOR HIGH-THROUGHPUT ENRICHMENT OF CIRCULATING TUMOR CELLS**  
Jingjing Sun<sup>1</sup>, Xiwei Huang<sup>1</sup>, Xuefeng Xu<sup>1</sup>, Jin Chen<sup>1</sup>, Guohua Wu<sup>2</sup>, Shuqi Wang<sup>2</sup>, Jinhong Guo<sup>3</sup>, and Lingling Sun<sup>1</sup>  
<sup>1</sup>Hangzhou Dianzi University, CHINA, <sup>2</sup>Zhejiang University, CHINA, and <sup>3</sup>Shanghai Jiao Tong University, CHINA
- W006.a ISOLATION OF MITOCHONDRIAL SUBPOPULATIONS BY INERTIAL MICROFLUIDICS**  
Shirui Zhao, Thomas Ting Hei Chan, Fuyang Qu, Kathrine Nygaard Borg, and Yi-Ping Ho  
*Chinese University of Hong Kong, HONG KONG*



## Cell Capture, Counting, and Sorting

### **W007.a MICROFLUIDIC CHIP-BASED NONINVASIVE REMISSION STATUS MONITORING AND PROGNOSIS PREDICTION OF ACUTE MYELOID LEUKEMIA**

Juan Song<sup>1</sup>, Huimin Zhang<sup>2</sup>, and Chaoyong Yang<sup>1,2</sup>  
<sup>1</sup>Xiamen University, CHINA and <sup>2</sup>Innovation Laboratory for Sciences and Technologies of Energy Materials of Fujian Province (IKKEM), CHINA

### **W008.a SORTING OF BREAST CANCER CELL INTO DIFFERENT SUBPOPULATIONS TOWARDS LONG-TERM OBSERVATION**

Esra Yilmaz, Jason P. Beech, and Jonas O. Tegenfeldt  
Lund University, SWEDEN

## a - Cells, Organisms and Organs on a Chip

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

### **M018.a FRAGMENTED COLLAGEN MICROFIBER-ASSISTED FORMATION OF SKIN TISSUE MODELS WITH TUNALBE CELL/MATRIX DENSITIES**

Yuri Shimoda, Keigo Yamanaka, Masumi Yamada, Rie Utoh, and Minoru Seki  
Chiba University, JAPAN

### **M019.a HIGH-THROUGHPUT GENERATION OF GRADIENT SPHEROID ARRAY USING HANGING DROP MICROARRAY AND SHAPE-GUIDING BLOCK**

Hwisoo Kim and Je-Kyun Park  
Korea Advanced Institute of Science and Technology (KAIST), KOREA

### **M020.a MICROFLUIDIC DEVICE FOR LOCAL DIFFERENTIATION INDUCTION OF IPS CELLS-DERIVED EMBRYOID BODIES**

Naoto Kusunoki<sup>1</sup>, Shuhei Konagaya<sup>2</sup>, Mitsunori Nishida<sup>3</sup>, Shigehiro Sato<sup>3</sup>, Hidekuni Takao<sup>1</sup>, Fusao Shimokawa<sup>1</sup>, and Kyohei Terao<sup>1</sup>  
<sup>1</sup>Kagawa University, JAPAN, <sup>2</sup>Kyoto University, JAPAN, and <sup>3</sup>TAZMO Co., Ltd., JAPAN

### **M021.a MICROFLUIDIC NMR FOR IN SITU CULTURE AND METABOLOMIC ANALYSIS OF HEPATOCELLULAR CARCINOMA CELL LINES**

Evie Rogers, Sylwia Barker, Manvendra Sharma, Bishnubrata Patra, Salim Khakoo, and Marcel Utz  
University of Southampton, UK

### **T009.a A NEW BODY-ON-A-CHIP MICROSYSTEM FOR THE STUDY OF EARLY-STAGE OF OVARIAN CANCER METASTASIS**

Magdalena Flont, Dominik Kołodziejek, Artur Dybko, and Elżbieta Jastrzębska  
Warsaw University of Technology, POLAND

### **T010.a BIOPRINTING SOFT COLLAGEN TISSUES EMBEDDED WITH PERFUSABLE BRANCHING CHANNELS**

Tomohiro Morita, Minghao Nie, Shigenori Miura, and Shoji Takeuchi  
University of Tokyo, JAPAN



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

- T011.a FORMATION OF INTESTINAL EPITHELIAL MONOLAYER ON VARIOUS FOLLICLE GEOMETRIES TO MIMIC THE PEYER'S PATCH**  
Jongho Park, Gihyun Lee, and Je-kyun Park  
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*
- T012.a LIQUID MARBLE - A NOVEL HIGH YIELD PHOTO-MICROREACTOR PLATFORM**  
Nhat-Khuong Nguyen, Pradip Singha, Ann Chuang, Gregor Kijanka, Michele Burford, Nam-Trung Nguyen, and Chin Hong Ooi  
*Griffith University, AUSTRALIA*
- T013.a PATIENT-SPECIFIC HIGH-THROUGHPUT DRUG SCREENING IN MICROWELLS**  
Qiyue Luan<sup>1,2</sup>, Ines Pulido<sup>1,2</sup>, Jian Zhou<sup>1,2</sup>  
Takeshi Shimamura<sup>1,2</sup>, and Ian Papautsky<sup>1,2</sup>  
<sup>1</sup>*University of Illinois, Chicago, USA and*  
<sup>2</sup>*University of Illinois Cancer Center, USA*
- T014.a REVERSIBLE BONDING OF THERMOPLASTIC ELASTOMERS FOR CELL AND TISSUE HARVESTING APPLICATIONS**  
Byeong-Ui Moon<sup>1</sup>, Kebin Li<sup>1</sup>, Caroline Miville-Godin<sup>1</sup>, Lidija Malic<sup>1</sup>, Edmond Young<sup>2</sup>, Sowmya Viswanathan<sup>2,3</sup>, and Teodor Veres<sup>1</sup>  
<sup>1</sup>*National Research Council, CANADA,*  
<sup>2</sup>*University of Toronto, CANADA,*  
*and* <sup>3</sup>*University Health Network, CANADA*
- T015.a ROD-SHAPED OSTEOBLASTIC TISSUES FABRICATED USING TISSUE MOLDING METHOD WITH MICRO-ANCHOR DEVICES**  
Kohei Fukushima, Minghao Nie, Shigenori Miura, Yuya Morimoto, and Shoji Takeuchi  
*University of Tokyo, JAPAN*
- W009.a A TUMOR-ON-A-CHIP MICROFLUIDIC PLATFORM FOR IMMUNE CELL INFILTRATION STUDY**  
Yu-Chen Chen<sup>1</sup>, Kang-Yun Lee<sup>2</sup>, Wei-Lun Sun<sup>2</sup>, Wan-Chen Huang<sup>3</sup>, Wei-Chiao Chang<sup>4</sup>, and Cheng-Hsien Liu<sup>1</sup>  
<sup>1</sup>*National Tsing Hua University, TAIWAN,* <sup>2</sup>*Shuang Ho Hospital, TAIWAN,* <sup>3</sup>*Academia Sinica, TAIWAN,* and <sup>4</sup>*Taipei Medical University, TAIWAN*
- W010.a DROPLET INCUBATOR: A NEW DROPLET-BASED MODEL TO INVESTIGATE LIVING CELL-SYNTHETIC CELL INTERACTIONS**  
Pantelitsa Dimitriou, Jin Li, Giusy Tornillo, Matthew J. Smalley, and David A. Barrow  
*Cardiff University, UK*
- W011.a DYNAMIC VANISHING CHARACTERISTICS OF CONFINED MICROBUBBLES DURING PROTEIN PATTERNING**  
Yechang Guo<sup>1</sup>, Tingting Hun<sup>1</sup>, Peiyue Li<sup>1</sup>, Zhou Yang<sup>3</sup>, Shaofeng Wang<sup>3</sup>, Hao Wang<sup>1</sup>, Pan Zhang<sup>1</sup>, and Wei Wang<sup>1,2</sup>  
<sup>1</sup>*Peking University, CHINA,* <sup>2</sup>*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA,* and  
<sup>3</sup>*China University of Geosciences, CHINA*



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

- W012.a** **HYPOXIA SIMULATION IN PC-PDMS-PC MICROSYSTEM INTEGRATED WITH NANOFIBROUS MATS**  
Dominik Kołodziejek, Urszula Sierańska, Michal Wojasiński, Iwona Łopianiak, Zbigniew Brzozka, and Elzbieta Jastrzebska  
*Warsaw University of Technology, POLAND*
- W013.a** **OPEN MICROFLUIDIC SYSTEM FOR PATTERNING CHEMOTACTIC GRADIENTS IN CELL-LADEN HYDROGELS TO DIRECT MIGRATION**  
Aditya Rane, Steven Tate, Hui Zong, Benjamin Purow, and Nathan Swami  
*University of Virginia, USA*

## a - Cells, Organisms and Organs on a Chip

### Inter-and Intracellular Signaling, Cell Migration

- M022.a** **CELLS DECIPHER THE INTEGRATED CHEMICAL AND FLUIDIC CUES AS TERNARY LOGIC PROCESSOR FOR DIRECTED MIGRATION**  
Hye-ran Moon<sup>1</sup>, Soutick Saha<sup>1</sup>, Andrew J. Mugler<sup>1,2</sup>, and Bumsoo Han<sup>1</sup>  
*<sup>1</sup>Purdue University, USA and <sup>2</sup>University of Pittsburgh, USA*
- M023.a** **IN SITU MONITORING OF PTK7 DURING CELL MIGRATION BASED ON A SERS-MICROFLUIDIC PLATFORM**  
Xiao-Peng Liu, Jie Wang, Wen-Shu Zhang, Yue Wang, and Zhang-Run Xu  
*Northeastern University, CHINA*
- T016.a** **AN OPEN MICROFLUIDIC COCULTURE MODEL OF EOSINOPHILS AND FIBROBLASTS TO INVESTIGATE MECHANISMS OF AIRWAY INFLAMMATION**  
Yuting Zeng<sup>1</sup>, Xiaojing Su<sup>1</sup>, Meg G. Takezawa<sup>1</sup>, Paul S. Fichtinger<sup>2</sup>, Ulri N. Lee<sup>1</sup>, Jeffery W. Pippin<sup>1</sup>, Stuart J. Shankland<sup>1</sup>, Fang Yun Lim<sup>1</sup>, Loren C. Denlinger<sup>2</sup>, Nizar N. Jarjour<sup>2</sup>, Sameer K. Mathur<sup>2</sup>, Nathan Sandbo<sup>2</sup>, Erwin Berthier<sup>1</sup>, Stephane Esnault<sup>2</sup>, Ksenija Bernau<sup>2</sup>, and Ashleigh B. Theberge<sup>1</sup>  
*<sup>1</sup>University of Washington, USA and <sup>2</sup>University of Wisconsin, USA*
- T017.a** **UNIDIRECTIONAL ANALYSIS OF CARDIAC PROPAGATION VELOCITY BY HUMAN IPSC-DERIVED CARDIAC CORE-SHELL MICROFIBER**  
Akari Masuda<sup>1</sup>, Shun Itai<sup>1</sup>, Yuta Kurashina<sup>2</sup>, Shugo Tohyama<sup>1</sup>, and Hiroaki Onoe<sup>1</sup>  
*<sup>1</sup>Keio University, JAPAN and <sup>2</sup>Tokyo University of Agriculture and Technology, JAPAN*
- W014.a** **ISOLATION AND CONTROL OF IMMUNE CELLS IN RESPONSE TO CHEMOKINE GRADIENT**  
Parvaneh Sardarabadi<sup>1</sup>, Kang-Yun Lee<sup>2</sup>, Wei-lun Sun<sup>2</sup>, and Cheng-Hsien Liu<sup>1</sup>  
*<sup>1</sup>National Tsing Hua university, TAIWAN and <sup>2</sup>Shuang Ho Hospital, TAIWAN*



- M024.a DESIGN AND CHARACTERIZATION OF ENZYME-RESPONSIVE SYNTHETIC ION CHANNELS**  
Iiro Kiiski<sup>1</sup>, Nanami Takeuchi<sup>1</sup>, Alexandre Legrand<sup>2</sup>, Reiko Sakaguchi<sup>3</sup>, Kenji Usui<sup>4</sup>, Shuhei Furukawa<sup>2</sup>, and Ryuji Kawano<sup>1</sup>  
<sup>1</sup>Tokyo University of Agriculture and Technology, JAPAN, <sup>2</sup>Kyoto University, JAPAN, <sup>3</sup>University of Occupational and Environmental Health, JAPAN, and <sup>4</sup>Konan University, JAPAN
- M025.a EVALUATING THE ACCURACY OF IMPEDANCE FLOW CYTOMETRY WITH CELL-SIZED LIPOSOMES**  
Huichao Chai, Yongxiang Feng, Junwen Zhu, Fei Liang, Weihua He, and Wenhui Wang  
*Tsinghua University, CHINA*
- M026.a HETEROGENEOUS EXTRACELLULAR MATRIX DETERMINES NANOVESICLE-CELL ADSORPTIONS**  
Hua Sun and Qionglin Liang  
*Tsinghua University, CHINA*
- T018.a INVESTIGATION OF CELL PENETRATING PEPTIDE MEDIATED THE PROTEIN TRANSLOCATION INTO CELL-SIZED ASYMMETRIC LIPID VESICLES**  
Miwa Akari and Koki Kamiya  
*Gunma University, JAPAN*
- T019.a REAL-TIME ESTIMATION OF PHYSIOLOGICAL STIMULI FROM GATING CURRENTS OF ION CHANNELS**  
Kazuto Ogishi<sup>1</sup>, Toshihisa Osaki<sup>2</sup>, Hisatoshi Mimura<sup>2</sup>, Yuya Morimoto<sup>1</sup>, and Shoji Takeuchi<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Kanagawa Institute of Industrial Science and Technology, JAPAN
- W015.a CAPTURING THE NANO-SIZED SINGLE LIPOSOME VESICLES IN NANOFLUIDIC DEVICE**  
Yuki Arai<sup>1</sup>, Hiroto Kawagishi<sup>1</sup>, Yusufu Aishan<sup>2</sup>, and Yan Xu<sup>1,2,3</sup>  
<sup>1</sup>Osaka Prefecture University, JAPAN, <sup>2</sup>Osaka Metropolitan University, JAPAN, and <sup>3</sup>Japan Science and Technology Agency (JST), JAPAN
- W016.a VERTICAL LIPID BILAYERS FORMATION IN NANOFLUIDIC CHANNELS BY REVERSE MICELLES CONTACT**  
Hiroto Kawagishi<sup>1</sup>, Yusufu Aishan<sup>2,5</sup>, Shigetoshi Oiki<sup>3</sup>, Masayuki Iwamoto<sup>4</sup>, and Yan Xu<sup>1,2,5</sup>  
<sup>1</sup>Osaka Prefecture University, JAPAN, <sup>2</sup>Osaka Metropolitan University, JAPAN, <sup>3</sup>University of Fukui, JAPAN, <sup>4</sup>University of Fukui Faculty of Medical Sciences, JAPAN, and <sup>5</sup>Japan Science and Technology Agency (JST), JAPAN



- M027.a** INVESTIGATION ON PARTICLE DEPOSITION IN MULTILAYER LUNG CHIP WITH MULTI-GENERATIONAL ALVEOLAR DUCTS  
Yan Qiu<sup>1</sup>, Chao Lu<sup>2</sup>, and Guoqing Hu<sup>1</sup>  
<sup>1</sup>Zhejiang University, CHINA and <sup>2</sup>China Jiliang University, CHINA
- M028.a** SCANNING THE MORPHOLOGY OF SINGLE IMMOBILIZED *C. ELEGANS* IN AN IMPEDANCE-BASED MULTI-ELECTRODE MICROFLUIDIC DEVICE  
Xingyu Xu<sup>1</sup>, Tiancong Lan<sup>1</sup>, Song Yu<sup>1</sup>, Cheng-en Zheng<sup>1</sup>, Zi Wang<sup>2</sup>, Di Chen<sup>2</sup>, and Zhen Zhu<sup>1</sup>  
<sup>1</sup>Southeast University, CHINA and <sup>2</sup>Nanjing University, CHINA
- T020.a** A 3D BIOPRINTED LIVER-ON-A-CHIP FOR HIGH THROUGHPUT TOXICITY SCREENING  
Qihong Huang, Tianhao Yang, Hongbo Zhang, Ruixue Yin, Lei Ma, and Honglin Li  
East China University of Science and Technology, CHINA
- T021.a** MICROFLUIDIC DEVICE TO SCREEN THE FIN AND HEART ACTIVITIES OF MULTIPLE ZEBRAFISH LARVAE  
Arezoo Khalili, Ellen Van Wijngaarden, Georg R. Zoidl, and Pouya Rezai  
York University, CANADA
- T022.a** SAMPLING MICROBIAL VOLATILE COMMUNICATION IN A NOVEL SEGREGATED COCULTURE DEVICE  
Jodie C. Tokihiro, Ulri N. Lee, Lina Mikaliunaite, Sarah Prebihalo, Erwin Berthier, Robert E. Synovec, and Ashleigh B. Theberge  
University of Washington, USA
- W017.a** RAPID SORTING, TRAPPING, AND LONG-TERM IMAGING OF CAENORHABDITIS ELEGANS EMBRYOS IN A SPIRAL MICROCHANNEL  
Peng Pan, Zhen Qin, Yuxiao Zhou, Xia Wu, John Calarco, and Xinyu Liu  
University of Toronto, CANADA
- W018.a** *IN VIVO* ACOUSTIC PATTERNING IN ZEBRAFISH EMBRYOS  
Viktor M. Jooss<sup>1</sup>, Jan Stephan Bolten<sup>2</sup>, Jörg Huwyler<sup>2</sup>, and Daniel Ahmed<sup>1</sup>  
<sup>1</sup>ETH Zürich, SWITZERLAND and <sup>2</sup>Universität Basel, SWITZERLAND
- W019.a** MONITORING THE LOCOMOTION OF *C. ELEGANS* BY AN ELECTRICAL-IMPEDANCE-TOMOGRAPHY-INTEGRATED MICROFLUIDIC DEVICE  
Haoxi Wang<sup>1</sup>, Song Yu<sup>1</sup>, Jiankun Yang<sup>1</sup>, Xinxin Lu<sup>1</sup>, Zi Wang<sup>2</sup>, Di Chen<sup>2</sup>, and Zhen Zhu<sup>1</sup>  
<sup>1</sup>Southeast University, CHINA and <sup>2</sup>Nanjing University, CHINA



**M029.a BaSiC: A MODULAR SYSTEM FOR LONG-TERM BRAIN SLICE CULTURE AND CIRCADIAN RHYTHM STUDY**

Kui Han<sup>1</sup>, Meimei Liao<sup>2</sup>, Eric Erquan Zhang<sup>2</sup>, and Yanyi Huang<sup>1</sup>  
<sup>1</sup>Peking University, CHINA and <sup>2</sup>National Institute of Biological Sciences, CHINA

**M030.a BIOENGINEERING OF HOMOGENOUS hiPSC-DERIVED ORGANOID ON A CHIP**

Pu Chen, Xiaodong Xu, Bin Li, Shanqing Jiang, Jia Shang, Longjun Gu, and Wen Zhao  
*Wuhan University TaiKang Medical School, CHINA*

**M031.a CELL MANIPULATING SYSTEM FOR GENERATION OF CELL PATTERNS FROM MICROMETER TO MILLIMETER SCALE**

Kohei Morita and Takeshi Hayakawa  
*Chuo University, JAPAN*

**M032.a FABRICATION OF JOINT-ON-A-CHIP DEVICE FOR COMPRESSION OF CARTILAGE EXPLANTS**

Ka Kit Cheung<sup>1</sup>, Lauren Banh<sup>1,2</sup>, Mable W.Y. Chan<sup>1,2</sup>, Byeong-Ui Moon<sup>3</sup>, Sowmya Viswanathan<sup>1,2</sup>, and Edmond W.K. Young<sup>1</sup>  
<sup>1</sup>University of Toronto, CANADA, <sup>2</sup>University Health Network, CANADA, and <sup>3</sup>National Research Council, CANADA

**M033.a IMPEDANCE MEASUREMENTS REVEAL CISPLATIN-INDUCED NEPHROTOXICITY IN RENAL PROXIMAL TUBULE EPITHELIAL CELLS**

Yuji Takata, Ramin Banan Sadeghian, Kazuya Fujimoto, and Ryuji Yokokawa  
*Kyoto University, JAPAN*

**M034.a IN VITRO VASCULARIZED MUSCLE ON CHIP FOR MYOSITIS INVESTIGATION**

Meng-Qian Zhao<sup>1,2</sup>, Xu Zhang<sup>1</sup>, Peng-Wei Deng<sup>1,2</sup>, Hai-Tao Liu<sup>1</sup>, and Jian-Hua Qin<sup>1,2</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and <sup>2</sup>University of Chinese Academy of Sciences, CHINA

**M035.a MICROFLUIDIC DIGITAL-TO-ANALOG CONVERTER (µDAC) TO STUDY FATTY ACID UPTAKE RATES IN EX VIVO ADIPOSE TISSUE BY RAPID STIMULATION**

Md Moniruzzaman, Nan Shi, and Christopher J. Easley  
*Auburn University, USA*

**M036.a MICROSENSOR WELLS FOR OXYGEN MONITORING OF BIOPRINTED SINGLE BREAST CANCER SPHEROIDS**

Johannes Dornhof<sup>1</sup>, Viktoria Zieger<sup>1</sup>, Jochen Kieninger<sup>1</sup>, Daniel Frejek<sup>2</sup>, Gerald A. Urban<sup>1</sup>, Sabrina Kartmann<sup>1,2</sup>, and Andreas Weltin<sup>1</sup>  
<sup>1</sup>University of Freiburg, GERMANY and <sup>2</sup>Hahn-Schickard, GERMANY





## Organs on Chip

### **M037.a OPEN MICROFLUIDIC DEVICE FOR 3D CO-CULTURED TUMOR SPHEROIDS AND FACILE RETRIEVAL**

Jooyoung Ro<sup>1,2</sup>, Junyoung Kim<sup>1,2</sup>, and Yoon-Kyoung Cho<sup>1,2</sup>

<sup>1</sup>Ulsan National Institute of Science and Technology (UNIST), KOREA and <sup>2</sup>Institute for Basic Science (IBS), KOREA

### **M038.a OPTIMIZING CO-CULTURE SYSTEM OF KIDNEY ORGANOID AND ON-CHIP VASCULAR BED**

Yoshikazu Kameda<sup>1</sup>, Kensuke Yabuuchi<sup>2,3</sup>, Junichi Taniguchi<sup>2</sup>, Toshikazu Araoka<sup>1</sup>, Minoru Takasato<sup>1,2,3</sup>, Kazuya Fujimoto<sup>1</sup>, and Ryuji Yokokawa<sup>1</sup>

<sup>1</sup>Kyoto University, JAPAN, <sup>2</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN, and <sup>3</sup>Osaka University, JAPAN

### **M039.a PARALLEL FORMATION OF CELL SPHEROIDS BASED ON VIBRATION-INDUCED FLOW**

Takuya Iizawa and Takeshi Hayakawa  
Chuo University, JAPAN

### **M040.a PERIODONTIUM-ON-A-CHIP**

Sara Svanberg and Petra S. Dittrich  
ETH Zürich, SWITZERLAND

### **M041.a SLIDING MICROFLUIDIC DEVICE FOR VASCULARIZED ORGAN-ON-A-CHIP APPLICATIONS**

Feifan Wang, Qinyu Li, and Xiaolin Wang  
Shanghai Jiao Tong University, CHINA

### **T023.a ANTI-ANGIOGENIC EFFECTS OF SODIUM SELENITE SUPPLEMENT ON MICROVASCULAR NETWORK ON A CHIP**

Maneesha Shaji<sup>1</sup>, Atsuya Kitada<sup>1</sup>, Kazuya Fujimoto<sup>1</sup>, Stanislav L. Karsten<sup>2</sup>, and Ryuji Yokokawa<sup>1</sup>

<sup>1</sup>Kyoto University, JAPAN and <sup>2</sup>NeuroInDx Inc., USA

### **T024.a EVALUATION OF ISLET HETEROGENEITY IN ANGIOGENIC CAPABILITY USING A MICROFLUIDIC DEVICE**

An Konno<sup>1</sup>, Yuji Nashimoto<sup>2</sup>, Hirofumi Shintaku<sup>3</sup>, Kosuke Ino<sup>1</sup>, Masafumi Goto<sup>1</sup>, and Hitoshi Shiku<sup>1</sup>

<sup>1</sup>Tohoku University, JAPAN, <sup>2</sup>Tokyo Medical and Dental University, JAPAN, and <sup>3</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN

### **T025.a MICROFLUIDIC DEVICE WITH POROUS ELECTRODE FOR ELECTROCHEMICAL ANALYSIS OF VASCULAR ENDOTHELIAL CELLS**

Yoshinobu Utagawa<sup>1</sup>, Kosuke Ino<sup>1</sup>, Yuji Nashimoto<sup>2</sup>, and Hitoshi Shiku<sup>1</sup>

<sup>1</sup>Tohoku University, JAPAN and

<sup>2</sup>Tokyo Medical and Dental University, JAPAN

### **T026.a PERFUSION MODES AFFECT FIBROBLAST OVERGROWTH IN LONG-TERM MICROFLUIDIC VESSEL NETWORK CULTURE**

Han Shao and Edmond W. K. Young  
University of Toronto, CANADA



## Organs on Chip

- W020.a AN ENGINEERED EPITHELIAL TISSUE OFFERS IMPROVED URINARY EXCRETION PERFORMANCE IN A PROXIMAL TUBULE MICROPHYSIOLOGICAL SYSTEM**  
Ramin Banan Sadeghian<sup>1</sup>, Akihiko Kawakami<sup>1</sup>, Cheng Ma<sup>1</sup>, Toshikazu Araoka<sup>2</sup>, Minoru Takasato<sup>3</sup>, and Ryuji Yokokawa<sup>1</sup>  
<sup>1</sup>Kyoto University, JAPAN, <sup>2</sup>Center for iPS Cell Research and Application, JAPAN, and <sup>3</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN
- W021.a DEVELOPMENT OF ROBUST SACRIFICIAL SUPPORT CONSTRUCT WITH DECELLULARIZED LIVER EXTRACELLULAR MATRIX**  
Vamakshi Khatri<sup>1</sup>, Johannes A. Turkki<sup>2</sup>, Harisha Ramachandraiah<sup>3</sup>, Falguni Pati<sup>4</sup>, Giulia Gaudenzi<sup>5</sup>, and Aman Russom<sup>1</sup>  
<sup>1</sup>KTH Royal Institute of Technology, SWEDEN, <sup>2</sup>Tampere University, FINLAND, <sup>3</sup>Biopromic AB, SWEDEN, <sup>4</sup>Indian Institute of Technology, Hyderabad, INDIA, and <sup>5</sup>Karolinska Institute, SWEDEN
- W022.a IN VITRO VASCULAR FORMATION IN A MICROFLUIDIC DEVICE WITH LIVER SINUSOIDAL ENDOTHELIAL CELLS**  
Satomi Matsumoto, Jennifer S. Fang, Yu-Hsi Chen, Abraham P. Lee, and Christopher C.W. Hughes  
University of California, Irvine, USA
- W023.a MESENCHYMAL STEM CELL-DERIVED EXTRACELLULAR VESICLES PROMOTE REPAIRING OF CORNEAL WOUND IN HUMAN CORNEA-ON-A-CHIP**  
Zitong Yu, Rui Hao, Xi Chen, Yi Zhang, and Hui Yang  
Chinese Academy of Sciences, CHINA
- W024.a THE EFFECT OF CURVATURE ON CORNEAL KERATOCYTES USING A PNEUMATICALLY CONTROLLED ORGAN CHIP**  
Minju Kim, Kanghoon Choi, Yeji Ann, and Jungkyu Kim  
University of Utah, USA

## a - Cells, Organisms and Organs on a Chip

### Single-Cell Analysis

- M042.a A MICROPORE MEMBRANE-BASED SINGLE-CELL HANDLING SYSTEM**  
Zhi Dong, Hui-Feng Wang, Jian-Bo Chen, and Qun Fang  
Zhejiang University, CHINA
- M043.a AN INTEGRATED AND INDIVIDUALLY ADDRESSABLE MICROFLUIDIC SINGLE-CELL ARRAY CHIP**  
Qiaoyi Wang and Hongkai Wu  
Hong Kong University of Science and Technology, HONG KONG
- M044.a CELL-ANCHORED MATRIX TECHNOLOGY FOR HIGH THROUGHPUT SINGLE CELL MULTIDIMENSIONAL ANALYSIS**  
Ying Xu and Chia-Hung Chen  
City University of Hong Kong, HONG KONG



## Single-Cell Analysis

- M045.a** **COMPARING SHEATH CONSTRICTION WITH MECHANICAL CONSTRICTION IN IMPEDANCE FLOW CYTOMETRY**  
Junwen Zhu, Yongxiang Feng, Huichao Chai,  
Fei Liang, and Wenhui Wang  
*Tsinghua University, CHINA*
- M046.a** **DROPLET-BASED ULTRA-HIGH-THROUGHPUT MICROBIAL SINGLE-CELL WHOLE-GENOME AMPLIFICATION AND BARCODING**  
Jie Li, Rong Zhang, and Yifan Liu  
*ShanghaiTech University, CHINA*
- M047.a** **HIGH THROUGHPUT DIELECTROPHORESIS ASSISTED ELECTROPORATION FOR LOCALIZED INTRACELLULAR DELIVERY**  
Xiaochen Qin, Yuyuan Zhou, Ratul Paul, and Yaling Liu  
*Lehigh University, USA*
- M048.a** **MATS-DROP: A HIGHLY SENSITIVE HIGH-THROUGHPUT SINGLE-CELL WHOLE TRANSCRIPTOMIC SEQUENCING METHOD**  
Wenjian Cao, Yating Pan, Ying Mu, and Qiangyuan Zhu  
*Zhejiang University, CHINA*
- M049.a** **MICROFLUIDIC PROBE FOR ELECTRO-PERMEABILIZATION-BASED SINGLE CELL ANALYSIS**  
Samuel Sofela<sup>1</sup>, Alla Saleh<sup>1</sup>, and Mohammad A. Qasaim<sup>1,2</sup>  
<sup>1</sup>*New York University Abu Dhabi (NYUAD), UAE and*  
<sup>2</sup>*New York University, USA*
- M050.a** **PREPARATION OF SINGLE NEURON SAMPLES USING A TWO-LAYERED MICROWELL-ARRAY DEVICE**  
Ayaka Nakama and Takashi Yasuda  
*Kyushu Institute of Technology, JAPAN*
- T027.a** **ACHIEVING SUPER-POISSONIAN MICROBEAD LOADING IN DROPLETS VIA HYDROGEL LUBRIFICATION**  
Long Chen<sup>1,2</sup>, Xianqiang Mi<sup>2</sup>, and Yifan Liu<sup>1</sup>  
<sup>1</sup>*ShanghaiTech University, CHINA and*  
<sup>2</sup>*Chinese Academy of Sciences, CHINA*
- T028.a** **AUTOMATED BIOPHYSICAL DISTINCTION OF DRUG-TREATED CANCER VERSUS ASSOCIATED FIBROBLAST CELLS FROM PANCREATIC TUMORS**  
Armita Salahi, Carlos Honrado, John Moore, Sara Adair,  
Todd Bauer, and Nathan S. Swami  
*University of Virginia School of Engineering, USA*
- T029.a** **DEVELOPMENT OF A REAL-TIME MICROFLUIDIC IMPEDANCE FLOW CYTOMETRY**  
Xiaofeng Luan<sup>1,2</sup>, Yuang Li<sup>1,2</sup>, Pengbin Liu<sup>1</sup>, Sheng Sun<sup>1,2</sup>,  
Wenchang Zhang<sup>1</sup>, Lingqian Zhang<sup>1</sup>, Mingxiao Li<sup>1</sup>,  
Haiping Zhao<sup>3</sup>, Yang Zhao<sup>1</sup>, and Chengjun Huang<sup>1,2</sup>  
<sup>1</sup>*Chinese Academy of Sciences, CHINA,*  
<sup>2</sup>*University of Chinese Academy of Sciences, CHINA, and*  
<sup>3</sup>*Xuanwu Hospital of Capital Medical University, CHINA*



## Single-Cell Analysis

- T030.a DEVELOPMENT OF MICROFLUIDIC DEVICES FOR SINGLE-CELL OXYGEN TENSION ANALYSIS**  
Santhosh Kannan<sup>1,2</sup>, Ping-Liang Ko<sup>1,3</sup>, Hsiao-Mei Wu<sup>1,3</sup>, and Yi-Chung Tung<sup>1</sup>  
<sup>1</sup>Academia Sinica, TAIWAN, <sup>2</sup>National Tsing Hua University, TAIWAN, and <sup>3</sup>National Taiwan University, TAIWAN
- T031.a OIL-SEALED HYDROGEL MICROWELL ARRAY FOR ANALYSIS ON SECRETORY COMPONENTS FROM CONFINED SINGLE CELLS**  
Chisaki Yamagata<sup>1</sup>, Shun Itai<sup>1</sup>, Yuta Kurashina<sup>2</sup>, Makoto Asai<sup>3</sup>, Ayuko Hoshino<sup>4</sup>, and Hiroaki Onoe<sup>1</sup>  
<sup>1</sup>Keio University, JAPAN, <sup>2</sup>Tokyo University of Agriculture and Technology, JAPAN, <sup>3</sup>Keio University Global Research Institute, JAPAN, and <sup>4</sup>Tokyo Institute of Technology, JAPAN
- W025.a CLASSIFICATION OF NEUTROPHILS, EOSINOPHILS AND BASOPHILS BASED ON 58 SINGLE-CELL BIOELECTRICAL PARAMETERS DERIVED FROM IMPEDANCE FLOW MICROCYTOMETRY**  
Minruihong Wang<sup>1,2</sup>, Huiwen Tan<sup>1,2</sup>, Deyong Chen<sup>1,2</sup>, Junbo Wang<sup>1,2</sup>, and Jian Chen<sup>1,2</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and <sup>2</sup>University of Chinese Academy of Sciences, CHINA
- W026.a APPLYING SUCCESSIVE MECHANICAL STRESSES ON CIRCULATING CELLS USING MICROFLUIDIC VASCULAR NETWORK TO ASSESS SICKLED RED BLOOD CELLS RIGIDITY**  
Tieying Xu<sup>1</sup>, Maria A. Lizarralde-Iragorri<sup>2</sup>, Olivier Français<sup>3</sup>, Wassim El Nemer<sup>2</sup>, and Bruno Le Pioufle<sup>1</sup>  
<sup>1</sup>Université Paris-Saclay, FRANCE, <sup>2</sup>Université de Paris, FRANCE, and <sup>3</sup>Université Gustave Eiffel, FRANCE
- W027.a CONTINUOUS MONITORING OF LIVE SINGLE-CELL METABOLISM FOR DRUG THERAPY**  
Shengsen Zhang, Shengjie Chen, and Rong Zhu  
Tsinghua University, CHINA
- W028.a DROPLET ARRAY-BASED PLATFORM FOR TIME-LAPSE QUANTIFICATION OF EXTRACELLULAR VESICLE RELEASE FROM SINGLE CELLS**  
Kazuki Hattori<sup>1</sup>, Yuki Goda<sup>1</sup>, Minato Yamashita<sup>1</sup>, Yusuke Yoshioka<sup>2</sup>, Ryosuke Kojima<sup>1</sup>, and Sadao Ota<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Tokyo Medical University, JAPAN
- W029.a EASYFLOW: TOOL FOR QUICK DROPLET DATA ANALYSIS**  
Immanuel Sanka<sup>1</sup>, Simona Bartkova<sup>1</sup>, Pille Pata<sup>1</sup>, Mart Ernits<sup>2</sup>, Olli-Pekka Smolander<sup>1</sup>, and Ott Scheler<sup>1</sup>  
<sup>1</sup>Tallinn University of Technology, ESTONIA and <sup>2</sup>University of Tartu, ESTONIA
- W030.a GLIOMA SINGLE CELLS ANALYSIS BY CYCLIC GRADUAL CONSTRICTION MICROCHANNELS**  
Xin Geng<sup>1</sup>, Chunhong Wang<sup>2</sup>, Meng Wang<sup>1</sup>, Hongming Ji<sup>2</sup>, and Xiang Ren<sup>2,3</sup>  
<sup>1</sup>Fifth Clinical Medical College of Shanxi Medical University, CHINA, <sup>2</sup>Fifth Hospital of Shanxi Medical University, CHINA, and <sup>3</sup>Tianjin University, CHINA



## Single-Cell Analysis

- W031.a MICROFLUIDIC CELL ASSEMBLY DEVICE FOR CELL-CELL INTERACTIONS AT THE SINGLE-CELL LEVEL**  
Weizhi Liu, Shanqing Huang, Zhi Zhu, and Chaoyong Yang  
*Xiamen University, CHINA*
- W032.a MICROFLUIDIC SINGLE-CELLS SAMPLING COMBINED WITH 2D CYTOMETRY SPECTRUM/MASS SPECTROMETRY ENABLES SIMULTANEOUS ONLINE PROFILING OF BIOMARKER AND AGENT UPTAKE**  
Xuan Zhang, Cheng-Xin Wu, Xing Wei, Jiao Wang, Xue Men, Ming-Li Chen, and Jian-Hua Wang  
*Northeastern University, CHINA*
- W033.a MICROPROBE ELECTROSPRAY IONIZATION MASS SPECTROMETRY REVEALS METABOLIC REGULATION OF SINGLE BACTERIAL CELL DURING ANTIBIOTICS INDUCED FILAMENTATION**  
Dongxue Zhang and Liang Qiao  
*Fudan University, CHINA*
- W034.a SINGLE-CELL IMPEDANCE CYTOMETRY TO EXPLORE THE ACTION OF ANTIMICROBIAL PEPTIDES**  
Cassandra Troiano<sup>1</sup>, Adele De Ninno<sup>2</sup>, Bruno Casciaro<sup>3</sup>, Francesco Riccitelli<sup>1</sup>, Sara Bobone<sup>1</sup>, Renato Massoud<sup>1</sup>, Maria L. Mangoni<sup>4</sup>, Paolo Bisegna<sup>1</sup>, Lorenzo Stella<sup>1</sup>, and Federica Caselli<sup>1</sup>  
<sup>1</sup>University of Rome Tor Vergata, ITALY, <sup>2</sup>Italian National Research Council, ITALY, <sup>3</sup>Italian Institute of Technology, ITALY, and <sup>4</sup>Sapienza University of Rome, ITALY
- W035.a SINGLE-CELL METABOLITE AND LIPID PROFILING REVEALS MACROPHAGE HETEROGENEITY DURING FOAM CELL FORMATION**  
Yiwen Wang, Ling Lin, and Liang Qiao  
*Fudan University, CHINA*
- W036.a WELL-PAIRED-SEQ: A SIZE-EXCLUSION AND LOCALLY QUASI-STATIC HYDRODYNAMIC MICROWELL CHIP FOR SINGLE-CELL RNA-SEQ**  
Kun Yin<sup>1</sup>, Meijuan Zhao<sup>1</sup>, Li Lin<sup>1</sup>, Yingwen Chen<sup>1</sup>, He Dong<sup>1</sup>, Dianyi Liang<sup>1</sup>, Jia Song<sup>2</sup>, and Chaoyong Yang<sup>1,2</sup>  
<sup>1</sup>Xiamen University, CHINA and <sup>2</sup>Shanghai Jiao Tong University, CHINA

## a - Cells, Organisms and Organs on a Chip

### Synthetic Biology

- M051.a CONCENTRATION-CONTROLLED GENERATION OF DNA CONDENSATES WITHIN MONODISPERSE GIANT UNILAMELLAR VESICLES**  
Ryotaro Yoneyama<sup>1</sup>, Ryota Ushiyama<sup>1</sup>, Tomoya Maruyama<sup>2</sup>, Masahiro Takinoue<sup>2</sup>, and Hiroaki Suzuki<sup>1</sup>  
<sup>1</sup>Chuo University, JAPAN and <sup>2</sup>Tokyo Institute of Technology, JAPAN



## Synthetic Biology

### **W037.a DETECTION OF Y-SHAPED DNA USING MUTANT NANOPORE PROTEIN BY A PATCH CLAMP METHOD OF THE ARTIFICIAL LIPID BILAYER**

Toshiyuki Tosaka and Koki Kamiya  
*Gunma University, JAPAN*

## a - Cells, Organisms and Organs on a Chip

## Other Applications in Biology

### **M052.a A LABEL-FREE PLATFORM COMBINING QUANTITATE PHASE IMAGING AND MICROFLUIDICS FOR THE MEASUREMENT OF CELLULAR BIOPHYSICAL PROPERTIES**

Qinru Xiao, Yanping He, Md Habibur Rahman,  
Renjie Zhou, and Yi-Ping Ho  
*Chinese University of Hong Kong, HONG KONG*

### **M053.a CRYOPRESERVATION OF NATURAL KILLER CELLS IN DROPLETS**

Pilar Carreras<sup>1,2</sup>, Alejandra Ortiz-Ruiz<sup>1,2</sup>, Laura Sanchez-Vega<sup>1,2</sup>,  
Laura Cordoba<sup>1,2</sup>, Alejandra Leivas<sup>1,2</sup>, Itziar Gonzalez<sup>3</sup>,  
and Joaquín Martínez-Lopez<sup>1,2</sup>  
<sup>1</sup>*Hospital 12 Octubre, SPAIN*, <sup>2</sup>*CNIO Spanish National Cancer  
Research Centre, SPAIN*, and <sup>3</sup>*CSIC Spanish National  
Research Council, SPAIN*

### **M054.a PRODUCTION AND VIABILITY OF ENCAPSULATED BACTERIAL-FUNGAL CONSORTIA FOR DELIVERY IN SOIL**

Alexandra Homys<sup>1</sup>, Edith Laux<sup>1</sup>, Laure Jeandupeux<sup>1</sup>,  
Tatiana Nogueira-Matos<sup>1</sup>, Ajith Manimala<sup>1</sup>, Nina Châtelain<sup>1</sup>,  
Claudio Prieur<sup>1</sup>, Cristina Martin-Olmos<sup>2,3</sup>, Isha Hashmi<sup>4</sup>,  
Camille Hyde<sup>4</sup>, Celia Ruiz<sup>4</sup>, Pilar Junier<sup>4</sup>,  
and Saskia Bindschedler<sup>4</sup>  
<sup>1</sup>*University of Applied Sciences Western Switzerland, SWITZERLAND*,  
<sup>2</sup>*University of Lausanne, SWITZERLAND*,  
<sup>3</sup>*Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND*, and  
<sup>4</sup>*University of Neuchâtel, SWITZERLAND*

### **T032.a MICROFLUIDIC DEVICES FOR PLATELET ACTIVATION**

Naim Yağız Demir, İbrahim Bozyel, Baran Erman,  
Dinçer Gökçen, and Memed Duman  
*Hacettepe University, TURKEY*

## b - Diagnostics, Drug Testing and Personalized Medicine

## Cancer Research, Capture and Analysis of Circulating Tumor Cells

### **M055.b A FLEXIBLE INDWELLING SYSTEM FOR IN VIVO ENRICHMENT OF CIRCULATING TUMOR CELLS**

Yixing Gou<sup>1</sup>, Zheng You<sup>2</sup>, and Dahai Ren<sup>2</sup>  
<sup>1</sup>*Hebei University of Technology, CHINA* and  
<sup>2</sup>*Tsinghua University, CHINA*

### **M056.b A GEL-FREE MICROFLUIDIC CELL CULTURE ARRAY FOR SELECTIVE EXPANDING CIRCULATING TUMOR STEM CELLS**

Yanzhang Luo, Yang Liu, Zihe Chen, Jueming Chen,  
Dongguo Lin, and Dayu Liu  
*South China University of Technology, CHINA*



## Cancer Research, Capture and Analysis of Circulating Tumor Cells

### **M057.b A NOVEL ELECTROROTATION PLATFORM “vROT” WITH EASY CELL HANDLING FOR CANCER ANALYSIS**

Kazuma Yoda, Yoshiyasu Ichikawa, and Masahiro Motosuke  
*Tokyo University of Science, JAPAN*

### **T033.b MICROFLUIDIC ISOLATION AND CAPTURE OF CIRCULATING TUMOR CELLS AND CLUSTERS FROM MOUSE BLOOD**

Celine Macaraniag, Jian Zhou, Jing Li, William Putzbach, Nissim Hay, and Ian Papautsky  
*University of Illinois, Chicago, USA*

### **T034.b THE UNDERLYING CORRELATION BETWEEN THE PRIMARY SINGLE CELLS’ ADHERENT MORPHOLOGY AND SUSPENDED ELECTRICAL PROPERTIES DISCOVERED WITH A MICROFLUIDIC IMPEDANCE FLOW CYTOMETRY**

Xiaofeng Luan<sup>1,2</sup>, Yuang Li<sup>1,2</sup>, Sheng Sun<sup>1,2</sup>, Wenchang Zhang<sup>1</sup>, Lingqian Zhang<sup>1</sup>, Mingxiao Li<sup>1</sup>, Jinghui Wang<sup>3</sup>, Lina Zhang<sup>3</sup>, Yang Zhao<sup>1</sup>, and Chengjun Huang<sup>1,2</sup>  
<sup>1</sup>*Chinese Academy of Sciences, CHINA*, <sup>2</sup>*University of Chinese Academy of Sciences, CHINA*, and <sup>3</sup>*Beijing Chest Hospital, Capital Medical University, CHINA*

### **W038.b 3D-OXYGEN GRADIENT CHIP FOR CANCER CELL MIGRATION RESEARCH**

Pan Zuo, Jelle J.F. Sleeboom, and Jaap M.J. den Toonder  
*Eindhoven University of Technology, NETHERLANDS*

### **W039.b BIOPRINTING MICRODISSECTED TUMOR “CUBOIDS”**

Anjul M. Bansal<sup>1</sup>, Lisa F. Horowitz<sup>1</sup>, Taranjit S. Gujral<sup>2</sup>, and Albert Folch<sup>1</sup>  
<sup>1</sup>*University of Washington, USA* and <sup>2</sup>*Fred Hutchinson Cancer Research Center, USA*

### **W040.b ESTABLISHMENT OF A CASCADED MICROFLUIDIC SINGLE CELL ANALYSIS SYSTEM FOR MOLECULAR AND FUNCTIONAL HETEROGENEITY ANALYSIS OF CIRCULATING TUMOR CELL**

Yingying Lu, Shuai Yue, and Jin Fang  
*China Medical University, CHINA*

### **W041.b IN-VIVO PERFECT FILTER-BASED CIRCULATING FILTRATION SYSTEM FOR DEPLETION OF CIRCULATING TUMOR CELLS**

Qingmei Xu<sup>1,2</sup>, Tingting Hun<sup>1</sup>, Songtao Dou<sup>1</sup>, Yi Zhang<sup>1</sup>, Qi Wang<sup>3</sup>, and Wei Wang<sup>1</sup>  
<sup>1</sup>*Peking University, CHINA*, <sup>2</sup>*Taiyuan Institute of Technology, CHINA*, and <sup>3</sup>*Second Affiliated Hospital of Dalian Medical University, CHINA*

## b - Diagnostics, Drug Testing and Personalized Medicine

### Drug Delivery

### **M058.b REAL TIME IMAGING OF ACOUSTIC MICROROBOTS INSIDE MICROFLUIDIC AND EX-VIVO VESSELS**

Alexia D.C. Fonseca, Anna Heinle, Tirza Heinle, and Daniel Ahmed  
*ETH Zürich, SWITZERLAND*



## Drug Delivery

- M059.b TONICITY CHANGE USING EXODISC FOR DRUG LOADING INTO EXTRACELLULAR VESICLES**  
Chaeun Lee<sup>1,2</sup>, Sumit Kumar<sup>2</sup>, Juhee Park<sup>2</sup>,  
and Yoon-Kyoung Cho<sup>1,2</sup>  
<sup>1</sup>Ulsan National Institute of Science and Technology (UNIST),  
KOREA and <sup>2</sup>Institute for Basic Science (IBS), KOREA
- T035.b DEVELOPMENT OF DELIVERY METHOD USING LIPID NANOPARTICLES OF LONG-CHAIN DNAs ENCODING CRISPR/CAS SYSTEM COMPONENTS**  
Shuya Uno<sup>1</sup>, Masatoshi Maeki<sup>1,2,3</sup>, Yusuke Sato<sup>1</sup>, Akihiko Ishida<sup>1</sup>,  
Hideyoshi Hrasima<sup>1</sup>, and Manabu Tokeshi<sup>1</sup>  
<sup>1</sup>Hokkaido University, JAPAN, <sup>2</sup>Japan Science and Technology Agency (JST), JAPAN, and <sup>3</sup>High Energy Accelerator Research Organization, JAPAN
- T036.b MEGAHELTZ-BAND ULTRASOUND-TRIGGERED ON-DEMAND DRUG RELEASE FROM HYDROGEL MICROSPHERES WITH ACOUSTIC-RESPONSIVE MICROBUBBLES**  
Shuhei Takatsuka<sup>1</sup>, Takeshi Kubota<sup>1</sup>, Yuta Kurashina<sup>2</sup>,  
and Hiroaki Onoe<sup>1</sup>  
<sup>1</sup>Keio University, JAPAN and <sup>2</sup>Tokyo University of Agriculture and Technology, JAPAN
- T037.b PULSE LASER ACTIVATED HIGH THROUGHPUT INTRACELLULAR DELIVERY ON HANGING DROP SPHEROIDS USING NANO-SPIKES GOLD NANOPARTICLES**  
Pallavi Gupta<sup>1</sup>, Srabani Kar<sup>2</sup>, Ashish Kumar<sup>3</sup>, Fan-Gang Tseng<sup>3</sup>,  
Shantanu Pradhan<sup>1</sup>, Pallab Sinha Mahapatra<sup>1</sup>,  
and Tuhin Subhra Santra<sup>1</sup>  
<sup>1</sup>Indian Institute of Technology, Madras, INDIA, <sup>2</sup>University of Cambridge, UK, and <sup>3</sup>National Tsing Hua University, TAIWAN
- W042.b PERMEATION CHARACTERISTIC OF EXOSOME-ENCAPSULATING MICRO-HYDROGEL**  
Daisuke Takeuchi<sup>1</sup>, Shuhei Takatsuka<sup>1</sup>, Yuto Hamazaki<sup>2</sup>,  
Yuta Kurashina<sup>3</sup>, Makoto Asai<sup>4</sup>, Ayuko Hoshino<sup>2</sup>, and Hiroaki Onoe<sup>1</sup>  
<sup>1</sup>Keio University, JAPAN, <sup>2</sup>Tokyo Institute of Technology, JAPAN,  
<sup>3</sup>Tokyo University of Agriculture and Technology, JAPAN, and  
<sup>4</sup>Keio University Global Research Institute, JAPAN
- W043.b PROTOTYPING OF SHEAR-MEDIATED MEMBRANE DEFORMATION FOR SCALE-UP PAYLOAD LOADING INTO ERYTHROCYTES**  
Md Habibur Rahman, Zerui Li, Jiale Zheng,  
Chung Hong Nathaniel Wong, Marianne M. Lee,  
Michael K. Chan, and Yi-Ping Ho  
Chinese University of Hong Kong, HONG KONG
- W044.b TUMOR-DERIVED EXOSOMES PURIFIED BY MICROFLUIDIC DEVICE FOR DRUG DELIVERY AGAINST THEIR HOMOLOGOUS TUMOR**  
Ke Ge<sup>1</sup>, Yongan Ren<sup>2</sup>, Danyang Sun<sup>2</sup>, Changku Jia<sup>1</sup>, and Bo Yao<sup>2</sup>  
<sup>1</sup>Hangzhou Hospital of Nanjing Medical University, CHINA and  
<sup>2</sup>Zhejiang University, CHINA



## b - Diagnostics, Drug Testing and Personalized Medicine

### Drug Screening and Development

- M060.b COCKTAIL DRUGS DELIVERY CHIP WITH SELECTIVELY CROSSLINKING HYDROGEL FOR COLON CANCER DRUG SCREENING**  
Hsin-Yu Yang<sup>1</sup>, Ouyang Chih-Hsuan<sup>1</sup>, and Fan-Gang Tseng<sup>1,2</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN and  
<sup>2</sup>Academia Sinica, TAIWAN
- T038.b HETEROGENEITY ANALYSIS OF MICRO-DISSECTED CANCER “CUBOIDS” USING A MICROFLUIDIC DEVICE**  
Lisa F. Horowitz<sup>1</sup>, Tran N.H. Nguyen<sup>1</sup>, Ethan Lockhart<sup>1</sup>,  
Cb Lim<sup>2</sup>, Taranjit S. Gujral<sup>2</sup>, and Albert Folch<sup>1</sup>  
<sup>1</sup>University of Washington, USA and <sup>2</sup>Fred Hutchinson  
Cancer Research Center, USA
- W045.b HIGH-THROUGHPUT DRUG DELIVERY BASED ON A DRIED DRUG PROBE ARRAY FOR DRUG SCREENING**  
Yi-Xue Chen, Meng-Ting Zhang, Jian-Zhang Pan, and Qun Fang  
Zhejiang University, CHINA

## b - Diagnostics, Drug Testing and Personalized Medicine

### Liquid Biopsy and Sample Preparation

- M061.b AUTOMATIC BACTERIAL DNA PURIFICATION DEVICE UTILIZING PRESSURE-DRIVEN AND SELF-CONTAINED CARTRIDGE**  
Le Tran Huy Thang, Han Won, and Joong Ho Shin  
Pukyong National University, KOREA
- M062.b DYNAMIC MAGNETIC NANOMIXERS ENABLING RAPID ISOLATION AND MOLECULAR PROFILING OF TUMOR-DERIVED EXTRACELLULAR VESICLES**  
Guihua Zhang<sup>1</sup>, Yanmei Lei<sup>2</sup>, Zhi Zhu<sup>1</sup>,  
Peng Zhang<sup>2</sup>, and Chaoyong Yang<sup>1,2</sup>  
<sup>1</sup>Xiamen University, CHINA and  
<sup>2</sup>Shanghai Jiao Tong University, CHINA
- M063.b LABEL-FREE AND RAPID DETECTION OF URINARY TRACT INFECTION USING IMPEDANCE CYTOMETRY**  
Chayakorn Petchakup<sup>1</sup>, Hui Min Tay<sup>1</sup>, Yuan Yi Constance Chen<sup>2</sup>,  
Pei Yun Hon<sup>2</sup>, Partha Pratim De<sup>2</sup>, Tsin Wen Yeo<sup>1</sup>,  
King Ho Holden Li<sup>1</sup>, Shawn Vasoo<sup>2</sup>, and Han Wei Hou<sup>1</sup>  
<sup>1</sup>Nanyang Technological University, SINGAPORE and  
<sup>2</sup>Tan Tock Seng Hospital, SINGAPORE
- M064.b MICROARC: AN AUTOMATED MICROFLUIDIC SYSTEM FOR ULTRA HIGH THROUGHPUT ISOLATION OF LOW ABUNDANCE BACTERIA FROM BLOOD TOWARDS RAPID SEPSIS DIAGNOSTICS**  
Sheng Yuan Leong<sup>1</sup>, Hui Min Tay<sup>1</sup>, Wan Wei Lok<sup>1</sup>,  
Xing Yang<sup>2</sup>, and Han Wei Hou<sup>1</sup>  
<sup>1</sup>Nanyang Technological University, SINGAPORE and  
<sup>2</sup>Jiaxing Accunome Biotechnology, CHINA



## Liquid Biopsy and Sample Preparation

- M065.b** **MICRORNA EXPRESSION PROFILING OF SINGLE TUMOR-ASSOCIATED EXOSOME BY PROGRAMMABLE LIPSOME VECTOR**  
Yanmei Lei, Xiaochen Fei, Chaoyong Yang, and Peng Zhang  
*Shanghai Jiao Tong University, CHINA*
- M066.b** **PUSHBUTTON-ACTIVATED MICROFLUIDIC DEVICE FOR DNA EXTRACTION AND DROPLET GENERATION FOR DDPQR**  
Dong Hyun Han, Juhwan Park, and Je-Kyun Park  
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*
- M067.b** **SINGLE EV QUANTIFICATION USING PLASMONIC RESONANCE INSIDE DROPLET REACTOR**  
Nakyung Jung<sup>1</sup>, Sumit Kumar<sup>1,2</sup>, and Yoon-Kyoung Cho<sup>1,2</sup>  
<sup>1</sup>*Ulsan National Institute of Science and Technology (UNIST), KOREA* and <sup>2</sup>*Institute for Basic Science (IBS), KOREA*
- M068.b** **TOPOGRAPHIC MODULATION OF ENZYMIC REACTION AFFORDS ULTRASENSITIVE DIGITAL DETECTION OF TUMOR EXOSOMES**  
Yunjie Wen<sup>1</sup>, Yutao Li<sup>1</sup>, Andrew K. Godwin<sup>2</sup>, and Yong Zeng<sup>1,3</sup>  
<sup>1</sup>*University of Florida, USA*, <sup>2</sup>*University of Kansas Medical Center, USA*, and <sup>3</sup>*University of Florida Health Cancer Center, USA*
- T039.b** **DIRECT SAMPLE EXTRACTION AND ADVANCED PRE-PROCESSING ON A SELF-POWERED MICROFLUIDIC CHIP FOR LATERAL FLOW IMMUNOASSAY AUTOMATION**  
Dries Vloemans, Lorenz Van Hileghem, Francesco Dal Dosso, and Jeroen Lammertyn  
*KU Leuven, BELGIUM*
- T040.b** **METABOLIC GLYCAN LABELING-BASED ISOLATION OF NEWLY SYNTHESIZED EXOSOMES IN IMMUNOTHERAPY**  
Qiuyue Wu, Yanling Song, and Chaoyong Yang  
*Xiamen University, CHINA*
- T041.b** **NEAR-PATIENT EXTRACTION AND DETECTION OF MIR-122 MICRORNA BIOMARKER FOR DRUG-INDUCED LIVER INJURY DIAGNOSTICS**  
Maiwenn Kersaudy-Kerhoas<sup>1,2</sup>, Antonio Liga<sup>1,2</sup>, Appan Roychoudhury<sup>2</sup>, Marilena Stamouli<sup>2</sup>, Rhiannon Grant<sup>2</sup>, Damaso Sanchez Carrera<sup>1</sup>, Holger Schulze<sup>2</sup>, Witold Mielczarek<sup>1,2</sup>, Wilna Oosthuizen<sup>2</sup>, Juan Quintana-Alcala<sup>2</sup>, Paul Dickinson<sup>2</sup>, Amy H. Buck<sup>2</sup>, Nicholas R. Leslie<sup>1</sup>, Jurgen Haas<sup>2</sup>, Till T. Bachmann<sup>2</sup>, and James W. Dear<sup>2</sup>  
<sup>1</sup>*Heriot-Watt University, SCOTLAND* and <sup>2</sup>*University of Edinburgh, SCOTLAND*
- W046.b** **3D-PRINTED SLIPCHIP FOR COLLECTION OF AQUEOUS SAMPLES WITH A SPECIFIC VOLUME**  
Zhiqing Xiao, Zejingqiu Chen, Zitao Feng, and Weijin Guo  
*Shantou University, CHINA*



## Liquid Biopsy and Sample Preparation

### **W047.b CO-ISOLATION OF EXTRACELLULAR VESICLES AND CELL-FREE DNA IN THE SAME ALIQUOT OF BLOOD PLASMA USING CENTRIFUGAL MICROFLUIDICS**

Ehsan Mahmodi Arjmand<sup>1,2</sup>, Franziska Schlenker<sup>1</sup>,  
Gustav Grether<sup>1</sup>, Truong-Tu Truong<sup>1,2</sup>,  
Tobias Hutzenlaub<sup>1,2</sup>, Roland Zengerle<sup>1,2</sup>,  
Nils Paust<sup>1,2</sup>, Jan Lüddecke<sup>1,2</sup>, and Peter Juelg<sup>1,2</sup>

<sup>1</sup>Hahn-Schickard, GERMANY and <sup>2</sup>University of Freiburg, GERMANY

### **W048.b OPTIMIZATION OF CELL CAPTURE AND RELEASE FROM UNDILUTED WHOLE BLOOD BY POLYVINYL ALCOHOL (PVA) - FUNCTIONALIZED FILTRATION SYSTEM**

Qingmei Xu<sup>1,2</sup>, Tingting Hun<sup>1</sup>, Yi Zhang<sup>1</sup>, Songtao Dou<sup>1</sup>,  
Tingyu Li<sup>1</sup>, Xiao Ma<sup>3</sup>, and Wei Wang<sup>1</sup>

<sup>1</sup>Peking University, CHINA, <sup>2</sup>Taiyuan Institute of Technology, CHINA, and <sup>3</sup>Hangzhou Branemagic Medical Technology Co. Ltd., CHINA

### **W049.b SERS-BASED MICROFLUIDIC BIOCHIP FOR TUMOR-RELATED EXOSOME ANALYSIS**

Weiming Lin<sup>1,2</sup>, Xianjie Xiu<sup>3</sup>, Zehang Gao<sup>1</sup>, Gaozhe Cai<sup>1</sup>,  
Zizhen Ming<sup>4</sup>, Zufang Huang<sup>2</sup>, Jing Wang<sup>2</sup>, Jianlong Zhao<sup>1</sup>,  
and Shilun Feng<sup>1</sup>

<sup>1</sup>Chinese Academy of Sciences, CHINA, <sup>2</sup>Fujian Normal University, CHINA, <sup>3</sup>Shanghai Jiao Tong University, CHINA, and <sup>4</sup>Shanghai Jiao Tong University School of Medicine, CHINA

### **W050.b SIZE-DEPENDENT MICROFLUIDIC FILTRATION COUPLED ON-CHIP SURFACE-ENHANCED RAMAN SCATTERING FOR EXOSOME ANALYSIS**

Liang Qiao and Zhenzhen Han  
Fudan University, CHINA

## b - Diagnostics, Drug Testing and Personalized Medicine

### Neurobiology/Neuroscience

### **M069.b ASTROCYTE POTENTIAL MEASUREMENT USING A MICROELECTRODE ARRAY WITH BACK-TO-BACK LAYERED CO-CULTURE**

Satoshi Yoshida and Takashi Yasuda  
Kyushu Institute of Technology, JAPAN

### **M070.b DEVELOPMENT OF SHAPE-COMFORTABLE HYDROGEL-BASED CUFF ELECTRODE FOR VAGUS NERVE STIMULATION**

Hayato Yoroizuka<sup>1</sup>, Daigo Terutsuki<sup>1</sup>, Shin-ichiro Osawa<sup>1</sup>,  
Yuka Ogihara<sup>1</sup>, Hiroya Abe<sup>1</sup>, Atsuhiko Nakagawa<sup>1</sup>,  
Masaki Iwasaki<sup>2</sup>, and Matsuhiko Nishizawa<sup>1</sup>

<sup>1</sup>Tohoku University, JAPAN and <sup>2</sup>National Center of Neurology and Psychiatry (NCNP), JAPAN





## b - Diagnostics, Drug Testing and Personalized Medicine

### Nucleic-Acid Analysis

- M071.b DETECTION OF MICRORNA-21 BASED ON ROLLING CIRCLE AMPLIFICATION IN MICROFLUIDIC DROPLET**  
Ze-Lin Du, Wen-Qi Ye, Dan Wang, Qing-Shuo Li, Chun-Guang Yang, and Zhang-Run Xu  
*Northeastern University, CHINA*
- M072.b LABEL-FREE AND NAKED-EYE BASED DIGITAL LAMP IN MULTIFUNCTIONAL HYDROGEL**  
Mei Fang and Xingyu Lin  
*Zhejiang University, CHINA*
- T042.b HIGH-THROUGHPUT NUCLEIC ACID QUANTIFICATION USING LabChip® GX Touch™ NUCLEIC ACID ANALYZER**  
Brendan Curran, Gayatri P. Gautam, Jason Charbonneau, Guangnan Meng, Thomas Perroud, and James White  
*PerkinElmer Inc., USA*
- T043.b INTEGRATING CRISPR-Cas12a AND MULTIPLEX RPA INTO A MICROFLUIDIC DUAL-DROPLET DEVICE ENABLES SIMULTANEOUS DETECTION OF HPV16 AND HPV18**  
Yin Zhao<sup>1,2</sup>, Guoyong Xu<sup>1</sup>, Ying Li<sup>2</sup>, and Yunhuang Yang<sup>2</sup>  
<sup>1</sup>*Wuhan University, CHINA and*  
<sup>2</sup>*Chinese Academy of Sciences, CHINA*
- T044.b MICROFLUIDIC SPACE CODING FOR MULTIPLEXED NUCLEIC ACID DETECTION VIA CRISPR-Cas12a: A NOVEL APPROACH**  
Zhichen Xu<sup>1,2</sup>, Tao Li<sup>1,2</sup>, Ying Li<sup>1,2</sup>, and Yunhuang Yang<sup>1,2</sup>  
<sup>1</sup>*Innovation Academy for Precision Measurement Science and Technology, CHINA and* <sup>2</sup>*University of Chinese Academy of Sciences, CHINA*
- W051.b A FINGER-DRIVEN DISPOSABLE MICRO-PLATFORM BASED ON ISOTHERMAL AMPLIFICATION FOR THE APPLICATION OF MULTIPLEXED AND POINT-OF-CARE DIAGNOSIS OF TUBERCULOSIS**  
Zhiying Wang, Yang Wang, and Lingqian Chang  
*Beihang University, CHINA*
- W052.b A MICROFLUIDIC-BASED QUANTITATIVE LAMP DETECTION SYSTEM FOR MULTIPLE FOOD ALLERGENS**  
Daigo Natsuhara<sup>1</sup>, Yuka Kiba<sup>2</sup>, Koki Shirai<sup>1</sup>, Tomoya Bussho<sup>1</sup>, Ryogo Saito<sup>1</sup>, Shunya Okamoto<sup>1</sup>, Moeto Nagai<sup>1</sup>, Masashi Kitamura<sup>2</sup>, and Takayuki Shibata<sup>1</sup>  
<sup>1</sup>*Toyohashi University of Technology, JAPAN and* <sup>2</sup>*Josai University, JAPAN*
- W053.b CARBON BLACK-PDMS EMBEDDED PAPER-BASED DEVICE FOR PATHOGEN DETECTION USING PHOTOTHERMAL EFFECT**  
Ye Lin Kim and Joong Ho Shin  
*Pukyong National University, KOREA*
- W054.b OVERCOMING FALSE POSITIVES CAUSED DUE TO PRIMER-DIMERS IN A NUCLEIC ACID LATERAL FLOW ASSAY USING LATE-PCR**  
Priyanka Agarwal and Bhushan J. Toley  
*Indian Institute of Science, Bangalore, INDIA*



## Nucleic-Acid Analysis

- W055.b PARTITIONED PRESTORAGE AND CONTROLLED RECONSTITUTION OF PRIMER/PROBE REAGENTS FOR ROBUST MULTIPLEX DIGITAL PCR**  
Tengbao Xie<sup>1</sup>, Ping Wang<sup>2</sup>, Qiang Zhao<sup>1</sup>, and Gang Li<sup>1</sup>  
<sup>1</sup>Chongqing University, CHINA and  
<sup>2</sup>Henan University of Science and Technology, CHINA

## b - Diagnostics, Drug Testing and Personalized Medicine

### Pathogen Detection and Antibiotics

- M073.b A DIGITAL CULTURE PLATFORM FOR STUDYING VIRUS DISTRIBUTION IN RESPIRATORY AEROSOLS**  
Siddharth Raghu Srimathi and Don L. DeVoe  
*University of Maryland, USA*
- M074.b LOGARITHMIC-DILUTION-BASED DROPLET DIGITAL PCR FOR HIGH-DYNAMIC-RANGE QUANTIFICATION OF CLINICAL-RELEVANT VIRAL PATHOGENS**  
Qingyuan Shi, Jie Li, Rong Zhang, and Yifan Liu  
*ShanghaiTech University, CHINA*
- T045.b COMMENSAL BACTERIA DETECTION USING A LOLLIPOP-BASED MICROFLUIDIC DEVICE**  
Wan-chen Tu<sup>1</sup>, Anika M. McManamen<sup>1</sup>, Xiaojing Su<sup>1</sup>, Danielle L. Hieber<sup>1</sup>, Meg G. Takezawa<sup>1</sup>, Grant W. Hassan<sup>1</sup>, Ulri N. Lee<sup>1</sup>, Eden V. Anana<sup>1</sup>, Molly W. Stephenson<sup>1</sup>, Ingrid Jeacopello<sup>1</sup>, Karen N. Adams<sup>1</sup>, Erwin Berthier<sup>1</sup>, Sanitta Thongpang<sup>1,2</sup>, and Ashleigh B. Theberge<sup>1</sup>  
<sup>1</sup>University of Washington, USA and <sup>2</sup>Mahidol University, THAILAND
- T046.b IDENTIFICATION OF SEPSIS-CAUSING PATHOGENS USING A MICROBIAL CELL-FREE DNA METAGENOMIC APPROACH**  
Ana Martinez-Lopez<sup>1</sup>, Kazuhiro Horiba<sup>2</sup>, Linda Marriott<sup>1</sup>, Amanda Warr<sup>3</sup>, Jacob N. Phulusa<sup>4</sup>, Jamie Rylance<sup>4,5</sup>, Yoshinori Ito<sup>2</sup>, and Maiwenn Kersaudy-Kerhoas<sup>1,3</sup>  
<sup>1</sup>Heriot-Watt University, UK, <sup>2</sup>Nagoya University, JAPAN, <sup>3</sup>University of Edinburgh, UK, <sup>4</sup>Malawi-Liverpool Wellcome Clinical Research Programme, MALAWI, and <sup>5</sup>Liverpool School of Tropical Medicine, UK
- T047.b INTEGRATED PLATFORM FOR AUTOMATED SAMPLE PREPARATION AND MULTIPLEXED POINT-OF-CARE DIAGNOSTICS VIA SEQUENTIAL MAGNETOFLUIDIC ELUTION**  
Asher Varon, David Lu, Fan-En Chen, Alexander Y. Trick, and Tza-Huei Wang  
*Johns Hopkins University, USA*
- T048.b MONOLITH-MODIFIED PAPER ANALYTICAL DEVICE FOR TUBERCULOSIS DETECTION**  
Wei-Yi Chu, Chun-Hui Yang, and Chien-Fu Chen  
*National Taiwan University, TAIWAN*
- T049.b ONE-STEP SIGNAL AMPLIFIED GOLD NANOPARTICLES FOR BACTERIAL INFECTION DIAGNOSIS ON LATERAL FLOW IMMUNOASSAY DEVICE**  
Yuh-Shiuan Chien and Chien-Fu Chen  
*National Taiwan University, TAIWAN*



## Pathogen Detection and Antibiotics

### **W056.b GENERATION OF SERIES OF DILUTIONS ON SLIPCHIP FOR DRUG RESISTANCE STUDIES**

Wong Wai Tan<sup>1</sup>, Xu Miao<sup>1</sup>, Ho Cheung Shum<sup>1,2</sup>,  
and Sammer Ul Hassan<sup>1,2</sup>

<sup>1</sup>University of Hong Kong, HONG KONG and

<sup>2</sup>Advanced Biomedical Instrumentation Centre, HONG KONG

### **W057.b POINT-OF-CARE DEVICES FOR DETECTING MOSQUITO-BORNE AND AIRBORNE VIRUSES**

George Adedokun, Carlos Manzanos, Morteza Alipanah,  
John A. Lednicky, Chang-Yu Wu, and Z. Hugh Fan  
University of Florida, USA

### **W059.b SPORE-BASED BIOSENSOR-ON-PILLAR PLATFORM FOR DETECTION OF $\beta$ -LACTAM ANTIBIOTICS IN MILK**

Sammer Ul Hassan<sup>1,3</sup>, Prashant Goel<sup>2</sup>, Naresh Kumar<sup>2</sup>,  
and Xunli Zhang<sup>1</sup>

<sup>1</sup>University of Southampton, UK, <sup>2</sup>ICAR-National Dairy Research  
Institute, INDIA, and <sup>3</sup>University of Hong Kong, HONG KONG

## b - Diagnostics, Drug Testing and Personalized Medicine

### Protein Analysis and Proteomics

### **M075.b A SENSITIVE NATIVE PURIFICATION AND MASS SPECTROMETRIC CHARACTERIZATION STRATEGY FOR PROTEIN COMPLEX ANALYSIS**

Xinyang Shao<sup>1</sup>, Meng Tian<sup>2</sup>, Guanbo Wang<sup>1,3</sup>, Hongwei Wang<sup>2</sup>,  
Jianbin Wang<sup>2</sup>, and Yanyi Huang<sup>1,3</sup>

<sup>1</sup>Peking University, CHINA, <sup>2</sup>Tsinghua University, CHINA, and

<sup>3</sup>Shenzhen Bay Laboratory, CHINA

### **M076.b EFFICIENT SAMPLE PREPARATION SYSTEM FOR HIGHLY ACCELERATED PROTEIN DIGESTION VIA SINGLE CELL MASS SPECTROMETRY**

Peng Zhao, Yongxiang Feng, Fei Liang, and Wenhui Wang  
Tsinghua University, CHINA

### **M077.b SIMULTANEOUS TRANSCRIPTOME AND PROTEOME PROFILING OF SINGLE MOUSE OOCYTE USING DEEP SINGLE-CELL MULTI-OMICS TECHNIQUE**

Yi-Rong Jiang<sup>1</sup>, Le Zhu<sup>2</sup>, Lan-Rui Cao<sup>2,3</sup>, Qiong Wu<sup>1</sup>,  
Jian-Bo Chen<sup>1</sup>, Yu Wang<sup>1</sup>, Zhi-Ying Guan<sup>1</sup>, Tian-Yu Zhang<sup>4</sup>,  
Zhao-Lun Wang<sup>4</sup>, Shao-Wen Shi<sup>5</sup>, Hui-Feng Wang<sup>5</sup>,  
Jian-Zhang Pan<sup>1,5</sup>, Xu-Dong Fu<sup>2,3</sup>, Yong-Cheng Wang<sup>2</sup>,  
and Qun Fang<sup>1,5</sup>

<sup>1</sup>Zhejiang University, CHINA, <sup>2</sup>Zhejiang University Medical Center,  
CHINA, <sup>3</sup>Zhejiang University School of Medicine, CHINA,

<sup>4</sup>M20 Genomics, CHINA, and <sup>5</sup>ZJU-Hangzhou Global Scientific  
and Technological Innovation Center, CHINA

### **T050.b A MAGNETIC BEAD-BASED PROXIMITY EXTENSION ASSAY FOR HIGHLY-SENSITIVE PROTEIN DETECTION**

Jiumei Hu, Pengfei Zhang, Joon Soo Park, Kuangwen Hsieh,  
Liben Chen, and Tza-Huei Wang  
Johns Hopkins University, USA



## Protein Analysis and Proteomics

- T051.b A NITROCELLULOSE PAPER-BASED MULTI-WELL PLATE FOR POINT-OF-CARE ELISA**  
Zhen Qin, Zongjie Huang, Peng Pan, Yueyue Pan, Yu Sun, and Xinyu Liu  
*University of Toronto, CANADA*
- W060.b A HIGH-SENSITIVE DETECTION OF AGGREGATED  $\alpha$ -SYNUCLEIN BY SALT ADDITION FOR LIPOSOME-IMMOBILIZED QCM MECHANICAL SENSOR**  
Kotaro Kamitani<sup>1</sup>, Masanori Sawamura<sup>2</sup>, Hodaka Yamakado<sup>2</sup>, Yuya Takahashi<sup>1</sup>, Carl Frederik Werner<sup>1</sup>, Masayuki Sohgewa<sup>3</sup>, and Minoru Noda<sup>1</sup>  
<sup>1</sup>*Kyoto Institute of Technology, JAPAN*, <sup>2</sup>*Kyoto University, JAPAN*, and <sup>3</sup>*Niigata University, JAPAN*
- W061.b BEAD-BASED SLIPCHIP FOR DIGITAL IMMUNOASSAY WITH MULTISTEP SAMPLE DELIVERY**  
Weiyuan Lyu, Jingwei Yi, Hong Xu, Feng Shen, and Hongchen Gu  
*Shanghai Jiao Tong University, CHINA*
- W062.b DIFFUSIONAL MICROFLUIDICS FOR PROTEIN ANALYSIS**  
Huimin Xie<sup>1</sup>, Yuanxi Yang<sup>2</sup>, Chenghao Xia<sup>1</sup>, Tung-Chun Lee<sup>2</sup>, Qiaosheng Pu<sup>1</sup>, Yang Lan<sup>2</sup>, and Yuewen Zhang<sup>1</sup>  
<sup>1</sup>*Lanzhou University, CHINA* and <sup>2</sup>*University College London, UK*
- W063.b GOLD NANOPARTICLE ENHANCED 3D FLUORESCENCE MICROARRAY FOR HIGHLY SENSITIVE MULTIPLEXED PROTEIN ANALYSIS IN EXTRACELLULAR VESICLES**  
Nikan Momenbeitollahi, Roshan Aggarwal, Gisela Strohle, and Huiyan Li  
*University of Guelph, CANADA*
- W064.b MILLISECONDS TIME RESOLVED CRYO-EM THROUGH DROPLET MICROFLUIDICS**  
Stefania Torino<sup>1,2</sup>, Mugdha K. Dhurandhar<sup>1,2</sup>, and Rouslan G. Efremov<sup>1,2</sup>  
<sup>1</sup>*Vlaams Instituut voor Biotechnologie (VIB), BELGIUM* and <sup>2</sup>*Vrije Universiteit Brussel (VUB), BELGIUM*

## b - Diagnostics, Drug Testing and Personalized Medicine

### Testing for COVID-19, Rapid Virus Testing, Pandemic Management

- M078.b LAB-ON-PCB DEVICE FOR HANDHELD, RAPID, MOLECULAR SARS-CoV-2 DIAGNOSTIC IN WASTEWATER**  
Sotirios Papamatthaiou<sup>1</sup>, James Boxall-Clasby<sup>1</sup>, Varun K.S. Kumar<sup>1</sup>, Mirella Di Lorenzo<sup>1</sup>, Julien Reboud<sup>2</sup>, Jonathan M. Cooper<sup>2</sup>, Pedro Estrela<sup>1</sup>, Barbara Kasprzyk-Hordern<sup>1</sup>, and Despina Moschou<sup>1</sup>  
<sup>1</sup>*University of Bath, UK* and <sup>2</sup>*University of Glasgow, UK*





- M079.b AUTOMATED MICROFLUIDIC SYSTEM WITH GLUCOSE OUTPUT FOR POINT-OF-NEED DIAGNOSTICS**  
Evan Amalfitano<sup>1</sup>, Jennifer Doucet<sup>1</sup>, Moiz Charania<sup>1</sup>, Kebin Li<sup>2</sup>, Matthew Shiu<sup>2</sup>, Marc-Alexandre Chan<sup>2</sup>, Aaron Besso<sup>2</sup>, Émilie Leblanc Gaudreau<sup>2</sup>, Jarod Matwiy<sup>2</sup>, Kaiyue Wu<sup>3</sup>, Alexander A. Green<sup>3</sup>, Tony Mazzulli<sup>4</sup>, Claudia DosSantos<sup>5</sup>, Keith Morton<sup>2</sup>, Teodor Veres<sup>2,6</sup>, and Keith Pardee<sup>1</sup>  
<sup>1</sup>University of Toronto, CANADA, <sup>2</sup>National Research Council Canada, CANADA, <sup>3</sup>Boston University, USA, <sup>4</sup>Sinai Health System, CANADA, <sup>5</sup>Unity Health Toronto, CANADA, and <sup>6</sup>Centre for Research and Applications in Fluidic Technologies (CRAFT), CANADA
- M080.b CLINICAL APPLICATIONS OF POINT-OF-CARE REAL-TIME PHOTOTHERMAL PCR FOR COVID-19 DIAGNOSTICS**  
Byoung-Hoon Kang, Eun-Sil Yu, Hamin Na, and Ki-Hun Jeong  
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- M081.b DUAL-CLAMPED SERS BASED BIOSENSORS FOR RAPID AND SENSITIVE DETECTION OF THE OMICRON VARIANT OF SARS-CoV-2 USING PORTABLE RAMAN SPECTROMETER**  
Kiran Kaladharan<sup>1</sup>, Kuan-Hung Chen<sup>1</sup>, Ping-Han Chen<sup>1</sup>, and Fan-Gang Tseng<sup>1,2</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN and <sup>2</sup>Academia Sinica, TAIWAN
- M082.b MULTIPLEX RT-PCR ASSAYS FOR RAPID DIAGNOSIS OF SARS-CoV-2 AND INFLUENZA A/B BY USING AN ELECTROMAGNETICALLY-DRIVEN INTEGRATED MICROFLUIDIC PLATFORM**  
Chien-Hsin Chiu, Chih-Hung Wang, Yi-Cheng Tsai, and Gwo-Bin Lee  
University of Tsing Hua, TAIWAN
- M083.b ULTRAFAST AND DIGITAL QUANTIFICATION OF SARS-COV-2 USING NANOCONFINED RT-LAMP WITHOUT PRE-LYSIS**  
Tao Yang, Yuhua Yan, and Xingyu Lin  
Zhejiang University, CHINA
- T052.b A NOVEL DUAL-MODE CAPILLARY METHOD FOR RAPID DETECTION OF SARS-CoV-2**  
Chunpeng Jiao and Jingbin Zeng  
China University of Petroleum (East China), CHINA
- T053.b RAPID ELECTROCHEMICAL DETECTION OF SARS-COV-2 ANTIGENS IN HUMAN SALIVA**  
Yueyue Pan and Xinyu Liu  
University of Toronto, CANADA
- W065.b A MICROFLUIDIC CHIP FOR DETECTING MULTIPLE SARS-CoV-2 VARIANTS BASED ON CRISPR/CAS SYSTEM**  
Wen Li and Zewen Wei  
Beijing Institute of Technology, CHINA
- W066.b A ULTRAFAST qPCR SYSTEM FOR DETECTING 2019-nCoV UNDER 1000 COPIES/ ML WITHIN 15 MINUTES**  
Yu Guo<sup>1</sup> and Wenming Wu<sup>2</sup>  
<sup>1</sup>Guangdong University of Technology, CHINA and <sup>2</sup>Guangdong Academy of Sciences, CHINA



## Testing for COVID-19, Rapid Virus Testing, Pandemic Management

- W067.b NEUTRALIZING APTAMER-LIPID NANOPARTICLES FOR SYNERGISTIC TREATMENT OF SARS-CoV-2 INFECTION**  
Miao Sun, Yanling Song, and Chaoyong Yang  
*Xiamen University, CHINA*
- W068.b RAPID CONVECTIVE PCR-BASED BIODETECTION AT THE POINT OF CARE FOR RESOURCE LIMITED SETTINGS**  
MinGin Kim, Vijay Ravisankar, and Victor M. Ugaz  
*Texas A&M University, USA*

## b - Diagnostics, Drug Testing and Personalized Medicine

### Others

- W069.b ENHANCED SIGNAL INTENSITY AND SENSITIVITY IN PRESSED LATERAL FLOW ASSAY STRIP**  
Se Been Park and Joong Ho Shin  
*Pukyong National University, KOREA*
- W070.b MACHINE LEARNING ENABLES QUANTIFYING CELL-JANUS PARTICLE CONJUGATES THROUGH MICROFLOWING IMPEDANCE SIGNALS**  
Brandon K. Ashley, Jianye Sui, Mehdi Javanmard, and Umer Hassan  
*Rutgers University, USA*
- W071.b NANOPARTICLE SYNTHESIS USING THREE-DIMENSIONAL HYDRODYNAMIC FLOW FOCUSED MICROFLUIDIC DEVICES WITH A HILLOCK STRUCTURE FOR AN INFLUENZA A VIRUS TREATMENT**  
Eric K. Marecki, Corrin Bowman, Diego Gutierrez, Morgan Ketcham, Rayhan, Bruce Davidson, Paul Knight, and Kwang W. Oh  
*State University of New York at Buffalo (SUNY-Buffalo), USA*
- W072.b RAPID DETECTION OF DNASE I BY DIELECTROPHORESIS AND IMPEDANCE MEASUREMENT OF DNA-LABELED MICROBEADS**  
Michihiko Nakano, Makoto Shigemoto, Masafumi Inaba, and Junya Suehiro  
*Kyushu University, JAPAN*

## c - Fundamentals in Microfluidics and Nanofluidics

### Acousto- and Magnetofluidics

- M084.c ACOUSTOFLUIDIC INTRA DROPLET CELL SEPARATION FOR SUBSEQUENT MALDI-MS ANALYSIS**  
Michael Gertl, Maximilian Breinfeld, Aurelia Bucciarelli, Petra Dittrich, and Jürg Dual  
*ETH Zürich, SWITZERLAND*
- M085.c CONTROLLABLE PHASE ACOUSTIC FIELD IN THE OCTAGONAL CHAMBER FOR CELL PATTERNING AND MANIPULATION**  
Liang Huang, Dong Tang, Jingui Qian, and Haojie Xia  
*Hefei University of Technology, CHINA*



## Acousto- and Magnetofluidics

- M086.c FERROFLUID DROPLET TO SPIKE REVERSIBLE TRANSITION DUE TO AN APPROACHING PERMANENT MAGNET**  
Sachin K. Jain, Utsab Banerjee, Chiranjit Mandal, and Ashis K. Sen  
*Indian Institute of Technology, Madras, INDIA*
- M087.c FOURIER-SYNTHESIZED HARMONIC BULK ACOUSTIC STANDING WAVE FOR CHANGEABLE FOCUSING OF MICRO/SUBMICRON PARTICLES**  
Yoshiyuki Tsuyama<sup>1</sup>, Yusuke Yoshioka<sup>1</sup>, SangWook Lee<sup>2</sup>, and Sadao Ota<sup>2</sup>  
<sup>1</sup>*Tokyo Medical University, JAPAN* and <sup>2</sup>*University of Tokyo, JAPAN*
- M088.c MICROPARTICLE ORIENTATION AND PATTERN IN A COMBINED ACOUSTIC AND MAGNETIC FIELD**  
Zhiyuan Zhang and Daniel Ahmed  
*ETH Zürich, SWITZERLAND*
- T054.c 3D PHONONIC BASED PH SENSING AND ITS EXPEDITED CLASSIFICATION VIA DEEP NEURAL NETWORKS**  
Syed Muhammad Anas Ibrahim, Zhang Fang, Gyubin Park, Jaehyun Kim, and Jungyul Park  
*Sognag University, KOREA*
- T055.c BEAD-BASED ELISA ACCELERATED VIA SURFACE ACOUSTIC WAVE-DRIVEN MIXING FLOW**  
Shuai Zhang<sup>1</sup>, Lei Zhang<sup>1</sup>, Kha Nguyen<sup>1</sup>, Cécile Floer<sup>2</sup>, and James Friend<sup>1</sup>  
<sup>1</sup>*University of California, San Diego, USA* and <sup>2</sup>*Université de Lorraine, FRANCE*
- T056.c MAGNETIC LEVITATION-BASED VISCOSITY MEASUREMENT IN A MICROCAPILLARY CHANNEL**  
Oyku Doyran<sup>1</sup> and H. Cumhuri Tekin<sup>1,2</sup>  
<sup>1</sup>*Izmir Institute of Technology, TURKEY* and <sup>2</sup>*Middle East Technical University (METU), TURKEY*
- T057.c OPTIMISED ACOUSTOPHORESIS CONDITIONS ENABLE SEPARATION OF MICROPARTICLES AT A SAMPLE FLOW RATE  $\approx 1$  mL/min**  
Thierry Baasch, Linda Péroux, Wei Qiu, Andreas Lenshof, and Thomas Laurell  
*Lund University, SWEDEN*
- T058.c SURFACE ACOUSTIC WAVE-INDUCED REAGENT-FREE CELL LYSIS**  
Hyeono Nam, Hyung Jin Sung, and Jessie S. Jeon  
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*
- T059.c MULTIPLE VORTICES-STRUCTURE STREAMING FLOW AT AUDIBLE FREQUENCY**  
Chuanyu Zhang, Shuo Liu, and Xueyong Wei  
*Xi'an Jiaotong University, CHINA*
- W073.c ANALYSIS OF ACOUSTIC RELOCATION OF IMMISCIBLE FLUIDS IN A MICROCHANNEL**  
Varun Kumar Rajendran and Karthick Subramani  
*Indian Institute of Information Technology, Design and Manufacturing, INDIA*



## Acousto- and Magnetofluidics

- W074.c** **COMBINING A 3D-LOCATION AND TEMPERATURE MEASUREMENT WITH THE TRAPPING OF PARTICLES**  
Zhichao Deng<sup>1</sup>, Vijay V. Kondalkar<sup>2</sup>, Robert Weser<sup>2</sup>, Hagen Schmidt<sup>2</sup>, Christian Ciepka<sup>1</sup>, and Jörg König<sup>1</sup>  
<sup>1</sup>Technische Universität Ilmenau, GERMANY and <sup>2</sup>Leibniz Institute for Solid State and Materials Research Dresden, GERMANY
- W075.c** **CONTROLLABLE MICROBUBBLE: A VERSATILE TOOL FOR MULTI-DIMENSIONAL INFORMATION ACQUISITION**  
Yidi Zhou, Dunqing Hong, Jixiao Liu, Shijie Guo, and Tiejun Li  
Hebei University of Technology, CHINA
- W076.c** **FUSION OF VESICLES BY THE GHZ ACOUSTIC STREAMING**  
Yao Lu<sup>1</sup>, Yang Yang<sup>2</sup>, Xiaotian Shen<sup>2</sup>, Huikai Xie<sup>1</sup>, and Xuexin Duan<sup>2</sup>  
<sup>1</sup>Beijing Institute of Technology, CHINA and <sup>2</sup>Tianjin University, CHINA

## c - Fundamentals in Microfluidics and Nanofluidics

### Capillary Microfluidics

- T060.c** **GROOVED MICRONEEDLES WITH ABSORBENT BEADS FOR CONTINUOUS SAMPLING OF INTERSTITIAL FLUID**  
Ruben Del-Rio-Ruiz, Atul Sharma, and Sameer Sonkusale  
Tufts University, USA
- T061.c** **TOWARD OPERATION OF MOLECULAR ROBOT IN THE AIR: GLASS CAPILLARY-BASED GENERATION OF REPRODUCIBLE SOAP BUBBLES**  
Rina Takagi, Sotaro Takiguchi, and Ryuji Kawano  
Tokyo University of Agriculture and Technology, JAPAN
- W077.c** **A WEARABLE MICROFLUIDIC SENSING PATCH DRIVEN BY CAPILLARY PUMP FOR RAPID SWEAT COLLECTION AND MULTIPLEX ANALYSIS**  
Teng Sun<sup>1,2,3</sup>, Jiannan Hui<sup>1,2</sup>, Lin Zhou<sup>1,2</sup>, Hongju Mao<sup>1,2</sup>, and Jianlong Zhao<sup>1,2,3</sup>  
<sup>1</sup>Chinese Academy of Science, CHINA,  
<sup>2</sup>University of Chinese Academy of Sciences, CHINA, and  
<sup>3</sup>ShanghaiTech University, CHINA
- W078.c** **CAPILLARY FLOW IN CONVERGING OPEN-FLUIDIC CHANNELS**  
Anika M. McManamen<sup>1</sup>, Jean Berthier<sup>1</sup>, Jodie Tokihiro<sup>1</sup>, Sanitta Thongpang<sup>1,2</sup>, Ashleigh B. Theberge<sup>1</sup>, and Erwin Berthier<sup>1</sup>  
<sup>1</sup>University of Washington, USA and <sup>2</sup>Mahidol University, THAILAND
- W079.c** **DROP IMPACT ON A SUPERHYDROPHILIC SPOT SURROUNDED BY A SUPERHYDROPHOBIC SURFACE**  
Niladri Sekhar Satpathi, Lokesh Malik, Alwar Samy Ramasamy, and Ashis Kumar Sen  
Indian Institute of Technology, Madras, INDIA
- W080.c** **ENHANCING CAPILLARY PUMPING ON NITROCELLULOSE PAPER BY APPLYING PRESSURE USING AN ELECTROMAGNET**  
Zitao Feng, Zejingqiu Chen, and Weijin Guo  
Shantou University, CHINA



## Capillary Microfluidics

- W081.c SINGLE-CELL MASS-DENSITY MEASUREMENTS USING MICROCHANNEL GRADIENT CENTRIFUGATION**  
Richard Soller<sup>1</sup> and Rune Barnkob<sup>2</sup>  
<sup>1</sup>Lund University, SWEDEN and <sup>2</sup>Independent Researcher, ITALY
- W082.c SINGLE-CELL TRAPPING IN OPEN MICROFLUIDICS**  
Tomoki Murakami and Hiroaki Suzuki  
Chuo University, JAPAN

## c - Fundamentals in Microfluidics and Nanofluidics

### Centrifugal Microfluidics

- M089.c A PORTABLE SMARTPHONE-BASED CENTRIFUGAL MHEALTH PLATFORM WITH INTELLIGENT RESULT ANALYSIS**  
Bangfeng Wang<sup>1</sup>, Zetai Liu<sup>1</sup>, Mingyu Zhang<sup>1</sup>, Hufei Duan<sup>2</sup>, Hongjia Kang<sup>3</sup>, Peng Chen<sup>1</sup>, Wei Du<sup>1</sup>, Yiwei Li<sup>1</sup>, Xiaojun Feng<sup>1</sup>, and Bi-Feng Liu<sup>1</sup>  
<sup>1</sup>Huazhong University of Science and Technology, CHINA, <sup>2</sup>Tsinghua Shenzhen International Graduate School, CHINA, and <sup>3</sup>Xi'an Jiaotong University, CHINA
- M090.c AN ADDRESSABLE ELECTROWETTING VALVE FOR CENTRIFUGAL MICROFLUIDICS**  
Yanming Xia<sup>1,2</sup>, Chao Song<sup>2</sup>, Yingchao Meng<sup>2</sup>, Peng Xue<sup>2</sup>, Andrew J. deMello<sup>2</sup>, Quan Gao<sup>2</sup>, Stavros Stavrakis<sup>2</sup>, Shenglin Ma<sup>1</sup>, and Xiaobao Cao<sup>1,3</sup>  
<sup>1</sup>Xiamen University, CHINA, <sup>2</sup>ETH Zürich, SWITZERLAND, and <sup>3</sup>Guangzhou Laboratory, CHINA
- M091.c PARALLEL DROPLET GENERATION IN 8-TUBE STRIPS FOR HIGH-THROUGHPUT DIGITAL ASSAYS**  
Yu-Kai Lai<sup>1</sup>, Yu-Ting Kao<sup>1</sup>, Jacob F. Hess<sup>2</sup>, Silvia Calabrese<sup>2</sup>, Felix von Stetten<sup>1,2</sup>, and Nils Paust<sup>1,2</sup>  
<sup>1</sup>University of Freiburg, GERMANY and <sup>2</sup>Hahn-Schickard, GERMANY
- T062.c MAGNETIC ISOLATION OF HUMAN PERIPHERAL MONONUCLEAR CELLS ON CENTRIFUGAL PLATFORMS WITH ACTIVE PNEUMATIC CONTROL AND WORLD-TO-CHIP INTERFACE**  
Liviu Clime, Lidija Malic, Byeong-Ui Moon, Dillon Da Fonte, Mojra Janta-Polczynski, and Teodor Veres  
National Research Council, CANADA
- W083.c A ROLLING BALL VISCOMETER ON A CENTRIFUGAL PLATFORM**  
Chih-Hsin Shih, Chia-Lin Chang, and Yuan-Ting Cheng  
Feng Chia University, TAIWAN
- W084.c AQUEOUS TWO-PHASE SYSTEM APPLICATIONS ON A CENTRIFUGAL MICROFLUIDIC PLATFORM**  
Byeong-Ui Moon, Liviu Clime, Daniel Brassard, Christina Nassif, Lidija Malic, and Teodor Veres  
National Research Council, CANADA
- W085.c DEVELOPMENT OF FRACTION COLLECTORS FOR CONDUCTING CHROMATOGRAPHY ON A CENTRIFUGAL PLATFORM**  
Chih-Hsin Shih and Chih-Chien Hsiao  
Feng Chia University, TAIWAN



## Centrifugal Microfluidics

### **W086.c ENRICHMENT OF VEGF165 IN BLOOD BASED ON A NOVEL CENTRIFUGAL MICROFLUIDIC CHIP**

Xinyu He, Junyan Xu, Xiaoli Wang, and Yi Xu

*Chongqing University, CHINA*

## c - Fundamentals in Microfluidics and Nanofluidics

## Digital Microfluidics

### **M092.c HIGHLY PARALLEL, RAPID, AND SENSITIVE SINGLE-CELL PROTEIN ANALYSIS WITH DIGITAL MICROFLUIDICS**

Linfeng Cai, Xing Xu, Li Lin, Zhi Zhu, and Chaoyong Yang

*Xiamen University, CHINA*

### **M093.c MAGNETO TWISTER: STABLE DROPLET MANIPULATION SYSTEM**

Udara BBimendra Gunatilake<sup>1</sup>, Rafael Morales<sup>1</sup>,

Lourdes Basabe-Desmonts<sup>1,2,3,4</sup>,

and Fernando Benito-Lopez<sup>1,2,3</sup>

<sup>1</sup>*University of the Basque Country, SPAIN, <sup>2</sup>IKERBASQUE, SPAIN,*

<sup>3</sup>*Bioaraba Health Research Institute, SPAIN, and <sup>4</sup>BCMaterials, SPAIN*

### **M094.c ON-CHIP ELECTROPORATION IN EWOD DIGITAL MICROFLUIDICS**

Siyi Hu<sup>1</sup>, Qi Huang<sup>1</sup>, Jie Yue<sup>2</sup>, Kai Jin<sup>1</sup>, Chenxuan Hu<sup>1</sup>,  
and Hanbin Ma<sup>1,2</sup>

<sup>1</sup>*Chinese Academy of Sciences, CHINA and*

<sup>2</sup>*Guangdong ACXEL Micro & Nano Tech Co., Ltd., CHINA*

### **M095.c SUPERWETTABILITY BASED MICROARRAYS FOR HIGH-THROUGHPUT SINGLE-MICROSPHERE ISOLATION ON DIGITAL MICROFLUIDICS**

Li Meng<sup>1</sup>, Mingzhong Li<sup>1</sup>, Man-Kay Law<sup>1</sup>, Pui-In Mak<sup>1</sup>,  
and Rui P. Martins<sup>1,2</sup>

<sup>1</sup>*University of Macau, CHINA and*

<sup>2</sup>*Universidade de Lisboa, PORTUGAL*

### **T063.c 3D-PRINTED MAGNETIC SOFT MILLIROBOTS FOR DROPLET MANIPULATION ON MAGNETIC DIGITAL MICROFLUIDIC PLATFORM**

Yi Zhang

*University of Electronic Science and Technology of China, CHINA*

### **T064.c ONE-FACTOR-AT-A-TIME – A NEW ROUTE FOR HIGH-THROUGHPUT DIGITAL MICROFLUIDICS**

Fatemeh Ahmadi<sup>1</sup>, Mohammad Simchi<sup>2</sup>, James M. Perry<sup>1</sup>,  
Stephane Frenette<sup>1</sup>, Habib Benali<sup>1</sup>, Jean Paul Soucy<sup>1,3</sup>,  
Gassan Massarweh<sup>3</sup>, and Steve C.C. Shih<sup>1</sup>

<sup>1</sup>*Concordia University, CANADA, <sup>2</sup>University of Toronto,*

*CANADA, and <sup>3</sup>McGill University, CANADA*

### **W176.c WEARABLE SWEAT SENSING DEVICE FOR MONITORING SWEAT RATE FROM SINGLE GLANDS IN SEDENTARY STATE**

Emma J.M. Moonen<sup>1</sup>, Sander J.N. de Graaf<sup>1</sup>,

Sebastiaan van Kemenade<sup>1</sup>, Eduard Pelssers<sup>1,2</sup>,

and Jaap M.J. den Toonder<sup>1</sup>

<sup>1</sup>*Eindhoven University of Technology, NETHERLANDS and*

<sup>2</sup>*Philips Research, NETHERLANDS*



## Digital Microfluidics

- W087.c HIGH FILLING DIGITAL PCR THROUGH-HOLE ARRAY FOR PATHOGENS DETECTION**  
Yaru Huang<sup>1,3</sup>, Zehang Gao<sup>1</sup>, Yimeng Sun<sup>1</sup>, Cong Ma<sup>1,2</sup>, Gaozhe Cai<sup>1</sup>, Haoran Hu<sup>1</sup>, Lijuan Liang<sup>1</sup>, Chunping Jia<sup>1</sup>, Jianlong Zhao<sup>1</sup>, and Shilun Feng<sup>1</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA, <sup>2</sup>ShanghaiTech University, CHINA, and <sup>3</sup>Shanghai Normal University, CHINA
- W088.c PARTICLE SORTING BY INTEGRATED DIELECTROPHORESIS-DIGITAL MICROFLUIDIC PLATFORM**  
Chenxuan Hu<sup>1,2</sup>, Siyi Hu<sup>1</sup>, Qi Huang<sup>1</sup>, and Hanbin Ma<sup>1,3</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA, <sup>2</sup>University of Science and Technology, CHINA, and <sup>3</sup>Guangdong ACXEL Micro & Nano Tech Co., Ltd., CHINA
- W089.c WHOLE-GENOME PROFILING OF SINGLE BACTERIAL CELL BY DIGITAL MICROFLUIDICS-BASED ISOLATION AND SEQUENCING**  
Junnan Guo<sup>1</sup>, Di Sun<sup>2</sup>, Shichen Geng<sup>1</sup>, Mengwu Mo<sup>1</sup>, Wei Wang<sup>2</sup>, Jia Song<sup>2</sup>, Huimin Zhang<sup>1</sup>, and Chaoyong Yang<sup>1,2</sup>  
<sup>1</sup>Xiamen University, CHINA and <sup>2</sup>Shanghai Jiao Tong University, CHINA

## c - Fundamentals in Microfluidics and Nanofluidics

### Droplet Microfluidics

- M096.c ACTIVE CONTENT RELEASE FROM SYNTHETIC CELL INTERIOR TOWARDS A NOVEL DRUG DELIVERY METHOD**  
Pantelitsa Dimitriou, Jin Li, William D. Jamieson, Oliver K. Castell, and David A. Barrow  
Cardiff University, UK
- M097.c COMPLEX FILTRATION-ENABLED SUBCULTURE-FREE PHENOTYPIC IDENTIFICATIONS OF CARBAPENEM-RESISTANT ORGANISMS WITH A DROPLET DIGITAL CHROMOGENIC ASSAY**  
Yu Wang<sup>1</sup>, Haoyan He<sup>1</sup>, Dongyang Cai<sup>1</sup>, Bin Wu<sup>1</sup>, and Dayu Liu<sup>1,2</sup>  
<sup>1</sup>South China University of Technology, CHINA and <sup>2</sup>Guangdong Engineering Technology Research Center of Microfluidic Chip Medical Diagnosis, CHINA
- M098.c DROPLET ENCODING AND PAIRING-BASED MULTIPLEXED DROPLET DIGITAL LOOP-MEDIATED ISOTHERMAL AMPLIFICATION**  
Dongyang Cai, Jingjing Zou, and Dayu Liu  
South China University of Technology, CHINA
- M099.c EFFICIENT MICRODROPLET INJECTION METHOD FOR SINGLE-CELL SELECTIVE LYSIS AND SORTING**  
Zhihang Yu<sup>1</sup>, Jing Jin<sup>1</sup>, Huaying Chen<sup>1</sup>, Siyuan Chen<sup>1</sup>, Lingling Shui<sup>2</sup>, Liuyong Shi<sup>3</sup>, and Yonggang Zhu<sup>1</sup>  
<sup>1</sup>Harbin Institute of Technology, CHINA, <sup>2</sup>South China Normal University, CHINA, and <sup>3</sup>Hainan University, CHINA



## Droplet Microfluidics

- M100.c** **EFFICIENT PROTEIN CRYSTALLIZATION AND DAMAGELESS EXTRACTION FLOW DEVICE USING MULTI-MICRODROPLET TRAPPING STRUCTURE**  
Aya Miyazaki, Daiki Tanaka, Tetsushi Sekiguchi,  
Masahiro Furuya, and Shuichi Shoji  
*Waseda University, JAPAN*
- M101.c** **HIGH-THROUGHPUT PRODUCTION OF GIANT UNILAMELLAR VESICLES BY STEP EMULSIFICATION AND DROPLET TRANSFER TECHNIQUE**  
Shota Nakagawa, Naotomo Tottori,  
Shinya Sakuma, and Yoko Yamanishi  
*Kyushu University, JAPAN*
- M102.c** **LIPOSOME TRAP USING A MICROFLUIDICS CHANNEL WITH RAIL**  
Shun Okada and Kan Shoji  
*Nagaoka University of Technology, JAPAN*
- M103.c** **MULTIPLEX DIGITAL PCR USING A SELF-PARTITIONING SLIPCHIP WITH MELTING CURVE ANALYSIS**  
Yan Yu<sup>1</sup>, Ziqing Yu<sup>1</sup>, Xufeng Pan<sup>2</sup>, Lei Xu<sup>1</sup>, Rui Guo<sup>1</sup>,  
Xiaohua Qian<sup>1</sup>, and Feng Shen<sup>1</sup>  
<sup>1</sup>Shanghai Jiao Tong University, CHINA and  
<sup>2</sup>Shanghai Chest Hospital, CHINA
- M104.c** **PARALLEL SYNTHESIS OF CELL-LADEN CALCIUM-ALGINATE MICROSPHERES IN MICROFLUIDIC DROPLET GENERATORS ON SLITS**  
Yingzhe Liu and Takasi Nisisako  
*Tokyo Institute of Technology, JAPAN*
- M105.c** **PUMP-FREE GENERATION OF HYDROGEL BEADS BY MICROFLUIDIC STEP EMULSIFICATION**  
Jijo Easo George, Riddha Manna,  
Shomdutta Roy, and Debjani Paul  
*Indian Institute of Technology, Bombay, INDIA*
- M106.c** **SYNTHESIS OF FUNCTIONAL POLYMERIC MICROSPHERES VIA SETP EMULSIFICATION AND DETERMINISTIC LATERAL DISPLACEMENT**  
Guangchong Ji, Yusuke Kanno, and Takasi Nisisako  
*Tokyo Institute of Technology, JAPAN*
- M107.c** **TIME-VARIANT DUAL PICOINJECTION FOR FAST REAGENT CONCENTRATION SCREENING IN DROPLETS**  
Jolien Breukers<sup>1</sup>, Hannah Op de Beeck<sup>1</sup>, Iene Rutten<sup>1</sup>,  
Montserrat López Fernández<sup>2,3</sup>, Sven Eyckerman<sup>2,3</sup>,  
and Jeroen Lammertyn<sup>1</sup>  
<sup>1</sup>KU Leuven, BELGIUM, <sup>2</sup>VIB-Ghent University, BELGIUM, and  
<sup>3</sup>Ghent University, BELGIUM
- T066.c** **ANTIBIOTIC COMBINATION SCREENING VIA ROBOTIC PRINTED COMBINATORIAL DROPLET (ROBODROP) PLATFORM**  
Fangchi Shao, Hui Li, Kuangwen Hsieh,  
Pengfei Zhang, and Tza-Huei Wang  
*Johns Hopkins University, USA*



## Droplet Microfluidics

- T067.c BUILDING LIPID-BASED ARTIFICIAL TISSUES USING A BESPOKE MICROFLUIDIC PLATFORM**  
Oluwaseun Daini, Arash Dalili, Elanna Stephenson, and Katherine S. Elvira  
*University of Victoria, CANADA*
- T068.c EXPERIMENTAL INVESTIGATION OF THE DEFORMATION AND MIGRATION OF MICROCAPSULES IN CURVED VESSELS**  
Yeganeh Saffar, David S. Nobes, and Reza Sabbagh  
*University of Alberta, CANADA*
- T069.c IN SITU PREPARATION OF POROUS GELMA MICROGELS VIA DROPLET MICROFLUIDIC CHAOTIC ADVECTION EFFECTS**  
Zhong-Qiao Gan<sup>1,2</sup>, Hai-Tao Liu<sup>1,2</sup>, Meng-Qian Zhao<sup>1,2</sup>, Ya-Qing Wang<sup>1,2</sup>, and Jian-hua Qin<sup>1,2</sup>  
<sup>1</sup>*Chinese Academy of Sciences, CHINA and*  
<sup>2</sup>*University of Chinese Academy of Sciences, CHINA*
- T070.c PERFORMANCE OPTIMIZATION OF THE STAGNANT CAP HYDRODYNAMIC RETARDATION EFFECT DETECTOR (SHRED)**  
Afreeen Fatima and Amar S. Basu  
*Wayne State University, USA*
- W090.c A DROPLET DIGITAL PCR CHIP WITH AUTOMATIC BUBBLES REMOVAL FOR ABSOLUTE NUCLEIC ACID QUANTIFICATION**  
Zehang Gao<sup>1,2</sup>, Laidi Jin<sup>2</sup>, Xiaodong Wang<sup>2</sup>, Hui Zhao<sup>2</sup>, Man Wu<sup>2</sup>, Jianlong Zhao<sup>2</sup>, Xuguang Guo<sup>1</sup>, and Shilun Feng<sup>2</sup>  
<sup>1</sup>*Third Affiliated Hospital of Guangzhou Medical University, CHINA and* <sup>2</sup>*Chinese Academy of Sciences, CHINA*
- W091.c A POWER-FREE EMULSION PLATFORM FOR FACILE AND UNIVERSAL PREPARATION OF MONODISPERSE MICROSPHERES**  
Nankun Xiong<sup>1</sup>, Yanwu Liu<sup>2</sup>, and Gang Li<sup>1</sup>  
<sup>1</sup>*Chongqing University, CHINA and*  
<sup>2</sup>*Chongqing Medical University, CHINA*
- W092.c A PURIFICATION AND ddPCR INTEGRATED CHIP FOR COVID-19 DETECTION**  
Cong Ma<sup>1,2,3</sup>, Yuhang Huang<sup>1,4</sup>, Yaru Huang<sup>1,4</sup>, Yimeng Sun<sup>1,3</sup>, Chunping Jia<sup>1</sup>, Lijuan Liang<sup>1</sup>, Jianlong Zhao<sup>1</sup>, and Shilun Feng<sup>1</sup>  
<sup>1</sup>*Chinese Academy of Sciences, CHINA,* <sup>2</sup>*ShanghaiTech University, CHINA,* <sup>3</sup>*University of Chinese Academy of Sciences, CHINA, and*  
<sup>4</sup>*Shanghai Normal University, CHINA*
- W093.c ACOUSTIC LEVITATION OF COMPLEX EMULSIONS AND HIERARCHICAL SOFT MATTER CONSTRUCTS**  
Jin Li<sup>1</sup>, Pantelitsa Dimitriou<sup>1</sup>, Bruce Drinkwater<sup>2</sup>, and David Barrow<sup>1</sup>  
<sup>1</sup>*Cardiff University, UK and* <sup>2</sup>*University of Bristol, UK*
- W094.c CONTINUOUS GENERATION OF FUSED CELLS IN MICRODROPLETS UTILIZING A DROPLET MICROFLUIDIC SYSTEM**  
Naotomo Tottori<sup>1</sup>, Sora Sadamichi<sup>1</sup>, Shinya Sakuma<sup>1</sup>, Tomomi Tsubouchi<sup>2</sup>, and Yoko Yamanishi<sup>1</sup>  
<sup>1</sup>*Kyushu University, JAPAN and*  
<sup>2</sup>*National Institute for Basic Biology, JAPAN*



## Droplet Microfluidics

- W095.c DEVELOPMENT OF MICROFLUIDIC PLATFORM ENABLING QUANTITATIVE MEASUREMENTS OF SINGLE-CELL PROTEINS LEVERAGING DROPLET BASED CONSTRICTION MICROCHANNELS**  
Guang Yang<sup>1,2</sup>, Hongyu Yang<sup>1,2</sup>, Ting Zhang<sup>1,2</sup>, Chiyuan Gao<sup>1,2</sup>, Deyong Chen<sup>1,2</sup>, Junbo Wang<sup>1,2</sup>, and Jian Chen<sup>1,2</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and  
<sup>2</sup>University of Chinese Academy of Sciences, CHINA
- W096.c GRAVITY ENABLES FAST GENERATION OF SPHEROIDS IN GELMA DROPLETS**  
Chang Liu, Tao Tang, Zeqi Min, Biyi Xu, and Wen Li  
Shanghai University, CHINA
- W097.c IMAGE-ACTIVATED PICO-INJECTION FOR SINGLE CELL ANALYSIS**  
Zhantao Zhao and Zida Li  
Shenzhen University, CHINA
- W098.c IMPROVING SINGLE-TARGET ENCAPSULATION EFFICIENCY USING VISCOELASTIC MEDIUM**  
Siyuan Zhuang<sup>1</sup>, Ling Liu<sup>1</sup>, Yoichiro Hosokawa<sup>2</sup>, Yalikus Yaxiaer<sup>2</sup>, David Inglis<sup>1</sup>, and Ming Li<sup>1</sup>  
<sup>1</sup>Macquarie University, AUSTRALIA and  
<sup>2</sup>Nara Institute of Science and Technology, JAPAN
- W099.c NUMERICAL MODELING OF MICROFLUIDIC GENERATION AND SHOOTING OF PICOLITER LIQUID DROPLETS USING AIR FLOW**  
Po-yin Chen<sup>1</sup>, Chihchen Chen<sup>1</sup>, Yutaka Kazoe<sup>2</sup>, Kyojiro Morikawa<sup>1,3</sup>, and Takehiko Kitamori<sup>1,3</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN,  
<sup>2</sup>Keio University, JAPAN, and  
<sup>3</sup>University of Tokyo, JAPAN
- W100.c RAPID ACOUSTIC MIXER FOR HIGH THROUGHPUT DROPLET MICROFLUIDICS**  
Xiaotian Shen, Tiechuan Li, and Xuexin Duan  
Tianjin University, CHINA

## c - Fundamentals in Microfluidics and Nanofluidics

### Electrokinetic Phenomena

- M108.c ELECTRICAL GENERATION OF ION CONCENTRATION GRADIENT IN HYDROGEL MICROFLUIDIC DEVICE**  
Chenwei Xiong, Jie Li, Yuewei Zhu, Long Chen, Rong Zhang, and Yifan Liu  
ShanghaiTech University, CHINA
- M109.c ENERGY-EFFICIENT ION CONCENTRATION POLARIZATION DESALINATION WITH A POROUS ION EXCHANGER**  
Dongho Kim<sup>1</sup>, Yeonuk Yu<sup>1</sup>, Junghyo Yoon<sup>2</sup>, Hyukjin Kwon<sup>2</sup>, Jongyoon Han<sup>2</sup>, and Rhokyun Kwak<sup>1</sup>  
<sup>1</sup>Hanyang University, KOREA and  
<sup>2</sup>Massachusetts Institute of Technology, USA



## Electrokinetic Phenomena

- M110.c** **ENHANCED ELECTRIC FIELD UNIFORMITY USING DC VOLTAGE SOURCES FOR SINGLE-CELL ELECTROROTATION**  
Liang Huang, Qiang Fang, Zhihui Han, and Haojie Xia  
*Hefei University of Technology, CHINA*
- M111.c** **INTERPLAY OF ELECTROKINETIC EFFECTS IN NONPOLAR SOLVENTS FOR E-PAPER DISPLAYS**  
Mohammad Khorsand Ahmadi<sup>1</sup>, Wei Liu<sup>1,2</sup>,  
Alex Henzen<sup>2</sup>, and Hans M. Wyss<sup>1</sup>  
<sup>1</sup>*Eindhoven University of Technology, NETHERLANDS and*  
<sup>2</sup>*South China Academy of Advanced Optoelectronics,  
Electronic Paper Display Institute, CHINA*
- M112.c** **ULTRA-LONG NANOWIRE SYNTHESIS BASED ON ELECTRICALLY-DRIVEN IONIC DIODES**  
Ran Peng, Hanqiong Song, Yongxin Song,  
Tong Li, and Tingting Zhang  
*Dalian Maritime University, CHINA*
- T071.c** **SCAFFOLD-FREE FORMATION OF 3D CELL CLUSTERS USING DIELECTROPHORESIS AND ELECTRO-OSMOSIS AT A BIPOLAR ELECTRODE ARRAY**  
Yupan Wu, Haohao Zhang, and Xunma  
*Northwestern Polytechnical University, CHINA*
- T072.c** **STREAMING CURRENT IN 50NM NANOFUIDIC CHANNEL**  
Kyojiro Morikawa<sup>1,2</sup>, Chih-Chang Chang<sup>3</sup>, Yutaka Kazoe<sup>4</sup>,  
Kazuma Mawatari<sup>2</sup>, and Takehiko Kitamori<sup>1,2</sup>  
<sup>1</sup>*National Tsing Hua University, TAIWAN, <sup>2</sup>University of Tokyo, JAPAN,*  
<sup>3</sup>*National Kaohsiung Normal University, TAIWAN, and*  
<sup>4</sup>*Keio University, JAPAN*
- W101.c** **CREATING PAPER-BASED ELECTRIC FIELD GRADIENTS FOR HIGH-THROUGHPUT DIELECTROPHORETIC TRAPPING**  
Md. Nazibul Islam and Zachary R. Gagnon  
*Texas A&M University, USA*

## c - Fundamentals in Microfluidics and Nanofluidics

### Modeling/Numerical Simulation

- M113.c** **NUMERICAL STUDY OF THE VIBRATION-INDUCED CHAOTIC MIXER BASED ON VIBRATION SWITCHING**  
Kanji Kaneko<sup>1</sup>, Yosuke Hasegawa<sup>2</sup>, Takeshi Hayakawa<sup>1</sup>,  
and Hiroaki Suzuki<sup>1</sup>  
<sup>1</sup>*Chuo University, JAPAN and <sup>2</sup>University of Tokyo, JAPAN*
- T073.c** **DEVELOPING A DIGITAL TWIN FOR SINGLE-CELL MECHANICAL PHENOTYPING MICROFLUIDIC DEVICES**  
Sayan Roychowdhury<sup>1</sup>, Samreen T. Mahmud<sup>1</sup>,  
Daniel F. Puleri<sup>1</sup>, Andre Lai<sup>2</sup>, Rachel Rex<sup>2</sup>,  
Brian Li<sup>2</sup>, Lydia Sohn<sup>2</sup>, and Amanda Randles<sup>1</sup>  
<sup>1</sup>*Duke University, USA and <sup>2</sup>University of California, Berkeley, USA*



## Modeling/Numerical Simulation

- W102.c AUTOMATED DESIGN AND SIMULATION SOFTWARE FOR MICROFLUIDIC DEVICES**  
Weidong Zhou, Wei Hua, Zhenfeng Wang, and Wei Wang  
*Singapore Institute of Manufacturing Technology (SIMTech), SINGAPORE*
- W103.c EXPERIMENT-SIMULATION COMPARISON IN LIQUID FILLING PROCESS**  
Wei Hua, Wei Wang, Weidong Zhou, and Zhenfeng Wang  
*Singapore Institute of Manufacturing Technology (SIMTech), SINGAPORE*
- W104.c ROLE OF DEFORMABILITY AND SUPER-HYDROPHOBICITY IN THE MICROCHANNEL**  
Kumar Amit, Ashwani Assam, and Abhishek Raj  
*Indian Institute of Technology, Patna, INDIA*
- W105.c THE LIFETIME OF CONFINED MICROBUBBLES ON SUBMERGED SUPERHYDROPHOBIC SURFACES**  
Yechang Guo<sup>1</sup>, Peiyue Li<sup>1</sup>, Shaofeng Wang<sup>3</sup>, Tingting Hun<sup>1</sup>, Pan Zhang<sup>1</sup>, and Wei Wang<sup>1,2</sup>  
<sup>1</sup>*Peking University, CHINA*, <sup>2</sup>*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA*, and <sup>3</sup>*China University of Geosciences (Beijing), CHINA*

## c - Fundamentals in Microfluidics and Nanofluidics

### Nanofluidics/Nanofluidic Phenomena

- M114.c DECIPHERING ENZYMELESS CHEMICAL MODIFICATIONS OF NUCLEOBASES USING NANOPORE SEQUENCING**  
Qingyuan Fan, Ronghui Liu, Qiang Ji, and Yi Li  
*Southern University of Science and Technology (SUSTech), CHINA*
- M115.c IONIC SYNAPTIC DEVICE BASED ON FUNNEL NANOCHANNEL EMULATE SYNAPSE PLASTICITY**  
Peiyue Li<sup>1</sup>, Yechang Guo<sup>1</sup>, Pan Zhang<sup>1</sup>, Yufeng Jin<sup>1</sup>, and Wei Wang<sup>1,2</sup>  
<sup>1</sup>*Peking University, CHINA* and <sup>2</sup>*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA*
- T074.c ASYMMETRIC COFs/AO NANOFLUIDIC DEVICE FOR ION RECTIFICATION AND BIOANALYSIS**  
Mengyuan Chen and Chen Wang  
*Nanjing Normal University, CHINA*
- T075.c DEVELOPMENT OF A METHOD OF SINGLE-PARTICLE TRANSPORT UTILIZING ULTRASMALL-DROPLETS IN NANOCHANNELS**  
Ryosuke Ohho and Yutaka Kazoe  
*Keio University, JAPAN*
- T076.c ELUCIDATION OF TRAPPING BEHAVIORS OF SINGLE EXOSOMES IN A NANOFLUIDIC DEVICE**  
Daigo Tamaoki<sup>1</sup>, Nattapong Chantipmanee<sup>1,3</sup>, Ryosuke Kojima<sup>2</sup>, and Yan Xu<sup>1,3</sup>  
<sup>1</sup>*Osaka Metropolitan University, JAPAN*, <sup>2</sup>*University of Tokyo, JAPAN*, and <sup>3</sup>*Japan Science and Technology Agency (JST), JAPAN*



## Nanofluidics/Nanofluidic Phenomena

- T077.c FABRICATION OF ATTOLITER DROPLETS BASED ON LIQUID/SOLID INTERFACES IN NANOFUIDIC CHANNELS**  
Yuto Tanaka<sup>1</sup>, Hiroto Kawagishi<sup>2</sup>, Nattapong Chantipmanee<sup>1</sup>, and Yan Xu<sup>1,2,3</sup>  
<sup>1</sup>Osaka Metropolitan University, JAPAN,  
<sup>2</sup>Osaka Prefecture University, JAPAN, and  
<sup>3</sup>Japan Science and Technology Agency (JST), JAPAN
- T078.c NANOFUIDIC ENZYME REACTOR EXCEEDING BULK SOLUBILITY LIMIT**  
Kyojiro Morikawa<sup>1,2</sup>, Koki Yamamoto<sup>3</sup>, Kota Sakurai<sup>2</sup>, and Takehiko Kitamori<sup>1,2</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN,  
<sup>2</sup>University of Tokyo, JAPAN, and  
<sup>3</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN
- W106.c CONTROLLABLE SIZE-INDEPENDENT SINGLE-LINE INERTIAL FOCUSING IN HIGH ASPECT RATIO SERPENTINE MICROCHANNELS**  
Chen Ni, Shu Zhu, Yao Chen, Zheng Zhou, Kefan Guo, Weiqi Cheng, and Nan Xiang  
Southeast University, CHINA
- W107.c HIGHLY EFFICIENT OSMOTIC ENERGY HARVESTING IN PDMS NANOCHANNEL-BASED DEVICE**  
Chun Sheng Chen<sup>1</sup>, Yu Zheng<sup>1</sup>, Jie Cheng<sup>1</sup>, Xin Ying Jiang<sup>2</sup>, Chun Yan Zhu<sup>2</sup>, Tian Hang Feng<sup>2</sup>, and Pan Zhang<sup>2,3</sup>  
<sup>1</sup>Central South University, CHINA, <sup>2</sup>South-Central Minzu University, CHINA, and <sup>3</sup>Peking University, CHINA
- W108.c MODELING OF DIFFUSIOOSMOTIC ION TRANSPORT THROUGH NANOPORES TOWARD UNDERSTANDING NEURAL SIGNAL RETARDATION BY LOW TEMPERATURE**  
Dongwoo Seo, Dongjun Kim, and Taesung Kim  
Ulsan National Institute of Science and Technology (UNIST), KOREA
- W109.c TRANSPORT OF FINE PARTICLES IN ALVEOLI**  
Huimin Lv, Jun Dong, Yue Yang, Wei Zhang, and Yonggang Zhu  
Harbin Institute of Technology, CHINA
- W110.c ULTRAFast SELECTIVE PROTON TRANSPORT UNDER SUBNANOMETER CONFINEMENT ENABLED BY ATOMICALLY THIN NANOPOROUS N-DOPED GRAPHENE**  
Shengping Zhang, Zhiyang Zeng, Ningran Wu, Ruiyang Song, Xiao Han, Xiaobo Chen, Dandan Hou, and Luda Wang  
Peking University, CHINA

## c - Fundamentals in Microfluidics and Nanofluidics

### Others

- T079.c MICROBREWIDICS: WHAT STABILIZES HOP OIL EMULSIONS IN BEER?**  
Alex McDonald<sup>1</sup>, Alexandra Schauman<sup>1</sup>, Kaitlyn E.E. Ramsay<sup>1</sup>, Euan L. Thomson<sup>2</sup>, and Katherine S. Elvira<sup>1</sup>  
<sup>1</sup>University of Victoria, CANADA and  
<sup>2</sup>Phillips Brewing and Malting Co., CANADA



## d - Integrated Microfluidic Platforms

### Chemical and Particle Synthesis

- M116.d A LOW-COST PLATFORM WITH FINGER-OPERATED-PUMPING FOR MICROFLUIDIC PREPARATION OF NANOPARTICLES**  
Ahmed Azmeer, Ibraheem Kanan, Ghaleb Hussein,  
and Mohamed Abdelgawad  
*American University of Sharjah, UAE*
- M117.d DEVELOPMENT OF NOVEL MICROFLUIDIC PLATFORM FOR ON-CHIP FORMULATION SCREENING OF LIPID NANOPARTICLES**  
Yuka Matsuura-Sawada<sup>1,2</sup>, Shuya Uno<sup>2</sup>, Masatoshi Maeki<sup>2,3</sup>,  
Koichi Wada<sup>1</sup>, and Manabu Tokeshi<sup>2</sup>  
<sup>1</sup>*Nippon Boehringer Ingelheim Co., Ltd., JAPAN,*  
<sup>2</sup>*Hokkaido University, JAPAN, and*  
<sup>3</sup>*Japan Science and Technology Agency (JST), JAPAN*
- M118.d HIGH SPEED AND ROOM TEMPERATURE SYNTHESIS OF AMINO ACID SCHIFF BASE COPPER COMPLEX USING MICROFLUIDIC DEVICE**  
Masashi Kobayashi<sup>1</sup>, Daiki Tanaka<sup>1</sup>, Takashiro Akitsu<sup>2</sup>,  
Tetsushi Sekiguchi<sup>1</sup>, and Shuichi Shoji<sup>1</sup>  
<sup>1</sup>*Waseda University, JAPAN and* <sup>2</sup>*Tokyo University of Science, JAPAN*
- T080.d MICROFLUIDIC GENERATION OF THERAPEUTICALLY RELEVANT POLYCAPROLACTONE (PCL) MICROPARTICLES: COMPUTATIONAL AND EXPERIMENTAL APPROACHES**  
Alejandro Forigua, Arash Dalili, Rebecca Kirsch,  
Stephanie Willerth, and Katherine Elvira  
*University of Victoria, CANADA*

## d - Integrated Microfluidic Platforms

### Electrophoretic and Chromatographic Separation

- M119.d AN INTEGRATED MICRO-PROBE FOR LOSSLESS LIQUID CHROMATOGRAPHIC INJECTION AND ITS APPLICATION IN SINGLE CELL PROTEOMIC ANALYSIS**  
Wei-Xin Ying<sup>1</sup>, Shao-Wen Shi<sup>2</sup>, Hui-Feng Wang<sup>2</sup>, Jian-Bo Chen<sup>1</sup>,  
Jian-Zhang Pan<sup>1,2</sup>, and Qun Fang<sup>1,2</sup>  
<sup>1</sup>*Zhejiang University, CHINA and* <sup>2</sup>*ZJU-Hangzhou Global Scientific and Technological Innovation Center, CHINA*
- M120.d AUTOMATED MICROFLUIDIC SAMPLE PREPARATION FOR CRYOGENIC ELECTRON MICROSCOPY USING SUB-MICROGRAM AMOUNTS OF PROTEIN**  
Gangadhar Eluru<sup>1,2</sup> and Rouslan G. Efremov<sup>1,2</sup>  
<sup>1</sup>*Vlaams Instituut voor Biotechnologie (VIB), BELGIUM and*  
<sup>2</sup>*Vrije Universiteit Brussel (VUB), BELGIUM*
- W111.d FEMTOLITER VOLUMETRY BY LAPLACE VALVE AND MECHANICAL VALVE FOR SAMPLE INJECTION IN FEMTOLITER CHROMATOGRAPHY**  
Kyojiro Morikawa<sup>1,2</sup>, Shin-ichi Murata<sup>2</sup>, Hiroki Sano<sup>2</sup>,  
Yutaka Kazoe<sup>3</sup>, and Takehiko Kitamori<sup>1,2</sup>  
<sup>1</sup>*National Tsing Hua University, TAIWAN,*  
<sup>2</sup>*University of Tokyo, JAPAN, and*  
<sup>3</sup>*Keio University, JAPAN*



## Electrophoretic and Chromatographic Separation

### W112.d OPTIMIZED LABCHIP® ASSAY FOR ANALYSIS OF cfDNA

Gayatri P. Gautam, Jason Charbonneau, Brendan Curran,  
Thomas D. Perroud, and James D. White  
*PerkinElmer Inc., USA*

### W113.d PARTICLE ASSEMBLY VIA WET PDMS RUBBING IN PRE-PATTERNED SILICON SUBSTRATES FOR THE FABRICATION OF ORDERED PARTICLE ARRAYS IN MICROFLUIDIC DEVICES

Sandrien Verloy<sup>1</sup>, Ignaas S.M. Jimidar<sup>1,2</sup>,  
Bert Vankeerberghen<sup>1</sup>, Han Gardeniers<sup>2</sup>,  
and Gert Desmet<sup>1</sup>

<sup>1</sup>*Vrije Universiteit Brussel (VUB), BELGIUM and*

<sup>2</sup>*University of Twente, NETHERLANDS*

## d - Integrated Microfluidic Platforms

### Micromixers and Microreactors

### M121.d A MICROFLUIDIC REACTOR ENABLING PHOTOCATALYTIC COENZYME REGENERATION FOR ARTIFICIAL PHOTOSYNTHESIS OF GLUCOSE

Fengjia Xie<sup>1</sup>, Yujiao Zhu<sup>1</sup>, Chi Chung Tsoi<sup>1</sup>, Huaping Jia<sup>1</sup>,  
Abdel El Abed<sup>2</sup>, and Xuming Zhang<sup>1</sup>

<sup>1</sup>*Hong Kong Polytechnic University, HONG KONG and*

<sup>2</sup>*Université Paris-Saclay, FRANCE*

### M122.d CONTINUOUS HIGH-VISCOSITY BIPHASIC FLOW SEPARATION

Hsiang-Yu Yang, Yu-Chieh Chen, and Ya-Yu Chiang  
*National Chung Hsing University, TAIWAN*

### M123.d GENERATION OF MULTIPLE CONCENTRATION GRADIENTS AIDED BY MACHINE LEARNING PREDICTION

Xinlei Qi and Guoqing Hu  
*Zhejiang University, CHINA*

### M124.d HIGH-YIELD AND WELL-CONTROLLED SYNTHESIS OF Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub>/Pt-Pd NANOCOMPOSITES USING TWO 3D MICROMIXERS

Bo Liu, Bin Ran, Chaozhan Chen, and Yonggang Zhu  
*Harbin Institute of Technology, CHINA*

### M125.d INTEGRATED MICROFLUIDIC CHIP FOR AUTOMATED AND CONTINUOUS PHAGE SELECTION

Pin-Ru Huang<sup>1</sup>, Zong-Han Sie<sup>1</sup>, Shin-Tsung Huang<sup>2</sup>,  
Bor-Yu Tsai<sup>2</sup>, and Ya-Yu Chiang<sup>1</sup>

<sup>1</sup>*National Chung Hsing University, TAIWAN and*

<sup>2</sup>*NAVI Bio-Therapeutics. Inc., TAIWAN*

### M126.d L-2L LADDER MICROFLUIDICS FOR DYNAMIC GENERATION OF CHEMICAL CONCENTRATIONS

Suguru Shiraishi<sup>1</sup>, Tomohito Chatani<sup>1</sup>, Hiroki Miyazako<sup>2</sup>,  
Hiroaki Onoe<sup>1</sup>, and Yutaka Hori<sup>1</sup>

<sup>1</sup>*Keio University, JAPAN and* <sup>2</sup>*University of Tokyo, JAPAN*



## Micromixers and Microreactors

- M127.d MICROFLUIDIC PROBES INTEGRATED WITH MICROMIXERS**  
Dima Samer Ali<sup>1,2</sup>, Ayoub Glia<sup>1</sup>, Samuel Sofela<sup>1</sup>,  
and Mohammad A. Qasaimeh<sup>1,2</sup>  
<sup>1</sup>New York University Abu Dhabi (NYUAD), UAE and  
<sup>2</sup>New York University, USA
- M128.d PORTABLE IMMUNO-MICROFLUIDIC SYSTEM WITH ELECTROSPUN POLYSTYRENE MICROFIBROUS REACTOR FOR RAPID DETECTION**  
Yecan Wang<sup>1</sup>, Hiroshi Murakami<sup>1</sup>, Toshihiro Kasama<sup>1</sup>,  
Shigenobu Mitsuzawa<sup>2</sup>, Satoru Shinkawa<sup>2</sup>, Ryo Miyake<sup>1</sup>,  
and Madoka Takai<sup>1</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Honda Motor Co., Ltd, JAPAN
- M129.d PREDICTING BIPHASIC FLOW SEPARATION**  
Yi-Chieh Chang<sup>1</sup>, Yu-Jen Chen<sup>2</sup>, Tsung-Yi Ho<sup>2</sup>,  
and Ya-Yu Chiang<sup>1</sup>  
<sup>1</sup>National Chung Hsing University, TAIWAN and  
<sup>2</sup>National Tsing Hua University, TAIWAN
- W114.d A NOVEL 3D TESLA VALVE MICROMIXER FOR EFFICIENT SYNTHESIS OF CHITOSAN NANOPARTICLES**  
Kefan Guo, Shu Zhu, Yao Chen, Chen Ni, Zheng Zhou,  
and Zhonghua Ni  
University of Southeast, CHINA
- W115.d CONTROLLABLE HIGH-SPEED MIXING MICROFLUIDICS DEVICE BASED ON AN AZ-SU8 PHOTORESISTS COMBINATIONAL MOLD PROCESS**  
Nanxin Wang<sup>1,2</sup>, Xianglong Chu<sup>2</sup>,  
Ramón Santiago Herrera Restrepo<sup>4</sup>,  
Yanming Xia<sup>2,3</sup>, Caiming Zhao<sup>2</sup>, Juan Yu<sup>2</sup>,  
Josep Puigmartí-Luis<sup>4</sup>, Yufeng Jin<sup>1</sup>,  
and Shenglin Ma<sup>2</sup>  
<sup>1</sup>Peking University Shenzhen Graduate School, CHINA,  
<sup>2</sup>Xiamen University, CHINA, <sup>3</sup>ETH Zürich, SWITZERLAND,  
and <sup>4</sup>University of Barcelona, SPAIN
- W116.d SELECTIVE CHEMICAL PRODUCTS SEPARATION FROM ORGANIC MICRO DROPLETS USING SURFACTANT FREE SINGLE MICRON DROPLET GENERATION**  
Shengqi Zheng<sup>1</sup>, Daiki Tanaka<sup>1</sup>, Hiroyuki Fujita<sup>3</sup>, Takashiro Akitsu<sup>2</sup>,  
Tetsushi Sekiguchi<sup>1</sup>, and Shuichi Shoji<sup>1</sup>  
<sup>1</sup>Waseda University, JAPAN, <sup>2</sup>Tokyo University of Science,  
JAPAN, and <sup>3</sup>Canon Medical Systems Corporation, JAPAN
- W117.d ULTRAFast ACOUSTOFLUIDIC HANDLING OF HUMAN BLOOD**  
Md Ehtashamul Haque<sup>1</sup>, Alvaro Conde<sup>2</sup>,  
Harikumar Kuzhikkattu Chandrasekharan<sup>1</sup>,  
William N. MacPherson<sup>1</sup>, Stephen Knight<sup>3</sup>,  
Richard Carter<sup>1</sup>, and Mäiwenn Kersaudy-Kerhoas<sup>1</sup>  
<sup>1</sup>Heriot-Watt University, UK, <sup>2</sup>Micronit B.V., NETHERLANDS, and  
<sup>3</sup>University of Edinburgh, UK



## d - Integrated Microfluidic Platforms

### Particle Separation

- M130.d A MICROFLUIDIC SYSTEM FOR LABEL-FREE AND BIO-COMPATIBLE MAGNETIC SEPARATION OF SMALL EXTRACELLULAR VESICLES**  
Lin Zeng<sup>1</sup>, Shi Hu<sup>1</sup>, Xi Chen<sup>1</sup>, Pengcheng Zhang<sup>1</sup>, Guoqiang Gu<sup>1</sup>, Yuye Wang<sup>1</sup>, Hongpeng Zhang<sup>2</sup>, and Hui Yang<sup>1</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and  
<sup>2</sup>Dalian Maritime University, CHINA
- M131.d HIGH VOLUME EXTRACELLULAR VESICLE SEPARATION IN MICROFLUIDICS: PROOF OF PRINCIPLE**  
Arturs Abols<sup>1</sup>, Miks Priedols<sup>1</sup>, Felikss Rumnieks<sup>1</sup>, Gunita Paidere<sup>2</sup>, Gatis Mozolevskis<sup>2</sup>, and Roberts Rimša<sup>2</sup>  
<sup>1</sup>Latvian Biomedical Research and Study Centre, LATVIA and  
<sup>2</sup>University of Latvia, LATVIA
- M132.d MICROFLUIDIC DEVICE FOR FLUORESCENCE SPECTROSCOPY-BASED SORTING OF MARINE MICROPLASTICS**  
Yuka Kurosaki<sup>1</sup>, Natsuo Hasegawa<sup>1</sup>, Yoshikazu Koike<sup>1</sup>, Hisayuki Arakawa<sup>2</sup>, and Nobuyuki Futai<sup>1</sup>  
<sup>1</sup>Shibaura Institute of Technology, JAPAN and  
<sup>2</sup>Tokyo University of Marine Science and Technology, JAPAN
- M133.d OSTE DEVICE FOR MAGNETIC PARTICLE CAPTURE**  
Janis Cipa<sup>1,2</sup>, Edgars Endzelins<sup>3</sup>, Roberts Rimša<sup>2</sup>, Artis Galvanovskis<sup>3</sup>, Arturs Abols<sup>2,3</sup>, Aija Line<sup>3</sup>, and Gatis Mozolevskis<sup>2</sup>  
<sup>1</sup>University of Latvia, LATVIA, <sup>2</sup>Cellboxlab Ltd, LATVIA, and  
<sup>3</sup>Latvian Biomedical Research and Study Centre, LATVIA
- M134.d RELATIVE QUANTIFICATION OF EXOSOMES DIRECTLY FROM ORIGINAL SAMPLES BY NANOFUIDICS**  
Kosaku Murata<sup>1</sup>, Nattapong Chantipmanee<sup>2,5</sup>, Chitose Oneyama<sup>3</sup>, Ryosuke Kojima<sup>4</sup>, and Yan Xu<sup>1,5</sup>  
<sup>1</sup>Osaka Prefecture University, JAPAN, <sup>2</sup>Osaka Metropolitan University, JAPAN, <sup>3</sup>Aichi Cancer Center Research Institute, JAPAN, <sup>4</sup>University of Tokyo, JAPAN, and <sup>5</sup>Japan Science and Technology Agency (JST), JAPAN
- T081.d ESTABLISHMENT OF COMPONENT SEPARATION METHOD DEPENDING ON PARTICLE SIZE USING MICRO-CHAMBER ARRAY**  
Mitsuhiro Horade<sup>1</sup>, Ryuusei Okumura<sup>1</sup>, Shuichi Murakami<sup>2</sup>, and Tsunemasa Saiki<sup>3</sup>  
<sup>1</sup>National Defense Academy of Japan, JAPAN, <sup>2</sup>Osaka Research Institute of Industrial Science and Technology, JAPAN, and  
<sup>3</sup>Hyogo Prefectural Institute of Technology, JAPAN
- T082.d MICROPARTICLE SEPARATION WITH A ROUNDED FLEXIBLE MEANDERING CHANNELS**  
Sho Yokoyama  
Osaka Institute of Technology, JAPAN



## Particle Separation

- T083.d PARTICLE TRAPPING WITH FOCUSED TRAVELING SURFACE ACOUSTIC WAVE ON A MICROFLUIDIC CHIP**  
Yuang Li<sup>1,2</sup>, Xiaofeng Luan<sup>1,2</sup>, Yun Zhang<sup>1,2</sup>, Yijun Zhang<sup>1,2</sup>, Hang Gao<sup>1</sup>, Wenchang Zhang<sup>1</sup>, Yang Zhao<sup>1</sup>, and Chengjun Huang<sup>1,2</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and  
<sup>2</sup>University of Chinese Academy of Sciences, CHINA
- T084.d VISCOELASTIC SEPARATION OF DRUG-TREATED *E. COLI* BY SHAPE**  
Tianlong Zhang<sup>1,2</sup>, Yaxiaer Yalikun<sup>2</sup>, Kazunori Okano<sup>2</sup>, Yo Tanaka<sup>3</sup>, David W. Inglis<sup>1</sup>, Yoichiro Hosokawa<sup>2</sup>, and Ming Li<sup>1</sup>  
<sup>1</sup>Macquarie University, AUSTRALIA,  
<sup>2</sup>Nara Institute of Science and Technology, JAPAN, and  
<sup>3</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN
- W118.d A TWO-PARAMETER INTEGRATED SYSTEM FOR EFFICIENCY ISOLATION OF BREAST CANCER CELLS**  
Yixing Gou<sup>1</sup>, Zheng You<sup>2</sup>, and Dahai Ren<sup>2</sup>  
<sup>1</sup>Hebei University of Technology, CHINA and  
<sup>2</sup>Tsinghua University, CHINA
- W119.d DISCONTINUOUS DEWETTING FOR DROPLET SPLITTING AS AN ASSET FOR PARTICLE TRAPPING AND SEPARATION**  
Lilu Jia and Richard Oleschuk  
Queen's University, CANADA
- W120.d ISOLATION OF EpCAM EXPRESSING EXOSOMES USING RADIAL FLOW MICROFLUIDIC CHIP WITH IEDDA CHEMISTRY (EpCAM-TCOONCOBEAN CHIP)**  
Nna-Emeka Onukwugha, Henry McEacheron, and Sunitha Nagrath  
University of Michigan, USA

## d - Integrated Microfluidic Platforms

## Other Applications in Chemistry

- M135.d DEVELOPMENT OF LIQUID-LIQUID PHASE SEPARATOR FOR CONTINUOUS ASPIRIN PROCESS**  
Guan-Yu Lu, Can-Hong Ni, and Ya-Yu Chiang  
National Chung Hsing University, TAIWAN
- M136.d MICROFLUIDIC PLATFORM INTEGRATED WITH ALGINATE/TiO<sub>2</sub> BEADS FOR GLUCOSE DETERMINATION IN ARTIFICIAL SWEAT**  
Sandra Garcia-Rey<sup>1</sup>, Eva Gil Hernandez<sup>1</sup>, Udara Bimendra Gunatilake<sup>1</sup>, Lourdes Basabe-Desmonts<sup>1,2,3,4</sup>, and Fernando Benito-Lopez<sup>1,3,4</sup>  
<sup>1</sup>University of the Basque Country, SPAIN, <sup>2</sup>IKERBASQUE, SPAIN,  
<sup>3</sup>Bioaraba Health Research Institute, SPAIN, and <sup>4</sup>BCMaterials, SPAIN
- T085.d REAL-TIME ENZYME KINETICS MONITORING OF TYROSINASE USING A PORTABLE 3D PRINTED SPECTROMETER**  
Antony Jesuraj and Umer Hassan  
Rutgers University, USA



- M137.e THE EFFECT OF  $C\alpha_e$  DISTRIBUTION ON THE REGIONAL CAPTURE EFFICIENCY IN MEF CHIPS WITH 2 DIFFERENT PACKAGING DESIGNS**  
Jose Cabot<sup>1</sup>, Huahuang Luo<sup>1</sup>, Tianer Feng<sup>1</sup>, Izhar<sup>1</sup>, Mingzheng Duan<sup>1</sup>, Jung Eun Ahn<sup>1</sup>, Xioahuan Cao<sup>1</sup>, Nong Xu<sup>2</sup>, Yulong Zheng<sup>2</sup>, and Yi-Kuen Lee<sup>1</sup>  
<sup>1</sup>*Hong Kong University of Science and Technology, HONG KONG* and <sup>2</sup>*Zhejiang University, CHINA*
- T086.e DIFFUSION BONDING TECHNOLOGY FOR THREE-LAYERED POLYMER MICROFLUIDIC DEVICES**  
Rintaro Kishima and Sho Yokoyama  
*Osaka Institute of Technology, JAPAN*
- W121.e AN APPROACH TO CONVERT FRAGILE HYDROGEL MICROFLUIDIC CHIPS INTO CARTRIDGES EASY AND RELIABLE TO USE**  
Sin-Yung Siu<sup>1</sup>, Chiu-Wing Chan<sup>1</sup>, Yisu Wang<sup>1</sup>, Langcheng Feng<sup>2</sup>, and Kangning Ren<sup>1,2</sup>  
<sup>1</sup>*Hong Kong Baptist University, HONG KONG* and <sup>2</sup>*Translational Research and Development Center for Biomimetic Microfluidic Systems, CHINA*
- W122.e RAPID PROTOTYPING OF PARAFILM®-BASED ANALYTICAL MICROFLUIDIC DEVICES USING LASER ABLATION AND THERMAL FUSION BONDING**  
Yuanyuan Wei<sup>1</sup>, Tianle Wang<sup>1</sup>, Yuye Wang<sup>2</sup>, Yi-Ping Ho<sup>1</sup>, and Ho-Pui Ho<sup>1</sup>  
<sup>1</sup>*Chinese University of Hong Kong, HONG KONG* and <sup>2</sup>*Chinese Academy of Science, CHINA*

- M138.e HIGH-SPEED ON-CHIP FLOW CONTROL UTILIZING CYCLO-OLEFIN POLYMER MEMBRANE PUMP**  
Nariaki Kiyama, Makoto Saito, Yoko Yamanishi, and Shinya Sakuma  
*Kyushu University, JAPAN*
- M139.e OPTIMIZATION OF A PHASED PERISTALTIC MICROPUMP FOR DROPLET MICROFLUIDIC BASED POINT OF CARE SENSORS**  
Liam Carter<sup>1</sup>, Adrian Nightingale<sup>1</sup>, Martin Feelisch<sup>2</sup>, and Xize Niu<sup>1</sup>  
<sup>1</sup>*University of Southampton, UK* and <sup>2</sup>*University of Southampton and University Hospital Southampton, UK*
- M140.e RIPPLE REDUCTION IN PIEZOELECTRIC MICROPUMPS BY PHASED ACTUATION IN PARALLEL AND DAMPING**  
Gürhan Özkayar<sup>1</sup>, Joost C. Lötters<sup>1,2</sup>, Marcel Tichem<sup>1</sup>, and Murali K. Ghatkesar<sup>1</sup>  
<sup>1</sup>*Delft University of Technology, NETHERLANDS* and <sup>2</sup>*Bronkhorst High-Tech BV, NETHERLANDS*



## Micropumps, Valves, and Dispensers

- T087.e ELASTOMERIC CYCLIC OLEFIN COPOLYMER (ECOC) CHARACTERIZATION AND APPLICATION AS MICROFLUIDIC VALVES FOR INTEGRATED SYSTEMS**  
Katie Childers<sup>1,2</sup>, Mateusz L. Hupert<sup>3</sup>, and Steven A. Soper<sup>1,2,3</sup>  
<sup>1</sup>University of Kansas, USA, <sup>2</sup>Center for BioModular Multiscale Systems, USA, and <sup>3</sup>Biofluidica, Inc., USA
- T088.e METACHRONAL MOTION OF MINIATURIZED MAGNETIC ARTIFICIAL CILIA GENERATES MICROFLUIDIC FLOW**  
Zhiwei Cui, Ye Wang, and Jaap den Toonder  
Eindhoven University of Technology, NETHERLANDS
- T089.e MICROFLUIDIC PEN FOR LONG-TERM LOCAL DELIVERY THROUGH TISSUE WITH MITIGATION OF LATERAL DIFFUSION**  
Hannah Musgrove and Rebecca R. Pompano  
University of Virginia, USA
- W123.e DESIGN AND DEVELOPMENT OF PIEZOELECTRIC BASED 3-D PRINTED VALVELESS MICROPUMP FOR DRUG DELIVERY APPLICATION**  
Arkaprava Datta, Shatavisha Biswas, Riddhiman Dhar, and Tarun K. Bhattacharyya  
Indian Institute of Technology, Kharagpur, INDIA
- W124.e DEVELOPING AN EXTREMELY HIGH FLOW RATE MICRO PUMP FOR BLOOD PLASMA SEPARATION WITH INERTIAL PHENOMENON**  
Tuan N.A. Vo and Pin-Chuan Chen  
National Taiwan University of Science and Technology, TAIWAN

## e - Micro- and Nanoengineering

### Microscale Fabrication, Patterning, and Integration

- M141.e A WEARABLE MICROFLUIDIC PATCH FOR REAL-TIME COLLECTING, STORAGE, AND COLORIMETRIC ANALYSIS OF SWEAT**  
Juan Yu<sup>1</sup>, Zhizhen Wang<sup>1</sup>, Yanming Xia<sup>1</sup>, Xianglong Chu<sup>1</sup>, Caiming Zhao<sup>1</sup>, Nanxin Wang<sup>1,2</sup>, Yufeng Jin<sup>2</sup>, and Shenglin Ma<sup>1</sup>  
<sup>1</sup>Xiamen University, CHINA and <sup>2</sup>Peking University Shenzhen Graduate School, CHINA
- M142.e WETTABILITY ASSISTED DIRECT PATTERNING OF SILVER NANOWIRES ON VARIOUS SUBSTRATES AS TRANSPARENT, FLEXIBLE, OR STRETCHABLE ELECTRODE**  
Peng Ma, Yiwei Lin, Peng Chen, Wei Du, Yiwei Li, and Bi-Feng Li  
Huazhong University of Science and Technology, CHINA
- M143.e A NOVEL PAPER-BASED ELECTROWETTING DEVICE USING CELLULOSE PAPER AND PARAFFIN WAX**  
He Li<sup>1,3</sup>, Zhibin Yan<sup>1,2</sup>, Mingliang Jin<sup>1</sup>, Guofu Zhou<sup>1</sup>, and Lingling Shui<sup>1</sup>  
<sup>1</sup>South China Normal University, CHINA, <sup>2</sup>Chongqing University, CHINA and, <sup>3</sup>Guangdong Shunde Innovative Design Institute, CHINA
- M144.e A SELF-ASSEMBLING SYSTEM USING AIR-WATER INTERFACIAL TENSION AS A BONDING FORCE**  
Akira Ito and Hiroaki Suzuki  
Chuo University, JAPAN



- M145.e ACTIVE CONTROL OF THE VIBRATION-INDUCED FLOW BY PNEUMATICALLY ACTUATED MICROPILLARS**  
Taku Sato, Kanji Kaneko, Takeshi Hayakawa, and Hiroaki Suzuki  
*Chuo University, JAPAN*
- M146.e DEEP-LEARNING DEFORMATION CYTOMETRY**  
Zheng Zhou, Chen Ni, Kefan Guo, Zhixian Zhu, Shu Zhu, Yao Chen, Dezhi Tang, Hui Ren, Yaohui Fang, Hang Yang, Lin Jiang, Weiqi Cheng, Zhonghua Ni, and Nan Xiang  
*Southeast University, CHINA*
- M147.e DEPOSITION OF MULTIPLE METAL SPECIES ON HYDROGELS USING MICRO-PLASMA-BUBBLES**  
Haruna Takahashi, Yu Yamashita, Shinya Sakuma, and Yoko Yamanishi  
*Kyushu University, JAPAN*
- M148.e DEVELOPMENT OF A LOW-COST MICROCHANNEL MOLD FOR A SOFT LITHOGRAPHY PROCESS BY UV LASER CUTTING & ANODIC BONDING**  
Neethish Kumar Unnam and Lung-Jieh Yang  
*Tamkang University, TAIWAN*
- M149.e HIGH-THROUGHPUT PATTERNING OF ALL INORGANIC PEROVSKITE MICRO-NANO STRUCTURES BY DROPLET EVAPORATIVE ASSEMBLY AND THEIR OPTOELECTRONIC APPLICATIONS**  
Bori Shi<sup>1</sup>, Mengying Zhang<sup>1</sup>, Weijia Wen<sup>2</sup>, and Jinbo Wu<sup>1</sup>  
<sup>1</sup>Shanghai University, CHINA and <sup>2</sup>Hong Kong University of Science and Technology, HONG KONG
- M150.e PROCESS IMPROVEMENT OF THE THREE-WIRE ANEMOMETER**  
Wangnan Chen, Zhezhen Zhu, Lingmeng Yang, Chengchen Gao, Yilong Hao, and Zhenchuan Yang  
*Peking University, CHINA*
- M151.e SELF-ALIGNMENT OF MICROSTRUCTURES USING LATERAL FLUIDIC FORCE BASED ON LOCAL SPATIAL ASYMMETRY**  
Tao Yue<sup>1</sup>, Shenyu Gu<sup>1</sup>, Xinye Zhang<sup>1</sup>, Long Li<sup>1</sup>, Quan Zhang<sup>1</sup>, and Toshio Fukuda<sup>2,3</sup>  
<sup>1</sup>Shanghai University, CHINA, <sup>2</sup>Beijing Institute of Technology, CHINA, and <sup>3</sup>Nagoya University, JAPAN
- M152.e THREE-DIMENSIONAL CHANNEL FOR PREPARATION OF MICROPATTERNED HYDROGEL ARRAYS**  
Haruka Oda and Shoji Takeuchi  
*University of Tokyo, JAPAN*
- M153.e WAX PATTERNED PAPER-BASED MICROWELLS FOR 3D CELL CULTURE AND CRYOPRESERVATION**  
Ayoub Gli<sup>1</sup>, Pavithra Sukumar<sup>1</sup>, Muhammedin Deliorman<sup>1</sup>, and Mohammad A. Qasaimeh<sup>1,2</sup>  
<sup>1</sup>New York University Abu Dhabi (NYUAD), UAE and <sup>2</sup>New York University, USA



- T090.e A MONOLITHICALLY INTEGRATED MICROCANTILEVER ARRAY FOR BIOMOLECULAR DETECTION**  
Yi Liu, Cong Lin, Jiahao Miao, and Xiaomei Yu  
*Peking University, CHINA*
- T091.e A SLICE-LIKE MICROFLUIDIC IMPEDANCE CYTOMETRY FOR CELL ANALYSIS**  
Shu Zhu, Yao Chen, Chen Ni, Zheng Zhou, Kefan Guo, Weiqi Chen, Nan Xiang, and Zhonghua Ni  
*Southeast University, CHINA*
- T092.e FACILE FABRICATION OF TWO-DIMENSIONAL MICRONOZZLE ARRAY USING SKEW-POSITIONED WIRES AS A MOLD**  
Koki Takahashi and Kyohei Terao  
*Kagawa University, JAPAN*
- T093.e MULTI-MATERIAL MICROFLUIDIC VALVES via STEREO LITHOGRAPHY 3D-PRINTING**  
Alireza Ahmadianyazdi, Isaac J. Miller, and Albert Folch  
*University of Washington, USA*
- T094.e PORTABLE 3D-PRINTED PNEUMATIC OSCILLATOR CIRCUITS CHARACTERIZED BY SMARTPHONE AUDIO AND VIDEO AND USED FOR PUMPING FLUIDS WITH MICROFLUIDIC VALVES**  
Joanne Seow, Md Mohibullah, and Christopher J. Easley  
*Auburn University, USA*
- T095.e PORTABLE AND PUMPLESS MICROFLUIDIC DEVICE FOR VISCOELASTIC PARTICLE FOCUSING**  
Dan Yuan, Azadeh Nilghaz, and Rosanne M. Guijt  
*Deakin University, AUSTRALIA*
- W125.e A GLASS-ULTRA-THIN PDMS FILM-GLASS MICROFLUIDIC DEVICE FOR DIGITAL PCR APPLICATION BASED FLEXIBLE MOLD PEEL-OFF PROCESS**  
Yanming Xia<sup>1,2</sup>, Xianglong Chu<sup>1</sup>, Caiming Zhao<sup>1</sup>, Nanxin Wang<sup>1,3</sup>, Juan Yu<sup>1</sup>, Yufeng Jin<sup>3</sup>, Xiaobao Cao<sup>2,4</sup>, and Shenglin Ma<sup>1</sup>  
<sup>1</sup>Xiamen University, CHINA, <sup>2</sup>ETH Zürich, SWITZERLAND, <sup>3</sup>Peking University, CHINA, and <sup>4</sup>Guangzhou Laboratory, CHINA
- W126.e A MAGNETORHEOLOGICAL ELASTOMER BASED MICROFLUIDIC SYSTEM FOR BACTERIAL DETECTION**  
Gaozhe Cai<sup>1</sup>, Haoran Hu<sup>1</sup>, Cong Ma<sup>1,2</sup>, Yaru Huang<sup>1,3</sup>, Jianlong Zhao<sup>1</sup>, and Shilun Feng<sup>1</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA, <sup>2</sup>ShanghaiTech University, CHINA, and <sup>3</sup>Shanghai Normal University, CHINA
- W127.e BIOMIMETIC THREE-DIMENSIONAL TUMOR MANIPULATION AND ANALYSIS USING MICROCONTACT PRINTING-BASED POLYDIMETHYLSILOXANE MICROPATTERNING**  
Menlin Sun, Jinwei Zhang, and Wenming Liu  
*Central South University, CHINA*
- W128.e HIGH-PERFORMANCE 3D PRINTABLE BIO-INK BASED ON GRANULAR HYDROGEL MICROBEADS**  
Xinyang Shao, Zhizhao Liao, Yifan Wang, and Yanyi Huang  
*Peking University, CHINA*



## Microscale Fabrication, Patterning, and Integration

### **W129.e HIGHER RESOLUTION MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICES**

Lishen Zhang, Daniel O. Reddy, Timothy T. Salomons,  
and Richard Oleschuk  
*Queen's University, CANADA*

### **W130.e MOLECULARLY IMPRINTED POLYMER (MIP) COATINGS ON MICROSCALE SPHERICAL AND CYLINDRICAL SUBSTRATES**

Shiva Akhtarian<sup>1</sup>, Ali Doostmohammadi<sup>1</sup>, Khaled Youssef<sup>1</sup>,  
Satinder Kaur Brar<sup>1</sup>, Garrett Kraft<sup>2</sup>, and Pouya Rezaei<sup>1</sup>  
<sup>1</sup>*York University, CANADA and* <sup>2</sup>*Sixth Wave Innovations Inc., CANADA*

### **W131.e UTILIZING STEREOLITHOGRAPHY 3D PRINTING TO MANUFACTURE MONOLITHIC LAYER 3D-µPADS FOR MULTISTEP DOPAMINE ASSAY**

Muhammad Faizul Zaki<sup>1</sup>, Pin-Chuan Chen<sup>1</sup>, Yi-Chun Yeh<sup>2</sup>,  
Ping-Heng Lin<sup>2</sup>, and Ming-Yi Xu<sup>1</sup>  
<sup>1</sup>*National Taiwan University of Science and Technology, TAIWAN and*  
<sup>2</sup>*National Taiwan Normal University, TAIWAN*

## e - Micro- and Nanoengineering

## Nanoscale Fabrication, Patterning, and Integration

### **M154.e DEVELOPMENT OF A NANOFLUIDIC ANALYTICAL SYSTEM INTEGRATED WITH NANOCHANNEL OPEN/CLOSE VALVES**

Hiroki Sano<sup>1</sup>, Yutaka Kazoe<sup>2</sup>, Ryoichi Ohta<sup>1</sup>, Hisashi Shimizu<sup>1</sup>,  
Kyojiro Morikawa<sup>1,3</sup>, and Takehiko Kitamori<sup>1,3</sup>  
<sup>1</sup>*University of Tokyo, JAPAN,* <sup>2</sup>*Keio University, JAPAN, and*  
<sup>3</sup>*National Tsing Hua University, TAIWAN*

### **W132.e A BOWL-LIKE TiO<sub>2</sub> NANOSPHERE INTEGRATED MICROFLUIDIC CHIP FOR LABEL-FREE ENRICHMENT OF SMALL EXTRACELLULAR VESICLES**

Le Wang, Song Huang, Ming Jiang, Li Xu, and Xu Yu  
*Huazhong University of Science and Technology, CHINA*

### **W133.e FABRICATION OF THREE-LAYERED HYBRID NANOFLUIDIC DEVICE WITH FLEXIBLE GLASS NANOVALVES**

Jo Kobayashi<sup>1</sup>, Hiroto Kawagishi<sup>1</sup>, and Yan Xu<sup>1,2,3</sup>  
<sup>1</sup>*Osaka Metropolitan University, JAPAN,*  
<sup>2</sup>*Osaka Prefecture University, JAPAN, and*  
<sup>3</sup>*Japan Science and Technology Agency (JST), JAPAN*

### **W134.e GENERATION AND FUSION OF SIZE-CONTROLLED FL DROPLETS USING GAS/LIQUID INTERFACE**

Kyojiro Morikawa<sup>1,2</sup>, Ryoichi Ohta<sup>2</sup>, Naoya Sawahata<sup>2</sup>,  
and Takehiko Kitamori<sup>1,2</sup>  
<sup>1</sup>*National Tsing Hua University, TAIWAN and*  
<sup>2</sup>*University of Tokyo, JAPAN*





## e - Micro- and Nanoengineering

### New Materials and Surface Modification

- W135.e INVESTIGATION OF MANUFACTURING APPROACHES FOR SUSTAINABLE BIOPOLYMER BASED MICROFLUIDIC SYSTEMS**  
Dylan Doherty, Yevhen Brych, David Solola, and Jennifer Gaughran  
*Dublin City University, IRELAND*
- W136.e NOVEL NANOFIBER MATERIAL WITH MAGNETIC PROPERTIES FOR CARDIAC CELL CULTURES**  
Dominik Kołodziejek, Oliwia Tadko, Michal Wojasiński, Iwona Łopianiak, Marcin Drozd, and Elzbieta Jastrzebska  
*Warsaw University of Technology, POLAND*

## e - Micro- and Nanoengineering

### Others

- M155.e IN-SITU INJECTION OF MOLECULES INTO CELLS**  
Shinya Sakuma<sup>1</sup>, Niko Kimura<sup>1</sup>, Shigeo S. Sugano<sup>2</sup>, Wenjing Huang<sup>1</sup>, and Yoko Yamanishi<sup>1</sup>  
<sup>1</sup>*Kyushu University, JAPAN* and <sup>2</sup>*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*
- M156.e VACUUM-DRIVEN DRY ASSEMBLY OF ELECTROSTATICALLY LEVITATED MICROSPHERES ON PERFORATED DEVICES**  
Ignaas S.M. Jimidar<sup>1,2</sup>, Ward Van Geite<sup>1</sup>, Han Gardeniers<sup>2</sup>, and Gert Desmet<sup>1</sup>  
<sup>1</sup>*Vrije Universiteit Brussel (VUB), BELGIUM* and <sup>2</sup>*University of Twente, NETHERLANDS*
- T096.e LOW-COST DROPLET LIBRARY GENERATOR FOR MODULAR LAB-IN-TUBING SYSTEMS**  
Abdul Basit Zia and Ian G. Foulds  
*University of British Columbia, CANADA*
- W137.e MICROCONTACT TRANSFER OF WAX PATTERNS FOR PAPER-BASED MICROFLUIDICS**  
Pavithra Sukumar and Mohammad A. Qasaimeh  
*New York University Abu Dhabi (NYUAD), UAE*

## f - Sensors and Detection Technologies

### Chemical and Electrochemical Sensors

- M157.f A CRISPR-POWERED ELECTROCHEMICAL SENSOR BASED ON GOLD NANOPARTICLES/MXENE NANOCOMPOSITES**  
Haowei Duan, Yizhou Wang, and Ming Li  
*Macquarie University, AUSTRALIA*
- M158.f A NUMERICAL STUDY ON THE ELECTROCHEMICAL SENSING PROPERTIES OF BIO-INSPIRED MICROPILLAR ARRAY ELECTRODE IN A MICROFLUIDIC CHIP**  
Chaozhan Chen, Bin Ran, Bo Liu, Xiaoxuan Liu, Huaying Chen, and Yonggang Zhu  
*Harbin Institute of Technology, CHINA*

## Chemical and Electrochemical Sensors

- M159.f AN ELECTROCHEMICAL THREE-ELECTRODE BIOSENSOR ENHANCED BY HIGH-FREQUENCY SURFACE ACOUSTIC WAVES**  
Zhihua Pu, Liangya Han, and Dacaho Li  
*Tianjin University, CHINA*
- M160.f BIOLOGICAL NANOPORE PROBES FOR LOCAL MOLECULAR DETECTION AND TOPOGRAPHIC IMAGING**  
Shuta Nomi, Ryo Yoshihara, and Kan Shoji  
*Nagaoka University of Technology, JAPAN*
- M161.f INGESTIBLE BIOSENSING CAPSULE WITH INTEGRATED THREAD-BASED SENSORS**  
Cihan Ascı, Ruben Del-Rio-Ruiz, Atul Sharma, and Sameer Sonkusale  
*Tufts University, USA*
- M162.f INTEGRATED MICROFLUIDIC CHIP FOR CHEMILUMINESCENCE DETECTION OF URINE OCCULT BLOOD**  
Zong-Hui Qiu and Che-Hsin Lin  
*National Sun Yat-sen University, TAIWAN*
- M163.f ISOTHERMAL EG-FET pH SENSOR FOR REAL-TIME LABEL-FREE LOOP-MEDIATED ISOTHERMAL AMPLIFICATIONS**  
Wei-Sin Kao, Ling-Shan Yu, and Che-Hsin Lin  
*National Sun Yat-sen University, TAIWAN*
- T097.f A TOUCH-BASED, CRYPTOGRAPHIC, SMART MEDICATION DISPENSING SYSTEM**  
Jialun Zhu, Shuyu Lin, Wenzhuo Yu, and Sam Emaminejad  
*University of California, Los Angeles, USA*
- T098.f MULTIPLEXED, SELF-CALIBRATED POTENTIOMETRIC SENSOR SYSTEM FOR LONG-TERM, IN SITU MEASUREMENTS**  
Zhehao Zhang, Elena Boselli, and Ian Papautsky  
*University of Illinois, Chicago, USA*
- T099.f A MICROFLUIDIC DEVICE FOR DNA ELECTROCHEMICAL DETECTION ON PLATINUM ELECTRODES**  
Martina Freisa, Choayb Omar, Djamila Kechkeche, Thi Hong Nhung Dinh, David Bouville, Isabelle Le Potier, and Jean Gamby  
*Université Paris-Saclay, FRANCE*
- T100.f A NOVEL METAL ION SENSOR USING RESISTIVE SWITCHING EFFECT**  
Tian Kang, Shengxiao Jin, Guanzhou Lin, Yusa Chen, Liye Li, Hongshun Sun, Senyong Hu, and Wengang Wu  
*Peking University, CHINA*
- T101.f A SLOT ANTENNA TERAHERTZ SENSOR FOR URIC ACID DETECTION**  
Yuke Han, Xiaomeng Bian, Rui You, Tianshu Li, Lianqing Zhu, and Fei Luo  
*Beijing Information Science and Technology University, CHINA*



## Chemical and Electrochemical Sensors

- T102.f AN IMPEDIMETRIC MICRO CHIP FOR NON-INVASIVE MEASUREMENT OF STRESS BIOMARKER TO TRACK THE ANIMAL HEALTH**  
Brince Paul, Luiza A. Wasiewska, Fernando Garrido Diaz, Marcello Valente, Han Shao, and Alan O'Riordan  
*Tyndall National Institute, IRELAND*
- T103.f AN INTEGRATED MICROFLUIDIC SYSTEM FOR DETECTING CARDIOVASCULAR DISEASE BIOMARKERS**  
Pei-Rong Li<sup>1</sup>, Yu-Jen Cheng<sup>1</sup>, Yi-Xian Chen<sup>2</sup>, Hsiao-Yu Huang<sup>3</sup>, Chih-Hung Wang<sup>1</sup>, Tsung-Heng Tsai<sup>2</sup>, Chien-Nan Kuo<sup>3</sup>, and Gwo-Bin Lee<sup>1</sup>  
<sup>1</sup>*National Tsing Hua University, TAIWAN,*  
<sup>2</sup>*National Chung Cheng University, TAIWAN, and*  
<sup>3</sup>*National Yang Ming Chiao Tung University, TAIWAN*
- T104.f ENZYME-LIKE SYNTHETIC BIOSENSORS FOR STEROIDS DETECTION**  
Sanjida Yeasmin, Ahasan Ullah, Xueqiao Zhang, and Li-Jing Cheng  
*Oregon State University, USA*
- T105.f MECHANICALLY-SENSITIVITY-TUNABLE STRUCTURAL-COLOR CHEMICAL SENSOR COMBINED WITH DNA-APTAMER HYDROGEL FOR VISIBLE SILVER ION DETECTION**  
Ryohei Ueno, Shota Yamawaki, and Hiroaki Onoe  
*Keio University, JAPAN*
- T106.f MULTIPLEXED SENSING MICROPROBE FOR BIOPROCESS MONITORING**  
Atul Sharma, Mossab K. Alsaedi, Ruben Del-Rio-Ruiz, Cihan Asci, Emmanuel S. Tzanakakis, and Sameer Sonkusale  
*Tufts University, USA*
- T107.f NITRATE SENSORS WITH ULTRA SENSITIVE AND SELECTIVE GRAPHENE FIELD EFFECT TRANSISTORS**  
Yingming Xu, Jungyoon Kim, Peng Zhou, and Tianhong Cui  
*University of Minnesota, USA*
- T108.f SMARTPHONE-BASED ELECTROCHEMILUMINESCENCE DETECTION OF METABOLIC BIOMARKERS**  
Yueyue Pan, Tianyu Li, Peng Pan, and Xinyu Liu  
*University of Toronto, CANADA*
- T109.f FABRICATION AND VALIDATION OF FULLY CUSTOMIZABLE ATR-FITR BASED SPECTROFLUIDIC DEVICES**  
Nan Jia, Arthur Bouchard, Tianyang Deng, André Bégin-Drolet, Jesse Greener  
*Université Laval, CANADA*
- W138.f ELECTROCHEMILUMINESCENCE HETEROGENEOUS IMMUNASSAY ON A MICROFLUIDIC CHIP**  
Yun Hui, Weiliang Shu, Fenglin Liu, Tianzhun Wu, Wenhua Zhou, and Xuefeng Yu  
*Chinese Academy of Sciences, CHINA*



- W139.f INTELLIGENT IMPEDANCE SYSTEM FOR RECOGNIZING SINGLE BACTERIA SUSCEPTIBLE TO ANTIBIOTIC TREATMENT**  
Tao Tang<sup>1</sup>, Yo Tanaka<sup>2</sup>, Yang Yang<sup>3</sup>, Ming Li<sup>4</sup>, Yoichiro Hosokawa<sup>1</sup>, and Yaxiaer Yalikul<sup>1,2</sup>  
<sup>1</sup>Nara Institute of Science and Technology, JAPAN,  
<sup>2</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN,  
<sup>3</sup>Chinese Academy of Sciences, CHINA, and  
<sup>4</sup>Macquarie University, AUSTRALIA
- W140.f IONOTROPIC RECEPTOR-BASED SENSOR ARRAY UTILIZING SOLID-SUPPORTED MEMBRANE ELECTROPHYSIOLOGY**  
Hisatoshi Mimura<sup>1</sup>, Toshihisa Osaki<sup>1</sup>, Sho Takamori<sup>1</sup>, and Shoji Takeuchi<sup>1,2</sup>  
<sup>1</sup>Kanagawa Institute of Industrial Science and Technology, JAPAN and <sup>2</sup>University of Tokyo, JAPAN
- W141.f MICRODIALYSIS/ULTRAFILTRATION-INTEGRATED DROPLET MICROFLUIDIC SENSORS FOR DECODING NITRATE DYNAMICS IN SOIL**  
Bingyuan Lu, James Lunn, Adrian M. Nightingale, and Xize Niu  
University of Southampton, UK
- W142.f MICRORNA AND TROPONIN DETECTION IN ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION**  
Xiang Ren<sup>1</sup>, George Ronan<sup>1</sup>, S. Gulberk Ozcebe<sup>1</sup>, Satyajyoti Senapati<sup>1</sup>, Keith L. March<sup>2</sup>, Eileen Handberg<sup>2</sup>, David Anderson<sup>2</sup>, Carl Pepine<sup>2</sup>, Hsueh-Chia Chang<sup>1</sup>, and Pinar Zorlutuna<sup>1</sup>  
<sup>1</sup>University of Notre Dame, USA and  
<sup>2</sup>University of Florida, USA
- W143.f MOLECULAR BASIS OF FEMTOMOLAR-NANOPORE-DETECTION OF DNAs WITH THE EXCESS COMPLEMENTARY PROBES**  
Nanami Takeuchi and Ryuji Kawano  
Tokyo University of Agriculture and Technology, JAPAN
- W144.f MOLECULARLY IMPRINTED POLYMER-COATED MICROWIRES FOR SENSOR APPLICATIONS AND BACTERIA DETECTION**  
Shiva Akhtarian<sup>1</sup>, Ali Doostmohammadi<sup>1</sup>, Khaled Youssef<sup>1</sup>, Daphne-Eleni Archonta<sup>1</sup>, Satinder Kaur Brar<sup>1</sup>, Garrett Kraft<sup>2</sup>, and Pouya Rezaei<sup>1</sup>  
<sup>1</sup>York University, CANADA and  
<sup>2</sup>Sixth Wave Innovations Inc., CANADA
- W145.f SINGLE-CELL PROTEIN ANALYSIS ENABLED BY MICROFLUIDIC PLATFORM LEVERAGING CONSTRICTION MICROCHANNEL AND LIGHT MODULATION**  
Ting Zhang<sup>1,2</sup>, Lixing Liu<sup>1,2</sup>, Hongyu Yang<sup>1,2</sup>, Deyong Chen<sup>1,2</sup>, Junbo Wang<sup>1,2</sup>, and Jian Chen<sup>1,2</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and  
<sup>2</sup>University of Chinese Academy of Sciences, CHINA



## f - Sensors and Detection Technologies

### Optical Sensors and Imaging

- M165.f A PAPER-BASED MICROFLUIDIC BIOSENSOR FOR LOW-COST, ON-SITE DIAGNOSIS OF URINARY TRACT INFECTIONS ON A SMARTPHONE**  
Athul Janev and Sung-Yong Park  
*San Diego State University, USA*
- M166.f A SMARTPHONE-ASSISTED MICROARRAY IMMUNOSENSOR FOR HIGH-SENSITIVITY DETECTION OF OKADAIC ACID**  
Xiaotong Li, Yongqiang Cheng, Ranran Xu, Ziwei Zhang, Xiaoxiao Qi, Longyu Chen, and Meijia Zhu  
*Shandong University, CHINA*
- M167.f CELL ACTIVITY MEASUREMENT FOR EVALUATION OF PHYSICAL AND CHEMICAL REACTIONS BY UTILIZING 1D-SPR MEASUREMENT**  
Suzuyo Inoue, Aya Tanaka, Tomomi Murai, Riku Takahashi, and Michiko Seyama  
*NTT Corporation, JAPAN*
- M168.f MICROSPHERE ASSISTED LIGHT-SCATTERING IMAGING OF PLASMONIC NANOPARTICLES AT THE SINGLE PARTICLE LEVEL**  
Pengcheng Zhang, Guoqiang Gu, Sha Xue, Xiaoqin Huo, Xi Chen, Lin Zeng, and Hui Yang  
*Chinese Academy of Sciences, CHINA*
- M169.f SERUM CREATININE DETECTION IN A MICROFLUIDIC CHIP USING A SMARTPHONE CAMERA**  
Betul Karakuzu<sup>1</sup>, Ergun Alperay Tarim<sup>1</sup>, and H. Cumhur Tekin<sup>1,2</sup>  
<sup>1</sup>*Izmir Institute of Technology, TURKEY and*  
<sup>2</sup>*Middle East Technical University (METU), TURKEY*
- M170.f SIMPLE ANION DETECTION ON MICROFLUIDIC PAPER ANALYTICAL DEVICE**  
Grasianto<sup>1</sup>, Mao Fukuyama<sup>1</sup>, Motohiro Kasuya<sup>2</sup>, Masao Gen<sup>1</sup>, Carlos Baptista<sup>1</sup>, Shin-Ichi Kondo<sup>3</sup>, and Akihide Hibara<sup>1</sup>  
<sup>1</sup>*Tohoku University, JAPAN,*  
<sup>2</sup>*Komatsu University, JAPAN, and*  
<sup>3</sup>*Yamagata University, JAPAN*
- M171.f ULTRA HIGH-THROUGHPUT CELL IMAGING ENABLED BY OPTIMIZED MICROFLUIDIC DEVICE WITH HORIZONTAL CONNECTION**  
Xun Liu<sup>1</sup>, Jiehua Zhou<sup>2</sup>, Tao Tang<sup>1</sup>, Yoichiro Hosokawa<sup>1</sup>, Yaxiaer Yalikul<sup>1</sup>, and Cheng Lei<sup>2</sup>  
<sup>1</sup>*Nara Institute of Science and Technology, JAPAN and*  
<sup>2</sup>*Wuhan University, CHINA*



## Optical Sensors and Imaging

- T110.f A NOVEL QUANTITATIVE METHOD BASED ON ON-CHIP FLOW RATE MEASUREMENT**  
Kuizhi Qu<sup>1</sup>, Kazuhiro Morioka<sup>2</sup>, Konoka Nakamura<sup>2</sup>, Shoji Yamamoto<sup>1</sup>, Akihide Hemmi<sup>3</sup>, Atsushi Shoji<sup>2</sup>, and Hizuru Nakajima<sup>1</sup>  
<sup>1</sup>Tokyo Metropolitan University, JAPAN, <sup>2</sup>Tokyo University of Pharmacy and Life Sciences, JAPAN, and <sup>3</sup>Mebius Advanced Technology Ltd., JAPAN
- T111.f REFLECTION-MODE PHOTOPLETHYSMOGRAPHY SENSOR PATCH FOR MENTAL HEALTH SCREENING TOOLS**  
Namyun Kim<sup>1</sup>, Yao Zhang<sup>1</sup>, and Yi Jae Lee<sup>1,2</sup>  
<sup>1</sup>Korea Institute of Science and Technology (KIST), KOREA and <sup>2</sup>University of Science & Technology (UST), KOREA
- T112.f SENSITIVE AND SELECTIVE PREGNENOLONE DETECTION WITH NARROW EMISSION GREEN CARBON DOTS**  
Xueqiao Zhang, Sanjida Yeasmin, Ahasan Ullah, and Li-Jing Cheng  
Oregon State University, USA
- T113.f SENSITIVE INTERROGATION OF ENHANCER ACTIVITY IN LIVING CELLS ON NANO-ELECTROPORATION-PROBING PLATFORM**  
Zaizai Dong and Lingqian Chang  
Beihang University, CHINA
- T114.f SOLUTE DIFFUSION AND HYDROGEL SWELLING EVALUATION METHOD AIMING AT NON-LABEL SENSING IN MICROPHYSIOLOGICAL SYSTEMS**  
Tomomi Murai, Suzuyo Inoue, Riku Takahashi, Aya Tanaka, and Michiko Seyama  
NTT Corporation, JAPAN
- T115.f TOWARDS A LOW-COST AND HANDHELD THERMO-PHOTONIC DEVICE FOR RAPID DETECTION OF BACTERIA IN DRINKING WATER**  
Mohammad Javad Farshchi Heydari, Daphne-Eleni Archonta, Vasily G. Panferov, Sergey N. Krylov, Pouya Rezaei, and Nima Tabatabaei  
York University, CANADA
- W146.f FLOW-CONTROLLED PLASMONIC SENSORS**  
Raquel Catalan-Carrio<sup>1</sup>, Alba Calatayud-Sanchez<sup>1</sup>, Yara Alvarez-Braña<sup>1</sup>, Joel Villatoro<sup>1,2</sup>, Fernando Benito-Lopez<sup>1,3,4</sup>, and Lourdes Basabe-Desmonts<sup>1,2,3,4</sup>  
<sup>1</sup>University of the Basque Country, SPAIN, <sup>2</sup>IKERBASQUE, SPAIN, <sup>3</sup>Bioaraba Health Research Institute, SPAIN, and <sup>4</sup>BCMaterials, SPAIN



## f - Sensors and Detection Technologies

### Others

- T116.f** **SIMPLIFIED PROCESS FOR PICOWATT CALORIMETER BASED ON FLEXIBLE PRINTED CIRCUIT TECHNIQUE**  
Hanliang Zhu, Lan Wang, and Pavel Neuzil  
*Northwestern Polytechnical University, CHINA*
- W147.f** **MALDI MASS SPECTROMETRY ON HIGH-DENSITY DROPLET ARRAYS: MATRIX DEPOSITION, SELECTIVE REMOVAL AND RECRYSTALLIZATION**  
Simon F. Berlanda, Maximilian Breinfeld, and Petra S. Dittrich  
*ETH Zürich, SWITZERLAND*
- W148.f** **A ZnO-MICROCHIP FOR EXTRACELLULAR VESICLES DETECTION WITH CASCADE SIGNAL AMPLIFICATION AND GLUCOSE METER READOUT**  
Song Haung, Le Wang, Li Xu, and Xu Yu  
*Huazhong University of Science and Technology, CHINA*
- W149.f** **MULTI-ANALYTE SENSING MICROFLUIDIC STRUCTURE FOR ARRAY SENSORS AND ITS USAGE WITH A CANTILEVER BIO SENSOR**  
Yuya Takahashi<sup>1</sup>, Kotaro Kamitani<sup>1</sup>, Carl Frederik Werner<sup>1</sup>, Masayuki Sohgwawa<sup>2</sup>, and Minoru Noda<sup>1</sup>  
<sup>1</sup>*Kyoto Institute of Technology, JAPAN and*  
<sup>2</sup>*Niigata University, JAPAN*
- W150.f** **POROUS MICRONEEDLES INTEGRATED PAPER SENSOR FOR CHOLESTEROL MEASUREMENT**  
Heyi Jing, Boyu Qin, Leilei Bao, Jongho Park, and Beomjoon Kim  
*University of Tokyo, JAPAN*

## f - Sensors and Detection Technologies

### Physical Sensors

- M172.f** **A FLEXIBLE, WEARABLE AND WIRELESS ELECTROPHYSIOLOGICAL SIGNAL SENSING SYSTEM FOR ERG WAVE DETECTION**  
Rui Luo<sup>1,3</sup>, Wei Zhang<sup>1,2</sup>, Ding Shen<sup>1,3</sup>, and Dahai Ren<sup>1,3</sup>  
<sup>1</sup>*Tsinghua University, CHINA, <sup>2</sup>Beijing Information Science and Technology University, CHINA, and <sup>3</sup>State Key Laboratory of Precision Measurement Technology and Instruments, CHINA*
- M173.f** **A HOT-FILM AIRFLOW SENSOR WITH HIGHLY THERMAL SENSITIVE THIN FILM**  
Jie Wang, Yunfei Liu, Zhezhen Zhu, Chengchen Gao, Zhenchuan Yang, and Yilong Hao  
*Peking University, CHINA*
- M174.f** **A LOW HYSTERESIS FORCE DISTRIBUTION TRANSDUCER FOR ARTIFICIAL JOINT**  
Yunfei Liu, Jie Wang, Zhenchuan Yang, Yilong Hao, and Chengchen Gao  
*Peking University, CHINA*



## Physical Sensors

### **M175.f AN L-SHAPED TWO-DIMENSIONAL HOT-WIRE ANEMOMETER FOR LOW SPEED GAS FLOW DETECTION**

Zhezhen Zhu, Wangnan Chen, Lingmeng Yang, Chengchen Gao, Yilong Hao, and Zhenchuan Yang  
*Peking University, CHINA*

### **M176.f APPLICATION OF A THERMAL SENSOR SYSTEM FOR THE MEASUREMENT OF BIOFILM FORMATION OVER 24 H AND INHIBITION BY AN ANTIMICROBIAL PEPTIDE IN REAL-TIME**

Tobias Wieland, Krishan Kotthaus, Leon Brenner, and Gerald A. Urban  
*University of Freiburg, GERMANY*

### **M177.f ENABLING HIGH SENSITIVITY AIRFLOW MEASUREMENT USING PHASE-CHANGE MATERIALS**

Yushan Zhou<sup>1</sup>, Yunqi Cao<sup>1</sup>, Nelson Sepúlveda<sup>2</sup>, and Hongjian Zhang<sup>1</sup>  
*<sup>1</sup>Zhejiang University, CHINA and <sup>2</sup>Michigan State University, USA*

### **M178.f NOVEL MEASUREMENT COMPENSATION TECHNIQUE FOR WEARABLE MICROFLUIDIC SWEAT SENSOR**

Yuki Hashimoto, Takako Ishihara, Kei Kuwabara, and Hiroyoshi Togo  
*NTT Corporation, JAPAN*

### **M179.f PATCH-TYPE PRESSURE SENSOR WITH UNBALANCED MICRO-STRUCTURE**

Zhang Yao<sup>1,2</sup>, Jun Suk Chae<sup>1,2</sup>, and Yi Jae Lee<sup>1,3</sup>  
*<sup>1</sup>Korea Institute of Science and Technology (KIST), KOREA, <sup>2</sup>Seoul National University of Science and Technology, KOREA, and <sup>3</sup>University of Science & Technology (UST), KOREA*

### **T117.f A CMOS-MEMS THERMAL CONVECTIVE ACCELEROMETER FOR PERFORMANCE ENHANCEMENT USING FILM THINNING METHOD**

Xiaoyi Wang<sup>1</sup>, Zhongyi Liu<sup>1</sup>, Yi-Kuen Lee<sup>2</sup>, and Huikai Xie<sup>1</sup>  
*<sup>1</sup>Beijing Institute of Technology, CHINA and <sup>2</sup>Hong Kong University of Science and Technology, HONG KONG*

### **T118.f FLOATING ELECTRODES CONFIGURATION ENABLING SPATIAL LOCATION OF SINGLE CELLS IN MICROCHANNEL**

Qiang Fang<sup>1</sup>, Yongxiang Feng<sup>2</sup>, Liang Huang<sup>1</sup>, and Wenhui Wang<sup>2</sup>  
*<sup>1</sup>Hefei University of Technology, CHINA and <sup>2</sup>Tsinghua University, CHINA*

### **T119.f LOW-COST AND LABEL-FREE RESISTIVE MICROFLUIDIC BIOSENSOR FOR BACTERIA DETECTION IN DRINKING WATER**

Mohammad Javad Farshchi Heydari, Daphne-Eleni Archonta, Vasily G. Panferov, Sergey N. Krylov, Nima Tabatabaei, and Pouya Rezai  
*York University, CANADA*

### **W151.f GENE EXPRESSION ANALYSIS FOLLOWING MECHANICAL CHARACTERIZATION OF A CELL BY MEMS TWEEZERS**

Kouhei Takamura and Momoko Kumemura  
*Kyushu Institute of Technology, JAPAN*



## Physical Sensors

### **W152.f** HIGHLY FLEXIBLE SENSOR INTEGRATED WITH ULTRA THIN GLASS CANTILEVER FOR STIFFNESS EVALUATION

Yapeng Yuan<sup>1,2</sup>, Yaxiaer Yaliku<sup>1,3</sup>, and Yo Tanaka<sup>1,2</sup>

<sup>1</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN,

<sup>2</sup>Osaka University, JAPAN, and <sup>3</sup>Graduate School of Nara

Institute of Science and Technology, JAPAN

## g - Other Applications of Microfluidics

### Artificial Intelligence and Microfluidics

### **M180.g** MACHINE LEARNING-BASED QUANTITATIVE ANALYSIS METHOD USING IMMUNO-WALL DEVICE

Jungchan Shin, Toshihiro Kasama, and Ryo Miyake

University of Tokyo, JAPAN

## g - Other Applications of Microfluidics

### Fuel Cells and Energy

### **T120.g** CANTILEVER STRUCTURE FOR PORTABLE SOLID OXIDE FUEL CELL WITH HIGH THERMAL INSULATION AND DURABILITY IN HARSH CONDITIONS

Ryutaro Torikai<sup>1</sup>, Daiki Takeda<sup>2</sup>, Tetsuya Yamada<sup>1</sup>, and Yasuko Yanagida<sup>1</sup>

<sup>1</sup>Tokyo Insutitute of Technology, JAPAN and

<sup>2</sup>Industrial Research Institute of Ishikawa, JAPAN

### **T121.g** IMPROVED PERFORMANCE OF TWO-PHASE MICROFLUIDIC FUEL CELLS USING NANOSTRUCTURES: A NUMERICAL STUDY

Michel Takken<sup>1</sup> and Robert Wille<sup>1,2</sup>

<sup>1</sup>Technical University of Munich, GERMANY and

<sup>2</sup>Software Competence Center Hagenberg SCCH, AUSTRIA

### **W153.g** 3D PRINTED MICRO FUEL CELLS FOR POINT-OF-CARE DIAGNOSTICS

Lore Van Looy<sup>1</sup>, Frederic Becker<sup>1</sup>, Philippe Vereecken<sup>1,2</sup>, and Rob Ameloot<sup>1</sup>

<sup>1</sup>KU Leuven, BELGIUM and <sup>2</sup>imec, BELGIUM

### **W154.g** INTEGRATED MICROFLUIDIC DEVICE FOR MICROALGAL CELLS CULTIVATION AND CARBOHYDRATES EXTRACTION

Qianwei Jiang<sup>1</sup>, Toshihiro Kasama<sup>1</sup>, Tomomi Sato<sup>2</sup>,

Jin Matsugaki<sup>2</sup>, and Ryo Miyake<sup>1</sup>

<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>KISTEC, JAPAN

### **W155.g** LIQUID-LIQUID CONTACT ELECTRIFICATION FOR MICROFLUIDICS-BASED TRIBOELECTRIC NANOGENERATOR

Ruotong Zhang, Haisong Lin, and Anderson Ho Cheung Shum

University of Hong Kong, HONG KONG





## g - Other Applications of Microfluidics

### Others

#### **M181.g NUMERICAL CHARACTERIZATION OF THE VIBRATION-INDUCED FLOW IN VARIOUS CONDITIONS**

Zhitai Huang<sup>1</sup>, Kanji Kaneko<sup>1</sup>, Yuto Asada<sup>1</sup>, Yosuke Hasegawa<sup>2</sup>, Takeshi Hayakawa<sup>1</sup>, and Hiroaki Suzuki<sup>1</sup>

<sup>1</sup>Chuo University, JAPAN and <sup>2</sup>University of Tokyo, JAPAN

#### **T122.g STUDENT ENGAGEMENT & ACHIEVEMENT IN A COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCE CREATING APPLIED MICROFLUIDIC DEVICES**

Andrew Dean, James Redfern, and Kirsty J. Shaw

Manchester Metropolitan University, UK

#### **T123.g THE FUNCTIONALITY OF PROGRAMMABLE MICROFLUIDICS IN MICROGRAVITY**

Zachary Estlack<sup>1</sup>, Matin Golozar<sup>2</sup>, Anna Butterworth<sup>2</sup>, Richard A. Mathies<sup>2</sup>, and Jungkyu Kim<sup>1</sup>

<sup>1</sup>University of Utah, USA and <sup>2</sup>University of California, Berkeley, USA

## h - Late News

### Cells, Organisms and Organs on a Chip

#### **M182.h A GLASS MICROFLUIDIC BIOELECTROCHEMICAL CELL PLATFORM FOR THE STUDY OF MICROBIAL EXTRACELLULAR ELECTRON UPTAKE**

Andreea Stoica, Karthikeyan Rengasamy, Tahina O. Ranaivoarisoa, Arpita Bose, and J. Mark Meacham

Washington University, St. Louis, USA

#### **M183.h A NANOPIPETTE-BASED THERMOCOUPLE FOR SINGLE-CELL ANALYSIS**

Li-Qiu Huang, Xin-Lei Ding, Xiao-Tong Pan, Kang Wang, Zhong-Qiu Li, and Xing-Hua Xia

Nanjing University, CHINA

#### **T124.h CHARACTERIZATION OF THE WHOLE NEURAL NETWORK SIGNAL READOUT PLATFORM FROM A 3D NEURONAL NETWORK USING THE CELL PATTERNING ON A MICROELECTRODE ARRAY**

Dongjo Yoon and Yoonkey Nam

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

#### **T125.h MICROCHANNEL WITH PATTERNED SURFACE COATING AS FLUID GUIDE FOR ON-CHIP CELL CULTURING**

Ming Pan, Xiaohua Qian, and Xin Xie

Xellar Biosystems, USA

#### **T126.h SPATIOTEMPORAL CONTROL OF APOPTOSIS BY MANIPULATING OPTOGENETIC-BAX**

Dain Lee and Seok Chung

Korea University, KOREA



## Cells, Organisms and Organs on a Chip

- W156.h A MICROFLUIDIC SPHEROIDS-BASED DERMAL MODEL FOR SCREENING HYDROPHILIC AND HYDROPHOBIC ACTIVE INGREDIENTS FOR SKINCARE**  
Zhengkun Chen<sup>1</sup>, Sina Kheiri<sup>1</sup>, Albert Gevorkian<sup>1</sup>, Edmond Young<sup>1</sup>, Oussama El Baraka<sup>2</sup>, Valarie Andre<sup>2</sup>, Ted Deisenroth<sup>3</sup>, and Eugenia Kumacheva<sup>1</sup>  
<sup>1</sup>University of Toronto, CANADA, <sup>2</sup>BASF Beauty Care Solutions France S.A.S, FRANCE, and <sup>3</sup>BASF Advanced Formulation Research North America, USA
- W157.h PROGRAMMABLE MICRO-FLOW ASSAY OF APATMER AS A POTENTIAL THERAPEUTIC AGENT TOWARDS NEUTROPHILS RESPIRATORY BURST**  
Xiaoning Liang, Yayue Mei, and Hong Shen  
Zhejiang University, CHINA
- W158.h RAPID DETERMINATION OF ANTIBIOTIC RESISTANCE IN KLEBSIELLA PNEUMONIAE VIA DIRECT SINGLE-CELL IMAGING BY DROPLET MICROFLUIDICS**  
Yue Wang<sup>1,2</sup>, Cancan Zhu<sup>1</sup>, Ke Yang<sup>1</sup>, Jun Zhao<sup>1</sup>, Zhenyu Wang<sup>1</sup>, Xueer Yin<sup>1</sup>, Yong Liu<sup>1</sup>, and Ling Zhu<sup>1</sup>  
<sup>1</sup>Chinese Academy of Sciences, CHINA and <sup>2</sup>University of Science and Technology of China, CHINA

## h - Late News

### Diagnostics, Drug Testing and Personalized Medicine

- M184.h A DIGITAL MICROFLUIDIC DEVICE INTEGRATED WITH COLORIMETRIC LOOP-MEDIATED ISOTHERMAL AMPLIFICATION FOR VISUAL DETECTION OF MULTIPLE PATHOGENS**  
Mei Xie<sup>1</sup>, Bo Lei<sup>1</sup>, Tianlan Chen<sup>2</sup>, and Cheng Dong<sup>2,3</sup>  
<sup>1</sup>HKBU-NBU United International College, CHINA, <sup>2</sup>Digifluidic Biotech Ltd, CHINA, and <sup>3</sup>Jinan University, CHINA
- M185.h SENSITIVITY-IMPROVED IMMUNOASSAY FOR SARS-CoV-2 SPIKE PROTEIN IN SALIVA WITHOUT PRETREATMENT BY USING IMMUNO-WALL MICROFLUIDIC DEVICE**  
Xiang Zhou, Toshihiro Kasama, and Ryo Miyake  
University of Tokyo, JAPAN
- T127.h ORGANOID BASED PRECLINICAL DRUG SCREENING STUDY OF OVARIAN CANCER USING PLATFORM DESIGNED FOR UNIFORMLY CULTIVATING AND ASSESSING**  
Seung-cheol Shin<sup>1</sup>, Yong Hun Jung<sup>1</sup>, Jung-Yun Lee<sup>2</sup>, and Seok Chung<sup>1</sup>  
<sup>1</sup>Korea University, KOREA and <sup>2</sup>Yonsei University College of Medicine, KOREA
- T128.h NUMERICAL STUDY OF IMMUNOASSAY ENHANCEMENT USING ACOUSTIC DEVICES**  
Yingqi Meng<sup>1</sup> and Yupan Wu<sup>2</sup>  
<sup>1</sup>Jiading District Central Hospital Affiliated Shanghai University of Medicine and Health Sciences, CHINA and <sup>2</sup>Northwestern Polytechnical University, CHINA



## Diagnosics, Drug Testing and Personalized Medicine

- W159.h** **MULTIPLE CONCENTRATION GRADIENT-TAILORED ARRAY FOR HIGH-THROUGHPUT SINGLE-CELL ANALYSIS**  
Ya-Nan Zhao, Xuan Zhang, Xing Wei, Ming-Li Chen, and Jian-Hua Wang  
*Northeastern University, CHINA*
- W160.h** **TTAGO-COUPLED-MULTIPLEX-DIGITAL-RPA-CRISPR/CAS12A FOR EGFR MUTATIONS DETECTION**  
Jianjian Zhuang<sup>1</sup>, Liping Xia<sup>3</sup>, Zheyu Zou<sup>3</sup>, Juxin Yin<sup>2</sup>, and Ying Mu<sup>3</sup>  
<sup>1</sup>*Zhejiang University School of Medicine, CHINA*,  
<sup>2</sup>*Zhejiang University City College, CHINA*, and  
<sup>3</sup>*Zhejiang University, CHINA*
- W161.h** **A FULLY AUTOMATED, INTEGRATED DROPLET DIGITAL PCR ANALYZER**  
Qian Nuan Shi<sup>1</sup>, Jian Zhang Pan<sup>1,2</sup>, and Qun Fang<sup>1,2</sup>  
<sup>1</sup>*ZJU-Hangzhou Global Scientific and Technological Innovation Center, CHINA* and <sup>2</sup>*Zhejiang University, CHINA*
- W162.h** **A DCD-CHIP DESIGNED FOR DIGITAL AND ULTRA-PRECISE QUANTIFICATION OF COPY NUMBER VARIATION**  
Zheyu Zou, Liping Xia, Juxin Yin, and Ying Mu  
*Zhejiang University, CHINA*
- W163.h** **DPCR DUPLEXING METHOD IN A SINGLE FLUORESCENCE CHANNEL**  
Haoqing Zhang<sup>1,2</sup>, Soňa Laššáková<sup>3</sup>, Zhiqiang Yan<sup>1</sup>, Xinlu Wang<sup>1</sup>, Pavel Šenkyřík<sup>3</sup>, Martina Gaňová<sup>4</sup>, Honglong Chang<sup>1</sup>, Marie Korabecna<sup>3,5</sup>, and Pavel Neuzil<sup>1</sup>  
<sup>1</sup>*Northwestern Polytechnical University, CHINA*, <sup>2</sup>*Xi'an Jiaotong University, CHINA*, <sup>3</sup>*Charles University and General University Hospital in Prague, CZECH REPUBLIC*, <sup>4</sup>*Brno University of Technology, CZECH REPUBLIC*, and <sup>5</sup>*University of Trnava, SLOVAKIA*
- W164.h** **DIRECT DIGITAL CRISPR/CAS-ASSISTED ASSAY FOR ULTRASENSITIVE DETECTION OF PATHOGENS**  
Liping Xia<sup>1</sup>, Juxin Yin<sup>2</sup>, Jianjian Zhuang<sup>3</sup>, Weihong Yin<sup>1</sup>, Zheyu Zou<sup>1</sup>, and Ying Mu<sup>1</sup>  
<sup>1</sup>*Zhejiang University, CHINA*, <sup>2</sup>*Zhejiang University City College, CHINA*, and <sup>3</sup>*Affiliated Hangzhou First People's Hospital, Zhejiang University School of Medicine, CHINA*

## h - Late News

### Fundamentals in Microfluidics and Nanofluidics

- M186.h** **ACOUSTOFLUIDIC FOR FOULING MITIGATION IN CROSS-FLOW MICROFILTRATION**  
Ting-Yu Wan, Yen-Wei Chang, Ta-Jen Yang, Tsui-Ting Lee, Hsiang-I Yin, Yu-Chin Ho, Hsiao-Lin Hwa, and Yen-Wen Lu  
*National Taiwan University, TAIWAN*
- T129.h** **CONTROLLED DROPLET PRODUCTION IN SYMMETRIC FLOW-FOCUSING DEVICE FOR TUNABLE GOLD NANOPARTICLES SYNTHESIS**  
Kavitha Illath<sup>1</sup>, Moeto Nagai<sup>2</sup>, and Tuhin S. Santra<sup>1</sup>  
<sup>1</sup>*Indian Institute of Technology Madras, INDIA* and  
<sup>2</sup>*Toyohashi University of Technology, JAPAN*



## Fundamentals in Microfluidics and Nanofluidics

- T130.h LAYERED BIOMIMETIC MICROGELS FOR GENE DELIVERY AND SCAFFOLD CONSTRUCT ASSEMBLY**  
Bruna G. Carvalho<sup>1</sup>, Sang W. Han<sup>2</sup>,  
and Lucimara G. de la Torre<sup>1</sup>  
<sup>1</sup>University of Campinas, BRAZIL and  
<sup>2</sup>São Paulo Federal University, BRAZIL
- W165.h TOWARDS CONCENTRIC TOPOLOGY IN ORGANOIDS: STRUCTURATION AND CULTURE OF BRAIN DERIVED SPHEROIDS IN A BULK ACOUSTIC WAVE RESONATOR**  
Chloé Dupuis<sup>1,2</sup>, Xavier Mousset<sup>1,2</sup>, Guillaume Viraye<sup>2</sup>,  
Pierre-Ewen Lecoq<sup>1,2</sup>, Mauricio Hoyos<sup>1</sup>, Jean-Luc Aider<sup>1</sup>,  
and Jean-Michel Peyrin<sup>2</sup>  
<sup>1</sup>École Supérieure de Physique Et de Chimie Industrielles de  
La Ville de Paris, FRANCE and <sup>2</sup>Sorbonne Université, FRANCE
- W166.h MEASUREMENT OF PRESSURE-DRIVEN FLOW IN A NANOCHANNEL BY DEFOCUSING NANO-PARTICLE IMAGE VELOCIMETRY**  
Yutaka Kazoe<sup>1</sup>, Minoru Tanaka<sup>1</sup>, and Itsuo Hanasaki<sup>2</sup>  
<sup>1</sup>Keio University, JAPAN and <sup>2</sup>Tokyo University of Agriculture  
and Technology, JAPAN
- W167.h NANOFUIDIC DEVICE FOR SURFACE CHARGE MEASUREMENT OF NANOPARTICLES USING TUNABLE ELECTROSTATIC LANDSCAPE**  
Imman I. Hosseini, Zezhu Liu, Walter Reisner, and Sara Mahshid  
McGill University, CANADA

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### Integrated Microfluidic Platforms

- M187.h SEEDLESS SYNTHESIS OF GOLD NANOTRIANGLES USING MICROFLUIDICS WITH NON-THERMAL LIQUID PHASE REDUCTION**  
Mao Hamamoto and Hiromasa Yagyu  
Kanto Gakuin University, JAPAN
- T131.h MICROFLUIDIC FABRICATION OF MONODISPERSE DEGRADABLE CELL-SUPPORTIVE HYDROGEL MICROPARTICLES (MICROGELS)**  
Afshin Abrishamkar, Cynthia Pham, Eva Mueller, and Todd Hoare  
McMaster University, CANADA

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### Micro- and Nanoengineering

- M188.h DEVELOPMENT OF MICROWELL ARRAY FOR CELL TRAPPING AND SHRNA DELIVERY USING ELECTROPORATION**  
Han-Yun Hsieh<sup>1</sup>, Che-Yi Li<sup>1</sup>, Jian-Chie Chao<sup>1</sup>,  
Yu-Jui Fan<sup>2</sup>, and Horn-Jiunn Sheen<sup>1</sup>  
<sup>1</sup>National Taiwan University, TAIWAN and  
<sup>2</sup>Taipei Medical University, TAIWAN





## Micro- and Nanoengineering

### **M189.h MULTILAYER MICROFLUIDIC DEVICES: NEW FABRICATION METHOD USING A CUSTOM-BUILT WAFER-SCALE PDMS SLAB ALIGNER**

Trieu Nguyen<sup>1,2</sup>, Tanoy Sarkar<sup>1</sup>, and Fakhru Ahsan<sup>1</sup>

<sup>1</sup>California Northstate University, USA and

<sup>2</sup>East Bay Institute for Research & Education (EBIRE), USA

### **M190.h STEREOLITHOGRAPHY 3D PRINTING FOR RAPID FABRICATION OF MICROFLUIDIC CHANNELS WITH INTEGRATED QUAKE VALVES**

Isteaque Ahmed and Aashish Priye

University of Cincinnati, USA

### **T132.h LOW TEMPERATURE BONDING WITH ROUGH BONDING SURFACE FOR GLASS MICRO/NANOFLUIDIC DEVICE**

Ryoichi Ohta<sup>1</sup>, Kyojiro Morikawa<sup>1,2</sup>, and Takehiko Kitamori<sup>1,2</sup>

<sup>1</sup>University of Tokyo, JAPAN and

<sup>2</sup>National Tsing Hua University, TAIWAN

### **T133.h LOW COST LIFT-OFF TECHNIQUE TO FABRICATE MICRO-ELECTRODE ARRAY FOR NEURON CULTURE PLATFORM**

Xiangping Li, Steffen Fricke, Jochen Meier,  
and Andreas Dietzel

Technical University Braunschweig, GERMANY

### **W168.h ULTRAFast-RESPONSE MICROPUMP ACTUATED BY A GIGAHERTZ ACOUSTIC RESONATOR**

Yangchao Zhou<sup>1,2</sup>, Moonkwang Jeong<sup>1</sup>, Wei Pang<sup>2</sup>,  
Xuexin Duan<sup>2</sup>, and Tian Qiu<sup>1</sup>

<sup>1</sup>University of Stuttgart, GERMANY and <sup>2</sup>Tianjin University, CHINA

### **W169.h 3D MULTICELLULAR CO-CULTURE ON A CHIP: NEW DESIGN TOWARDS COMMERCIALIZATION**

Trieu Nguyen<sup>1,2</sup>, Linh Ho<sup>1</sup>, and Fakhru Ahsan<sup>1</sup>

<sup>1</sup>California Northstate University, USA and <sup>2</sup>East Bay Institute for Research & Education (EBIRE), USA

### **W170.h PRESSURE-INDUCED CHANNEL DEFORMATION ON AN ULTRA-THIN GLASS MICROFLUIDICS**

Doudou Ma<sup>1,2</sup>, Koki Yamamoto<sup>1</sup>, Nobutoshi Ota<sup>1</sup>, Yuri Ito<sup>1</sup>,  
Yalikun Yaxiaer<sup>1,3</sup>, and Yo Tanaka<sup>1,2</sup>

<sup>1</sup>Institute of Physical and Chemical Research (RIKEN), JAPAN,

<sup>2</sup>Osaka University, JAPAN, and <sup>3</sup>Graduate School of Nara Institute of Science and Technology, JAPAN

## h - Late News

### Sensors and Detection Technologies

### **M191.h RAPID DETECTION OF AIRBORNE CORONAVIRUSES USING CARBON NANOTUBES-COATED PAPER WORKING ELECTRODES**

Daesoon Lee, Junbeom Jang, and Jaesung Jang

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





## Sensors and Detection Technologies

- T134.h** **ELECTROCHEMICAL CHARACTERIZATION OF POLYANILINE-BASED NANOFILMS FOR USE AS ELECTRODES FOR A MICRONEEDLE-TYPE PH SENSOR**  
Qi Kang<sup>1</sup>, Hiroaki Takehara<sup>1,2</sup>, and Takanori Ichiki<sup>1,2</sup>  
<sup>1</sup>University of Tokyo, JAPAN and <sup>2</sup>Innovation Center of NanoMedicine (iCONM), JAPAN
- W171.h** **LOW-COST AND POINT-OF-CARE ELECTROCHEMICAL MICROFLUIDIC DEVICE WITH ON-PLATFORM SAMPLE COLLECTION, PRE-TREATMENT AND ANALYSIS OF WHOLE BIOFLUIDS**  
Houda Shafique, Roozbeh Siavash Moakhar, Carolina del Real Mata, Tamer Abdel Fatah, Imman Isaac Hosseini, Sripath Guptha Yedire, Justin de Vries, Julia Strauss, and Sara Mahshid  
McGill University, CANADA
- W172.h** **CHIRAL RECOGNITION OF HOMOCHIRAL ZEOLITIC IMIDAZOLATE FRAMEWORK MEMBRANES WITH TUNABLE MICROENVIRONMENT**  
Ming-Yang Wu, Ri-Jian Mo, Zhong-Qiu Li, and Xing-Hua Xia  
Nanjing University, CHINA
- W173.h** **GOLD NANOPARTICLE-COATED MAGNETIC PARTICLES BASED ELECTROCHEMICAL BIOSENSOR FOR DETECTION OF PANCREATIC CANCER-DERIVED EXTRACELLULAR VESICLES**  
Seo-Eun Lee<sup>1,2</sup>, Se-Eun Jeong<sup>1,2</sup>, Jun Kyun Oh<sup>2</sup>, and Seong-Eun Kim<sup>1</sup>  
<sup>1</sup>Korea Electronics Technology Institute (KETI), KOREA and <sup>2</sup>Dankook University, KOREA
- W174.h** **PROTEIN-PROTEIN INTERACTION MEASUREMENT USING PARTICLE DIFFUSOMETRY IN A LOW-VOLUME MICROFLUIDIC CHIP**  
Hui Ma, Aiswarya A. Ramanujam, Jacqueline C. Linnes, and Tarama L. Kinzer-Ursem  
Purdue University, USA

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## Other Applications of Microfluidics

- W175.h** **ELECTROKINETIC ENERGY CONVERSION IN NANOFUIDIC CHANNEL: SQUARE NANOCHANNEL VS PLATE NANOCHANNEL**  
Kyojiro Morikawa<sup>1,2</sup>, Chih-Chang Chang<sup>3</sup>, and Yutaka Kazoe<sup>4</sup>  
<sup>1</sup>National Tsing Hua University, TAIWAN, <sup>2</sup>University of Tokyo, JAPAN, <sup>3</sup>National Kaohsiung Normal University, TAIWAN, and <sup>4</sup>Keio University, JAPAN



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*Mikolaj Kopernik University Torun, Poland*

•

**Prof Séverine Le Gac**

*University of Twente The Netherlands*

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**Prof Nicole Pamme**

*Stockholm University Sweden*

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**Prof Manabu Tokeshi**

*Hokkaido University, Japan*

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