MONTRÉAL CANADA

# μTAS 2024

28TH INTERNATIONAL CONFERENCE ON MINIATURIZED SYSTEMS FOR CHEMISTRY AND LIFE SCIENCES | 13-17 OCTOBER

# PROGRAM


**CONFERENCE CHAIRS**
**David Juncker**
*McGill University, CANADA*

**Aaron Wheeler**
*University of Toronto, CANADA*



SPONSORED BY
CBMS Chemical and Biological Microsystems Society

# CONFERENCE AT A GLANCE

## SUNDAY, 13 OCTOBER

| | |
|---|---|
| 09:00-17:00 | **Morning and Afternoon Workshops** |
| 17:00-19:00 | **Conference Registration and Check-In** |
| 17:00-19:00 | **Welcome Reception in Exhibit Hall** |

## MONDAY, 14 OCTOBER

| | | | |
|---|---|---|---|
| 07:00-18:05 | **Registration** | | |
| 08:00-08:30 | **Opening Remarks** | | |
| 08:30-09:15 | **Plenary Presentation I – John A. Rogers**<br>*Northwestern University, USA* | | |
| 09:15-09:30 | **Transition** | | |
| 09:30-10:30 | **Session 1A1**<br>**Liquid Biopsies and CTCs** | **Session 1B1**<br>**Micromotors and Microswimmers** | **Session 1C1**<br>**Blood Collection, Processing, and Analysis** |
| 10:30-11:00 | **Break: Exhibit and Poster Inspection** | | |
| 11:00-12:20 | **Session 1A2**<br>**Organ-on-a-Chip 1** | **Session 1B2**<br>**Liquid Control and Routing** | **Session 1C2**<br>**New Fabrication Techniques** |
| 12:20-13:50 | **Lunch** | | |
| 12:25-13:45 | **Early Career Networking Lunch** | | |
| 12:25-13:45 | **Industrial Stage 1 –** HiComp Microtech, Fluigent, Boston MicroFabrication (BMF), and X-FAB MEMS Foundry GmbH | | |
| 13:50-14:35 | **Plenary Presentation II – Bin Liu**<br>*National University of Singapore, SINGAPORE* | | |
| 14:35-16:35 | **Poster Session 1 and Exhibit Inspection** | | |
| 16:05-16:35 | **Break** | | |
| 16:35-18:05 | **Session 1A4**<br>**Organ-on-a-Chip 2**<br>**HOT TOPIC KEYNOTE**<br>Roger D. Kamm | **Session 1B4**<br>**Artificial Intelligence in Microfluidics 1**<br>**HOT TOPIC KEYNOTE**<br>Aydogan Ozcan | **Session 1C4**<br>**Digital and Ultrasensitive Assays**<br>**KEYNOTE**<br>David Duffy |
| 18:05 | **Adjourn for the Day** | | |
| 18:20-20:00 | **MicroTAS Student Mixer** | | |
| 18:20-20:00 | **Women in Microfluidics Faculty and Industry Mixer** | | |
| 18:20-20:00 | **Dinner Groups** | | |

## TUESDAY, 15 OCTOBER

| | |
|---|---|
| 08:15-08:30 | **Announcements** |
| 08:30-09:15 | **Plenary Presentation III – Ulf Landegren**<br>*Uppsala Universitet, SWEDEN* |
| 09:15-09:35 | **Lab on a Chip and ALine - Pioneers of Miniaturization Lectureship Prize and Presentation** |
| 09:35-10:05 | **Break: Exhibit and Poster Inspection** |

# CONFERENCE AT A GLANCE

| TUESDAY, 15 OCTOBER (continued) | | | |
|---|---|---|---|
| 10:05-11:55 | **Session 2A1 Organ-on-a-Chip 3**<br>HOT TOPIC KEYNOTE<br>Dongeun (Dan) Huh | **Session 2B1 Artificial Intelligence in Microfluidics 2**<br>HOT TOPIC KEYNOTE<br>Kevin Tsia | **Session 2C1 microTASs for Diagnostics**<br>KEYNOTE<br>Sara Mahshid |
| 11:55-13:10 | **Lunch** | | |
| 12:00-13:00 | **Industrial Stage 2 –** Micronit, Blue Ocean Technologies Inc., and Vital Biosciences Inc. | | |
| 13:10-14:40 | **Session 2A3 Organ-on-a-Chip 4** | **Session 2B3 Single Cell Omics** | **Session 2C3 Cell Motility and Migration** |
| 14:30-16:30 | **Poster Session 2 and Exhibit Inspection** | | |
| 16:00-16:30 | **Break** | | |
| 16:30-18:00 | **Session 2A4 Environment and Energy 1**<br>HOT TOPIC KEYNOTE<br>Chuck Henry | **Session 2B4 Wearables and Continuous Sensing 1**<br>HOT TOPIC KEYNOTE<br>Firat Güder | **Session 2C4 Blood Vessels and Flow**<br>KEYNOTE<br>Hang T. Ta |
| 18:00 | **Adjourn for the Day** | | |
| 18:15-19:00 | **Laminar (Recruitment) Mixer** | | |
| 18:20-20:00 | **Dinner Groups** | | |

| WEDNESDAY, 16 OCTOBER | | | |
|---|---|---|---|
| 08:15-08:30 | **Announcements** | | |
| 08:30-09:15 | **Plenary Presentation IV – Jennifer A Lewis**<br>*Harvard University, USA* | | |
| 09:15-09:30 | **Transition** | | |
| 09:30-10:40 | **Session 3A1 Environment and Energy 2**<br>HOT TOPIC KEYNOTE<br>David A. Weitz | **Session 3B1 Wearables and Continuous Sensing 2**<br>HOT TOPIC KEYNOTE<br>Ali Javey | **Session 3C1 Artificial Intelligence in Microfluidics 3**<br>KEYNOTE<br>Eugenia Kumacheva |
| 10:40-11:10 | **Break: Exhibit and Poster Inspection** | | |
| 11:10-12:20 | **Session 3A2 Sample & Reagent Processing and Characterization** | **Session 3B2 Mammalian Cell Culture and Analysis** | **Session 3C2 Microfluidic Horizons** |
| 12:10-13:20 | **Lunch** | | |
| 12:15-13:15 | **Industrial Stage 3 –** Nano Dimension, IMT Masken und Teilungen AG, and DBM Medix | | |
| 13:20-14:05 | **Plenary Presentation V – Hatice Altug**<br>*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND* | | |

# CONFERENCE AT A GLANCE

| WEDNESDAY, 16 OCTOBER (continued) | | | |
|---|---|---|---|
| 14:05-14:15 | MicroTAS 2025 Adelaide, AUSTRALIA Announcement | | |
| 14:15-16:15 | Poster Session 3 and Exhibit Inspection | | |
| 15:45-16:15 | Break | | |
| 16:15-18:05 | Session 3A4 Multiphase Droplets and Particles | Session 3B4 Microbial Culture and Analysis | Session 3C4 Neural Microenvironment |
| | KEYNOTE Masumi Yamada | KEYNOTE Jesse Greener | KEYNOTE Stephanie Willerth |
| 18:05 | Adjourn for the Day | | |
| 18:45 to MIDNIGHT | Conference Banquet | | |

| THURSDAY, 17 OCTOBER | | | |
|---|---|---|---|
| 08:25-08:30 | Announcements | | |
| 08:30-09:15 | Plenary Presentation VI – Yuk Ming "Dennis" Lo<br>*Chinese University of Hong Kong, HONG KONG* | | |
| 09:15-09:35 | Microsystems & Nanoengineering/Springer Nature – Test of Time Award | | |
| 09:35-09:50 | Transition | | |
| 09:50-11:20 | Session 4A1 Extracellular Vesicles | Session 4B1 Liposomes and Artificial Cells | Session 4C1 High Throughput Screening |
| | KEYNOTE Tijana Jovanovic-Talisman | KEYNOTE Hyomin Lee | KEYNOTE Lin Han |
| 11:20-11:50 | Break: Exhibit and Poster Inspection | | |
| 11:50-12:30 | **Awards Ceremony**<br>• CHEMINAS – Young Researcher Poster Awards<br>• Royal Society of Chemistry/Lab on a Chip – Widmer Poster Award<br>• Sensors (MDPI) – Outstanding Sensors and Actuators, Detection Technologies Poster Award<br>• IMT Masken und Teilungen AG – Microfluidics on Glass Poster Award<br>• Acoustofluidics Society Poster Award<br>• NIST and Lab on a Chip – Art in Science Award<br>• Biomicrofluidics (AIP) – Best Paper Awards<br>• Elsevier Sensors and Actuators B. Chemical – Best Paper Award<br>• Microsystems & Nanoengineering/Springer Nature – Best Talk Award | | |
| 12:30-12:45 | Closing Remarks | | |
| 12:45 | Conference Adjourns | | |

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## TECHNICAL PROGRAM



## Welcome to the 28th International Conference on Miniaturized Systems for Chemistry and Life Sciences

**Welcome to MicroTAS 2024**, the 28th International Conference on Miniaturized Systems for Chemistry and Life Sciences. Following the pandemic and online/hybrid meetings, and the successful return to an in-person format in Katowice, Poland in 2023, we are delighted to welcome you to Montreal, Canada on the 13th – 17th of October, 2024. The venue for this year's meeting is the venerable Palais des congrès de Montréal, one of the first convention centres in the Americas to have a completely carbon-neutral footprint. This year marks the 30-year anniversary of MicroTAS, and it is the first time MicroTAS is returning to Canada since the legendary 1998 meeting in Banff that cemented the concept of MicroTAS and bonded our community around it.

**MicroTAS is the** premiere forum for reporting research results in microfluidics, lab-on-a-chip, organ-on-a-chip, wearables, BioMEMS, microfabrication, 3D printing, nanotechnology, integration, materials and surfaces, analysis and synthesis, and detection technologies for chemistry, the life sciences, medicine, and the environment, agriculture, energy and food. MicroTAS 2024 offers an opportunity for trainees and experienced scientists, alike, to deliver oral and poster presentations selected from submitted abstracts to a global audience of experts in their field.

**The central organizing** principle of MicroTAS is an outstanding technical program selected from contributed abstracts. Abstracts were adjudicated by the Technical Program Committee (TPC) and Executive Technical Program Committee (ETPC), which consisted of 61 and 25 members (respectively), carefully balanced across the three key regions (Asia/Oceania, North and South America, and Europe and Africa). Together these volunteers evaluated 1,134 submissions in June, from which they selected 99 for oral presentations and 718 for poster presentations. In addition, 134 Late News submissions were accepted for poster presentations, for a grand total of 951 contributed presentations. These are record-breaking numbers for the conference, and we are very pleased to be featuring such outstanding work from so many of our colleagues from around the world.

**The MicroTAS 2024** Technical program includes 6 world-renowned Plenary Speakers, 18 exceptional Keynote Speakers (a record number in MicroTAS history), and the 99 outstanding oral and 852 poster presentations that were selected from contributed abstracts. These presentations were selected to highlight the exceptional diversity of the field, which covers more than 170 themes. The vibrant posters at MicroTAS, which many feel are the heart and soul of the conference, will be presented in 2-hour dedicated sessions on three consecutive days, and will remain displayed throughout the week, providing ample opportunities for repeated viewing, discussing, brainstorming, and networking. Finally, the program includes 13 workshops, which cover a wide range of emerging thematic areas related to microfluidics and provide an excellent opportunity to receive a comprehensive overview on a specific topic in an intensive, 3-hour session.

**This year, for** the first time in conference history, a group of "**Hot Topics**" viewed to be of strategic importance to the field were identified prior to receiving abstracts, including (1) Artificial Intelligence in Microfluidics, (2) Environment and Energy, (3) Organ on a Chip, and (4) Wearables and Continuous Biosensing. International leaders in the field were recruited to serve as "Hot Topic Chairs", to recruit excellent Keynote Speakers for these sessions, and to invite submissions to MicroTAS on each of the topics. The oral "**Hot Topic Sessions**" are highlighted in the program, and you will find corresponding posters throughout the exhibition floor; we encourage you to check this content out and let us know what you think of this initiative.

**We owe a** great debt of gratitude to the long list of volunteers who have selflessly dedicated their time to planning and bringing this conference to life. We start by thanking the members of the TPC and ETPC for selecting such a strong scientific program, and, in particular, the ETPC group-leaders who were

central to this process (Yi-Chin Toh, Joo Kang, Aram Chung, and Karen Cheung). We thank also the members of the Exhibition and Sponsorship committee (with co-chairs Govind Kaigala and Manabu Tokeshi), the Promotions committee (with co-chairs Lourdes Basabe, Katherine Elvira, and Chaoyong Yang), the Local Organizing committee (with co-chairs Thomas Gervais and Darius Rackus), the Poster Award committee (with chairs Edmond Young and Ya-Yu Chiang), the Workshop organizers (Nathan Swami and Sara Baratchi), and the Hot Topic Chairs (Keisuke Goda, David Issadore, Fiona Regan, David Sinton, Milica Radisic, Adrian Ranga, Martyn Boutelle, Wei Gao). There is not enough space to list all of the volunteers who have made valuable contributions – we thank each and every one of you for your contributions.

**We are also** grateful to the CBMS, who have provided such important leadership in this community for more than two decades. CBMS is involved in all aspects of conference planning and decision-making, and in particular, we thank the CBMS Executive (President Séverine Le Gac, Vice President Yoon-Kyoung Cho, and Treasurer Chuck Henry), the CBMS E/TPC liaison Joel Voldman, and the CBMS Awards liaison Elżbieta Jastrzębska, for their support.

**We also gratefully** acknowledge our Platinum (Fluigent, McGill University, and University of Toronto), Silver (ACX Instruments, Nikon, Teledyne, and Upnano), and Bronze (DBM Medix, Microfluidic ChipShop, and Roche) benefactors, as well as all other new and returning exhibitors and sponsors. Overall, MicroTAS 2024 features a record-breaking number of exhibitors and sponsors, which has given us the flexibility to plan a memorable event.

**In addition, we** thank the sponsors of the long list of prizes that are awarded at MicroTAS, including the 'Pioneers of Miniaturization Lectureship' (Lab on a Chip, Aline Inc., and CBMS), the 'Springer-Nature Test of Time Award' (Microsystems & Nanoengineering and Springer-Nature), the 'Art in Science Award' (Lab on a Chip and NIST), the 'Biomicrofluidics Best Paper Award' (AIP Publishing), the 'Elsevier-Sensors and Actuators B. Chemical-MicroTAS Best Paper Award' (Elsevier), the 'Springer-Nature Best Oral Award' (Microsystems & Nanoengineering and Springer-Nature), the 'Widmer Poster Award' (Lab on a Chip), the 'Young Researcher Poster Award' (CHEMINAS), the 'Microfluidics on Glass Poster Award' (IMT Masken und Teilungen AG), the 'CBMS Student/Young Researcher Award' (CBMS), the 'LMIC Travel Awards' (Victor Phillip Dahdaleh Institute of Genomic Medicine and CBMS and others), and the 'Acoustofluidics Award' (Acoustofluidics Society).

**Finally, we would** be remiss to not thank Sara Stearns and Shirley Galloway of Preferred Meeting Management Inc. (PMMI), who guided us through the many years of planning that led to this event, answering our questions, providing advice, and patiently explaining the best practices along the way. This meeting depends on PMMI's expertise, their institutional memory of CBMS/MicroTAS history, and their tireless work planning, implementing, and putting out fires. **Thank you**.

**Most importantly, we** thank all of you for joining us in Montreal for MicroTAS 2024 and for contributing to the success of the conference. **Welcome to Canada, welcome to Montreal!**

**David Juncker**
*McGill University, CANADA*

**Aaron Wheeler**
*University of Toronto, CANADA*

## MONDAY, 14 OCTOBER — 08:30 – 09:15

### Plenary Presentation I

**John A. Rogers** – *Northwestern University, USA*

**MICROFLUIDIC TOTAL ANALYSIS SYSTEMS FOR THE SKIN**

## MONDAY, 14 OCTOBER — 13:50 – 14:35

### Plenary Presentation II

**Bin Liu** – *National University of Singapore, SINGAPORE*

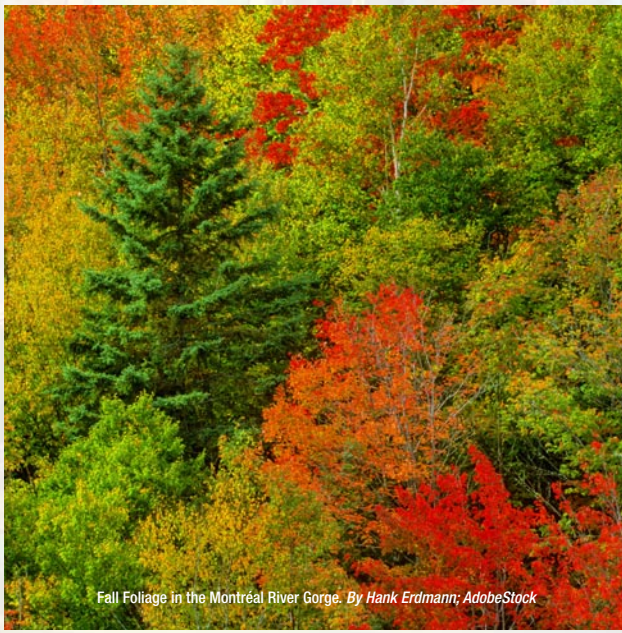
**ORGANIC NANOPARTICLES FOR BIOMEDICAL APPLICATIONS**

## TUESDAY, 15 OCTOBER — 08:30 – 09:15

### Plenary Presentation III

**Ulf Landegren** – *Uppsala Universitet, SWEDEN*

**TOOLS TO ANALYZE VERY FEW, AND VERY MANY MOLECULES**



Fall Foliage in the Montréal River Gorge. *By Hank Erdmann; AdobeStock*

## WEDNESDAY, 16 OCTOBER — 08:30 – 09:15

### Plenary Presentation IV

**Jennifer A. Lewis** – *Harvard University, USA*

**BUILDING VASCULARIZED KIDNEY TISSUES FOR DRUG TESTING, DISEASE MODELING, AND THERAPEUTIC USE**

## WEDNESDAY, 16 OCTOBER — 13:20 – 14:05

### Plenary Presentation V

**Hatice Altug** – *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

**NANOPHOTONIC LAB-ON-A-CHIP SYSTEMS FOR BIOMEDICAL APPLICATIONS**

## THURSDAY, 17 OCTOBER — 08:30 – 09:15

### Plenary Presentation VI

**Yuk Ming "Dennis" Lo** – *Chinese University of Hong Kong, HONG KONG*

**NONINVASIVE PRENATAL AND CANCER DETECTION BY PLASMA DNA ANALYSIS: FROM DREAM TO REALITY**

Montréal Botanic Garden. *By TomR; AdobeStock*

# KEYNOTE SPEAKERS

## MONDAY, 14 OCTOBER — 16:35 – 17:05

**Session 1A4 – Organ-on-a-Chip 2**

**Hot Topic Keynote**

**MODELING NEUROLOGICAL DISEASE: UNDERSTANDING THE TRANSPORT MECHANISMS AND PATHWAYS FOR THE CLEARANCE OF AMYLOID BETA FROM THE BRAIN**

Roger D. Kamm

*Massachusetts Institute of Technology, USA*

**Session 1B4 – Artificial Intelligence in Microfluidics 1**

**Hot Topic Keynote**

**VIRTUAL STAINING OF LABEL-FREE TISSUE USING DEEP LEARNING**

Aydogan Ozcan

*University of California, Los Angeles, USA*

**Session 1C4 – Digital and Ultrasensitive Assays**

**DIGITAL PROTEIN DETECTION: HISTORY, IMPACT, AND FUTURE**

David Duffy

*Quanterix Corporation, USA*

## TUESDAY, 15 OCTOBER — 10:05 – 10:35

**Session 2A1 – Organ-on-a-Chip 3**

**Hot Topic Keynote**

**MICROENGINEERED BIOMIMICRY OF HUMAN PHYSIOLOGICAL SYSTEMS**

Dongeun (Dan) Huh

*University of Pennsylvania, USA*

**Session 2B1 – Artificial Intelligence in Microfluidics 2**

**Hot Topic Keynote**

**TOWARD PETABYTE-SCALE OPTOFLUIDIC IMAGING CYTOMETRY**

Kevin Tsia

*University of Hong Kong, HONG KONG*

**Session 2C1 – microTASs for Diagnostics**

**FUNCTIONAL NANOSURFACED MICROFLUIDICS FOR DIAGNOSTICS**

Sara Mahshid

*McGill University, CANADA*

# KEYNOTE SPEAKERS

## TUESDAY, 15 OCTOBER — 16:30 – 17:00

**Session 2A4 – Environment and Energy 1**

**Hot Topic Keynote**

**CAN MICROFLUIDICS ADDRESS KEY ISSUES IN THE ENVIRONMENT, ENERGY, AND AGRICULTURE?**

Chuck Henry

*Colorado State University, USA*

**Session 2B4 – Wearables and Continuous Sensing 1**

**Hot Topic Keynote**

**WEARABLE RECONFIGURABLE METAMATERIALS AND ORIGAMIINSPIRED IMPLANTABLE SENSORS FOR HUMAN-MACHINE INTERFACES**

Firat Güder

*Imperial College London, UK*

**Session 2C4 – Blood Vessels and Flow**

**NOVEL MICROFLUIDIC MODELS OF ATHEROSCLEROSIS AND ATHEROTHROMBOSIS**

Hang T. Ta

*Griffith University, AUSTRALIA and University of Queensland, AUSTRALIA*

## WEDNESDAY, 16 OCTOBER — 09:30 – 10:00

**Session 3A1 – Environment and Energy 2**

**Hot Topic Keynote**

**MICROFLUIDICS AS A MODEL FOR ENERGY APPLICATIONS**

David A. Weitz

*Harvard University, USA*

**Session 3B1 – Wearables and Continuous Sensing 2**

**Hot Topic Keynote**

**WEARABLE SWEAT SENSORS - TOWARDS BIG DATA FOR HUMAN HEALTH**

Ali Javey

*University of California, Berkeley, USA*

**Session 3C1 – Artificial Intelligence in Microfluidics 3**

**AUTONOMOUS FLUIDIC LAB FOR NANOPARTICLE SYNTHESIS**

Eugenia Kumacheva

*University of Toronto, CANADA*

# KEYNOTE SPEAKERS

## WEDNESDAY, 16 OCTOBER — 16:15 – 16:45

**Session 3A4 – Multiphase Droplets and Particles**

**FUNCTIONALIZATION OF MICROFLUIDICS VIA BOTTOM-UP INTEGRATION FOR UPGRADING DROPLET FORMATION AND BIOLOGICAL APPLICATIONS**
Masumi Yamada
*Chiba University, JAPAN*

**Session 3B4 – Microbial Culture and Analysis**

**PROGRAMMING BACTERIAL BIOFILMS USING MICROFLUIDICS: FROM MODEL HYDRODYNAMIC GROWTH ENVIRONMENTS TO NEW SUSTAINABLE BIO-ENERGY APPLICATIONS**
Jesse Greener
*Universtié Laval, CANADA*

**Session 3C4 – Neural Microenvironment**

**3D BIOPRINTING COMPLEX TISSUES**
Stephanie Willerth
*University of Victoria, CANADA*

## THURSDAY, 17 OCTOBER — 09:50 – 10:20

**Session 4A1 – Extracellular Vesicles**

**SEVEN O'CLOCK: TIME FOR A NEW METHOD TO CHARACTERIZE INDIVIDUAL EXTRACELLULAR VESICLES AND NON-VESICULAR NANOPARTICLES**
Tijana Jovanovic-Talisman
*City of Hope, USA*

**Session 4B1 – Liposomes and Artificial Cells**

**MICROFLUIDIC SYNTHESIS OF POLYMERSOMES FOR PROGRAMMING ENZYMATIC REACTION NETWORK**
Hyomin Lee
*Pohang University of Science and Technology (POSTECH), KOREA*

**Session 4C1 – High Throughput Screening**

**HIGH-THROUGHPUT SCREENING OF BIOMOLECULES AND SINGLE CELLS BY NOVEL BIOCHIPS**
Lin Han
*Shandong University, CHINA*

## Parallel Oral Sessions

Each day papers will be presented in three parallel sessions. There will be a total of 99 oral presentations throughout the Conference.

## Guide to Understanding Session Numbering

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

Session Number: **1A1**
The first character (i.e., **1**) indicates the day of the Conference:

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

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

- **A** = Room 210A, Level 2
- **B** = Room 511, Level 5
- **C** = Room 510, Level 5

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

- **1** = morning
- **2** = late-morning
- **3** = afternoon
- **4** = late afternoon

## Posters

Three poster sessions will be held in Room 210D, Level 2 on Monday, Tuesday, and Wednesday. All posters are listed with their assigned number and day that they are on display. Authors will be available for questions during their appointed time. Posters are color coded by day and classification to coordinate with the poster floor plan on the last page of this program. See page 49 for classification chart.

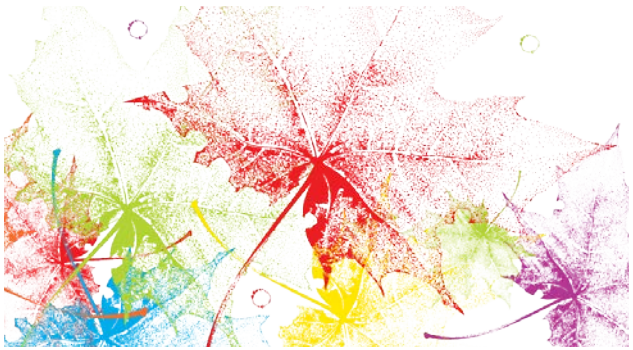
## Guide to Understanding Poster Numbering

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

Poster Number: **M001.a**
The first character (i.e., **M**) indicates the day that the poster will be on display.

**M** = Monday **T** = Tuesday **W** = Wednesday

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



# SUNDAY, 13 OCTOBER

**08:15 - 09:15** **Morning Workshop Registration**

**09:00 - 12:00** **Morning Workshops** (Break at 10:30)

## WORKSHOP 1

**3D PRINTING FOR MICROFLUIDICS**

Rosanne Guijt[1], Craig Priest[2], and Bin Guan[2]

[1]*Deakin University, AUSTRALIA and* [2]*University of South Australia, AUSTRALIA*

## WORKSHOP 2

**FRUGAL DIAGNOSTICS: SCIENCE EQUITY FOR GLOBAL HEALTH**

Maïwenn Kersaudy-Kerhoas[1], Ayokunle Olanrewaju[2], Jacqueline Linnes[3], and Brian Matovu[4]

[1]*Heriot-Watt University, UK,* [2]*University of Washington, Seattle, USA,* [3]*Purdue University, USA, and* [4]*Makerere University, UGANDA*

## WORKSHOP 3

**ADVANCING MICROELECTRONICS AND FUTURE BIOSENSOR FABRICATION TECHNOLOGIES**

Irina Stateikina, Julien Lemay-Gagne, and Christopher Sansregret

*C2MI, CANADA*

## WORKSHOP 4

**MICROFABRICATION-ASSISTED ADVANCEMENTS IN NEUROSCIENCE: NEXT GENERATION ADVANCES IN BIOSENSING, NEURAL TISSUE REPAIR, AND SCREENING TECHNOLOGY**

Ashley Ross[1], Alyson Fournier[2], and Adriana San Miguel[3]

[1]*University Cincinnati, USA,* [2]*McGill University, CANADA, and* [3]*North Carolina State University, USA*

## WORKSHOP 5

**STANDARDIZED APPROACHES TO FACILITATE THE DEVELOPMENT AND PRODUCTION OF MICROFLUIDIC PRODUCTS**

John Crabtree[1], Darwin Reyes-Hernandez[2], Joseph Farah[3], Marko Blom[4], Wilfred Buesink[5], Claudia Gärtner[6], and Elfi Töpfer[7]

[1]*HJC Consulting, Inc, CANADA,* [2]*National Institute of Standards and Technology (NIST), USA,* [3]*Fluigent, FRANCE,* [4]*Micronit, NETHERLANDS,* [5]*Micronit, NETHERLANDS,* [6]*microfluidic ChipShop, GERMANY, and* [7]*microfluidic ChipShop, GERMANY*

## WORKSHOP 6

**ON CHIP SENSING AND FLUIDIC INTEGRATION FOR ORGAN-ON-CHIP SYSTEMS**

Nien-Tsu "Joe" Huang[1], Ryuji Yokokawa[2], Yu-Hsiang Hsu[1], and Yi-Chin Toh[3]

[1]*National Taiwan University, TAIWAN,* [2]*Kyoto University, JAPAN, and* [3]*Queensland University of Technology, AUSTRALIA*

| | |
|---|---|
| **13:45 - 14:15** | **Afternoon Workshop Registration** |
| **14:00 - 17:00** | **Afternoon Workshops** (Break at 15:30) |

## WORKSHOP 7

**GLOBAL HEALTH DIAGNOSTICS – AN END USERS PERSPECTIVE**

Cédric Yansouni[1,2], Jesse Papenburg[2], and Momar Ndao[1]

[1]*McGill University, CANADA,* [2]*McGill University Health Centre, CANADA*

## WORKSHOP 8

**TUMOR MICROENVIRONMENTS ON CHIPS: FROM IN VITRO 3D CULTURES TO EX VIVO PATIENT EXPLANTS**

Edmond W. K. Young[1], John Stagg[2], and Amelie St-Georges-Robillard[3,4,5]

[1]*University of Toronto, CANADA,* [2]*University of Montreal, CANADA,* [3]*muFO Lab, CANADA,* [4]*Polytechnique Montreal, CANADA, and* [5]*University of Montreal Hospital Research Centre (CRCHUM), CANADA*

## WORKSHOP 9

**AI-ENHANCED SINGLE-CELL DATA ANALYTICS FOR LABEL-FREE CYTOMETRY**

Federica Caselli[1], David Dannhauser[2], and Yaxiaer Yalikun[3]

[1]*University of Rome Tor Vergata, ITALY,* [2]*University of Naples, ITALY, and* [3]*Nara Institute of Science and Technology, Japan*

## WORKSHOP 10

**REVOLUTIONIZING MICROFLUIDICS: THE POWER OF SMART MATERIALS AND ADAPTIVE SURFACES**

Lourdes Basabe-Desmonts and Fernando Benito-Lopez

University of the Basque Country, SPAIN

## WORKSHOP 11

**HANDS-ON 3D PRINTING FOR MICROFLUIDICS**

David Juncker, Houda Shafique, Molly L. Shen, Geunyong Kim, Justin de Vries, and Yonatan Morocz

McGill University, CANADA

## WORKSHOP 12

**EXOSOME DIAGNOSTICS AND THERAPEUTICS**

Yong Zeng and Mei He

*University of Florida, USA*

## WORKSHOP 13

**EVALUATION OF FOOD SAFETY AND QUALITY USING MICROFLUIDIC LAB-ON-A-CHIP**

Xiaonan Lu[1], Yaxi Hu[2], and Yang Lin[3]

[1]McGill University, CANADA, [2]Carleton University, CANADA, and [3]University Rhode Island, USA

| | |
|---|---|
| **17:00 - 19:00** | **Conference Registration and Check-In** |
| **17:00 - 19:00** | **Welcome Reception in Exhibit Hall** |

# The Most Advanced Fluid Handling Systems

**FROM LABS TO INDUSTRIAL APPLICATIONS**

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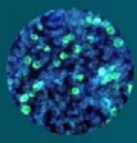
SMART MICROFLUIDICS

SUNDAY

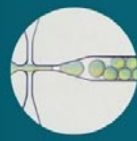
## For any scientist needs



Cell culture & Organ-on-chip

Fluid Delivery

Microscopy & Cell Biology



Droplet / Particle Generation

## 15 years of proprietary technologies

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# MONDAY AT A GLANCE



| | | | |
|---|---|---|---|
| 07:00-18:05 | Registration | | |
| 08:00-08:30 | Opening Remarks | | |
| 08:30-09:15 | Plenary Presentation I – John A. Rogers<br>*Northwestern University, USA* | | |
| 09:15-09:30 | Transition | | |
| 09:30-10:30 | Session 1A1<br>Liquid Biopsies and CTCs | Session 1B1<br>Micromotors and Microswimmers | Session 1C1<br>Blood Collection, Processing, and Analysis |
| 10:30-11:00 | Break: Exhibit and Poster Inspection | | |
| 11:00-12:20 | Session 1A2<br>Organ-on-a-Chip 1 | Session 1B2<br>Liquid Control and Routing | Session 1C2<br>New Fabrication Techniques |
| 12:20-13:50 | Lunch | | |
| 12:25-13:45 | Early Career Networking Lunch | | |
| 12:25-13:45 | **Industrial Stage 1 –** HiComp Microtech, Fluigent, Boston MicroFabrication (BMF), and X-FAB MEMS Foundry GmbH | | |
| 13:50-14:35 | Plenary Presentation II – Bin Liu<br>*National University of Singapore, SINGAPORE* | | |
| 14:35-16:35 | Poster Session 1 and Exhibit Inspection | | |
| 16:05-16:35 | Break | | |
| 16:35-18:05 | Session 1A4<br>Organ-on-a-Chip 2 | Session 1B4<br>Artificial Intelligence in Microfluidics 1 | Session 1C4<br>Digital and Ultrasensitive Assays |
| | HOT TOPIC KEYNOTE<br>Roger D. Kamm | HOT TOPIC KEYNOTE<br>Aydogan Ozcan | KEYNOTE<br>David Duffy |
| 18:05 | Adjourn for the Day | | |
| 18:20-20:00 | MicroTAS Student Mixer | | |
| 18:20-20:00 | Women in Microfluidics Faculty and Industry Mixer | | |
| 18:20-20:00 | Dinner Groups | | |

# MONDAY, 14 OCTOBER

**07:00 - 18:05** **Registration**

## Opening Remarks

**Room 210A, Level 2**

**08:00** **Welcome to Canada – Mitch Davies, President**
*National Research Council of Canada*

**CBMS President – Séverine Le Gac**
*University of Twente, NETHERLANDS*

**MicroTAS 2024 Conference Chairs**
**David Juncker**, *McGill University, CANADA*
**Aaron Wheeler**, *University of Toronto, CANADA*

## Plenary Presentation I

**Chair:** Aaron Wheeler, *University of Toronto, CANADA*

**Room 210A, Level 2**

**08:30** **MICROFLUIDIC TOTAL ANALYSIS SYSTEMS FOR THE SKIN**
John A. Rogers
*Northwestern University, USA*

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

## Session 1A1 - Liquid Biopsies and CTCs

**Chair:** Chaoyong Yang, *Xiamen University, CHINA*

**Room 210A, Level 2**

**09:30** **COMPREHENSIVE TUMOR CELL-BASED LIQUID BIOPSY USING HIGH-THROUGHPUT MICROFLUIDIC ENRICHMENT OF LEUKAPHERESIS PRODUCTS**
Avanish Mishra[1], Shih-Bo Huang[1], Jon F. Edd[1], Ben S. Wittner[1], Shyamala Maheswaran[1], David T. Miyamoto[1], Daniel A. Haber[1,2], Mehmet Toner[1,3]
[1]*Harvard Medical School, USA,* [2]*Howard Hughes Medical Institute, USA, and* [3]*Shriners Children's Boston, USA*

**09:50** **BRAIN-DERIVED EXTRACELLULAR VESICLE MICRORNAS AND PLASMA PROTEINS AS BLOOD-BASED BIOMARKERS FOR THE DIFFERENTIAL DIAGNOSIS OF NEURODEGENERATIVE DEMENTIA**
Stephanie Yang[1], Andrew Lin[1], Hanfei Shen[1], Jean Rosario[1], Leah K. Forsberg[2], Bradley F. Boeve[2], Owen A. Ross[2], Pamela J. McLean[2], David Issadore[1]
[1]*University of Pennsylvania, USA and* [2]*Mayo Clinic, USA*

**10:10** **BIOMECHANICS OF CIRCULATING CANCER CELLS: FOCUS ON THE ROLE OF VIMENTIN**
Emile Gasser[1,2], Arthur Salles[2,3], Kyohei Terao[4], Emilie Su[2], Nassiba Abbade[1,2], Kotryna Vaidžiulytė[1], Jean-Baptiste Manneville[2], Matthieu Piel[1], Jean-Yves Pierga[1,2], Catherine Villard[2]
[1]*Institut Curie, FRANCE,* [2]*CNRS/Université Paris Cité, FRANCE,* [3]*Fluigent SA, FRANCE, and* [4]*Kagawa University, JAPAN*

## Session 1B1 - Micromotors and Microswimmers

**Chair:** Gwo-Bin Lee, *National Tsing Hua University, TAIWAN*

**Room 511, Level 5**

**09:30** **THIN-STRUCTURE LIGHT-TRIGGERED SILICA-PARTICLE DRIVING SYSTEM FOR THE ELIMINATION OF THERMAL CONVECTION AIMED FOR LONG-TIME TRANSPORTATION**
Natsumi Watanabe, Hiroaki Onoe
*Keio University, JAPAN*

**09:50** **NANO-KIRIGAMI MICROROTORS CONTROLLED BY OPTOELECTRONIC TWEEZERS**
Bingrui Xu, Xiaorong Hong, Jiafang Li, Rongxin Fu, Hang Li, Shuailong Zhang
*Beijing Institute of Technology, CHINA*

**10:10** **DNA DROPLETS WITH CELL-RECOGNITION FUNCTIONS TOWARD IMMUNE CELL-LIKE MOLECULAR ROBOTS**
Ryoya Hasegawa[1], Jing Gong[1], Kei Goraku[1], Shin-Ichiro M. Nomura[2], Masahiro Takinoue[1]
[1]*Institute of Science Tokyo, JAPAN and* [2]*Tohoku University, JAPAN*

## Session 1C1 - Blood Collection, Processing, and Analysis

**Chair:** Shoji Takeuchi, *University of Tokyo, JAPAN*

**Room 510, Level 5**

**09:30** **MICROFLUIDIC PASSIVE DEVICE FOR PLASMA ENRICHED IN PLATELETS SEPARATION FROM WHOLE BLOOD MADE OF ACRYLIC AND TAPE**
Pablo E. Guevara-Pantoja[1], Yara Alvarez-Braña[1], Jon Mercader-Ruiz[1,2], Fernando Benito-Lopez[1], Lourdes Basabe-Desmonts[1,3]
[1]*University of the Basque Country, SPAIN,* [2]*Hospital Vithas, SPAIN, and* [3]*Basque Foundation of Science, SPAIN*

**09:50** **HEMORHEOLOGY USING TWO FOCI FLUORESCENCE CORRELATION SPECTROSCOPY**
Andy V. Le[1,2], Maya Salame[2], Muriel Giansily Blaizot[3], Viviana Clavería[1], Emmanuel Margeat[1], Marianne Fenech[2], Manouk Abkarian[1]
[1]*Centre de Biologie Structurale, FRANCE,* [2]*University of Ottawa, CANADA, and* [3]*CHU Saint Eloi, FRANCE*

**10:10** **INTEGRATED PLASMAPHERESIS SYSTEM FOR BLOOD SAMPLING IN NEONATAL CARE**
Amal Nath[1], Wei Qiu[1], Thierry Baasch[1], Andreas Lenshof[1], Marie Larsson[2,3], Linda Nilsson[3], Magnus Gram[3], David Ley[3], Thomas Laurell[1]
[1]*Lund University, SWEDEN,* [2]*Hospitals of Halland, SWEDEN, and* [3]*Skåne University Hospital, SWEDEN*

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

## Session 1A2 - Organ-on-a-Chip 1

**Chair:** Rebecca Pompano, *University of Virginia, USA*

**Room 210A, Level 2**

**11:00** **TUMOR SHAPE MATTERS: A MICROFLUIDIC PLATFORM FOR GROWTH AND RELEASE OF PATIENT-DERIVED CANCER ORGANOID**
Sina Kheiri[1,2], Ilya Yakavets[1], Jennifer Cruickshank[1,3], Fatemeh Ahmadi[1], David W. Cescon[1,3], Edmond W.K. Young[1], Eugenia Kumacheva[1]
[1]*Massachusetts Institute of Technology, USA,* [2]*University of Toronto, CANADA, and* [3]*University Health Network, CANADA*

**11:20** **A BIOENGINEERED MODEL OF HUMAN PLACENTAL EXPOSURE TO HEAVY METALS DURING PREGNANCY**
Pouria Fattahi[1], Mousa Younesi[1], Won Dong Lee[2], Joshua D. Rabinowitz[2], Lauren M. Aleksunes[3], Dan D. Huh[1]
[1]*University of Pennsylvania, USA,* [2]*Princeton University, USA, and* [3]*Rutgers University, USA*

**11:40** **FLOW IN A VASCULARIZED HEART-ON-A-CHIP MODEL**
Adriana Blazeski[1,2], Jules Allbritton-King[1], Marie A. Floryan[2], Roger D. Kamm[2], Guillermo García-Cardeña[1]
[1]*Brigham and Women's Hospital / Harvard Medical School, USA and* [2]*Massachusetts Institute of Technology, USA*

**12:00** **STEM CELL-DERIVED VESSELS-ON-CHIP FOR CARDIOVASCULAR DISEASE MODELING**
Caroline Remmert[1], Maren Marder[1], Julius A. Perschel[1], Munkhtur Otgonbayar[1], Christine von Toerne[1], Stefanie Hauck[1], Judith Bushe[1], Annette Feuchtinger[1], Bilal Sheikh[1,2], Michel Moussus[1], Matthias Meier[1,2]
[1]*Helmholtz Center Munich, GERMANY and* [2]*University of Leipzig, GERMANY*

## Session 1B2 - Liquid Control and Routing

**Chair:** Govind Kaigala, *University of British Columbia, CANADA*

**Room 511, Level 5**

**11:00** **A COMPACT HYDRAULIC HEAD AUTO-REGULATING MODULE (CHARM) FOR LONG-TERM CONSTANT GRAVITY-DRIVEN FLOW MICROFLUIDICS**
Fan Xue, Ulri N. Lee, Joel Voldman
*Massachusetts Institute of Technology, USA*

**11:20** **A MICROFLUIDIC TRANSISTOR FOR AUTOMATIC CONTROL OF LIQUIDS**
Kaustav A. Gopinathan, Avanish Mishra, Baris R. Mutlu, Jon F. Edd, Mehmet Toner
*Massachusetts General Hospital, USA*

## Session 1B2 - Liquid Control and Routing (continued)

**11:40** **INERTIAL BALLISTIC MICROFLUIDICS AS A PLATFORM FOR BIOMEDICAL AND CHEMICAL ENGINEERING APPLICATIONS**
David Fernandez Rivas[1,2], Ulisses J. Gutierrez Hernandez[1], Jelle J. Schoppink[1], Diana van der Ven[1], Keerthana Mohan[1], Ruchi Bansal[1], Carlos Cuartas Velez[1], Nienke Bosschaart[1], Akash Raman[1], Arturo Susarrey Arce[1], Ian Hunter[2], Gareth H. McKinley[2], Andrew Keith Dickerson[1], Christophe Moser[1], Miguel Ángel Quetzeri[1]
[1]*University of Twente, NETHERLANDS,* [2]*Massachusetts Institute of Technology, USA,* [3]*University of Tennessee, USA,* [4]*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND, and* [5]*Universidad Nacional Autónoma de México, MEXICO*

**12:00** **HIGHLY EFFICIENT ONE-TO-ONE CO-ENCAPSULATION OF TWO DISTINCT PARTICLE TYPES INTO DROPLETS THROUGH AN ON-CHIP "VIRTUAL PARTICLE VALVE"**
Yuma Kadomura, Naotomo Tottori, Shinya Sakuma, Yoko Yamanishi
*Kyushu University, JAPAN*

## Session 1C2 - New Fabrication Techniques

**Chair:** Lourdes Basabe, *University of the Basque Country, SPAIN*

**Room 510, Level 5**

**11:00** **MICRO-PATTERNING WETTABILITY IN PARALLELIZED SI/GLASS MICROFLUIDIC CHIP FOR DOUBLE EMULSION GENERATION**
Yoon-Ho Hwang, Jingyu Wu, Sagar Yadavali, Daeyeon Lee, David Issadore
*University of Pennsylvania, USA*

**11:20** **FABRICATION AND THERMAL MODELING OF ELECTROTHERMAL ORIGAMI MEMS FOR DRY AND AQUEOUS ENVIRONMENTS**
Anan Ghrayeb, Kenn Oldham, Evgueni T. Filipov
*University of Michigan, USA*

**11:40** **LASER-INDUCED GRAPHENE BASED DIGITAL MICROFLUIDICS (GDMF): A SUB-ONE-DOLLAR PLATFORM FOR POCT APPLICATIONS**
Ke Liu, Yu He, Zefan Lu, Qiudi Xu, Lan Wang, Zhongxuan Liu, Jeremy Khou, Ying Mu, Wei Jin, Tao Zhang
*Zhejiang University, CHINA*

**12:00** **VERTICAL DEEP ETCHING TECHNIQUE FOR SILICA GLASS USING A CATALYST AND FABRICATION OF MICROWELL CHIPS FOR DIGITAL BIOSENSING**
Yoshitaka Ono, Ko-hei Sano, Yasuo Hayashi
*AGC Inc., JAPAN*

**12:20 - 13:50** **Lunch**

**12:25 - 13:45** **Early Career Networking Lunch**

MONDAY

## Industrial Stage 1

**Chair:** Christopher Easley, *Auburn University, USA*

**Room 220, Level 2 (Lunch Room)**

**12:25** **1a – LAB TO FAB: STREAMLINING MICROFLUIDIC TRANSITIONS FROM PDMS PROTOTYPES TO COMMERCIAL PRODUCTS**
Jing Chen
*HiComp Microtech, USA*

**12:45** **1b – MASTERING AND AUTOMATING FLOW CONTROL FOR CELL CULTURE**
Joseph Farah
*Fluigent, FRANCE*

**13:05** **1c – MICRO 3D PRINTING APPLICATIONS IN MICROFLUIDICS**
Dan Tucker
*Boston MicroFabrication (BMF), USA*

**13:25** **1d – BIOSENSORS FOR LAB-ON-CHIP APPLICATIONS**
Christine Dufour
*X-FAB MEMS Foundry GmbH, GERMANY*

## Plenary Presentation II

**Chair:** Petra Dittrich, *ETH Zürich, Basel, SWITZERLAND*

**Room 210A, Level 2**

**13:50** **ORGANIC NANOPARTICLES FOR BIOMEDICAL APPLICATIONS**
Bin Liu
*National University of Singapore, SINGAPORE*

**14:35 - 16:35** **Poster Session 1 and Exhibit Inspection**
Presentations are listed by topic category with their assigned number starting on page 49.

**16:05 - 16:35** **Break**

## Session 1A4 - Organ-on-a-Chip 2

**Chair:** Milica Radisic, *University of Toronto, CANADA*

**Room 210A, Level 2**

**16:35** HOT TOPIC KEYNOTE
**MODELING NEUROLOGICAL DISEASE: UNDERSTANDING THE TRANSPORT MECHANISMS AND PATHWAYS FOR THE CLEARANCE OF AMYLOID BETA FROM THE BRAIN**
Roger D. Kamm
*Massachusetts Institute of Technology, USA*

**17:05** **ELUCIDATING THE INFLUENCE OF FIBROBLAST-MACROPHAGE INTERACTIONS ON TRANSCRIPTOMIC ALTERATIONS OF TRIPLE-NEGATIVE BREAST CANCER CELLS USING A TUMOR-ON-A-CHIP MODEL INTEGRATED WITH SINGLE-CELL RESOLUTION STUDIES**
Kalpana Ravi[1], Yining Zhang[1], Lydia Sakala[1], Twinkle Jina M. Manoharan[1], Barbara Pockaj[2], Joshua LaBaer[1], Jin Park[1], Mehdi Nikkhah[1]
[1]*Arizona State University, USA and* [2]*Mayo Clinic, USA*

**17:25** **HUMAN GUT-BLOOD-BRAIN AXIS MICROPHYSIOLOGICAL SYSTEM FOR STUDIES OF GUT-NEUROPATHOGENESIS**
Minh Tran[1], Chaeyeon Been[1], Van Thi Ai Tran[1], Luke P. Lee[2], Hansang Cho[1]
[1]*Sungkyunkwan University, KOREA and* [2]*Harvard University, USA*

**17:45** **A HUMAN NEURAL TUBE-ON-A-CHIP SYSTEM FOR UNDERSTANDING HUMAN NEURAL DEVELOPMENT AND DISEASES**
Xufeng Xue[1,2], Yung Su Kim[2], Yiwen Zhai[2], Donna M. Martin[2], Orly Reiner[3], Jianping Fu[2]
[1]*Cincinnati Children's Hospital Medical Center, USA,* [2]*University of Michigan, USA, and* [3]*Weizmann Institute of Science, ISRAEL*

## Session 1B4 - Artificial Intelligence in Microfluidics 1

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

**Room 511, Level 5**

**16:35** HOT TOPIC KEYNOTE
**VIRTUAL STAINING OF LABEL-FREE TISSUE USING DEEP LEARNING**
Aydogan Ozcan
*University of California, Los Angeles, USA*

**17:05** **MICROFLUIDIC PLATFORM FOR COMPREHENSIVE COMBINATION SCREENING OF TRANSCRIPTOMIC RESPONSES IN INDIVIDUAL CELLS**
Jonathan Matthews, Baylee Heiden, Suhail Peer, Bijentimala Keisham, Savas Tay
*University of Chicago, USA*

## Session 1B4 - Artificial Intelligence in Microfluidics 1 (continued)

**17:25** **FAST, PRECISE, AND EASY-TO-USE METHOD FOR DETECTING CELLS ON CHIP USING FASTER R-CNN**
Guillaume Aubry[1], Yanjun Zhao[2], Erin Shappell[1], Jacob Wheelock[1], Hang Lu[1]
[1]*Georgia Institute of Technology, USA and* [2]*Troy University, USA*

**17:45** **SHAPE CLASSIFICATION-BASED FLUORESCENCE ANALYSIS IN HYDROGELS ENCAPSULATING ODORANT SENSOR CELLS**
Sho Takamori[1], Taisei Kawakami[1,2], Hisatoshi Mimura[1], Toshihisa Osaki[1], Norihisa Miki[1,2], Shoji Takeuchi[1,3]
[1]*Kanagawa Institute of Industrial Science and Technology, JAPAN,* [2]*Keio University, JAPAN, and* [3]*University of Tokyo, JAPAN*

## Session 1C4 - Digital and Ultrasensitive Assays

**Chair:** Kazuma Mawatari, *Waseda University, JAPAN*

**Room 510, Level 5**

**16:35** **KEYNOTE**
**DIGITAL PROTEIN DETECTION: HISTORY, IMPACT, AND FUTURE**
David Duffy
*Quanterix Corporation, USA*

**17:05** **ULTRASENSITIVE AND ULTRAFAST PROTEIN CAPTURE IN BROWNIAN AFFINITY TRAP ARRAYS —10- 19 M LIMIT OF DETECTION WITH 30 S INCUBATION**
Geunyong Kim, Molly L. Shen, Felix Lussier, Andy Ng, David Juncker
*McGill University, CANADA*

**17:25** **STRATOLAMP: LABEL-FREE, MULTIPLEX DIGITAL LOOP-MEDIATED ISOTHERMAL AMPLIFICATION BASED ON VISUAL STRATIFICATION OF PRECIPITATE**
Zida Li, Meichi Jin, Jingyi Ding
*Shenzhen University, CHINA*

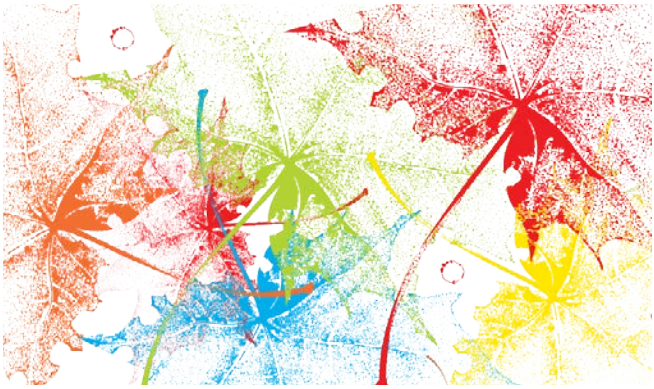
**17:45** **EXCESS PROBE-BASED NANOPORE DEVICE FOR AMPLIFICATION-FREE NUCLEIC ACID DETECTION**
Nanami Takeuchi, Ryuji Kawano
*Tokyo University of Agriculture and Technology, JAPAN*

| | |
|---|---|
| **18:05** | **Adjourn for the Day** |
| **18:20 - 20:00** | **Student Mixer** |
| **18:20 - 20:00** | **Women in Microfluidics Faculty and Industry Mixer** |
| **18:20 - 20:00** | **Dinner Groups** |

# TUESDAY AT A GLANCE

| | | | |
|---|---|---|---|
| 08:15-08:30 | **Announcements** | | |
| 08:30-09:15 | **Plenary Presentation III – Ulf Landegren**<br>*Uppsala Universitet, SWEDEN* | | |
| 09:15-09:35 | **Lab on a Chip and ALine - Pioneers of Miniaturization Lectureship Prize and Presentation** | | |
| 09:35-10:05 | **Break: Exhibit and Poster Inspection** | | |
| 10:05-11:55 | **Session 2A1 Organ-on-a-Chip 3**<br>**HOT TOPIC KEYNOTE** Dongeun (Dan) Huh | **Session 2B1 Artificial Intelligence in Microfluidics 2**<br>**HOT TOPIC KEYNOTE** Kevin Tsia | **Session 2C1 microTASs for Diagnostics**<br>**KEYNOTE** Sara Mahshid |
| 11:55-13:10 | **Lunch** | | |
| 12:00-13:00 | **Industrial Stage 2 –** Micronit, Blue Ocean Technologies Inc., and Vital Biosciences Inc. | | |
| 13:10-14:40 | **Session 2A3 Organ-on-a-Chip 4** | **Session 2B3 Single Cell Omics** | **Session 2C3 Cell Motility and Migration** |
| 14:30-16:30 | **Poster Session 2 and Exhibit Inspection** | | |
| 16:00-16:30 | **Break** | | |
| 16:30-18:00 | **Session 2A4 Environment and Energy 1**<br>**HOT TOPIC KEYNOTE** Chuck Henry | **Session 2B4 Wearables and Continuous Sensing 1**<br>**HOT TOPIC KEYNOTE** Firat Güder | **Session 2C4 Blood Vessels and Flow**<br>**KEYNOTE** Hang T. Ta |
| 18:00 | **Adjourn for the Day** | | |
| 18:15-19:00 | **Laminar (Recruitment) Mixer** | | |
| 18:20-20:00 | **Dinner Groups** | | |





# TUESDAY, 15 OCTOBER

**08:15 – 08:30** **Announcements**

## Plenary Presentation III
**Chair:** David Juncker, *McGill University, CANADA*

**Room 210A, Level 2**

**08:30** **TOOLS TO ANALYZE VERY FEW, AND VERY MANY MOLECULES**
Ulf Landegren
*Uppsala Universitet, SWEDEN*



## Lab on a Chip and ALine - Pioneers of Miniaturization Lectureship Prize and Presentation

**Room 210A, Level 2**

**09:15** **MICROFLUIDICS FOR SEPARATION AND MOLECULAR PROFILING OF EXTRACELLULAR VESICLES**
Jiashu Sun
*National Center for Nanoscience and Technology, CHINA*

**09:35 - 10:05** **Break: Exhibit and Poster Inspection**

## Session 2A1 - Organ-on-a-Chip 3
**Chair:** Adrian Ranga, *KU Leuven, BELGIUM*

**Room 210A, Level 2**

**10:05** **HOT TOPIC KEYNOTE**
**MICROENGINEERED BIOMIMICRY OF HUMAN PHYSIOLOGICAL SYSTEMS**
Dongeun (Dan) Huh
*University of Pennsylvania, USA*

**10:35** **HIGH-THROUGHPUT PRECLINICAL MODEL OF BREATHING HUMAN ALVEOLI**
Kimia Asadi Jozani, Shravanthi Rajasekar, Andrew Hollinger, Nicky Anvari, Abeka Selliah, Boyang Zhang
*McMaster University, CANADA*

**10:55** **PULSEPLATE: INTEGRATED CULTURE OF ORGANOIDS WITH PULSED HYDRODYNAMICS**
Iago Pereiro, Eylul Ceylan, Hannah Kronabitter, Eléonore Cauquil, Julien Aubert, Mehmet Girgin, Jyoti Rao, Giuliana Rossi, Matthias Lutolf, Jose Garcia-Cordero
*Roche Institute of Human Biology, SWITZERLAND*

**11:15** **MODELING THE EARLY RESPONSE TO VACCINATION IN 3D PRINTED MULTI-ORGAN-ON-CHIP DEVICES**
Sophie R. Cook, Alexander G. Ball, Rebecca R. Pompano
*University of Virginia, USA*

## Session 2A1 - Organ-on-a-Chip 3 (continued)

**11:35** **CELL MIGRATION AND PHENOTYPIC SHIFT IN A COMPARTMENTALIZED TRIPLE CO-CULTURE SYNOVIUM-ON-CHIP MODEL INCLUDING AN IMMUNE CELL COMPONENT**
Laurens R. Spoelstra[1], Nuno Araújo Gomes[1], Mariia Zakharova[1], Daniël Wijnperle[1], Jan Hendriks[1], Tim Welting[2], Marcel Karperien[1], Loes I. Segerink[1], Séverine Le Gac[1]
[1]*University of Twente, NETHERLANDS and* [2]*Maastricht University Medical Center, NETHERLANDS*

## Session 2B1 - Artificial Intelligence in Microfluidics 2
**Chair:** David Issadore, *University of Pennsylvania, USA*

**Room 511, Level 5**

**10:05** **HOT TOPIC KEYNOTE**
**TOWARD PETABYTE-SCALE OPTOFLUIDIC IMAGING CYTOMETRY**
Kevin Tsia
*University of Hong Kong, HONG KONG*

**10:35** **A HIGH-DENSITY MICROCHAMBER ARRAY FOR THE ANALYSIS OF EXTRACELLULAR VESICLES DERIVED FROM SINGLE CANCER CELLS**
Lucien R. Stöcklin, Claudius L. Dietsche, Petra S. Dittrich
*ETH Zürich, SWITZERLAND*

**10:55** **EXPEDITING EMERGENCY TRANSFUSION WITH T-BOT: AI-ENABLED DIGITAL MICROFLUIDICS PLATFORM FOR RAPID BLOOD TYPING**
Anthony K.C. Yong[1], Alexandros A. Sklavounos[1,2], Omar I. Hajjaj[3,4], Chantal Armali[3], Julian Lamanna[1], Lenny Chen[1], Dimpy Modi[3,5], Jeannie L. Callum[3,4], Aaron R. Wheeler[1]
[1]*University of Toronto, CANADA,* [2]*Blue Ocean Technologies Inc., CANADA,* [3]*Sunnybrook Health Sciences Centre, CANADA,* [4]*Queen's University, CANADA, and* [5]*McMaster University, CANADA*

**11:15** **HIGH-THROUGHPUT SINGLE-CELL MIGRATION ANALYSIS WITH MICROFLUIDICS, ROBOTICS, AND COMPUTER VISION FOR DECIPHERING THE INFLUENCE OF EXTRACELLULAR MATRIX**
Mengli Zhou[1,2], Yushu Ma[1,2], Edwin C. Rock[1], Jinxiong Cheng[1,2], Yu-Chih Chen[1,2,3]
[1]*University of Pittsburgh, USA,* [2]*UPMC Hillman Cancer Center, USA, and* [3]*Carnegie Mellon University, USA*

**11:35** **STAIN-FREE DRUG SCREENING USING NANOWELL-IN-MICROWELL PLATE**
Pan Deng, Deasung Jang, Samuel G. Berryman, Kerryn Matthews, Simon Duffy, Hongshen Ma
*University of British Columbia, CANADA*

## Session 2C1 - microTASs for Diagnostics

**Chair:** Darius Rackus, *Toronto Metropolitan University, CANADA*

**Room 510, Level 5**



**10:05** **KEYNOTE**
**FUNCTIONAL NANOSURFACED MICROFLUIDICS FOR DIAGNOSTICS**
Sara Mahshid
*McGill University, CANADA*

**10:35** **HIV TESTING AT POINT-OF-CARE BY INTEGRATING A SAMPLE PREPARATION DEVICE WITH A PORTABLE REAL-TIME DETECTOR**
George Adedokun, Gurjit Sidhu, Morteza Alipanah, Gary P. Wang, Z. Hugh Fan
*University of Florida, USA*

**10:55** **MICROFLUIDIC-INTEGRATED BIOSENSOR FOR RAPID DETECTION OF GLIAL FIBRILLARY ACIDIC PROTEIN (GFAP) IN THE WHOLE BLOOD OF MILD TRAUMATIC BRAIN INJURY PATIENTS**
Mohammadreza Farrokhnia[1,2], Bahareh Babamiri[1,2], Mehdi Mohammadi[2], Amir Sanati-Nezhad[1]
[1]*University of Calgary, CANADA and* [2]*BioChipTech-Fluidome Company, CANADA*

**11:15** **VIRAL MOLECULAR IDENTIFICATION SYSTEM FOR SAMPLE-TO-ANSWER QUANTITATION OF VIRAL INFECTION: SARS-COV-2 CASE**
Lidija Malic[1], Liviu Clime[1], Byeong-Ui Moon[1], Christina Nassif[1], Dillon Da Fonte[1], Daniel Brassard[1], Ljuboje Lukic[1], Matthias Geissler[1], Keith Morton[1], Denis Charlebois[2], Teodor Veres[1]
[1]*National Research Council of Canada, CANADA and* [2]*Canadian Space Agency, CANADA*

**11:35** **MULTIPLEX SERODETECTION OF TWO ROGUE ANTI-CYTOKINE AUTOANTIBODIES WITH A 3D-PRINTED CAPILLARIC ELISA-CHIP**
Houda Shafique[1], Stéphane Bernier[2], Andy Ng[1], Lucie Roussel[2], Donald C. Vinh[2], David Juncker[1]
[1]*McGill University, CANADA and* [2]*McGill University Health Centre, CANADA*

**11:55 - 13:10** **Lunch**

## Industrial Stage 2

**Chair:** Sara Baratchi, *Baker Heart and Diabetics Institute, AUSTRALIA*

**Room 220, Level 2 (Lunch Room)**

**12:00** **2a – HOW MICRONIT EMPOWERS CLIENTS TO INNOVATE WITH MICROFLUIDICS, FROM CONCEPT TO PRODUCTION**
Marko Blom
*Micronit, NETHERLANDS*

**12:20** **2b – DIVE INTO THE FUTURE OF MICROFLUIDICS WITH BLUE OCEAN TECHNOLOGIES**
Alexandros Sklavounos
*Blue Ocean Technologies Inc., USA*

**12:40** **2c – MICROFLUIDIC CARTRIDGE DESIGN FOR SCALABLE, COST-EFFECTIVE DIAGNOSTIC INNOVATION**
Miguel Joao Marques Barreiros
*Vital Biosciences Inc., USA*

## Session 2A3 - Organ-on-a-Chip 4

**Chair:** Karen Cheung, *University of British Columbia, CANADA*

**Room 210A, Level 2**

**13:10** **MICROENGINEERED TRANSPLANTATION OF HUMAN SOLID TUMORS FOR IN VITRO STUDIES OF CAR T IMMUNOTHERAPY**
Haijiao Liu[1], Estela Noguera-Ortega[1], Won Dong Lee[2], Maria Liousia[1], Zeyu Chen[1], Xuanqi Dong[1], Anni Wang[1], Juyoung Park[1], Aidi Liu[1], Marina Martinez[1], Joshua Brotman[1], Soyeon Kim[1], Scott Worthen[1], Ellen Pure[1], Joshua Rabinowitz[1], E. John Wherry[1], Edmund Moon[1], Steven Albelda[1], and Dongeun Huh[1]
[1]*University of Pennsylvania, USA,* [2]*Princeton University, USA, and* [3]*Children's Hospital of Philadelphia, USA*

**13:30** **EVALUATION OF A BIOPRINTED GUT-ASSOCIATED LYMPHOID TISSUE MIMICKING PEYER'S PATCH IN THE INTESTINAL MICROENVIRONMENT**
Jongho Park, Gihyun Lee, Je-Kyun Park
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**13:50** **AN INTEGRATED MICROPHYSIOLOGICAL SYSTEM FOR MULTI-EPITHELIAL BARRIERS: APPLICATION TO INTESTINAL AND EPIDERMAL BARRIERS**
Qasem Ramadan[1], Rana Hazaymeh[2], Moahammed Zourob[1]
[1]*Alfaisal University, SAUDI ARABIA and* [2]*Almaarefa University, SAUDI ARABIA*

**14:10** **FABRICATION OF AN ENVIRONMENTAL-CONTROLLED HUMAN COLON-ON-CHIP**
Duvan Andres Rojas Garcia[1,2], Dimitri Hamel[1,2], Julie Foncy[2], Laurent Malaquin[2], Audrey Ferrand[1]
[1]*IRSD-INSERM, FRANCE and* [2]*LAAS-CNRS, FRANCE*

## Session 2B3 - Single Cell Omics

**Chair:** Thomas Gervais, *Polytechnique Montreal, CANADA*

**Room 511, Level 5**

**13:10** **SPATIALCELLOMICS: HIGH-RESOLUTION SPATIAL SAMPLING WORKFLOW COUPLED WITH GENE EXPRESSION AND MASS SPECTROMETRIC ANALYSIS FOR MULTI-OMIC PROFILING**
Sharvari Somayaji[1,2], Sofia Arshavsky Graham[1], May Dang-Lawson[1], Farah Jayousi2, Philipp Lange[2], Govind Kaigala[1,3]
[1]*University of British Columbia, CANADA,* [2]*BC Children's Hospital Research Institute, CANADA, and* [3]*Vancouver Prostate Centre, CANADA*

**13:30** **SCBLOT-SEQ: A MULTI-MODAL, SAME-CELL ASSAY FOR CHROMATIN ACCESSIBILITY AND PROTEIN IMMUNOBLOTTING**
Trinh Lam[1], Anna Fomitcheva Khartchenko[1], Alison Su[1], Amy E. Herr[1,2]
[1]*University of California, Berkeley, USA and*
[2]*Chan Zuckerberg Biohub, USA*

**13:50** **INTEGRATING SCATAC-SEQ WITH IMAGING MODALITIES VIA MAGNETIC-BASED DETERMINISTIC BARCODING**
Anna Fomitcheva Khartchenko[1], Trinh Lam[1], Amy E. Herr[1,2]
[1]*University of California, Berkeley, USA and*
[2]*Chan Zuckerberg Biohub, USA*

**14:10** **SCBIOPSY-SEQ: AN OPEN PLATFORM FOR TEMPORAL SINGLE-CELL RNA-SEQ ANALYSIS WITH WELL-CONTROLLED EXTRACTION VOLUME AND GENOME-WIDE COVERAGE**
Xing Xu, Chaoyong Yang
*Xiamen University, CHINA*

## Session 2C3 - Cell Motility and Migration

**Chair:** Masumi Yamada, *Chiba University, JAPAN*

**Room 510, Level 5**

**13:10** **CTC-RACE: SINGLE-CELL MOTILITY ASSAY OF CIRCULATING TUMOR CELLS FROM METASTATIC LUNG CANCER PATIENTS**
Yang Liu, Leidong Mao
*University of Georgia, USA*

**13:30** **LAMELLIPODIA-MEDIATED OSTEOBLAST HAPTOTAXIS GUIDED BY FIBRONECTIN LIGAND CONCENTRATIONS ON A MULTIPLEX CHIP**
Chao Liu, Xiaotian Feng, Seoyoung Jeong, Melissa L. Carr, Yiwen Gao, Radhika P. Atit, Samuel E. Senyo
*Case Western Reserve University, USA*

**13:50** **SKETCH AND ETCH: SPATIOTEMPORAL INVESTIGATIONS INTO RARE CELL POPULATIONS DRIVING COLLECTIVE CANCER MIGRATION**
Sofia Arshavsky Graham[1], Sharvari Somayaji[1], Yara Nasrallah[1], Aditya Kashyap[1,2], May Dang-Lawson[1], Pamela M. Austin Dean[1], Calvin D. Roskelley[1], Govind V. Kaigala[1,2]
[1]*University of British Columbia, CANADA and*
[2]*Vancouver Prostate Centre, CANADA*

**Session 2C3 - Cell Motility and Migration** (continued)

**14:10** **3D MICRO-/NANOFLUIDIC CELL CULTURE PLATFORM GENERATING FULL-COMBINATORIAL CONCENTRATION GRADIENTS**
Juyeol Bae[1,2], Hwisu Jeon[1], Yukyung Park[3], Taesung Kim[1,3]
[1]*Ulsan National Institute of Science and Technology (UNIST), KOREA,* [2]*Chonnam National University, KOREA, and* [3]*TK Medical Solution Inc., KOREA*

**14:30 - 16:30** **Poster Session 2 and Exhibit Inspection**
Presentations are listed by topic category with their assigned number starting on page 49.

**16:00 - 16:30** **Break**

## Session 2A4 - Environment and Energy 1
**Chair:** Fiona Regan, *Dublin City University, IRELAND*

**Room 210A, Level 2**

**16:30** **HOT TOPIC KEYNOTE**
**CAN MICROFLUIDICS ADDRESS KEY ISSUES IN THE ENVIRONMENT, ENERGY, AND AGRICULTURE?**
Chuck Henry
*Colorado State University, USA*

**17:00** **INTEGRATED PLATFORM FOR ON-SITE SIMULTANEOUS MICROFLUIDIC QPCR AND ELISA ANALYSIS: FOOD ALLERGEN DETECTION FROM SAMPLE TO RESULTS**
Anne-Gaëlle Bourdat, Remco den Dulk, Bastien Serrano, François Boizot, Gervais Clarebout, Xavier Mermet, Raymond Charles, Jean Porcherot, Armelle Keiser, Manuel Alessio, Patricia Laurent, Charlotte Parent, Nicolas Sarrut-Rio and Myriam Cubizolles
*University Grenoble, Alpes, FRANCE*

**17:20** **ENVIRONMENTALLY DISPERSIBLE AND FULLY BIODEGRADABLE WIRELESS UREA SENSOR FOR SOIL MONITORING**
Yu Tanaami[1], Ken Sakabe[1], Tetsuo Kan[2], Hiroaki Onoe[1]
[1]*Keio University, JAPAN and*
[2]*University of Electro-Communications, JAPAN*

**17:40** **ECHOBEAM: ACOUSTOFLUIDIC CLUSTER ANALYSIS FOR MICRO AND NANOPLASTIC IDENTIFICATION USING FLUORESCENCE AND RAMAN SPECTROSCOPY**
Martim Costa[1], Mehrdad L. Choobbari[2], Björn Hammarström[1], Selim Tanriverdi[1], Haakan Joensson[1], Martin Wiklund[1], Heidi Ottevaere[2], Aman Russom[1]
[1]*KTH Royal Institute of Technology, SWEDEN and*
[2]*Vrije Universiteit Brussel, BELGIUM*

## Session 2B4 - Wearables and Continuous Sensing 1

**Chair:** Martyn Boutelle, *Imperial College London, UK*

**Room 511, Level 5**



**16:30** HOT TOPIC KEYNOTE

**WEARABLE RECONFIGURABLE METAMATERIALS AND ORIGAMI-INSPIRED IMPLANTABLE SENSORS FOR HUMAN-MACHINE INTERFACES**

Firat Güder

*Imperial College London, UK*

**17:00** **INTEGRATED MULTI-SENSING PLATFORM FOR ON-DEMAND QUANTITATIVE IN VITRO CELLULAR MODEL ANALYSIS AND MONITORING**

Silvia Demuru[1], Bradley Petkus[1], Adel Tekari[2], Esteban A. Seoane[2], Saskia Schmidt[3,4], Samuel Wenger[2], Frédéric Flahaut[2], Samantha Paoletti[1], Felix Kurth[1], Carine Gaiser[4], Laura Suter-Dick[4,5], Jérôme Charmet[2,6], Alexandra Homsy[2], Loïc Burr[1]

[1]*Swiss Center for Electronics and Microtechnology (CSEM), SWITZERLAND,* [2]*University of Applied Sciences Western Switzerland (HES-SO), SWITZERLAND,* [3]*University of Applied Sciences and Arts Northwestern Switzerland, SWITZERLAND,* [4]*University of Basel, SWITZERLAND,* [5]*Swiss Centre for Applied Human Toxicology, SWITZERLAND, and* [6]*University of Bern, SWITZERLAND*

**17:20** **ALL-FLEXIBLE EPIFLUIDIC NANOPLASMONIC SENSOR FOR LABEL-FREE CHRONOLOGICAL SWEAT PROFILING**

Jaehun Jeon, Ki-Hun Jeong

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

**17:40** **USING IMPEDANCE PLETHYSMOGRAPHY TO DETECT THE FLOW STATUS OF THE RADIAL ARTERY BLOOD AND PERFORM CONTINUOUS MONITORING OF PULSE WAVE AND BLOOD PRESSURE**

Juncheng Fan[1], Shuangye Xu[1], Xiaoyu Huang[1], Jiaqi Liu[1], Yongchang Wang[1], Haoming Zhang[1], Xiaozhi Wang[2], Zhen Zhu[1]

[1]*Southeast University, CHINA and* [2]*First Affiliated Hospital of Nanjing Medical University, CHINA*

## Session 2C4 - Blood Vessels and Flow

**Chair:** Catherine Villard, *CNRS, FRANCE*

**Room 510, Level 5**

**16:30** **KEYNOTE**
**NOVEL MICROFLUIDIC MODELS OF ATHEROSCLEROSIS AND ATHEROTHROMBOSIS**
Fahima Akther[1,2], Dimple Thomas[1], Huong D.N. Tran[1,2], Shebbrin Moonshi[1], Yuao Wu[1], Jun Zhang[1], Nam-Trung Nguyen[1], Hang T. Ta[1,2]
[1] *Griffith University, AUSTRALIA and*
[2] *University of Queensland, AUSTRALIA*

**17:00** **HEMADYNE: CLINICAL HEMODYNAMICS AND ENDOTHELIAL RESPONSES RECREATED IN PRECLINICAL HUMAN BIOLOGY-MODELING MICROSYSTEMS**
Ankit Kumar, Rushangi Patel, Abhishek Jain
*Texas A&M University, USA*

**17:20** **CIRCUMFERENTIAL STRETCH AND PERFUSION CULTURE OF A FLEXIBLE 3D VESSEL MODEL THROUGH ADJUSTABLE FLOW PROFILE**
Byeongwook Jo, Shoji Takeuchi
*University of Tokyo, JAPAN*

**17:40** **AN IPSC-BLOOD VESSEL WITH SPIRALLY ORIENTED SMOOTH MUSCLE MIMIC AGING PHENOTYPES IN PHYSIOLOGICAL FUNCTION AND METABOLITES**
Shun Itai[1], Takafumi Toyohara[1], Hiroaki Onoe[2], Takaaki Abe[1]
[1] *Tohoku University, JAPAN and* [2] *Keio University, JAPAN*

| | |
|---|---|
| **18:00** | **Adjourn for the Day** |
| **18:15 - 19:00** | **Laminar (Recruitment) Mixer** |
| **18:20 - 20:00** | **Dinner Groups** |

# WEDNESDAY AT A GLANCE

| | | | |
|---|---|---|---|
| 08:15-08:30 | Announcements | | |
| 08:30-09:15 | Plenary Presentation IV – Jennifer A Lewis<br>*Harvard University, USA* | | |
| 09:15-09:30 | Transition | | |
| 09:30-10:40 | Session 3A1 Environment and Energy 2 | Session 3B1 Wearables and Continuous Sensing 2 | Session 3C1 Artificial Intelligence in Microfluidics 3 |
| | HOT TOPIC KEYNOTE<br>David A. Weitz | HOT TOPIC KEYNOTE<br>Ali Javey | KEYNOTE<br>Eugenia Kumacheva |
| 10:40-11:10 | Break: Exhibit and Poster Inspection | | |
| 11:10-12:20 | Session 3A2 Sample & Reagent Processing and Characterization | Session 3B2 Mammalian Cell Culture and Analysis | Session 3C2 Microfluidic Horizons |
| 12:10-13:20 | Lunch | | |
| 12:15-13:15 | Industrial Stage 3 – Nano Dimension, IMT Masken und Teilungen AG, and DBM Medix | | |
| 13:20-14:05 | Plenary Presentation V – Hatice Altug<br>*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND* | | |
| 14:05-14:15 | MicroTAS 2025 Adelaide, AUSTRALIA Announcement | | |
| 14:15-16:15 | Poster Session 3 and Exhibit Inspection | | |
| 15:45-16:15 | Break | | |
| 16:15-18:05 | Session 3A4 Multiphase Droplets and Particles | Session 3B4 Microbial Culture and Analysis | Session 3C4 Neural Microenvironment |
| | KEYNOTE<br>Masumi Yamada | KEYNOTE<br>Jesse Greener | KEYNOTE<br>Stephanie Willerth |
| 18:05 | Adjourn for the Day | | |
| 18:45 to MIDNIGHT | Conference Banquet | | |



# WEDNESDAY, 16 OCTOBER

**08:15 – 08:30** **Announcements**

## Plenary Presentation IV

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

**Room 210A, Level 2**

**08:30** **BUILDING VASCULARIZED KIDNEY TISSUES FOR DRUG TESTING, DISEASE MODELING, AND THERAPEUTIC USE**
Jennifer A. Lewis
*Harvard University, USA*

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

## Session 3A1 - Environment and Energy 2

**Chair:** Jesse Greener, *Université Laval, CANADA*

**Room 210A, Level 2**

**09:30** **HOT TOPIC KEYNOTE**
**MICROFLUIDICS AS A MODEL FOR ENERGY APPLICATIONS**
David A. Weitz
*Harvard University, USA*

**10:00** **DROPLET-BASED MICROFLUIDICS SCREENING OF PLASTIC DEGRADING ENZYMES**
Thomas Beneyton[1], Alexandre Gilles[2,3], Alexandra Tauzin[2,3], Nicolas Chabot[3], Vincent Tournier[3], Alain Marty[3], Jean-Christophe Baret[1]
[1]*Université de Bordeaux, FRANCE,* [2]*Université de Toulouse, FRANCE, and* [3]*Carbios, FRANCE*

**10:20** **MICROFLUIDIC GAS DIFFUSION ELECTRODE FOR ELECTROWETTING MONITORING AND VISUALIZATION OF ELECTROCHEMICAL REACTIONS**
Sebastian Brosch[1], Alexandra Decker[1], Eike Häger[1], John Linkhorst[3], Matthias Wessling[1,2]
[1]*RWTH Aachen University, GERMANY,* [2]*DWI Leibniz Institute for Interactive Materials, GERMANY, and* [3]*Technical University Darmstadt, GERMANY*

## Session 3B1 - Wearables and Continuous Sensing 2

**Chair:** Tyler Ray, *University of Hawaii, Manoa, USA*

**Room 511, Level 5**

**09:30** **HOT TOPIC KEYNOTE**
**WEARABLE SWEAT SENSORS - TOWARDS BIG DATA FOR HUMAN HEALTH**
Ali Javey
*University of California, Berkeley, USA*

**10:00** **RETINAL TREATMENT EVALUATION AFTER TRANSCORNEAL ELECTRICAL STIMULATION BASED ON A WIRELESS CONTACT LENS DEVICE**
Rui Luo, Ding Shen, Dahai Ren
*Tsinghua University, CHINA*

**10:20** **IMPLANTABLE ACTIVE-RESET PROTEIN SENSORS: A VERSATILE APPROACH FOR IN VIVO REAL-TIME INFLAMMATION MONITORING**
Hossein Zargartalebi[1], Shana O. Kelley[1,2]
[1]*Northwestern University, USA and* [2]*Chan Zuckerberg Biohub, USA*

## Session 3C1 - Artificial Intelligence in Microfluidics 3

**Chair:** Aram Chung, *Korea University, KOREA*

**Room 510, Level 5**

**09:30** **KEYNOTE**
**AUTONOMOUS FLUIDIC LAB FOR NANOPARTICLE SYNTHESIS**
Eugenia Kumacheva
*University of Toronto, CANADA*

**10:00** **TRANSFORMING LYME DISEASE DIAGNOSIS: USING A SINGLE-TIER MULTIPLEXED VERTICAL FLOW ASSAY EMPOWERED BY MACHINE LEARNING**
Rajesh Ghosh[1], Hyou-Arm Joung[1], Artem Goncharov[1], Barath Palanisamy[1], Wesley Luk[1], Kevin Ngo[1], Elizabeth J. Horn[2], Paul M. Arnaboldi[3], Raymond J. Dattwyler[3], Omai B. Garner[1], Aydogan Ozcan[1], Dino Di Carlo[1]
[1]*University of California, Los Angeles, USA,*
[2]*Lyme Disease Biobank, USA, and*
[3]*New York Medical College, USA*

**10:20** **NEURAL NETWORK ENABLED MULTIPARAMETRIC IMPEDANCE SIGNAL TEMPLATING FOR HIGH THROUGHPUT SINGLE-CELL DEFORMABILITY CYTOMETRY**
Javad Jarmoshti[1], Federica Caselli[2], Nathan S. Swami[1]
[1]*University of Virginia, USA and* [2]*University of Rome Tor Vergata, ITALY*

**10:40 - 11:10** **Break: Exhibit and Poster Inspection**

## Session 3A2 - Sample and Reagent Processing and Characterization

**Chair:** Manabu Tokeshi, *Hokkaido University, JAPAN*

**Room 210A, Level 2**

**11:10** **BASIC EVALUATION OF CRISPR/CAS12A SYSTEM STABILITY ON PAPER SUBSTRATES AND ITS APPLICATION TO MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICES**
Yohei Tanifuji, Guodong Tong, Yuki Hiruta, Daniel Citterio
*Keio University, JAPAN*

**11:30** **INTEGRATED MICROFLUIDIC ENZYME REACTOR FOR AUTOMATED SAMPLE PREPARATION AND UNAMBIGUOUS SEQUENCE CHARACTERIZATION OF MONOCLONAL ANTIBODIES VIA ELECTROSPRAY IONIZATION MASS SPECTROMETRY (ESI-MS)**
Junyi Yao, Killian O'Connell, Melissa R. Leyden, Maria C. Panepinto, Rob A. D'Ippolito, Donald F. Hunt, Jeffrey Shabanowitz, James P. Landers
*University of Virginia, USA*

**11:50** **INTEGRATED SAMPLE TREATMENT AND LAMP ASSAY ON A MICROFLUIDIC CHIP FOR RAPID ON SITE BACTERIA DETECTION IN SEAWATER**
Charlotte Parent, Hugo Benchetrit, Anne-Gaelle Bourdat, Yves Fouillet, Thomas Provent, Guillaume Daufouy, Xavier Mermet, Mahfod Benessalah, Manuel Alessio, François Boizot, Mélissa Baque, Thomas Alava
*University Grenoble, Alpes, FRANCE*

## Session 3B2 - Mammalian Cell Culture and Analysis

**Chair:** Elżbieta Jastrzębska, *Warsaw University of Technology, POLAND*

**Room 511, Level 5**

**11:10** **A MULTIMODAL DIGITAL MICROFLUIDIC TESTING PLATFORM FOR ANTIBODY-PRODUCING CELL LINES**
Jeremy T. Lant[1], Jurgen Frasheri[1], Taehong Kwon[2], Camille M.N. Tsang[1], Samin Akbari[2], Aaron R. Wheeler[1]
[1]*University of Toronto, CANADA and*
[2]*Sartorius Stedim North America Inc., USA*

**11:30** **CO-CULTURE OF ANTIBODY-SECRETING AND IMMUNE CELLS: HIGH-THROUGHPUT FUNCTIONAL SCREENING USING CORE-SHELL HYDROGEL MICROPARTICLES**
Kazuki Nishimoto[1,2], Rajesh Ghosh[1], Mark van Zee[1], Darren Fang[1], Miyako Noguchi[1], Dino Di Carlo[1]
[1]*University of California, Los Angeles, USA and*
[2]*University of Tokyo, JAPAN*

## Session 3B2 - Mammalian Cell Culture and Analysis (continued)

**11:50** **ELUCIDATION OF UNEXPLORED CIRCULATING TROPHOBLASTS USING CONTINUOUS CENTRIFUGAL MICROFLUIDICS TOWARD PRECISE NON-INVASIVE PRENATAL DIAGNOSIS**
Hyun Gyu Kang[1], Seung-Hoon Kim[2], Ji Hyae Lim[3], Aseer Intisar[1], Sohae Yang[1], Jong Man Kim[2], Hyun Young Shin[2], Su Ji Yang[3], Hyun Mee Ryu[3,4], Minseok S. Kim[1,2,5,6]
[1]*Daegu Gyeongbuk Institute of Science & Technology (DGIST), KOREA,* [2]*CTCELLS, KOREA,* [3]*CHA Future Medicine Research Institute, KOREA,* [4]*CHA University School of Medicine, KOREA,* [5]*Translational Responsive Medicine Center (TRMC), KOREA, and* [6]*New Biology Research Center (NBRC), KOREA*

## Session 3C2 - Microfluidic Horizons

**Chair:** Mohamed Abdelgawad, *American University of Sharjah, UAE*

**Room 510, Level 5**

**11:10** **BI-DIRECTIONAL DUAL-FLOW-ROOTCHIP TO STUDY CALCIUM AND ROS SIGNALLING IN RESPONSE TO FORCE AND OSMOTIC STRESS SENSING IN ROOTS**
Claudia Allan, Yiling Sun, Haig Bishop, Claudia-Nicole Meisrimler, Volker Nock
*0University of Canterbury, NEW ZEALAND*

**11:30** **A PLATFORM FOR THE FORMATION OF COMPLEX AND UNIFORM DNA GEL USING VIBRATION-INDUCED LOCAL VORTICES**
Zhitai Huang[1], Kanji Kaneko[1], Ryotaro Yoneyama[1], Takeshi Hayakawa[1], Tomoya Maruyama[2], Masahiro Takinoue[2], Hiroaki Suzuki[1]
[1]*Chuo University, JAPAN and* [2]*Tokyo Institute of Technology, JAPAN*

**11:50** **A LOW-INPUT MICROFLUIDIC METHOD FOR STUDYING LNCRNA BINDING**
Jenna Catalano[1], Zhengzhi Liu[1], Yuan-Pang Hsieh[1], Zhen Bouman Chen[2], Chang Lu[1]
[1]*Virginia Tech, USA and* [2]*City of Hope, USA*

**12:10 - 13:20** **Lunch**

## Industrial Stage 3

**Chair:** Ghulam Destgeer, *Technical University of Munich, GERMANY*

**Room 220, Level 2 (Lunch Room)**

**12:15** **3a - MICRO AND ELECTRONICS 3D PRINTING FOR LIFE SCIENCES AND MEDICAL DEVICES**
Jasmin Zeyn
*Nano Dimension, USA*

**12:35** **3b - GLASS MICROFLUIDICS – HARVESTING THE POWER OF WAFER LEVEL MANUFACTURING FROM PROTOTYPING TO LARGE VOLUME MANUFACTURING**
Tobias Bauert
*IMT Masken und Teilungen AG, SWITZERLAND*

**12:55** **3c - SCALABLE SILICONE-BASED MICROFLUIDIC DEVICES**
Anuthasan Balasingam
*DBM Medix, USA*

## Plenary Presentation V

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

**Room 210A, Level 2**

**13:20** **NANOPHOTONIC LAB-ON-A-CHIP SYSTEMS FOR BIOMEDICAL APPLICATIONS**
Hatice Altug
*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

## MicroTAS 2025 Adelaide, Australia Announcement

**Room 210A, Level 2**

**14:05** **2025 Conference Chairs**
Michael Breadmore, *University of Tasmania, AUSTRALIA*
Rosanne Guijt, *Deakin University, AUSTRALIA*
Craig Priest, *University of South Australia, AUSTRALIA*

**14:15 - 16:15** **Poster Session 3 and Exhibit Inspection**
Presentations are listed by topic category with their assigned number starting on page 49.

**15:45 - 16:15** **Break**

## Session 3A4 - Multiphase Droplets and Particles

**Chair:** Carolyn Ren, *University of Waterloo, CANADA*

**Room 210A, Level 2**

**16:15** **KEYNOTE**
**FUNCTIONALIZATION OF MICROFLUIDICS VIA BOTTOM-UP INTEGRATION FOR UPGRADING DROPLET FORMATION AND BIOLOGICAL APPLICATIONS**
Masumi Yamada
*Chiba University, JAPAN*

**16:45** **TUNABLE DROPICLE FORMATION USING AMPHIPHILIC MICROPARTICLES WITH FOUR DISCRETE HYDROPHILIC PATCHES**
Xinpei Song[1], Shreya Udani[2], Mengxing Ouyang[2], Dino D. Carlo[2], Ghulam Destgeer[1]
[1] *Technical University of Munich, GERMANY and*
[2] *University of California, Los Angeles, USA*

**17:05** **MULTICOMPARTMENT ROD SHAPE MICROGELS FABRICATED BY 3D PRINTED MICROFLUIDIC DEVICES FOR CELL CULTURE AND TISSUE ENGINEERING APPLICATIONS**
Esfandyar Askari, Mohsen Akbari
*University of Victoria, CANADA*

**17:25** **QUAD-CORE AMPHIPHILIC PARTICLES FOR MULTIPLEXED AMPLIFIED IMMUNOASSAY**
Muhammad Usman Akhtar, Ghulam Destgeer
*Technical University of Munich, GERMANY*

**17:45** **MICROFLUIDIC BASED CELL-MIMETIC COACERVATE-CORE-DROPLET FOR MOLECULES SEQUESTRATION**
Yuhao Geng, Jing Yu
*Nanyang Technological University, SINGAPORE*

## Session 3B4 - Microbial Culture and Analysis

**Chair:** Michael Breadmore, *University of Tasmania, AUSTRALIA*

**Room 511, Level 5**

**16:15** KEYNOTE

**PROGRAMMING BACTERIAL BIOFILMS USING MICROFLUIDICS: FROM MODEL HYDRODYNAMIC GROWTH ENVIRONMENTS TO NEW SUSTAINABLE BIO-ENERGY APPLICATIONS**

Jesse Greener

*Universtié Laval, CANADA*

**16:45** **SPATIOTEMPORALLY RESOLVED MICROBIAL BEHAVIORAL ANALYSIS WITH A CLEAR CORRELATION TO RAPID OXYGEN FLUCTUATIONS**

Keitaro Kasahara[1,2], Johannes Seiffarth[1,2], Katharina Nöh[1], Dietrich Kohlheyer[1]

[1]*Forschungszentrum Jülich, GERMANY and* [2]*RWTH Aachen University, GERMANY*

**17:05** **PASSIVE DROPLET MICROFLUIDIC PLATFORM FOR HIGH-THROUGHPUT SCREENING OF MICROBIAL PROTEOLYTIC ACTIVITY**

Luca Potenza, Tomasz Kaminski

*University of Warsaw, POLAND*

**17:25** **ULTRAHIGH-THROUGHPUT SCREENING OF ENZYME VARIANTS IN DROPLET-BASED MICROFLUIDICS USING A NOVEL CONFOCAL ABSORBANCE-MEASUREMENT SETUP**

Abdi Mirgissa Kaba, Sébastien Gounel, Thomas Beneyton, Lionel Buisson, Nicolas Mano, Jean-Christophe Baret

*Centre de Recherche Paul Pascal (CNRS), FRANCE*

**17:45** **UNRAVELING DEEP SEA MICROBIAL DARK MATTER: A DROPLET BASED SINGLE CELL CULTURE METHOD UNDER HIGH HYDROSTATIC PRESSURE**

Zhiyi Wang[1], Tong Yu[2], Linfeng Gong[2], Zongze Shao[2], Hongliang Wang[3], Wenbin Du[1]

[1]*Chinese Academy of Sciences, CHINA,* [2]*Third Institute of Oceanography, Ministry of Natural Resources, CHINA, and* [3]*National Deep Sea Center, Ministry of Natural Resources, CHINA*

## Session 3C4 - Neural Microenvironment

**Chair:** Jose Garcia-Cordero, *Roche Institute of Human Biology, SWITZERLAND*

**Room 510, Level 5**

**16:15** KEYNOTE
**3D BIOPRINTING COMPLEX TISSUES**
Stephanie Willerth
*University of Victoria, CANADA*

**16:45** **HUMAN NEURON MICROENVIRONMENTS CONFINED WITHIN FLUID WALLS**
Edmond J. Walsh[1], Federico Nebuloni[1], Ricardo Marquez-Gomez[1], Quyen B. Do[2], Joseph A. Morgan[1], Richard Wade-Martins[1]
[1]*University of Oxford, UK and* [2]*Agency for Science, Technology and Research (A*STAR), SINGAPORE*

**17:05** **BIOFABRICATION OF MULTILAYERED AND HETEROGENEOUS NEURAL CONSTRUCTS**
Soo Jee Kim, Dongjo Yoon, Yejin Choi, Gihyun Lee, Yoonkey Nam, Je-Kyun Park
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**17:25** **VENTURI-BASED MICROFLUIDIC DEVICE FOR SIMULTANEOUS IMAGING OF NEURAL ACTIVITY AND BEHAVIOR IN HEAD-FIXED C. ELEGANS**
Hyun Jee Lee, Julia Vallier, Hang Lu
*Georgia Institute of Technology, USA*

**17:45** **ENGINEERING OF ENDOTHELIALIZED AND INNERVATED MUSCLE TISSUE ON-CHIP TO INVESTIGATE METABOLIC RESPONSES TO EXTERNAL STIMULATION**
Jinchul Ahn[1], Min-seop Kim[1], Dain Lee[1], Hui-Wen Liu[1], Seung-cheol Shin[1], Seok-Hyeon Kang[1], Hyunsoo Kim[1], Kyungwon Park[1], Yeju Jeong[1], Oak-Kee Hong[2], Jang-Won Son[3], Seok Chung[1]
[1]*Korea University, KOREA,* [2]*Catholic University of Korea, KOREA, and* [3]*Bucheon St. Mary's Hospital, KOREA*

**18:05** **Adjourn for the Day**

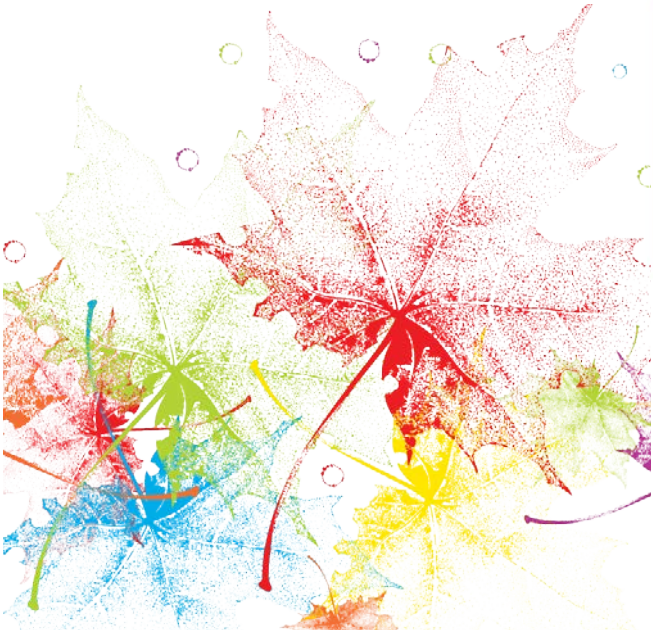
**18:45 to Midnight** **Conference Banquet**

WEDNESDAY


Old Town Montréal – Cobbled Streets. *By f11photo; AdobeStock*

# THURSDAY AT A GLANCE

| | | | |
|---|---|---|---|
| 08:25-08:30 | Announcements | | |
| 08:30-09:15 | Plenary Presentation VI – Yuk Ming "Dennis" Lo<br>*Chinese University of Hong Kong, HONG KONG* | | |
| 09:15-09:35 | Microsystems & Nanoengineering/Springer Nature – Test of Time Award | | |
| 09:35-09:50 | Transition | | |
| 09:50-11:20 | Session 4A1 Extracellular Vesicles<br>KEYNOTE<br>Tijana Jovanovic-Talisman | Session 4B1 Liposomes and Artificial Cells<br>KEYNOTE<br>Hyomin Lee | Session 4C1 High Throughput Screening<br>KEYNOTE<br>Lin Han |
| 11:20-11:50 | Break: Exhibit and Poster Inspection | | |
| 11:50-12:30 | Awards Ceremony<br>• CHEMINAS – Young Researcher Poster Awards<br>• Royal Society of Chemistry/Lab on a Chip – Widmer Poster Award<br>• Sensors (MDPI) – Outstanding Sensors and Actuators, Detection Technologies Poster Award<br>• IMT Masken und Teilungen AG – Microfluidics on Glass Poster Award<br>• Acoustofluidics Society Poster Award<br>• NIST and Lab on a Chip – Art in Science Award<br>• Biomicrofluidics (AIP) – Best Paper Awards<br>• Elsevier Sensors and Actuators B. Chemical – Best Paper Award<br>• Microsystems & Nanoengineering/Springer Nature – Best Talk Award | | |
| 12:30-12:45 | Closing Remarks | | |
| 12:45 | Conference Adjourns | | |



# THURSDAY, 17 OCTOBER

**08:25 - 08:30** **Announcements**

## Plenary Presentation VI

**Chair:** Yoon-Kyoung Cho,
*Ulsan National Institute of Science & Technology (UNIST), KOREA*

**Room 210A, Level 2**

**08:30** **NONINVASIVE PRENATAL AND CANCER DETECTION BY PLASMA DNA ANALYSIS: FROM DREAM TO REALITY**
Yuk Ming "Dennis" Lo
*Chinese University of Hong Kong, HONG KONG*

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

**Room 210A, Level 2**

**09:15** **CMOS MICROELECTRODE ARRAYS FOR FUNCTIONAL CHARACTERIZATION OF NEURONAL PREPARATIONS AT SUBCELLULAR RESOLUTION**
Andreas Hierlemann
*ETH Zürich, SWITZERLAND*

**09:35 - 09:50** **Transition**

## Session 4A1 - Extracellular Vesicles

**Chair:** Yong Zeng, *University of Florida, USA*

**Room 210A, Level 2**

**09:50** **KEYNOTE**
**SEVEN O'CLOCK: TIME FOR A NEW METHOD TO CHARACTERIZE INDIVIDUAL EXTRACELLULAR VESICLES AND NON-VESICULAR NANOPARTICLES**
Andras Saftics[1], Sarah Abuelreich[1], Nan Jiang[1], Benjamin Purnell[1], Balint Beres[1], Carinna Lima[1], Marta Garcia Contreras[2], S. Thompson[1], Eugenia Romano[1], Ima Ghaeli[1], Alex Spark[3], Alexandre Kitching[3], Victoria L. Seewaldt[1], Kendall Van Keuren-Jensen[4], Saumya Das[2], Tijana Jovanovic-Talisman[1]
[1]*City of Hope, USA,* [2]*Massachusetts General Hospital, Harvard Medical School, USA,* [3]*Nanometrix Ltd, UK, and* [4]*National Institutes of Health, USA*

**10:20** **MONITORING OF ACTIONABLE MUTATIONS VIA DIGITAL PROFILING OF BLOOD EXTRACELLULAR VESICLES FROM PATIENTS WITH NON-SMALL CELL LUNG CANCER**
Elizabeth Maria Clarissa[1,2], Sumit Kumar[1,2], Yoon-Kyoung Cho[1,2]
[1]*Ulsan National Institute of Science and Technology (UNIST), KOREA and* [2]*Institute of Basic Science (IBS), KOREA*

**10:40** **V-DISK: A CENTRIFUGAL MICROFLUIDIC CARTRIDGE FOR PURIFICATION OF EXTRACELLULAR VESICLES FROM BLOOD OR PLASMA SAMPLES**
Ehsan Mahmodiarjmand[1,2], Gustav Grether[1], Nils Paust[1,2], Jan Lueddecke[1,2]
[1]*Hahn-Schickard, GERMANY and* [2]*University of Freiburg, GERMANY*

## Session 4A1 - Extracellular Vesicles (continued)

**11:00** **SEPARATION OF EXTRACELLULAR VESICLES WITH DIFFERENT SIZES IN CULTURE MEDIUM USING OPTICALLY-INDUCED DIELECTROPHORESIS ON A MULTI-CHANNEL MICROFLUIDIC CHIP**
Cheng-Hsuan Chung, Chih-Hung Wang, Wei-Jen Soong, Gwo-Bin Lee
*National Tsing Hua University, TAIWAN*

## Session 4B1 - Liposomes and Artificial Cells

**Chair:** Katherine Elvira, *University of Victoria, CANADA*

**Room 511, Level 5**

**09:50** KEYNOTE
**MICROFLUIDIC SYNTHESIS OF POLYMERSOMES FOR PROGRAMMING ENZYMATIC REACTION NETWORK**
Hyomin Lee
*Pohang University of Science and Technology (POSTECH), KOREA*

**10:20** **PREPARATION OF CELL-SIZED LIPOSOMES USING BUDDING IN MICROFLUIDIC DEVICE**
Jiajue Ji, Ryuji Kawano
*Tokyo University of Agriculture and Technology, JAPAN*

**10:40** **CONSTRUCTION OF A SYNTHETIC CELL WITH A CYTOSKELETON USING 2-PHOTON POLYMERIZATION AND MICROFLUIDIC METHODS**
Myra Kurosu Jalil, Saisneha Koppaka, Sindy K.Y. Tang
*Stanford University, USA*

**11:00** **UNVEILING MECHANISMS IN MICROLFUIDICS-ENHANCED LIPID NANOPARTICLE DIALYSIS VIA SINGLE-PARTCILE CYLINDRICAL ILLUMINATION CONFOCAL SPECTROSCOPY**
Fangchi Shao, Xiang Liu, Sixuan Li, Arman Mirmiran, Jinghan Lin, Kuangwen Hsieh, Lai Wei, Jiumei Hu, Hai-Quan Mao, Tza-Huei Wang
*Johns Hopkins University, USA*

## Session 4C1 - High Throughput Screening

**Chair:** Yi-Chin Toh, *Queensland University of Technology, AUSTRALIA*

**Room 510, Level 5**

**09:50** KEYNOTE
**HIGH-THROUGHPUT SCREENING OF BIOMOLECULES AND SINGLE CELLS BY NOVEL BIOCHIPS**
Lin Han
*Shandong University, CHINA*

**10:20** **AUTOMATED SYSTEM FOR STUDY OF CELLULAR COMMUNICATION IN HYDROGEL-BASED DYNAMIC MICROENVIRONMENTS**
Yoon Jeong, Gabriel Mercado, Abinash Padhi, Yiyu Deng, Madhumita Prakash, Savas Tay
*University of Chicago, USA*

## Session 4C1 - High Throughput Screening (continued)

**10:40** **INTEGRATED OPTOFLUIDIC PLATFORM FOR HIGH THROUGHPUT OPTICAL SPECTROSCOPY IN PL DROPLETS**
Marc Sulliger[1], Annina Stuber[1,2], Nako Nakatsuka[2], Jaime Ortega Arroyo[1], Romain Quidant[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

**11:00** **A NOVEL DROPLET MICROFLUIDIC SCREENING SYSTEM FOR DISCOVERING SLOW-GROWING MICROBES FROM THE ENVIRONMENT**
Byeolnim Oh[1], Mingyeong Kang[2], So-Ra Ko[2], Jaewon Park[3], Chi-Yong Ahn[2], Hyun Soo Kim[1]
[1]*Kwangwoon University, KOREA,* [2]*Korea Research Institute of Bioscience and Biotechnology (KRIBB), KOREA, and* [3]*Konkuk University, KOREA*

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

## Awards Ceremony

**Room 210A, Level 2**

**11:50** **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
- Acoustofluidics Society Poster Award
- NIST and Lab on a Chip – Art in Science Award
- Biomicrofluidics (AIP) – Best Paper Awards
- Elsevier Sensors and Actuators B. Chemical – Best Paper Award
- Microsystems & Nanoengineering/Springer Nature – Best Talk Award

## Closing Remarks

**12:30** **MicroTAS 2024 Conference Chairs**
David Juncker, *McGill University, CANADA*
Aaron Wheeler, *University of Toronto, CANADA*

**12:45** **Conference Adjourns**

| MONDAY | TUESDAY | WEDNESDAY |
|---|---|---|
| 14:35 – 16:35 | 14:30 – 16:30 | 14:15 – 16:15 |

# CLASSIFICATION

(last character of poster number)

| | |
|---|---|
| a | Biology, Medicine and Diseases |
| b | Cells, Artificial Cells and Soft Nanoparticles |
| c | Environment, Energy, Agriculture, and Food |
| d | Fundamentals In Microfluidics and Nanofluidics |
| e | Integrated Microfluidic Platforms |
| f | Microfabrication, Manufacturing and Rapid Prototyping |
| g | Sensors, Actuators and Detection Technologies |
| h | Tissue Engineering, Organs on a Chip and Organisms |
| i | Wearables and Continuous Biosensing |
| j | µTAS and Diagnostics |
| k | Other Microfluidics and µTAS |

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

## a - Biology, Medicine and Diseases

### Antimicrobial Resistance (AMR)

**M001.a** **DETECTION OF ANTIBIOTIC RESISTANCE IN UROPATHOGENIC BACTERIA USING A MICROFLUIDIC POINT-OF-CARE SYSTEM FOR A FAST AND KNOWLEDGE-BASED ANTIBIOTIC THERAPY**
Nicole Isserstedt-John[1], Luise Schuchardt[1], Susanne Ackermann[2], Claudia Gärtner[1], Ralf Mrowka[2]
[1] *microfluidic ChipShop, GERMANY and*
[2] *University Hospital Jena, GERMANY*

**M002.a** **MULTISTEP SLIPCHIP FOR RAPID PHENOTYPIC ANTIMICROBIAL SUSCEPTIBILITY TESTING**
Qi Wang, Xiang Li, Yanan Ren, Feng Shen, Meifeng Tao
*Shanghai Jiao Tong University, CHINA*

**T001.a** **DEVELOPMENT IN MULTIPLEX-crRNA CRISPR/Cas12a-BASED DIAGNOSTIC PLATFORM FOR IDENTIFYING ANTIBIOTIC-RESISTANCE GENES AND DISCRIMINATING VIRAL FROM BACTERIAL INFECTIONS USING HOST-RNA SIGNATURES**
Hsuan-Wen Huang, Wen-Yu Kang, Hsin-Ying Ho, Wen-Hung Wang, Ling-Shan Yu
*National Sun Yat-sen University, TAIWAN*

**T002.a** **SIMPLIFIED ANTIMICROBIAL RESISTANCE DETECTION IN BACTEREMIA BY ON-CHIP MULTIPLEXED ISOTHERMAL PCR**
Capucine Treille, Karla Perez-Toralla, Lilas Pommies, Stéphanie Simon, Hervé Volland, Hervé Boutal
*Université Paris Saclay, FRANCE*

**W001.a** **LAB-IN-A-TABLET: PHAGE TABLETS ENABLE HIGH-THROUGHPUT SCREENING FOR RAPID IDENTIFICATION OF PERSONALIZED THERAPEUTIC BACTERIOPHAGES**
Fereshteh Bayat[1], Arwa Hilal[1], Mathura Thirugnanasampanthar[1], Denise Tremblay[2], Carlos D.M. Filipe[1], Sylvain Moineau[2], Tohid F. Didar[1], Zeinab Hosseinidoust[1]
[1]*McMaster University, CANADA and* [2]*Université Laval, CANADA*

## Cancer

**M003.a** **ANTI-CANCER THERAPEUTIC SCREENING: QUANTIFYING IMMUNO-ONCOLOGICAL INTERACTIONS FROM CONCEPT TO PRACTICE**
Ada H. Wong, Edward Seto
*George Washington University, USA*

**T003.a** **3D ENGINEERED MICROFLUIDIC TUMOR PLATFORM TO INVESTIGATE MONOCYTE COATED NANOPARTICLE DRUG DELIVERY STRATEGY TARGETING GLIOBLASTOMA MULTIFORME**
Twinkle Jina Minette Manoharan, Ting-Yun Wang, Shivani Mantri, Hanan Alarnous, Kuei-Chun Wang, Mehdi Nikkhah
*Arizona State University, USA*

**W002.a** **MODULATION OF SIALYLATION OF N-GLYCAN BY SELECTIVE SIALYLTRANSFERASE INHIBITORS: A NEW APPROACH TO ANTITUMOR AND ANTI-SARS-COV-2 AGENTS**
Wen-Shan Li[1], Ser John L. Perez[2], Tzu-Ting Chang[1], Chia-Ling Chen[1], Shih-Han Wang[1], Chia-Wei Li[1]
[1]*Academia Sinica, TAIWAN and* [2]*National Yang Ming Chiao Tung University, TAIWAN*

**W003.a** **POLYPLOIDY OF MDA-MB-231 BREAST CANCER CELLS PREDICTS INCREASED EXTRAVASATION**
Satomi Hirose, Tatsuya Osaki, Roger D. Kamm
*Massachusetts Institute of Technology, USA*

## Drug Delivery

**M004.a** **A NOVEL DEVICE FOR SELF-POWERED LYOPHILIZED VACCINE RECONSTITUTION AND INTRADERMAL DELIVERY**
Wannes Verbist, Elias Broeckhoven, Pieter De Wever, Lorenz Van Hileghem, Dries Vloemans, Lotte Coelmont, Francesco Dal Dosso, Pedro Fardim, Kai Dallmeier, Jeroen Lammertyn
*KU Leuven, BELGIUM*

**M005.a** **LABEL-FREE TARGETED DELIVERY USING FEEDBACK-CONTROLLED SINGLE CELL MICRO-ELECTROPORATION IN FOCUSED ELECTRIC FIELDS**
Josiah Rudge, Yuvraj Rallapalli, Madeline Hoyle, Aniruddh Sarkar
*Georgia Institute of Technology, USA*

**M006.a** **THE INCREASED EFFECT OF MICROBUBBLE-ASSISTED GEMCITABINE DELIVERY WITH REPEATED ULTRASOUND EXPOSURE IN A PANCREATIC CANCER-ON-A-CHIP MODEL**
Delanyo Kpeglo[1], Magaret A. Knowles[1], Malcolm Haddrick[2], Stephen D. Evans[1], Sally A. Peyman[3]
[1]*University of Leeds, UK,* [2]*Medicines Discovery Catapult, UK, and* [3]*Heriot-Watt University, UK*

**T004.a** **CAVITY ACOUSTIC TRANSDUCERS FOR RAPID AND EFFICIENT VIRAL TRANSDUCTION**
Mohammad Aghaamoo, Abraham Lee
*University of California, Irvine, USA*

**T005.a** **LED PLASMONIC OPTOPORATION FOR HIGH-THROUGHPUT AND SIMPLE INTRACELLULAR DELIVERY IN SUSPENSION CELLS**
Hamin Na, Eun-Sil Yu, Hyejeong Jeong, Junhee Han, Ji-Ho Park, Ki-Hun Jeong
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**W004.a** **GASTROINTESTINAL RATE-CONTROLLABLE DRUG RELEASE FROM A DIFFUSIONAL INJECTION SYSTEM**
Joshua A. Levy, Jude A.C. Stephen, Michael A. Straker, Reza Ghodssi
*University of Maryland, USA*

**W005.a** **MICROFLUIDIC DROPLET-BASED SYNTHESIS OF NANOGEL FOR DRUG DELIVERY IN OVARIAN CANCER: A DESIGN OF EXPERIMENT STUDY**
Emanuele Limiti[1], Eleonora D'Alessandro[1], Alessio Bucciarelli[2], Sofia Raniolo[1], Elisa De Luca[3], Pamela Mozetic[3], Filippo Rossi[4], Marcella Trombetta[1], Sara M. Giannitelli[1], Alberto Rainer[1,3]
[1]*Università Campus Bio-Medico di Roma, ITALY,* [2]*IRCCS Istituto Ortopedico Rizzoli, ITALY,* [3]*Institute of Nanotechnology (NANOTEC), ITALY, and* [4]*Politecnico di Milano, ITALY*

## Global Health

**M007.a** **MANUFACTURING ON THE GO (MANGO): A DEVICE FOR LOW-COST AND PORTABLE CELL-FREE PROTEIN MANUFACTURING**
Quinn Matthews[1], Severino J.R. da Silva[1], Mohammad Simchi[1], Pouriya Bayat[1], Idorenyin Iwe[1], Lauren Cranmer[1], Andy Wu[1], Fahim Masum[1], Justin Vigar[1], Barbara Santos[2], Ryan Fobel[1], Yuxiu Guo[1], Serena Singh[1], Seray Cicek[1], Aidan Tinafar[1], David Sinton[1], Lindomar Pena[2], Keith Pardee[1]
[1]*University of Toronto, CANADA and* [2]*Fiocruz Pernambuco, BRAZIL*

**T006.a** **EMPLOYING CANDYCOLLECT, A LOLLIPOP-INSPIRED SALIVA SAMPLING DEVICE, IN REMOTE RESPIRATORY PATHOGEN SAMPLING OF PARENT-CHILD DYADS NATIONWIDE**
D.B. Hatchett[1], Wan-chen Tu[1], Ingrid Jeacopello[1], Xiaojing Su[1], Sarah Ho[1], Albert Shin[1], Keila Uchimura[1], Sharon Oh[1], Perla Antunez[1], Anna Korolova[1], Sanitta Thongpang[1,2], Ashleigh B. Theberge[1], Ellen R. Wald[3], Greg P. DeMuri[3]
[1]*University of Washington, USA,* [2]*Mahidol University, THAILAND, and* [3]*University of Wisconsin, USA*

**W006.a** **HIGH-THROUGHPUT CHARACTERIZATION OF YOUNG'S MODULUS, SHAPE AND ADHESION OF SINGLE RED BLOOD CELLS FROM SICKLE CELL DISEASE AND TRAIT BLOOD SAMPLES**
Savita Kumari[1], Oshin Sharma[1], Dhrubaditya Mitra[2,3], Debjani Paul[1]
[1] *Indian Institute of Technology, Bombay, INDIA,* [2] *KTH Royal Institute of Technology, SWEDEN, and* [3] *Stockholm University, SWEDEN*

## High Throughput Screening

**M008.a** **HIGH-THROUGHPUT DETECTION OF MICROBIAL GROWTH AND ANTIBIOTIC SUSCEPTIBILITY IN DROPLETS USING ANGLE-RESOLVED SCATTERED LIGHT IMAGING AND CONVOLUTIONAL NEURAL NETWORKS**
Martina Graf[1,2], Arjun Sarkar[1,2], Carl M. Svensson[1], Anne S. Munser[3], Sven Schröder[3], Sundar Hengoju[1], Miriam A. Rosenbaum[1,2], Marc T. Figge[1,2]
[1] *Leibniz Institute for Natural Product Research and Infection Biology - HKI, GERMANY,* [2] *Friedrich Schiller University, GERMANY, and* [3] *Fraunhofer Institute for Applied Optics and Precision Engineering IOF, GERMANY*

**T007.a** **FULLY AUTOMATED MICROFLUIDIC 96-CHANNEL ELECTROPORATION SYSTEM ENABLES RAPID, PARALLEL SCREENING OF ELECTROPORATION CONDITIONS OF MICROORGANISMS**
Po-Hsun Huang[1], Owen T. Porth[1], Lei Wei[2], Maria Marco[2], K. Dane Wittrup[1], Kerwyn Casey Huang[3], Cullen R. Buie[1]
[1] *Massachusetts Institute of Technology, USA,*
[2] *University of California, Davis, USA, and*
[3] *Stanford University, USA*

**T008.a** **HIGH-THROUGHPUT DROPLET-MICROFLUIDIC PLATFORM FOR CELL-FREE SYNTHETIC BIOLOGY-DRIVEN FUNCTIONAL METAGENOMICS**
Eunhee Cho, Sandrine Kammerecker, Shinichi Suangawa, Stavros Stavrakis, Andrew deMello
*ETH Zürich, SWITZERLAND*

**W007.a** **FUNCTION-FIRST SELECTION OF A PROTEIN BIOSENSOR BY SCREENING OF COLONIES IN CORE-SHELL MICROPARTICLES**
Rajesh Ghosh[1], Shosei Imai[2], William Vo[1], Wesley Luk[1], Darren Fang[1], Timothy Vernon[1], Mark van Zee[1], Issei Yamaguchi[2], Cayden Williamson[1], Takuya Terai[2], Robert E. Campbell[2], Dino Di Carlo[1]
[1] *University of California, Los Angeles, USA and*
[2] *University of Tokyo, JAPAN*

## Immune Cells and Immunity

**M009.a** **DROPLET MICROFLUIDIC BASED CD3 DIMERIZATION FOR T-CELL PRECISION ACTIVATION**
Huang Lai, Wen Yin, Yi Liu, Xiaozhe Zhang, Guojie Luo, Xiaodong Lin, Mo Yang
*Hong Kong Polytechnic University, HONG KONG*

**M010.a** **HIGHLY EFFICIENT HUMAN PRIMARY T CELL ENGINEERING VIA DROPLET CELL PINCHER PLATFORM**
You-Jeong Kim, Da Young Yun, Sungwon Bang, Cheulhee Jung, Aram J. Chung
*Korea University, KOREA*

**T009.a** **ENGINEERING IMMUNE CELL INTERACTIONS SPATIALLY TO STUDY THEIR RESPONSES TO DRUGS AND CYTOKINES WITHIN THE TUMOR MICROENVIRONMENT**
Megha Srinivas[1], Aditya Kashyap[1,2], Michael Gold[1], Govind Kaigala[1,2]
[1]*University of British Columbia, CANADA and* [2]*Vancouver Prostate Centre, CANADA*

**T010.a** **MICROFLUIDIC TUMOR MODEL WITH OXYGEN MODULATION FOR HYPOXIA-TARGETED DRUG SCREENING**
Tsai-Yu Shih[1], Wei-Yu Huang[1], Kang-Yun Lee[2], Wei-Lun Sun[3], Cheng-Hsien Liu[1]
[1]*National Tsing Hua University, TAIWAN,* [2]*Taipei Medical University, TAIWAN, and* [3]*Pythia Biotech Ltd, TAIWAN*

**W008.a** **CAR-T MANUFACTURING ON AN INTEGRATED MICROFLUIDIC DEVICE**
Tugce Pasa, Allan Dietz, Kevin Loutherback
*Mayo Clinic, USA*

**W009.a** **ENHANCING NATURAL KILLER CELL CYTOTOXICITY ASSESSMENT THROUGH DROPLET-BASED MICROFLUIDICS: IMPLICATIONS FOR IMMUNOTHERAPY**
Rana Ozcan, Fatemeh Vahedi, Ali Ashkar, Tohid Didar
*McMaster University, CANADA*

**W010.a** **MICROFLUIDIC-ENHANCED ISOLATION OF ANTI-TUMOR T-CELLS USING AC ELECTROTHERMAL FLOW**
Desh Deepak Dixit[1], Kavya L. Singamapalli[3], Amanda Montoya[2], Alexandre Reuben[2], Peter B. Lillehoj[1]
[1]*Rice University, USA,* [2]*M.D. Anderson Cancer Center, USA, and* [3]*Baylor College of Medicine, USA*

## Infectious Diseases

**M011.a** **CELL-FREE DNA METAGENOMIC APPROACH TO THE IDENTIFICATION OF CIRCULATING PATHOGENS: NEW CLINICAL CASE STUDY**
Maiwenn Kersaudy-Kerhoas[1], Linda Marriott[1], Ana Martinez-Lopez[2], Nicholas Leslie[1], Katharina Hoeter[3], Stephanie Wiemann[3], Marc Bodenstein[3], Michael Schäfer[3]
[1]*Heriot-Watt University, UK,* [2]*University of Edinburgh, UK, and* [3]*Universitätsmedizin Mainz, GERMANY*

**M012.a** **ENGINEERING A SAMPLE-TO-ANSWER SYSTEM TO IDENTIFY CIRCULATING CELL-FREE DNA FROM M. TUBERCULOSIS IN WHOLE BLOOD**
Rachel Warren, David Boegner, John Rzasa, Ian White
*University of Maryland, USA*

**M013.a** **HIGHLY-EFFICIENT PLASMONIC NANOCAVITY THERMOCYCLER FOR ULTRAFAST REAL-TIME POLYMERASE CHAIN REACTION**
Hyejeong Jeong, Jae-Myeong Kwon, Eun-Sil Yu, Jaehyeok Park, Ki-Hun Jeong
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**M014.a** **SEPSI CHIP: A TOOLKIT FOR THE RAPID PATHOGEN ISOLATION AND DETECTION FROM WHOLE BLOOD**
Sushma Agarwalla, Suhanya Duraiswamy
*Indian Institute of Technology, Hyderabad, INDIA*

**T011.a** **CLINIC-COMPATIBLE COLORIMETRIC MICROFLUDIC DEVICE FOR DETECTION OF CARBAPENEMASE PRODUCING ORGANISMS**
Anjana Dissanayaka[1,2], Ali Haider[1], Jesse J. Waggoner[1], David R. Myers[1,2]
[1] *Emory University, USA and* [2] *Georgia Institute of Technology, USA*

**T012.a** **ENHANCED BACTERIAL SEPARATION FROM BLOOD THROUGH AUTOMATED REPEATED FILTRATION IN A CENTRIFUGE**
Aoi Tanaka[1,2], Mohammad Osaid[1], Wouter van der Wijngaart[1]
[1] *KTH Royal Institute of Technology, SWEDEN and* [2] *Keio University, JAPAN*

**T013.a** **MICROFLUIDIC DIGITAL FOCUS ASSAY FOR THE QUANTIFICATION OF INFECTIOUS INFLUENZA VIRUS**
Siddharth Raghu Srimathi, Maxinne A. Ignacio, Sheldon Tai, Donald K. Milton, Margaret A. Scull, Don L. DeVoe
*University of Maryland, USA*

**T014.a** **NANOPARTICLE-SUPPORTED, RAPID, DIGITAL SARS-COV2 NEUTRALIZING ASSAY**
Seyedsina Mirjalili[1], Md Ashif Ikbal[1], Ching-Wen Hou[1], Yeji Choi[1], Maziyar Kalatehmohammdi[1], Laura A. VanBlargan[2], Laimonas Kelbauskas[1], Neal Woodbury[1], Vel Murugan[1], Brenda Hogue[1], Michael S. Diamond[3], Chao Wang[1]
[1] *Arizona State University, USA,* [2] *National Institutes of Health, USA, and* [3] *Washington University School of Medicine, USA*

**W011.a** **CULTURE-FREE RAPID ISOLATION AND DETECTION OF BACTERIA FROM WHOLE BLOOD AT CLINICALLY RELEVANT CONCENTRATIONS**
María Henar Marino Miguélez[1,2], Mohammad Osaid[1], Vinodh Kandavalli[2], Jimmy Larsson[2], Johan Elf[2], Wouter M. van der Wijngaart[1]
[1] *KTH Royal Institute of Technology, SWEDEN and* [2] *Uppsala University, SWEDEN*

**W012.a** **ENHANCED FLUORESCENCE GOLD NANOPARTICLE CRISPR/CAS12A-BASED PLATFORM FOR RAPID AND SENSITIVE DETECTION OF HUMAN PAPILLOMAVIRUS TYPES16 AND18**
Hsin-Ying Ho[1], Fang-Ying Lai[1], Yan-Bo Chen[2], Ling-Shan Yu[1]
[1] *National Sun Yat-sen University, TAIWAN and* [2] *Kaohsiung Armed Forces General Hospital, TAIWAN*

**W013.a** **MULTI-DIMENSIONAL LASER INDUCED MICROFLUIDIC VALVE SYSTEM BASED COMBINATIONAL ANTIBIOTICS SUSCEPTIBILITY SCREENING AND SUB-5 MINUTE PATHOGEN IDENTIFICATION**
Lai Wei, Sayuni Dharmasena, Fangchi Shao, Sixuan Li, Jiyuan Yang, Arman Mirmiran, Kuangwen Hsieh, Jeff Tza-Huei Wang
*Johns Hopkins University, USA*

**W014.a** **NANOPARTICLE-SUPPORTED, RAPID, DIGITAL DETECTION OF AFRICAN SWINE FEVER**
Seyedsina Mirjalili[1], Yeji Choi[1], Carmina Gallardo[2], Marisa Arias Neira[2], Chao Wang[1]
[1] *Arizona State University, USA and* [2] *Spanish National Research Council (CSIC), SPAIN*

## Neurobiology and Neuroscience

**M015.a** **A MICROFLUIDIC CHIP FOR SUSTAINED OXYGEN GRADIENT FORMATION IN THE INTESTINE**
Colby E. Witt, Ashley E. Ross
*University of Cincinnati, USA*

## Precision Medicine and Biomarkers

**M016.a** **RAPID DETECTION OF ISLET AUTOANTIBODIES USING PAPER-BASED VERTICAL FLOW ASSAY**
Barath Palanisamy[1], Rajesh Ghosh[1], Cristian Miko Y. Santos[1], Nathan Ou[1], Dahlia Liu[1], Abheerava G. Koka[1], Alejandro F. Siller[2], Maria J. Redondo[2], Aydogan Ozcan[1], Dino Di Carlo[1]
[1]*University of California, Los Angeles, USA and* [2]*Baylor College of Medicine, USA*

**T015.a** **A MULTIMODAL BIOSENSOR PLATFORM FOR RAPID CHARACTERIZATION OF GUT MICROBIOTA**
Jyong-Huei Lee[1], Chriss Chin[1], Dennis C. Chan[1], Joseph C. Liao[2], Sam Yang[2], Nanying Zhang[1], Pak Kin K. Wong[1]
[1]*Pennsylvania State University, USA and* [2]*Stanford University, USA*

**W015.a** **DRUG-DISCOVERY-ON-CHIP: DISCOVERY AND VALIDATION OF TARGETS IN PANCREATIC CANCER USING MICROFLUIDIC PANCREATIC CANCER-ASSOCIATED COAGULATION MODELS**
Sae Rome Choi[1,2], Hye-ran Moon[2], Natalia Ospina Munoz[1,2], Yun Chang[2], Xiaoping Bao[2], Bennett D. Elzey[2], Melissa Fishel[3], Mattew J. Flick[4], Bumsoo Han[1,2]
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## Virus, Bacteria, and Parasite

**M017.a** **AUTOMATED DIGITAL MICROFLUIDIC PHAGE SUSCEPTIBILITY TESTING**
Michael D.M. Dryden[1,2,3], Bernadette Ng[1,3], Danielle L. Peters[1,2], Jonathan D. Cook[1,3,4], Wangxue Chen[1,2], Aaron R. Wheeler[1,3], Teodor Veres[1,2], Greg J. German[1,3,4]
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**M018.a** **FAST AND SENSITIVE DETECTION OF VIABLE BACTERIAL USING MICROWELL CONFINED AND PROPIDIUM MONOAZIDE ASSISTED DIGITAL CRISPR ASSAY**
Weihong Yin, Kai Hu, Haohua Mei, Wei Jin, Ying Mu
*Zhejiang University, CHINA*

**T016.a** **A FAST ASSAY OF BACTERIA CELL PERMEABILITY FOR GENETIC TRANSFORMATION**
Charmaine Nieves, Po-Hsun Huang, Cullen R. Buie
*Massachusetts Institute of Technology, USA*

**T017.a** **CANDYCOLLECT OPEN TO CLOSED (O2C) MICROFLUIDIC SYSTEM FOR RAPID AND USER-CENTRIC DETECTION OF GROUP A STREPTOCOCCUS**
Kelsey M. Leong[1], J. Carlos Sanchez[1], Cosette Craig[1], John A. Tatka[1], Rene R. Arvizu[1], Ingrid Jeacopello[1], Victoria A. Shinkawa[1], Timothy R. Robinson[1], Megan M. Chang[1], Xiaojing Su[1], Sanitta Thongpang[1,2], Ashleigh B. Theberge[1], Erwin Berthier[1], Ayokunle Olanrewaju[1]
[1]*University of Washington, USA and* [2]*Mahidol University, THAILAND*

**W016.a** **A GUT FEELING: UNDERSTANDING THE GUT MICROBIOTA THROUGH MICROENCAPSULATION**
Sydney K. Wheatley[1,2], Hanna Hamoud-Michel[1,2], Claire Phan[1,2], Sophie Lerouge[1,2,3], Corinne F. Maurice[4], Ali Ahmadi[1,2]
[1]*École de Technologie Supérieure, CANADA,* [2]*University of Montreal Hospital Research Centre, CANADA,* [3]*University of Montreal, CANADA, and* [4]*McGill University, CANADA*

**W017.a** **CHARACTERIZATION OF THE BIOPHYISCAL PROPERTIES OF HUMAN PAPILLOMAVIRUS-LIKE PARTICLES WITH IN-PLANE NANOFLUIDIC DEVICES**
MacRyan P. Biever, Angela J. Patterson, Kim Young, Shelby M. Klein, Martin F. Jarrold, Adam Zlotnick, Stephen C. Jacobson
*Indiana University, USA*

## Late News

**M501.a** **A MICROFLUIDIC CHIP FOR GROWING MICROBIAL BIOFILMS IN A DYNAMIC SYSTEM WITH INTEGRATED REAL-TIME SENSING**
Adei Abouhagger, Eivydas Andriukonis, Kamile Kasperavičiute, Arunas Stirke, Wanessa Melo
*Nacionalinis Fizinių ir Technologijos Mokslų Centras (NFTMC), LITHUANIA*

**M502.a** **ANALYSIS OF CELL MECHANOPORATION WITH USE OF HYALURONIC ACID**
Lija Fajdiga[1], Spela Zemljic-Jokhadar[1], Spela Malensek[2], Roman Jerala[2], Tadej Kokalj[3], Jure Derganc[1]
[1]*University of Ljubljana, SLOVENIA,* [2]*National Institute of Chemistry, SLOVENIA, and* [3]*Institute of Metals and Technology, SLOVENIA*

**M503.a** **ONE-STEP SCREENING OF A MAGNETIC NANOPARTICLE APTAMER LIBRARY WITH MULTIPLEX MICROFLUIDIC SURFACE PLASMON RESONANCE BIOSENSOR**
John V. L. Nguyen[1], Lidija Malic[1,2], Maryam Tabrizian[1]
[1]*McGill University, CANADA and* [2]*National Research Council Canada, CANADA*

**M505.a** **THE CLOCK IN GROWING HYPHAE AND THEIR SYNCHRONIZATION IN NEUROSPORA CRASSA**
Jia Hwei Cheong, Xiao Qiu, Yang Liu, Heinz-Bernd Schuttler, Jonathan Arnold, Leidong Mao
*University of Georgia, USA*

**T501.a** **A TACROLIMUS-ELUTING NERVE GUIDANCE CONDUIT ENHANCES REGENERATION IN CRITICAL-SIZED PERIPHERAL NERVE INJURY RAT MODEL**
Azur Azapagic, Jayant P. Agarwal, Bruce K. Gale, Jill E. Shea, Susan Wojtalewicz, Himanshu J. Sant
*University of Utah, USA*

**T502.a** **HIGHLY INTEGRATED TUMOR MICROENVIRONMENT 3D MICROFLUIDIC DEVICE FOR STUDYING CANCER ASSOCIATED FIBROBLAST PROMOTE HCC SORAFENIB RESISTANCE**
Zihan Yang, Yuanyuan Jiang, Tongxu Si, Zesheng Wang, Zhengdong Zhou, Zhihang Zhou, Mengsu Yang
*City University of Hong Kong, HONG KONG*

**T503.a** **OPTIMIZING SHOCK WAVE-MEDIATED TRANSFECTION: A PARAMETRIC STUDY**
Mahyar Malekidelarestaqi, Martin Brouillette, Viktor Steimle, Alexandre Maréchal
*Université de Sherbrooke, CANADA*

**T504.a** **SYNTHESIS OF CDS@ZIF67 PRECISION NANOZYME FOR POINT-OF-CARE APPLICATIONS**
Anna Anandita, Premveer Singh, Dharitri Rath
*Indian Institute of Technology, Jammuogy, INDIA*

**T505.a** **THYROSENSE - A SENSING DEVICE FOR HOME MONITORING OF THYROID-STIMULATING HORMONE**
Winnie E. Svendsen[1], Pulkit Saluja[1], Fabien Abeille[2], Jelle Bannink[2], Bianka Fabinyi[2], Marko Blom[2], Alemnew Mekonnen[3], Kumaravel Shanmugavel[3], Jaime I. Castillo-León[3]
[1] *Technical University of Denmark, DENMARK,* [2] *Micronit B V., NETHERLANDS, and* [3] *HEI Therapeutics, DENMARK*

**W501.a** **AN ELECTRONIC-FREE DEVICE FOR THE TARGETED SAMPLING OF MICROBIOTA WITHIN THE GASTROINTESTINAL TRACT**
Hanna Hamoud-Michel[1,2], Sydney K. Wheatley[1,2], Claire Phan[1,2], Irah King[3,4], Corinne Maurice[3], Ali Ahmadi[1,2]
[1] *École de Technologie Supérieure, CANADA,* [2] *University of Montreal Research Center, CANADA,* [3] *McGill University, CANADA, and* [4] *McGill University Health Centre Research Institute, CANADA*

**W502.a** **LOCAL DRUG DELIVERY AS BREAST CANCER TREATMENT: MINIATURE IMPLANTABLE OSMOGENECALLY DRIVEN PUMP**
Jade Bookwalter, Bruce K. Gale, Jayant P. Agarwal, Jill E. Shea, Azur Azapagic, Himanshu J. Sant
*University of Utah, USA*

**W503.a** **PROTOCOL OPTIMIZATION FOR THE ISOLATION AND SINGLE-CELL CHARACTERIZATION OF CIRCULATING TUMOR CELLS**
Anna Terrazzan[1,2], Francesca P. Carbone[1], Stefano Volinia[1,2], Tomasz Kaminski[2]
[1] *University of Ferrara, ITALY and* [2] *University of Warsaw, POLAND*

**W504.a** **TARGETED SELECTION AND B CELL FUSION ON CHIP FOR THE GENERATION OF MONOCLONAL ANTIBODIES**
Fanny Rousseau[1], Séverine Tarpau[1], Alexandre Chargueraud[3], Stéphanie Simon[1], Bruno Le Piouffle[2], Jacques Fattaccioli[3], Anne Wijkhuisen[1], Karla Perez-Toralla[1]
[1] *CEA, FRANCE,* [2] *ENS, FRANCE, and* [3] *PASTEUR, FRANCE*

**W505.a** **VIBRATION MIXING FOR ENHANCED PAPER-BASED RECOMBINASE POLYMERASE AMPLIFICATION**
Kelli N. Shimazu, Andrew T. Bender, Per G. Reinhall, Jonathan D. Posner
*University of Washington, USA*

## b - Cells, Artificial Cells and Soft Nanoparticles

### Bioinspired, Biomimetic & Biohybrid Devices

**M019.b** **ACOUSTICALLY DRIVEN CELL-MIMETIC MICROSTRUCTURES: TOWARDS HIGH THROUGHPUT CELLULAR ELASTOGRAPHY**
Alinaghi Salari, Aaron R. Wheeler
*University of Toronto, CANADA*

**M020.b** **GAS-PHASE-CULTURED CELL-BASED ODORANT SENSOR WITH HYDROGEL MICROWELLS**
Shino Fujioka[1], Chisaki Yamagata[1], Koji Sato[2], Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*University of Tokyo, JAPAN*

**T018.b** **BIOMIMETIC SOFT FUNCTIONAL IONIC GEL FIBER FOR SMART WEARABLE STRAIN SENSOR HUMAN-MACHINE INTERFACE APPLICATIONS**
Animesh Sinha, Junho Kim, Sangyeun Park, Doheon Koo, Hongyun So
*Hanyang University, KOREA*

**T019.b** **CELLS DETECT AIRBORNE CHEMICALS: A 3D-PRINTED MICROFLUIDIC DEVICE FOR GAS-TO-LIQUID TRANSFER IN A CELL-BASED SENSOR**
Kao Ikeda, Haruka Oda, Minghao Nie, Shoji Takeuchi
*University of Tokyo, JAPAN*

**T020.b** **STABLE FORMATION OF LIPID BILAYER IN PARALLEL MICROFLUIDIC CHANNELS UTILIZING OPERATION OF AQUEOUS/ORGANIC TWO-PHASE FLOW**
Masaya Ohba[1], Xin Jiang[1,2], Yutaka Kazoe[1]
[1]*Keio University, JAPAN and* [2]*Kanagawa Institute of Industrial Science and Technology, JAPAN*

**W018.b** **ALGAE-DRIVEN BIOHYBRID MICRO-ROTOR WITH STABILIZED ROTATION**
Haruki Kawakami, Haruka Oda, Minghao Nie, Shoji Takeuchi
*University of Tokyo, JAPAN*

**W019.b** **GAS-BASED SWITCHING OF IONIC DIODE FOR PROGRAMMABLE CONTROLABILTIY OF IONIC CIRCUIT**
Sangjin Seo, Taesung Kim
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

### Cell Capture, Counting, and Sorting

**M021.b** **AUTOMATED DROPLET-ON-DEMAND OPTOFLUIDIC PLATFORM FOR SINGLE CELL CAPTURE, ISOLATION AND COLLECTION**
William Mills[1], Ruifeng Zheng[1], Hongyu Zhao[1], Yecang Chen[1], Andrew Glidle[1], Peng Liang[2], Hing Leung[1], Huabing Yin[1]
[1]*University of Glasgow, UK and* [2]*Hooke Instruments Ltd, CHINA*

**M022.b** **CHARACTERISING THE ROLE OF CELL SHAPE IN INERTIAL MICROFLUIDIC SORTING USING PARASITES AS MODEL PARTICLES**
Jessie Howell[1,2], Nicole Hall[2], Sulochana Omwenga[1], Tansy Hammarton[1], Melanie Jimenez[2]
[1]*University of Glasgow, UK and* [2]*University of Strathclyde, UK*

**M023.b** **GLYCORNA-SPECIFIC CELL SUBPOPULATIONS PROFILING BY DNA PROXIMITY-MEDIATED MAGNETIC SORTING**
Haotian Li, Feng Chen, Ningfeng Luo, Yongxi Zhao
*Xi'an Jiaotong University, CHINA*

**M024.b** **HONEYCOMB FILM-INTEGRATED INTERDIGITATED MICROCHANNELS FOR SELECTIVE CAPTURE AND DETECTION OF RARE CELLS**
Yuheng Cheng, Jiwen Jiang, Yuhei Saito, Masumi Yamada
*Chiba University, JAPAN*

**M025.b** **INERTIAL MICROFLUIDICS FOR THE SEPARATION OF SPERMATOGENIC CELL PHASES TO ASSIST IN-VITRO HUMAN SPERMATOGENESIS**
Sabin Nepal[1], Alex Jafek[2], Joey Casalini[2], Bruce Gale[1,2]
[1]*University of Utah, USA and* [2]*Paterna Biosciences, USA*

**M026.b** **MICROFLUIDIC INTRACYTOPLASMIC SPERM INJECTION (MICSI)**
Majid Ebrahimi Warkiani
*University of Technology Sydney, AUSTRALIA*

**M027.b** **THERMO-RESPONSIVE DETERMINISTIC LATERAL DISPLACEMENT FOR CELL SEPARATION**
Ze Jiang, Yusuke Kanno, Takasi Nisisako
*Tokyo Institute of Technology, JAPAN*

**T021.b** **CELL SPHEROID SEPARATION IN A 3D-PRINTED MICROPILLAR ARRAY DEVICE**
Yeyi Tang, Yusuke Kanno, Takasi Nisisako
*Tokyo Institute of Technology, JAPAN*

**T022.b** **DOUBLE DIP: STEPWISE ISOLATION OF DIVERSE METABOLIC POPULATIONS USING SORTING BY INTERFACIAL TENSION (SIFT)**
Matthew Shulman, Thomas Mathew, Aria Trivedi, Paul Abbyad
*Santa Clara University, USA*

**T023.b** **HIGH THROUGHPUT INTRACELLULAR DELIVERY BY VISCOELASTIC MECHANOPORATION**
Derin Sevenler[1], Mehmet Toner[2]
[1]*Carnegie Mellon University, USA and* [2]*Massachusetts General Hospital, Harvard Medical School, and Shriners Children's Hospital, USA*

**T024.b** **HYBRID 3D GRILL-STRUCTURED MICROFLUIDIC DEVICE FOR RAPID HIGH-THROUGHPUT WHOLE BLOOD CTC ENRICHMENT**
Lawrence Chen, Yehyun Choi, Euisik Yoon
*University of Michigan, USA*

**T025.b** **MARROWCELLDLD: A MICROFLUIDIC METHOD FOR LABEL-FREE RETRIEVAL OF FRAGILE BONE MARROW-DERIVED CELLS**
Gloria Porro[1], Rita Sarkis[2], Clara Obergozo[1,2], Lucie Godot[1,2], Francesco Amato[1,2], Magali Humbert[2], Olaia Naveiras[2], Carlotta Guiducci[1]
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**W020.b ACTIVE MATTER AND ACOUSTOFLUIDICS: SELECTING SELF-PROPELLED JANUS PARTICLES AND SPEM CELLS BASED ON MOTILITY**
Vyacheslav R. Misko[1,2], Larysa Baraban[3], Denys Makarov[3], Tao Huang[3], Pierre Gelin[1], Ileana Mateizel[4], Koen Wouters[4], Neelke De Munck[4], Franco Nori[2,5], Wim De Malsche[1]
[1] *Vrije Universiteit Brussel, BELGIUM,* [2] *RIKEN Saitama, JAPAN,* [3] *HZDR Dresden, GERMANY,* [4] *Brussels IVF, BELGIUM, and* [5] *University of Michigan, USA*

**W021.b CELLTRAP: A MICROFLUIDIC PLATFORM ENABLING CELL-CELL INTERACTIONS**
Muhammad Zia Ullah Khan[1], Morteza Hasanzadeh Kafshgari[1], Ali Bashiri Dezfouli[2], Mehmet Akif Sahin[1], Gabriele Multhoff[1], Ghulam Destgeer[1]
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**W022.b DURABLE BUBBLE-JET SORTER FOR CONTINUOUS AND HIGH-PERFORMANT BIO SAMPLE ISOLATION**
Thomas Hopfes[1], Radin Tahvildari[1], Koen de Wijs[1], Chi Dang[1], Jelle Fondu[1], Liesbet Lagae[1,2], Sarah Libbrecht[1]
[1] *imec, BELGIUM and* [2] *KU Leuven, BELGIUM*

**W023.b HIGH-THROUGHPUT SCREENING OF FILAMENTOUS FUNGI USING SOLID SUBSTRATES IN DROPLETS**
Chiara Leal Alves[1], Mari Valkonen[2], Adiphol Dilokpimol[2], Zhiyang Deng[1], Sarah Alkhaldi[1], Steve Shih[1]
[1] *Concordia University, CANADA and* [2] *VTT Technical Research Centre of Finland Ltd., FINLAND*

**W024.b HYDROGEL-BASED, ULTRAHIGH-THROUGHPUT SCREENING PLATFORM FOR THE ACCELERATION OF SYNTHETIC BIOLOGY**
Cayden Williamson, Moriel Dror, Yi Tang, Dino DiCarlo
*University of California, Los Angeles, USA*

**W025.b MICROFLUIDIC CELL MANIPULATION BY BIOMOLECULAR ARTIFICIAL MUSCLE-DRIVEN MICROGRIPPERS**
Yingzhe Wang[1], Xiangli Zeng[1], Takahiro Nitta[2], Yuichi Hiratsuka[3], Keisuke Morishima[1]
[1] *Osaka University, JAPAN,* [2] *Gifu University, JAPAN, and* [3] *Japan Advanced Institute of Science and Technology (JAIST), JAPAN*

**W026.b SURFACE TENSION TRAPS TO OBSERVE FRATRICIDE BETWEEN STREPTOCOCCUS PNEUMONIAE CELLS**
Anna Borowska, Donald A. Morrison, David T. Eddington
*University of Illinois, Chicago, USA*

## Cell Migration

**M028.b ON-CHIP RECONSTRUCTION OF CLINICALLY RELEVANT TUMOR-MICROENVIRONMENT INTERACTIONS THAT DRIVE BREAST CANCER CELLS MIGRATION**
Simona Visan[1], Valentina Pilecki[1], Oana Baldasici[1], Olga Soritau[1], Andrei Roman[1], Carmen Lisencu[1], Daniel Cruceriu[1], Laura Maja[1], Bogdan Pop[1], Bogdan Fetica[1], Loredana Balacescu[1] Ovidiu Balacescu[1], Aman Russom[2], Oana Tudoran[1,2]
[1] *Oncology Institute, ROMANIA and* [2] *KTH Royal Institute of Technology in Stockholm, SWEDEN*

**T027.b** **DIFFERENTIAL MIGRATORY RESPONSES OF CANCER CELL AND IMMUNE CELL TO WIRELESS ELECTRICAL STIMULATION**
Nicholas Palmerley[1], Yang Liu[1], Amanda Stefanson[1], Dumitru Tomsa[1], Amir Hossein Abolfathi[1], Xuehui Jiang[2], René P. Zahedi[1,2,3], John A. Wilkins[1,2], Ruey-Chyi Su[1,4], Francis Lin[1]
[1] *University of Manitoba, CANADA,* [2] *Manitoba Centre for Proteomics and Systems Biology, CANADA,* [3] *CancerCare Manitoba, CANADA, and* [4] *National Microbiology Laboratory, CANADA*

**T028.b** **PSEUDOPODIA PROTEOME FOR COMPOSITIONAL CHARACTERIZATIONS OF MIGRATING T CELLS USING 3D PRINTED CELL PROTRUSION ISOLATION DEVICES**
Yang Liu, Dumitru Tomsa, Xuehui Jiang, Amir Hossein Abolfathi, Nicholas Palmerley, René P. Zahedi, John A. Wilkins, Francis Lin
*University of Manitoba, CANADA*

**W027.b** **EFFECTS OF ADHESION TO ROD-SHAPED PARTICLES ON CELL SHAPE AND MIGRATION**
Masayuki Hayakawa, Hiroaki Suzuki
*Chuo University, JAPAN*

**W028.b** **QUANTITATIVE MEASUREMENTS OF DICTYOSTELIUM DISCOIDEUM AMOEBA SHEAR STRESS-DEPENDENT CELL ADHESION ANALYSIS AND MOTION IN A MICROFLUIDIC DEVICE**
Sepideh Fakhari, Clemence Belleannee, Steve Charette, Jesse Greener
*Université Laval, CANADA*

## Inter- and Intracellular Signaling

**M029.b** **COMBINING MULTIPLEX CELL MICROPATTERNING AND MICROFLUIDICS TO STUDY CELL-CELL COMMUNICATION IN MELANOMA**
Francesca Pollet[1], Ada Nowosad[2], Anaïs Lescroart[1], Roselien Verboven[1], Jolien Breukers[1], Karen Ven[1], Chris Marine[2], Jeroen Lammertyn[1]
[1] *KU Leuven, BELGIUM and* [2] *VIB-KU Leuven, BELGIUM*

**T029.b** **EXTRACELLULAR ADENOSINE TRIPHOSPHATE RELEASE KINETICS FOLLOWING MICROBUBBLE CAVITATION IN CULTURED HUMAN ENDOTHELIAL CELLS**
Marie Amate[1], Ju Jing Tan[1], Francis Boudreault[1], Ryszard Grygorczyk[1], Thomas Gervais[2], Francois Yu[1]
[1] *University of Montreal, CANADA and* [2] *Ecole Polytechnique Montréal, CANADA*

## Liposomes, Lipid Nanoparticles, Engineered Vesicles and Aggregates

**M030.b** **DEVELOPMENT OF A SIZE-CONTROLLED HYBRID EXOSOME PRODUCTION METHOD FOR RNA DELIVERY USING A MICROFLUIDIC DEVICE**
Masatoshi Maeki[1,2], Shota Oyama[1], Mitsue Hibino[1], Akihiko Ishida[1], Manabu Tokeshi[1]
[1] *Hokkaido University, JAPAN and* [2] *High Energy Accelerator Research Organization, JAPAN*

**M031.b** **MICROFLUIDIC-BASED PRODUCTION OF UNIFORM GIANT VESICLES WITH MEMBRANE PROTEINS BY DIRECT SYNTHESIS AND INSERTION**
Satoshi Nanjo[1], Mamiko Tsugane[1], Tomoaki Matsuura[2], Hiroaki Suzuki[1]
[1] *Chuo University, JAPAN and* [2] *Tokyo Institute of Technology, JAPAN*

**M032.b** **SINGLE-PARTICLE SPECTROSCOPIC HYDRODYNAMIC CHROMATOGRAPHY REVEALS HETEROGENEOUS RNA LOADING AND SIZE CORRELATIONS IN LIPID NANOPARTICLES**
Sixuan Li, Fangchi Shao, Yizong Hu, Jinghan Lin, Kuangwen Hsieh, Lai Wei, Tine Curk, Hai-Quan Mao, Tza-Huei Wang
*Johns Hopkins University, USA*

**T030.b** **FOULING-RESISTANT SI/GLASS MICROFLUIDIC CHIP FOR SCALABLE AND CONTINUOUS MANUFACTURING OF RNA LIPID NANOPARTICLES**
Yoon-Ho Hwang, David Issadore, Daeyeon Lee
*University of Pennsylvania, USA*

**T031.b** **NANOSCALE TOOLS FOR THE FORMATION OF COMPLEX GIANT UNILAMELLAR VESICLES**
Jorik Waeterschoot, Willemien Gosselé, Hojjat Alizadeh Zeinabad, Jeroen Lammertyn, Erin Koos, Xavier Casadevall i Solvas
*KU Leuven, BELGIUM*

**W029.b** **ASSEMBLY OF SINGLE DNA NANOPORE ON TARGETED LIPOSOMES USING DNA NANOPORE PROBE TECHNOLOGY**
Taisei Morikawa, Shun Okada, Hiroki Koiwa, Yukihiro Izawa, Hiromu Akai, Kan Shoji
*Nagaoka University of Technology, JAPAN*

**W030.b** **MAGNETICALLY-DRIVEN LIPOSOME ASSEMBLIES**
Shun Okada, Kan Shoji
*Nagaoka University of Technology, JAPAN*

**W031.b** **PREFERENCE MAPS FOR DESIGNING LIPID NANOPARTICLES: CELLULAR UPTAKE VS. PHYSICAL CHARACTERISTICS**
Niko Kimura[1], Shinya Sakuma[2]
[1] *Tokyo University of Agriculture and Technology, JAPAN and* [2] *Kyushu University, JAPAN*

## Others

**T041.b** **INVESTIGATING THE EFFECTS OF PULSED ELECTRIC FIELDS (PEFS) ON HUMAN OSTEOSARCOMA CELLS FOR OPTIMIZING ELECTROCHEMOTHERAPIES**
Thomas Nesmith
*Toronto MetropolitanUniversity, CANADA*

## Single-Cell Analysis

**M033.b** **DROPLET-BASED SINGLE-CELL FULL-LENGTH16S RRNA SEQUENCING**
Jian Zhang, Yifan Liu
*ShanghaiTech University, CHINA*

**M034.b** **EXPANDING THE CAPACITY OF OPTO-COMBINATORIAL INDEXING FOR MULTIMODAL SINGLE-CELL ANALYSIS**
Arata Tsuchida[1], Taikopaul Kaneko[2], Kaori Nishikawa[1], Mayu Kawasaki[1], Hirofumi Shintaku[1,2]
[1] *Institute of Physical and Chemical Research (RIKEN), JAPAN and* [2] *Kyoto University, JAPAN*

**M035.b** **HYDROGEL PARTICLE BI-FUNCTIONALIZATION PROMOTES SELECTIVE SECRETION CAPTURE AND ANTIBODY-SECRETING CELL PURITY**
Michael Mellody[1], Mihye Lee[1], Sevana Baghdasarian[1], Citra Soemardy[1], Richard James[2], Dino Di Carlo[1]
[1] *University of California, Los Angeles, USA and* [2] *Seattle Children's Hospital, USA*

**M036.b** **MICROFLUIDIC CELL MEMBRANE BARCODING FOR SECRETION KINETICS AND IMMUNE ESCAPE ANALYSIS**
Ying Xu, Chia-Hung Chen
*City University of Hong Kong, HONG KONG*

**M037.b** **PHENOTYPING DIFFERENTIATED FIBROBLAST BY IMPEDANCE DEFORMABILITY CYTOMETRY**
Junyu Chen, Daniel Spencer, Yihua Wang, Donna Davies, Mark Jones, Zijian Xu, Liudi Yao, Siyuan Wang, Kun Zheng, Hywel Morgan
*University of Southampton, UK*

**M038.b** **SINGLE-CELL IMPEDANCE CYTOMETRY TO EVALUATE MODE OF ACTION OF COLISTIN**
Xiang Wang[1], Bethany Martin[1,2], Daniel Spencer[1], Mark Sutton[2], Hywel Morgan[1]
[1] *University of Southampton, UK and* [2] *UK Health Security Agency, UK*

**M039.b** **TOWARDS PRECISION OPTOGENETIC CONTROL OF MAMMALIAN CELL SIGNALING PATHWAYS BASED ON MICROFLUIDICS**
Jialu Tian, Qianming Yan, Junwen Zhu, Ke A, Huichao Chai, Peng Zhao, Juncheng Wu, Xiaowo Wang, Wenhui Wang
*Tsinghua University, CHINA*

**T032.b** **AN OPTICAL-ELECTRICAL DEFORMABILITY CYTOMETER**
Xueping Zou, Daniel Spencer, Junyu Chen, Hywel Morgan
*University of Southampton, UK*

**T033.b** **DYNAMIC INVESTIGATION OF IMMUNE-CANCER CELL INTERACTIONS WITH A CONTROLLABLE CELL-PAIRING PLATFORM AND MASS SPECTROMETRY-BASED SINGLE-CELL PROTEOMICS ANALYSIS SYSTEM**
Qinqin Xu, Yirong Jiang, Yi Yang, Jianzhang Pan, Qun Fang
*Zhejiang University, CHINA*

**T034.b** **EXTENDING THE UTILITY OF A DIGITAL MICROFLUIDIC-BASED SINGLE-CELL -OMICS TOOL (TDISCO) TO TARGETED SPATIAL ASSAYS FOR GLIAL CELLS**
Savina R. Cammalleri[1,2], Erica Y. Scott[1], Jason Okpere[1], Maryam Faiz[1], Aaron R. Wheeler[1]
[1] *University of Toronto, CANADA and* [2] *Max Planck Institute, GERMANY*

**T035.b** **HIGH-THROUGHPUT AND MULTIPLEX ANALYSIS OF SINGLE-CELL, SINGLE-MITOCHONDRIAL DNA MUTATION USING HYDROGEL DROPLET MICROFLUIDICS AND ROLLING CIRCLE AMPLIFICATION**
Juhwan Park[1,2], Michelle Feng[1], Parnika Kadam[1], Yasemin Atiyas[1], Bonirath Chhay[1], Andrew Tsourkas[1], James Eberwine[1], David Issadore[1]
[1] *University of Pennsylvania, USA and* [2] *Kookmin University, KOREA*

**T036.b** **MICROFLUIDIC IMPEDANCE ANALYSIS OF CELL-LOADED NANOVIALS**
Cristian Brandi[1], Adele De Ninno[2], Filippo Ruggiero[2], Emanuele Limiti[3], Franca Abbruzzese[3], Marcella Trombetta[3], Alberto Rainer[3], Paolo Bisegna[1], Federica Caselli[1]
[1] *University of Rome Tor Vergata, ITALY,* [2] *Italian National Research Council, ITALY, and* [3] *Università Campus Bio-Medico di Roma, ITALY*

**T037.b** **PIP-PLEX: A PARTICLE-IN-PARTICLE SYSTEM FOR MULTIPLEX QUANTIFICATION OF PROTEINS SECRETED BY SINGLE CELLS**
Felix Lussier[1], Byeong-Ui Moon[2], Mojra Janta-Polczynski[2], Fabian Svahn[1], Molly Shen[1], Lidija Malic[2], Teodor Veres[2], Andy Ng[1], David Juncker[1]
[1] *McGill University, CANADA and* [2] *National Research Council of Canada, CANADA*

**T038.b** **SINGLE CELL ELECTRO-MECHANICAL PHENOTYPING WITH MICROFLUIDIC IMPEDANCE CYTOMETRY**
Junyu Chen, Daniel Spencer, Hywel Morgan
*University of Southampton, UK*

**T039.b** **VISCOELASTIC DEFORMABILITY CYTOMETRY: MECHANICAL PHENOTYPING IN LIQUID AND SOLID BIOPSIES**
Sarah Duclos Ivetich, Mohammad Asghari, Mahmut Kamil Aslan, Stavros Stavrakis, Andrew J. deMello
*ETH Zürich, SWITZERLAND*

**W032.b** **CELLULAR-IMAGING AND WELL-PLATE INDEXING (CIWI): A NEW PLATFORM FOR IMAGING AND SEQUENCING SINGLE CELLS**
Boden B. Eakins[1], Aaron M. Streets[1,2]
[1] *University of California, Berkeley, USA and*
[2] *Chan Zuckerberg Biohub SF, USA*

**W033.b** **EIS MONITORING OF SINGLE YEAST GROWTH AND DISSECTION ON A MEA-INTEGRATED MICROFLUIDIC DEVICE**
Haoran Wu[1], Yulu Geng[1], Yanze Shi[1], Zixin Wang[2], Yingying Wang[1], Zhen Zhu[1]
[1] *Southeast University, CHINA and* [2] *Sun Yat-Sen University, CHINA*

**W034.b** **HIGH-THROUGHPUT AND HIGH-EFFICIENT SINGLE CELL-IN-DROPLET ENCAPSULATION BASED ON PARTICLE ORDERING BY VISCOELASTIC AND ACOUSTOPHORETIC FORCES**
Youngseo Cho[1], Sangwook Lee[2], Younghak Cho[1]
[1] *Seoul National University of Science and Technology, KOREA and* [2] *PCL Inc., KOREA*

**W035.b** **IMPEDANCE-MASS DUAL FLOW CYTOMETRY FOR MULTI-MODAL SINGLE CELL ANALYSIS**
Junwen Zhu, Huichao Chai, Peng Zhao, Wenhui Wang
*Tsinghua University, CHINA*

**W036.b** **MICROFLUIDIC TOOLS FOR STUDYING SINGLE CELL SECRETIONS: A CASE STUDY ON HYBRIDOMA ANTIBODY SECRETION**
Julie Van Lent[1], Iene Rutten[1], Karen Ven[1], Jolien Breukers[1], Eleonore Verstraete[1], Katrien Van der Borgt[2], Julie Van Duyse[2], Kristina Fokias[1], Maya Imbrechts[1], Gert Van Isterdael[2], Karen Vanhoorelbeke[1], Nick Geukens[1], Jeroen Lammertyn[1]
[1]*KU Leuven, BELGIUM and* [2]*VIB Flow Core, BELGIUM*

**W037.b** **RED BLOOD CELL LENGTH CHANGE PHENOMENON WITHIN THE CONSTRICTION**
Mitsuhiro Horade[1], Kimihiro Sakamoto[2], Shuichi Murakami[3]
[1]*Setsunan University, JAPAN,* [2]*National Defense Academy of Japan, JAPAN, and* [3]*Osaka Research Institute of Industrial Science and Technology, JAPAN*

**W038.b** **SINGLE-CELL IMPEDANCE SPECTROSCOPY AND DOUBLE SHELL MODEL**
Xueping Zou, Daniel Spencer, Hywel Morgan
*University of Southampton, UK*

## Synthetic Biology and Artificial Cells

**M040.b** **LIVING META-SURFACE SENSOR TO SCREEN SINGLE-CELL SECRETIONS FOR BIO-FABRICATION**
Wenxin Jiang, Chia-Hung Chen
*City University of Hong Kong, HONG KONG*

**M041.b** **THE POWER OF A DROP IN SYNTHETIC BIOLOGY DNA ENTRAP: A DROPLET MICROFLUIDIC PLATFORM FOR ENHANCED DNA TRANSFER BETWEEN MICROBIAL SPECIES**
Jose A. Wippold[1], Monica Chu[1], Rebecca Renberg[1], Yuwen Li[2], Bryn L. Adams[1], Arum Han[2]
[1]*Army Research Laboratory, USA, and* [2]*Texas A&M University, USA*

**T040.b** **PH-MODULATING POLYMERIC MICROCAPSULES: PKA-DEPENDENT SELF-REGULATION AND ENZYMATIC PH CONTROL**
Joshua Krehan, Andreas Walther
*University of Mainz, GERMANY*

**W039.b** **INTEGRATION OF OPTOGENETICS AND MICROFLUIDICS FOR CONTROLLING GENE EXPRESSION**
Aniket A. Kandalkar, James M. Perry, Joel Phillips, Samuel R. Little, Steve C.C. Shih
*Concordia University, CANADA*

**W040.b** **PRESSURE DEPENDENCE OF IMPROVED PROTEIN RECONSTITUTION AND MECHANICAL STIMULATION FOR ELECTROPHYSIOLOGICAL RECORDING OF MECHANOSENSITIVE CHANNELS**
Bong Kyu Kim[1,2], Dong-Hyun Kang[1], Seok Chung[1,2], Tae Song Kim[1]
[1]*Korea Institute of Science and Technology (KIST), KOREA and* [2]*Korea University, KOREA*

## Late News

**M506.b** **A MICROFLUIDIC PLATFORM FOR EXTRACTION AND ANALYSIS OF BACTERIAL CHROMOSOMES**
Alex Joesaar, Martin Holub, Cees Dekker
*Delft University of Technology, NETHERLANDS*

**M507.b** **IDENTIFYING TUMOR CELLS AT THE SINGLE-CELL LEVEL WITHOUT PREVIOUS KNOWLEDGE USING SCATTERING SNAPSHOTS**
David Dannhauser[1], Paolo Antonio Netti[1,2], Filippo Causa[1]
[1]*University of Naples, Federico II, ITALY and* [2]*Istituto Italiano di Tecnologia, ITALY*

**M508.b** **SINGLE-CELL SECRETED PROCOLLAGEN ASSAY USING FUNCTIONALIZED NANOVIALS**
Yuta Nakagawa, Michael Mellody, Dino Di Carlo
*University of California, Los Angeles, USA*

**T506.b** **A SIMPLE METHOD OF FORMING LIPOSOME BY USING HYDROPHILIC-HYDROPHOBIC COMPOSITE MICROFLUIDIC DEVICES**
Yiting Zhang, Naoki Sasaki
*Rikkyo University, JAPAN*

**T507.b** **INTEGRATING ELECTROCHEMICAL SENSING USING REDOX-LABELLED APTAMERS WITH DIELECTROPHORETIC SINGLE-CELL TRAPPING FOR CANCER CELL DETECTION**
Hanye Dai[1], Shuo Li[1], Akira Fujiwara[2], Nicolas Clément[1], Soo Hyeon Kim[1]
[1]*University of Tokyo, JAPAN and* [2]*NTT Basic Research Laboratories, JAPAN*

**T508.b** **SURFACE ENGINEERING OF ARTIFICIAL CELLS TO INTERROGATE TISSUE MECHANOBIOLOGY: POLYACRYLAMIDE MICROGEL DROPLET SURFACE MODIFICATION WITH DIAZIRINE-BASED CROSSLINKERS**
Alejandro Forigua, Christina-Marie Boghdady, Christopher Moraes
*McGill University, CANADA*

**W506.b** **DIELECTROPHORETIC ISOLATION OF MELANOMA CELLS FOLLOWED BY SINGLE-CELL PROTEASE ACTIVITY TO EVALUATE INVASIVE POTENTIAL**
Benjamin T. Schelske, Ethan H. Leung, Joseph T. Banovetz, Jared L. Anderson, Robbyn K. Anand
*Iowa State University, USA*

**W507.b** **LEUKOCYTE DIFFERENTIAL BASED ON AN IMPEDANCE FLOW CYTOMETRY COUPLED WITH VIRTUAL CONSTRICTION MICROCHANNELS**
Xiao Chen[1,2], Minruihong Wang[1,2], Yimin Li[1,2], Xukun Huang[1,2], Yuan Wang[1], Junbo Wang[1,2], Xiaoye Huo[1,2], Jian Chen[1,2]
[1]*Chinese Academy of Sciences, CHINA and* [2]*University of Chinese Academy of Sciences, CHINA*

**W508.b** **TOWARDS DESIGNER NANOBUBBLES: CONCENTRATING MONODISPERSE AND STABLE MICROFLUIDIC NANOBUBBLES WITH AQUEOUS TWO-PHASE SYSTEMS**
Steven B. H. Tran, Michael C. Kolios, Scott S. H. Tsai
*Toronto Metropolitan University, CANADA*

## c - Environment, Energy, Agriculture, and Food

### Agriculture and Plant Analysis

**M042.c** **INTEGRATED MICROFLUIDIC PLATFORM FOR ISOLATION AND IRRADIATION OF CHLOROPLASTS TOWARDS GENE EXPRESSION ANALYSIS**
Oriana G. Chavez[1], Pablo E. Guevara[1], Victor M. Marín[2], Luis D. Patiño[2], Gabriel A. Caballero[1], Clelia De la Peña[2], Daniel A. May[3], Jose L. Garcia[1]
[1]*Centro de Investigación y de Estudios Avanzados del IPN (CINVESTAV), MEXICO,* [2]*Centro de Investigación Científica de Yucatán (CICY), MEXICO, and* [3]*Centro de Investigaciones en âptica (CIO), MEXICO*

**M043.c** **PLANT-DRIVEN ACTUATORS FOR PUMPING APPLICATIONS**
Ryosuke Tani, Minghao Nie, Shoji Takeuchi
*University of Tokyo, JAPAN*

**T042.c** **MICROFLUIDIC CHANNELS FOR PERFORMING ANTIMICROBIAL SUSCEPTIBILITY TEST OF NATURAL COMPOUNDS AGAINST XYLELLA FASTIDIOSA GROWTH**
Francesca Costantini[1], Nicola Lovecchio[1], Valeria Scala[2], Stefania Loreti[2], Nicoletta Pucci[2]
[1]*Sapienza University of Rome, ITALY and* [2]*CREA-DC, ITALY*

**W041.c** **AUTOMATED PLANT PATHOGEN DETECTION USING LAB-ON-A-DISC (LOAD) AND SECONDARY MOTION TECHNOLOGY**
Abrar Abdelsalam[1,2], Matthew Cavazzana[1], David J. Kinahan[1,2], Eadaoin Carthy[1,2]
[1]*Dublin City University, IRELAND and* [2]*RAPID Institute, IRELAND*

**W042.c** **PAPER-BASED MICROFLUIDIC DETECTION AND QUANTIFICATION OF MICRORNA 408 AS AN INDICATOR OF STRESS RESPONSES IN CROPS**
F. Nicolas Nazar[1], Stefania Pellegrini[1], Enrique Azuaje-Hualde[1], Xabier Arciniega[1], Pablo E. Guevara-Pantoja[1], Lourdes Basabe-Desmonts[1,2], Fernando Benito López[1]
[1]*Microfluidics Cluster UPV/EHU, SPAIN and*
[2]*Basque Foundation for Science, SPAIN*

### Artificial Meat

**M044.c** **STRETCHABLE AND PERFUSABLE 3D CULTURE SYSTEM TOWARD MATURED AND SCALE-UP CULTURED MEAT FORMATION**
Jung-Chun Sun, Byeongwook Jo, Shoji Takeuchi
*University of Tokyo, JAPAN*

**T043.c** **CULTURED MEAT CONSTRUCTED WITH CONTRACTIBLE CORE-SHELL FIBERS THROUGH BOVINE PLASMA-ALGINATE**
Asa Hasegawa, Kensei Okada, Byeongwook Jo, Shoji Takeuchi
*University of Tokyo, JAPAN*

**W043.c** **EDIBLE AND DEGRADABLE PLASMA-ALGINATE MICROCARRIERS FOR CULTURED MEAT**
Kensei Okada, Byeongwook Jo, Minghao Nie, Shoji Takeuchi
*University of Tokyo, JAPAN*

## Food Sampling and Analysis

**M045.c** **GENETIC IDENTIFICATION OF THREE CITES-LISTED SHARKS USING A PAPER-BASED LAB ON A CHIP**
Guuske P. Tiktak[1], Alexandria GabB[1], Margarita Brandt[2], Fernando R. Diz[3], Karla Bravo-Vasquez[4], César Peñaherrera-Palma[5], Jonathan Valdiviezo-Rivera[6], Aaron J. Carlisle[7], Louise M. Melling[1], Bradley Cain[1], David Megson[1], Richard Preziosi[1], Kirsty J. Shaw[1]
[1]*Manchester Metropolitan University, UK,* [2]*Universidad San Francisco de Quito, ECUADOR,* [3]*WWF Fisheries, ECUADOR,* [4]*Viceministerio de Acuacultura y Pesca del Ecuador, ECUADOR,* [5]*MigraMar, USA,* [6]*Instituto Nacional de Biodiversidad, ECUADOR, and* [7]*University of Delaware, USA*

**T045.c** **NOVEL OIL-WATER SEPARATOR IN A THREAD-BASED MICROFLUIDIC PLATFORM FOR MASS SPECTROMETRY DETECTION OF OLEOPHILIC AND HYDROPHILIC SPECIES**
Chun-Chih Kao, Che-Hsin Lin
*National Sun Yat-sen Universit, TAIWAN*

**W044.c** **FOOD-SAFE, ENVIRONMENT-RESPONSIVE MICRONEEDLES FOR CONSUMER-LEVEL MONITORING OF SPOILAGE WITHIN PACKAGED FISH**
Shadman Khan, Akansha Prasad, Mahum Javed, Roderick Maclachlan, Carlos D.M. Filipe, Tohid F. Didar
*McMaster University, CANADA*

**W045.c** **IN SITU SALMONELLA CONTAMINATION DETECTION IN WHOLE CHICKEN WITH LAB-IN-A-PACKAGE**
Akansha Prasad, Shadman Khan, Jiuxing Li, Carlos Filipe, Yingfu Li, Tohid Didar
*McMaster University, CANADA*

## Fuel Cells and Electrolyzers

**M046.c** **ALL-GRAPHITE MICROFLUIDIC MICROBIAL FUEL CELL: FROM CONCEPT TO STACKS**
Linlin Liu[1], William Varroy[1], Marc-Antoine Bansept[1], Changhong Cao[2], Denis Boudreau[1], Jesse Greener[1]
[1]*Université Laval, CANADA and* [2]*McGill University, CANADA*

**T046.c** **FUEL DELIVERY SYSTEM WITH SEQUENTIAL OPERATION OF STACKED CLOCKWORKS APPLICABLE TO FUEL CELL**
Won Han, Thangavel Balamurugan, Joong Ho Shin
*Pukyong National University, KOREA*

**W046.c** **ON-CHIP THERMALLY RECYCLED AMMONIA BATTERIES: BENCHMARKING AND HIGH ENERGY DENSITIES**
Haleh Baghernavehsi[1], Linlin Liu[1], Derek M. Hall[3], Jesse Greener[1]
[1]*Université Laval, CANADA and* [2]*Penn State University, USA*

## Hydrogen

**M047.c** **EVOLUTION OF TRAPPED BUBBLES IN UNDERGROUND HYDROGEN STORAGE**
Mohammad Salehpour, Benzhong (Robin) Zhao
*McMaster University, CANADA*

## Integration and Autonomous

**T047.c** **SPERM CELL ORIENTATION IN HYDRODYNAMIC FOCUSING FOR SEMEN SEXING**
Wujun Zhao, Mohammad Manshadi, Yuqian Zhang, Zheng Xia
*ABS Global Inc., USA*

## Microorganisms

**M048.c** **MORPHOLOGICAL IDENTIFICATION OF SOIL-BORNE PLANT PATHOGENS USING MICROFLUIDIC SOIL MODELS AND DEEP LEARNING IMAGE ANALYSIS**
Erik Karlsson[1], Julia Forsbacka[1], Hanbang Zou[1], Pelle Ohlsson[1], Kristian Enkvist[2], Edith Hammer[1]
[1]*Lund University, SWEDEN and* [2]*Independent Researcher, SWEDEN*

**T048.c** **SEAMLESS OSMOTIC STIMULATIONS TO FLOWING CELLS FOR OSMOADAPTATION-BASED CELL SEPARATION**
Makoto Saito, Hiroki Fukunaga, Naotomo Tottori, Yoko Yamanishi, Shinya Sakuma
*Kyushu University, JAPAN*

**W047.c** **MICROFABRICATED SYSTEMS TO OPTIMIZE MYCELIUM COLONIZATION OF FUNGAL BIOCOMPOSITE MATERIALS**
Alexandre Leblond, Christopher Moraes
*McGill University, CANADA*

## Oil, Gas and Mining

**M049.c** **OPTIMIZING INTEGRATED MICROFLUIDIC BIODIESEL PRODUCTION: A GENETIC ALGORITHM AND NEURAL NETWORK APPROACH**
Chun-Yang Huang, Szu-I Yeh, Yi-Shiuan Tsai, Steven Iversen
*National Cheng Kung University, TAIWAN*

**W048.c** **MICROMIBA PROJECT: ANALYSIS OF BACTERIAL BIOMINING PROCESSES INSIDE MICROFLUIDIC CHIPS TOWARDS FUTURE EXPERIMENTS UNDER MICROGRAVITY CONDITIONS**
Marco Mairena-Salazar, Felipe Bustamante, Catalina Porras-Silesky, Arnoldo Castro, Leonardo Lesser-Rojas
*University of Costa Rica, COSTA RICA*

## Others

**W050.c** **MICROFLUIDICS IS COMING FOR YOUR THERMOPHYSICAL FLUID PROPERTIES: NEW MEASUREMENT METHODS FOR AN ENERGY-INDUSTRY-PROVEN MICROFLUIDIC PLATFORM**
Mohammad Zargartalebi[1], Tom D. Haas[2], David Sinton[1]
[1]*University of Toronto, CANADA and* [2]*Interface Fluidics Ltd., CANADA*

## Pollution - Chemicals, Nanparticles, Nanoplastics

**W049.c** **A MICROFLUIDIC PLATFORM FOR ENVIRONMENTAL NANOPLASTIC ANALYSIS**
Eric Johnston, Victor M. Ugaz
*Texas A&M University, USA*

## Water

**M050.c** **ADDITIVE MANUFACTURED ELECTRONICS (AME) FOR INTEGRATED MICROFLUIDIC IMPEDANCE SPECTROSCOPY**
Haiyang Yun[1], Yilmaz A. Manav[1], Enise F. Altin[1], Mehdi Y. Arzefouni[1], Jacky Borenstein[2], Benyamin Davaji[1,3]
[1]*Northeastern University, USA,* [2]*NanoDimensions, USA, and* [3]*Institute for NanoSystem Innovation, USA*

**T049.c** **(BIOSENSE) BIOSENSOR-BASED INTEGRATED OBSERVATION STRATEGIES TOWARD EMERGING NEW SUBSTANCES FOR ENVIRONMENTAL MONITORING**
Fiona Regan, Caroline Murphy, Paul Leonard, Ciprian Briciu-Burghina
*Dublin City University, IRELAND*

**T050.c** **SCALABILITY OF ION CONCENTRATION POLARIZATION-BASED WATER PURIFICATION PLATFORM**
Zisun Ahmed, Beatrise Berzina, Robbyn K. Anand
*Iowa State University, USA*

## Late News

**M509.c** **FAST PCR UTILIZING A FILM CHIP ON A ROTATING ROLLER FOR UNMANNED CONTINUOUS DETECTION OF AIRBORNE VIRUSES**
Kwang Hyo Chung, Chang-Geun Ahn, You Jin Kim
*Electronics and Telecommunications Research Institute, KOREA*

**M510.c** **PATHFINDING STRATEGY OF CANDIDA ALBICANS HYPHAE IN A NETWORK OF OBSTACLES**
Luna Kaiser[2], Domenico Catucci[2], Christophe Lalanne[2], Antoine Rittaut[1], Igor M. Kulic[1], Catherine Villard[1,2]
[1]*CNRS, FRANCE and* [2]*CNRS/Université Paris Cité, FRANCE*

**T509.c** **MICROFLUIDIC SIZE EXCLUSION CHROMATOGRAPHY FOR SUSTAINABLE NANOPLASTIC DETECTION**
Liyuan Gong, Payel Biswas, Bryan Varela, Samantha Kipper, Irene Andreu, Yang Lin
*University of Rhode Island, USA*

**T510.c** **REAL-TIME TRACKING AND FORCE QUANTIFICATION OF ROOT - BACTERIA INTERACTIONS AT SINGLE-CELL LEVEL IN AN OPEN-CHANNEL MICROFLUIDICS SETUP**
Yilei Xue, Mackenzie E. Loranger, Keiko Yoshioka, Ruby M. Sullan
*University of Toronto, CANADA*

**W509.c** **MICROFLUIDIC STUDY OF CYCLIC INJECTION AND MICROBIAL ACTIVITY ON H2 RECOVERY AND LOSS MECHANISMS DURING UNDERGROUND H2 STORAGE**
Na Liu, Martin Fernø
*University of Bergen, NORWAY*

**W510.c** **μMISPE-MS: REPACKABLE MICROFLUIDIC MOLECULARLY IMPRINTED SOLID-PHASE EXTRACTION COUPLED WITH MASS SPECTROMETRY FOR RAPID DETECTION OF MYCOTOXIN IN AGRI-FOOD MATRICES**
Marti Z. Hua[1], Jinxin Liu[1], David R. McMullin[2], Yaxi Hu[2], Xiaonan Lu[1]
[1] *McGill University, CANADA and* [2] *Carleton University, CANADA*

## d - Fundamentals in Microfluidics and Nanofluidics

### Acousto- and Magnetofluidic

**M051.d** **A DIGITAL FERROFLUIDIC PLATFORM FOR OPERATING DIFFERENT FORMATS OF FERRO-DROPLETS**
Chengzhi Zhang[1,2], Ruotong Zhang[1], Haotian Liu[2], Xing Cheng[2], Haisong Lin[1,3], Ho Cheung Shum[1,3]
[1] *University of Hong Kong, HONG KONG,* [2] *Southern University of Science and Technology, CHINA, and* [3] *Advanced Biomedical Instrumentation Centre, HONG KONG*

**M052.d** **INCREASED THROUGHPUT AND CAPACITY OF NM-PARTICLE AND EXTRACELLULAR VESICLE TRAPPING USING AN ULTRASOUND ACTIVATED PACKED BED**
Michael Gerlt, Thomas Laurell
*Lund University, SWEDEN*

**M053.d** **RAPID AND DIRECT SEPARATION OF BLOOD PLASMA WITH NEGATIVE MAGNETOPHORESIS**
Lin Zeng
*Chinese Academy of Sciences, CHINA*

**M054.d** **THEORETICAL AND EXPERIMENTAL EVALUATION OF ROTATION OF MICROOBJECTS BASED ON A VIBRATION-INDUCED FLOW**
Masatomo Arai, Takeshi Hayakawa
*Chuo University, JAPAN*

**T051.d** **ACOUSTIC PATTERNING OF MICROPARTICLES BY DIGITALLY CONTROLLED DROPLET-BASED WAVEGUIDE**
Zhen Wang[1], Fenggang Li[1], Huikai Xie[1], Rongxin Fu[1], Hang Li[1], Yucheng Luo[2], Zhichao Ma[2], Shuailong Zhang[1], Yao Lu[1]
[1] *Beijing Institute of Technology, CHINA and*
[2] *Shanghai Jiao Tong University, CHINA*

**T052.d** **NOVEL ACOUSTOFLUIDIC THIN-FILM DEVICE FOR HIGH THROUGHPUT APPLICATIONS**
Andreas Lenshof[1], Ramin Matloub[2], Pelle Ohlsson[3], Igor Lubomirsky[4], Henrik Bruus[5], Nini Pryds[5], Vincenzo Esposito[5], Paul Muralt[2,6], Thomas Laurell[1]
[1] *Lund University, SWEDEN,* [2] *Piemacs SARL, SWITZERLAND,* [3] *AcouSort AB, SWEDEN,* [4] *Weizmann Institute, ISRAEL,* [5] *Technical University of Denmark, DENMARK, and* [6] *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

**T053.d** **SYMPHONY OF SOUND: A NOVEL ACOUSTIC MODULATION OF OSCILLATING THIN ELASTIC MEMBRANE FOR ENHANCED STREAMING IN MICROFLUIDICS AND NANOSCALE LIPOSOME PRODUCTION**
Ali V. Pourabdollah, Faruk Aksoy, Gurkan Yesiloz
*Bilkent University, TURKEY*

**T054.d** **TWO-DIMENSIONAL TRAPPING AND ROTATIONAL MANIPULATION OF PANAGRELLUS REDIVIVUS BY SUPERPOSED BULK ACOUSTIC WAVES**
Andreas Fuchsluger[1], Tina Mitteramskogler[1], Annalisa De Pastina[2], Bernhard Jakoby[1]
[1] *Johannes Kepler University Linz, AUSTRIA and*
[2] *Silicon Austria Labs, AUSTRIA*

**W051.d** **BULK ACOUSTIC WAVE-INTEGRATED MICROFLUIDIC PROBE TO MANIPULATE FLUIDS AND MICROPARTICLES**
Waqas Waheed[1], Mohammad A. Qasaimeh[1,2]
[1] *New York University, Abu Dhabi, UAE and* [2] *New York University, USA*

**W052.d** **ON-DEMAND VARIOUS-SIZED TUMOR SPHEROIDS VIA TRAVELLING SURFACE ACOUSTIC WAVES**
Yongtaek Im, Daesik Kwak, Hyung Jin Sung, Jessie S. Jeon
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**W053.d** **TEMPERATURE CYCLE WITH SURFACE ACOUSTIC WAVE DEVICES FOR PCR APPLICATIONS**
Clémence Biscara[1], Cécile Floer[1], Olivier Joubert[1], Mélanie Leroux[1], Laurent Badie[1], James Friend[2], Omar Elmazria[1]
[1] *Université de Lorraine, FRANCE and*
[2] *University of California, San Diego, USA*

## Capillary Microfluidics

**M055.d** **ENSURING HIGH REPRODUCIBILITY AND RELIABLE PERFORMANCE OF CAPILLARY-DRIVEN MICROFLUIDICS AT THE POINT-OF-NEED**
Ifeoluwa Babalola[1], Jose C. Contreras-Naranjo[1], Oyindamola Aje[1], Ghada Abdelrahman[2], Victor M. Ugaz[1]
[1] *Texas A&M University, USA and* [2] *Texas A&M University, QATAR*

**T055.d** **REVERSABLE CAPILLARY CIRCUIT ACTUATION: NEW CFET FUNCTIONALITY TO AUTOMATE FLUID MANIPULATION IN PORTABLE ASSAYS**
Daniel Mak[1], Claude Meffan[1,2], Julian Menges[1], Rhys Marchant-Ludlow[1], Azy Hashemi[1], Renwick Dobson[1], Volker Nock[1]
[1] *University of Canterbury, NEW ZEALAND and*
[2] *Victoria University of Wellington, NEW ZEALAND*

**W054.d** **ACTUATED PINCHED CAPILLARY FLOWS VIA TRIGGER VALVES IN OPEN-CHANNEL GEOMETRY**
Jodie C. Tokihiro[1], Ingrid Robertson[1], Albert Shin[1], Denise Gregucci[1,2], Tristan M. Nicholson[1], Ayokunle Olanrewaju[1], Ashleigh B. Theberge[1], Jean Berthier[1], Erwin Berthier[1]
[1] *University of Washington, USA and* [2] *University of Bologna, ITALY*

**W055.d** **TOWARDS QUANTITATIVE ASSAYS IN LOW-RESOURCE-SETTINGS WITH A LOW-COST, ROBUST, FAST, AND EQUIPMENT-FREE PARTITIONING PLATFORM MADE OF THERMOPLASTIC**
Phenix-Lan Quan, Maria Alvarez-Amador, Amir Salimov, Yuhe Jiang, Martin Sauzade, Eric Brouzes
*Stony Brook University, USA*

## Centrifugal Microfluidics

**M056.d** **AN ADJUSTABLE ELUENT MIXER FOR STEPWISE GRADIENT ELUTION IN REVERSED-PHASE LIQUID CHROMATOGRAPHY ON A CENTRIFUGAL PLATFORM**
Chih-Hsin Shih
*Feng Chia University, TAIWAN*

**M057.d** **HIGH-THROUGHPUT CENTRIFUGAL PRODUCTION OF ALGINATE BEADS USING A FULLY 3D-PRINTED MULTI-NOZZLE DEVICE**
Yu Suzuki, Kensei Okada, Minghao Nie, Shoji Takeuchi
*University of Tokyo, JAPAN*

**T056.d** **COMPUTER VISION-ENABLED CENTRIFUGAL MICROFLUIDIC PLATFORM: SAMPLE-TO-ANSWER NUCLEIC ACID-BASED DIAGNOSTICS IN POINT-OF-CARE SETTINGS**
Ahmad Saleem Akhtar[1], Noa Lapins[1], João M. Moura[2], Luis Paula[2], Adriano Pedro[2], Fabio Martins[2], Duarte Mota[2], Inês F. Pinto[1], Marco Martins[2], Aman Russom[1]
[1]*KTH Royal Institute of Technology, SWEDEN and*
[2]*International Iberian Nanotechnology Laboratory, PORTUGAL*

**T057.d** **MICROPARTICLE-SYNTHESIZED SYSTEM BY ULTRASOUND AND CENTRIFUGATION FOR HIGH-VISCOSITY FLUIDS**
Yuta Bando[1], Hiroaki Onoe[2], Yoshiyuki Tagawa[1], Yuta Kurashina[1]
[1]*Tokyo University of Agriculture and Technology, JAPAN and*
[2]*Keio University, JAPAN*

**W056.d** **DEVELOPING A MODULAR FRACTION COLLECTOR FOR CONDUCTING CHROMATOGRAPHY ON A CENTRIFUGAL PLATFORM FOR PROTEIN SEPARATION**
Chih-Hsin Shih
*Feng Chia University, TAIWAN*

## Digital Microfluidics

**M058.d** **A BACTERIAL ENDOTOXIN TEST ON A NOVEL SELF-CONTAINED DIGITAL MICROFLUIDICS PLATFORM**
Jurgen Frasheri, Bingyu B. Li, Ian Swyer, Michael Dryden, Alexandros Sklavounos, Aaron R. Wheeler
*University of Toronto, CANADA*

**M059.d** **OPTIMIZED DIELECTRIC STACK FOR IMPROVING PERFORMANCE OF 3D DIGITAL MICROFLUIDIC PLATFORMS IN CELL CULTURING**
Mert Ozden, Burcu Gumuscu
*Eindhoven University of Technology, NETHERLANDS*

**T058.d** **HIGHLY EFFICIENT PHAGE DISPLAY METHOD BASED ON THE ACTIVE-MATRIX DIGITAL MICROFLUIDICS TECHNOLOGY**
Siyi Hu[1,2], Jianle Huang[2], Jiahao Li[3], Mude Shi[2], Hanbin Ma[1,2,3]
[1]*Chinese Academy of Sciences, CHINA,* [2]*Guangdong ACXEL Micro & Nano Tech Co., Ltd., CHINA, and* [3]*ACX instruments Ltd, UK*

**W057.d** **5×10$^5$-MICROWELL HIGHLY PRECISE DIGITAL PCR WITH WIDE-FIELD OPTICAL SYSTEM**
Yoshio Kamura, Yoshiki Nakamura, Tatsuo Nakagawa
*Hitachi, Ltd., JAPAN*

W058.d **MINI-MAGBEAD: A SMALL AUTOMATED MAGNETIC BEAD CONCENTRATION PLATFORM BASED ON DIGITAL MICROFLUIDICS FOR IMMUNOASSAYS**
Jose G. Camacho Valenzuela, Nguyen Le, Alinaghi Salari, Alexandros Sklavounos, Aaron R. Wheeler
*University of Toronto, CANADA*

## Droplet Microfluidics

M060.d **ACOUSTIC STREAMING FLOW INDUCED DYNAMIC CONTROL OF PICOLITER DROPLETS CHEMICAL CONCENTRATION**
Woohyuk Kim, Jinsoo Park
*Chonnam National University, KOREA*

M061.d **DEVELOPMENT AND ASSESSMENT OF NANOFLUIDIC DROPLETS WITH EXTENDED LIFETIMES**
Nattapong Chantipmanee[1], Yuto Tanaka[1], Hiroto Kawagishi[2], Yan Xu[1,2,3]
[1]*Osaka Metropolitan University, JAPAN,* [2]*Osaka Prefecture University, JAPAN, and* [3]*Japan Science and Technology Agency (JST), JAPAN*

M062.d **GENERATION OF SIZE CONTROLLABLE MONODISPERSE DROPLET DEPENDING ON THE CONTINUOUS FLOW DIRECTION USING MICROFLUIDIC CHANNELS WITH HIGH-ASPECT-RATIO ASYMMETRIC CROSS-SECTION**
Youngseo Cho, Younghak Cho
*Seoul National University of Science and Technology, KOREA*

M063.d **INTEGRATED MICROFLUIDIC PLATFORM FOR SINGLE-CELL ANALYSIS REVEALING THE MATRIX MECHANICAL REGULATION ON CSCS**
Jialei Song, Yi Liu, Mo Yang
*Hong Kong Polytechnic University, CHINA*

M064.d **OPTIMAL CHANNEL WIDTH OF MICROFLUIDIC DEVICES TOWARD SINGLE-CELL ENCAPSULATION IN MICRODROPLETS**
Risa Fujita, Masashi Kobayashi, Daiki Tanaka, Yuka Adachi, Tetsushi Sekiguchi, Shuichi Shoji, Masahiro Furuya, Takashi Tanii
*Waseda University, JAPAN*

M065.d **THE OPTIDROP MICROFLUIDIC ANALYZER AND SORTER: FIBER OPTICS INTEGRATED SYSTEM FOR MULTIPLEXED OPTICAL DETECTION AND SORTING OF SINGLE CELLS IN DROPLETS**
Preksha Gupta[1], Ambili Mohan[2], Atindra Nair[1], Dhanush Balekai[1], Neeladri Chowdhury[1], Anil Prabhakar[2], Taslimarif Saiyed[1]
[1]*Centre for Cellular and Molecular Platforms (C-CAMP), INDIA and* [2]*Indian Institute of Technology Madras (IITM), INDIA*

T059.d **A DOUBLE EMULSION DROPLET DIGITAL CRISPR/CAS12A ASSAY FOR ULTRASENSITIVE AND RAPID ABSOLUTE QUANTIFICATION OF VIRAL DNA**
Yang Zhang, Ming Li
*University of New South Wales, AUSTRALIA*

T060.d **CONTINUOUS PRODUCTION OF SINGLE-CELL-LADEN MICROGELS THROUGH DETERMINISTIC LATERAL DISPLACEMENT MICROPILLAR ARRAYS**
Hiroki Fukunaga, Naotomo Tottori, Shinya Sakuma, Yoko Yamanishi
*Kyushu University, JAPAN*

**T061.d** **DEVELOPMENT OF A METHOD FOR LIQUID INJECTION INTO FEMTOLITER DROPLET IN A NANOFLUIDIC CHANNEL UTILIZING LAPLACE PRESSURE**
Yuki Watabe[1], Yuki Mita[1], Xin Jiang[1,2], Yutaka Kazoe[1]
[1]*Keio Univercity, JAPAN and* [2]*Kanagawa Institute of Industrial Science and Technology, JAPAN*

**T062.d** **HIGH-EFFICIENCY INTERDIGITATED ELECTRODE-BASED DROPLET MERGER UNDER POLYDISPERSE DROPLET MICROFLUIDIC CONDITIONS**
Jeong Jae Han, Han Zhang, Yuwen Li, Arum Han
*Texas A&M University, USA*

**T063.d** **MICROFLUIDIC ENCAPSULATION OF CELLS IN HOLLOW HYDROGEL MICROCAPSULES FOR IN VIVO AND IN VITRO THERAPEUTIC APPLICATIONS**
Nicholas Soucy, Simon Chewchuck, Fan Wan,
James Harden, Michel Godin
*University of Ottawa, CANADA*

**T064.d** **PUMPLESS MICROFLUIDIC SYSTEM FOR CREATING UNIDIRECTIONAL FLOW PATTERNS FOR ON-CHIP ENDOTHELIAL CELL CULTURES**
Eun-Jin Lee[1,2], Mandy B. Esch[2]
[1]*University of Maryland, USA and*
[2]*National Institute of Standards and Technology, USA*

**W059.d** **A LOW COST MICROFLUIDICS PLATFORM FOR SPHEROID GENERATION**
Sourita Ghosh, Pavan Kumar Kirar, Falguni Pati, Suhanya Duraiswamy
*Indian Institute of Technology, Hyderabad, INDIA*

**W061.d** **ENHANCING MOTILITY BY CONTROLLING DROP SHAPE IN CENTRIFUGE-BASED DROPLET DISPENSERS**
Mi Song Nam[1], Hiroaki Onoe[2], Choongyeop Lee[1], Yun Jung Heo[1]
[1]*Kyung Hee University, KOREA and* [2]*Keio University, JAPAN*

**W062.d** **HIGH-THROUGHPUT GENERATION OF SPHERICAL AND DISK-SHAPED DROPLETS AND HYDROGEL BEADS FOR BIOMEDICAL APPLICATIONS USING MICROFLUIDIC STEP EMULSIFICATION**
Jenil Mange, Riddha Manna, Debjani Paul
*Indian Institute of Technology, Bombay, INDIA*

**W063.d** **MICROFLUIDIC JETTING IN A STEP EMULSIFICATION SLIT DEVICE**
Chunqi Zheng[1], Shuzo Masui[2], Yusuke Kanno[1], Takasi Nisisako[1]
[1]*Tokyo Institute of Technology, JAPAN and* [2]*University of Tokyo, JAPAN*

**W064.d** **SURFACE TENSION-DRIVEN SORTING OF BACTERIA LADEN DROPLETS**
Giulia Venturini, Donald A. Morrison, David T. Eddington
*University of Illinois, Chicago, USA*

## Electrokinetic Phenomena

**T065.d** **ELECTROKINETIC DEVICE FOR PARALLEL ENZYMATIC DNA AMPLIFICATION ASSAYS COMPATIBLE WITH RAW INPUT SAMPLE**
Alexandre S. Avaro[1,2], Andrew D. Griffiths[2], Juan G. Santiago[1]
[1] *Stanford University, USA and* [2] *ESPCI Paris, FRANCE*

## Modeling, Numerical Simulation, Artificial Intelligence

**M066.d** **BRIDGING THE GAP: AN OPEN-SOURCE TOOLKIT FOR SIMULATION AND DESIGN AUTOMATION OF MICROFLUIDIC DEVICES**
Michel Takken[1], Maria Emmerich[1], Philipp Ebner[2], Robert Wille[1,3]
[1] *Technical University of Munich, GERMANY,* [2] *Johannes Kepler University, AUSTRIA, and* [3] *Software Competence Center Hagenberg GmbH (SCCH), AUSTRIA*

**M067.d** **SIMULATIONS OF MORPHOLOGY AND VIABILITY DETECTION OF C. ELEGANS WORMS IN AN ELECTRICAL-IMPEDANCE-SPECTROSCOPY-BASED MICROFLUIDIC DEVICE**
Jiaqi Liu[1], Song Yu[1], Tiancong Lan[1], Yingying Wang[1], Jianwei Ouyang[1], Yiyan Zhang[2,3], Di Chen[3], Zixin Wang[4], Zhen Zhu[1]
[1] *Southeast University, CHINA,* [2] *Nanjing University, CHINA,* [3] *Zhejiang University, CHINA, and* [4] *Sun Yat-sen University, CHINA*

**T066.d** **CHANNEL CROSS-SECTIONAL SHAPE EFFECT ON FLUID MIXING SIMULATION USING DISSIPATIVE PARTICLE DYNAMICS WITH WALL INTERACTION**
Otoha Ebine, Mao Hamamoto, Hiromasa Yagyu
*Kanto Gakuin University, JAPAN*

**T067.d** **THE EFFECT OF DIURNAL FLUCTUATIONS IN INTESTINAL FLOW AND GEOMETRY ON SHAPING THE MICROBIAL POPULATIONS IN THE HUMAN LARGE INTESTINE**
Alinaghi Salari[1], Jonas Cremer[2]
[1] *University of Toronto, CANADA and* [2] *Stanford University, USA*

**W065.d** **AN INTEGRATED ALGORITHM FOR CAPILLARY MICROFLUIDIC CHIP DEVELOPMENT**
Mahmood Khalghollah, Azam Zare, Amir Sanati Nezhad, Behrouz H. Far, Amin Komeili
*University of Calgary, CANADA*

**W066.d** **MOLECULAR DYNAMICS SIMULATION OF ION CONCENTRATION POLARIZATION INDUCED BY HYDROGEL MEMBRANE IN A NANOFLUIDIC SYSTEM**
Hiba Aljayyousi[1,2], Serdal Kirmizialtin[1,2], Yong-Ak Song[1,2]
[1] *New York University, Abu Dhabi, UAE and* [2] *New York University, USA*

## Nanofluidics and Nanofluidic Phenomena

**M068.d** **DEVELOPMENT OF NON-FLUORESCENT SINGLE NANOPARTICLE TRACKING METHOD IN NANOSPACES USING INTERFEROMETRIC LIGHT SCATTERING**
Koichiro Yamano, Yutaka Kazoe
*Keio University, JAPAN*

**M069.d** **MEMRISTIVE ION TRANSFER IN FUNNEL NANOCHANNEL EMULATES NEUROMORPHIC FUNCTIONS UNDER ULTRA-LOW VOLTAGE**
Peiyue Li[1], Junjie Liu[1], Junhui Yuan[2], Yechang Guo[1], Shaofeng Wang[3], Pan Zang[1,4], Wei Wang[1,4,5]
[1] *Peking University, CHINA,* [2] *Wuhan University of Technology, CHINA,* [3] *China University of Geosciences (Beijing), CHINA,* [4] *National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA, and* [5] *Beijing Advanced Innovation Center for Integrated Circuits, CHINA*

**M070.d** **NANOLIQUID MANIPULATION ON A PILLAR ARRAY-BASED FLUIDIC SENSOR**
Bin Guan[1], Rossen Sedev[1,2], Craig Priest[1]
[1] *University of South Australia, AUSTRALIA and*
[2] *University of Western Australia, AUSTRALIA*

**M071.d** **SINGLE MOLECULE ANALYSIS IN LIQUID PHASE THROUGH HIGH-THROUGHPUT NANOFLUIDIC DROPLET GENERATION**
Ryoya Kato[1], Nattapong Chantipmanee[1], Yan Xu[1,2]
[1] *Osaka Metropolitan University, JAPAN and*
[2] *Japan Science and Technology Agency, JAPAN*

**M368.d** **DIFFUSION AND CHAOTIC ADVECTION REGIMES FOR STEALTH LIPOSOME SYNTHESIS IN 3D MULTIHELICAL MICROMIXER**
Bruno Telli Ceccato[1,2], Sávio S.V. Vianna[1], Lucimara G. de la Torre[1]
[1] *University of Campinas (UNICAMP), BRAZIL and* [2] *Norwegian University of Science and Technology (NTNU), NORWAY*

**T069.d** **MOLECULAR DYNAMICS SIMULATION OF VISCOELECTRIC EFFECTS IN NANOCHANNELS**
Che-Wei Ou[1], Haoyu Wang[1], Rui Qiao[2], Hirofumi Daiguji[1], Wei-Lun Hsu[1]
[1] *University of Tokyo, JAPAN and* [2] *Virginia Tech, USA*

**T070.d** **ON-DEVICE NANOFLUIDIC MIXING TO RAPIDLY ADJUST IONIC STRENGTH PRIOR TO RESISTIVE-PULSE MEASUREMENTS**
Quintin J. Brown, Michael P. Kappler, Tariq Hussain, Adam Zlotnick, Stephen C. Jacobson
*Indiana University, USA*

**T071.d** **THREE-DIMENSIONAL NANOSCALE CONTROL OF LIQUID WATER USING ENVIRONMENTAL LIQUID CELL CONCEPT**
Chiwon Lee, R. J. Dwayne Miller
*University of Toronto, CANADA*

**W067.d** **BEHAVIOR OF NANOPARTICLES IN NANOCHANNELS REVEALED BY DEFOCUSING NANOPARTICLE TRACKING VELOCIMETRY**
Minato Tsuda, Yo Saeki, Yutaka Kazoe
*Keio University, JAPAN*

**W068.d** **IN-PLANE RESISTIVE-PULSE MEASUREMENTS WITH INTEGRATED BASELINE SUBTRACTION FOR IMPROVED SIGNAL-TO-NOISE RATIOS**
Ethan D. Call, Andrew R. Kneller, Quintin J. Brown, Kim Young, Adam Zlotnick, Stephen C. Jacobson
*Indiana University, USA*

**W070.d** **PERVAPORATION-BASED HETEROGENEOUS NANOPORE-INTEGRATED MICRO-/NANOFLUIDIC PLATFORM FOR ION TRANSPORT ANALYSIS IN THE PRESENCE OF MULTIPLE ELECTROLYTES**
Dongwoo Seo, Sangjin Seo, Taesung Kim
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

**W071.d** **TUNABLE NANOFLUIDIC DEVICES: PUSHING THE BOUNDARIES OF ELECTRICAL SENSITIVITY**
Daichi Nakahara, Nattapong Chantipmanee, Yan Xu
*Osaka Metropolitan University, JAPAN*

## Open Space Microfluidics

**M072.d** **CHARACTERIZING THE IMPACT OF SIGNAL FREQUENCY ON THE NOTCH CELL SIGNALING PATHWAY USING MICROFLUIDIC DISPLAYS**
Maude Proulx[1], Pierre Clapperton-Richard[1], Laurent Potvin-Trottier[2], Alisa Piekny[2], Thomas Gervais[1,3]
[1]*Polytechnique Montréal, CANADA,* [2]*Concordia University, CANADA, and* [3]*Université de Montréal, CANADA*

**M073.d** **MODULAR MICROFLUIDIC PROBES: DISCRETIZING CONCENTRATION GRADIENTS BRICK BY BRICK**
Ayoub Glia[1], Mohammad A. Qasaimeh[1,2]
[1]*New York University, Abu Dhabi, UAE and*
[2]*New York University, USA*

**T072.d** **LUXNFLOW: DIRECT-LIGHT PROJECTION ON A CHIP FOR DYNAMIC FLOW PATTERNING**
Sridaran Rajagopal[1], Sofia Graham[1], Jonathan Ericsson[2], Moran Bercovici[2], Govind Kaigala[1]
[1]*University of British Columbia, CANADA and*
[2]*Technion - Israel Institute of Technology, ISRAEL*

**W072.d** **MICROSCALE MOLECULAR GRADIENTS ON OPEN BIOLOGICAL SURFACES**
Alisa Da Silva[1,2], Sofia Arshavsky Graham[1], Jake Pringle[1], Amirreza Ameri[1], Aditya Kashyap[1,2], Govind Kaigala[1,2]
[1]*University of British Columbia, CANADA and*
[2]*Vancouver Prostate Center, CANADA*

## Others

**M074.d** **SHEATHLESS FOCUSING OF NANOPARTICLES IN ELASTO-INERTIAL MICROFLUIDICS**
Selim Tanriverdi[1], Javier Cruz[1,2], Martim Costa[1], Gustaf Mårtensson[1], Aman Russom[1]
[1]*Royal Institute of Technology, SWEDEN and*
[2]*Uppsala University, SWEDEN*

**T073.d** **DISPERSION-FREE INERTIAL FOCUSING (DIF) FOR HIGH-YIELD SINGLE-CELL ANALYSIS OF POLYDISPERSE PARTICLES**
Kelvin C. M. Lee[1,2], Bob M.F. Chung[1,2], Dickson M.D. Siu[1,2], Sam C.K. Ho[1], Daniel K.H. Ng[1], Kevin K. Tsia[1,2]
[1]*University of Hong Kong, HONG KONG and* [2]*Advanced Biomedical Instrumentation Centre (ABIC), HONG KONG*

**W073.d** **ELASTO-INERTIAL FOCUSING AND MIGRATION OF PARTICLES FOR HIGH-THROUGHPUT SEPARATION**
Selim Tanriverdi[1], Javier Cruz[1,2], Martim Costa[1], Gustaf Mårtensson[1], Aman Russom[1]
[1] *Royal Institute of Technology, SWEDEN and*
[2] *Uppsala University, SWEDEN*

## Late News

**M511.d** **ACOUSTOFLUIDIC CHIP BASED ON SHARP-EDGES AND AIR-BUBBLES FOR RAPID CELL SPHEROID FORMATION.**
Bryan D. Herrera Lozada, Maryam Tabrizian
*McGill University, CANADA*

**M512.d** **APPLICATION OF CAPILLARY FLOW WITH MEDIATING OIL FILM TO OPEN MICROFLUIDICS**
Hiroki Yasuga[1], Yusuke Takei[1], Shun Okada[2], Yuki Nakayama[2], Kan Shoji[2]
[1] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and* [2] *Nagaoka University of Technology, JAPAN*

**M513.d** **DETECTION OF RED BLOOD CELL DEFORMABILITY AND SICKLE CELL ANEMIA USING MINIATURIZED PHOTODETECTOR ARRAYS ON ELECTRIFIED LAB ON DISC PLATFORMS**
Vahid Kordzadeh-Kermani[1], Sergio O Martinez Chapa[1], Marc J. Madou[1,2], Masoud Madadelahi[1]
[1] *Tecnologico de Monterrey, MEXICO and*
[2] *University of California, Irvine, USA*

**M514.d** **INVESTIGATION OF ANISOTROPIC FLUID TRANSPORT IN PAPER-BASED MATERIALS**
Anna Anandita[1], Gaytri Sachdeva[1], Hemanth P[1], Kundan Kumar[2], Dharitri Rath[1]
[1] *Indian Institute of Technology, Jammu, INDIA and*
[2] *University of Bergen, NORWAY*

**M515.d** **NANOFLUIDIC PLATFORM FOR QUANTITATIVE ANALYSIS AND DISENTANGLEMENT OF PLASMON MEDIATED ELECTROCHEMISTRY AND THERMAL EFFECTS VIA IONIC CURRENT**
Dongwoo Seo[1], Gyubin Park[2], Jaehyun Kim[2], Taesung Kim[1], Jungyul Park[2]
[1] *Ulsan National Institute of Science and Technology (UNIST), KOREA and* [2] *Sogang University, KOREA*

**T511.d** **ADJUSTMENT OF DROPLET SIZE FOR THE MICROFLUIDIC DROPLET SHOOTER THROUGH HYDROPHOBIC MEMBRANE THICKNESS CONTROL**
Wei Lin Liu[1], Hsin-Yi Lee[1], Chihchen Chen[1], Yutaka Kazoe[2], Kyojiro Morikawa[1,3,4], Takehiko Kitamori[1,4,5]
[1] *National Tsing Hua University, TAIWAN,* [2] *Keio University, JAPAN,* [3] *University of Tokyo, JAPAN,* [4] *Kanagawa Institute of Industrial Science and Technology, JAPAN, and* [5] *Lund University, SWEDEN*

**T512.d** **AUTOMATED DENSITY GRADIENT CENTRIFUGE BASED ON LAB-ON-A DISC SYSTEM FOR SEPARATION OF MOTILE SPERM CELLS**
Esmail Pishbin[1], Dorsa Kargaran[2], Amin Dehghan[2]
[1] *Iranian Research Organization for Science and Technology, IRAN and* [2] *Iran University of Science and Technology, IRAN*

**T513.d** **DIGITAL MICROFLUIDICS: ELECTROWETTING TECHNOLOGY FOR MOTION, DISTURBING, AND SPLITTING**
Arman Hajizadeh, Mohammad Hossein Pourghasemian, Amir Shamloo
*Sharif University of Technology, IRAN*

**T514.d** **INVESTIGATION OF WAVE-FLUID- SOLID INTERACTION IN DETACHABLE PDMS MICROFLUIDIC CHIP**
Jeongeun Park[1], Beomseok Cha[1], Furkan G. Almus[2], Mehmet A. Sahin[2], Ghulam Destgeer[2], Jinsoo Park[1]
[1] *Chonnam National University, KOREA and* [2] *Technical University of Munich, GERMANY*

**W511.d** **ANCHORING BIO-IONIC CONTAINERS OF IONIC LIQUIDS ON MICROFLUIDIC-PAPER ANALYTICAL DEVICES FOR HIGH-PERFORMANCE COLORIMETRIC DETECTION**
Daniel S. de Paula[1], Larissa G. Velasco[1], Jean C.P. Sousa[1], Thiago M.G. Cardoso[1], Muhammad I. Qadir[1], Boniek G. Vaz[1], Wendell K.T. Coltro[1,2]
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**W512.d** **CAPILLARY-BASED MICROFLUIDIC PLATFORM FOR EXTRACELLULAR VESICLES FILTRATION**
Mohsen Hassani, Amir Sanati Nezhad
*University of Calgary, CANADA*

**W513.d** **EWOD DEVICE WITH INKJET PRINTED 3D PEDOT:PSS ELECTRODE**
Eli Nadia Abdul Latip[1], Christabel Tan[2], Loic Coudron[2], Ian Munro[2], Ian Johnston[2]
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**W514.d** **LCD 3D PRINTED REAGENT STORAGE CAPSULES AND CAPILLARIC CIRCUITS FOR SNAP-ON REAGENT DELIVERY AT THE POINT-OF-CARE**
Berine Wehbeh, Houda Shafique, David Juncker
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## e - Integrated Microfluidic Platforms

## Artificial Intelligence and Integrated Microfluidics

**M075.e** **LABEL-FREE BLOOD CELL ENRICHMENT AND QUANTIFICATION USING INERTIAL MICROFLUIDICS INTEGRATED TO AI-POWERED DIGITAL HOLOGRAPHIC MICROSCOPY**
Kerem Delikoyun[1,2], Kay Khine Maw[3], Qianyu Chen[1,2], Si Ko Myo[1], Koh Kai Bing[1], Han Wei Hou[3], Oliver Hayden[1,2]
[1] *TUMCREATE, SINGAPORE,* [2] *Technical University of Munich, GERMANY, and* [3] *Nanyang Technological University, SINGAPORE*

**T074.e** **AI ANALYSIS OF SERS BIOSENSOR SPECTRA FOR COVID-19**
Ankhbayar Nyamdavaa[1], Kiran Kaladharan[2],
Fan-Gang Tseng[2], Tseren-Onolt Ishdorj[1]
[1] *Mongolian University of Science and Technology, MONGOLIA and*
[2] *National Tsing Hua University, TAIWAN*

**T075.e** **MAGNETIC LEVITATION-BASED CYTOMETRY IN A MICROFLUIDIC CHIP VIA DEEP LEARNING-ASSISTED ANALYSIS**
Seyda Keles[1], H. Cumhur Tekin[1,2]
[1] *Izmir Institute of Technology, TURKEY and*
[2] *METU MEMS Center, TURKEY*

**W074.e** **AI-DRIVEN DIGITAL MICROFLUIDICS FOR ENHANCED LABEL-FREE CELL SORTING**
Zongliang Guo[1], Fenggang Li[1], Rongxin Fu[1], Yao Lu[1],
Siyi Hu[2], Hanbin Ma[2], Hang Li[1], Shuailong Zhang[1]
[1] *Beijing Institute of Technology, CHINA and*
[2] *Guangdong ACXEL Micro & Nano Tech Co., Ltd, CHINA*

**W075.e** **TAILORING COMPLEX FLOW SHAPES IN MICROFLUIDIC CHANNELS WITH DEEP LEARNING**
Zhenyu Yang[1,2], Zhongning Jiang[3], Haisong Lin[1], Ho Cheung Shum[1,2]
[1] *University of Hong Kong, HONG KONG,* [2] *HKU Inno, HONG KONG, and*
[3] *City University of Hong Kong, HONG KONG*

## Capillary and Paper Microfluidics

**M076.e** **A LOW-COST AND SIMPLE FABRICATION OF ETHYL-CYANOACRYLATE PATTERNED PAPER-BASED ANALYTICAL DEVICE USING SUPER GLUE**
Hyo-eun Kang[1], Bui T. Huy[1], Won Han[1],
Yong-Ill Lee[2], Joong Ho Shin[1]
[1] *Pukyong National University, KOREA and*
[2] *Pharmaceutical Technical University, UZBEKISTAN*

**M077.e** **DEVELOPMENT OF QUANTITATIVE BARCODE READOUT APPROACH FOR PAPER-BASED ANALYTICAL DEVICES (PADS)**
Yanawut Manmana, Yuki Hiruta, Daniel Citterio
*Keio University, JAPAN*

**M078.e** **LAB ON CAPILLARY TOWARDS INSTRUMENT-FREE MULTIPLEX IMMUNOASSAY**
Yimin Yang, Mehmet Akif Sahin, Muhammad Usman Akhtar,
Ghulam Destgeer
*Technical University of Munich, GERMANY*

**M079.e** **OXIDATIVE DYES-INSPIRED PEROXIDASE SUBSTRATES SIGNIFICANTLY IMPROVE THE SENSITIVITY OF ENZYMATIC LATERAL FLOW IMMUNOASSAYS**
Karan Saxena, Bhushan J. Toley
*Indian Institute of Science, Bangalore, INDIA*

**M080.e** **POLYMERIC SHEETS WITH ORIENTED MICROGROOVES FOR STREAMLINING HIGH PERFORMANCE LATERAL FLOW IMMUNOASSAYS**
Asahi Ohtsu, Yuhei Saito, Rie Utoh, Masumi Yamada
*Chiba University, JAPAN*

**T076.e** **A MICROFLUIDIC CAPILLARY DEVICE FOR LOW-COST, RAPID, AND MULTIPLEXED IMMUNOASSAYS IN WHOLE BLOOD**
Yasin Ekinci, Thomas Mortelmans, Dimitrios Kazazis, Celestino Padeste, Xiao-Dan Li
*Paul Scherrer Institute, SWITZERLAND*

**T077.e** **DIRECT IMMOBILIZATION OF ANTIBODY FOR RAPID AND SIMPLE MICROFLUIDIC PAPER-BASED ELISA AND ASSAY AUTOMATION USING A 3D-PRINTED CAPILLARIC CIRCUIT CHIP**
Ahmed A. Shalaby[1], Houda Shafique[2], Akihiko Ishida[1], Yutaka Shimizu[1], Hiroki Saeki[1], Mitsue Hibino[1], Masatoshi Maeki[1], David Juncker[2], Manabu Tokeshi[1]
[1]*Hokkaido University, JAPAN and* [2]*McGill University, CANADA*

**T078.e** **MAGNETOPHORETIC SLIDER ASSAY: A SENSITIVE POINT-OF-CARE DEVICE FOR RAPID DETECTION OF SARS-COV-2 NUCLEOCAPSID PROTEIN**
Thaisa A. Baldo[1], Nutnaree Fukana[1,2], Joowon Park[1], Gilberto J. Silva Junior[3], Lauren E. Malsick[1], Emily N. Gallichotte[1], Gregory D. Ebel[1], Brian J. Geiss[1], David S. Sandy[1], Duangjai Nacapricha[2], Charles S. Henry[1]
[1]*Colorado State University, USA,* [2]*Mahidol University, THAILAND, and* [3]*University of Sao Paulo, BRAZIL*

**T079.e** **PAPER MICROFLUIDIC PLATFORM FOR MULTIPLEX SARS-COV-2 GENE DETECTION**
Pavithra Sukumar, Alla Saleh, Muhammedin Deliorman, Mohammad Qasaimeh
*New York University, Abu Dhabi, UAE*

**T080.e** **ROBUST PAPER-BASED NANOFLUIDIC CONCENTRATOR FOR PROTEIN PRECONCENTRATION IN LATERAL FLOW IMMUNOASSAY**
Qin-ge Yi, Cong Wang
*China University of Geosciences, CHINA*

**W076.e** **ACCESSIBLE ACUTE KIDNEY INJURY MONITORING FOR PEDIATRIC PATIENTS USING NOVEL LATERAL FLOW ASSAYS**
Kevin Da, Ryan Li, Craig Simmons, Xinyu Liu
*University of Toronto, CANADA*

**W077.e** **ELECTRONIC FLOW MONITORING OF PAPER/TEXTILE-BASED MICROFLUIDIC DEVICES**
Isidoro Ruiz-García, Pablo Escobedo, Celia E. Ramos-Lorente, Miguel M. Erenas, Luis F. Capitan-Vallvey, Miguel A. Carvajal, Alberto J. Palma, Nuria Lopez-Ruiz
*University of Granada, SPAIN*

**W078.e** **MICFLOW: A CAPILLARY-DRIVEN MICROFLUIDIC DEVICE FOR RAPID AND ACCURATE DETERMINATION OF MINIMUM INHIBITORY CONCENTRATIONS OF ANTIMICROBIAL SUBSTANCES**
Pezhman Jalali, Soroush Abdollahi, Maryam Vatani, Amir Sanati Nezhad
*University of Calgary, CANADA*

**W079.e** **PIEZO-DISPENSED PAPER-BASED MICRODEVICES FOR RAPID AND MULTIPLEX DETECTION OF BIOTOXINS**
Monica Araya-Farias, Elora Bessot, Hervé Volland, Stéphanie Simon, Nathalie Morel, Karla Perez-Toralla
*CEA, FRANCE*

**W080.e** **TARGET ACQUIRED: A MODIFIED SUBSTRATE FOR PREPARING AND SAMPLING DRIED MATRIX SPOTS WITH LIQUID MICROJUNCTION - SURFACE SAMPLING PROBE - MASS SPECTROMETRY AIDED BY COMPUTER VISION**
Daniel O. Reddy, Katherine Williams, Malek Hassan, Randy E. Ellis, Richard D. Oleschuk
*Queen's University, CANADA*

## Chemical Synthesis and Particle Synthesis

**M081.e** **CONTINUOUS ACETYLSALICYLIC ACID GREEN PRODUCTION**
Cheng-You Yang, Ya-Yu Chiang
*National Taiwan University, TAIWAN*

**M082.e** **MICROFLUIDIC SYNTHESIS OF IRON OXIDE NANOPARTICLES FOR HIGHLY EFFICIENT INTRACELLULAR DELIVERY**
Athira Prasad, Gayathri R, Ashwini Shinde, R Jayaganthan, Tuhin Subh Santra
*Indian Institute of Technology, Madras, INDIA*

**T081.e** **FAST ANTISOLVENT CRYSTALLIZATION OF MICONAZOLE NITRATE IN MICROFLUIDIC DROPLETS**
Amaury de Hemptinne, Müge Bilgen, Wim De Malsche
*Vrije Universiteit Brussel, BELGIUM*

**T082.e** **SYNTHESIS AND CRYSTALLIZATION OF PROTEINS CONTAINING METAL COMPLEXES BY APPLICATION OF MICROFLUIDIC DEVICES FOR BOTH LIQUID AND SOLID**
Daiki Tanaka[1], Masashi Kobayashi[1], Risa Fujita[1], Masahiro Furuya[1], Takashiro Akitsu[2], Tetsushi Sekiguchi[1], Shuichi Shoji[1], Takashi Tanii[1]
[1] *Waseda University, JAPAN and* [2] *Tokyo University of Science, JAPAN*

**W081.e** **MICROFLUIDIC DROPLET BASED POLYMERIZATION OF IMPRINTED POLYMERS FOR BIOLOGICAL APPLICATIONS**
John Brown, Alireza Zabihihesari, Pouya Rezai
*York University, CANADA*

## Digital Microfluidics and Digital Assays

**M083.e** **A DIGITAL MICROFLUIDIC PLATFORM FOR THE PRODUCTION OF FUNCTIONAL IMMUNE CELL THERAPIES FROM PRIMARY HUMAN T-CELLS**
Samuel R. Little, Niloufar Rahbari, Fatemeh Gholizadeh, Mehri Hajiaghayi, Joel Philips, Peter J. Darlington, Steve C.C. Shih
*Concordia University, CANADA*

**M084.e AUTOMATED AND USER-FRIENDLY DIGITAL IMMUNOASSAY PLATFORM TO ENABLE REAL-TIME POINT-OF-CARE MEASUREMENT OF CRITICAL ILLNESS**

Adrienne D. Füredi[1], Mark Nicolas[2], Amanda Giacobbe[2], Andrew Stephens[3], Yujing Song[1], Ming X. Tan[2], Katsuo Kurabayashi[1]
[1]*New York University, USA,* [2]*Wainamics Inc., USA, and* [3]*University of Michigan, USA*

**M085.e DIGITAL DETECTION OF EXTRACELLULAR VESICLES USING NANOWIRE DOT ARRAY**

Kunanon Chattrairat[1], Shunsuke Suzuki[2], Taiga Ajiri[1], Yoshinobu Baba[2], Takao Yasui[1]
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**M086.e LOW COST, PORTABLE DNA NANOBALL AMPLIFICATION KIT TO INTEGRATE WITH AND PERFORM LAMP REACTION IN A POINT-OF-CARE DIGITAL ASSAY FOR RAPID ELECTRONIC QUANTIFICATION OF CLINICAL PATHOGENS USING DNA NANOBALLS**

Koosha Karimi[1], Donal Barrett[2], Erin Chille[1], Timothy G. Stephens[1], Anna Toldra[2], Haoyu Jiang[1], Mahtab Kokabi[1], Debashish Bhattacharya[1], Vicent Pelechano[2], Mehdi Javanmard[1]
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**M087.e SURFACTANT IMPREGNATED PAPER-DIGITAL MICROFLUIDICS FOR PLASMA SEPARATION AND DIAGNOSTIC ASSAYS**

Nguyen Le[1], Alinaghi Salari[1], Gilberto Camacho[1], Joshua Dahmer[1], Ryan Manning[2], Cheuk W. Kan[2], Nira R. Pollock[3], David C. Duffy[2], Aaron R. Wheeler[1]
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**M088.e** **ULTRAFAST AND ULTRAPARALLEL PICOLITER PARTITIONING OF DIFFERENT REACTION MIXES BY CENTRIFUGAL MICROFLUIDIC ARRAY TECHNOLOGY (CM-ART)**
Marvin Heyer[1], Salman Murad[1], Fabian Lickert[2], Helena Gmoser[1], Tobias Hutzenlaub[1,2], Nils Paust[1,2], Peter Juelg[1,2]
[1] *University of Freiburg, GERMANY and* [2] *Hahn-Schickard, GERMANY*

**T083.e** **ALL-IN-ONE DIGITAL MICROFLUIDICS-BASED SURVEILLANCE TOOL FOR AUTONOMOUS MULTIPLEXED PORTABLE DETECTION OF VIRAL INFECTION AND IMMUNITY**
Sathishkumar Narayanaswamy[1,2], Jose Gilberto Camacho Valenzuela[1,2], Nguyen Le[1,2], Anthony K.C. Yong[1,2], Martin A. Rossotti[2,3], Daniel Brassard[2,3], Lidija Malic[2,3], Martin Plante[2,3], Anna N. Moraitis[2,3], Joshua Dahmer[1,2], Alexandros A. Sklavounos[1,2], Jamshid Tanha[2,3,4], Jean Labrecque[2,3], Teodor Veres[2,3], Aaron R. Wheeler[1,2]
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**T084.e** **AUTOMATED SEMI-INTELLIGENT DIGITAL MICROFLUIDICS PLATFORM FOR OPTICAL DETECTION IN CHEMICAL-ASSAYS**
Casper Kunstmann[1,2], Jacek Fiutowski[1], Steven D. Johnson[2], Andy M. Tyrrell[2]
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[2] *University of York, UK*

**T085.e** **DOUBLE DIGITAL ASSAY FOR SINGLE EXTRACELLULAR VESICLE AND SINGLE MOLECULE DETECTION**
David E. Reynolds, Menghan Pan, Jingbo Yang, George Galanis, Yoon Ho Roh, Renee T. Morales, Shailesh S. Kumar, Su-Jin Heo, Xiaowei Xu, Wei Guo, Jina Ko
*University of Pennsylvania, USA*

**T086.e** **MICROSPRAY HOLE FACILITATED COUPLING OF DIGITAL MICROFLUIDICS WITH THIN LAYER CHROMATOGRAPHY AND SURFACE-ENHANCED RAMAN SPECTROCOPY**
Anish Das, Detlev Belder
*Leipzig University, GERMANY*

**T087.e** **TIME-RESOLVED AND WASH-FREE DIGITAL IMMUNOASSAY BASED ON DYNAMIC TRACKING OF SINGLE BINDING EVENTS**
Tingting Zhan, Pengcheng Zhang, Yi Zhang, Hui Yang
*Chinese Academy of Sciences, CHINA*

**T088.e** **ULTRASENSITIVE DDPCR:100K+ AI-DETECTED DROPLETS IN A MONOLAYER CONSUMABLE**
Alex Jafek, David Bauer, Kalyan Handique
*Bio-Rad Laboratories, USA*

**W082.e** **A DIGITAL BEAD ASSAY FOR SARS-COV-2 DETECTION VIA ROLLING CIRCLE AMPLIFICATION IMPLEMENTED ON DIGITAL MICROFLUIDICS**
Alinaghi Salari[1], Nguyen Le[1], N. Sathishkumar[1], Martin A. Rossotti[2], Sheldon Decombe[1], Richard P.S. de Campos[1], M. D. Chamberlain[1], Jamshid Tanha[2], Aaron Wheeler[1]
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[2] *National Research Council Canada, CANADA*

**W083.e** **AMPLIFICATION-FREE DIGITAL CRISPR-POWERED BIOSENSOR CONCEPT USING SINGLE-IMPACT ELECTROCHEMISTRY**
Sebastian Freko[1], Marta Nikić[1], Lennart J.K. Weiß[1], Dirk Mayer[2], Bernhard Wolfrum[1]
[1] *Technical University of Munich, GERMANY and*
[2] *Research Centre Jülich, GERMANY*

**W084.e** **COLLECTION OF RARE SINGLE CELLS USING DROPLET-DIGITAL MICROFLUIDICS**
Zhiyang Deng[1], James M. Perry[1], Marian Weiss[2], Robert Genth[2], Christoph A. Merten[3], Steve Shih[1]
[1] *Concordia University, CANADA,* [2] *VERAXA Biotech GmbH, GERMANY, and*
[3] *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

**W085.e** **HIGH-RESOLUTION MELTING CURVE ANALYSIS WITH LINEAR TEMPERATURE GRADIENT IN DIGITAL MICROFLUIDICS PLATFORM**
Li Meng, Mingzhong Li, Zhenyu Xu, Meiwan Chen, Man-Kay Law
*University of Macau, CHINA*

**W086.e** **MULTI-AGENT PATHFINDING FOR DROPLET ROUTING IN DIGITAL MICROFLUIDIC BIOCHIP**
Mehjabin Rahman[1], Darius Rackus[1], Richard Valenzano[1,2]
[1] *Toronto Metropolitan University, CANADA and*
[2] *Vector Institute for Artificial Intelligence, CANADA*

**W087.e** **TOWARDS PROCESS INTEGRATION OF DIGITAL MICROFLUIDICS (DMF) WITH SINGLE MOLECULE ARRAYS (SIMOA) FOR ENHANCED ASSAY CAPABILITIES**
Alinaghi Salari[1], Jose Gilberto Camacho Valenzuela[1], Nguyen Le[1], Joshua Dahmer[1], Alexandros A. Sklavounos[1], Cheuk W. Kan[2], Ryan Manning[2], David C. Duffy[2], Nira R. Pollock[3], Aaron R. Wheeler[1]
[1] *University of Toronto, CANADA,* [2] *Quanterix Corporation, USA, and*
[3] *Boston Children's Hospital, USA*

## Electrophoretic and Chromatographic Separation

**W088.e** **A NANOBODY-BASED MICROFLUIDIC CHIP FOR AUTOMATED HIGH-THROUGHPUT PURIFICATION OF BIOLOGICAL SAMPLES**
Phebe De Keyser[1,2], Jan Steyaert[1,2], Gert Desmet[2]
[1] *Vlaams Instituut voor Biotechnologie, BELGIUM and*
[2] *Vrije Universiteit Brussel, BELGIUM*

## Micromixers and Microreactors

**M089.e** **ACOUSTICALLY EXCITED MICROPOST-BASED MICROMIXERS: ENHANCING MIXING PERFORMANCE VIA ACOUSTIC MICROSTREAMING USING SYNTHESIZED MICROPOSTS IN MICROFLUIDIC DEVICES**
Bahareh Chaichypour[1], Sinthuran Jegatheeswaran[1], Alinaghi Salari[2], Dae Kun Hwang[1], Michael C. Kolios[1], Scott S.H. Tsai[1]
[1] *Toronto Metropolitan University, CANADA and*
[2] *University of Toronto, CANADA*

**M090.e** **MICROFLUIDIC MIXING IN STAGNANT FLUID USING PROGRAMMABLE MAGNETIC ARTIFICIAL CILIA**
Tongsheng Wang[1], Ishu Aggarwal[2], Erik Steur[1], Tess Homan[1], Patrick R. Onck[2], Ye Wang[1], Jaap M.J. den Toonder[1]
[1]*Eindhoven University of Technology, NETHERLANDS and* [2]*University of Groningen, NETHERLANDS*

**M091.e** **RAPID ACOUSTOFLUIDIC MIXING BY SURFACE ACOUSTIC WAVE-INDUCED ACOUSTIC STREAMING FLOW AND ITS BIOLOGICAL APPLICATIONS**
Beomseok Cha, Jinsoo Park
*Chonnam National University, KOREA*

**T089.e** **CONTINUOUS-FLOW SYNTHESIS AND PURIFICATION OF DRUGS IN MICRODROPLETS**
Roel Poppen, Mirjam Brinkman, Elisabeth Verpoorte, Pim de Haan
*University of Groningen, NETHERLANDS*

**T090.e** **MAGNETOHYDRODYNAMICS-INDUCED STIRRING IN AN ELECTRO-OSMOTIC FLOW**
Léna Gonzalez, Clémence Biscara, Laurent Davoust, Jean-Maxime Roux
*University Grenoble, Alpes, FRANCE*

**T091.e** **SERIALLY CONNECTED GLASS MICROFLUIDIC CHIPS VS SINGLE CHIP FOR PRECISE COPOLYMERS SYNTHESIS**
Adelina Smirnova[1], Hisashi Shimizu[1], Kyojiro Morikawa[1,2], Takahiro Aratani[3], Atsushi Mori[3], Chihchen Chen[2], Takehiko Kitamori[1,2,4]
[1]*KISTEC, JAPAN,* [2]*National Tsing Hua University, TAIWAN,* [3]*Daicel Corporation, JAPAN, and* [4]*Lund University, SWEDEN*

**W089.e** **HYDROPHOBIC SURFACE STRATEGIES TO IMPROVE THE MIXING EFFICIENCY IN THE Y-TYPE PASSIVE MICROMIXER**
Ayoub Rahali[1], Arnaud Stolz[1], Sophie Roman[2], Philippe Lefaucheux[1], Rémi Dussart[1], Thomas Tillocher[1]
[1]*Research Group for the Energetics of Ionised Environments (GREMI), FRANCE and* [2]*Earth Sciences Institute of Orleans (ISTO), FRANCE*

**W090.e** **MICROFLUIDIC MIXING INDUCED BY A MAGNETIC ARTIFICIAL CILIUM IN A CLOSED CHAMBER**
Yangyu Duan[1], Ye Wang[1], Patrick R. Onck[2], Jaap M.J. den Toonder[1]
[1]*Eindhoven University of Technology, NETHERLANDS and* [2]*University of Groningen, NETHERLANDS*

## Particle Separation

**M092.e** **ECHOSEED: MODELING NANOPARTICLE RELEASE IN SILICA CLUSTERS AND PIONEERING NEW SEED PARTICLE MATERIALS FOR ACOUSTOFLUIDICS**
Martim Costa, Björn Hammarström, Selim Tanriverdi, Haakan Joensson, Martin Wiklund, Aman Russom
*KTH Royal Institute of Technology, SWEDEN*

**M093.e** **MULTI-PARAMETER PARTICLE ANALYSIS AND SINGLE-CELL PHENOTYPING WITH TRANSVERSE ALTERNATING CURRENT ELECTROPHORESIS (TRACE)**
M. Hannah Choi[1], Samaneh Zare Harofteh[1], William Booth[2], Boyd F. Edwards[2], Aaron T. Timperman[1]
[1] *University of Pennsylvania, USA and* [2] *Utah State University, USA*

**M094.e** **TUNABILITY OF CRITICAL SIZE OF PARTICLE SORTING IN SINGLE-COLUMN DETERMINISTIC LATERAL DISPLACEMENT DEVICES BY LATERAL FLOW CONTROL**
Miftahul Jannat Rasna, James C. Sturm
*Princeton University, USA*

**T092.e** **HIGH-RECOVERY HARVESTING OF LENTIVIRAL VECTORS FROM PERFUSION CULTURE USING SPIRAL INERTIAL MICROFLUIDIC TECHNOLOGY**
Alexander Bevacqua, Fuguo Liu, Do Hyun Park, Hans Gaensbauer, Jianzhu Chen, Jongyoon Han
*Massachusetts Institute of Technology, USA*

**T093.e** **MULTI-SORTING OF LARGE PARTICLES UTILIZING ON-DEMAND VORTEX GENERATION IN A MICROFLUIDIC CHIP FABRICATED BY INJECTION MOLDING**
Makoto Saito[1], Nariaki Kiyama[1], Yoko Yamanishi[1], Niko Kimura[2], Shigeo S. Sugano[3], Shinya Sakuma[1]
[1] *Kyushu University, JAPAN,* [2] *Tokyo University of Agriculture and Technology, JAPAN, and* [3] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

**W091.e** **DEVELOPMENT OF MICROFLUIDIC DEVICES WITH THREE-DIMENSIONAL ELECTRODES FOR EFFICIENT CELL SEPARATION BY DIELECTROPHORESIS**
Keisuke Ueda[1], Toru Uda[1], Soo Hyeon Kim[2]
[1] *NOK Corporation, JAPAN and* [2] *University of Tokyo, JAPAN*

**W092.e** **MICRO-VISCOUS FLOW (UVISFLO) CELL RETENTION DEVICE FOR AUTOMATED SAMPLER IN BIOTECHNOLOGY USING DENSE SUSPENSION INERTIAL MICROFLUIDIC PARTICLE THEORY (DENSE-IMPACT)**
Shireen Goh[1,2], Soon Wei Daniel Lim[3], Shan Mei Tan[2], Rerngchai Arayanarakool[2], Sitaram V.S.N. Gupta Vangeti[2], Yuansheng Yang[2], Steven Boon Hong Tan[4]
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**W093.e** **REAL-TIME IMPEDANCE-BASED DIELECTROPHORETIC ACTUATION FOR SELECTIVE MANIPULATION OF FLOWING PARTICLES**
Cristian Brandi[1], Alexis Lefevre[2], Adele De Ninno[3], Filippo Ruggiero[3], Enrico Verona[3], Michael Gauthier[2], Paolo Bisegna[1], Aude Bolopion[2], Federica Caselli[1]
[1] *University of Rome Tor Vergata, ITALY,* [2] *FEMTO-ST Institute, FRANCE, and* [3] *Italian National Research Council, ITALY*

**W094.e** **TUNABLE PARTICLE SEPARATION VIA ACOUSTICALLY ASSISTED DETERMINISTIC LATERAL DISPLACEMENT**
Hiroki Fukunaga[1], Naotomo Tottori[1], Shinya Sakuma[1], Takeshi Hayakawa[2], Yoko Yamanishi[1]
[1] *Kyushu University, JAPAN and* [2] *Chuo University, JAPAN*

## System Integration

**M095.e** **ALL-IN-ONE CHIP-FREE OSCIDROP DIGITAL PCR SYSTEM FOR HIGHLY MULTIPLEXED MOLECULAR DIAGNOSTICS**
Caiming Li, Wenbin Du
*Chinese Academy of Sciences, CHINA*

**M096.e** **EGFET INTEGRATED INTO MICROFLUIDIC CHIP FOR NON-INVASIVE SERUM CREATININE RECOGNITION**
Dhaniella Cristhina B. Oliveira[1], Fernando Henrique M. Costa[1], Elizangela Sanchez[1], José Alberto F. Silva[1,2]
[1] *Universidade Estadual de Campinas, BRAZIL and* [2] *INCTBio, BRAZIL*

**M097.e** **ON-THE-SPOT DETECTION OF AIRBORNE VIRUSES ENABLED BY A 3D-PRINTED INTERFACE BETWEEN AN AEROSOL COLLECTOR AND A MICROFLUIDIC DEVICE**
Matthew Jansen[1], William Vass[2], Morteza Alipanah[1], Amin Shirkani[2], Tracey Logan[1], John Lednicky[1], Chang-Yu Wu[2], Hugh Fan[1]
[1] *University of Florida, USA and* [2] *University of Miami, USA*

**T094.e** **A 3D PRINTED BIOCOMPATIBLE MOUTHGUARD WITH MICROFLUIDIC DRUG DISPENSER**
Tymon Janisz, Wojciech Kubicki, Rafał Walczak
*Wroclaw University of Science and Technology, POLAND*

**T095.e** **AN INTEGRATED MICROFLUIDIC SYSTEM FOR AUTOMATIC MRNA DISPLAY USING TRANSCRIPTION-TRANSLATION COUPLED WITH ASSOCIATION OF PUROMYCIN LINKER FOR PEPTIDE SCREENING**
Hao-Yen Wang, Shih-Yu Shen, Hui-Ching Wang, Gwo-Bin Lee
*National Tsing Hua University, TAIWAN*

**T096.e** **EXPERIMENTAL CHARACTERIZATION OF THE DYNAMIC RESPONSE OF FLUID SAMPLE TUBING FOR THE IMPROVEMENT OF FEEDBACK DROPLET MICROLFUIDIC CONTROL SYSTEMS**
Dylan G. H. Hahn, Carolyn L. Ren
*University of Waterloo, CANADA*

**T097.e** **OPTICAL AND MICROFLUIDIC PLATFORM FOR BIOSENSORS BINDING PERFORMANCE OPTIMIZATION**
Hélène Jousset[1,3], Xavier Mermet[1], Hippolyte Durand[1], Caroline Fontelaye[1], Mahfod Benessalah[1], Manuel Alessio[1], François Boizot[1], Stéphane Caplet[1], Cécile Jamois[2], Emmanuelle Laurenceau[3], Charlotte Parent[1]
[1] *University Grenoble, Alpes, FRANCE,* [2] *University Lyon, FRANCE, and* [3] *Université Claude Bernard, FRANCE*

**W095.e** **DEVELOPMENT OF A MICROFLUIDIC SPIRAL SEPARATOR AND TRANSFECTION SYSTEM FOR CONTINUOUS TRANSIENT TRANSFECTION OF MAMMALIAN CELLS**
Michaela Dehne[1,2], Anton Enders[1], Janina Bahnemann[1,2]
[1] *Leibniz University Hannover, GERMANY and*
[2] *University of Augsburg, GERMANY*

**W096.e** **NFC-ENABLED POTENTIOSTAT AND NITROCELLULOSE-BASED METAL ELECTRODES FOR ELECTROCHEMICAL LATERAL FLOW ASSAY**
Laura Gonzalez-Macia, Yunpeng Li, Kaijia Zhang, Estefania Nunez-Bajo, Giandrin Barandun, Yasin Cotur, Tarek Asfour, Selin Olenik, Philip Coatsworth, Jack Herrington, Firat Güder
*Imperial College London, UK*

## Late News

**M516.e** **AN AUTONOMOUS, CLOCKWORK-DRIVEN, CUSTOMIZABLE PERISTALTIC PUMP NETWORK**
Carter K. Jones, Catherine Engel, Katherine Page, James P. Landers
*University of Virginia, USA*

**T515.e** **A SCALABLE MICROFLUIDIC SYSTEM FOR NANOPARTICLE FORMULATION: FOR HIGH AND LOW FLOWRATE SCALES**
Islam Fayyad Seder, Tao Zheng, Yi Sun
*Technical University of Denmark, DENMARK*

**T516.e** **DEVELOPMENT OF A PAPER-ON-A-ROLL PLATFORM WITH DISTANCE PADS FOR CONTINUOUS MONITORING OF DISSOLVED INORGANIC CARBON LEVELS IN WATER**
Amparo Ferrer-Vilanova, Pablo Giménez-Gómez, Alexander Iles, Nicole Pamme
*Stockholm University, SWEDEN*

**W515.e** **ALL POLYMER 3D PRINTED PUSH/PULL SYRINGE PUMP FOR ENHANCED FLOW CONTROL**
Pulkit Saluja, Rahul Singh, Neeti Kalyani, Aabha Bajaj, Maria Dimaki, Winnie Edith Svendsen
*Technical University of Denmark, DENMARK*

**W516.e** **MULTI-FUNCTIONAL DIGITAL MICROFLUIDICS COUPLED WITH LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY: A DETECTION PLATFORM FOR SARS-COV-2 VARIANT IN WASTEWATER SURVEILLANCE**
Jiaxi Peng[1,2], Vigneshwar Rajesh[1], Jiarui Shen[1], Jianxian Sun[1], Calvin Chan[1,2], Yechen Hu[1], Hui Peng[1], Aaron Wheeler[1]
[1]*University of Toronto, CANADA and* [2]*Mount Sinai Hospital, CANADA*

## f - Microfabrication, Manufacturing and Rapid Prototyping

### 3D Bioprinting

**W097.f** **HIGH THROUGHPUT BIOPRINTING OF PURE PROTEIN HYDROGELS IN THREE-DIMENSIONAL MICROARRAYS FOR DISEASE BIOMONITORING**
Lubna Najm[1], Amid Shakeri[2], Shadman Khan[1], Zeinab Hosseinidoust[1], Tohid F. Didar[1]
[1]*McMaster University, CANADA and* [2]*University of Toronto, CANADA*

### 3D Printing - Stereolithography (Laser, DLP, LCD, …)

**M098.f** **3D PRINTING SPATIALLY ENGINEERED ACOUSTOFLUIDIC DEVICES**
Roxanne Kate Balanay, Tyler R. Ray
*University of Hawaii, Manoa, USA*

**M099.f** **EXPANDING CAPILLARY MICROFLUIDICS WITH 3D-PRINTED PHASEGUIDES AND SELF-COALESCING MODULES**
Cosette Craig, Megan Chang, Kelsey Leong, Carrie Lin, Ayokunle Olanrewaju
*University of Washington, USA*

**M100.f** **PORTABLE, 3D-PRINTED PNEUMATIC TIMERS FOR PRECISE AND FLEXIBLE NANOLITER DROPLET CONTROL WITHOUT THE NEED FOR ELECTRICAL POWER**
Joanne Y.R. Seow, Md Mohibullah, Christopher Easley
*Auburn University, USA*

**T098.f** **ACHIEVING HIGH RESOLUTION MICROFLUIDIC PRINTING BY PNEUMATIC CLEARANCE OF NASCENT MICROCHANNELS**
Dionis S. Yew, Cyrus W. Beh
*Agency for Science, Technology and Research (A*STAR), SINGAPORE*

**T099.f** **INTEGRATION OF MEMBRANES INTO A MICROFLUIDIC SYSTEM BY UTILIZING MULTISCALE 3D PRINTING**
Julia K. Hoskins, Patrick M. Pysz, Julie A. Stenken, Min Zou
*University of Arkansas, USA*

**T100.f** **RAPID PROTOTYPING OF MICROFLUIDIC CHANNELS USING 3D-PRINTER FOR DENSITY BASED ANALYSIS OF MICROPARTICLES IN A MAGNETIC LEVITATION PLATFORM**
Seyda Keles[1], E. Alperay Tarim[1], H. Ahsen Ozcan[1], H. Cumhur Tekin[1,2]
[1] *Izmir Institute of Technology, TURKEY and* [2] *METU MEMS Center, TURKEY*

**W098.f** **COMBINING ONE - AND TWO-PHOTON 3D PRINTING: ON THE MECHANICAL PROPERTIES OF LATTICE STRUCTURES AND THE MANUFACTURING OF MICROFLUIDIC CHIPS**
Oliver Walker[1], Thierry Roland[2], Michael Heymann[1], Cosima Stubenrauch[1]
[1] *University of Stuttgart, GERMANY and*
[2] *Institute Charles Sadron, GERMANY*

**W099.f** **LCD 3D PRINTING OF A FLUIDIC DIODE**
Abdil Muhaymin Chowdhury, Thaddaeus D. Stine, Kalp B. Upadhayay, Carolyn G. Catan, Althea Marielle G. Eclarin, Luana M. Rojas Zurita, Catherine W. Lim, Michelle Liu, Ryan D. Sochol
*University of Maryland, USA*

**W100.f** **SUB-$500 PROJECTION MICROSTEREOLITHOGRAPHY 3D PRINTING**
Olivia O. Enietan, Lauren Twombly, Patrick M. Pysz, Julie A. Stenken
*University of Arkansas, USA*

## Bonding, Sealing and Interfacing

**M101.f** **A TEFLON-MEDIATED GLASS HETEROGENEOUS BONDING METHOD FOR FABRICATING HIGH CHEMICAL RESISTANCE MICROFLUIDIC FLOW REGULATOR**
Kao-Mai Shen[1], Kyojiro Morikawa[1,2,3], Takehiko Kitamori[1,3,4], Chihchen Chen[1]
[1] *National Tsing Hua University, TAIWAN,* [2] *University of Tokyo, JAPAN,* [3] *Kanagawa Institute of Industrial Science and Technology, JAPAN, and* [4] *Lund University, SWEDEN*

**M102.f** **THE STUDY OF CYTOTOXICITY AND INTEGRATION EFFICIENCY OF POROUS POLYMER MEMBRANES AS STRUCTURAL ELEMENTS IN ORGAN-ON-A-CHIP SYSTEMS**
Magdalena Flont, Kena D. Ejeta, Oliwia Tadko, Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

**T101.f** **FLEXCONNECT: AN ELECTROMECHANICALLY RELIABLE, FLEXIBLE, UNIVERSAL LEADOUT SOLUTION FOR SOFT BIOELECTRONIC INTERFACES**
Zhitong Zhang, Ziyan He, Xiaoyi Shi, Junshi Li, Zhongyan Wang, Jiayan Zhang, Xiaoyong Tang, Yu-Qing Zheng, Zhihong Li
*Peking University, CHINA*

**W101.f** **REVERSIBLE MICROFLUIDIC INTERCONNECTS FOR HIGH-DESNSITY ELECTRICAL AND FLUIDIC INTERFACING OF SOLID-STATE NANOPORE SENSOR ARRAYS**
Dmytro Lomovtsev, Michel Stephan, Matthew Waugh, Vincent Tabard-Cossa
*University of Ottawa, CANADA*

## Design for Manufacturability

**M103.f** **LOW-COST, HIGH-RESOLUTION 3D-PRINTING OF MICROFLUIDICS TOWARDS SELF-SUSTAINING HYDRATION IN ENGINEERED LIVING MATERIALS**
Aileen Y. Sun, Carrie H. Lin, John A. Tatka, Shannon Daily, Kinsey Drake, Alshakim Nelson, Ayokunle O. Olanrewaju
*University of Washington, USA*

**T102.f** **ADVANCING TUBULAR-LUMEN ORGAN-ON-CHIPS: FROM 3D-PRINTING TO MASS-MANUFACTURING-, AUTOMATION- AND HIGH THROUGHPUT-COMPATIBILITY**
Julius A. Perschel[1], Munkhtur Otgonbayar[1], Caroline Remmert[1], Maren Marder[1], Flavien Martinot[1], Sandra Wiedenmann[1], Matthias Meier[1,2]
[1] *Helmholtz Munich, GERMANY and* [2] *University of Leipzig, GERMANY*

**T103.f** **ON-SKIN SENSING DEVICE WITH FILM-BASED FLEXIBLE ACTIVE PUMP**
Ryo Matsui[1], Gaia Oda[1], Toshihiro Kasama[2], Madoka Takai[2], Ryo Miyake[2], Yuichiro Abe[1]
[1] *TOPPAN Inc., JAPAN and* [2] *University of Tokyo, JAPAN*

**W102.f** **FLOW CONTROL INSIDE 3D PRINTED MICROCHANNEL WITH MULTIPLE STACKED NOZZLES**
Helen Werner[1], Ebrahim TaiediNejad[2], Mehmet A. Sahin[1], Peer Erfle[2], Andreas Dietzel[2], Ghulam Destgeer[1]
[1] *Technical University of Munich, GERMANY and*
[2] *Technical University of Braunschweig, GERMANY*

## Direct Laser Write and 2-Photon Fabrication

**M104.f** **COMBINING 2-PHOTON POLYMERIZATION AND NANOIMPRINT LITOGRAPHY FOR THROMBOGENICITY ASSESSMENT IN LEFT VENTRICULAR ASSIST DEVICES**
Stjepan Perak[1,5], Marta Bonora[2,5], Sonja Kopp[3], Michael Muehlberger[3], Francesco Moscato[2,4,5], Markus Lunzer[1,5]
[1] *UpNano GmbH, AUSTRIA,* [2] *Medical University of Vienna, AUSTRIA,* [3] *PROFACTOR GmbH, AUSTRIA,* [4] *Ludwig Boltzmann Institute for Cardiovascular Research, AUSTRIA, and* [5] *Austrian Cluster for Tissue Regeneration, AUSTRIA*

**T104.f** **DIRECT LASER WRITING OF A SOFT MULTI-ACTUATOR MICROROBOT ATOP AN LCD 3D-PRINTED MICROFLUIDIC CHIP**
Olivia M. Young[1], Adira Colton[1], Dheeraj Gandhi[2], Miroslaw Janowski[2], Jeremy D. Brown[3], Mark Fuge[1], Axel Krieger[3], Ryan D. Sochol[1]
[1] *University of Maryland, USA,* [2] *University of Maryland School of Medicine, USA, and* [3] *Johns Hopkins University, USA*

**W103.f** **3D PRINTED µDICER FOR UNIFORM TISSUE MICRODISSECTION**
Annatoma Arif, Saisneha Koppaka, Seth C. Cordts, Sindy K.Y. Tang
*Stanford University, USA*

## Droplets, Particles and Fiber Manufacturing

**M105.f** **A CUSTOMIZED ASSEMBLED CENTRIFUGAL STEP EMULSIFIER FOR DROPLET GENERATION PREDICTION**
Xin Wang, Peng Chen, Bi-Feng Liu
*Huazhong University of Science and Technology, CHINA*

**M106.f** **TAILORING THE DEGRADATION KINETICS OF POLYCAPROLACTONE (PCL) MICROPARTICLES VIA MICROFLUIDIC SYNTHESIS WITH A BIS-DIAZERINE CROSSLINKER**
Paige Allard[1,2], Lily Pestereva[1,2], Jeremy E. Wulff[1,2], Katherine S. Elvira[1,2]
[1] *University of Victoria, CANADA and* [2] *Centre for Advanced Materials and Related Technology (CAMTEC), CANADA*

**T105.f** **CORE-SHELL STRUCTURAL COLOR VOXELS WITH CONTROLLABLE ELASTICITY FOR ACOUSTICALLY LEVITATED DISPLAYS**
Hayato Goto, Satoshi Nishita, Hidetoshi Takahashi, Hiroaki Onoe
*Keio University, JAPAN*

**T106.f** **THERMORESPONSIVE POLYMER BRUSH GRAFTED-GELMA MICROGELS FACILITATE FIBROBLAST CELL EXPANSION**
Esfandyar Askari, Mohsen Akbari
*University of Victoria, CANADA*

**W104.f** **3D HYDRODYNAMIC FLOW SCULPTING USING PDMS MICROCHANNELS FOR STRUCTURED ANISOTROPIC PARTICLE FABRICATION**
Yiying Zou, Mehmet Akif Sahin, Ghulam Destgeer
*Technical University of Munich, GERMANY*

**W105.f** **MICROFLUIDIC MANUFACTURING AND BIOSENSOR APPLICATION OF MAGNETIC FIELD-RESPONSIVE GLUCOSE OXIDASE BEADS**
Yusuke Kanno[1], Yeyi Tang[1], Shuzo Masui[2], Takasi Nisisako[1]
[1] *Tokyo Institute of Technology, JAPAN and* [2] *University of Tokyo, JAPAN*

## Microfluidics-Based Patterning and Manufacturing

**M107.f** **SELECTIVE SURFACE COATING IN CLOSED MICROFLUIDIC ARRAYS FOR CELL ASSAYS**
Anna Kaehr, Guillaume Aubry, Hang Lu
*Georgia Institute of Technology, USA*

**T107.f** **WATER/OIL MULTI-PHASE FLOW IN MICROCHANNEL WITH HELICAL CORRUGATION SURFACE BY DIGITAL LIGHT PROCESSING 3D PRINTING TECHNOLOGY**
Doheon Koo, Hongyun So
*Hanyang University, KOREA*

**W106.f** **REPRODUCIBLE AND REPEATABLE CELLULAR MICROARRAY GENERATION USING MULTI-CAPILLARY STAMPING**
Haruka Oda[1], Hisatoshi Mimura[2], Toshihisa Osaki[2], Shoji Takeuchi[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Kanagawa Institute of Industrial Science and Technology, JAPAN*

## Microscale Fabrication, Patterning, and Integration

**M108.f** **ANALYSIS OF ELECTROPLATING PROCESS CONDITIONS FOR MICROSCALE COPPER STRUCTURE FABRICATION**
Sangyeun Park, Byungkwon Chun, Doheon Koo, Hongyun So
*Hanyang University, KOREA*

**M109.f** **COMBINING INJECTION MOLDING AND MICRO-3D PRINTING FOR SPATIALLY RESOLVED POLYMER MATERIAL PROPERTIES**
Michelle Vigogne[1], Carsten Zschech[1], Markus Stommel[1], Ines Kühnert[1], Julian Thiele[1,2]
[1]*Leibniz Institute of Polymer Research Dresden, GERMANY and* [2]*Otto von Guericke University Magdeburg, GERMANY*

**M110.f** **FABRICATION AND CHARACTERISATION OF BIOPOLYMER NANOFIBERS USING ELECTROHYDRODYNAMIC JET 3D PRINTING**
Sara Sadati[1], Marcus Swann[2], Jerome Charmet[1,3,4], Steven L Percival[2], Meera Unnikrishnan[1], Dmitry Isakov[1]
[1]*University of Warwick, UK,* [2]*5D Health Protection Group Ltd, UK,* [3]*University of Applied Sciences, Western Switzerland (HES-SO), SWITZERLAND, and* [4]*University of Bern, SWITZERLAND*

**M111.f** **IN SITU UV-CROSSLINKING OF HYDROGELS TO ESTABLISH CELL-BARRIERS IN ORGAN-ON-CHIP SYSTEMS.**
Simon Werner[1], Ning Zhang[2], Melisa Tekinalp[2], Tengku I. Maulana[2], Brigitte Angres3, Helmut Wurst[3], Peter M. Loskill[2]
[1]*University of Tübingen, GERMANY,* [2]*University of Tübingen, GERMANY, and* [3]*Cellendes GmbH, GERMANY*

**M112.f** **MICROFLUIDIC PREPARATION OF ULTRATHIN, MINERALIZED COLLAGEN SHEETS**
Gahyeon Kim, Liyang Zhong, Wuyang Gao, Eli Sone, Axel Günther
*University of Toronto, CANADA*

**M113.f** **PLASTRON LIFETIME OF SUPERHYDROPHOBIC SURFACES SUBMERGED IN BIOFLUIDS**
Mohammad Awashra, Seyed Mehran Mirmohammadi, Lingju Meng, Sami Franssila, Ville Jokinen
*Aalto University, FINLAND*

**M114.f** **SMOOTH SURFACE FUSED SILICA MICROCHANNEL BY CNC MILLING FABRICATION**
Wei-Jen Soong[1], Chihchen Chen[1], Takehiko Kitamori[1,2,3], Kyojiro Morikawa[1,2,4]
[1] *National Tsing Hua University, TAIWAN,* [2] *Kanagawa Institute of Industrial Science and Technology, JAPAN,* [3] *Lund Univeristy, JAPAN, and* [4] *University of Tokyo, JAPAN*

**T108.f** **ATOMIZATION OF NARROW-WIDTH SURFACE ACOUSTIC WAVE DEVICE FOR INTRANASAL NEBULIZATION**
Kosuke Wakayama[1], Shun Koda[1], Yuta Bando[1], Sho Kurihara[2], Yuta Kurashina[1]
[1] *Tokyo University of Agriculture and Technology, JAPAN and* [2] *Jikei University School of Medicine, JAPAN*

**T109.f** **CONFIGURABLE AND MODULAR 3D-PRINTED MICROSTRUCTURED STAMP FOR VERSATILE PATTERNING OF A LOW-VISCOUS BIOINK**
Yejin Choi, Soo Jee Kim, Je-Kyun Park
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**T110.f** **FABRICATION OF PICOLITER TO MICROLITER STRUCTURES IN ONE CHIP USING HYBRID COC FILM TECHNOLOGY**
Salman Murad[1], Marvin Heyer[1], Fabian Lickert[2], Christoph Stöver[3], Thomas Ruhl[3], Benedikt Bläsi[4], Markus Rombach[2], Daniel Kainz[2], Tobias Hutzenlaub[1,2], Nils Paust[1,2], Peter Juelg[1,2]
[1] *University of Freiburg, GERMANY,* [2] *Hahn-Schickard, GERMANY,* [3] *Temicon GmbH, GERMANY, and* [4] *Fraunhofer Institute, GERMANY*

**T111.f** **MASSIVELY PARALLEL HIGH THROUGHPUT SINGLE-CELL PRINTING AND HIGHLY EFFICIENT LARGE BIOMOLECULAR DELIVERY INTO MAMMALIAN CELLS**
Ashwini S. Shinde[1], Pallavi S. Shinde[1], Moeto Nagai[2], Srabani Kar[3], Tuhin S. Santra[1]
[1] *Indian Institute of Technology, Madras, INDIA,* [2] *Toyohashi University of Technology, JAPAN, and* [3] *Indian Institute of Science Education and Research Tirupati, INDIA*

**T112.f** **MODIFYING A CONTROLLED DIFFUSION MICROFLUIDIC DEVICE THROUGH APPLICATIONS OF TUNABLE WIDTH CHANNELS BASED ON PDMS NANOCRACKS**
Animesh Sahu, Nicholas J. Ginga
*University of Alabama, Huntsville, USA*

**T113.f** **POLYMORPHING HYDROGELS REGULATED BY PHOTO-REACTIVE DNA CROSS-LINKS**
Junho Roh, Seongjun Park, Hoeseong Kim, Eunjin Choi, Yeongjae Choi
*Gwangju Institute of Science and Technology, KOREA*

**T114.f** **USE OF POLYMER MICROPILLAR ARRAYS FOR SIGNAL ENHANCEMENT IN COLORIMETRIC AND FLUORESCENCE-BASED DETECTION ASSAYS**
Matthias Geissler[1], Daniel Brassard[1], Nadine Adam[2], Neda Nasheri[2], Liviu Clime[1], Caroline Miville-Godin[1], Maxence Mounier[1], Christina Nassif[1], Lidija Malic[1], Keith J. Morton[1], Nathalie Corneau[2], Teodor Veres[1]
[1] *National Research Council of Canada, CANADA,* [2] *Health Canada, CANADA,* [3] *National Research Council, CANADA, and* [4] *Health Canada, CANADA*

**W107.f ACTISCULPT: ACTIVE SCULPTING OF MULTILAYERED FLOW FOR NEXT GENERATION OF 3D PRINTING NOZZLES**
Mehmet Akif Sahin, Ghulam Destgeer
*Technical University of Munich, GERMANY*

**W108.f BIOELECTROCHEMICAL CROSSBAR ARCHITECTURE SCREENING PLATFORM FOR HIGH-THROUGHPUT ANALYSIS OF ELECTROACTIVE BACTERIA**
Hasika Suresh[1], Kundan Saha[1], Cihan Asci[1], Rhea Patel[2], Surya V. Devaraj[2], Atul Sharma[1], Matthew Carpenter[3], Caroline M. Ajo-Franklin[3], Maryam S. Baghini[2], Sameer Sonkusale[1]
[1] *Tufts University, USA,* [2] *Indian Institute of Technology, Bombay, INDIA, and* [3] *Rice University, USA*

**W109.f EXPLORING COST-EFFECTIVE APPROACHES TO MICROFLUIDIC SYSTEMS FOR HEALTHCARE IN DEVELOPING COUNTRIES**
Shermineh Shakeri[1], Nasrollah Tabatabaei[1], Nur Mustafaoglu[2], Mahya Marashian[1], Mohammad Amin Hashemi[1], Houra Mobaleghol Eslam[1], Mohammad Akbarpour[1], Mohammad Taleb[1]
[1] *Tehran University of Medical Sciences, IRAN and* [2] *Sabanci University, TURKEY*

**W110.f HIGH-THROUGHPUT X-Y SPERM SORTING MICROFLUIDIC DEVICE IN A REVERSE MICRO FLOW TO MEET THE MARKET NEEDS OF EVERY LIVESTOCK SPECIES**
Cheng-Yang Li[1], Bang-Lun Wang[1], Hsien-Chin Peng[1], Ching-Fu Tu[3], Tzu-Hsuan Kuo[1], Fan-Gang Tseng[1,2]
[1] *National Tsing Hua University, TAIWAN,* [2] *Academia Sinica, TAIWAN, and* [3] *Agricultural Technology Research Institute, TAIWAN*

**W111.f MICROFLUIDIC DEVICE PROCESSING AND PRODUCTION IN THERMOPLASTIC AND GLASS FOR ALL**
Izadora Fujinami Tanimoto[1,2], Elian Martin[1,2], Bertrand Cinquin[1,2]
[1] *ESPCI-PSL, FRANCE and* [2] *CNRS, FRANCE*

**W112.f ON-CHIP MECHANICAL CHARACTERIZATION OF SINGLE CELLS BY UTILIZING LAYERED RIGID POLYMER STRUCTURE**
Nariaki Kiyama, Yoko Yamanishi, Shinya Sakuma
*Kyushu University, JAPAN*

**W113.f RAPID FABRICATION OF THERMOPLASTIC-BASED MICROFLUIDIC CHIP BY COMBINING 3D LITHOGRAPHY AND INJECTION MOLDING**
Ayumu Oizumi[1], Atsuhito Okonogi[2], Tomomi Okonogi[2], Arata Tsuchida[3], Hirofumi Shintaku[3,4], Takaaki Suzuki[1]
[1] *Gunma University, JAPAN,* [2] *Laboko Co., LTD, JAPAN,* [3] *RIKEN, JAPAN, and* [4] *Kyoto University, JAPAN*

**W114.f VALIDATION AND CHARACTERIZATION OF RAPID PROTOTYPED MATERIALS FOR SUB-TERAHERTZ DIELECTRIC SPECTROSCOPY IN BIOMEDICAL APPLICATIONS**
Hanane Tissir, Jian-Ye Mai, Raphael Trouillon, Ke Wu
*Polytechnique Montréal, CANADA*

## Molding, Embossing, and Roll-to-Roll

**M115.f** **COMBINATORIAL MOLDING STRATEGIES FOR MONOLITHIC TRUE 3D MICROFLUIDIC BIOREACTORS**
Bram Servais, David R. Nisbet, David Collins
*University of Melbourne, AUSTRALIA*

**T115.f** **MASS FABRICATION OF PDMS DEVICES BY INJECTION MOLDING**
Raphaël Filion[1,2,3], Yann Trovalet[4], David Reyter[4], Zahra Kanani[1], Claire Cerclé[1], Abdellah Ajji[1], Thomas Gervais[1,2,3,5]
[1]Polytechnique Montréal, CANADA, [2]Centre de recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM), CANADA, [3]Institut du Cancer de Montréal (ICM), CANADA, [4]DBM Reflex, CANADA, and [5]Miso Chip, CANADA

**W115.f** **TOWARD REPRODUCEABLE MULTILUMEN TUBING AS A SUBSTRATE FOR DIRECT LASER WRITING-BASED MICROFLUIDICS**
Bailey M. Felix[1], Jordi T. Andreou[1], Olivia M. Young[1], Nicholas Portwood[1], A. Muhaymin Chowdhury[1], Hannah Moskios[1], Sarah McHugh[1], Claudia Davis[1], Nathan Ravnitzky[1], Fola Agbebi[1], Clifford R. Weiss[2], Christopher R. Bailey[2], Deeraj Gandhi[3], Miroslaw Janowski[3], Jeremy D. Brown[4], Mark Fuge[1], Axel Kreiger[4], Ryan D. Sochol[1]
[1]*University of Maryland, USA,* [2]*Johns Hopkins School of Medicine, USA,* [3]*University of Maryland School of Medicine, USA, and* [4]*Johns Hopkins University, USA*

## New Materials and Surface Modification

**M116.f** **CHARACTERIZATION OF UV NAIL SCULPTING GEL FOR LOW-COST APPLICATIONS IN MICROFLUIDICS**
Lorenzo A. Tell, Karen A. Sosa Navarro, María de los Angeles Rossi, Carolina D.V. Bessone, Evelina Frontera
*Universidad Nacional de Villa Mercedes, ARGENTINA*

**M117.f** **OPTICAL QUALITY CONTROL OF FUNCTIONALIZED GLASS SURFACES FOR NANOPARTICLE AND SINGLE FLUOROPHORE DETECTION**
Andreas Wallucks, Hugues Martin, David Juncker
*McGill University, CANADA*

**T116.f** **DUAL SURFACE FUNCTIONALIZATION OF MICROFLUIDIC BLOOD OXYGENATORS USING ANTITHROMBIN-HEPARIN COMPLEX (ATH) AND TISSUE PLASMINOGEN ACTIVATOR (T-PA) PROVIDES SUPERIOR ANTITHROMBOGENICITY**
Siyuan Li[1], Helen M. Atkinson[1], Gerhard Fusch[1], Niels Rochow[1,2], Christoph Fusch[1,2], P. Ravi Selvaganapathy[1], John L. Brash[1], Anthony K.C. Chan[1], Kyla N. Sask[1]
[1]*McMaster University, CANADA and*
[2]*University Hospital Nuremberg, GERMANY*

**W116.f** **INVESTIGATION OF THE SCALABILITY OF POSS-BASED PHOTOMATERIALS FOR 3D-PRINTED GLASS MICROFLUIDICS**
Adira Colton[1], Mahima Srivastava[1], Ryan N. Halli[1], Declan Fitzgerald[1], Kinneret Rand-Yadin[2], Ryan D. Sochol[1]
[1]*University of Maryland, USA and* [2]*SeeTrue Technology, USA*

## Others

**W118.f** **NON-INVASIVE TOOLKIT FOR SURVEILLING MOSQUITO PATHOGEN THROUGH EXCRETA**
Zhuolun Meng, Dana Price, Mehdi Javanmard
*Rutgers University, New Brunswick, USA*

## Resins and Inks for 3D Printing

**M118.f** **PRINTING OF SHAPE MEMORY HYDROGELS BY ROBOTIC DISPENSERS**
Shumon Ogura, Hiroaki Suzuki
*Chuo University, JAPAN*

**T117.f** **CYTOTOXICITY ASSESSMENT IN RAPID PROTOTYPING INJECTION MOLDING FOR MANUFACTURING OF POLYMERS-BASED MICROFLUIDIC DEVICES**
Mert Gulcur[1], Adel Tekari[2], Pengcheng Zhu[1], Lucia Brown[1], Vito Kontrimas[1], Fréderic Flahaut[2], Esteban Alvarez Seoane[2], Valentin Robert-Charrue[2], Saskia Schmidt[3,4], Carine Gaiser[3,4], Silvia Demuru[5], Bradley Petkus[5], Loïc Burr[5], Laura Suter-Dick[3], Robert Dallmann[1], Greg Gibbons[1], Alexandra Homsy[2], Jérôme Charmet[1,2,6]
[1] *University of Warwick, UK,* [2] *University of Applied Sciences Western Switzerland (HES-SO), SWITZERLAND,* [3] *University of Applied Sciences and Arts Northwestern Switzerland, SWITZERLAND,* [4] *University of Basel, SWITZERLAND,* [5] *Centre Suisse d'Electronique et de Microtechnique SA (CSEM), SWITZERLAND, and* [6] *University of Bern, SWITZERLAND*

**W117.f** **POROUS POLY(ETHYLENE GLYCOL) DIACRYLATE HYDROGEL-BASED INKS FOR HIGH-RESOLUTION LOW-COST LCD 3D PRINTING OF MICROFLUIDICS**
Justin de Vries, Houda Shafique, Emilie Johnson, David Juncker
*McGill University, CANADA*

## Subtractive Prototyping (Laser Machining, Milling, Etc.)

**T118.f** **TINY CHANNELS, STICKY STUFF, AND BIOFIXES - KAPPA (κ) CHIP: A MODULAR MICROFLUIDIC DEVICE FOR ANALYTE SCREENING USING A PARALLELIZED ASSAYS AND MULTIPLE SHEAR RATE APPROACH**
Jose A. Wippold, Mark Kozlowski, Joshua Orlicki, Justin Jahnke
*Army Research Laboratory, USA*

## Late News

**M517.f** **3D-PRINTED PERMEOTUBES FOR INVESTIGATING CARDIAC RESISTANCE TO CANCER METASTASIS**
Amid Shakeri[1,2], Sargol Okhovatian[1,2], Matthew Lei[1,2], Richard Jiang[1,2], Milica Radisic[1,2]
[1] *University of Toronto, CANADA and*
[2] *Toronto General Hospital Research Institute, CANADA*

**M518.f BIOMIMETIC FRACTAL TOPOGRAPHY ENHANCES KIDNEY PODOCYTE MATURATION IN VITRO**
Chuan Liu[1,2], Praful Aggarwal[3], Karl T. Wagner[1,2], Shira S. Landau[1,2], Teng Cui[1], Xin Song[1], Laleh Shamaei[4], Naimeh Rafatian[1], Yimu Zhao[1,2], Sonia Rodriguez-Ramirez[2], Keith Morton[5,6], Elizabeth Virlee[3], Chen Yu Li[1], Dawn Bannerman[1,2], Simon Pascual-Gil[2], Sargol Okhovatian[1,2], Anastasia Radisic[1], Sergi Clotet-Freixas[2], Teodor Veres[1,5,6], Mohtada Sadrzadeh[4], Tobin Filleter[1], Ulrich Broeckel[3], Ana Konvalinka[1,2], Milica Radisic[1,2,6]
[1]*University of Toronto, CANADA,* [2]*University Health Network, CANADA,* [3]*Medical College of Wisconsin, USA,* [4]*University of Alberta, CANADA,* [5]*National Research Council Canada, CANADA, and* [6]*Centre for Research and Applications in Fluidic Technologies, CANADA*

**M519.f ENHANCING STRUCTURAL INTEGRITY OF GRANULAR HYDROGELS THROUGH SURFACE ROUGHNESS MODULATION OF MICROGELS**
Navid Tavoosi, Luc Mongeau
*McGill University, CANADA*

**M520.f FEASIBILITY OF 3D MICROELECTRODE ARRAY FOR 3D NEURONAL CULTURES USING A DIGITAL LIGHT PROCESSING 3D PRINTING**
Dongjo Yoon, Yoonkey Nam
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**M521.f MANIPULATION OF CELL MORPHOLOGY AND ATTACHMENT ON NANOIMPRINTED THIOL-ENE-EPOXY TOPOGRAPHIES**
Reza Zandi Shafagh[1], Joanne Shen[1], Sonia Youhanna[1], Weijin Guo[2], Tommy Haraldsson[2], Wouter van der Wijngaart[2], Volker Lauschke[1]
[1]*Karolinska Institute, SWEDEN and*
[2]*KTH Royal Institute of Technology, SWEDEN*

**M522.f MICROFLUIDIC PAPER-BASED ANALYTICAL SOFT ACTUATORS (μPAC)**
Koki Yoshida[1,2], Masahiro Takinoue[1], Hiroaki Onoe[3], Michinao Hashimoto[2]
[1]*Tokyo Institute of Technology, JAPAN,* [2]*Singapore University of Technology and Design, SINGAPORE, and*
[3]*Keio University, JAPAN*

**M523.f SIMPLE FABRICATION METHOD OF OPEN 3D ELECTRODES INTEGRAED IN MICROFLUIDIC SYSTEMS FOR HIGHLY SENSITIVE DROPLET ANALYSIS**
Byeolnim Oh[1], Moon Sung Son[1], Jaewon Park[3], Kang-Ho Lee[2], Hyun Soo Kim[1]
[1]*Kwangwoon University, KOREA,* [2]*Korea Institute of Machinery and Materials, KOREA, and* [3]*Konkuk University, KOREA*

**M524.f VASCULAR FLOW MODEL FOR THE EVALUATION OF EMBOLIC AGENTS: ENHANCING ANATOMICAL ACCURACY AND COMPLIANCE**
Élie Daoust[1], Arthur Haroutounian[2], Sophie Lerouge[1], Gilles Soulez[2]
[1]*École de Technologie Supérieure, CANADA and*
[2]*Université de Montréal, CANADA*

**T517.f** **AGILE AND LOW-COST FABRICATION OF GLASS MICROFLUIDIC DEVICES - CHARACTERIZING THE EFFECT OF TOOL GEOMETRY AND TOOL PATH STRATEGY USING SPARK-ASSISTED CHEMICAL ENGRAVING**

Guillaume Villeneuve[1], Jean-Philippe Leclair[1], Rolf Wuthrich[2], Emmanuel Brousseau[3], Lucas A. Hof[1]
[1] *École de Technologie Supérieure, CANADA,* [2] *Concordia University, CANADA, and* [3] *Cardiff University, UK*

**T518.f** **DIRECT LASER WRITING OF LIQUID CRYSTALLINE CELLULOSE PHOTONIC ACTUATORS RESPONSIVE MICROFLUIDICS WITH A SPLASH OF COLOUR**

Aoife Donohoe[1], Jing Qian[1], Raquel Catalan[2], Enrique Azuaje Hualde[1,2], Louise Bradley[1], Lourdes Basabe-Desmonts[2], Fernando Benito-Lopez[2], Larissa Florea[1], Colm Delaney[1]
[1] *Trinity College Dublin, IRELAND and*
[2] *University of the Basque Country UPV/EHU, SPAIN*

**T519.f** **FABRICATION OF NANO-ELECTRODES IN A NANOCHANNEL USING NANOFLUIDICS AND NANO-ELECTROCHEMISTRY**

Kyojiro Morikawa[1,2,3], Tomoaki Takeuchi[2], Takehiko Kitamori[1,3,4]
[1] *National Tsing Hua University, TAIWAN,* [2] *University of Tokyo, JAPAN,* [3] *Kanagawa Institute of Industrial Science and Technology, JAPAN, and* [4] *Lund University, SWEDEN*

**T520.f** **FUNCTIONALIZATION OF 3D PRINTED MICROCHANNEL PLATE DETECTORS BY ATOMIC LAYER DEPOSITION**

Kristian Deneke, Stefanie Haugg, Bent Andersen, Robert Zierold, Robert H. Blick
*Universität Hamburg, GERMANY*

**T521.f** **MASSIVE GENERATION OF INDEPENDENTLY STRUCTURE-ENCODABLE PARTICLES BY NOVEL 3D-CONFIGURED FLOW-LITHOGRAPHY**

Akihiro Eguchi, Yuichiro Iwamoto, Hinata Tokuda, Minato Yamashita, Kazuki Hattori, Sadao Ota
*University of Tokyo, JAPAN*

**T522.f** **MICROCYCLONES FOR HIGH-EFFICIENCY COLLECTION OF SUBMICRON BIOAEROSOLS**

Proma Bhattacharya, Dewansh Rastogi, Sima Mehraji, Akua Asa-Awuku, Don L. DeVoe
*University of Maryland, USA*

**T523.f** **SURFACTANT BASED DEVELOPMENT OF UNIQUE MULTI-RING PHOTONIC STRUCTURES**

Appurva Tiwari[1], Ashish K. Thokchom[1], Seong J. Lee[2]
[1] *Shiv Nadar Institution of Eminence Deemed to be University, INDIA and*
[2] *University of Suwon, KOREA*

**W517.f** **ATPSPIN: A MICROFLUIDIC APPROACH FOR VARIED ALGINATE MICROFIBER PRODUCTION**

Niloofar Ghasemzaie[1,2,4], Morteza Jeyhani[1,2,4], Kushal Joshi[1,2,4], Warren L. Lee[1,2,3,4], Scott S. H. Tsai[1,2,4]
[1] *Toronto Metropolitan University, CANADA,* [2] *St. Michael's Hospital, Unity Health, CANADA,* [3] *University of Toronto, CANADA, and* [4] *Institute for Biomedical Engineering, Science and Technology (iBEST), CANADA*

**W519.f** **FABRICATION OF VERTICAL THROUGH GLASS MICROCHANNEL WITH DETACHABLE BONDING, MILLING, AND ETCHING**
Hsin-Yi Lee[1], Po-yin Chen[1], Wei-Jen Soong[1], Chihchen Chen[1], Takehiko Kitamori[1,2,3], Kyojiro Morikawa[1,2,4]
[1]*National Tsing Hua University, TAIWAN,* [2]*Kanagawa Institute of Industrial Science and Technology, JAPAN,* [3]*Lund Univeristy, JAPAN, and* [4]*University of Tokyo, JAPAN*

**W520.f** **INTEGRATED CIRCUIT (IC) BASED SINGLE-CELL ELECTRIC IMPEDANCE SENSING CHIPLET BATCHES PROCESSING**
Wenhao Hui, Ren Shen, Pui-In Mak, Rui P. Martins, Yanwei Jia
*University of Macau, MACAO*

**W521.f** **NOVEL CULTURE SUBSTRATES FOR MECHANICAL STIMULATION IN CARDIOVASCULAR RESEARCH**
Dominik Kolodziejek, Zuzanna Zoltowska, Natalia Wasiak, Julia Bialota, Aleksandra Dabala, Marcin Drozd, Zbigniew Brzózka, Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

**W522.f** **REALIZING HIGH-VIABILITY SINGLE CELL PRINTING IN ACRYLATED HYDROGESL BY OVERCOMING OXYGEN TOXICITY**
Alan Stenquist, Ben Noren, Cassidy Enloe, John Oakey
*University of Wyoming, USA*

**W523.f** **TEXTILE-BASED SUBSTRACTIVE MANUFACTURING APPLIED TO ORGANS-ON-CHIPS**
Vivian Aubert[1], Melissa Saelens[1], Arthur Salles[1,2], Emile Gasser[1,2], Catherine Villard[2], Andrei Kolosov[1], Anissa Kaddouche[1], Quentin Watel[3], Aurelie Cayla[3], Fabien Salaun[3], François Boussu[3], Jean-Louis Viovy[1]
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## g - Sensors, Actuators and Detection Technologies

### Artificial Intelligence Enhanced Sensing

**M119.g** **AIOT-ENHANCED GLOBAL ANTIMICROBIAL RESISTANCE AUTOMATED SURVEILLANCE SYSTEM USING MULTIPLEX MICROFLUIDIC TECHNIQUE**
Jinxin Liu[1], Xinyu Yan[1], Luyao Ma[2], Qian Liu[1], Xiaonan Lu[1]
[1]*McGill University, CANADA and* [2]*Oregon State University, USA*

**T119.g** **IONIC CELL MICROSCOPY: A NEW MODALITY FOR VISUALIZING CELLS USING MICROFLUIDIC IMPEDANCE CYTOMETRY AND GENERATIVE AI**
Mahtab Kokabi[1], Gulam M. Rather[2], Mehdi Javanmard[1]
[1]*Rutgers University, New Brunswick, USA and*
[2]*Rutgers Cancer Institute of New Jersey, USA*

**W119.g** **A COMPARATIVE ANALYSIS OF MACHINE LEANRING ALGORITHMS FOR THE CLASSIFICATION OF REAL-TIME ELECTROCHEMICAL SENSING DATA**
Sadman Sakib, Kulmanak Bajaj, Payel Sen, Wantong Li, Jimmy Gu, Yingfu Li, Leyla Soleymani
*McMaster University, CANADA*

## Chemical and Electrochemical Sensors

**M120.g A MICROFLUIDIC PLASMA SEPARATION DEVICE INTEGRATED WITH A NOVEL REDOX-CONTAINING MOLECULAR IMPRINTED POLYMER BIOSENSOR FOR DETECTION OF METABOLITES IN THE WHOLE BLOOD**
Bahareh Babamiri, Mohammadreza Farrokhnia, Mehdi Mohammadi, Amir Sanati Nezhad
*University of Calgary, CANADA*

**M121.g ADDITIVELY MANUFACTURED ELECTROCHEMICAL PLATFORMS FOR BIOSENSING APPLICATIONS**
Arash Khorrami Jahromi
*McGill University, CANADA*

**M122.g DEVELOPMENT OF A MICROPORE-BASED FLUIDIC CELL FOR RAPID DETECTION OF NANOPARTICLES IN FLUIDS**
Leon Juarez, Alessandro Porro, Giulia Montrucchio, Federico Thei
*elements srl, ITALY*

**M123.g FABRICATION AND INTEGRATION OF 3D ELECTRODES FOR MICROFLUIDICS**
Said Abdellatif, Darius G. Rackus
*Toronto Metropolitan University, CANADA*

**M125.g MULTIVALENT APTAMER GENERATION THROUGH ROLLING CIRCLE AMPLIFICATION ON A NANOSTRUCTURED SURFACE FOR BIOSENSING APPLICATIONS**
Seyed Vahid Hamidi, Arash Khorrami Jahromi, Imman I. Hosseini, Roozbeh Siavash Moakhar, Sara Mahshid
*McGill University, CANADA*

**M126.g PHOTOELECTROCHEMICAL SENSOR FOR DETECTION OF ULTRA-LOW CONCENTRATION PHOSPHATE**
Peng Zhou, Yingming Xu, Tianhong Cui
*University of Minnesota, USA*

**M127.g SENSITIVE ARSENITE DETECTION BASED ON GRAPHENE ION-SENSITIVE FIELD-EFFECT TRANSISTORS**
Yingming Xu, Peng Zhou, Terrence Simon, Tianhong Cui
*University of Minnesota, USA*

**T120.g A NOVEL ELECTROCHEMICAL MICROFLUIDIC APTASENSOR FOR THE DETECTION OF PARASITE**
Roozbeh Siavash Moakhar[1], Rohan Mahimkar[2], Arash Khorrami Jahromi[1], Sahar Sadat Mahshid[3], Carolina del Real Mata[1], Yao Lu[1], Fabio Vasquez Camargo[2], Brent Dixon[4], John Gilleard[5], Alexandre J. Da Silva[6], Momar Ndao[1,2], Sara Mahshid[1]
[1]*McGill University, CANADA,* [2]*McGill University Health Center, CANADA,* [3]*Sunnybrook Health Sciences Centre, CANADA,* [4]*Health Canada, CANADA,* [5]*University of Calgary, CANADA, and* [6]*US FDA-Center for Food Safety and Applied Nutrition, CANADA*

**T121.g AN INTEGRATED DIGITAL MICROFLUIDIC ELECTROCHEMICAL BROAD-SPECTRUM PATHOGEN SENSOR**
Richard Piffer Soares de Campos[1], Dipesh Aggarwal[1], Nora W.C. Chan[2], Abebaw B. Jemere[1]
[1] *National Research Council of Canada, CANADA and* [2] *Defence Research and Development Canada, CANADA*

**T122.g DEVELOPMENT OF A PORTABLE MEASUREMENT SYSTEM FOR MULTI-ION DETECTION**
Jia-Yuan Chang[1], Chia-Ming Yang[1,2,3], Chao-Sung Lai[1,2,3]
[1] *Chang-Gung University, TAIWAN,* [2] *Chang Gung Memorial Hospital, TAIWAN, and* [3] *Ming-Chi University, TAIWAN*

**T123.g FABRICATION OF A CMOS ISFET MICROSYSTEM TO CHARACTERIZE THE PROTON PUMPING OF BACTERIORHODOPSIN**
Abhijit Kakati[1], Oleksandr Dobroliubov[1], Hope Sylva[4], Daniel Sylva[4], Ashley Johnson[4], Krishna Dixit[4], Jordan Greco[4], Nicole Wagner[4], Robert Birge[4], Bjørn T. Stokke[1,2], Philipp Häfliger[3], Erik A. Johannessen[1]
[1] *University of Southeastern, NORWAY,* [2] *Norwegian University of Science and Technology, NORWAY,* [3] *University of Oslo, NORWAY, and* [4] *LambdaVision, USA*

**T124.g HIGHLY SENSITIVE, MULTIPLEXED DETECTION OF CIRCULATING BIOMARKERS USING A GOLD-NANOPARTICLE-EMBEDDED MEMBRANE**
Rebecca Goodrum, Roshan Tosh Aggarwal, Huiyan Li
*University of Guelph, CANADA*

**T125.g NANO-CRYSTALIZED PRUSSIAN BLUE MODIFIED GRAPHENE OXIDE LEAD NEEDLE FOR HIGH-PERFORMANCE ELECTROCHEMICAL DETERMINATION OF HYDROGEN PEROXIDE**
Wei-Ren Hou, Dai-En Li, Yi-Xiang Wang, Che-Hsin Lin
*National Sun Yat-sen University, TAIWAN*

**T127.g TUMOR DIAGNOSIS ON ELECTRIC IMPEDANCE INTEGRATED CIRCUIT (IC) CHIP WITH SINGLE-CELL RESOLUTION**
Wenhao Hui[1], Ren Shen[1], Yingying Liu[1], Ka-Meng Lei[1], Pui-In Mak[1], Rui Martins[1,2], Yanwei Jia[1]
[1] *University of Macau, MACAO and* [2] *Universidade de Lisboa, PORTUGAL*

**W120.g A METAL-ORGANIC FRAMEWORKS (MOF)-BASED ELECTROCHEMICAL BIOSENSOR WITH A WIDE LINEAR RANGE FOR GLUCOSE DETECTION**
Muxue Wang, Xun Xu, Youchun Xu
*Tsinghua University, CHINA*

**W121.g A REUSABLE MICROFLUIDIC SENSOR DEVICE FOR THE COLORIMETRIC DETECTION OF AMMONIA EXUDATES IN BUILDING MATERIALS**
Emilio García-Rodríguez[1], Ilaria Costantini[2], Kepa Castro[2], Lourdes Basabe-Desmonts[1], Fernando Benito-Lopez[1]
[1] *Microfluidics Cluster, SPAIN and* [2] *University of the Basque Country, SPAIN*

**W122.g BROAD SIZE-SPECTRUM SENSING FROM IONS TO PROTEINS ENABLED BY DNA APTAMER HYDROGEL SENSORS**
Satofumi Kato[1], Masahiro Takinoue[2], Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Institute of Science Tokyo, JAPAN*

**W123.g** **ELECTROTHERMAL COATING OF BACTERIA IMPRINTED POLYMER ON METALLIC MICROWIRES**
Alireza Zabihihesari, Arezoo Khalili, Ayobami Elisha Oseyemi, Pouya Rezai
*York University, CANADA*

**W124.g** **FABRICATION OF HIGH-RESOLUTION, FLEXIBLE, LASER-INDUCED GRAPHENE SENSORS VIA STENCIL MASKING**
Kaylee Clark, Tyler R. Ray
*University of Hawaii, Manoa, USA*

**W125.g** **LOW-COST MEMBRANE-INTEGRATED MICROFLUIDIC ELECTROCHEMICAL SENSOR FOR LOW-LIMIT DETECTION OF SPECIFIC SALT IONS IN DRINKING WATER**
Ayobami Elisha Oseyemi, Alireza Zabihihesari, Pouya Rezai
*York University, CANADA*

**W126.g** **NOVEL IMPEDIMETRIC MICROFLUIDIC BIOSENSOR BASED ON CELL IMPRINTED POLYMERS FOR ENHANCED WATERBORNE BACTERIA DETECTION**
Shiva Akhtarian, Satinder Kaur Brar, Pouya Rezai
*York University, CANADA*

**W127.g** **POROUS MEMBRANE ELECTRODE DEVICES FOR IN SITU ELECTROCHEMICAL MEASUREMENT OF ALKALINE PHOSPHATASE ACTIVITY IN HUMAN GUT MODELS**
Yoshinobu Utagawa[1], Kosuke Ino[1], Takeo Miyake[2], Hiroya Abe[1], Hitoshi Shiku[1]
[1] *Tohoku University, JAPAN and* [2] *Waseda University, JAPAN*

**W128.g** **USING DNA NANOSCAFFOLD TO CONTROL THE SIZE OF PEPTIDE NANOPORES TOWARD DEVELOPMENT OF ULTRASENSITIVE NANOPORE SENSOR**
Zugui Peng, Ryuji Kawano
*Tokyo University of Agriculture and Technology, JAPAN*

## Micropumps, Valves, and Dispensers

**M128.g** **ADDITIVELY MANUFACTURED MICROFLUIDICS FOR SEQUENTIAL FLOW CONTROL IN AMPLIFICATION ASSAYS**
Sripadh Guptha Yedire, Imman Isaac Hosseini, Tamer AbdelFatah, Sara Mahshid
*McGill University, CANADA*

**T128.g** **DEVELOPMENT OF A HYDRAULIC ACTUATOR FOR INTEGRATION OF NANOCHANNEL OPEN/CLOSE VALVES UTILIZING ELASTIC GLASS DEFORMATION**
Shohei Sugita[1], Mizuho Koyama[1], Xin Jiang[1,2], Yutaka Kazoe[1]
[1] *Keio University, JAPAN and* [2] *Kanagawa Institute of Industrial Science and Technology, JAPAN*

**W129.g** **EFFECT OF NOZZLE RADIUS ON THE PERFORMANCE OF A HEAT-DRIVEN MICRO JET PUMP USING A SELF-OSCILLATING FLUIDIC HEAT ENGINE (SOFHE)**
Nooshin Karami, Etienne Leveille, Amrid Amnache, Luc Frechette
*Université de Sherbrooke, CANADA*

## Nanopores and Others

**M129.g** **ELECTROCHEMICAL DETECTION AND ELECTROCHEMILUMINESCENCE REPORTING OF NITRATED PEPTIDES WITH MICROCHIP ELECTROPHORESIS**
Indika K. Warnakula[1], Manjula B. Wijesinghe[2], Susan M. Lunte[1]
[1] *University of Kansas, USA and* [2] *University of Peradeniya, SRI LANKA*

**M130.g** **NANOWELL-BASED IMPEDANCE SENSING FOR REAL-TIME RAPID SARS-COV-2 DETECTION**
Zhuolun Meng, Liam White, Pengfei Xie, Reza Mahmoodi, Aris Karapiperis, Hao Lin, German Drazer, Mehdi Javanmard, Edward P. DeMauro
*Rutgers University, New Brunswick, USA*

**T129.g** **ION CONCENTRATION-DRIVEN MOLECULE ACCUMULATION USING HETEROGENEOUS NANOPORE-INTEGRATED MICRO-/NANOFLUIDIC PLATFORM**
Dongwoo Seo, Taesung Kim
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

**W130.g** **LABEL-FREE CONTINUOUS CORROSION MONITORING MICROSENSOR USING ELECTRICAL IMPEDANCE SPECTROSCOPY**
Yuwen Li, Song-I Han, Han Zhang, Arum Han
*Texas A&M University, USA*

## Optical Sensors and Imaging

**M131.g** **DETECTION OF MULTISPECIES ORAL BIOFILM GROWTH IN 3D-PRINTED MICROFLUIDIC FLOW CHAMBERS**
Nicolas Debener[1,2], Nils Heine[1,3], Katharina Frings[1,2], Maria L. Torres-Mapa[1,2], Alexander Heisterkamp[1,2], Meike Stiesch[1,3], Katharina Doll-Nikutta[1,3], Thomas Scheper[1,2], Janina Bahnemann[1,4]
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**M132.g** **DUAL-CLAMPED SERS BARCODING-BASED DIAGNOSTIC ASSAY FOR MULTIPLEX DETECTION OF SARS-COV-2 VARIANTS USING PORTABLE RAMAN SPECTROMETER**
Kiran Kaladharan[1], Tuhin Subhra Santra[2], Tseren-Onolt Ishdorj[3], Fan-Gang Tseng[1,4]
[1] *National Tsing Hua University, TAIWAN,* [2] *Indian Institute of Technology Madras, INDIA,* [3] *Mongolian University of Science and Technology, MONGOLIA, and* [4] *Academia Sinica, TAIWAN*

**M133.g** **HIGH-THROUGHPUT TITRATION VIA SEGMENTED FLOW IN A LAB-ON-A-CHIP DEVICE FOR ENVIRONMENTAL SENSING APPLICATIONS**
Shahrooz Motahari, Alireza Zabihihesari, Colin Sonnichsen, Andre Hendricks, Vincent J. Sieben
*Dalhousie University, CANADA*

**M134.g MOBILE-PHONE BASED PORTABLE DEVICE FOR MI-RNA DETECTION IN PLASMA AND SALIVA**
Sadhana Tiwari[1], Martin Sosniok[1], Nilüfer Tasli[1], Nathalie P. Pranzner[1], Alischa B. Ostermaier[1], Malte Holzapfel[2], Neus Feliu[2], Irene Fernandez-Cuesta[1]
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**M135.g SILVER CLUSTERS GROWN WITHIN ZEOLITES FOR WASH-FREE BIOSENSING**
Cecilia García-Guzmán[1], Eduardo Coutiño-González[2], Eden Morales-Narváez[3]
[1] *Centro de Investigaciones en Optica A.C., MEXICO,* [2] *Flemish Institute for Technological Research - VITO, BELGIUM, and* [3] *Universidad Nacional Autónoma de México, MEXICO*

**M136.g UNVEILING TUMOR MICROENVIRONMENT DYNAMICS: RUTHENIUM-EMBEDDED OXYGEN SENSITIVE PROBE WITH LONG LIFETIME AND HIGH QUANTUM YIELD**
Ashish Kumar[1,2], Chih Cheng Chen[1], Fan-Gang Tseng[2]
[1] *Academia Sinica, TAIWAN and* [2] *National Tsing Hua University, TAIWAN*

**T130.g DESIGNING AND COMPARING ROBUST COVALENT SURFACE FUNCTIONALIZATION APPROACHES FOR MICROFLUIDICS-INTEGRATED SILICON PHOTONIC IMMUNOSENSORS**
Lauren S. Puumala[1,2,3], Samantha M. Grist[1,2,3], Karyn Newton[1,2], Stephen Kioussis[1,2], Lukas Chrostowski[1,3], Sudip Shekhar[1,3], Karen C. Cheung[1,2]
[1] *University of British Columbia, CANADA,* [2] *Centre for Blood Research, CANADA, and* [3] *Dream Photonics Inc., CANADA*

**T131.g DEVELOPMENT OF A FIELD-DEPLOYABLE DIAGNOSTIC SYSTEM (DELISA) BASED ON DIGITAL MICROFLUIDIC CHIPS UTILIZING MAGNETIC PARTICLES**
Woojoong Kim, Unjin Choi, Eunyoung Jeong, Kyunghee Seo, Sungchul Kim, Han T.N. Bui, Seongsu Byun, Minsik Sung, Joshua T. Kim, Junkyu Choi
*Smallmachines, KOREA*

**T132.g ENHANCING SURFACE PLASMON RESONANCE IMAGING SENSITIVITY TO MICRO-RNAS IN THE CONTEXT OF ORGAN DONATION**
Coline Beltrami[1,2], Julien Moreau[2], Laurence Convert[1], Jean-François Bryche[1], Paul G. Charette[1], Michael Canva[2]
[1] *Université de Sherbrooke, CANADA and*
[2] *Université de Paris Saclay, FRANCE*

**T133.g IMPROVEMENT OF DETECTION PERFORMANCE OF 2-DIMENSIONAL FLOW CYTOMETRY BY ADDING METAL MASKS ON SINGLE PHOTON AVALANCHE DIODES FOR AUTOMATED CYTOLOGY**
Shogo Mikami[1], Kunihiko Iizuka[1,2], Teruo Fujii[1], Soo Hyeon Kim[1]
[1] *University of Tokyo, JAPAN and* [2] *Lab Arco Limited, JAPAN*

**T134.g MULTIPLEXED ULTRASENSTIVE CANCER EARLY DETECTION ON A PAPER-IN-POLYMER HYBRID MICROFLUIDIC DEVICE**
Sanjay Timilsina, XiuJun Li
*University of Texas, El Paso, USA*

**T135.g** **TOWARDS A PORTABLE IMPRINTED POLYMER-BASED MICROFLUIDIC SENSOR FOR FLUOROSCENT BACTERIA DETECTION IN WATER**
Ali Doostmohammadi, Pouya Rezai
*York University, CANADA*

**W131.g** **DETECTION AND CAPTURE OF CANCER CELLS USING A LAB-IN-A-FIBER DEVICE**
João C. Varela[1], Achar V. Harish[1,2], Pawel Maniewski[1], Oana Tudoran[3], Rainer Heuchel[4], Matthias Löhr[4], Walter Margulis[1], Aman Russom[1], Fredrik Laurell[1]
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**W132.g** **OPTICAL-FIBER ENHANCED MINIATURIZED MICROSCOPE FOR RECONFIGURABLE MULTI-SPOT FLUORESCENCE DETECTION**
Tsuyoshi Koga, Byeongwook Jo, Haruka Oda, Minghao Nie, Shoji Takeuchi
*University of Tokyo, JAPAN*

**W133.g** **FULLY INTEGRATED MULTICOLOR, MULTIPLEX OPTICAL BIOSENSOR FOR DETECTING MULTIPLE ANALYTES FOR HEALTH MONITORING AT POINT OF NEED**
Reza Abbasi, Sebastian Wachsmann-Hogiu
*McGill University, CANADA*

**W134.g** **LAB-ON-CHIP BASED ON MICROFLUIDIC ENABLES IMPROVEMENT OF APTAMER SENSITIVITY IN THE DETECTION OF ZINC WATER POLLUTANT**
Francesca Costantini, Nicola Lovecchio, Alexandra Mogosmortean, Augusto Nascetti, Gabriele Favero, Giampiero de Cesare, Massimo Reverberi, Cesare Manetti, Domenico Caputo
*Sapienza University of Rome, ITALY*

**W135.g** **NANOSCALE FUNCTIONALIZATION BY ULTRAFAST PHOTODEGRADATION**
Marlo Vega[1,2,3], Paul-Ludovic Karsenti[1,2], Julien Moreau[3], Michael Canva[1,2], Paul Charette[1,2], Jean-François Bryche[1,2]
[1]*LN2 CNRS, CANADA,* [2]*Université de Sherbrooke, CANADA, and* [3]*LCF Université Paris Saclay, FRANCE*

**W136.g** **TOWARDS INTEGRATED ENRICHMENT AND LATERAL FLOW ASSAY BASED DETECTION OF E. COLI USING VISCOELASTIC FOCUSING AND PHOTOTHERMAL SENSING**
Yasaman Ghazi, Arsalan Nikdoost, Nima Tabatabaei, Pouya Rezai
*York University, CANADA*

## Physical Sensors

**M137.g** **HIGH-THROUGHPUT CHIP-CALORIMETER FOR BACTERIAL METABOLIC HEAT MEASUREMENT USING A BITE THERMOPILE HEAT FLUX SENSOR ARRAY**
Yang Liu, Yushan Xie, Zhengguang Chen, Yinghao Zhang
*Beijing Institute of Technology, CHINA*

**M138.g** **MICROFLUIDIC PLATFORM WITH EMBEDDED PRESSURE TRANSDUCER FOR ON-CHIP NANOPARTICLE DETECTION**
Zachary AB. Morris, Juliana Chawich, Owen Perreault, Cole Gavin, Michel Godin
*University of Ottawa, CANADA*

**M139.g** **PROTRUDING CANTILEVERS MEA WITH EMBEDDED STRAIN GAUGES FOR MONITORING CONTRACTILE ORGANOIDS**
Oramany Phouphetlinthong[1,2], Audrey Sebban[1,2], Robert Zweigerdt[3], Andree Birgit[3], Lika Drakhlis[3], Florence Rage[2,4], Benoit Charlot[1,2]
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**T136.g** **GHZ ULTRASOUND ENABLED NONINVASIVE QUANTITATIVE CHARACTERIZATION OF OOCYTE MECHANOBIOLOGY**
Yilmaz Arin Manav[1], Andrew Piasecki[1], Anuj Baskota[2], Justin Kuo[2], Amit Lal[2,3], Dori Woods[1], Benyamin Davaji[1,4]
[1] *Northeastern University, USA,* [2] *Geegah LLC, USA,* [3] *Cornell University, USA, and* [4] *Institute for NanoSystems Innovation (NanoSI), USA*

**T137.g** **HIGHLY SENSITIVE BIOSENSOR UTILIZING THE GAP METHOD AND CANTILEVER BEAM PAIR FOR DETECTION OF E-COLI BACTERIA**
Syed Ali Raza Bukhari, Yongjun Lai
*Queen's University, CANADA*

**T138.g** **MULTI-MICROCHANNEL FLUIDIC FORCE SENSORS**
Wael Othman[1,2], Mohammad A. Qasaimeh[1,2]
[1] *New York University, Abu Dhabi, UAE and* [2] *New York University, USA*

**T139.g** **SMART INTRAOCULAR PLATFORM FOR REAL-TIME INTRAOCULAR PRESSURE MONITORING**
Pablo Pérez-Merino[1], Steven Verstuyft[2], Günther Roelkens[2], Andrés Vásquez Quintero[2]
[1] *Consejo Superior de Investigaciones Científicas (CSIC), SPAIN and* [2] *Ghent University, BELGIUM*

**W137.g** **HARMONIZING HEALTH METRICS: MICROFLUIDIC SURFACE ACOUSTIC WAVE TECHNOLOGY FOR MEASURING PLASMA VISCOSITY**
Karina Torres-Castro[1,2], Jason J. Gorman[1], Darwin R. Reyes[1]
[1] *National Institute of Standards and Technology (NIST), USA and* [2] *Theiss Research, USA*

**W138.g** **INNOVATIVE ULTRASOUND TELEMETRY METHODS FOR INTRACRANIAL PRESSURE SENSING USING AN IMPLANTED MICROSYSTEMS TARGET**
Cecilia A. Luna[1,2], Saeyoung Kim[2], Adeoye Olomodosi[1,2], Nicholas Au Yong[1,2], Brooks D. Lindsey[1,2], David R. Myers[1,2]
[1] *Emory University, USA and* [2] *Georgia Institute of Technology, USA*

**W139.g** **PRINTED HIGH-PERFORMANCE FLEXIBLE POLYSTYRENE/GRAPHITE-BASED TEMPERATURE SENSOR**
Ahmad M. Al Shboul, Ricardo R. Izquierdo
*École de Technologie Supérieure ETS, CANADA*

## Sensor Stability and Fouling

**W140.g PLATFORM FOR CHARACTERIZING FUNCTIONALIZED SOLID-STATE NANOPORE SENSORS**
Mohamed Yassine Bouhamidi, Zachary Roelen, Vincent Tabard-Cossa
*University of Ottawa, CANADA*

## Late News

**M525.g A LOW-COST 3D-PRINTED MOBILE STATION FOR ANALYSIS OF SHAPE CODED PARTICLES**
Leander V. D. Eijnden, Mehmet Akif Sahin, Ghulam Destgeer
*Technical University of Munich, GERMANY*

**M526.g DEVELOPMENT OF AN ELECTROCHEMICAL CONDUCTOMETRIC SENSING METHOD FOR THE LABEL-FREE AND RAPID DETECTION OF SHIGA TOXIN IN FOOD**
Yeongbeom Jang, Jeongtae Kim, Chiwan Koo
*Hanbat National University, KOREA*

**M527.g ENHANCED SURFACE REACTION IN SOLID-PHASE DIGITAL ELISA USING MULTIPLE EVAPORATION OF FL-SCALE DROPLETS**
Bo Hoon Han[1,2], Seok Chung[2], Ji Yoon Kang[1]
[1]*Korea Institute of Science and Technology, KOREA and*
[2]*Korea University, KOREA*

**M528.g IMPROVING THE LIMIT OF DETECTION AND SENSITIVITY OF A HOME-MADE MICROFLUIDIC ELECTROCHEMICAL SENSOR THROUGH THE UTILIZATION OF SECONDARY DEAN FLOW**
Shapour Jafargholinejad, Basit Ilyas, Alireza Zabihihesari, Razieh Salahandish, Stephanie Gora, Pouya Rezai
*York University, CANADA*

**M529.g MICROFABRICATED HYDROGEL DROPLET SENSORS TO OPTICALLY MEASURE EVOLUTION OF INTERNAL AND EXTERNAL STRESSES DURING 3D TUMOR METASTATIC PROGRESSION**
Christina-Marie Boghdady, Ayesha Basu, Mara Whitford, Luke McCaffrey, Christopher Moraes
*McGill University, CANADA*

**M530.g PAPER-BASED MICROFLUIDICS AS A TOOL FOR IMPROVING ON-SITE ELECTROCHEMICAL DETECTION OF MANGANESE IN WATER**
Enahoro Asein, Selina Kern, Alexander Iles, Pablo Giménez-Gómez, Nicole Pamme
*Stockholm University, SWEDEN*

**M531.g SIMULTANEOUS SENSING OF MULTI-PROTEINS BY SERS USING MACHINE LEARNING**
Dongkwon Seo, Yeonho Choi
*Korea University, KOREA*

**T525.g** **A NOVEL INVASIVE BIOSENSOR SENSOR MODULE INTEGRATING MULTI-SENSORS AND READOUT IC FOR ENHANCED CONVENIENCE IN DAILY LIFE BIOMONITORING**
Kwon-Hong Lee[1,2], Sang-Sik Kim[1,2], Jin-Hyoung Kim[1], Kyoung-A Hyun[1], Ji-Hyoung Roh[3], Yong-Chan Lee[3], Kyu-Sik Shin[1], Cheol-Ung Cha[1], Hyung-Min Lee[2]
[1]*Korea Electronics Technology Institute, KOREA,* [2]*Korea University, KOREA, and* [3]*KEMDIhub, KOREA*

**T526.g** **DEVELOPMENT OF ENVIRONMENTALLY FRIENDLY CONDUCTIVE BIOINK AND ELECTROCHEMICAL PAPER-BASED ANALYTICAL DEVICES FOR EPINEPHRINE ANALYSIS**
Danielly S. Rocha[1,2], Laisa C. Oliveira[1], Habdias A. Silva-Neto[3], Wendell K. T. Coltro[1,4]
[1]*Federal University of Goiás, BRAZIL,* [2]*University of Toronto, CANADA,* [3]*Federal University of Santa Catarina, BRAZIL, and* [4]*National Institute of Bioanalytical Science and Technology, BRAZIL*

**T527.g** **ENHANCING ILLEGAL DRUG DETECTION WITH A MULTIMODAL INTELLIGENT E-NOSE SYSTEM: VIRTUAL SENSOR GENERATION VIA ADAPTIVE HEATING VOLTAGE MODULATION**
Hyung Wook Noh, Yongwon Jang, Hwin Dol Park, Do Hyeun Kim, Chang-Geun Ahn
*Electronics and Telecommunications Research Institute, KOREA*

**T528.g** **LABORATORY TESTING OF HUMAN BLOOD SAMPLES USING MICROFLUIDIC ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY**
Zhbanov Alexander, Ye Sung Lee, Sung Yang
*Gwangju Institute of Science and Technology, KOREA*

**T529.g** **MINIATURIZED AND PORTABLE MULTIPLEX SENSING PLATFORM FOR MONITORING OF PREDICTIVE BIOMARKERS IN VASCULARIZED COMPOSITE ALLOTRANSPLANTATION**
Atul Sharma[1], Nafize Ishtiaque Hossain[1], Vijay Gorantla[2], Anvesh N. Kodali[2], Yalcin Kulahci[2], Omer F. Dirican[2], Wensheng Zhang[3,4], Casey M. Sabbag[3,4,5], Sameer Sonkusale[1]
[1]*Tufts University, USA,* [2]*Atrium Health Wake Forest Baptist Medical Center, USA,* [3]*59th Medical Wing/Science & Technology, USA,* [4]*Uniformed Services University of the Health Sciences, USA, and* [5]*Brooke Army Medical Center, USA*

**T530.g** **QUANTIFICATION AND CLASSIFICATION OF DISEASE BIOMARKERS USING MACHINE LEARNING AND MULTIWAVELENGTH SURFACE ENHANCED RAMAN SPECTROSCOPY**
Saba Ale Ebrahim, Katelyn Dixon, Farzad Khalvati, Anna Zavodni, Naomi Matsuura, Nazir P. Kherani
*University of Toronto, CANADA*

**T531.g** **STUDY ON A LONG-TERM STORAGE OF GLOBOTRIAOSYLCERAMIDE (GB3)-COATED MICROCHIP FOR ON-SITE IN-FOOD SHIGA TOXIN DETECTION**
Jeongtae Kim[1], Keying Li[1], Moo-seung Lee[2], Chiwan Koo[1]
[1]*Hanbat National University, KOREA and* [2]*Korea Research Institute of Bioscience and Biotechnology (KRIBB), KOREA*

**W524.g A HANDHELD SYSTEM UTILIZING OPTICAL EMISSION SPECTROSCOPY FOR RAPID ANALYSIS OF LIQUID SAMPLES**
Manjeet Kumar, Bhaskar Mitra
*Indian Institute of Technology, Delhi, INDIA*

**W525.g DETECTING IL-8 USING ENZYMATIC AMPLIFICATION AND REGENERATION WITH PDA-BASED ANTIBODY MMOBILIZATION ON MICROFLUIDICS-INTEGRATED SILICON PHOTONIC IMMUNOSENSORS**
Sajida Chowdhury[1,2], Yuting Hou[1,2], Samantha M. Grist[1,2,3], Avineet Randhawa[1,2], Lauren S. Puumala[1,2,3], Karyn Newton[1,2], Stephen Kioussis[1,2], Lukas Chrostowski[1,3], Sudip Shekhar[1,3], Karen C. Cheung[1,2]
[1]*University of British Columbia, CANADA,* [2]*Centre for Blood Research, CANADA, and* [3]*Dream Photonics Inc., CANADA*

**W526.g ELECTROCHEMICAL-BASED POINT-OF-CARE DETECTION OF G6PD THROUGH BI-SUBSTRATE REACTION**
Arun Saini, P.H. Sai Siddharth, Ishani Gupta, Dharitri Rath
*Indian Institute of Technology, Jammu, INDIA*

**W527.g FLUORESCENCE SENSING SYSTEM FOR DETECTING TNT EXPLOSIVES BASED ON CAPILLARY MICROCHANNELS**
Piaotong Liu, Jialong Guo, Xin Li, Weize Shi, Yang Liu
*Beijing Institute of Technology, CHINA*

**W528.g METAMATERIALS WITH ENHANCED PIEZOELECTRIC AND PYROELECTRIC PROPERTIES**
Jiahao Shi[1,2,3], Kang Ju[1], Haoyu Chen[1], Ali Ahmadi[2,3], Agus Sasmito[1], Abdolhamid Akbarzadeh[1]
[1]*McGill University, CANADA,* [2]*École de Technologie Supérieure, CANADA, and* [3]*University of Montreal, CANADA*

**W529.g MOLECULARLY IMPRINTED POLYMER-BASED VP28 ELECTROCHEMICAL SENSOR FOR ANALYSIS OF WHITE SPOT SYNDROME VIRUS**
Young-ran Yun, Sung Yang
*Gwangju Institute of Science and Technology, KOREA*

**W530.g REAL-TIME, IMPEDIMETRIC MONITORING OF CARDIOMYOCYTE DYNAMICS ON BOTH FACES OF A POROUS MEMBRANE**
Derrick J. Butler, Darwin R. Reyes
*National Institute of Standards and Technology (NIST), USA*

**W531.g STUDY ON MEASURING URINE-DERIVED GASES FOR DETECTING ADULT DIEASES USING NDIR SENSOR**
JinHyoung Kim[1], Jaln Choi[1,2], KwonHong Lee[1,2], Kyoung-A Hyun[1], KyuSik Shin[1], Cheolung Cha[1]
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## h - Tissue Engineering, Organs on a Chip and Organisms

### 3D Cell Culture and 3D Constructs

**M140.h A MICROPHYSIOLOGICAL SYSTEM FOR DEVELOPING A VASCULARIZED LIVER TUMOR MODEL**
Yu-Hsiang Hsu[1], Yu-Zhou Lin[1], Kang-Hsu Liu[1], Chih-Yu Lin[1], Yu-Chia Su[2], Chia-Yuan Chang[2], Chi-Kuang L. Wang[2], Hsian-Jean Chin[2]
[1] *National Taiwan University, TAIWAN and* [2] *National Applied Research Laboratories, TAIWAN*

**M141.h BRACHYTHERAPY ON-A-CHIP: EXPLORING THE EFFECT OF DOSE-RATE MODULATION IN RADIOTHERAPY/DRUG COMBINATIONS FOR TRANSLATIONAL RESEARCH**
Rodin Chermat[1,2,3], Elena Refet-Mollof[1,2,3], Yuji Kamio[2,5], Jean-François Carrier[2,3,4], Philip Wong[2,3,5], Thomas Gervais[1,2,3]
[1] *Polytechnique Montréal, CANADA,* [2] *Centre de recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM), CANADA,* [3] *Institut du Cancer de Montréal (ICM), CANADA,* [4] *Centre Hospitalier de l'Université de Montréal (CHUM), CANADA, and* [5] *University Health Network, CANADA*

**M142.h CULTURE DEVICE FOR HUMAN NEUROMUSCULAR TISSUE USING REMOVABLE CULTURE WELL WITH MOTOR NEURONS**
Kanta Shimamoto, Yuya Morimoto
*Waseda University, JAPAN*

**M143.h FORMING SPHEROIDS IN MICRO-MOLDED AGAROSE GELS USING MECHANICAL STIMULI**
Ryota Kawamae[1], Atsushi Takata[2], Kenjiro Takemura[3], Yuta Kurashina[1]
[1] *Tokyo University of Agriculture and Technology, JAPAN,*
[2] *Tokyo Institute of Technology, JAPAN, and*
[3] *Keio University, JAPAN*

**M144.h IN VITRO 3D COMPARTMENTALIZED TUMOUR MODELS FOR SPATIAL RECAPITULATION OF PROSTATE CANCER CELL PLASTICITY NICHES**
Brian Ma, Aditya Kashyap, Govind Kaigala
*University of British Columbia, CANADA*

**M145.h MICROFLUIDICS-BASED DROPLETS HYDROGEL TO CULTURE REVERSAL-POLARITY SPHEROIDS FOR DRUG RESEARCH**
Jhonatan R.O. Bianchi, Hernandes F. de Carvalho, Lucimara G. de la Torre
*University of Campinas (UNICAMP), BRAZIL*

**M146.h QUANTIFYING CELL FREE DNA; A MEANS FOR MONITORING CELL DEATH AND TREATMENT RESPONSE FOR ON-CHIP THREE-DIMENSIONAL TUMOR MODELS**
Maryam Ziaee[1,2], Julie Lafontaine[2], Francis Rodier[2,3], Thomas Gervais[1,2,3], Philip Wong[2,3,4]
[1] *Polytechnique Montréal, CANADA,* [2] *Université de Montréal, CANADA,* [3] *Institut du Cancer de Montréal, CANADA, and* [4] *Princess Margaret Cancer Centre, CANADA*

**M147.h SCREENING OF BREAST CANCER AND IPSC SPHEROIDS ON A RECONFIGURABLE CHIP USING OPTICAL COHERENCE TOMOGRAPHY**
Hiba Aljayyousi[1,2], Sarah Sahloul[1], Paulin John[1], Ajymurat Orozaliev[1], Azhar Zam[1,2], Yong-Ak Song[1,2]
[1] *New York University, Abu Dhabi, UAE and* [2] *New York University, USA*

**M148.h TUMOROID ARRAY-ON-A-PLATE (TOP): PHYSIOLOGICALLY RELEVANT CO-CULTURED PDAC MODEL GENERATION AND THERAPEUTIC SCREENING**
Amir Seyfoori, Esfandyar Askari, Mohsen Akbari
*University of Victoria, CANADA*

**T140.h A TUBULAR PLACENTAL VILI BARRIER MODEL FOR TRANSPORT STUDIES**
Seyedaydin Jalali, Ponnambalam R. Selvaganapathy
*McMaster University, CANADA*

**T141.h CAPILLARY IMAGING SYSTEM USING A 3D PRINTED FOCUSING JIG TOWARDS HIGH-THROUGHPUT 3D SHAPE EVALUATION OF CELL SPHEROIDS**
Xueping Yu, Yuta Tezuka, Takeshi Hayakawa
*Chuo University, JAPAN*

**T142.h DEMONSTRATING THE BIOMIMETIC VERSATILITY OF A MAGNETICALLY INTEGRATED TUMOR-ON-CHIP PLATFORM**
Simrit Safarulla[2], Vikram Surendran[1], Jonathan Spicer[2], Arvind Chandrasekaran[1]
[1] *North Carolina A&T State University, USA and*
[2] *McGill University, CANADA*

**T143.h HORIZONTALLY STANDING THERMOPLASTIC ELASTOMER POST ASSISTED HANGING DROPLETS FOR SPHEROID FORMATION**
Byeong-Ui Moon, Kebin Li, Lidija Malic, Elham Moslemi, Keith Morton, Teodor Veres
*National Research Council of Canada, CANADA*

**T144.h INVESTIGATING THE INFLUENCE OF BACTERIAL BIOFILMS ON THE PROGRESSION OF ATHEROSCLEROTIC PLAQUES USING A MICROSYSTEM-BASED FP-I MODEL**
Yatian Fu[1,2], Bee Luan Khoo[1,2]
[1] *City University of Hong Kong, HONG KONG and* [2] *Hong Kong Center for Cerebro-Cardiovascular Health Engineering, HONG KONG*

**T145.h ORGAN-ON-A-CHIP DRIVEN REGENERATION: INVESTIGATING NANOFIBROUS MAT IMPACT ON HUMAN INDUCED PLURIPOTENT STEM CELLS-DERIVED CARDIOMYOCYTES (IPSC-CM) POST-HYPOXIA**
Dominik Kolodziejek[1], Zuzanna Iwon[1], Aleksandra Szlachetka[1], Marcin Drozd[1], Michał Wojasiński[1], Ewelina Krogulec[2], Elżbieta Jastrzębska[1]
[1] *Warsaw University of Technology, POLAND and*
[2] *Nencki Institute of Experimental Biology PAS, POLAND*

**T146.h** **RAPID SCAFFOLD-FREE ADDITIVE MANUFACTURING OF SCALABLE SKIN ANALOGOUS FROM MSCS FOR BURN WOUND HEALING**
Maedeh Khodamoradi, Yufei Chen, Marc G. Jeschke, Ponnambalam R. Selvaganapathy
*McMaster University, CANADA*

**T147.h** **SPHEROID FORMATION IN CELLULOSE NANOFIBRILS-COATED MICROFLUIDIC CHIPS**
Farzaneh Fayazbakhsh, Negar Abbasi Aval, Noa Lapins, Torbjörn Pettersson, Aman Russom
*KTH Royal Institute of Technology, SWEDEN*

**T148.h** **VITRIFICATION STRATEGIES FOR IMPROVED CRYOPRESERVATION OF COMPLEX 3D TUMORAL TISSUE MODELS ON MICROFLUIDIC CHIPS**
Tommy Brasseur[1,2,3], Gabriel Pagé[2,3], Benjamin Péant[2,3], Jennifer Kendall-Dupont[2,3], Amélie St-Georges-Robillard[1,2,3], Thomas Gervais[1,2,3]
[1]*Polytechnique Montréal, CANADA,* [2]*Centre de Recherche du Centre Hospitalier de l'Université de Montréal, CANADA, and* [3]*Institut du Cancer de Montréal, CANADA*

**W141.h** **A TUMOR SPHEROIDS CULTURE PLATFORM FOR SMALL AMOUNTS OF CELL SAMPLES TOWARDS FAST CLINICAL PRIMARY CELL DRUG SCREENING WITHIN A WEEK**
Yixue Chen, Jianzhang Pan, Qun Fang
*Zhejiang University, CHINA*

**W142.h** **COMBINATION OF VIBRATION-INDUCED FLOW AND FARADAY WAVES FOR LARGE SCALE TISSUE CONSTRUCTION BUILT UP FROM CELL SPHEROIDS**
Ryutaro Toyoshima, Takeshi Hayakawa
*Chuo University, JAPAN*

**W143.h** **DEVELOPMENT OF A DUAL-FLOW MICROFLUIDIC DEVICE TO STUDY THE INTERACTION OF THE INTESTINAL EPITHELIUM AND THE ENTERIC NERVOUS SYSTEM**
Alexandra Lorenz, Martin Frauenlob, Peter Ertl
*TU Wien, AUSTRIA*

**W144.h** **HYPOXIC-CORE SPHEROIDS ON CHIP**
Elena Refet-Mollof[1,2,3], Rodin Chermat[1,2,3], Julie Lafontaine[2,3], Philip Wong[2,3,4,5,6], Thomas Gervais[1,2,3]
[1]*Polytechnique Montréal, CANADA,* [2]*Montreal Cancer Institute, CANADA,* [3]*University Hospital of the University of Montréal, CANADA,* [4]*University of Toronto, CANADA,* [5]*Princess Margaret Cancer Centre, CANADA, and* [6]*University Health Network, CANADA*

**W145.h** **MICROFLUIDIC-PREPARATION OF VISCOELATIC MICROFIBER FOR ENHANCED FABRICATION OF ARTIFICIAL MEAT**
Si Da Ling, Wenjun Ma, Yingzhe Liu, Yanan Du, Zhuo Chen, Jianhong Xu
*Tsinghua University, CHINA*

**W146.h** **PHOTOCROSSLINKABLE GELMA HYDROGELS SUPPORT NEURITE OUTGROWTH IN A MICROSCALE IN VITRO SPINAL CORD INJURY MODEL**
Iryna Liubchak, Alex Pieters, Paul Juralowicz, Tanya Bennet, Tara M. Caffrey, Karen C. Cheung
*University of British Columbia, CANADA*

**W147.h** **ROOM-TEMPERATURE STORED MESENCHYMAL STEM CELL SPHERES BANDAGE FOR WOUND HEALING**
Yingying Liu[1], Aman Lv[1], Wenhao Hui[1], Caiwei Li[1], Pui-in Mak[1], Martins P. Rui[1,2], Yanwei Jia[1]
[1]*University of Macau, CHINA and* [2]*Universidade de Lisboa, PORTUGAL*

**W148.h** **THREE-DIMENSIONAL IN VITRO MODELING FOR PANCREATIC CANCER AND NERVE CO-CULTURE IN A MICROFLUIDIC CHIP**
Seok-Hyeon Kang, Jinchul Ahn, Sieun Choi, Seok Chung
*Korea University, KOREA*

## Artificial Intelligence Enhanced Culture Systems

**W149.h** **REVOLUTIONIZING CANCER SPHEROID VIABILITY ANALYSIS: DEEP LEARNING IN MICROFLUIDICS**
Rajiv Anne[1,2], Chun-Cheng Chiang[1,2], Pooja Chawla[1], Rachel M. Shaw[1], Sarah He[3], Edwin C. Rock[1], Mengli Zhou[1,2], Jinxiong Cheng[1,2], Yinan Gong[1,2], Yu-Chih Chen[1,2]
[1]*University of Pittsburgh, USA,* [2]*UPMC Hillman Cancer Center, USA, and* [3]*Carnegie Mellon University, USA*

## Body on a Chip

**T149.h** **24-WELL TRANSWELL FORMAT-BASED MICROFLUIDIC PLATFORM AND TILTING TOWER SYSTEM FOR PARALLEL INTERCONNECTION AND CULTIVATION**
Chaewon Jin, Yeo Jin Hwang, Hongsoo Choi, Kyeong-Min Lee, Jin-Young Kim
*Daegu Gyeongbuk Institute of Science & Technology (DGIST), KOREA*

**W150.h** **PARALLELIZED DRUG TOXICITY TESTING WITH THE ON-CHIP 3D MICROTISSUE NETWORK IN A 96-WELL FORMAT-BASED MICROFLUIDIC PLATFORM**
Sebeen Lee, Chaewon Jin, Hongsoo Choi, Jin-young Kim
*Daegu Gyeongbuk Institute of Science & Technology (DGIST), KOREA*

## Cell Culture

**M150.h** **A FIVE-CHANNEL MICROFLUIDIC DEVICE TO STUDY CELL-TO-CELL COMMUNICATION IN THE TUMOR MICROENVIRONMENT**
Riley Osbourn[1], Emmaline Miller[2], Laurel Fishburn[2], Elizabeth C. Martin[3], Adam T. Melvin[1]
[1]*Clemson University, USA,* [2]*Louisiana State University, USA, and* [3]*Tulane University, USA*

**M151.h** **HARNESSING MICROFLUIDIC CONCENTRATION GRADIENT GENERATORS FOR CELLULAR MICROENVIRONMENT CONTROL**
Kebin Li[1], Byeong-Ui Moon[1], Liviu Clime[1], Luke Lukic[1], Keith Morton[1], Lidija Malic[1], Anu David[2], Christophe Faure[2], Teodor Veres[1,3]
[1]*National Research Council of Canada, CANADA,* [2]*University of Montreal, CANADA, and* [3]*University of Toronto, CANADA*

**M152.h** **THE SOUND OF SEEDING: AN ACOUSTIC-BASED STRATEGY TO CONTROL MAMMALIAN CELL PATTERNING IN MICROFLUIDICS**
Gianpio Caringella, Elise Cachat, Filippo Menolascina, Lucia Bandiera
*University of Edinburgh, UK*

**T150.h** **DEVELOPMENT OF A SUPERCOOLING PRESERVATION METHOD FOR A THREE-DIMENSIONALLY CULTURED MICROLIVER MODEL**
Maaya Hikichi[1], Masaru Tsunoda[2], Kiichi Sato[1]
[1] *Gunma University, JAPAN and* [2] *Sanden Retail Systems, JAPAN*

**T151.h** **INVESTIGATION OF THE EFFECTS OF URACIL IN CANCER METASTASIS UNDER SHEAR STRESS**
Sitang Maknitikul[1], Huabing Yin[1], Jim Norman[2], Cassie Clarke[2]
[1] *University of Glasgow, UK and*
[2] *Cancer Research UK Scotland Institute, UK*

**W151.h** **DEVELOPMENT OF NEURONAL JUNCTION CHAMBER VIA HIGH-PRECISION ROLL-TO-ROLL (R2R) MANUFACTURING**
Nihan Atak
*Joanneum Research, AUSTRIA*

## Organ on Chip and Organoids

**M153.h** **A BIOENGINEERED LUNG-ON-A-CHIP PLATFORM FOR IN VITRO MODELING AND MECHANIS-TIC INVESTIGATION OF CHLORINE INHALATION TOXICOLOGY IN HUMAN LUNGS**
Pouria Fattahi[1], Mousa Younesi[1], Sezin Aday[1],
Darrell N. Kotton[2], Dan D. Huh[1]
[1] *University of Pennsylvania, USA and* [2] *Boston University, USA*

**M154.h** **A FUNCTIONAL ORGAN-ON-A-CHIP MODEL FOR STUDYING HYPERTENSIVE PODOCYTOPATHY**
Yun-Jie Hao[1], Bo-Yi Yao[1], Yi-Ching Ko[2],
Hsiang-Hao Hsu[2], Fan-Gang Tseng[1]
[1] *National Tsing Hua University, TAIWAN and*
[2] *Chang Gung Memorial Hospital, TAIWAN*

**M155.h** **A MULTILAYER ORGAN-ON-A-CHIP FOR GENERATING CENTIMETER-SCALE MICROVASCULAR NETWORKS**
Xiaoqi Lu, Ning Jiang, Huiying Yang, Yue Wang, Na Liu, Tao Yue
*Shanghai University, CHINA*

**M156.h** **BLADDER-ON-A-CHIP RECAPITULATING THE PROCESS OF UROTHELIAL MATURATION REGULATED BY FIBROBLASTS**
Taiki Nishimura[1], Yuji Takata[1], Kazuhiro Ofuji[2], Kazuya Fujimoto[1],
Minoru Takasato[2], Ryuji Yokokawa[1]
[1] *Kyoto University, JAPAN and* [2] *Institute of Physical and Chemical Research (RIKEN), JAPAN*

**M157.h** **DEVELOPMENT OF HIPSC-DERIVED AIRWAY AND ALVEOLUS MPS TO EMULATE VIRAL PATHOGENESIS**
Sachin Yadav[1,2], Kazuya Fujimoto[1,2], Toru Takenaga[1,2],
Senye Takahashi[1,2], Yukiko Muramoto[1,2], Ryuta Mikawa[1,2],
Takeshi Noda[1,2], Shimpei Gotoh[1,2], Ryuji Yokokawa[1,2]
[1] *Kyoto University, JAPAN and*
[2] *Japan Science and Technology Agency (JST), JAPAN*

**M158.h** **EVALUATION OF VASCULATURE FORMATION AND HEPATOCYTE FUNCTION OF A VASCULARIZED LIVER SPHEROID**
Satomi Matsumoto[1], Yixin Sun[1], Jo Sugawa[1], Anna K. Kopec[2],
Julie Harney[2], Lindsay Tomlinson[2], Nasir Khan[2],
Kazuya Fujimoto[1], Ryuji Yokokawa[1]
[1] *Kyoto University, JAPAN and* [2] *Pfizer, Inc., USA*

**M159.h HIGH-THROUGHPUT MICROPHYSIOLOGICAL MODEL OF HEALTHY AND ASTHMATIC AIRWAYS FOR VIRAL EXPOSURE AND DRUG SCREENING**
Kimia Asadi Jozani, Alexander Sotra, Nadia Milad, Karen Mossman, Matthew Miller, Manali Mukherjee, Jeremy Hirota, Boyang Zhang
*McMaster University, CANADA*

**M160.h HYPERGLYCEMIC NEUROVASCULATURE-ON-A-CHIP TO STUDY THE AXIS OF DIABETES AND ALZHEIMER'S DISEASE**
Minjeong Jang[1], Hong Nam Kim[2]
[1]*Korea Institute of Radiological and Medical Sciences (KIRAMS), KOREA and* [2]*Korea Institute of Science and Technology (KIST), KOREA*

**M161.h INTEGRATED MICROFLUIDIC PLATFORM FOR SINGLE ORGANOID CULTURE AND SECRETED EXTRACELLULAR VESICLE ISOLATION**
Marie Hut, Flora Clement, Frederic Bottausci, Josiane Denis, Manuel Alessio, François Boizot, Nadia Cherradi, Myriam Cubizolles, Fabrice Navarro, Yves Fouillet, Vincent Agache
*University Grenoble, Alpes, FRANCE*

**M162.h KINTRE SYSTEM: KINETIC TRAING AND EVALUATION SYSTEM FOR ENGINEERED SKELETAL MUSCLE TISSUE**
Shota Noda, Sterker Louis, Jun Sawayama, Shoji Takeuchi
*University of Tokyo, JAPAN*

**M164.h PIEZOELECTRIC HEART-ON-CHIP PLATFORM FOR NON-INVASIVE CARDIOMYOCYTE CONTRACTILITY MEASUREMENT**
Lance D. Cordes, Alexis P. Applequist, Lais Ferreira, Julia Hoskins, Min Zou, Kartik Balachandran
*University of Arkansas, USA*

**M166.h SPATIOTEMPORALLY MAPPED ENDOTHELIAL DYSFUNCTION AT BIFURCATIONS IN A CORONARY ARTERY-ON-A-CHIP**
Jasneil Singh[1,2], Tanya Gambhir[1,2], Tiffany Goh[1,2], Isabelle van Vuuren[1,2], Lingzi Gao[1,2], Steven Wise[1], Anna Waterhouse[1,2]
[1]*University of Sydney, AUSTRALIA and*
[2]*Heart Research Institute, AUSTRALIA*

**M167.h VESSEL-ON-CHIP MODEL FOR THE EMULATION OF B-CELL LYMPHOMA AND VESSEL TARGETING CAR-T CELL THERAPY**
Mohammad Jouybar[1,2,3], Charlotte M. de Winde[3,4,5], Parvin Akbari[3,5], Judy R. van Beijnum[3,5], Arjan W. Griffioen[3,5], Reina E. Mebius[3,4,5], Jaap M.J. den Toonder[1,2]
[1]*Eindhoven University of Technology, NETHERLANDS,* [2]*Institute for Complex Molecular Systems, NETHERLANDS,* [3]*University Medical Center Vrije Universiteit, NETHERLANDS,* [4]*Amsterdam Institute for Immunology & Infectious Diseases, NETHERLANDS, and* [5]*Cancer Center Amsterdam, NETHERLANDS*

**T152.h 3D PERFUSABLE IN VITRO INTESTINAL TUBE-SAHPED DEVICE WITH CRYPTIC STRUCTURE COVERED BY MUCIN LAYER FOR BACTERIAL CO-CULTURE**
Shota Uramoto[1], Shuma Tanaka[1], Shun Itai[2], Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*Tohoku University, JAPAN*

**T153.h** **A BIOMIMETIC ALVEOLI-ON-A-CHIP SYSTEM WITH RELEVANT GEOMETRY AND CYCLICAL STRETCH**
Shiyuan Bian[1,2], Maryam Nejatian[1,2], Thomas K. Waddell[1,2], Golnaz Karoubi[1,2]
[1]*University of Toronto, CANADA and* [2]*University Health Network, CANADA*

**T154.h** **A GLOMERULUS-ON-A-CHIP USING A HIGHLY POROUS ELECTROSPUN MEMBRANE PROMOTING CELL-CELL INTERACTION FOR SLIT DIAPHRAGM FORMATION**
Minju Kim, Kibin Park, Jiyoung Chang, Laith Al-Rabadi, Jungkyu Kim
*University of Utah, USA*

**T155.h** **A PROXIMAL TUBULE-ON-CHIP MODEL INCORPORATING HIPSC-DERIVED KIDNEY ORGANOIDS FOR ENHANCED FUNCTIONAL ANALYSIS OF RENAL TRANSPORTERS**
Cheng Ma[1], Ramin B. Sadeghian[1], Ryosuke Negoro[2], Kazuya Fujimoto[1], Toshikazu Araoka[1], Naoki Ishiguro[3], Minoru Takasato[1,4,5], Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN,* [2]*Ritsumeikan University, Kusatsu, JAPAN,* [3]*Nippon Boehringer Ingelheim Co. Ltd., JAPAN,* [4]*RIKEN Center for Biosystems Dynamics Research (BDR), JAPAN, and* [5]*Osaka University, JAPAN*

**T156.h** **DESIGN TOOL FOR THE GENERATION OF MULTI-ORGAN-ON-CHIP GEOMETRIES**
Maria Emmerich[1], Philipp Ebner[2], Robert Wille[1,3]
[1]*Technical University of Munich, GERMANY,* [2]*Johannes Kepler University Linz, AUSTRIA, and* [3]*Software Competence Center Hagenberg GmbH, AUSTRIA*

**T157.h** **ENGINEERING COMPLEX VASCULAR ARCHITECTURES: SPATIALLY INTRICATE VESSELS FOR ENHANCED VASCULAR MODELING**
Jennifer D. Lee[1], Ankit Kumar[1], Tanmay Mathur[1], Abhishek Jain[1,2,3]
[1]*Texas A&M University, USA,* [2]*Texas A&M Health Science Center, USA, and* [3]*Houston Methodist Research Institute, USA*

**T158.h** **EXPLORING THE IMPACT OF ELECTROMAGNETIC STIMULATION ON CARDIOVASCULAR MICROMODELS**
Ana C. Manjua, Burcu Gumuscu
*Eindhoven University of Technology, NETHERLANDS*

**T159.h** **HIGH-THROUGHPUT PLATFORM FOR MODELLING TUBULAR INJURIES IN KIDNEY**
Shravanthi Rajasekar, Anushree Chakravarthy, Kimia Asadi, Brenda Truong, Matana Hendrickson, Ahmed Attia, Muna Sabouny, Anna Basatskaya, Sergi-Clotet Freixas, Madeline Ludlow, Alexander Sotra, Dawn S.Y. Lin, Feng Zhang, Boyang Zhang
*McMaster University, CANADA*

**T160.h** **IN VITRO 3D MODELING OF ER+ BREAST CANCER AND PRIMARY ADIPOSE DERIVED STEM CELL DEMONSTRATES ALTERATIONS IN ENDOCRINE THERAPY RESPONSE DUE TO PATIENT CHARACTERISTICS**
Braulio A. Ortega Quesada[1], Elizabeth C. Martin[2], Adam T. Melvin[1]
[1]*Clemson University, USA and* [2]*Tulane University, USA*

**T161.h** **INTEGRATION OF COMPRESSIVE FORCES IN HUMAN BIOMIMETIC GUT-ON-CHIP MODEL TO STUDY MICROBIOTA BACTERIAL MIXING**
Elise Delannoy, Aurélie Burette, Catherine Daniel, Alexandre Grassart
*Center for Infection & Immunity of Lille, FRANCE*

**T162.h** **LCD 3D PRINTING FOR THE FABRICATION AND MASS PRODUCTION OF ORGAN-ON-A-CHIP DEVICES**
Molly L. Shen, Houda Shafique, Vahid Karamzadeh, David Juncker
*McGill University, CANADA*

**T163.h** **MODELING THE DRAINAGE OF NANOPARTICLES TO THE LYMPH NODE USING EX VIVO LYMPH NODE SLICES IN A MULTI-ORGAN-ON-CHIP DEVICE**
Erin Lawrence, Sophie Cook, Rebecca Pompano
*University of Virginia, USA*

**T164.h** **PLATELET ADHESION AND ACTIVATION IN AN ECMO THROMBOSIS-ON-A-CHIP MODEL**
Tiffany Goh[1], Lingzi Gao[1], Jasneil Singh[1], Richard Totaro[2], Ruaidhri Carey[2], Kevin Yang[2], Bruce Cartwright[2], Mark Dennis[2], Lining A. Ju[1], Anna Waterhouse[1]
[1]*University of Sydney, AUSTRALIA and*
[2]*Royal Prince Alfred Hospital, Sydney, AUSTRALIA*

**T165.h** **PULMONARY ACINUS-ON-A-CHIP**
Yuta Tani[1], Jun Sawayama[1], Satoshi Ikeo[1], Yuki Yamamoto[2], Minghao Nie[1], Shoji Takeuchi[1]
[1]*University of Tokyo, JAPAN and* [2]*HiLung Inc., JAPAN*

**T166.h** **THE TRANSLATIONAL ORGAN-ON-CHIP PLATFORM STARTER KIT: AN ISO-COMPLIANT, RECONFIGURABLE PLATFORM FOR PLUG-AND-PLAY ORGAN-ON-CHIP RESEARCH**
Joshua Loessberg-Zahl, Aniruddha Paul, Eric Safai, Anke Vollertsen, Jasper Lozeman, Loes Segerink, Mathieu Odijk, Andries van der Meer
*University of Twente, NETHERLANDS*

**T167.h** **µGRATER: A MICROFABRICATED DEVICE TO ACCELERATE TISSUE DISSECTION TO GENERATE ORGANOIDS FOR TUMOR-IMMUNE MICROENVIRONMENT MODELING**
Seth C. Cordts, Kanako Yuki, Maria F. Henao Echeverri, Balasubramanian Narasimhan, Calvin J. Kuo, Sindy K.Y. Tang
*Stanford University, USA*

**W153.h** **3D-OXYGEN GRADIENT CHIP FOR CANCER CELL MIGRATION RESEARCH**
Pan Zuo, Jelle J.F. Sleeboom, Oscar Stassen, Mohammad JouyBar, Ye Wang, Jaap M.J. den Toonder
*Eindhoven University of Technology, NETHERLANDS*

**W154.h** **A DROPLET MICROFLUIDIC PLATFORM USED TO ENCAPSULATE PRE-FORMED CANCER SPHEROIDS IN HYDROGEL SYSTEMS FOR CONTROLLED GROWTH AND ANALYSIS**
Noura Ezzo, Thu H. Nguyen, Evelyn K.F. Yim, Carolyn L. Ren
*University of Waterloo, CANADA*

**W155.h A LONG-TERM STORABLE HT-OOC PLATFORM AND ARTIFICIAL INTELLIGENCE-ASSISTED DRUG TESTING**
Jeong Ah Kim[1], Min Kyeong Kim[1], Kyurim Paek[1]
[1]*Korea Basic Science Institute, KOREA and*
[2]*University of Science & Technology, KOREA*

**W156.h ADIPOCYTE-INS1 CROSSTALK: CLOSED LOOP CO-CULTURE MODEL WITH SHEAR MODULATION**
Mohamad Orabi, Tae-Hwa Chun, Joe F. Lo
*University of Michigan, USA*

**W157.h DEVELOPMENT OF A SMALL-INTESTINE-ON-A-CHIP DEVICE THOUGH VISCOUS FINGER PATTERNING METHODOLOGY**
Sergio Davila Martinez, Maria Peltonen,
Federica Quacquarelli, Maria Antfolk
*University of Lund, SWEDEN*

**W158.h ENHANCEMENT OF MICROSCOPE VISUALIZATION FOR 3D-NANOPRINTED PDMS MICROVESSELS**
Xin Xu[1], Abdil Muhaymin Chowdhury[1], Yunxiu Qiu[2], Chen-Yu Chen[1], Bidhan C. Bandyopadhyay[3], Bryan R. Smith[2], William E. Bentley[1], Ryan D. Sochol[1]
[1]*University of Maryland, USA,* [2]*Michigan State University, USA, and* [3]*Veterans Affairs Medical Center, USA*

**W159.h HCC-ON-A-CHIP MODEL TO EVALUATE THE TUMOR ENVIRONMENTAL STRESS ON MACROPHAGE HETEROGENEITY AND ITS EFFECT ON HCC PROGRESSION**
Xiahe Han, Wu Liu
*Shandong University, CHINA*

**W160.h HUMAN BRAIN TUMOR-ON-A-CHIP MODEL INVESTIGATING THE INFLUENCE OF ASTROCYTES, PERICYTES, AND BRAIN ENDOTHELIAL CELLS ON GLIOMA STEM CELLS INVASION DYNAMICS**
Kalpana Ravi[1], Twinkle Jina M. Manoharan[1], Samantha O' Connor[1], Christopher Plaisier[1], Shwetal Mehta[2], Mehdi Nikkhah[1]
[1]*Arizona State University, USA and* [2]*Barrow Neurological Institute, USA*

**W161.h INTEGRATED MICROFLUIDIC PLATFORM FOR HIGH-THROUGHPUT GENERATION OF INTESTINAL ORGANOIDS IN HYDROGEL DROPLETS**
Barbora Lavickova, Hannah T. Kronabitter, Mar Cervera Negueruela, Eylul Ceylan, Laura Benito Zarza, Jose L. Garcia-Cordero
*Roche Institute of Human Biology, SWITZERLAND*

**W162.h INVESTIGATING THE IMPACT OF CANCER DRUGS ON SPECIFIC ORGANS USING A MULTI-ORGAN-ON-CHIP (MULTI-OOC) APPROACH**
Pawel Romanczuk, Gabriela Ulanowicz, Agnieszka Zuchowska, Elżbieta Jastrzębska, Zbigniew Brzózka
*Warsaw University of Technology, POLAND*

**W163.h MICROFLUIDIC TUMOR-ON-A-CHIP FOR INVESTIGATING TUMOR-IMMUNE DYNAMICS IN BREAST CANCER**
Twinkle Jina Minette Manoharan[1], Kalpana Ravi[1], Abhirami P. Suresh[1,2], Abhinav P. Acharya[1,2], Mehdi Nikkhah[1]
[1]*Arizona State University, USA and*
[2]*Case Western Reserve University, USA*

**W164.h** **MULTI-ORGAN-ON CHIP APPROACH TOWARD SIMULATION OF BREAST CANCER METASTASIS TO LIVER**
Joanna Konopka, Agnieszka Zuchowska, Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

**W165.h** **PRESERVATION OF DRUG SENSITIVITY STRATIFICATION IN MINIATURIZED TUMOR ORGANOID CULTURES**
Aarthi Namasivayam, Christopher Halbrook, Elliot Hui
*University of California, Irvine, USA*

**W166.h** **RECONFIGURABLE HANGING DROP MICROARRAY PLATFORM FOR HIGH-THROUGHPUT FORMATION OF BRAIN ASSEMBLOID ARRAY AND MULTIPLEXED CONDITION TREATMENT**
Hwisoo Kim, Hyunsoo Jang, Ki-Jun Yoon, Je-Kyun Park
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**W167.h** **THREE-DIMENSIONAL VASCULARIZED MODEL OF OVARIAN CANCER - A NEW APPROACH IN STUDYING THE CANCER PROCESS BASED ON ORGAN-ON-A-CHIP TECHNOLOGY**
Oliwia Tadko[1], Magdalena Flont[2], Joanna Konopka[1], Agnieszka Gnyszka[1], Agnieszka Zuchowska[1], Elżbieta Jastrzębska[1,2]
[1] *Warsaw University of Technology, POLAND and*
[2] *Center for Advanced Materials and Technologies, POLAND*

## Organisms On Chip (C. Elegans, Zebrafish, Arabidopsis, Etc.)

**M168.h** **CONCURRENT FORCE SENSING AND IMAGING OF ACTIN CYTOSKELETON DYNAMICS IN PHYTOPHTHORA SPECIES ON A LAB-ON-A-CHIP DEVICE**
Ayelen Tayagui[1], Yiling Sun[1], Kiki Kots[2], Haig BIshop[1], Tijs Ketelaar[2], Francine Govers[2], Volker Nock[1], Ashley Garrill[1]
[1] *University of Canterbury, NEW ZEALAND and*
[2] *Wageningen University, NETHERLANDS*

**M169.h** **ON-CHIP MULTI-ROUTE IN-VIVO REAL-TIME NANOPLASTIC TOXICITY TEST: FROM SOFT LITHOGRAPHY TO 3D PRINTING**
Preyojon Dey[1], Terence M. Bradley[2], Alicia Boymelgreen[1]
[1] *Florida International University, USA and*
[2] *University of Rhode Island, USA*

**T168.h** **LABEL-FREE AND ULTRA-SENSITIVELY MONITORING C.ELEGANS MULTI-ORGAN DEGENERATION ALONG AGING WITH WIDE-BAND ELECTRICAL IMPEDANCE SPECTROSCOPY**
Song Yu[1], Jiaqi Liu[1], Jianwei Ouyang[1], Yingying Wang[1], Yiyan Zhang[2,3], Di Chen[3], Zixin Wang[4], Zhen Zhu[1]
[1] *Southeast University, CHINA,* [2] *Nanjing University, CHINA,* [3] *Zhejiang University, CHINA, and* [4] *Sun Yat-sen University, CHINA*

**W168.h** **ADVANCED 3D GLASS CHIP FOR PATTERNED STIMULATION AND RECORDING OF NEURONAL ACTIVITY IN SINGLE CELL RESOLUTION**
Dominika Schrödter, Janine Fichtner, Jakob W. von Trotha, Reinhard W. Köster, Andreas Dietzel
*Technische Universität Braunschweig, GERMANY*

**W169.h** **MICROFLUIDIC AND COMPUTATIONAL APPROACH TO MODELING BIOMINERALIZATION IN LIVING MATERIALS**
Brooke Filanoski, Kendal Phinney, Liming Zhao, Darke Hull
*Cornell University, USA*

## Others

**T177.h** **OPTICAL DENSITY MEASUREMENT FOR FLOW MONITORING OF MICROPHYSIOLOGICAL SYSTEM**
Hiroki Kumon, Kosuke Hironaka, Shigeo Hara, Hidenao Yamada
*Hamamatsu Photonics K.K., JAPAN*

## Tissue Engineering

**M170.h** **BIOPRINTING BIPHASIC JAMMED BIOINKS USING MULTI-NOZZLE PRINTHEADS ON PHYSIOLOGICAL SURFACES AND IN REDUCED GRAVITY**
Sushant Singh
*University of Toronto, CANADA*

**M171.h** **DEVELOPMENT OF A CULTURE VISSEL TO EVALUATE THE EFFECTS OF MICROGRAVITY ON ARITIFICIAL SKELETAL MUSCLE**
Ryo Nakajima, Yuka Nakanaga, Tomohiro Nakamura, Sho Yokoyama
*Osaka Institute of Technology, JAPAN*

**M173.h** **MULTI-STIMULUS FUSION PLATFORM FOR PROMOTING C2C12 ALIGNMENT AND MYOTUBE FORMATION**
Yuyin Zhang, Yuanjie Gan, Yue Wang, Na Liu, Tao Yue
*Shanghai University, CHINA*

**T169.h** **A NEEDLE BIOPSY INSPIRED MICROCATHETER FOR RAPID TISSUE MECHANICAL MEASUREMENT**
Zhaokai Wang, Syed Ali Raza Bukhari, Diancheng Li, Matthew A. Robertson, Yong Jun Lai, Xian Wang
*Queen's University, CANADA*

**T170.h** **CARDIAC TISSUE ABLATION USING A MINIATURIZED SMART ELECTROPORATION SYSTEM**
Junrui Zhang[1,2], Yizhou Jiang[3], Jiabin Dou[1], Xingyu Jiang[1]
[1] *Southern University of Science and Technology, CHINA,* [2] *Roumai Medical SA, SWITZERLAND, and* [3] *Fuwai Hospital, CHINA*

**T171.h** **ENGINEERED GELATIN METHACRYLOYL GRANULAR SCAFFOLDS FOR MRNA DELIVERY**
Bruna G. Carvalho[1,2], Aya Nakayama[1], Hiromi Miwa[3], Sang W. Han[4], Lucimara G. de la Torre[2], Dino Di Carlo[3], Junmin Lee[5,6], Han-Jun Kim[1,7,8], Ali Khademhosseini[1], Natan R. Barros[1]
[1] *Terasaki Institute for Biomedical Innovation, USA,* [2] *University of Campinas, BRAZIL,* [3] *University of California, Los Angeles, USA,* [4] *Federal University of São Paulo, BRAZIL,* [5] *Pohang University of Science and Technology, KOREA,* [6] *Yonsei University, KOREA,* [7] *Korea University, KOREA, and* [8] *Vellore Institute of Technology, INDIA*

**T172.h** **HIGH-RESOLUTION STRUCTURING OF BIOACTIVE GLASSES BY TWO-PHOTON LITHOGRAPHY**
Leonhard Hambitzer[1], Louise Roolfs[2], Cornelia Lee-Thedieck[2], Frederik Kotz-Helmer[1]
[1] *University of Freiburg, GERMANY and*
[2] *University of Hannover, GERMANY*

**W170.h** **BIOMIMETIC PIEZOELECTRIC NANOFIBER SCAFFOLD AND ITS EFFECTS ON THE CHONDROGENIC DIFFERENTIATION OF MESENCHYMAL STEM CELLS**
Jing Li, Runxin Liu, Dahai Ren
*Tsinghua University, CHINA*

**W171.h** **CELL-ENCAPSULATING HOLLOW COLLAGEN MICROGEL BEADS FOR HOLLOW ORGAN TISSUE MODEL IN VITRO**
Satona Abeta[1], Akari Masuda[1], Aiki Hioki[1], Kayoko Hirayama-Shoji[2], Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Oslo University Hospital, NORWAY*

**W172.h** **EVALUATION OF CONTRACTILE FORCE OF RING-SHAPED SMOOTH MUSCLE TISSUE USING A 3D-PRINTED FLEXIBLE DEVICE**
DongWoo Lee, Byeongwook Jo, Shoji Takeuchi
*University of Tokyo, JAPAN*

**W173.h** **MICROFLUIDIC-GENERATED CRESCENT-SHAPED HYDROGEL PARTICLES AS BUILDING BLOCKS THAT ENCOURAGE CELL INGROWTH FOR MICROPOROUS ANNEALED PARTICLE SCAFFOLDS**
Rui Chian Tang[1], Lily Shang[1], Phillip O. Scumpia[1,2], Dino Di Carlo[1]
[1] *University of California, Los Angeles, USA and*
[2] *VA Greater Los Angeles Healthcare System, USA*

## Vascularization and Perfusion

**M174.h** **BACK-AND-FORTH OSCILLATORY SHEAR STRESS IN MICROFLUIDIC CULTURE SYSTEM ENABLES TO ANALYZE MECHANICAL RESPONSE OF VASCULAR ENDOTHELIAL TISSUE**
Hayate Yamamoto[1], Jumpei Muramatsu[1], Shigenori Miura[2], Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Hirosihma, JAPAN*

**M175.h** **EXPLORING THE INFLUENCE OF MICROENVIRONMENTAL CUES ON VASCULAR DYNAMICS**
Utku Devamoglu, Séverine Le Gac
*University of Twente, NETHERLANDS*

**M176.h** **MICROFLUIDIC MODULATION OF TUMOR MICROVASCULATURE IN MICRO-DISSECTED CANCER TISSUES**
Tran N.H. Nguyen[1], Lisa Horowitz[1], Brandon Nguyen[1], Timothy Krilov[1], Songli Zhu[2], Ethan Lockhart[1], Taranjit Gujral[2], Albert Folch[1]
[1] *University of Washington, USA and* [2] *Fred Hutchinson Cancer Research Center, USA*

**M177.h VASCULARIZED PERFUSABLE LIVER TISSUE ON CHIP FABRICATED USING EMBEDDED BIOPRINTING METHOD**
Nima Tabatabaei Rezaei[1], Kartikeya Dixit[1], Hitendra Kumar[2], Jacob John[1], Giovanniantonio Natale[1], Simon S. Park[1], Keekyoung Kim[1]
[1]*University of Calgary, CANADA and*
[2]*Indian Institute of Technology Indore, INDIA*

**T173.h A MICROFLUIDIC METHOD TO STUDY THE DEVELOPMENT AND REMODELING OF HUAEC VESSELS UNDER CYCLIC FLOWS**
Subhashree Shivani, Chih-Ting Lin, Yu-Hsiang Hsu
*National Taiwan University, TAIWAN*

**T174.h BIOMIMETIC RETINA ON A CHIP FOR CHARACTERIZATION OF MICROVASCULAR DYNAMICS**
Laureline Julien[1,2,3], Andy V. Le[4,5], Tatiana Turcitu[4], Manouk Abkarian[5], Léo Coudène[5], Michel Paques[3], José-Maria Fullana[2], Benoît Charlot[5], Marianne Fenech[4]
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**T175.h IN VITRO MICROENVIRONMENT OF TRANSLOCATION RENAL CELL CARCINOMA FOR THE QUANTITATIVE EVALUATION OF ANGIOGENESIS**
Atsuya Kitada[1], Hang Zhou[1], Kazuya Fujimoto[1], Miwa Tanaka[2], Masaya Baba[3], Takuro Nakamura[4], Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN,* [2]*Japanese Foundation for Cancer Research, JAPAN,* [3]*Kumamoto University, JAPAN, and* [4]*Tokyo Medical University, JAPAN*

**T176.h MICROFLUIDIC VASCULARIZATION IN PARAMETERIZED CHANNEL GEOMETRY FROM A METABOLIC PERSPECTIVE**
Joonha Park, Soonyong Kwon, Hongki Yoo, Jessie S. Jeon
*Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**W174.h ADVANCED MORPHOLOGY ANALYSIS ON THE BIOCHEMICAL AND MECHANICAL EFFECT ON MICROFLUIDIC VESSEL NETWORK**
Han Shao, Edmond W.K. Young
*University of Toronto, CANADA*

**W175.h DEVELOPMENT OF THE 3D PERFUSABLE TUMOR TISSUE MODEL WITH ENHANCED T-CELL PERFUSION AND INFILTRATION**
Rinki Singh[1,2], Nobuhito Mori[2], Ryo Tsumura[3], Yoshikatsu Koga[3], Yasuyuki S. Kida[1,2]
[1]*University of Tsukuba, JAPAN,* [2]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and* [3]*National Cancer Center, JAPAN*

**W176.h LIVE-CELL IMAGING SYSTEM FOR ECM-BASED BRANCHING VASCULAR MODEL IN PERFUSION AND STRETCHING CULTURE**
Jumpei Muramatsu[1], Michinao Hashimoto[2], Shigenori Miura[3], Hiroaki Onoe[1]
[1]*Keio University, JAPAN,* [2]*Singapore University of Technology and Design, SINGAPORE, and* [3]*Hiroshima University, JAPAN*

**W177.h** **SIMULATION OF ON-CHIP VASCULAR BED FORMATION AND ITS VERIFICATION BY COMPARISON WITH EXPERIMENTS**
Kazuya Fujimoto Fujimoto[1], Yoshikazu Kameda[2], Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN and* [2]*Icomes Lab Co., Ltd., JAPAN*

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**M532.h** **3D PRINTED MICROPERFUSED AND MESOSCALE HUMAN LIVER MODEL WITH PHYSIOLOGICAL OXYGEN GRADIENT AND HEPATIC ZONATION**
Nayere Taebnia[1], Milan Wesseler[2],
Niels B. Larsen[2], Volker M. Lauschke[1]
[1]*Karolinska Institute, SWEDEN and*
[2]*Technical University of Denmark, DENMARK*

**M533.h** **A CHITOSAN-BASED INJECTABLE AND MACROPOROUS SCAFFOLD AS A IMMUNE CELLS GROWTH AND DELIVERY SYSTEM TO TREAT CANCER**
Baptiste Marin[1,2], Paméla Thébault[2,3], Nick Cunningham[1,2],
Inès Hamouda[1,2], Réjean Lapointe[2,3,4], Sophie Lerouge[1,2]
[1]*École de Technologie Supérieure, CANADA,* [2]*University of Montreal Hospital Center, CANADA,* [3]*Institut du Cancer de Montréal, CANADA, and* [4]*University of Montreal, CANADA*

**M535.h** **DEVELOPMENT OF A 2D GRADIENT CULTURE MODEL FOR PRIMARY INTESTINAL EPITHELIAL CELLS**
Federica Quacquarelli[1], Sergio Davila[1], Zishuo Yuan[2],
Jörg Kutter[2], Maria Antfolk[1]
[1]*Lund University, SWEDEN and* [2]*University of Copenhagen, DENMARK*

**M536.h** **EXPLORING THE MECHANISMS OF COLORECTAL CANCER METASTASIS THROUGH ITS MICROENVIRONMENT USING MICROFLUIDIC TUMOR ON A CHIP ARRAY**
Shao-Wei Huang[1], Long-Sheng Lu[2], Fan-gang Tseng[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*Taipei Medical University Hospital, TAIWAN*

**M537.h** **INVESTIGATION OF GLYCOCALYX DYNAMICS IN CIRCULAR CHANNELS UNDER VARYING SHEAR STRESSES**
Karim Saadé, Maryam Tabrizian
*McGill University, CANADA*

**M538.h** **SUPERCRITICAL CO2 SOFT TISSUE DECELLULARIZATION PRESERVES IN VIVO-LIKE MECHANICAL PROPERTIES**
Omar Peza-Chavez, Yulemi Gonzalez-Quesada, Kelly K. Hu,
Lauren R. Harrison, Melanie Rodger, Joseph M. Kinsella
*McGill University, CANADA*

**M539.h** **UNLOCKING THE FUTURE OF MENTAL HEALTH: BRAIN-ON-CHIP AS THE ULTIMATE BLOOD-BRAIN BARRIER (BBB) MODEL**
Pawel Romanczuk[1], Agnieszka Zuchowska[1],
Patrycja Baranowska[2], Zbigniew Brzózka[1]
[1]*Warsaw Univeristy of Technology, POLAND and*
[2]*Centre for Advanced Materials and Technologies CEZAMAT, POLAND*

**T532.h** **3D PRINTING-BASED ORGAN-ON-A-CHIP SYSTEM TO RECAPITULATE A PHYSIOLOGICAL ORGAN MICROENVIRONMENT WITH COMPLEX VASCULAR STRUCTURE**

Yong Duk Han, Alma Antonio, Tracy Lin, Queeny Dasgupta, Juliana Navarro-Yepes, SoonSeng Ng, Ameya Narkar, Taci Pereira, Sammy S. Datwani
*Systemic Bio, USA*

**T533.h** **A PERIPHERAL-CENTRAL NERVOUS SYSTEM ON-CHIP TO STUDY TARGETED DELIVERY OF PERIPHERALLY ADMINISTRATED NUCLEIC ACIDS**

Miguel Xavier[1], Ana P. Spencer[2,3,4], Adiana Vilaça[1], Sofia C. Guimarães[2,3], Rafael Santos[2,3], Ariel Ionescu[5], Yael Leichtmann-Bardoog[5], Maria Lazaro[2,3], Victoria Leiro[2,3], Eran Perlson[5], Ben Maoz[5], Ana P. Pego[2,3,6]
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**T534.h** **DESIGN & DEVELOPMENT OF DEFORMABLE PERITONEUM-ON-CHIP TO INVESTIGATE OVARIAN CANCER METASTASIS**

Satyarthi Mishra, Bhavana C. R, Ramray Bhat, Prosenjit Sen
*Indian Institute of Science, INDIA*

**T535.h** **DEVELOPMENT OF A MICROFLUIDIC PLATFORM TO PRODUCE CELL-LOADED ZWITTERIONIC MICROGELS FOR CELL THERAPEUTICS**

Afshin Abrishamkar[1,2,3,4], Nada Ibrahim[2], Cynthia Pham[2], Keith Morton[1,3], Todd Hoare2, Teodor Veres[1,3,4]
[1] *National Research Council, CANADA,* [2] *McMaster University, CANADA,* [3] *Centre for Research and Applications in Fluidic Technologies (CRAFT), CANADA, and* [4] *University of Toronto, CANADA*

**T536.h** **HIGH FIDELITY CARDIAC VENTRICLE FABRICATED FROM POROUS ELASTOMER PROMOTES VASCULOGENESIS**

Sargol Okhovatian[1,2], Ramak Khosravi[2,3], Shira Landau[1,2], Milica Radisic[1,2]
[1] *University of Toronto, CANADA,* [2] *Toronto General Research Institute, CANADA, and* [3] *Duke University, USA*

**T537.h** **INSIDE-OUT INTESTINAL ORGANOIDS USING DROPLET MICROFLUIDIC-PRODUCED HYDROGEL MICROPARTICLES**

Federica Quacquarelli[1], Sergio Davila[1], Jaekyung Koh[2], Joseph de Rutte[2], Dino Di Carlo[2], Maria Antfolk[1]
[1] *Lund University, SWEDEN and* [2] *University of California, USA*

**T538.h** **VASCULARIZATION OF KIDNEY ORGANOIDS AND GLOMERULAR CELLS WITH SELF-ASSEMBLED VASCULATURE**

Chuan Liu[1,2], Shira S. Landau[1,2], Qinghua Wu[1,2], Matthew Lei[1,2], Milica Radisic[1,2,3]
[1] *University of Toronto, CANADA,* [2] *University Health Network, CANADA, and* [3] *Centre for Research and Applications in Fluidic Technologies, CANADA*

**W532.h A BIOMIMETIC DILATED THREE-LAYER PLACENTA-ON-A-CHIP WITH MICROPOROUS MEMBRANE LAYER UNDER FLOW-INDUCED SHEAR STRESS STIMULATION AND PLACENTAL CIRCULATION**
Tzu-Chi Wang[1], Hao-En Lee[1], Chie-Pein Chen[2], Tong-Miin Liou[1], Chien-Chong Hong[1]
[1]*National Tsing Hua University, TAIWAN and* [2]*MacKay Memorial Hospital, TAIWAN*

**W533.h A REVERSIBLE BONDING MICROFLUIDIC CHIP FOR VERSATILE CELL CULTURING AND EXTRACTION**
Xiaohan Feng[1], Zehaoyu Wu[1], Lily K.W. Cheng[1], Yang Xiang[2], Ryohichi Sugimura[2], Xuyan Lin[1], Angela R. Wu[1]
[1]*Hong Kong University of Science and Technology, HONG KONG and* [2]*University of Hong Kong, HONG KONG*

**W534.h DEVELOPING PATENT-DERIVED ORGANOID MODELS FOR PRECISION MEDICINE IN RENAL CELL CARCINOMA (RCC)**
Ali Shahini[1], Zohreh Mehrjoo[1], Hellen Kuasne[1], Minjun Kim[1], Binesh Emami[1], Simon Tanguay[1], Sebastian Merker[2], Morag Park[1], Yasser Riazalhosseini[1]
[1]*McGill University, CANADA and* [2]*Maisonneuve-Rosemont Hospital Research Centre, CANADA*

**W535.h EFFECT OF POROSITY ON TIGHT JUNCTION FORMATION OF CEREBRAL VASCULAR ENDOTHELIAL CELLS CULTURED ON A MICROPOROUS SIN MEMBRANE**
Kota Usui, Takashi Yasuda
*Kyushu Institute of Technology, JAPAN*

**W536.h HUMAN-LIKE CANCER TISSUE MODELS AS A DRUG SCREENING PLATFORM**
Asees Kaur, Anna Poon, Sam Paton, Annelise Lapointe, Ekaterina Shteinberg, Jenna Sonmor, Sebastian Steiner, Genevieve Boice, Karolina Valente
*VoxCell BioInnovation, CANADA*

**W537.h SENSOR-INTEGRATED MICROFLUIDIC ORGAN CHIPS FOR CONTINUOUS METABOLIC PROFILING**
Zohreh Izadifar, Micaela Almeida, Kanoelani Pilobello, Adama M. Sesay, Donald E. Ingber
*Harvard University, USA*

**W538.h TAILORING HYDROGEL MECHANICS AND ARCHITECTURE FOR EFFECTIVE VOCAL FOLD REGENERATION**
Sara Nejati, Luc Mongeau
*McGill University, CANADA*

## i - Wearables and Continuous Biosensing

### Continuous Monitoring and Biosensing

**M178.i A HIGHLY SENSITIVE AND LONG-TERM STABLE ELECTROCHEMICAL APTAMER-BASED SENSOR BASED ON AUNPS@MXENE NANOCOMPOSITE FOR CONTINUOUS DETECTION OF BIOMARKERS**
Haowei Duan, Ming Li
*University of New South Wales, AUSTRALIA*

**M179.i** **AN INTEGRATED DIGITAL MICROFLUIDICS DEVICE FOR MULTIPLEXED ELECTROCHEMICAL BIOSENSING OF PROTEIN BIOMARKERS OF PROSTATE CANCER: SOLVING ISSUES WITH TRANSLATION TO AUTOMATED AND SCALABLE SYSTEMS FOR COMMERCIALIZATION**
Kulmanak S. Bajaj[1], Harmanjit Kaur[1], Mohammed Hasan[1], Amin Hosseini[2], Jeff Sutton[2], Leyla Soleymani[1]
[1]*McMaster University, CANADA and* [2]*VERV Technologies, CANADA*

**M180.i** **CONTINUOUS IN-VITRO PHYSIOLOGICAL PH SENSING IN 3D CO-CULTURED TUMOUR SPHEROIDS USING SERS BASED PH NANOSENSORS**
Koyel Dey[1,2], Venkanagouda S. Goudar[1], Tuhin Santra[2], Fan Gang Tseng[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*Indian Institute of Technology, Madras, INDIA*

**M181.i** **ELECTROCHEMICAL MODULATION OF AFFINITY-BASED SENSORS**
Scott Isaacson, Connor Flynn, Shana O. Kelley
*Northwestern University, USA*

**M182.i** **INTEGRATED FULL-BRIDGE STRAIN SENSOR ON A POLYMER CANTILEVER FOR PRECISE CARDIOMYOCYTE CONTRACTION FORCE MEASUREMENT**
Ke Liu, Haolan Sun, Longlong Li, Dong-weon Lee
*Chonnam National University, KOREA*

**M183.i** **NANOBODY RECEPTORS ENABLE HIGH SENSITIVITY IL-6 MONITORING USING MOLECULAR PENDULUM BIOANALYSIS**
Connor D. Flynn[1], Zhenwei Wu[1], Amy Bantle[2], Scott Isaacson[1], Dingran Chang[1], Alam Mahmud[2], Hanie Yousefi[1], Jagotamoy Das[1], Shana O. Kelley[1]
[1]*Northwestern University, USA and* [2]*University of Toronto, CANADA*

**M184.i** **REDEFINING PASTURES: INNOVATING GRAZING SYSTEMS WITH AFFORDABLE VIRTUAL FENCING SOLUTIONS**
Hannah L. James, Clara Rial, Darke R. Hull, Julio Giordano, David Erickson
*Cornell University, USA*

**T178.i** **A MICROFLUIDIC CHOLINE SENSING SYSTEM TO DETECT ORGANOPHOSPHORUS POISONING BY THE CONTINUOUS MEASUREMENT OF CHANGES IN ACETYLCHOLINESTERASE ACTIVITY**
Georgia K. Smith[1], Nick Coe[2], Jennifer Dawson[2], Thomas Mann[2], Sally A.N. Gowers[1], Christopher Green[2], Sarah A. Goodchild[2], Martyn G. Boutelle[1]
[1]*Imperial College London, UK and* [2]*Dstl, UK*

**T179.i** **BEAD-BASED QUANTUM DOT MEDIATED IMMUNOASSAYS FOR REAL-TIME MULTIPLEXED BIOMARKER MONITORING**
Sanjana Srikant[1], Hesam Abouali[1], Nicole G. Barra[2], Jon D. Schertzer[2], Mahla Poudineh[1]
[1]*University of Waterloo, CANADA and* [2]*McMaster University, CANADA*

**T180.i** **CONTINUOUS LACTATE MONITORING WITH DROPLET-BASED PORTABLE DEVICE IN CLINICAL DIAGNOSIS**
Xinne Zhao[1], Tom A. Schröder[2], Lars Heubner[2], Larysa Baraban[1]
[1]*Helmholtz-Zentrum Dresden-Rossendorf, GERMANY and*
[2]*Universitätsklnikum Carl Gustav Carus, GERMANY*

**T181.i** **FLOWING TOWARDS EFFICIENCY: MICROFLUIDIC DNAZYME BIOSENSOR FOR REAL-TIME LEGIONELLA PNEUMOPHILA DETECTION IN WATER**
Enas Osman, Survanshu Saxena, Shuwen Qian,
Jonathan L'Heureux-Hache, Phoebe Li, Jinal Manek,
Jimmy Gu, Todd Hoare, Yingfu Li, Leyla Soleymani
*McMaster University, CANADA*

**T182.i** **LABEL-FREE IMPEDANCE FLOW CYTOMETRY WITH MICROELECTRODES OPTIMIZED FOR HIGH SENSITIVITY FOR INDIVIDUAL MICROORGANISMS**
Mohadeseh Mozafari, Peer Erfle, Jonathan Block,
Rainer Krull, Andreas Dietzel
*Technische Universität Braunschweig, GERMANY*

**T183.i** **RAPID BIOCHEMICAL SENSOR USING SUBMICROMETER-THICK HYDROGEL FILM WITH INTERFEROMETRIC COLOR**
Momoka Minami, Hiroaki Onoe
*Keio university, JAPAN*

**T184.i** **UTILIZING DEGREE OF CIRCULAR POLARIZATION TO DETECT D-GLUCOSE CONCENTRATION IN SCATTERING MEDIA**
Hsin-Yi Hsieh, Chia-Chun Chang, Chin-Chuan Hsieh
*VisEra Technologies Company Ltd., TAIWAN*

**W178.i** **3D PRINTED MICROSAMPLING PROBES**
Patrick M. Pysz, Julia K. Hoskins, Min Zou, Julie A. Stenken
*University of Arkansas, USA*

**W179.i** **ADVANCED SENSING TECHNOLOGIES FOR HEALTHCARE AUTOMATION**
Erfan Shirzadi[1], Irfani Ausri[1], Sadegh Sadeghzadeh[1],
Peyman GhavamiNejad[1], Amin GhavamiNejad[2],
Mahla Poudineh[1]
[1]*University of Waterloo, CANADA and*
[2]*University of Toronto, CANADA*

**W180.i** **CONTINUOUS BIOSENSING ENABLED BY MICROFLUIDICS INTEGRATED WITH NANOSWITCH-BASED FIBER OPTIC SPR**
Annelies Dillen[1], Claudia Scarpellini[1], Jalu Setiya Pradana[1,2],
Jolien Breukers[1], Seppe Driesen[1], Aurélie Mohrbacher[1],
Livio Oliveira de Miranda[3], Peter Zijlstra[3], Filip Delport[2],
Karen Leirs[1], Dragana Spasic[1], Jeroen Lammertyn[1]
[1]*KU Leuven, BELGIUM,* [2]*Fox Biosystems, BELGIUM, and*
[3]*Eindhoven University of Technology, NETHERLANDS*

**W181.i** **DUAL-MODE HEART RATE AND CONTINUOUS GLUCOSE MONITORING WEARABLE SYSTEM FOR HOUSE SPARROWS**
Rachel E. Riccio, Cihan Asci, L. Michael Romero, Sameer Sonkusale
*Tufts University, USA*

**W182.i** **IN-LINE MICROWAVE BIOSENSOR FOR MONITORING ANASTOMOTIC LEAKAGE THROUGH AMYLASE CONTENT IN POST-OPERATIVE PERITONEAL DRAINAGE FLUID AFTER COLORECTAL ANASTOMOSIS SURGERY**

Weijia Cui[1], Qianying Mao[1], Maziar Shafiei-Darabi[1], Lauren LeSergent[2], Ricky Tjandra[2], Robert Miranda[3], Zahra Abbasi[3], Carolyn L. Ren[1]
[1]*University of Waterloo, CANADA,* [2]*FluidAI Medical, CANADA, and* [3]*University of Calgary, CANADA*

**W183.i** **MICROFLUIDIC BIOSENSING SYSTEM FOR REAL-TIME CONTINUOUS MONITORING OF NEUROCHEMICAL CHANGES DURING CARDIAC ARREST AND RESUSCITATION IN A PORCINE MODEL**

Sally A.N. Gowers[1], Chiara Cicatiello[1], Georgia K. Smith[1], Xinyue Liu[1], Xueer Zhang[1], Raimund Helbok[2,3], Judith Martini[2], Gabriel Putzer[2], Martyn G. Boutelle[1]
[1]*Imperial College London, UK,* [2]*Innsbruck Medical University, AUSTRIA, and* [3]*Johannes Kepler University, AUSTRIA*

**W184.i** **REAL-TIME CONTINUOUS MONITORING MICROFLUIDIC PLATFORM FOR MULTIPLEXED BIOMARKER DETECTION**

Hesam Abouali[1], Sanjana Srikant[1], Md. Fahim Al Fattah[1], Nicole G. Barra[2], Dayan Ban[1], Jon D. Schertzer[2], Mahla Poudineh[1]
[1]*University of Waterloo, CANADA and* [2]*McMaster University, CANADA*

## Implantables and Ingestibles

**M185.i** **A THREE-DIMENSIONAL MICROELECTRODE ARRAY SIMULTANEOUSLY RECORDING ELECTROCORTICOGRAPHY AND INTRA-CORTEX SIGNALS**

Xiaoyi Shi[1,2], Yuxing Pang[1,2], Junshi Li[1,2], Zhihong Li[1,2]
[1]*Peking University, CHINA and* [2]*National Key Laboratory of Advanced Micro and Nano Manufacture Technology, CHINA*

**M186.i** **LOCATION AND VELOCITY DETECTION OF EDIBLE WIRELESS CAPSULE SENSOR FOR DIGESTIVE SYSTEM MONITORING**

Kentaro Tomita[1], Kan Tetsuo[2], Hiroaki Onoe[1]
[1]*Keio University, JAPAN and*
[2]*University of Electro-Communications, JAPAN*

**T185.i** **AN EDIBLE WIRELESS SENSOR USING PIEZOELETCRIC BROCCOLI/CELLULOCE FILM WITH SPLIT-RING RESONATORS FOR GASTRIC MOTILITY SENSING**

Shion Miura[1], Tetsuo Kan[2], Hiroaki Onoe[1]
[1]*Keio University, JAPAN and*
[2]*University of Electro-Communications, JAPAN*

**T186.i** **REMOTELY ACTIVATABLE GUT SAMPLING PILL**

Rogier M. Schoeman[1], Jinane Elias[1], Jan Willem de Wit[1], Anita Ahmadi[1], Aniek J.G. Even[1], Klaus Mathwig[1], Tom Torfs[2], Nick van Helleputte[2], Chris van Hoof[1,2]
[1]*iimec, NETHERLANDS and* [2]*iimec, BELGIUM*

**W185.i** **A NOVEL MULTI-ELECTRODE MICROPROBE ARRAY WITH DISSOLVING PROBE BODY**

Xiaoyi Shi, Xiaoyong Tang, YingJie Ren, Junshi Li, Zhihong Li
*Peking University, CHINA*

**W186.i** **INGESTIBLE BIOIMPEDANCE SENSING DEVICE FOR MONITORING INTESTINAL MUCOSAL PERMEABILITY**
Brian M. Holt[1], Hammed Ayansola[1], Justin M. Stine[1], Luke A. Beardslee[1], Pankaj J. Pasricha[2], Younggeon Jin[1], Reza Ghodssi[1]
[1]*University of Maryland, USA and* [2]*Mayo Clinic, USA*

## Microneedles

**M187.i** **CONDUCTIVE HYDROGEL MICRONEEDLE MADE WITH PEDOT: PSS AND GOLD NANOPARTICLES FOR SENSING OF GLUCOSE IN DIABETIC RATS**
Peyman GhavamiNejad, Mahla Poudineh
*University of Waterloo, CANADA*

**M188.i** **HIGHLY WICKING CELLULOSE MICRONEEDLES FOR RAPID SAMPLING AND TRANSPORT OF DERMAL INTERSTITAL FLUID**
Elizabeth C. Wilkirson, Peter B. Lillehoj
*Rice University, USA*

**M189.i** **METAL-BASED, THREE-DIMENSIONAL INTRACORTICAL MICROELECTRODE ARRAY AS A NEURAL INTERFACE**
Junshi Li[1,2], Zhongyan Wang[1,2], Yu-Qing Zheng[1,2], Zhihong Li[1,2]
[1]*Peking University, CHINA and* [2]*Beijing Advanced Innovation Center for Integrated Circuits, CHINA*

**T187.i** **DOPAMINE MODIFIED HYDROGEL MICRONEEDLE BIOSENSOR FOR KETONEBODY SENSING**
Sadegh Sadeghzadeh[1], Irfani Ausri[1], Amin GhavamiNejad[2], Mahla Poudineh[1]
[1]*University of Waterloo, CANADA and* [2]*University of Toronto, CANADA*

**T188.i** **HIGH-PERFORMANCE FLEXIBLE MICRONEEDLE DRY ELECTRODE ARRAY FOR HIGH-DENSITY ELECTROENCEPHALOGRAM (HD-EEG) RECORDING**
Junshi Li[1,2], Zhongyan Wang[1,2], Jiayan Zhang[1,2], Yu-Qing Zheng[1,2], Zhihong Li[1,2]
[1]*Peking University, CHINA and* [2]*Beijing Advanced Innovation Center for Integrated Circuits, CHINA*

**T189.i** **REMOTE-CONTROLLED SENSING AND DRUG DELIVERY VIA 3D-PRINTED HOLLOW MICRONEEDLES**
Mahmood Razzaghi, Mohsen Akbari
*University of Victoria, CANADA*

**W187.i** **A HYDROGEL MICRONEEDLE INTEGRATED APTAMER-BASED ELECTROCHEMICAL SENSOR FOR GLUCOSE AND LACTATE MONITORING IN LIVE ANIMALS**
Hanjia Zheng[1], Fatemeh Bakhshandeh[2], Leyla Soleymani[2], Mahla Poudineh[1]
[1]*University of Waterloo, CANADA and* [2]*McMaster University, CANADA*

**W188.i** **HIGH DENSITY GOLD NANOPARTICLES FUNCTIONALIZED ELECTRODE COMBINED WITH SWELLABLE MICRONEEDLE FOR IN-VIVO SENSING OF GLUCOSE IN DIABETIC RATS**
Ziying Yang, Peyman GhavamiNejad, Mahla Poudineh
*University of Waterloo, CANADA*

**W189.i** **HYDROGEL MICRONEEDLE COUPLED WITH ELECTROCHEMICAL APTASENSOR FOR MINIMALLY INVASIVE AND REAL-TIME THERAPEUTIC DRUG MONITORING**
Fatemeh Keyvani[1], Peyman GhavamiNejad[1], Mahmoud Ayman Saleh[2], Mahla Poudineh[1]
[1]*University of Waterloo, CANADA and* [2]*University of McGill, CANADA*

**W190.i** **SWELLABLE HYDROGEL MICRONEEDLE PATCHES CAN INTERROGATE MIRNA COMPOSITION IN SKIN FLUID TO DIAGNOSE SKIN CANCER**
Ahmad Kenaan, Oliver Teenan, Connor Daniels, Christina Malactou, Jessica Strid, Claire A. Higgins, Sylvain Ladame
*Imperial College London, UK*

## Physiological Sensing and Plethysmography

**M190.i** **WEARABLE SENSOR FOR CONTINUOUS MICROFLUIDIC BLOOD FLOW MEASUREMENT VIA MULTI-WAVELENGTH PHOTOPLETHYSMOGRAPHY (MWPPG) FOR REMOTE MONITORING**
Tenzin Yangzom, Megh Rathod, Samantha Unger, Daniel Franklin
*University of Toronto, CANADA*

## Wearable Systems

**M191.i** **AN ELECTRICAL-IMPEDANCE-TOMOGRAPHY-BASED WEARABLE ARMBAND FOR NON-INVASIVE AND CONTINUOUS BONE MONITORING**
Shuangye Xu[1], Liudi Dong[1], Junchen Fan[1], Xiaowen Huang[2], Zixin Wang[3], Zhen Zhu[1]
[1]*Southeast University, CHINA,* [2]*Jiangsu Province Hospital, CHINA, and* [3]*Sun Yat-Sen University, CHINA*

**M192.i** **WEARABLE ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY FOR NON-INVASIVE CORTISOL MONITORING: BRIDGING THE GAP IN STRESS**
Vyshnavi Devarakonda, Ahmed Asiff, Carter Fuchs, Thanusha Veeraperumal, Mitchell Rhead, Aliaa Elmurshedy, Bahareh Babamiri, Mohammadreza Farrokhnia, Mahmood Khalghollah, Kirankumar Kuruvinashetti, Mohsen HassaniAmir Sanati Nezhad, Amin Komeili
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**T190.i** **DEVELOPMENT OF A FLEXIBLE ELECTROCHEMICAL IMMUNOSENSOR WITH GRAPHENE AND GOLD NANOPARTICLE MODIFICATION FOR POINT-OF-CARE E-ELISA DETECTION OF BIOMARKERS**
Zahrasadat Hosseini, George Jie Yuan
*Hong Kong University of Science and Technology, HONG KONG*

**T191.i** **SKIN-INTERFACED, SOFT, RELIABLE PULSE SENSOR FOR CARDIOVASCULAR DISEASE DIAGNOSTICS ENABLED BY MACHINE LEARNING**
Zhiqiang Ma[1,2], Ke Huang[1,2], Bee Luan Khoo[1,2,3]
[1]*City University of Hong Kong, HONG KONG,* [2]*Hong Kong Center for Cerebro-Cardiovascular Health Engineering, HONG KONG, and* [3]*City University of Hong Kong, Futian, CHINA*

**W191.i** **RECORDING EEG ON HAIRY SCALP WITH FLEXIBLE ANNULAR MICRONEEDLE ARRAY ELECTRODE (A-MAE)**
Junshi Li[1,2], Zhitong Zhang[1,2], Jiayan Zhang[1,2], Yu-Qing Zheng[1,2], Zhihong Li[1,2]
[1]*Peking University, CHINA and* [2]*Beijing Advanced Innovation Center for Integrated Circuits, CHINA*

**W192.i** **STRETCHABLE RIGID-SOFT STRUCTURED ELECTRONIC SUBSTRATE ON WHICH ORGANIC THIN-FILM TRANSISTORS CAN BE MOUNTED**
Sho Sato[1], Fumika Nakamura[1], Yutaka Isoda[1], Tamami Takano[1], Kyohei Nagatake[1], Ryosuke Matsuda[1], Naoko Nanba[3], Takafumi Uemura[2], Tsuyoshi Sekitani[2], Hiroki Ota[1]
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## Late News

**T539.i** **ADVANCEMENTS IN SWEAT BIOMARKER ANALYSIS THROUGH A NOVEL AI-ASSISTED WEARABLE PLATFORM APPROACH: A PROOF OF CONCEPT**
Elnaz Haghani, Hamidreza Akbari, Iliya Beigmohammadi, Razieh Salahandish
*York Universiy, CANADA*

**T540.i** **REAL-TIME CUFFLESS BLOOD PRESSURE MEASUREMENT AFTER EXERCISE USING PULSE TRANSIT TIME METHOD**
Jingyu Choe, Chiwan Koo
*Hanbat National University, KOREA*

**W539.i** **DOUBLE-LAYERED MICRONEEDLES WITH RESISTANCE TO OXIDATION ENVIRONMENT FOR LONG-TERM CONTINUOUS GLUCOSE MONITORING**
Yuna Han[1,2], Ga Yeong Lee[1,2], Seonghyeon Eom[3], Inhee Choi[3], Yun Jung Heo[1,2]
[1]*Kyung Hee University, KOREA,* [2]*Kyung Hee University, KOREA, and* [3]*University of Seoul, KOREA*

**W540.i** **SWEAT FOR TRAINING SMART: HIGHLY INTEGRATED MICROFLUIDIC PLATFORM FOR ENHANCED SPORTS PERFORMANCE**
Genis Rabost-Garcia[1], Maria Sánchez[1], Andrea Fajardo-Garcia[1], Samantha Toinga-Villafuerte[1], Albert Álvarez-Carulla[1], Valeria Colmena-Rubil[1], Javier Aguilar-Torán[1], Alfredo Ongaro[1], Jaime Punter-Villagrasa[1], Pedro L. Cosio[3], Lia Moreno-Simonet[3], Joan Cadefau[3], Xavier Muñoz-Pascual[1], Jasmina Casals-Terré[2]
[1]*Onalabs Inno-Hub SL, SPAIN,* [2]*Universitat Politècnica de Catalunya, SPAIN, and* [3]*Institut Nacional d'Educació Física, SPAIN*

## j - μTAS and Diagnostics

### Artificial Intelligence Enhanced Analysis and Diagnostics

**M193.j** **DEEP LEARNING-ASSIST SINGLE-BACTERIUM DISTINGUISHMENT IN MICROWELL ARRAY**
Po-Hsuan Chao[1], Nien-Tsu Huang[1,2]
[1]*National Taiwan University, TAIWAN and*
[2]*Industrial Technology Research Institute, TAIWAN*

**M194.j** **OPTIMIZATION OF DROPLET-MICROARRAY 3D BIOPRINTING PARAMETERS USING A MACHINE-LEARNING APPROACH**
Jaemyung Shin[1], Minseok Kang[1], Kinam Hyun[1], Zhangkang Li[1], Hitendra Kumar[2], Kangsoo Kim[1], Simon S. Park[1], Keekyoung Kim[1]
[1] *University of Calgary, CANADA and*
[2] *Indian Institute of Technology, Indore, INDIA*

**T192.j** **AI ENHANCED LABEL-FREE PLASMONIC IMAGING OF SINGLE SMALL EXTRACELLULAR VESICLES FOR EARLY CANCER DETECTION**
Mohammad Sadman Mallick[1], Saswat Mohapatra[1], Steven H. Lin[2], Wei-Chuan Shih[1]
[1] *University of Houston, USA and* [2] *University of Texas MD Anderson Cancer Center, USA*

**T193.j** **MACHINE LEARNING ASSISTED RAPID SCREENING OF NUCLEIC ACID AMPLIFICATION COLORIMETRIC ASSAY.**
Carolina del Real Mata[1], Mahsa Jalali[2], Tamer AbdElFatah[1], Sara Mahshid[1]
[1] *McGill University, CANADA and* [2] *Research Institute of the McGill University Health Centre (RIMUHC), CANADA*

**W193.j** **ARTIFICIAL INTELLIGENCE IN LARGE SCALE ACTIVE-MATRIX DIGITAL MICROFLUIDICS**
Zhiqiang Jia[1,3], Wenfei Dong[1,3], Hanbin Ma[1,2]
[1] *Chinese Academy of Sciences, CHINA,* [2] *ACX Instruments Ltd, UK, and* [3] *Changchun University of Science and Technology, CHINA*

**W194.j** **OBJECT DETECTION ORIENTED DEEP LEARNING FOR ANALYSIS OF MICROBIAL COMMUNITIES AND HIGH-THROUGHPUT SCREENING USING DROPLET MICROFLUIDICS**
Anuj Tiwari, Robyn Manley, Fabrice Gielen
*University of Exeter, UK*

## Cell-Based Analysis and Diagnostics

**M195.j** **ASSESSMENT OF RED CELL DEFORMABILITY IN WHOLE BLOOD USING A MICROFLUIDIC DIELECTRIC COAGULOMETER**
Calvin Abonga, Hanif Alizadeh, Dante Disharoon, Sonali Rohiwal, Christopher A. Delianides, Sina Pourang, Anirban Sen Gupta, Michael A. Suster, Pedram Mohseni
*Case Western Reserve University, USA*

**M196.j** **CORRELATING THE MECHANICAL PROPERTIES OF MESENCHYMAL STEM CELLS AND THEIR DIFFERENTIATION ABILITIES BY HIGH-THROUGHPUT DEFORMABILITY CYTOMETRY**
Qinru Xiao, Yanlun Zhu, Hon Fai Chan, Yi-Ping Ho
*Chinese University of Hong Kong, HONG KONG*

**M197.j** **EXPLORING RED BLOOD CELL MARGINATION IN CAPILLARY MICROCHANNELS UNDER CONTROLLED SHEAR RATES**
Maya Salame, Camille Chartrand, Andy V. Le, Hiba Ksiaa, Marianne Fenech
*University of Ottawa, CANADA*

**M198.j** **INVESTIGATING T CELL ACTIVATION AND CYTOKINE SECRETION USING A NOVEL CELL MONITORING PLATFORM**
Naiara Lartitegui Meneses[1], Enrique Azuaje Hualde[1], Andrea Merino[1], Adai Colom[2], Janire Saez[1,2], Fernando Benito Lopez[1], Lourdes Basabe Desmonts[1,2]
[1]*University of the Basque Country, SPAIN and* [2]*IKERBASQUE, SPAIN*

**M199.j** **LINEAGE CELL AND MASS TRACKING IN LOW REFRACTIVE INDEX MICROWELLS VIA QUANTITATIVE PHASE IMAGING**
Jingzhou Zhang, Justin Griffin, Thomas A. Zangle
*University of Utah, USA*

**M200.j** **PHAGE INFECTION CYCLE MONITROED BY SINGLE CELL IMPEDANCE CYTOMETRY**
Xiang Wang[1], Franklin Nobrega[1], Yi Wu[1], Daniel Spencer[1], Mark Sutton[2], Hywel Morgan[1]
[1]*University of Southampton, UK and* [2]*UK Health Security Agency, UK*

**T194.j** **A MICRO-WELL DEVICE INTEGRATES MULTIPLE SENSOR CELLS WITH HYDROGEL FOR ODORANT DETECTION**
Hisatoshi Mimura[1], Toshihisa Osaki[1], Sho Takamori[1], Haruka Oda[2], Shoji Takeuchi[1,2]
[1]*Kanagawa Institute of Industrial Science and Technology, JAPAN and* [2]*University of Tokyo, JAPAN*

**T195.j** **AUTOMATED CULTURE SYSTEM FOR HIGH-THROUGHPUT ANALYSIS OF ORGANOID DYNAMICS IN 3D**
Yiyu Deng, Minjun Son, Jonathan Matthews, Feng Qian, Adekunle Odunsi, Savas Tay
*University of Chicago, USA*

**T196.j** **DIELECTROPHORESIS DIFFERENTIATION OF TEMOZOLOMIDE-RESISTANT AND NON-RESISTANT GLIOBLASTOMA CELLS**
Elham Salimi, Emerich Kovacs, Behnam Arzhang, Simone C. da Silva Rosa, Courtney Clark, Shahrokh Lorzadeh, Justyna Lee, Saeid Ghavami, Greg Bridges, Douglas Thomson
*University of Manitoba, CANADA*

**T197.j** **FLIP THE CHIP: TRAPPING LOW NUMBER OF CANCER CELLS FOR HOMOGENEOUS SPHEROID FORMATION**
Raphael Dezauzier, Petra S. Dittrich
*ETH Zürich, SWITZERLAND*

**T198.j** **LABEL-FREE, PHENOTYPIC CELL CHARACTERIZATION IN CONTINUOUS FLOW**
Laura C. Orellana, Thijs Roebroek, Willem Van Roy, Sophie Roth, Zhenxiang Luo, Elnaz Vaezzadeh, Wiebe Vanhove, Youssef El Jerrari, Deise Origuella, Joost Van Duppen, Guiquan WangRiet Labie, Kasper Claes, Siri Willems, Van Pham, Ben Jones, Chad Arnett, Frederic Van Bellinghen, Martin Obst, Ziduo Lin, Seungkyu Ha, Karolien Jans, Thomas Hopfes, Peter Peumans, Murali Jayapala, Tim Stakenborg
*imec, BELGIUM*

**T199.j** **MEASUREMENT OF IMMUNE RESPONSE BY ENVIRONMENTAL PARTICULATES**
Zhuohao Yang[1], Takumi Adachi[2], Nobutake Suzuki[1], Mai Yamagishi[3], Takashi Funatsu[3], Etsushi Kuroda[2], Shinya Sakuma[4], Yoshitaka Shirasaki[1]
[1]*University of Tokyo, JAPAN,* [2]*Hyogo College of Medicine, JAPAN,* [3]*Live Cell Diagnosis, Ltd., JAPAN, and* [4]*Kyushu University, JAPAN*

**T200.j** **POINT-OF-CARE TECHNOLOGIES FOR MOLECULAR SUBTYPING OF BREAST CANCER IN LOW- AND MIDDLE-INCOME COUNTRIES**
Wenting Gao[1], Iftak Hussain[1], David Erickson[1], Clement Adebamowo[2]
[1]*Cornell University, USA and* [2]*University of Maryland, USA*

**W195.j** **A SPONGE MONOLITH COLUMN FOR CELL SEPARATION BASED ON CELL ELASTICITY**
Yusei Tsutsumi[1], Tetsuya Tanigawa[2], Takuya Kubo[2], Noritada Kaji[1]
[1]*Kyushu University, JAPAN and* [2]*Kyoto University, JAPAN*

**W196.j** **BUOYANCY-BASED DROPLET MICROFLUIDICS FOR THE PRODUCTION OF CELL SPHEROIDS IN ALGINATE GEL BEADS**
Malik Grini[1], Kevin Maltez Cavalheiro[1], Stéphanie van Loo[2], Christine Gilles[1], Tristan Gilet[1]
[1]*University of Liège, BELGIUM and* [2]*Livedrop, BELGIUM*

**W197.j** **DIGITAL MICROFLUIDIC BENCHTOP SYSTEM FOR PRENATAL GENETIC TESTING FROM SINGLE CELLS**
Dylan Siriwardena[1], Michael Dryden[1], Dean Chamberlain[3], Louise Dupoiron[1], David Chitayat[2], Elena Greenfeld[2], Aaron Wheeler[1]
[1]*University of Toronto, CANADA,* [2]*Sinai Health System, CANADA, and* [3]*University of Saskatchewan, CANADA*

**W198.j** **FULLY-AUTOMATED ELECTROROTATION SYSTEM FOR ALIGNMENT-FREE CHARACTERIZATION OF CANCER CELLS**
Daisuke Sekiguchi, Yoshiyasu Ichikawa, Masahiro Motosuke
*Tokyo University of Science, JAPAN*

**W199.j** **LET IT SEDIMENT - A NOVEL MICROFLUIDIC SAMPLE PREPARATION STRATEGY FOR THE UNBIASED ANALYSIS OF SINGLE NUCLEATED CELLS FROM WHOLE BLOOD**
Samir Kadic[1], Michael Knapp[1], Jochen Hoffmann[1], Anne Serout[1], Steffen Strehle[2], Franz Lärmer[1]
[1]*Robert Bosch GmbH, GERMANY and*
[2]*Technische Universität Ilmenau, GERMANY*

**W200.j** **MICROPARTICLE ENABLED SINGLE CELL ELECTRONIC IMMUNOPHENOTYPING AND SELECTIVE ELECTROPORATION**
Madeline Hoyle, Josiah Rudge, Yuvraj Rallapalli, Aniruddh Sarkar
*Georgia Institute of Technology, USA*

**W201.j** **TWO-DIMENSIONAL FLOW CYTOMETRY DEVICE APPLIED FOR P16/KI 67 DUAL IMMUNOSTAINING CERVICAL CYTOLOGY**
Kunihiko Iizuka[1,2], Shogo Mikami[1], Teruo Fujii[1], Soo Hyeon Kim[1]
[1]*University of Tokyo, JAPAN and* [2]*Lab Arco Limited, JAPAN*

## Clinical Chemistry

**M201.j** **A PASSIVE FLOW MICROREACTOR FOR URINE CREATININE TEST**
Dumitru Tomsa[1], Yang Liu[1], Amanda Stefanson[1], Xiaoou Ren[1], AbdulRazaq A.H. Sokoro[1], Paul Komenda[1,3], Navdeep Tangri[1,3], René P. Zahedi[1,2], Claudio Rigatto[1,3], Francis Lin[1]
[1]*University of Manitoba, CANADA,* [2]*Manitoba Centre for Proteomics and Systems Biology, CANADA, and* [3]*Seven Oaks General Hospital, CANADA*

## Drug Screening and Development

**M202.j** **CONCENTRATION-BASED ANTICANCER DRUG SORTING FOR IN VITRO COMBINATORIAL EFFICACY TESTING AND PREDICTION USING MAGNETIC MICROFLUIDIC DEVICE**
Vinit K. Yadav, Preetha Ganguly, Prashant Mishra, Samaresh Das, Dhiman Mallick
*Indian Institute of Technology, Delhi, INDIA*

**M203.j** **MONITORING OF DRUG-IMFACTED CARDIOMYOCYTES CONTRACTILITY USING PI MICROCANTILEVER STRUCTURES WITH NANO-SILICON STRAIN SENSOR**
Haolan Sun, Longlong Li, Dong-weon Lee
*Chonnam National University, KOREA*

**T201.j** **A MICROFLUIDIC PLATFORM FOR EVALUATING THE INTERNALIZATION OF LIPOSOME DRUG CARRIERS IN TUMOR SPHEROIDS**
Ilya Yakavets[1], Monica Ayachit[1,2], Sina Kheiri[1], Zhengkun Chen[1], Faeze Rakhshani[1], Samantha McWhirter[1], Edmond W.K. Young[1], Gilbert C. Walker[1], Eugenia Kumacheva[1]
[1]*University of Toronto, CANADA and* [2]*Queen's University, CANADA*

**W202.j** **AUTONOMOUS MICROFLUIDIC DEVICE FOR THE NAKED-EYE DETECTION OF DIAZEPAM IN ADULTERATED BEVERAGES**
Isabel Poves-Ruiz[1], Enrique Azuaje-Hualde[1], Igor Corchado-Gonzalez[1], Lourdes Basabe-Desmonts[1,2], Fernando Benito-Lopez[1]
[1]*University of the Basque Country, SPAIN and* [2]*IKERBASQUE, SPAIN*

**W203.j** **HIGH-THROUGHPUT COMBINATORIAL SCREENING OF PHAGE-HOST INTERACTIONS**
Madhumitha Prakash, Gabriel Mercado-Vásquez, Jonathan Matthews, Mark Mimee, Savas Tay
*University of Chicago, USA*

## Exhalate and Air Sampling

**T203.j** **3D PRINTED MICROFLUIDIC CHANNEL IMPACTOR FOR EXHALED BIOAEROSOL CAPTURE**
Yonatan Morocz[1], Xavier Lefebvre[2], Justin De Vries[1], Etienne Robert[2], David Juncker[1]
[1]*McGill University, CANADA and* [2]*Polytechnique Montreal, CANADA*

**W204.j** **BIOAERIUM: AUTONOMOUS MICROFLUIDIC SENSOR FOR AIRBORNE VIRAL PATHOGEN DETECTION USING ISOTHERMAL NUCLEIC ACID AMPLIFICATION (LAMP)**
Nitin Jayakumar, Michael Caffrey, Igor Paprotny
*University of Illinois, Chicago, USA*

## Extracellular Vesicles and Nanoparticles

**M204.j** **AUTONOMOUS MICROFLUIDIC DEVICE FOR EXTRACELLULAR VESICLE EXTRACTION FROM WHOLE BLOOD**
Ellinor Hedberg[1], Carl Olsson[1], Mattias Hällbrink[2], André Görgens[2], Daniel Hagey[2], Niclas Roxhed[1]
[1]*KTH Royal Institute of Technology, SWEDEN and* [2]*Karolinska Institutet, SWEDEN*

**M205.j** **CONCURRENT DETECTION OF PROTEIN AND MIRNA AT THE SINGLE EXTRACELLULAR VESICLE LEVEL USING A DIGITAL DUAL CRISPR-CAS ASSAY**
Xun Xu, Yuanyue Zhang, Muxue Wang, Youchun Xu
*Tsinghua University, CHINA*

**M206.j** **HIGH-THROUGHPUT, MULTIPLEX, QUANTITATIVE ANALYSIS OF SINGLE-EV USING A HYDROGEL DROPLET BASED ROLLING CIRCLE AMPLIFICATION**
Juhwan Park[1,2], Michelle Feng[1], Jingbo Yang[1], Zhiyuan Qin[1], Hanfei Shen[1], Wei Guo[1], David Issadore[1]
[1]*University of Pennsylvania, USA and* [2]*Kookmin University, KOREA*

**M207.j** **OPTIMIZING EXTRACELLULAR VESICLE DELIVERY: ALGINATE ELECTROSPRAY AND ENZYMATIC CARGO RELEASE**
Reese Wunsche[1,2], Morteza Jeyhani[1], Boyang Su[2,3], Hon Leong[2,3], Scott Tsai[1]
[1]*Toronto Metropolitan University, CANADA,* [2]*Sunnybrook Research Institute, CANADA, and* [3]*University of Toronto, CANADA*

**M208.j** **STREAMLINED DIGITAL MICROFLUIDIC-MASS SPECTROMETRY FOR RAPID EXOSOME ENRICHMENT AND LIPIDS PROFILING**
Yudan Ma, Menglei Zhao, Fenggang Li, Boyu Li, Rongxin Fu, Yao Lu, Hang Li, Shuailong Zhang
*Beijing Institute of Technology, CHINA*

**M209.j** **UNIVERSAL DESIGN OF A MACROPOROUS MATERIAL FOR THE EFFECTIVE SEPARATING EXTRACELLULAR VESICLES, VIRUSES, AND CELLS**
Takuya Kubo[1], Sayaka Konishi-Yamada[1], Eisuke Kanao[2], Tetsuya Tanigawa[1,2], Noritada Kaji[3]
[1]*Kyoto Prefectural University, JAPAN,* [2]*Kyoto University, JAPAN, and* [3]*Kyushu University, JAPAN*

**T204.j** **APPLICATION OF HYALURONIC ACID-BASED NANOPARTICLE VIA SIMPLE MICROFLUIDICS ASSISTED NANOPRECIPITATION FOR TRANSDERMAL DELIVERY**
JungEun Lee, EunSol Choi, HyungJin Bae, JinMo Kim, SangKeun Han
*Kolmar Korea, KOREA*

**T205.j** **ELECTROCHEMICAL IMPEDANCE PROFILING FOR THE RAPID AND SENSITIVE ANALYSIS OF TUMOR-DERIVED EXOSOMES**
Youngeun Choi, Jonathan L'Heureux-Haché, Payel Sen, Leyla Soleymani
*McMaster University, CANADA*

**T206.j** **NANOFLUIDIC APPROACHES FOR SIZE-BASED SEPARATION TO EXPLORE EXOSOME DIVERSITY**
Sayano Arii[1], Daigo Tamaoki[1], Koichiro Hirosawa[2], Kenichi Suzuki[2], Nattapong Chantipmanee[1], Yan Xu[1,3]
[1] *Osaka Metropolitan University, JAPAN,* [2] *Gifu University, JAPAN, and* [3] *Japan Science and Technology Agency, JAPAN*

**T207.j** **PROFILING DNA CARGOS IN SINGLE EXTRACELLULAR VESICLES VIA HYDROGEL-BASED DROPLET DIGITAL MULTIPLE DISPLACEMENT AMPLIFICATION**
Yufeng Jiao[1], Liyang Gao[1], Ziyi He[2], Siyang Zheng[3], Wu Liu[1]
[1] *Shandong University, CHINA,* [2] *Huazhong Agricultural University, CHINA, and* [3] *Carnegie Mellon University, USA*

**T208.j** **SUPER ABSORBENT POLYMER BEAD-BASED EXTRACELLULAR VESICLE ENRICHMENT AND CAPTURE FOR EFFICIENT BIOMARKER DETECTION**
Won Jong Rhee, Yubin Kang, Soobin Lee
*Incheon National University, KOREA*

**W205.j** **AN ULTRAHIGH-THROUGHPUT NANOFLUIDIC DEVICE FOR MECHANOPORTION OF SMALL EXTRACELLULAR VESICLES**
Rui Hao[1], Shi Hu[1], Sihui Chen[2], Huitao Zhang[1], Wenhao Jiang[2], Lianyu Lu[1], Xiaotian Tan[1], Yi Zhang[1], Hui Yang[1]
[1] *Chinese Academy of Sciences, CHINA and* [2] *SomesTech Co., Ltd., CHINA*

**W206.j** **FLUID DEVICE FOR SIZE FRACTIONATION OF EXTRACELLULAR VESICLES**
Satoshi Sueyasu, Koki Sato, Yuto Matunaga, Yuka Nozaki, Masahiro Motosuke, Masakazu Umezawa
*Tokyo University of Science, JAPAN*

**W207.j** **ONE-STEP PRE-PROCESSING OF COMPLEX BIOLOGICAL SAMPLES USING HIGH-ASPECT RATIO SPIRAL (HARS) MICROFLUIDIC DEVICE FOR ENRICHMENT OF EXTRACELLULAR VESICLES**
Sourav Acharya, Ashwin A, Haimanti Mukherjee, Sayani Das, Sandip Kaledhonkar, Prakriti Tayalia, Debjani Paul
*Indian Institute of Technology, Bombay, INDIA*

**W208.j** **SINGLE PARTICLE ANALYSIS OF EXTRACELLULAR VESICLES FOR DETECTION OF MICROINFLAMMATION**
Shota Kawaguchi[1], Taiga Ajiri[1], Yukiko Kamiya[2], Masatoshi Maeki[3], Manabu Tokeshi[3], Hirotaka Koga[4], Masaaki Murakami[3], Takao Yasui[1]
[1] *Tokyo Institute of Technology, JAPAN,* [2] *Kobe Pharmaceutical University, JAPAN,* [3] *Hokkaido University, JAPAN, and* [4] *Osaka University, JAPAN*

**W209.j** **TRACER-LABELED EXTRACELLULAR VESICLES FOR CONFIRMING EXTRACELLULAR VESICLES FILTRATION IN GLOMERULUS**
Taiga Ajiri[1], Shota Kawaguchi[1], Rina Mitsuya[2], Atsuhi Natsume[2], Ryosuke Kojima[2], Kiichi Sato[3], Takao Yasui[1]
[1] *Tokyo Institute of Technology, JAPAN,* [2] *Nagoya University, JAPAN, and* [3] *Gunma University, JAPAN*

## Liquid Biopsy and Tissue Biopsy

**M210.j** **DEVELOPMENT OF A MICRO-FABRICATED FILTER BASED CIRCULATING FILTRATION SYSTEM FOR MEASURING DEPLETION KINETICS OF CIRCULATING TUMOR CELLS (CTCS)**
Yi Zhang[1], Songtao Dou[1], Qingmei Xu[1], Shitao Shen[1], Qi Wang[2], Wei Wang[1,3,4]
[1] *Peking University, CHINA,* [2] *Second Affiliated Hospital of Dalian Medical University, CHINA,* [3] *National Key Laboratory of Advanced Micro and Nano Manufacture Technology, CHINA, and* [4] *Beijing Advanced Innovation Center for Integrated Circuits, CHINA*

**M211.j** **MICROFILTER DEVICE FOR CANCER CELL DETECTION FROM PATIENT'S WHOLE BLOOD AND CONTENTIOUS CANCER MONITORING**
Yuta Nakashima[1], Suzuka Ishikawa[1], Aoi Ogata[1], Yoichi Saito[1], Seitaro Kumamoto[2], Keiichiro Yasuda[2], Yusuke Kitamura[1], Masaaki Iwatsuki[1], Hideo Baba[1], Toshihiro Ihara[1], Yoshitaka Nakanishi[1]
[1] *Kumamoto University, JAPAN and*
[2] *Ogic Technologies Co., Ltd., JAPAN*

**M212.j** **OPTIMIZATION OF A MICROFLUIDIC SYSTEM FOR AUTOMATED DETECTION OF CHOLANGIOCARCINOMA CELLS IN BILE FOR PROGNOSIS AND EARLY DIAGNOSIS**
Yu-Ting Su[1], Yi-Cheng Tsai[1], Chien-Jui Huang[2], Nai-Jung Chiang[3,4], Anandaraju Bandaru[5], Shang-Cheng Hung[5], Yan-Shen Shan[2], Gwo-Bin Lee[1]
[1] *University of Tsing Hua, TAIWAN,* [2] *University of Cheng Kung, TAIWAN,* [3] *Taipei Veterans General Hospital, TAIWAN,* [4] *National Health Research Institutes, TAIWAN, and* [5] *Academia Sinica, TAIWAN*

**M310.j** **ADVANCING KS-DETECT: IMPLEMENTING SLICER AND RAPID DNA EXTRACTION FOR KAPOSI'S SARCOMA DIAGNOSIS AT THE POINT OF CARE**
Jason Manning[1], Juan Boza[1], Aggrey Semeere[2], Ethel Cesarman[3], Jeffrey Martin[4], David Erickson[1]
[1] *Cornell University, USA,* [2] *Infectious Diseases Institute, UGANDA,* [3] *Weill Cornell Medical College, USA, and* [4] *University of California, San Francisco, USA*

**T210.j** **FLAME-MELT: A DIGITAL MELTING PLATFORM FOR QUANTITATIVE MULTIPLEX PROFILING OF DNA METHYLATION BIOMARKERS**
Yang Zhao, Weiwen Cui, Thomas R. Pisanic, Tza-Huei Wang
*Johns Hopkins University, USA*

**T211.j** **MICROFLUIDIC STRATEGY FOR SCREENING NK-CELL CYTOTOXICITY AGAINST CIRCULATING TUMOR CELL CLUSTERS**
Junhyun Park[1], Jaejeung Kim[1], Minjung Yoon[1], Hyo-Il Jung[1], Kyung-A Hyun[2]
[1] *Yonsei University, KOREA and*
[2] *Korea Electronics Technology Institute, KOREA*

**T212.j** **PROBE-FREE SINGLE EXTRACELLULAR VESICLE SERS LANDSCAPES FOR MOLECULAR PROFILING OF THERAPY RESISTANCE IN GLIOBLASTOMA**
Mahsa Jalali[1], Laura Montermini[1], Yao Lu[1], Brian Meehan[1], Nadim Tawil[1], Carolina Del real Mata[2], Sara Mahshid[2], Janusz Rak[1]
[1]*McGill University Health Center, CANADA and* [2]*McGill University, CANADA*

**W211.j** **HIGHLY EFFICIENT ISOLATION AND MULTISTEP ANALYSIS OF TUMOR CELLS FROM WHOLE BLOOD**
Michael Knapp[1,2], Samir Kadić[2], Nils Paust[1,3], Jochen Hoffmann[2], Roland Zengerle[1,3]
[1]*University of Freiburg, GERMANY,* [2]*Robert Bosch GmbH, GERMANY, and* [3]*Hahn-Schickard, GERMANY*

**W212.j** **NOVEL CANCER MARKER-INDEPENDENT ENRICHMENT AND CAPTURE MICROFLUIDIC SYSTEMS TO ANALYZE THE HETEROGENEITY OF CIRCULATING TUMOR CELLS**
Yoshinobu Sugitani[1], Kazunori Nagasaka[2], Yuko Miyagawa[2], Kazuki Takasaki[2], Teruo Fujii[1], Soo Hyeon Kim[1]
[1]*University of Tokyo, JAPAN and* [2]*Teikyo University, JAPAN*

## Nucleic-Acid Analysis and Genomics

**M213.j** **A FULLY INTEGRATED MICROFLUIDIC CARTRIDGE WITH FUNCTIONALIZED HYDROGEL-ASSISTED LAMP FOR COMPLETE SAMPLE-TO-ANSWER NUCLEIC ACID ANALYSIS**
Natish Kumar, Monika Kumari
*Indian Institute of Technology, Jammu, INDIA*

**M214.j** **AN INTEGRATED PLATFORM FOR DIGITAL DROPLET ASSAYS TOWARDS CRISPR/CAS12A-ASSISTED METHYLATION QUANTIFICATION**
Jasper Rietveld, Jeanne E. van Dongen, Loes I. Segerink
*University of Twente, NETHERLANDS*

**M215.j** **FLUIDICS-FREE GEL-GRID DIGITAL PCR**
Bhargav Krishna Pullagura[1], Sophia Ahktar[1], Sofonias N. Kedir[1], Abdi M. Kaba[1], Nhung Tran[2], Seunghyun Shin[2], Minsub Chung[2], Dohyun Kim[1]
[1]*Myongji University, KOREA and* [2]*Hongik University, KOREA*

**M216.j** **ISOTHERMAL MICROFLUIDIC PCR ENABLES ACCELERATED PATHOGEN DETECTION AND DIAGNOSTICS**
MinGin Kim, Vijay Ravisankar, Yassin A. Hassan, Victor M. Ugaz
*Texas A&M University, USA*

**M217.j** **SELF-INTERFERENCE DIGITAL OPTOFLUIDIC GENOTYPING FOR INTEGRATED AND LABEL-FREE BACTERIA DETECTION**
Tianqi Zhou[1], Fan Yang[1], Hang Li[1], Huikai Xie[1], Guoliang Huang[2], Rongxin Fu[1], Shuailong Zhang[1]
[1]*Beijing Institute of Technology, CHINA and* [2]*Tsinghua University, CHINA*

**M218.j** **ULTRAFAST PHOTOTHERMAL DROPLET PCR BASED ON ACTIVE PLASMONIC FLUOROSURFACTANT**
Chit Yau Kuan, Chun Lung Ho, Guangyao Cheng, Yi-Ping Ho
*Chinese University of Hong Kong, HONG KONG*

**T213.j** **A WIDE DYNAMIC RANGE MULTIPLEX DIGITAL CRISPR CHIP FOR RAPID DETECTION AND ABSOLUTE QUANTIFICATION OF NUCLEIC ACIDS**
Liping Xia, Yu Wang, Yehong Gui, Weihong Yin, Qiangyuan Zhu, Tao Zhang, Wei Jin, Ying Mu
*Zhejiang University, CHINA*

**T215.j** **FULLY AUTOMATED, SAMPLE-TO-ANSWER DETECTION OF MIRNA DIRECTLY FROM WHOLE BLOOD WITH THERMALLY RESPONSIVE ALKANE PARTITIONS AND LIGATION LOOP-MEDIATED ISOTHERMAL AMPLIFICATION**
Evan H. Benke, Alejandra Bogusch, David Boegner, Ian M. White
*University of Maryland, USA*

**T216.j** **PLASMONICALLY ENHANCED ISOTHERMAL NUCLEIC ACID ASSAYS FOR PATHOGENIC BACTERIA IDENTIFICATION**
Tamer AbdElFatah[1], Mahsa Jalali[1,2], Sripdah Guptha Yedire[1], Imman I. Hosseini[1], Carolina del Real Mata[1], Haleema Khan[1], Seyed Vahid Hamidi[1], Roozbeh Siavash Moakhar[1], Geoffrey Mckay[2], Dao Nguyen[1,2], Sara Mahshid[1]
[1]*McGill University, CANADA and* [2]*McGill University Health Centre, CANADA*

**T217.j** **SENSITIVE MULTIPLEXED MICRORNA SPATIAL PROFILING AND DATA CLASSIFICATION FRAMEWORK FOR ASSESSING DRUG EFFICACY IN MURINE BREAST TUMORS**
Omar N. Mohd[1], Yu J. Heng[2], Lin Wang[2], Abhishek Thavamani[2], Erica S. Massicott[2], Gerburg M. Wulf[2], Frank J. Slack[2], Patrick S. Doyle[1]
[1]*Massachusetts Institute of Technology, USA and* [2]*Harvard Medical School, USA*

**W214.j** **AN ELECTROMAGNETICALLY-DRIVEN PORTABLE MICROFLUIDIC SYSTEM FOR MULTIPLEX QRT-PCR DIAGNOSIS OF SARS-COV-2 AND INFLUENZA A/B VIRUSES**
Ko-Hua Lin[1], Chih-Hung Wang[1], Ying-Jun Lin[2], Wen-Yen Huang[2], Yan-Shen Shan[2], Huey-Pin Tsai[2], Gwo-Bin Lee[1]
[1]*University of Tsing Hua, TAIWAN and* [2]*University of Cheng Kung, TAIWAN*

**W215.j** **ELECTROCHEMICAL LIQUID-INFUSED BIOSENSORS WITH NANO-STRUCTURED FEATURES FOR DETECTING BACTERIA IN COMPLEX MATRICES**
Sara Moetakef Imani[1], Enas Osman[1], Fatemeh Bakhshandeh[1], Shuwen Qian[1], Sadman Sakib[1], Michael MacDonald[1], Mark Gaskin[2], Igor Zhitomirsky[1], Deborah Yamamura[2], Yingfu Li[1], Tohid Didar[1], Leyla Soleymani[1]
[1]*McMaster University, CANADA and* [2]*Hamilton General Hospital, CANADA*

**W216.j** **HIGHLY MULTIPLEXED DCAS9-MEDIATED NANOELECTROKINETIC DETECTION OF MUTATED DNA**
Taewan Kim[1], Sungjae Ha[2], Taehyun Kim[1], Sang Woo Seo[1], Sung Jae Kim[1]
[1]*Seoul National University, KOREA and* [2]*ProvaLabs, Inc., KOREA*

**W217.j** **QUANTITATIVE AND SPATIALLY RESOLVED DETECTION OF MULTIPLEXED MICRORNA FROM PLANT TISSUE USING NANOLITER WELL ARRAYS**
Jennifer Fang, Patrick S. Doyle
*Massachusetts Institute of Technology, USA*

**W218.j** **TOWARDS AUTONOMOUS MEASUREMENT OF ANTIRETROVIRAL DRUGS WITH 3D-PRINTED MICROFLUIDICS**
Carrie H. Lin, Cosette Craig, Kelsey M. Leong, Megan M. Chang, Ayokunle O. Olanrewaju
*University of Washington, USA*

## Protein Analysis and Proteomics

**M219.j** **A SPECTROFLUIDIC DEVICE FOR CHARACTERIZING ENZYME KINETICS: APPLICATION PLASTIC DEPOLYMERIZATION**
Laurent Gosselin, Nan Jia, Charles Larouche, Jérémie Labelle, Bianka Huot, Jordan Zounmenou, André Bégin-Drolet, Jesse Greener
*Université Laval, CANADA*

**M220.j** **MICROSECOND H/D EXCHANGE VIA AN INTEGRATED MICROFLUIDIC ESI-MS SILICON DEVICE**
Neha Srikumar[1], Benjamin A. Garcia[2], David A. Issadore[1]
[1]*University of Pennsylvania, USA and* [2]*Washington University, USA*

**M221.j** **RAPID, ELECTRONIC, ACCESSIBLE DETECTION OF SARS-COV-2**
Yeji Choi, Seyedsina Mirjalili, MD Ashif Ikbal, Sean McClure, Chao Wang
*Arizona State University, USA*

**T218.j** **A CLEAN-UP-BASED MICROFLUIDIC SAMPLE PREPARATION WORKFLOW FOR LOW-INPUT PROTEOMICS**
Aurélie Mohrbacher[1], Gemma Jacobs[1], Jolien Breukers[1], Iene Rutten[1], An Staes[2], Marcel Bühler[2], Francis Impens[2], Kris Gevaert[2], Jeroen Lammertyn[1]
[1]*KU Leuven, BELGIUM and* [2]*Ghent University, BELGIUM*

**T219.j** **AM-DMF-SCP: INTEGRATED SINGLE-CELL PROTEOMICS ANALYSIS ON AN ACTIVE-MATRIX DIGITAL MICROFLUIDIC CHIP**
Kai Jin[1], Zhicheng Yang[1], Maolin Zhang[1,2], Siyi Hu[1], Hu Zhou[1], Hanbin Ma[1,2]
[1]*Chinese Academy of Sciences, CHINA and*
[2]*University of Science and Technology of China, CHINA*

**T220.j** **MICROFLUIDIC STRESS DEVICE TO DECOUPLE THE SYNERGISTIC EFFECT OF SHEAR AND INTERFACES ON ANTIBODY AGGREGATION**
Michael Gerlt[1], Eduard Meier[1], Fabian Dingfelder[2], Dominik Zürcher[1], Marius Müller[2], Paolo Arosio[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*Janssen-Cilag AG, SWITZERLAND*

**W220.j** **HIGHLY SENSITIVE, MULTIPLEXED, AND ACCESSIBLE DIGITAL PROTEIN MEASUREMENT WITH MAGDROPLEX**
Jiumei Hu
*Johns Hopkins University, USA*

**W221.j** **PAT-ON-A-CHIP: MINIATURIZATION OF ANALYTICAL ASSAYS TOWARDS DATA-DRIVEN BIOPROCESS DEVELOPMENT AND OPTIMIZATION**
Inês F. Pinto[1], Fabien Abeille[2], Sebastian Giehring[3], David Sergeant[4], Veronique Chotteau[1], Aman Russom[1]
[1]*KTH Royal Institute of Technology, SWEDEN,* [2]*Micronit, NETHERLANDS,* [3]*PAIA Biotech, GERMANY, and* [4]*Ipratech, BELGIUM*

## Sample Preparation and Preservation

**M222.j** **A POINT-OF-CARE MICROFLUIDIC METHOD FOR LYSIS OF HIV AND PURIFICATION OF HIV RNA FROM SERUM**
Erin K. Heiniger, Kevin P. Jiang, Sujatha Kumar, Paul Yager
*University of Washington, USA*

**M224.j** **EVALUATION OF ERYTHROCYTES AND MUCUS REDUCTION METHODS IN PAP SAMPLES FOR AUTOMATED CERVICAL CANCER SCREENING WITH HIGH-THROUGHPUT IMAGING FLOW CYTOMETRY PLATFORM CELLFACE**
Ellen Emken, Julia Sistermanns, Christian Klenk, Marion Kiechle, Wolfgang Utschick, Gregor Weirich, Oliver Hayden
*Technical University of Munich, GERMANY*

**M225.j** **OPEN-CHANNEL DROPLET MICROFLUIDIC PLATFORM FOR PASSIVE GENERATION OF HUMAN SPERM MICRODROPLETS**
Jodie C. Tokihiro, Wan-chen Tu, Jian Wei Khor, Ulri N. Lee, Erwin Berthier, John K. Amory, Thomas J. Walsh, Charles H. Muller, Ashleigh B. Theberge, Tristan M. Nicholson
*University of Washington, USA*

**T221.j** **A COST-EFFECTIVE PAPER-DEVICE FOR FILTRATION, CONCENTRATION AND EXTRACTION OF ENVIRONMENTAL DNA (EDNA)**
Chau H. Pham[1], Birgitte K. Hønsvall[2], Erik A. Johannessen[1], Bao Q. Ta[1]
[1] *University of Southeastern, NORWAY and*
[2] *Zimmer & Peacock AS, NORWAY*

**T222.j** **A SIMPLE METHOD FOR THE LIBERATION OF MICRO-ORGANIC AND MICROBIOLOGICAL ENTITIES FROM SUBSTRATES USING A WATER-SOLUBLE RELEASE LAYER**
Juan Pablo Agusil[1], Marta Duch[1], Pau Mercier[1], Adrian Rodríguez-Lau[1], Lara Cantarero[2], Mònica Roldán[2,3], José A. Plaza[1]
[1] *Instituto de Microelectrónica de Barcelona (IMB-CNM (CSIC)), SPAIN,* [2] *Sant Joan De Déu Institut De Recerca, SPAIN, and*
[3] *Centro de Investigación Biomédica en Red de Enfermedades Raras (CIBERER), SPAIN*

**T223.j** **EASYBAT: A SAMPLE PREPARATION-TO-ANALYSIS WORKFLOW FOR SIMPLIFYING THE BASOPHIL ACTIVATION TEST FOR FOOD ALLERGY ASSESSMENT**
Nicolas Castano, An Nguyen, Kaiser Chua, Mindy Tsai, Manisha Desai, Sayantani B. Sindher, R. Sharon Chinthrajah, Stephen J. Galli, Sindy K.Y. Tang
*Stanford University, USA*

**T224.j** **HOMERNA+ AND HOMERNAMINI: DEVELOPMENT OF A NEW GENERATION OF TOOLS TO STABILIZE RNA IN BLOOD COLLECTED IN REMOTE STUDIES**
Madeleine P. Eakman[1], Filip Stefanovic[1], Liam Knudsen[1], Ingrid Jeacopello[1], Jean Berthier[1], Cosette Craig[1], Kelsey M. Leong[1], Karen N. Adams[1], Ayokunle O. Olanrewaju[1], Sanitta Thongpang[1,2], Tristan Nicholson[1], Erwin Berthier[1], Amanda J. Haack[1], Ashleigh B. Theberge[1]
[1] *University of Washington, USA and* [2] *Mahidol University, THAILAND*

**W222.j** **A MICROFLUIDIC DEVICE FOR RAPID ASSEMBLY OF LAYERED FILMS FOR CELL COATING**
So-Yeon Jung, Chang-Soo Lee
*Chungnam National University, KOREA*

**W223.j** **AUTOMATED PLATFORM FOR THE SAMPLE PREPARATION OF SEQUENCING: FROM SAMPLE TO LIBRARY PREPARATION**
Mélissa Baque, Nicolas Sarrut-Rio, yVES Fouillet, François Boizot, Mahfod Benessalah, Jean-Maxime Roux
*University Grenoble, Alpes, FRANCE*

**W224.j** **ENHANCING TIME-RESOLVED CRYO-EM SAMPLE PREPARATION WITH PARYLENE-BASED THIN-FILM MICROFLUIDICS**
Haerang Hwang[1], Bum-joon Jung[2], Jiho Park[1], Yujin Jung[1], Yo-han Choi[1], Jin Young Kang[1], Wonhee Lee[1]
[1]*Korea Advanced Institute of Science & Technology (KAIST), KOREA and* [2]*University of Chicago, USA*

**W225.j** **ON-CHIP DIELECTROPHRETIC ENRICHMENT AND MALDI-TOF MS IDENTIFICATION OF PATHOGENS FOR BLOODSTREAM INFECTIONS**
Xiaolin Wu[1], Xin Cheng[2], Shuilong Guo[2], Wenbin Du[1]
[1]*Chinese Academy of Sciences, CHINA and*
[2]*Beijing Friendship Hospital, Capital Medical University, CHINA*

## Tissue Analysis (Including Spatial Omics)

**M226.j** **WHOLE TRANSCRIPTOME SPATIAL GENE EXPRESSION WITH SINGLE CELL SCALE RESOLUTION IN FORMALIN-FIXED, PARAFFIN-EMBEDDED (FFPE) TISSUES USING VISIUM HD**
Zixue Ma, Jerald Sapida, Monica Nagendran, David Sukovich, Naishitha Anaparathy, Joey Arthur, David Patterson, Augusto M. Tentori
*10x Genomics, USA*

**T225.j** **HIGH-RESOLUTION AND HIGH-SENSITIVITY MASS SPECTROMETRY IMAGING SYSTEM BY PICOLITER DROPLET ELECTROSPRAY IONIZATION**
Peng Zhao, Jinlei Yang, Xinrong Zhang, Sichun Zhang, Wenhui Wang
*Tsinghua University, CHINA*

**W226.j** **TAGNBAG: SPATIAL DNA BARCODING ASSISTED BY MICROFLUIDICS FOR QUANTIFICATION OF TUMOR HETEROGENEITY**
Ruth Yu[1,2], Aditya Kashyap[1,2], Govind V. Kaigala[1,2]
[1]*University of British Columbia, CANADA and*
[2]*Vancouver Prostate Centre, CANADA*

## μTAS and Lab-on-a-Chip

**M227.j** **A MICRO AND NANOFLUIDIC LAB ON A CHIP SYSTEM FOR DNA EXTRACTION AND ANALYSIS**
Franziska M. Esmek, Louise Von Lacroix, Phil Grzybeck, Irene Fernández-Cuesta
*University of Hamburg, GERMANY*

**M228.j** **ACTIVE-MATRIX CONTROL OF HIGHLY MULTIPLEXED MICROFLUIDIC CONDITIONS**
Navid Ghorashian[1], Ziqi Jiao[1], Gengjie Jia[1], Heidi Klumpe[2], Andrey Rzhetsky[1], Michael Elowitz[2], Savas Tay[1]
[1]*University of Chicago, USA and* [2]*California Institute of Technology, USA*

**M229.j** **BIOMOLECULAR TRAPPING AND COUNTING TO DEPLETION: QUANTIFICATION OF SAMPLE CONCENTRATION WITH A MICROFLUIDIC-ASSISTED NANOPORE SENSOR**
Morteza Safari, Juliana Chawich, Ali Najafi Sohi, Martin Charron, Vincent Tabard-Cossa, Michel Godin
*University of Ottawa, CANADA*

**M230.j** **CONSTRUCTING AN EX-VIVO HUMAN OLFACTORY SYSTEM ON A CHIP**
Mahmoud A. Sakr, Tahmid Hussain, Maggie Li, Aaron Au, Aaron R. Wheeler, Michael Garton
*University of Toronto, CANADA*

**M231.j** **DYNAMICALLY MODULATED CORE-SHELL DROPLETS TO STUDY THE EFFECT OF MECHANICAL PROPERTIES ON STEM CELL FATE**
Shuai Bu
*University of Glasgow, UK*

**M232.j** **HEXAGONAL MICROFLUIDIC MIXING PROBE FOR FLOW CONCENTRATION GRADIENTS ON SUSPENDED CELLS**
Dima S. Ali[1,2], Ayoub Glia[1], Waqas Waheed[1], Pavithra Sukumar[1], Mohammad A. Qasaimeh[1,2]
[1] *New York University, Abu Dhabi, UAE and* [2] *New York University, USA*

**M233.j** **INNOVATIVE DETECTION OF BIOLOGICAL TARGETS USING A GMR SENSOR-BASED BIOCHIP PROTOTYPE FOR FUTURE EARLY DIAGNOSIS**
Agathe Trillat[1], Maïkane Deroo[1], Manon Giraud[1], Elodie Fabre-Paul[1], Aurélie Solignac[1], Pierre Bonville[1], Frédéric Coneggo[1], Amine Afroun[1], Stéphanie Simon[1], Florence Doucet-Populaire[2], Cécile Feraudet-Tarisse[1], Guenaelle Jasmin-Lebras[1]
[1] *CEA Saclay, FRANCE and* [2] *I2BC, FRANCE*

**M234.j** **ION SENSING IN DIGITAL MICROFLUIDICS FOR CELL MICROENVIRONMENT MONITORING**
Mohammad Khorsand Ahmadi[1,2,3]
[1] *Eindhoven University of Technology, NETHERLANDS,* [2] *Institute for Complex Molecular Systems (ICMS), NETHERLANDS, and* [3] *Max Planck Institute for Polymer Research, GERMANY*

**M235.j** **LUNG TUMOR MICROENVIRONMENT LAB CHIP FOR IMMUNOTHERAPY DRUGS AND IMMUNE-CELL MIGRATION ANALYSIS**
Xiao-Han Wang[1], Sin-Huei Wang[1], Kang-Yun Lee[2], Wei-Lun Sun[3], Cheng-Hsien Liu[1]
[1] *National Tsing Hua University, TAIWAN,* [2] *Taipei Medical University, TAIWAN, and* [3] *Pythia Biotech Ltd., TAIWAN*

**M236.j** **MICROFLUIDIC MULTI-FACETED BLADDER TUMOR MODEL FOR BIOFILM POTENTIATES CANCER-PROMOTING EFFECTS**
Mingze Zhu[1,2], Yanlin Deng[1], Bee Luan Khoo[1,2]
[1] *City University of Hong Kong, HONG KONG and* [2] *Hong Kong Centre for Cerebro-Cardiovascular Health Engineering, HONG KONG*

**M237.j** **ONE-STEP MULTI-MARKER IMMUNOASSAY SYSTEM FOR PRETERM BIRTH RISK DETECTION IN VAGINAL SECRETIONS**
Micaela S. Cristofori, Gloria Porro, Pierre-Emmanuel Thiriet, Carlotta Guiducci
*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

**M238.j** **PHOTOMASK-FREE DIGITAL PHOTOPATTERNING OF HYDROGELS IN SELF-ASSEMBLED CELL ARRAY (SACA) CHIPS FOR HIGH-THROUGHPUT CELLS SORTING**
Hsin-Ling Lee[1], Ren-Qui Wu[2], Fan-Gang Tseng[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*CellEnvision Company Limited, TAIWAN*

**M239.j** **RAPID LAMP-BASED COLORIMETRIC MRSA DETECTION USING A MICROFLUIDIC SYSTEM INTEGRATED WITH ACCELERATED ELECTROPHORETIC NUCLEIC ACIDS PURIFICATION**
Yung Ching Lee, Yang Bu, Sheng Ni, Yuze Liu, Anni Hu, Levent Yobas
*Hong Kong University of Science and Technology, HONG KONG*

**M241.j** **UBINAAT: MULTIPLEXED, DISEASE-AGNOSTIC NUCLEIC ACID DIAGNOSTIC TOOL FOR POINT-OF-CARE SIMULTANEOUS CLINICAL PATHOGEN DETECTION**
Kevin P. Jiang, Erin K. Heiniger, Steven Bennett, Sujatha Kumar, Paul Yager
*University of Washington, USA*

**T226.j** **3D-PRINTED LAB-ON-A-CHIP FOR AUTOMATED INSULIN MONITORING BY SCREEN-PRINTED ELECTRODE SENSORS**
Steffen Winkler[1], Natalie Plewka[1], Tanja Zidarič[2], Boštjan Vihar[2], Tina Maver[2], Uroš Maver[2], Janina Bahnemann[1]
[1]*University of Ausgburg, GERMANY and*
[2]*University of Maribor, SLOVENIA*

**T228.j** **AN INTERGATED PLATFORM ENABLING ISOLATING AND ELECTROPORATION TRANSFECTING OF CIRCULATING TUMOR CELLS HIGH EFFICIENTLY**
Songtao Dou[1], Qingmei Xu[1], Shitao Shen[1], Qi Wang[2], Yi Zhang[1], Wei Wang[1,3,4]
[1]*Peking University, CHINA,* [2]*Second Affiliated Hospital of Dalian Medical University, CHINA,* [3]*National Key Laboratory of Advanced Micro and Nano Manufacture Technology, CHINA, and* [4]*Beijing Advanced Innovation Center for Integrated Circuits, CHINA*

**T229.j** **CHICK EMBRYO SEXING 'SIMPLE-FIED' WITH A SAMPLE-IN-RESULT-OUT RPA LAB ON-A-CHIP PLATFORM**
Simão M.B. Santos, Dries Vloemans, Celine Wegsteen, Dragana Spasic, Jeroen Lammertyn
*KU Leuven, BELGIUM*

**T230.j** **CTC/CTM/EMT BASED COLORECTAL CANCER PROGNOSIS ON AN AUTOMATIC HIGH-DENSITY SELF-ASSEMBLE CELL ARRAY (HD-SACA) CHIP SYSTEM**
Fan-gang Tseng, Xin-Zhi Lee, Huan-Wei Liao, Hsiang-Wei Liu, Yun-Jie Hao, Hsin-Yu Yang, Ren-Qui Wu, Fan-gang Tseng
*National Tsing Hua University, TAIWAN*

**T231.j** **ECONOMICAL POINT-OF-CARE DEVICE FOR ELECTRICAL DETECTION OF A LARGE NUMBER OF BIOMARKERS FROM PLASMA**
Chih-Lin Chen, Thomas W. Cowell, Aaron Jankelow, Mohammadreza Ghaderinia, Enrique Valera, Rashid Bashir, Hee-Sun Han
*University of Illinois, Urbana-Champaign, USA*

**T232.j** **HIGH-THROUGHPUT 3D MICROFLUIDIC SKIN-ON-A-CHIP PLATFORM FOR COSMETIC COMPOUNDS TESTING**
Sunbeen Choi[1], Stephen Rhee[1], Sofia Madrigal Gamboa[1], Jungeun Lim[1,2], Mikang Shim[1], Noo Li Jeon[1]
[1]*Seoul National University, KOREA and*
[2]*Georgia Institute of Technology, USA*

**T233.j** **INTEGRATED MICROFLUIDIC DEVICE FOR BACTERIAL DNA PURIFICATION AND AMR GENES DETECTION**
Adrián Sánchez-Visedo[1], Ana Costa-Ribeiro[1], Sofia Araújo[1], Rui Campos[1], Andrey Ipatov[1], Marta Prado[2]
[1]*International Iberian Nanotechnology Laboratory, PORTUGAL and*
[2]*University of Santiago, SPAIN*

**T234.j** **LAB-ON-A-PARTICLE APPROACH FOR MULTIPLEXED IMMUNOASSAYS USING A TRYAMIDE-BASED DROPLET-FREE SIGNAL AMPLIFICATION STRATEGY**
Alyssa Arnheim, Alice Matsuda, Andrew Tran, Boyi Wang, Dino Di Carlo
*University of California, Los Angeles, USA*

**T235.j** **MECHANOPORATION OF HUMAN T-LYMPHOCYTES USING MICROFLUIDIC CONFINING CHANNEL ARRAY**
Yi Liu[1], Raymond Hiu Wai Lam[2], Mo Yang[1]
[1]*Hong Kong Polytechnic University, HONG KONG and*
[2]*City University of Hong Kong, HONG KONG*

**T236.j** **MULTIPLEXED COLORIMETRIC TEST ON A LENSLESS CMOS IMAGE SENSOR**
Xinyue Hu, Laura C. Penuela Cardenas, Young C. Han, Nassib Hassouna, Lan Anh Huynh, Mary Wang, Emma Wong, Sebastian Wachsmann-Hogiu
*McGill University, CANADA*

**T237.j** **OPTIMIZATION OF THE BIORECOGNITION SURFACE OF GRAPHENE FIELD-EFFECT SENSORS FOR THE DETECTION OF BIOMARKERS**
Madline Sauvage[1], Amira Bencherif[1], Charlotte Allard[2], Claudia M. Bazàn[1], Richard Martel[2], Delphine Bouilly[1]
[1]*Université de Montréal, CANADA and* [2]*Polytechnique Montréal, CANADA*

**T238.j** **PRECLINICAL TESTING OF HEMOSTATIC BIOMATERIALS USING A NOVEL MICROFLUIDIC PLATFORM**
Alireza Zabihihesari, Sajjad Fanaee, Mark Filiaggi, Vahid Adibnia
*Dalhousie University, CANADA*

**T239.j** **RAPID, CAPILARY-DRIVEN IMMUNOASSAYS FOR STI DETECTION**
Elijah J.O. Barstis, Joowon Park, Jonah Rodasta, Brian Geiss, David Dandy, Charles Henry
*Colorado State University, USA*

**T240.j** **SINGLE FETAL NUCLEATED RED BLOOD CELL (FNRBC) ISOLATION BY HIGH-DENSITY SELF-ASSEMBLED CELLS ARRAY CHIP SYSTEM FOR NON-INVASIVE PRENATAL TEST**
Fan-Gang Tseng[1,2], Mu-Chi Huang[1], Hsin-Yu Yang[1,2], Zhe-Xian Lin[1], Ren-Qui Wu[3]
[1]*National Tsing Hua University, TAIWAN,* [2]*Academia Sinica, TAIWAN, and*
[3]*CellEnvision Company Limited, TAIWAN*

**T241.j** **VESSEL STIFFNESS AND CYCLIC STRETCH BOOST NEUTROPHIL EXTRACELLULAR TRAP FORMATION**
Manijeh Khanmohammadi[1,2], Sergio Aguilera Suarez[1,2], Chanly Chheang[1], Karlheinz Peter[1,3], Khashayar Khoshmanesh[1,2], Sara Baratchi[1,3]
[1]*Baker Heart and Diabetes Institute, AUSTRALIA,* [2]*RMIT University, AUSTRALIA, and* [3]*University of Melbourne, AUSTRALIA*

**W227.j** **A DISPOSABLE, PASSIVE MICROFLUIDIC DEVICE FOR POINT-OF-CARE DETECTION OF SARS-COV-2 ANTIBODY USING HEMAGGLUTINATION ASSAY**
Munawar Jawad, Afroza Akhi, Bruce Gale
*University of Utah, USA*

**W228.j** **A PROGRAMMABLE MICROFLUIDIC PLATFORM FOR STUDYING BACTERIA CHEMOTAXIS AND CHEMOTAXIS-BASED CELL SORTING**
Xiaobo Li, Yanqing Song, Andrew Glidle, Cindy Smith, William Sloan, Huabing Yin
*University of Glasgow, UK*

**W229.j** **AUTOMATION OF FLUORESCENCE-ACTIVATED DROPLET RELEASE WORKFLOW BY DEEP LEARNING-BASED DROPLET DETECTOR**
Guangyao Cheng, Yi-Ping Ho
*Chinese University of Hong Kong, CHINA*

**W230.j** **BOOSTING ANALYTICAL CHEMISTRY WITH MICROFLUIDICS: INTRODUCING LAMINAR FLOW SPECTROELECTROCHEMISTRY**
Linlin Liu, Nan Jia, Ian Burgess, Jesse Greener
*Université Laval, CANADA*

**W231.j** **DEEP DROPLET DIGITAL NUCLEIC ACID QUANTIFICATION BY OMNI-DIRECTIONAL EJECTION ON DIGITAL MICROFLUIDICS**
Aman Lyu, Liang Wan, Ren Shen, Pui-In Mak, Rui P. Martins, Yanwei Jia
*University of Macau, CHINA*

**W232.j** **FAST SIZE PROFILING OF CHROMOSOMAL DNA USING OPTOFLUIDIC DEVICES**
Tzu-Tsai Chu[1,2,4], Yii-Lih Lin[2], Jia-Wei Yeh[2], Guia Abaya Cline[2,3], Chia-Fu Chou[2]
[1]*National Taiwan University, TAIWAN,* [2]*Academia Sinica, TAIWAN,* [3]*National Central University, TAIWAN, and* [4]*Taiwan International Graduate Program (TIGP), TAIWAN*

**W234.j** **INTEGRATED MULTISENSOR CHIP WITH DENSE-ELECTROPLATED REFERENCE ELECTRODE FOR GOAT ESTRUS DETECTION**
Hsiang Wang, Che-Hsin Lin, Wei-Sin Kao, Dai-En Li
*National Sun Yat-sen University, TAIWAN*

**W235.j** **LABEL-FREE QUANTIFICATION ACROSS TISSUE BARRIERS IN ORGAN-ON-A-CHIP SYSTEMS**
Niels W.J. Klement[1], Roel Poppen[1], Pim de Haan[1], Daniel R. Duijnstee[1,2], Vika Telle[1], Alexandar Staykov[2], Wesley R. Browne[1], Elisabeth M.J. Verpoorte[1]
[1]*University of Groningen, NETHERLANDS and* [2]*Kyushu University, JAPAN*

**W236.j** **MICROFLUIDIC DEVICE MIMICKING PERIODONTUM MICROARCHITECTURE**
Abinaya R[1], Lakshmi Krishnan[1], Suresh Rao[1], Moeto Nagai[2], Shantanu Pradhan[1], Tuhin S. Santra[1]
[1] *Indian Institute of Technology, Madras, INDIA and*
[2] *Toyohashi University of Technology, INDIA*

**W237.j** **MULTIPLEXED DETECTION OF PATHOGENIC RNAS BASED ON MICROFLUIDIC CELL-FREE PROTEIN SYNTHESIS**
Dong Hyun Han[1], Yurim Kim[1], Yu Jin Park[2], Dong-Myung Kim[2], Je-Kyun Park[1]
[1] *Korea Advanced Institute of Science & Technology (KAIST), KOREA and* [2] *Chungnam National University, KOREA*

**W238.j** **PASSIVELY PRESSURE-BALANCED MICROFLUIDIC DEVICE FOR NEUTROPHIL MIGRATION ANALYSIS**
Yehyun Choi, Subhash B. Arya, Carole A. Parent, Euisik Yoon
*University of Michigan, USA*

**W239.j** **PUMPLESS BLOOD SEPARATION PLATFORM WITH MAGNETIC REPULSION FORCE FOR POINT-OF-CARE TESTING**
Dong-Uk Han, Young Ki Hahn
*Kyungpook National University, KOREA*

**W240.j** **ROBUST SMARTPHONE-BASE PHENOTYPIC ANTIBIOTIC SUSCEPTIBILITY TESTING INCORPORATING A DAM DIVERSION CONCENTRATION GRADIENT GENERATOR**
Shunji Li, Wan Chao, Longyu Yi, Peng Chen, Bi-Feng Liu
*Huazhong University of Science and Technology, CHINA*

**W241.j** **TOWARDS A MULTIPLEXED HORMONAL SENSING MICROFLUIDIC PLATFORM: DEVELOPMENT OF A NOVEL ELECTROCHEMICAL APTASENSOR FOR THE DETECTION OF LUTEINISING HORMONE**
Marie-Charlotte Horny[1,2], Hiu Mun Man[1], Pierre-Emmanuel Bouet[3], Brice Calvignac[2], Isabelle Le Potier[1], Jean Gamby[1]
[1] *Paris-Saclay University, FRANCE,* [2] *Angers University, FRANCE, and* [3] *Angers University Hospital Center, FRANCE*

**W242.j** **VORTEX MICROSCALE ELECTROPORATOR FOR GENETIC MODIFICATION OF PRIMARY CELLS**
Hyun Woo Sung, Soojung Claire Hur
*Johns Hopkins University, USA*

## Late News

**M541.j** **3-D PRINTED BIOMIMETIC COLLECTORS FOR INGESTIBLE CAPSULE TISSUE BIOPSY**
Michael A. Straker, Joshua A. Levy, Reza Ghodssi
*University of Maryland, USA*

**M542.j** **A RAPID AND BUBBLE-FREE PCR THROUGH OSCILLATORY DISPLACEMENT ON A CENTRIFUGAL MICROFLUIDIC PLATFORM**
Tae-Hyeong Kim, Daniel Brassard, Christina Nassif, Dillon Da Fonte, Teodor Veres
*National Research Council, CANADA*

**M543.j** **DEVELOPMENT OF A LOW BARRIER-TO-ENTRY MICROFLUIDIC CHIP FOR HIGH THROUGHPUT CLONAL CULTURES**
Eve Petit, Fanny-Meï Cloarec-Ung, Delphine Bouilly, David J.H.F. Knapp
*Université de Montréal, CANADA*

**M544.j** **HIGH-PRECISION CELL CLASSIFICATION THROUGH MECHANICAL TRAIT ANALYSIS IN MICROFLUIDIC SYSTEMS USING MULTIPLEX IMAGE MACHINE LEARNING**
Yaling Liu, Khayrul Islam, Yuwen Zhao
*Lehigh University, USA*

**M545.j** **REAGENT-FREE ELECTROCHEMICAL BIOSENSOR UTILIZING MOLECULARLY IMPRINTED POLYMERS FOR SINGLE-STEP DETECTION OF TROPONIN I IN BIOLOGICAL SAMPLES**
Mahmoud Ayman Saleh, Arash Khorrami Jahromi, Hamed Shieh, Roozbeh Siavash Moakhar, Carolina del Real Mata, Sara Mahshid
*McGill University, CANADA*

**M546.j** **ULTRA-LOCALIZED IN-VIVO PROFILING OF BRAIN NEUROCHEMISTRY WITH SILICON INTEGRATED NANODIALYSIS PLATFORM DURING EPILEPTIC CORTICAL SEIZURES**
Weihua Shi, Keyin Li, Yu Ding, Alex Armstrong, Jonathan Sweedler, Yurii Vlasov
*University of Illinois, Urbana Champaign, USA*

**T541.j** **A 3D-PRINTED MICROFLUIDIC SENSOR PLATFORM FOR ONLINE BIOPROCESS MONITORING**
Christopher Heuer[1], Anton Enders[2], Jonathan Nyenhuis[1], Janina Bahnemann[1]
[1]*University of Augsburg, GERMANY and*
[2]*Leibniz University Hannover, GERMANY*

**T542.j** **AMPLIFICATION CASCADE FOR SARS-COV-2 DETECTION VIA DUAL STRUCTURE-SWITCHING APTAMERS**
Eun-Kyung Lim, Jaewoo Lim
*Korea Research Institute of Bioscience and Biotechnology, KOREA*

**T543.j** **EXPLORING EPIDIDYMAL CELL MECHANOTRANSDUCTION THROUGH MICROFLUIDIC SHEAR STRESS APPLICATIONS**
Sepideh Fakhari, Gabriel Campolina-Silva, Farnaz Asayesh, Laura Girardet, Marie-Pier Scott-Boyer, Arnaud Droit, Denis Soulet, Jesse Greener, Clémence Belleannée
*Laval University, CANADA*

**T544.j** **NANOPARTICLE-BASED ASSAY FOR MICRORNA PROFILING FROM UNPROCESSED BLOOD PLASMA: A NEW PREDICTIVE TEST FOR ADVERSE PRENATAL OUTCOMES**
Marc Soler, Loukia Petrou, Brenna Parke, Sylvain Ladame
*Imperial College London, UK*

**T545.j** **THE DEVELOPMENT OF LATERAL FLOW IMMUNOASSAY FOR MONITORING VANCOMYCIN IN PERITONEAL DIALYSATE**
Yugyung Jung, Seonjong Kim, Min-Gon Kim, Sung Yang
*Gwangju Institute of Science and Technology, KOREA*

**W541.j** **A NOVEL MICROFLUIDIC PLATFORM FOR SIMULATING CIRCULATING TUMOR CELL GENERATION PROCESS AND DOWNSTREAM STUDY**
Zihan Yang, Yuanyuan Jiang, Zhihang Zhou, Mengsu Yang
*City University of Hong Kong, CHINA*

**W542.j** **CENTRIFUGAL MICROFLUIDIC DEVICE FOR RAPID SERELOGICAL ANALYSIS OF FORENSICALLY-RELEVANT BODY FLUIDS**
Taylor G. Chambers[1], Renna L. Nouwairi[1], Larissa L. Cunha[1], Ashleigh Williamson[1], Liam Barry[2], Rachel Fleming[2], James P. Landers[1]
[1]*University of Virginia, USA and* [2]*Institute of Environmental Science and Research Limited, NEW ZEALAND*

**W543.j** **HIGH THROUGHPUT CENTRIFUGAL MICROFLUIDIC DEVICE FOR ONE-STEP GENERATION OF CORE-SHELL MICROSPHERES**
Elioth Daniel Macias Frotto, Mallar Ray, Masoud Madadelahi
*Tecnologico de Monterrey, MEXICO*

**W544.j** **PAM-FREE DETECTION OF MICRORNA USING A NOVEL DROPLET CRISPR-CAS12A ASSAY WITH NUCLEIC ACID BREAKS AND NONCANONICAL REPORTERS**
Yufeng Zhao[1,2], Idorenyin Iwe[2], Afshin Abrishamkar[1,2], Ariel Corsano[2], Kayla Soon[1], Keith Pardee[2], Teodor Veres[1]
[1]*National Research Council, CANADA and* [2]*University of Toronto, CANADA*

**W545.j** **TRANSMEMBRANE HYDROSTATIC PRESSURE DIFFERENTIALS AS A BIOPHYSICAL BASIS FOR AIR-LIQUID INTERFACE DIFFERENTIATION**
Chen Li[1], Kaline Arnauts[2], Tanvi A. Javkar[1], Syeda S. Z. Zaidi[1], John W. Hanrahan[1], Alex Gregorieff[1], Christopher Moraes[1]
[1]*McGill University, CANADA and* [2]*KU Leuven, BELGIUM*

**W547.j** **MICROFLUIDIC-ROBOTIC MANIPULATION OF MICRODISSECTED TUMORS FOR HIGHTHROUGHPUT DRUG TESTING**
Lisa F. Horowitz[1], Ivan Stepanov[1], Noah R. Gottshall[1], Casey Stiles[1], Tran N.H. Nguyen[1], Ethan J. Lockhart[1], Raymond S. Yeung[1], Taranjit S. Gujral[2], Albert Folch[1]
[1]*University of Washington, Seattle, WA, USA and* [2]*Human Biology Division, Fred Hutchinson Cancer Research Center, USA*

## k - Other Microfluidics and µTAS

### Anti-Counterfeiting

**M242.k** **DUAL-FRAME QR-CODED MICROTAGGANT INTEGRATED WITH A HIDDEN WATERMARK**
Junghyun Bae[1], Mingyeom Jeong[1], Cheolheon Park[2], Kibeom Kim[3], Wook Park[1]
[1]*Kyung Hee University, KOREA,* [2]*Seoul National University, KOREA, and* [3]*Korea Institute of Science and Technology, KOREA*

**T242.k** **FOUR-DIMENSIONAL PHYSICAL UNCLONABLE FUNCTIONS FOR ANTI-COUNTERFEITING APPLICATIONS BASED ON ORGANIC PHOSPHOR CRYSTAL MICROPATTERNS**
Jinsik Yoon[1], Healin Im[2,3], Dong Hyuk Park[4], Sunkook Kim[2], Wook Park[1]
[1]*Kyung Hee University, KOREA,* [2]*Sungkyunkwan University, KOREA,* [3]*University of California, Berkeley, USA, and* [4]*Inha University, KOREA*

W243.k **INTEGRATING VIVID-COLOUR, LINE ART HOLOGRAMS IN INJECTION MOLDED MICROFLUIDIC DEVICES AS ANTI-COUNTERFITTING SECURITY FEAUTRES**
Keith Morton, Liviu Clime, Gaétan Veilleux, Luke Lukic, Kebin Li, Karine Turcotte, Matthew Shiu, Alex Boutin, Daniel Brassard, Teodor Veres
*National Research Council of Canada, CANADA*

## Artificial Intelligence and Microfluidics

M243.k **ARTIFICIAL INTELLIGENCE ASSISTED PHENOTYPIC ANTIMICROBIAL RESISTANCE TESTING ON SLIPCHIP**
Zheyi Sheng, Yanan Ren, Qi Wang
*Shanghai Jiao Tong University, CHINA*

T243.k **NEUROMORPHIC-ENABLED VIDEO-ACTIVATED CELL SORTING FOR HIGH-ACCURACY CLASSIFICATION OF REGULAR RED BLOOD CELLS AND BLOOD-DISEASE-RELATED SPHEROCYTES**
Weihua He, Junwen Zhu, Yongxiang Feng, Fei Liang, Wenhui Wang
*Tsinghua University, CHINA*

## Forensics, Archeology, and Paleontology

M244.k **BRIGHTFIELD-ONLY DETECTION OF SPERM (BODS) USING A GENERATIVE ADVERSARIAL NETWORK**
Mohamed Elsayed[1], Harrison Edwards[1], Leticia Bodo[1], Melissa Schwandt[2], Julie F. French[2], Jonathan Millman[3], Aaron R. Wheeler[1]
[1] *University of Toronto, CANADA,* [2] *ANDE Corporation, USA, and* [3] *Centre of Forensic Sciences, CANADA*

T244.k **RAPID AND COST-EFFECTIVE MULTIPLEX DETECTION OF SYNTHETIC CATHINONES AND AMPHETAMINES**
Kirsty J. Shaw[1], Oliver B. Sutcliffe[1], David Megson[1], Lauren McNeill[1,2], Patricia E. Linton[1]
[1] *Manchester Metropolitan University, UK and* [2] *Lancaster University, UK*

W244.k **'WISDOM TEETH': AMINO ACID DATING OF FOSSILIED TEETH**
Laila Patinglag[1], Marcus Hill[1], Marc R. Dickinson[2], Kirsty E.H. Penkman[2], Kirsty J. Shaw[1]
[1] *Manchester Metropolitan University, UK and* [2] *University of York, UK*

## Military and Defense

W245.k **PRIMDEX: WHEN DEFENSE MEETS MICROFLUIDICS - FROM RAPID PROTOTYPING TO TIME & COST SAVING INJECTION MOLDING**
Jose A. Wippold, Patrick Kruk, Bryn L. Adams
*Army Research Laboratory, USA*

## Space and Space Travel

**M245.k** **MICROPREP MISSION: CENTRIFUGAL MICROFLUIDIC AUTOMATION OF COMPLEX SAMPLE PREPARATION PROCEDURES FOR THE INTERNATIONAL SPACE STATION**
Daniel Brassard[1], Karine Turcotte[1], Keith Morton[1], Liviu Clime[1], Matthias Geissler[1], Matthew Shiu[1], Tae-Hyeong Kim[1], Lidija Malic[1], Maxence Mounier[1], Christina Nassif[1], Dillon Da Fonte[1], Jason Ferreira[1], Emilie Leblanc Gaudreau[1], Mojra Janta-Polczynski[1], Sam Ng[2], Tim Fielding[2], Denis Charlebois[3], Teodor Veres[1]
[1]*National Research Council of Canada, CANADA,*
[2]*MDA, CANADA, and* [3]*Canadian Space Agency, CANADA*

**T245.k** **MICROSCALE THERMAL CONVECTION IN HYDROTHERMAL VENT SYSTEMS: ENVIRONMENTS FOR INTEGRATED PREBIOTIC CHEMISTRY AND EXOBIOLOGY PROCESSES**
Vijay Ravisankar, Yassin A. Hassan, Victor M. Ugaz
*Texas A&M University, USA*

## X-Ray (E.G. Synchrotron) and E-Beam

**M246.k** **DROPLET-BASED MICROFLUIDICS REVEALS INSIGHTS INTO CROSS-COUPLING MECHANISMS OVER SINGLE-ATOM HETEROGENEOUS CATALYSTS**
Thomas Moragues[1], Georgios Giannakakis[1], Andrea Ruiz-Ferrando[2,3], Camelia N. Borca[4], Thomas Huthwelker[4], Aram Bugaev[4], Andrew J. deMello[1], Javier Pérez-Ramírez[1], Sharon Mitchell[1]
[1]*ETH Zürich, SWITZERLAND,* [2]*ICIQ-CERCA, SPAIN,*
[3]*University of Rovira i Virgili, SPAIN, and*
[4]*Paul Scherrer Institute, SWITZERLAND*

**T246.k** **LOW-COST CONTINUOUS MANUFACTURING OF MICROFLUIDIC PLATFORMS FOR REMOTE AUTOMATED ROOM TEMPERATURE X-RAY PROTEIN CRYSTALLOGRAPHY**
Sarthak Saha[1], Yaozu Chen[1], Silvia Russi[2], Darya Marchany-Rivera[2], Aina Cohen[2], Sarah L. Perry[1]
[1]*University of Massachusetts, USA and*
[2]*SLAC National Accelerator Laboratory, USA*

**W246.k** **DIFFRACTED X-RAY TRACKING METHOD FOR ANALYZING THE SEQUENTIAL DYNAMIC MOTION OF ION CHANNELS IN RESPONSE TO A CHEMICAL STIMULUS**
Yusuke Asagoe[1], Hirofumi Shimizu[2], Yoshikazu Hirai[1]
[1]*Kyoto University, JAPAN and* [2]*University of Fukui, JAPAN*

## Late News

**T546.k** **GENERATIVE AI-BASED APPROACH FOR DESIGNING 3D-PRINTED MICROFLUIDIC DEVICES**
Kevin D. Hayes, Bailey M. Felix, Ryan D. Sochol
*University of Maryland, USA*

**W546.k** **ROBUST ACOUSTOFLUIDIC MICROMIXER BASED ON AN ULTRATHIN PDMS MICROBALLOON OSCILLATOR**
Yeji Yang, Heeyeon Kim, Dohyun Park, Abdi M. Kaba, Dohyun Kim
*Myongji University, KOREA*

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| MONDAY | TUESDAY | WEDNESDAY |
|---|---|---|
| 14:35 – 16:35 | 14:30 – 16:30 | 14:15 – 16:15 |

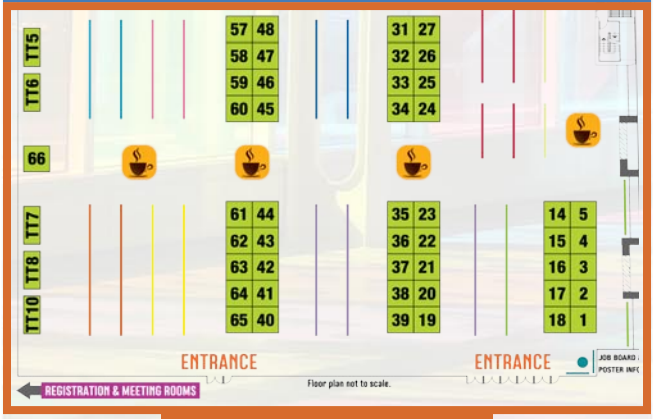
## CLASSIFICATION

(last character of poster number)

| | |
|---|---|
| a | Biology, Medicine and Diseases |
| b | Cells, Artificial Cells and Soft Nanoparticles |
| c | Environment, Energy, Agriculture, and Food |
| d | Fundamentals In Microfluidics and Nanofluidics |
| e | Integrated Microfluidic Platforms |
| f | Microfabrication, Manufacturing and Rapid Prototyping |
| g | Sensors, Actuators and Detection Technologies |
| h | Tissue Engineering, Organs on a Chip and Organisms |
| i | Wearables and Continuous Biosensing |
| j | µTAS and Diagnostics |
| k | Other Microfluidics and µTAS |

See fold out for poster presentation numbers.

## SECTION B


## SECTION A

# SECTION A

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W061.d M059.d
T061.d T059.d
M061.d W059.d
T060.d M060.d
W511.d M511.d

61 44
62 43
63 42
64 41
65 40

M053.d W508.b
W052.d T508.b
T052.d W041.c
M052.d M042.c
W051.d T042.c
T051.d W042.c
M051.d M043.c
W510.c T043.c
T510.c W043.c
M510.c M044.c
W509.c W044.c
T509.c M045.c
M509.c T045.c
W050.c W045.c
T050.c M046.c
M050.c T046.c
W049.c W046.c
T049.c M047.c
M049.c T047.c
W048.c W047.c
T048.c M048.c

M508.b M030.b
W507.b T030.b
T507.b W030.b
M507.b M031.b
W506.b T031.b
T506.b W031.b
M506.b M032.b
T041.b T032.b
M041.b W032.b
W040.b M033.b
T040.b T033.b
M040.b W033.b
W039.b M034.b
T039.b T034.b
M039.b W034.b
W038.b M035.b
T038.b T035.b
M038.b W035.b
W037.b M036.b
T037.b T036.b
M037.b W036.b

35 23
36 22
37 21
38 20
39 19

W029.b M503.a
T029.b T503.a
M029.b W503.a
W028.b T504.a
T028.b W504.a
M028.b M505.a
W027.b T505.a
T027.b W505.a
M027.b T018.b
W026.b W018.b
M026.b M019.b
W025.b T019.b
T025.b W019.b
M025.b M020.b
W024.b T020.b
T024.b W020.b
M024.b M021.b
W023.b T021.b
T023.b W021.b
M023.b M022.b
W022.b T022.b

W502.a T006.a
T502.a W006.a
M502.a M007.a
W501.a T007.a
T501.a W007.a
M501.a M008.a
W017.a T008.a
T017.a W008.a
M017.a T009.a
W016.a W009.a
T016.a M010.a
M016.a T010.a
W015.a W010.a
T015.a M011.a
M015.a T011.a
W014.a W011.a
T014.a M012.a
M014.a T012.a
W013.a W012.a
T013.a M013.a

14 5
15 4
16 3
17 2
18 1

M006.a
W005.a
T005.a
M005.a
W004.a
T004.a
M004.a
W003.a
T003.a

M003.a
W002.a
T002.a
M002.a
W001.a
T001.a
M001.a

ENTRANCE

ENTRANCE

JOB BOARD & POSTER INFO

REGISTRATION & MEETING ROOMS

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MONTRÉAL CANADA

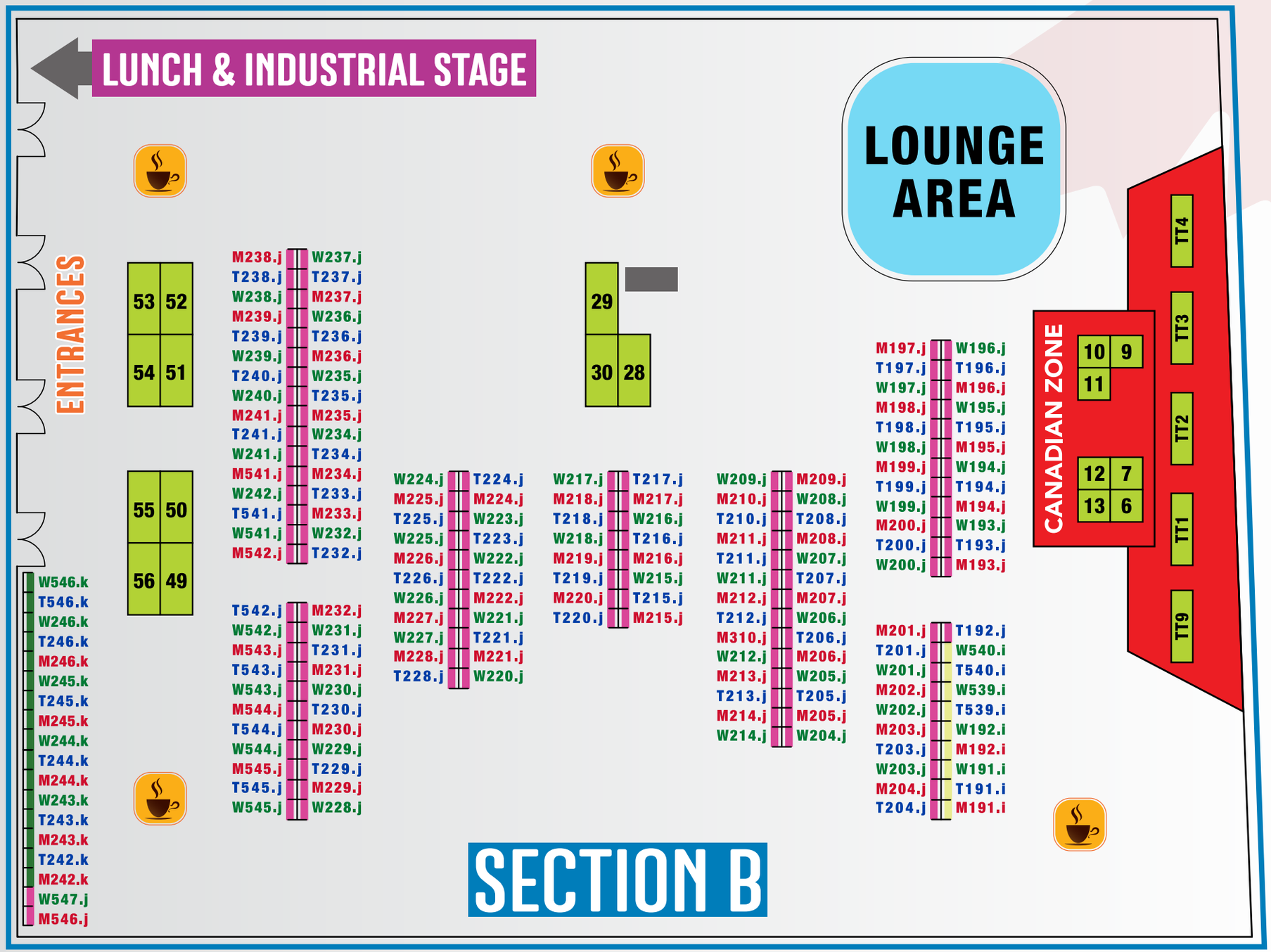
# µTAS 2024

## FOLD OUT FOR POSTER PRESENTATION FLOOR PLAN(S)

| MONDAY | TUESDAY | WEDNESDAY |
|---|---|---|
| 14:35 – 16:35 | 14:30 – 16:30 | 14:15 – 16:15 |

### CLASSIFICATION
(last character of poster number)

| | |
|---|---|
| a | Biology, Medicine and Diseases |
| b | Cells, Artificial Cells and Soft Nanoparticles |
| c | Environment, Energy, Agriculture, and Food |
| d | Fundamentals In Microfluidics and Nanofluidics |
| e | Integrated Microfluidic Platforms |
| f | Microfabrication, Manufacturing and Rapid Prototyping |
| g | Sensors, Actuators and Detection Technologies |
| h | Tissue Engineering, Organs on a Chip and Organisms |
| i | Wearables and Continuous Biosensing |
| j | µTAS and Diagnostics |
| k | Other Microfluidics and µTAS |

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2 – 6 November 2025
Adelaide Convention Centre

The 29th International Conference on Miniaturized Systems for Chemistry and Life Sciences

# μTAS 2025
## ADELAIDE - AUSTRALIA

## Abstract Submission Deadline: 20 May 2025

## PLENARY SPEAKERS

**Moran Bercovici**
Technion University, ISRAEL

**Maria Forsyth**
Deakin University, AUSTRALIA

**Erica Cheung**
Ethics in Entrepreneurship, USA

**Noo Li Jeon**
Seoul National University, KOREA

**Cather Simpson**
University of Auckland, NEW ZEALAND

## 2025 HOT TOPIC CATEGORIES

- Extreme and Remote Environments
- Sustainability, Energy and Resources
- Organoids and Microphysiological Systems
- Wearables, implantables and ingestibles

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