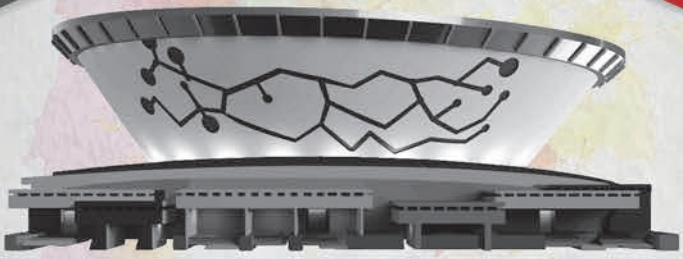
THE 27th INTERNATIONAL CONFERENCE
ON MINIATURIZED SYSTEMS
FOR CHEMISTRY AND
LIFE SCIENCES



# μTAS 2023

15-19 OCTOBER

KATOWICE | POLAND

# PROGRAM

## CONFERENCE CHAIRS


**Zbigniew Brzózka**
*Warsaw University of Technology*
*POLAND*

**Elżbieta Jastrzębska**
*Warsaw University of Technology*
*POLAND*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## TECHNICAL PROGRAM



## Welcome to the 27th International Conference on Miniaturized Systems for Chemistry and Life Sciences

**Welcome** to MicroTAS 2023, the 27th International Conference on Miniaturized Systems for Chemistry and Life Sciences, which represents a returning of our community's flagship scientific conference as an in-person event. Following on-line and hybrid versions of the conference in Asia (Hangzhou, China in 2022), America (Palm Springs, USA in 2021) and fully online/virtual in 2020, we are very pleased to welcome you this year in Katowice, Poland. Katowice is the heart of Silesia region and in the past, Silesia was known mainly for coal mines, heavy industry, agriculture, and forging. Today, it is one of the national leaders in innovation, new technologies, and green transformation. Katowice is an academic, cultural, and sports centre and we hope you enjoy your time in the city.

**In** redesigning several aspects of MicroTAS, we have been guided by a core mission: (1) to deliver a high-quality scientific program; (2) to create a forum for cutting edge and even unpublished work; (3) to facilitate scientific engagement across a spectrum of subject areas; (4) to foster connections among researchers of all career stages from across the international community; and (5) to grow and strengthen our community by including emerging scientific directions and diverse researchers.

**We** are pleased to welcome a community of almost 1,000 individuals to this "normal" MicroTAS, that continues to be the premier international forum for reporting the latest research results in microfluidics and lab-on-a-chip technologies, including aspects of microfabrication, nanotechnology, device integration, materials and surfaces, analysis and synthesis, and sensing and detection in the fields of life sciences and chemistry.

**Over** the last three years, the pandemic has prevented the safe organization of traditional forms of our conference, based on stationary presentations, direct scientific discussion, and participation in accompanying events. We thank you each for joining us and sharing your research here. It is you, our community, that makes MicroTAS the world's premier microfluidics conference.

**At** the heart of the meeting is the Technical Program. This year, abstract submissions were solicited within seven core topical areas that have been selected to reflect the scope of our growing field, spanning from fundamental physics and fabrication through sensors and detection to applications of microfluidic technology. Today, microfluidic technology addresses and serves a broad range of applications in the life sciences as reflected in the categories "cells and organs-on-chip" as well as biomedical and pharmaceutical areas like diagnostics, drug testing and personalized medicine.

**To** ensure the quality of abstracts accepted for MicroTAS 2023, a Technical Program Committee (TPC) consisting of 61 of our colleagues, together with 25 members of the Executive Technical Program Committee (ETPC), balanced across all three regions, contributed significant time and energy towards evaluating all abstract submissions. Together these volunteers evaluated 777 submissions in June, during on-line meetings, and selected 99 for oral presentations and 612 for poster presentations. In addition to the regular submissions, we accepted 101 Late News submissions for a grand total of 813 accepted abstracts. We arranged the parallel sessions into the Technical Program, taking care that similar topics be not presented in concurrent sessions, so that everybody be able to attend all talks on topics of his/her preference.

**The** importance of the contributions of TPC and ETPC members in maintaining the technical quality of the meeting and ensuring that the best and most exciting work emerges in both, poster and oral presentations cannot be overemphasized.

# WELCOME LETTER

**The** diligent, dedicated, and unbiased work of the TPC/ETPC members are the bedrock of MicroTAS scientific program with exceptional quality. Membership on each committee is for a fixed term, with new members nominated by leaders in our community and self-nominated, then selected by the CBMS Board of Directors. The TPC/ETPC members dedicate late nights and weekends to our community to ensure the best and most exciting work is accepted. Thank you, TPC and ETPC members.

**The** MicroTAS 2023 oral program includes a suite of six exceptional Plenary Speakers, and twelve engaging Keynote Speakers, along with a slate of 99 exceptional submitted oral presentations. In each case, we sincerely hope that the scientific content and the presenter will inspire you to reflect the capabilities and understanding that can be unlocked by microfluidic systems, perhaps even influencing your own thinking and path forward.

**For** the first time in the MicroTAS, we decided to organize a Special Focus Session. This year it will be Organoids and the session will present fundamental research concerning organoids, human-induced pluripotent cell (iPS cell) models and recent work on studies of tissue development using organoids. We believe that it will be a huge inspiration for our community for further research.

**The** heart of every day's program is the poster session. The excellent contributions of hundreds of presenters make this part of the day a particularly great time for discussions, brainstorming and networking. PhD students with abstracts that have been highly ranked during the TPC/ETPC evaluation will be challenged in a competition for the daily or conference poster award. Even more awards will be celebrated during the week and specifically during the awards ceremony on Thursday.

**In** addition to the talks and poster sessions, we have arranged for 8 pre-conference workshops on Sunday, October 15, 2023. The workshops cover a wide range of emerging thematic areas related to microfluidics and provide an excellent opportunity to get a comprehensive overview on a specific topic in an intensive, 3-hours lecture.

**COVID-19** showed us how in-person contact and conversation is important. Therefore, we organized for you activities associated with the conference such as Student Mixer, Women's Evening, and the Banquet in Spodek. Furthermore, for the first time in MicroTAS we have Science Speed Dating. This opportunity gives young scientists a chance to talk briefly with experienced scientists about specific topics such as Mobility, Family and Career, Women in Science, Post-Doc Positions, and Industrial. We hope that they will be held successfully and become a permanent part of the next MicroTAS conferences.

**The** list of individuals involved in making this MicroTAS conference a success is extensive. We would like to again thank the members of the TPC and ETPC for helping to build a strong scientific program and serving as session chairs, and, in particular, the ETPC group leaders who were central to this process (Yi-Chin Toh, Rebecca Pompano, Thomas Gervais, and Elzbieta Jastrzebska. Moreover, we are grateful for the efforts of members of the Exhibit and Sponsorship Committee (with Nicolas Verplanck and Artur Dybko as chairs), the Promotion Committee (with Stephanie Decrouix and Agnieszka Zuchowska as chairs) and Local Organizing Committee. We thank Jonathan Cottet and Bastien Venzac who have promotes MicroTAS in social media. We thank Ilona Grabowska-Jadach and Sławomir Jakieła for setting up the Sunday Workshops, Lourdes Basabe Desmonts and Edmond Young, for serving as Poster Award Chairs, Agnieszka Zuchowska for organizing Welcome Reception, Magdalena Flont for organizing the Women's Faculty Event and Patrycja Sokolowska for organizing the Students Mixer and Michal Chudy for coordinating Conference Banquet. Finally, we thank all 40 chairs of the sessions and plenary talks.

# WELCOME LETTER

**We** are most thankful for help and support of students and postdoctoral fellows before and during the conference.

**We** are grateful to CBMS and its board members, including the current and past Boards of Directors and Executive Boards, who have promoted the growth of the MicroTAS conference over the years and provided valuable feedback during the planning of this year's meeting. In particular, we thank Amy Herr, CBMS President, and Joel Voldman, head of the TPC, as well as Petra Ditrich, head of the Awards Committee, for their support. It was your trust that made it possible to host this top-level conference for the first time in Poland.

**Of** course, we also thank all the sponsors, who have generously supported the conference, as well as the exhibitors, who will present their products and services during the meeting.

**In** addition, as with previous MicroTAS, the recipients of the Young Innovator Award, co-sponsored by the ACS Analytical Chemistry and CBMS, the Pioneers in Miniaturization co-sponsored by RSC journal Lab on a Chip, Dolomite and CBMS, and the Test of Time Award sponsored by Springer Nature Microsystems & Nanoengineering will be announced. In each case, we sincerely hope that the scientific content and the presenter will inspire you to reflect the capabilities and understanding that can be unlocked by microfluidic systems.

**There** will also be a series of awards to be presented in MicroTAS 2023, including: Microsystems & Nanoengineering/Springer Nature Best Talk Award, Elsevier Sensors and Actuators B. Chemical Best Paper Award, Biomicrofluidics (AIP) Best Paper Award, NIST and Lab on a Chip Art in Science Award, CHEMINAS (Society for Chemistry and Micro-Nano Systems) daily Young Researcher Poster Award, Royal Society of Chemistry/Lab on a Chip Widmer Poster Award, Sensors (MDPI) Outstanding Sensors and Actuators, Detection Technologies Poster Award, and IMT Masken und Teilungen AG Microfluidics on Glass Poster Award.

**Moreover**, we would like to express our most sincere and deepest gratitude to Sara Stearns and Shirley Galloway of Preferred Meeting Management Inc. (PMMI), who guided us through the past months, answered questions efficiently and with great patience. Without their expertise, their deep knowledge of the MicroTAS community, permanent kindness and tireless efforts as conference organizers, the meeting would not be as successful as it is.

**Finally**, thank you to all of you for joining us in Katowice for MicroTAS 2023 and for contributing to the success of the conference.

**Welcome to Poland, welcome to Katowice!**

Zbigniew Brzózka
*Warsaw University of Technology, POLAND*

Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

# SPECIAL FOCUS SESSION SPEAKERS

## Special Focus Session - Organoids
## 11:40 - 12:40

**Hall C**

This session will present fundamental research concerning organoids, human-induced pluripotent cell (iPS cell) models and recent work on studies of tissue development using organoids.

## TUESDAY, 17 OCTOBER — 11:40 – 12:10

Special Session Speaker

**Leonora Bużańska**
*Polish Academy of Sciences, POLAND*

**EMERGING HUMAN BRAIN ORGANOID FIELD TO MODEL EARLY DEVELOPMENT AND PATHOLOGY**

## TUESDAY, 17 OCTOBER — 12:10 – 12:40

Special Session Speaker

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

**ORGANOIDS AND ORGANS-ON-A-CHIP: FROM TOXICITY TESTING TO PERSONALIZED MEDICINE**

Mariacka Pedestrian Street & Virgin Mary Church; Katowice. *By bbsferrari; Adobe Stock.*

# KEYNOTE SPEAKERS

## MONDAY, 16 OCTOBER — 16:35 – 17:05

### Session 1A4 - Extracellular Matrix

**ENGINEERING EXTRACELLULAR MATRIX: COMPONENTS, MECHANICS, AND ARCHITECTURE**

Pilnam Kim

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

### Session 1B4 - Blood Processing

**BLOOD MICROFLUIDICS: FROM FRACTIONATION TO LIQUID BIOPSY**

Ian Papautsky

*University of Illinois, Chicago, USA*

### Session 1C4 - Wearable and Diagnosis

**WEARABLE MICROFLUIDIC SENSING TECHNOLOGIES FOR HEALTHCARE APPLICATIONS**

Chwee Teck Lim

*National University of Singapore, SINGAPORE*

## TUESDAY, 17 OCTOBER — 17:10 – 17:40

### Session 2A4 - Cell/Organ-on-a-Chip I

**CELL AND ORGAN-ON-CHIP APPROACHES IN CANCER RESEARCH**

Agnieszka Żuchowska

*Warsaw University of Technology, POLAND*

### Session 2B4 - Optical Detection

**ADVANCEMENTS IN MICROFLUIDICS: CELL BIOPSIES, DIAGNOSTICS, AND PROGRAMMABLE MATTER**

Wouter van der Wijngaart

*KTH Royal Institute of Technology, SWEDEN*

## TUESDAY, 17 OCTOBER — 17:10 – 17:40 (continued)

### Session 2C4 - Single Cell Analysis III

**MICROFLUIDIC PLATFORMS FOR IMMUNOTHERAPY AND GENOME EDITING**

Aram Chung

*Korea University, KOREA*

## WEDNESDAY, 18 OCTOBER — 16:00 – 16:30

### Session 3A4 - Neurobiology & Neuroscience

**EX VIVO ORGAN-ON-CHIP PLATFORMS FOR SENSING NEURON-IMMUNE COMMUNICATION**

Ashley E. Ross

*University of Cincinnati, USA*

### Session 3B4 - Point-of-Care

**PAPER-BASED MOLECULAR DIAGNOSTICS FOR PATHOGEN DETECTION AT THE EXTREME POINTS-OF-CARE**

Jacqueline Linnes

*Purdue University, USA*

### Session 3C4 - 3D Printing

**3D PRINTING MEMBRANE INTEGRATED DEVICES**

Rosanne Guijt

*Deakin University, AUSTRALIA*

## THURSDAY, 19 OCTOBER — 09:50 – 11:20

### Session 4A1 - Cell-on-a-Chip Pathogens

**ADVANCED MODELS FOR COMPREHENSIVE UNDERSTANDING OF VIRAL INFECTION**

Krzysztof Pyrć

*Jagiellonian University, POLAND*

## THURSDAY, 19 OCTOBER — 09:50 – 11:20 (continued)

### Session 4B1 - Microvalves & Delivering

**DIGITAL MANUFACTURING OF FUNCTIONAL, READY-TO-USE MICROFLUIDIC SYSTEMS**

David Juncker

*McGill University, CANADA*

### Session 4C1 - Space Exploration

**TOWARDS UNIVERSAL ANALYTICAL PLATFORMS TO STUDY BIOLOGICAL SYSTEMS**

Lourdes Basabe

*University of the Basque Country, SPAIN*

Central Square of Katowice. *By velishchuk; Adobe Stock.*

# PLENARY SPEAKERS

## MONDAY, 16 OCTOBER — 08:30 – 09:15

### Plenary Presentation I

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

**MICROFLUIDICS FOR CLINICAL DIAGNOSTICS AND ENVIRONMENTAL ANALYSIS IN RESOURCE-LIMITED SETTINGS**

## MONDAY, 16 OCTOBER — 13:50 – 14:35

### Plenary Presentation II

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

**ORGAN-ON-CHIP MODELS FOR BIOLOGICAL AND MEDICAL APPLICATIONS**

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

### Plenary Presentation III

**Manabu Tokeshi**
*Hokkaido University, JAPAN*

**DEVELOPMENT OF FUNCTIONAL LIPID NANOPARTICLES USING MICROFLUIDIC DEVICES**

# PLENARY SPEAKERS

## WEDNESDAY, 18 OCTOBER — 08:30 – 09:15

### Plenary Presentation IV

**Bogusław Buszewski**
*Mikolaj Kopernik University Torun, POLAND*

**BIOANALYTICS FROM MICRO- TO NANO- DIMENSION**

## WEDNESDAY, 18 OCTOBER — 13:05 – 13:50

### Plenary Presentation V

**Lydia L. Sohn**
*University of California, Berkeley, USA*

**MICROFLUIDICS FOR ASSESSING BREAST CANCER SUSCEPTIBILITY**

## THURSDAY, 19 OCTOBER — 08:30 – 09:15

### Plenary Presentation VI

**Artur Chmielewski**
*National Aeronautics and Space Administration (NASA), and California Institute of Technology, USA*

**HOW MICRODEVICES REVOLUTIONIZE DEEP SPACE EXPLORATION**

## Parallel Oral Sessions

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

## Guide to Understanding Session Numbering

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

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

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

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

- **A** = Hall C
- **B** = Auditorium
- **C** = Ballroom B

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 Hall B of the Congress Centre 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.

## Guide to Understanding Poster Numbering

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

Poster Number: **M001a**
The first character (i.e., **M**) indicates the day of the Conference that the poster will be on display.

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

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

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

# SUNDAY, 15 OCTOBER

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

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



## WORKSHOP 1

**MULTIORGAN-ON-A-CHIP**

Yi-Chin Toh[1], Ashleigh Theberge[2], Rebecca Pompano[3], Bryan Gao[4], and Jee Yeon Lee[5]
[1]*Queensland University of Technology, AUSTRALIA,* [2]*University Washington, USA,* [3]*University of Virginia, USA,* [4]*University of Melbourne, AUSTRALIA, and* [5]*National University of Singapore, SINGAPORE*

## WORKSHOP 3

**MICROFLUIDICS MEETS CARDIOVASCULAR BIOLOGY**

Sara Baratchi[1], Khashayar Khoshmanesh[2], and Darwin R. Reyes[3,4]
[1]*Baker Heart Diabetes Institute, AUSTRALIA,* [2]*RMIT University, AUSTRALIA,* [3]*National Institute of Standards and Technology (NIST), USA, and* [4]*Microfluidics Association (MFA), USA*

## WORKSHOP 4

**SMART MATERIALS WITHIN MICROFLUIDIC DEVICES FOR SENSING AND ACTUATION**

Fernando Benito López, Lourdes Basabe-Desmonts, and Janire Saez Castaño
*University of the Basque Country, SPAIN*

**Workshop sponsored by: Frontiers Media S.A.**

## WORKSHOP 5

**DROPLET MICROGLUIDICS – DESIGN, IMPLEMENTATION AND APPLICATIONS**

Piotr M. Korczyk[1], Sławomir Błoński[1], and Sławomir Jakieła[2]
[1]*Institute of Fundamental Technological Research Polish Academy of Sciences, POLAND and* [2]*Warsaw University of Life Sciences, POLAND*

## WORKSHOP 6

**COMMERCIALIZATION OF MICROFLUIDICS DEVICES AND SYSTEMS**

Piotr Garstecki[1], Vincent Linder[2], Tomasz Kosiński[3], and Marcin Myszkowski[3]
[1]*Polish Academy of Sciences, POLAND,* [2]*BioMedical Entrepreneur and IVD Independent Consultant, and* [3]*Scope Fluidics S.A., POLAND*

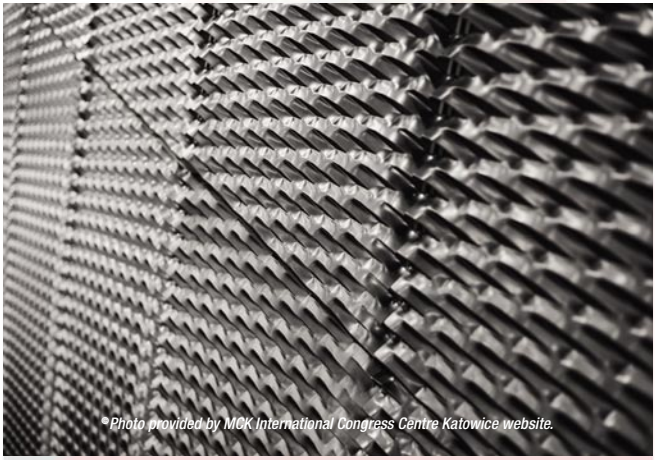

*Photo provided by MCK International Congress Centre Katowice website.

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

## WORKSHOP 7

**DNA ANALYSIS IN NANOCHANNELS**
Jonas Tegenfeldt[1] and Fredrik Westerlund[2]
[1] *Lund University, SWEDEN and* [2] *Chalmers University, SWEDEN*

## WORKSHOP 8

**STATISTICAL TOOLS AND APPROACHES TO VALIDATE RESEARCH RESULTS**
Katarzyna Pawlak and Magdalena Borowska
*Warsaw University of Technology, POLAND*

## WORKSHOP 9

**PAPER MICROFLUIDICS – DESIGN, MANUFACTURE, APPLICATION**
Daniel Citterio
*Keio University, JAPAN*

## WORKSHOP 10

**3D PRINTING FOR BIOMEDICINE**
Wojciech Swieszkowski[1] and Marco Costantini[2]
[1] *Warsaw University of Technology, POLAND and* [2] *Institute of Physical Chemistry, Polish Academy of Sciences, POLAND*

## WORKSHOP 11

**POC DIAGNOSTICS AT RESOURCE LIMITED SETTINGS**
Aman Russom
*KTH Royal Institute of Technology, SWEDEN*

## WORKSHOP 12

**POLYMER PRODUCTION AND STANDARDIZATION AND A HAND-ON TEST WITH OFF-THE-SHELF MICROFLUIDIC COMPONENTS**
Claudia Gärtner
*microfluidic ChipShop GmbH, GERMANY*

| | |
|---|---|
| **17:00 - 19:00** | **Conference Registration and Check-In** |
| **17:00 - 19:00** | **Wine and Cheese Reception** |

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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**<br>Nicole Pamme – *Stockholm University, SWEDEN* | | |
| 09:15-09:30 | Transition | | |
| 09:30-10:30 | **Session 1A1**<br>**Hypoxia-on-a-Chip** | **Session 1B1**<br>**Single Cell Analysis I** | **Session 1C1**<br>**Biomolecular Detection I** |
| 10:30-11:00 | Break: Exhibit and Poster Inspection | | |
| 11:00-12:20 | **Session 1A2**<br>**Microfluidic Flow Cytometry** | **Session 1B2**<br>**Single Cell Analysis II** | **Session 1C2**<br>**Permeability** |
| 12:20-13:30 | Lunch | | |
| 12:25-13:25 | Industrial Stage 1 | | |
| 13:30-13:50 | Analytical Chemistry – Young Innovator Award Presentation | | |
| 13:50-14:35 | **Plenary Presentation II**<br>Séverine Le Gac – *University of Twente, NETHERLANDS* | | |
| 14:35 - 16:35 | Poster Session 1 and Exhibit Inspection | | |
| 16:05-16:35 | Break | | |
| 16:35-18:05 | **Session 1A4**<br>**Extracellular Matrix** | **Session 1B4**<br>**Blood Processing** | **Session 1C4**<br>**Wearable and Diagnosis** |
| | **KEYNOTE**<br>Pilnam Kim | **KEYNOTE**<br>Ian Papautsky | **KEYNOTE**<br>Chwee Teck Lim |
| 18:15-19:45 | Student Mixer | | |
| 18:15-22:30 | Women in Microfluidics Event | | |

# MONDAY, 16 OCTOBER

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

**08:30** **Opening Remarks – MicroTAS 2023 Conference Chairs**
- Zbigniew Brzózka – *Warsaw University of Technology, POLAND*
- Elżbieta Jastrzębska – *Warsaw University of Technology, POLAND*

## Plenary Presentation I

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

**Hall C**

**08:30** **MICROFLUIDICS FOR CLINICAL DIAGNOSTICS AND ENVIRONMENTAL ANALYSIS IN RESOURCE-LIMITED SETTINGS**
Nicole Pamme
*Stockholm University, SWEDEN*

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

## Session 1A1 - Hypoxia-on-a-Chip

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

**Hall C**

**09:30** **BRACHYTHERAPY ON-A-CHIP: A SIMPLE, PRECISE, AND CLINICALLY-RELEVANT APPROACH FOR RADIOTHERAPY TESTING IN 3D BIOLOGY**
Rodin Chermat[1,2,3], Elena Refet-Mollof[1,2,3], Yuji Kamio[2,5], Jean-François Carrier[2,3,4,5], Philip Wong[2,3,6], and 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] *Université de Montréal, CANADA,* [5] *Centre Hospitalier de l'Université de Montréal (CHUM), CANADA, and* [6] *University Health Network, CANADA*

**09:50** **INTERPLAY BETWEEN DRUG RESISTANCE AND MITOCHONDRIA MORPHOLOGY IN A TUMOR-ON-CHIP MODEL UNDER PRECISE OXYGEN CONTROL**
Charlotte Bouquerel[1,2], Mathieu Deygas[1], Linda Meddahi[1], Bertrand Cinquin[3], Géraldine Gentric[1], Giacomo Gropplero[1], William César[2], Fatima Mechta-Grigoriou[1], Gérard Zalcman[1], Nathalie Mazure[4], Maria Carla Parrini[1], and Stephanie Descroix[1]
[1] *Institut Curie, FRANCE,* [2] *Fluigent, FRANCE,* [3] *Institut Pierre Gilles de Gennes, FRANCE, and* [4] *INSERM, FRANCE*

**10:10** **A MICROFLUIDIC DEVICE TO SIMULTANEOUOSLY GENERATE SHEAR STRESS AND HYPOXIA CONDITIONS TO STUDY ENDOTHELIAL CELL MORPHOLOGY AND REACTIVE OXYGEN SPECIES BEHAVIOR**
Min-Yen Hsin[1], Yen-Cheng Hsiung[1], Kuang-Hsing Chiang[1,2], and Nien-Tsu Huang[1,3]
[1] *National Taiwan University, TAIWAN,* [2] *Taipei Medical University, TAIWAN, and* [3] *National Taiwan University, TAIWAN*

## Session 1B1 - Single Cell Analysis I

**Chair:** Petra Ditrich, *ETH Zurich, SWITZERLAND*

**Auditorium**

**09:30** **THREE-DIMENSIONAL ISOTROPIC IMAGING OF LIVE SUSPENSION CELLS BASED ON DROPLET MICROVORTICES**
Braulio Cardenas Benitez, Xuhao Luo, Erin Rhee, Shehreen T. Hassan, Richard Hurtado, Abigail F. Howe, and Abraham P. Lee
*University of California, Irvine, USA*

**09:50** **LIVE FLUOROSPOT: HIGH-THROUGHPUT SYSTEM FOR REAL-TIME SINGLE-CELL SECRETION IMAGING WITH OPTICAL WAVEGUIDE CHIP**
Zhuohao Yang[1], Mai Yamagishi[2], Nobutake Suzuki[2], Yuto Kurisu[1], Koji Nagaoka[1], Kazuyo Moro[3], Kazuhiro Kakimi[4], Etsushi Kuroda[5], Shinya Sakuma[6], Takashi Funatsu[1], and Yoshitaka Shirasaki[1]
[1]*University of Tokyo, JAPAN,* [2]*Live Cell Diagnosis, Ltd., JAPAN,* [3]*Institute of Physical and Chemical Research (RIKEN), JAPAN,* [4]*Kindai University, JAPAN,* [5]*Hyogo College of Medicine, JAPAN, and* [6]*Kyushu University, JAPAN*

**10:10** **HIGH-SPEED REPETITIVE OSMOTIC STIMULATIONS TO A SIGNLE CELL BY UTILIZING MICRO-VORTICES**
Makoto Saito, Yoko Yamanishi, and Shinya Sakuma
*Kyushu University, JAPAN*

## Session 1C1 - Biomolecular Detection I

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

**Ballroom B**

**09:30** **A MICROFLUIDIC DEVICE COMBINING COMPETITIVE NON-SELEX METHOD WITH WASHING STRINGENCY CONTROL FOR SELECTING FOLATE RECEPTOR ALPHA APTAMERS**
Yi-Da Chung and Gwo-Bin Lee
*National Tsing Hua University, TAIWAN*

**09:50** **MEDIATOR PROBE-BASED MULTIPLEX DIGITAL METHYLATION-SPECIFIC PCR FOR SENSITIVE DETECTION AND METHYLATION ANALYSIS OF BIOMARKER PANELS**
Weiwen Cui, Fan-En Chen, Yang Zhao, and Tza-Huei Wang
*Johns Hopkins University, USA*

**10:10** **PIXELATED CHEMICAL DISPLAYS AS A TOOL FOR STUDYING THE DYNAMICS OF THE NOTCH CELLULAR SIGNALING PATHWAY**
Maude Proulx[1], Pierre Clapperton-Richard[1], Laurent Potvin-Trottier[2], and Thomas Gervais[1]
[1]*Polytechnique Montréal, CANADA and* [2]*Concordia University, CANADA*

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

## Session 1A2 - Microfluidic Flow Cytometry

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

**Hall C**

**11:00** **IMPEDANCE FLOW CYTOMETRY BASED ON CONSTRICTIONAL MICROCHANNELS AND DEEP LEARNING**
Huiwen Tan[1,2], Xiao Chen[1,2], Xukun Huang[1,2], Deyong Chen[1,2], Junbo Wang[1,2], and Jian Chen[1,2]
[1]*Chinese Academy of Sciences, CHINA and* [2]*University of Chinese Academy of Sciences, CHINA*

**11:20** **MULTI-COLOR AND MULTI-DELAY, TWO-DIMENSIONAL FLOW CYTOMETRY FOR MULTI MARKER IDENTIFICATION AND DISCRIMINATION OF FLUORESCENCE AND SCATTERING**
Kunihiko Iizuka[1,2], Masaki Ueno[1], and Soo Hyeon Kim[1]
[1]*University of Tokyo, JAPAN and* [2]*Lab Arco Limited, JAPAN*

**11:40** **IMAGING CYTOMETRY USING ELECTRICAL IMPEDANCE TRIGGERED FLASH**
Ishita Bansal, Shamibrota K. Roy, Kaushik Basu, and Prosenjit Sen
*Indian Institute of Science, INDIA*

**12:00** **IMPEDANCE FLOW CYTOMETRY BASED SINGLE CELL SORTING AND DESALTING FOR MASS SPECTROMETRY**
Junwen Zhu, Yongxiang Feng, Peng Zhao, Huichao Chai, Fei Liang, and Wenhui Wang
*Tsinghua University, CHINA*

## Session 1B2 - Single Cell Analysis II

**Chair:** Jose L. Garcia Cordero, *Institute of Human Biology, SWITZERLAND*

**Auditorium**

**11:00** **A NOVEL HIGH-THROUGHPUT INTRACELLULAR DELIVERY PLATFORM FOR HIGHLY EFFICIENT "OFF-THE-SHELF" NATURAL KILLER CELL-BASED IMMUNOTHERAPY**
Hyelee Kim[1], Mujin Lee[2], Bohwa Han[2], Junsang Doh[2], and Aram J. Chung[1]
[1]*Korea University, KOREA and* [2]*Seoul National University, KOREA*

**11:20** **DENDRIMERIC DNA COORDINATE BARCODING DESIGN FOR SPATIAL RNA SEQUENCING**
Jiao Cao and Lingling Wu
*Xiamen University, CHINA*

**11:40** **A MICROFLUIDIC ASSAY FOR SINGLE CELL MICRORNA QUANTIFICATION IN NON-INVASIVELY SAMPLED PRIMARY HUMAN CELLS**
Vanessa Ho, Jonathan R. Baker, Keith R. Willison, Peter J. Barnes, David R. Klug, and Louise E. Donnelly
*Imperial College London, UK*

**Session 1B2 - Single Cell Analysis II (continued)**

**12:00** **ELASTOMICS: HIGH-THROUGHPUT MECHANICAL PHENOTYPING AND TRANSCRIPTOMICS OF SINGLE CELLS**
Akifumi Shiomi[1], Taikopaul Kaneko[1], Kaori Nishikawa[1], and Hirofumi Shintaku[1,2]
[1]*Institute of Physical and Chemical Research (RIKEN), JAPAN and* [2]*Kyoto University, JAPAN*

## Session 1C2 - Permeability
**Chair:** Carolyn Ren, *University of Waterloo, CANADA*

**Ballroom B**

**11:00** **LIPOSOME BUDDING: MICROFLUIDIC GENERATION OF MONODISPERSE LIPOSOMES**
Jiajue Ji and Ryuji Kawano
*Tokyo University of Agriculture and Technology, JAPAN*

**11:20** **SHAPE-CONTROLLED LIPID BILAYER FOR ENHANCED ION CHANNEL INCORPORATION**
Hisatoshi Mimura[1], Toshihisa Osaki[1,2], Sho Takamori[1], Kenji Nakao[2], and Shoji Takeuchi[1,3]
[1]*Kanagawa Institute of Industrial Science and Technology, JAPAN,* [2]*MAQsys Inc., JAPAN, and* [3]*University of Tokyo, JAPAN*

**11:40** **MALE AND FEMALE HUMAN-MIMETIC ARTIFICIAL CELL MEMBRANES TO ASSESS PASSIVE PERMEABILITY IN THE SMALL INTESTINE USING MICROFLUIDIC TECHNOLOGIES**
Kirandeep Gill, Jaime Korner, and Katherine Elvira
*University of Victoria, CANADA*

**12:00** **SYNTHESIS AND ISOLATION OF METAL COMPLEX-CONTAINING PROTEINS BY SUPER WATER REPELLENT DOUBLY REENTRANT STRUCTURE UMBRELLA PILLAR ARRAY**
Daiki Tanaka[1], Masashi Kobayashi[1], Risa Fujita[1], Takashiro Akitsu[2], Takashi Tanii[1], Masahiro Furuya[1], Tetsushi Sekiguchi[1], and Shuichi Shoji[1]
[1]*Waseda University, JAPAN and* [2]*Tokyo University of Science, JAPAN*

**12:20 - 13:30** **Lunch**

## Industrial Stage 1
**Chair:** Lisa Muiznieks, *ELVESYS, FRANCE*

**Auditorium**

**12:25** **1a - CHALLENGES OF DEVELOPING HIGH-PRECISION FLUID MANAGEMENT PRODUCTS BASED ON STATE-OF-THE-ART TECHNOLOGIES FOR LIFE SCIENCES AND DIAGNOSTICS**
Bruno Charléty
*Fluigent, FRANCE*

**12:45** **1b - WHERE PHOTONICS MEET MICROFLUIDICS – CONSUMABLES FOR LIFE SCIENCES MADE OF GLASS**
Tobias Bauert
*IMT Microtechnologies, SWITZERLAND*

**Industrial Stage 1 (continued)**

**13:05** **1c - STANDARDIZATION LEADING MICROFLUIDICS TOWARDS LABORATORY ROUTINE**
Claudia Gärtner
*microfluidic ChipShop GmbH, GERMANY*

## Analytical Chemistry - Young Innovator Award Presentation

**Hall C**

**13:30** **To Be Announced**
Govind Kaigala
*University of British Columbia, CANADA*

## Plenary Presentation II

**Chair:** Amy Herr, *University of California, Berkeley, USA*

**Hall C**

**13:50** **ORGAN-ON-CHIP MODELS FOR BIOLOGICAL AND MEDICAL APPLICATIONS**
Séverine Le Gac
*University of Twente, NETHERLANDS*

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

**14:35 - 16:35** **Poster Session 1 and Exhibit Inspection**
Presentations are listed by topic category with their assigned number starting on page 45.

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

## Session 1A4 - Extracellular Matrix

**Chair:** Hiroaki Suzuki, *Chuo University, JAPAN*

**Hall C**

**16:35** KEYNOTE PRESENTATION
**ENGINEERING EXTRACELLULAR MATRIX: COMPONENTS, MECHANICS, AND ARCHITECTURE**
Pilnam Kim
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**17:05** **A PATTERNING TECHNIQUE FOR MICRO-CRIMPED COLLAGEN SHEETS WITH TUNABLE TENSILE PROPERTIES**
Yuming Zhang
*University of Toronto, CANADA*

**17:25** **TISSUE-M2: TUNABLE IN SITU SYNTHESIS OF ULTRA-THIN EXTRACELLULAR MATRIX-DERIVED MEMBRANES**
Jeremy Newton, Siwan Park, and Edmong W.K. Young
*University of Toronto, CANADA*

## Session 1A4 - Extracellular Matrix (continued)

**17:45** **IN-FLOW FORMATION OF COLLAGEN MICROGELS FOR REDUCED CONTRACTION IN LONG-TERM TISSUE CULTURE**
Sushant Singh, Teodor Veres, and Axel Guenther
*University of Toronto, CANADA*

## Session 1B4 - Blood Processing

**Chair:** Daniel Irimia, *Massachusetts General Hospital, Harvard Medical School, USA*

**Auditorium**

**16:35** KEYNOTE PRESENTATION
**BLOOD MICROFLUIDICS: FROM FRACTIONATION TO LIQUID BIOPSY**
Ian Papautsky
*University of Illinois, Chicago, USA*

**17:05** **ACOUSTOPHORESIS ENRICHMENT OF TUMOR CELL CLUSTERS IN BLOOD OF PATIENTS WITH METASTATIC PROSTATE CANCER**
Cecilia Magnusson[1], Per Augustsson[1], Eva Undvall Anand[1], Andreas Lenshof[1], Andreas Josefsson[2,3], Anders Bjartell[1], Yvonne Ceder[1], Hans Lilja[1,4], and Thomas Laurell[1]
[1]*Lund University, SWEDEN,* [2]*Gothenburg University, SWEDEN,* [3]*Umeå University, SWEDEN, and* [4]*Memorial Sloan-Kettering Cancer Center, USA*

**17:25** **INERTIAL ISOLATION OF LEUKOCYTES FROM ULTRA-LOW VOLUME BLOOD SAMPLES OBTAINED BY FINGERSTICK**
Roberto Rodriguez-Moncayo[1], John-Alexander Preuss[2], Janina Bahnemann[2], Jongyoon Han[1], and Joel Voldman[1]
[1]*Massachusetts Institute of Technology, USA and*
[2]*University of Augsburg, GERMANY*

**17:45** **RARE CELL ENRICHMENT BY CELL SELF-ORGANIZATION IN ACOUSTIC FIELDS**
Richard Soller, Ola Jakobsson, and Per Augustsson
*Lund University, SWEDEN*

## Session 1C4 - Wearable and Diagnosis

**Chair:** Artur Dybko, *Warsaw University of Technology, POLAND*

**Ballroom B**

**16:35** KEYNOTE PRESENTATION
**WEARABLE MICROFLUIDIC SENSING TECHNOLOGIES FOR HEALTHCARE APPLICATIONS**
Chwee Teck Lim
*National University of Singapore, SINGAPORE*

**17:05** **ARAUCARIA LEAF-INSPIRED MICROFLUIDIC PATCH FOR HIGHLY EFFICIENT SWEAT COLLECTION AND ANALYSIS**
Yifan Li[1,2], Sixuan Duan[1,2], Shuhe Liu[1], Kai Hoettges[1,2], Quan Zhang[1,2], Mark Leach[1,2], and Pengfei Song[1,2]
[1]*Xi'an Jiaotong-Liverpool University, CHINA and*
[2]*University of Liverpool, UK*

**Session 1C4 - Wearable and Diagnosis (continued)**

**17:25** **TEOS-COATED SERS MASK PATCH FOR LUNG CANCER BIOMARKER DETECTION IN EXHALED BREATH AEROSOL**
Sejin Lee, Sangyeon Lee, and Ki-hun Jeong
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**17:45** **QUANTUM SENSING MEETS LAB-ON-A-CHIP**
Robin D. Allert[1], Fleming Bruckmaier[1], Nick R. Neulig[1], Phillip Amrein[2], Sebastian Littin[2], Fabian A. Freire-Moschovitis[1], Kristina S. Liu[1], Karl D. Briegel[1], Claudia Schrepel[3], Philipp Schätzle[4], Peter Knittel[5], Martin Hermans[3], Maxim Zaitsev[2], and Dominik B. Bucher[1]
[1] *Technical University of Munich, GERMANY,* [2] *University Medical Center Freiburg, GERMANY,* [3] *LightFab GmbH, GERMANY,* [4] *University of Freiburg, GERMANY, and* [5] *Fraunhofer Institute for Applied Solid State Physics, GERMANY*

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|---|---|
| **18:05** | **Adjourn for the Day** |
| **18:15 - 19:45** | **Student Mixer** |
| **18:15 - 22:30** | **Women in Microfluidics Event** |

# TUESDAY AT A GLANCE

| | | | |
|---|---|---|---|
| 08:15-08:30 | Announcements | | |
| 08:30-09:15 | **Plenary Presentation III**<br>Manabu Tokeshi – *Hokkaido University, JAPAN* | | |
| 09:15-09:35 | **Lab on a Chip and Dolomite – Pioneers of Miniaturization Lectureship Prize and Presentation** | | |
| 09:35-09:50 | Transition | | |
| 09:50-11:10 | **Session 2A1**<br>**Cardiac & Stem-Derived Cells** | **Session 2B1**<br>**Pathogens Analysis** | **Session 2C1**<br>**Electrochemical Detection** |
| 11:10-11:40 | Break: Exhibit and Poster Inspection | | |
| 11:20-11:40 | **Science Speed Dating** | | |
| 11:40-12:40 | **Special Focus Session – Organoids**<br>**SPEAKERS**<br>Leonora Bużańska and Milica Radisic | | |
| 12:40-13:50 | Lunch | | |
| 12:45-13:45 | Industrial Stage 2 | | |
| 13:50-15:10 | **Session 2A3**<br>**Vascularization-on-a-Chip** | **Session 2B3**<br>**Droplets** | **Session 2C3**<br>**Bacteria Analysis** |
| 15:10-17:10 | Poster Session 2 and Exhibit Inspection | | |
| 16:40-17:10 | Break | | |
| 17:10-18:40 | **Session 2A4**<br>**Cell/Organ-on-a-Chip I** | **Session 2B4**<br>**Optical Detection** | **Session 2C4**<br>**Single Cell Analysis III** |
| | **KEYNOTE**<br>Agnieszka Żuchowska | **KEYNOTE**<br>Wouter van der Wijngaart | **KEYNOTE**<br>Aram Chung |



# TUESDAY, 17 OCTOBER

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

## Plenary Presentation III

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

**Hall C**

**08:30** **DEVELOPMENT OF FUNCTIONAL LIPID NANOPARTICLES USING MICROFLUIDIC DEVICES**
Manabu Tokeshi
*Hokkaido University, JAPAN*

**Lab on a Chip and Dolomite - Pioneers of Miniaturization Lectureship Prize and Presentation**

**Hall C**

**09:15** **To Be Announced**

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

## Session 2A1 - Cardiac & Stem-Derived Cells

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

**Hall C**

**09:50** **NOVEL LAB-ON-A-CHIP SYSTEM: MECHANICAL STIMULATION OF CARDIAC CELLS VIA MAGNETIC NANOFIBERS AND ALTERNATING MAGNETIC FIELDS**
Dominik Kołodziejek, Oliwia Tadko, Marcin Drozd, Michał Wojasiński, Iwona Łopianiak, and Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

**10:10** **THE HYBRID CANTILEVER OF CONDUCTIVE GRAPHENE AND SU-8 FOR IMPROVING THE MATURITY AND ELECTRICAL COUPLING OF CARDIOMYOCYTES**
Longlong Li[1], Jong-Yun Kim[1], Daeyun Lim[2], Chil-Hyoung Lee[2], and Dong-Weon Lee[1]
[1]*Chonnam National University, KOREA and* [2]*Korea Institute of Industrial Technology, KOREA*

**10:30** **PULSE FREQUENCY-DEPENDENT MATURATION OF HUMAN IPS-DERIVED CARDIAC MICROFIBER BY ELECTRICAL STIMULATION**
Akari Masuda[1], Jumpei Muramatsu[1], Shun Itai[1], Yuta Kurashina[2], Shugo Tohyama[1], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*Tokyo University of Agriculture and Technology, JAPAN*

**10:50** **LABEL-FREE SINGLE CELL IMPEDANCE ANALYSIS OF IPSC-DERIVED SPINAL CORD PROGENITOR CELLS FOR RAPID SAFETY AND EFFICACY PROFILING**
Linwei He[1], Jerome Tan[1,2], Shi Yan Ng[3], King Ho Holden Li[1], Jongyoon Han[2,4], Sing Yian Chew[1,2], and Han Wei Hou[1,2]
[1]*Nanyang Technological University, SINGAPORE,* [2]*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,* [3]*Agency for Science, Technology and Research (A*STAR), SINGAPORE, and* [4]*Massachusetts Institute of Technology, USA*

## Session 2B1 - Pathogens Analysis

**Chair:** Yoon-Kyoung Cho, *IBS (Institute for Basic Science), KOREA*

**Auditorium**

**09:50** **PORTABLE HIGHLY MULTIPLEXED PROBE-MELT PCR PLATFORM FOR RAPID IDENTIFICATION AND ANTIMICROBIAL RESISTANCE GENOTYPING**
Fan-En Chen, Alexander Trick, and Jeff Wang
*Johns Hopkins University, USA*

**10:10** **ON-DISC DNA EXTRACTION AND LAMP AMPLIFICATION FOR PLANT PATHOGEN DETECTION ENABLED BY DIGITAL ROTATIONALLY ACTUATED VALVES**
David Kinahan[1], Rohit Mishra[1], Lourdes Julius[1], Jack Condon[1], Patricija Pavelskopfa[1], Philip Early[1], Matthew Dorian[1], Katarina Mrvova[1], Grace Henihan[1], Faith Mangwanya[1], Tanya Dreo[2], and Cor Schoen[3]
[1]*Dublin City University, IRELAND,* [2]*National Institute of Biology, SLOVENIA, and* [3]*Wageningen University Research, NETHERLANDS*

**10:30** **MICROFLUIDIC DEVICE COUPLED WITH PLASMONIC HOT-SPOT CATALYSIS FOR RAPID PATHOGEN NUCLEIC ACID DETECTION**
Tamer AbdElFatah, Mahsa Jalali, Sripadh Guptha Yedire, Imman I. Hosseini, Carolina del Real Mata, Haleema Khan, Seyed Vahid Hamidi, Olivia Jeanne, Roozbeh Siavash Moakhar, Myles Mclean, Dhanesh PatelZhen Wang, Geoffrey McKay, Mitra Yousefi, Dao Nguyen, Silvia M. Vidal, Chen Liang, and Sara Mahshid
*McGill University, CANADA*

**10:50** **ELECTROSTATIC MICROFILTRATION-BASED ENRICHMENT OF LOW-ABUNDANCE PATHOGENS FROM LARGE-VOLUME SAMPLES IMPROVES THE DETECTION PERFORMANCE OF AMPLIFICATION-FREE NANOPORE SEQUENCING**
Yaoping Liu[1], Patrina Wei Lin Chua[1], Sharon Yan Han Ling[1], Joshua Raymond[1], James Strutt[1], Cheryl Siew Choo Chan[1], Peiying Ho[1], Megan Mcbee[1], Rohan Williams[1,2], Stacy L. Springs[1,3], and Jongyoon Han[1,3]
[1]*Singapore - MIT Alliance for Research and Technology (SMART), SINGAPORE,* [2]*National University of Singapore, SINGAPORE, and* [3]*Massachusetts Institute of Technology (MIT), USA*

## Session 2C1 - Electrochemical Detection

**Chair:** Elizaveta Vereshchagina, *SINTEF Digital, NORWAY*

**Ballroom B**

**09:50** **ON-CHIP ELECTROCHEMICAL SENSING WITH ENHANCED DETECTING SIGNAL DUE TO CONCENTRATION-POLARIZATION BASED ANALYTE PRECONCENTRATION**
Sinwook Park[1], Daniel Kaufman[2], Hadar Ben-Yoav[2], and Gilad Yossifon[1]
[1]*Tel Aviv University, ISRAEL and* [2]*Ben-Gurion University of the Negev, ISRAEL*

**Session 2C1 - Electrochemical Detection (continued)**

**10:10** **SUPER-NERNSTIAN PHOSPHORUS ION SENSITIVE FIELD EFFECT TRANSISTOR VIA EUROPIUM ION PROBE**
Yingming Xu, Peng Zhou, Terrence Simon, and Tianhong Cui
*University of Minnesota, USA*

**10:30** **SINGLE-CELL ELECTRIC IMPEDANCE SENSOR BASED ON INTEGRATED CIRCUIT CHIP**
Wenhao Hui[1], Aman Lyu[1], Yingying Liu[1], Pui-In Mak[1], P. Martins Rui[1,2], K-Meng Lei[1], and Yanwei Jia[1]
[1]*University of Macau, CHINA and* [2]*Universidade de Lisboa, PORTUGAL*

**10:50** **POINT-OF-CARE NUCLEIC ACID TESTING WITH A ONE-STEP BRANCHED DNA-BASED BIOSENSOR**
Xueqi Wang and Han Wang
*Tsinghua University, CHINA*

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

**11:20 - 11:40** **Science Speed Dating**

**Special Focus Session - Organoids**
**Chair:** Pilnam Kim, *Korea Advanced Institute of Science & Technology (KAIST), KOREA*

**Hall C**

**11:40** **EMERGING HUMAN BRAIN ORGANOID FIELD TO MODEL EARLY DEVELOPMENT AND PATHOLOGY**
Leonora Bużańska
*Polish Academy of Sciences, POLAND*

**12:10** **ORGANOIDS AND ORGANS-ON-A-CHIP: FROM TOXICITY TESTING TO PERSONALIZED MEDICINE**
Milica Radisic
*University of Toronto, CANADA*

**12:40 - 13:50** **Lunch**

**Industrial Stage 2**

**Auditorium**

**12:45** **2a - BIOCOMPATIBLE, HIGH- RESOLUTION, 3D PRINTING IN THE PRESENCE OF LIVING CELLS**
Henrik Akesson
*UpNano GmbH, AUSTRIA*

**13:05** **2b - TWO-PHOTON-POLYMERIZATION AS THE KEY ENABLING TECHNOLOGY FOR LIFE SCIENCES**
Alexander Legant
*Nanoscribe GmbH & Co. KG, GERMANY, AUSTRIA*

**13:25** **2c - A GENERIC MICROFLUIDIC CONNECTION SYSTEM BECOMES A REALITY**
Henne van Heeren
*The Microfluidics Association, NETHERLANDS*

## Session 2A3 - Vascularization-on-a-Chip

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

**Hall C**

**13:50** **A VASCULARIZED MULTI-COMPOSITION TUMOR ARRAY BIOPRINTED ON A MICROFLUIDIC CELL CULTURE AND DRUG SCREENING SYSTEM FOR MULTIVARIABLE ANALYSIS**
Gihyun Lee, Soo Jee Kim, and Je-Kyun Park
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**14:10** **PERSONALIZED ARTERIAL-WALL-ON-A-CHIP FOR ASSESSMENT OF VASCULAR DYSFUNCTION AND RISK STRATIFICATION IN TYPE 2 DIABETES MELLITUS**
Hiromi Takahashi[1], Hong Boon Ong[1], Chengxun Su[1], Rijan Gurung[2], Andrew Mark Choong[2,3], Rinkoo Dalan[4], Roger Foo[2,3], Derek Hausenloy[5,6], and Han Wei Hou[1,4]
[1]*Nanyang Technological University, SINGAPORE,* [2]*National University of Singapore, SINGAPORE,* [3]*National University Heart Centre, SINGAPORE,* [4]*Tan Tock Seng Hospital, SINGAPORE,* [5]*Duke-National University of Singapore Medical School, SINGAPORE, and* [6]*National Heart Research Institute, SINGAPORE*

**14:30** **A VASCULAR MICROPHYSIOLOGICAL SYSTEM WITH A DEFINED INJURY SITE FOR COAGULATION**
Halston Deal[1,2], Jack Twiddy[1,2], Kimberly Nellenbach[1,2], Anastasia Sheridan[1,2], Ashley Brown[1,2], and Michael Daniele[1,2]
[1]*North Carolina State University, USA and*
[2]*University of North Carolina, Chapel Hill, USA*

**14:50** **ENGINEERING AUTOLOGOUS VASCULARIZED THROMBUS IMPLANTS FOR ENHANCING CUTANEOUS WOUND HEALING**
Su Hyun Jung, Bong Hwan Jang, Seyong Kwon, Sung Jin Park, Tae-Eun Park, and Joo H. Kang
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

## Session 2B3 - Droplets

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

**Auditorium**

**13:50** **HIGH-THROUGHPUT DROPLET-PRINTING OF CONCENTRATION GRADIENTS FOR MULTIMODAL FLUORESCENCE- AND MALDI-MS ANALYSIS**
Maximilian Breitfeld, Claudius L. Dietsche, Mario A. Saucedo-Espinosa, Simon F. Berlanda, and Petra S. Dittrich
*ETH Zürich, SWITZERLAND*

**14:10** **DIGITAL DETECTION OF TUMOR-DERIVED EXTRACELLULAR VESICLES VIA CHARGE-INDUCED FUSION**
Elizabeth Maria Clarissa[1,2], Sumit Kumar[1,2], and Yoon-Kyoung Cho[1,2]
[1]*Ulsan National Institute of Science and Technology (UNIST), KOREA and* [2]*Institute of Basic Science (IBS), KOREA*

**14:30** **STIMULI-RESPONSIVE DNA ORIGAMI MICROCAPSULES**
Nagi Yamashita[1], Marcos K. Masukawa[1], Mayumi Chano[1], Yusuke Sato[2], Kanta Tsumoto[3], Kenichi Yoshikawa[4], and Masahiro Takinoue[1]
[1]*Tokyo Institute of Technology, JAPAN,* [2]*Kyushu Institute of Technology, JAPAN,* [3]*Mie University, JAPAN, and* [4]*Kyoto University, JAPAN*

**14:50** **VOICEPRINT FOR IDENTIFYING DRIPPING-JETTING TRANSITION IN A COAXIAL MICROFLUIDIC DEVICE**
Peng-Nian Chen, Jin-Jia Hu, and Chia-Hung D. Tsai
*National Yang Ming Chiao Tung University, TAIWAN*

## Session 2C3 - Bacteria Analysis

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

**Ballroom B**

**13:50** **MICROFLUIDIC CHANNELS FOR ANALYSIS OF FLAGELLAR WRAPPING MOTION OF BACTERIA**
Yoshiki Shimada, Aoba Yoshioka, Daisuke Nakane, and Tetsuo Kan
*University of Electro-Communications, JAPAN*

**14:10** **A NOVEL OPTICAL-ELECTROCHEMICAL LAB-ON-A-CHIP FOR BIOLOGICAL BEHAVIOR ACTIVATION AND MONITORING IN SINGLE BACTERIAL CELLS**
Daniel Kaufman[1], Chen Chen-Yu[2], Tsao Chen-Yu[2], Zhao Zhiling[2], Avia Lavon[1], Gregory F. Payne[2], William E. Bentley[2], and Hadar S. Ben-Yoav[1]
[1]*Ben-Gurion University in the Negev, ISRAEL and* [2]*University of Maryland, USA*

**Session 2C3 - Bacteria Analysis (continued)**

**14:30** **A MICROFLUIDIC 96-WELL ELECTROPORATION DEVICE FOR AUTOMATED, HIGH-THROUGHPUT BACTERIAL GENETIC ENGINEERING**
Po-Hsun Huang, Sijie Chen, and Cullen R. Buie
*Massachusetts Institute of Technology, USA*

**14:50** **REAL-TIME IN-SITU BACTERIAL GROWTH MONITORING USING MINIATURIZED MRI SYSTEM**
Qi Zhou[1], Shuhao Fan[1], Ka-Meng Lei[1], Donhee Ham[2], Rui P. Martins[1,3], and Pui-In Mak[1]
[1]*University of Macau, MACAO,* [2]*Harvard University, USA, and* [3]*Universidade de Lisboa, PORTUGAL*

**15:10 - 17:10** **Poster Session 2 and Exhibit Inspection**
Presentations are listed by topic category with their assigned number starting on page 45.

**16:40 - 17:10** **Break**

**Session 2A4 - Cell/Organ-on-a-Chip I**
**Chair:** Albert van den Berg, *University of Twente, NETHERLANDS*

**Hall C**

**17:10** **KEYNOTE PRESENTATION**
**CELL AND ORGAN-ON-CHIP APPROACHES IN CANCER RESEARCH**
Agnieszka Żuchowska
*Warsaw University of Technology, POLAND*

**17:40** **UNIVERSAL, HIGH-TROUGHPUT PLATFORM FOR THE MONITORING OF CELL BEHAVIOURS CONTROLING FUNDAMENTAL CELL INTERACTIONS**
Enrique Azuaje-Hualde, Naiara Lartitegi-Meneces, Juncal Alonso-Cabrera, Yara Alvarez Braña, Marian M. de Pancorbo, Fernando Benito-Lopez, and Lourdes Basabe-Desmonts
*University of the Basque Country, SPAIN*

**18:00** **SEMI TUBULAR ORGAN-ON-CHIP WITH TUBELESS PERFUSION**
Blanca del Pozo[1], Marta Ollé[2], Jonatan Cucala[2], Lourdes Gombay[2], Pooya Azizian[1], and Joan M. Cabot[1]
[1]*Leitat Technological Center, SPAIN and* [2]*ReadyCell SL, SPAIN*

**18:20** **OPEN MICROFLUIDIC PLATFORM FOR CO-CULTURING TUMOR SPHEROIDS AND ENDOTHELIAL CELLS IN A 3D ENVIRONMENT**
Jooyoung Ro[1,2], Junyoung Kim[1,2], and Yoon-Kyoung Cho[1,2]
[1]*Ulsan National Institute of Science and Technology (UNIST), KOREA and* [2]*Institute for Basic Science (IBS), KOREA*

## Session 2B4 - Optical Detection

**Chair:** Fernando Benito López, *University of the Basque Country, SPAIN*

**Auditorium**

**17:10** KEYNOTE PRESENTATION

**ADVANCEMENTS IN MICROFLUIDICS: CELL BIOPSIES, DIAGNOSTICS, AND PROGRAMMABLE MATTER**

Wouter van der Wijngaart

*KTH Royal Institute of Technology, SWEDEN*

**17:40** **NON-INVASIVE INTERFERENCE-BASED PROBE OF THE NANO-SCALE SURFACE ROUGHNESS OF LIVING CELLS**

Jose C. Contreras-Naranjo, Arul Jayaraman, and Victor M. Ugaz

*Texas A&M University, USA*

**18:00** **CRITICALLY AMPLIFIED HYDROGEL SENSORS FOR BIOCHEMICAL DETECTION**

Haitao Zhao[1,2], Sijun Pan[2], and Huilin Shao[2]

[1] *Northwestern Polytechnical University, CHINA and*
[2] *National University* of *Singapore, SINGAPORE*

**18:20** **DUAL-TARGET MICROFLUIDIC SYSTEM INTEGRATED WITH AN OPTICAL DETECTION MODULE FOR AUTOMATIC DIAGNOSIS OF RHEUMATOID ARTHRITIS**

Kuan-Yu Chen[1], Gwo-Bin Lee[1], Yi-Cheng Tsai[1], Feng-Chih Kuo[2], Mel S. Lee[3], and Chih-Chien Hu[4]

[1] *National Tsing Hua University, TAIWAN,* [2] *Kaohsiung Chang Gung Memorial Hospital, TAIWAN,* [3] *Paochien Hospital, TAIWAN, and* [4] *Chang Gung Memorial Hospital, TAIWAN*

## Session 2C4 - Single Cell Analysis III

**Chair:** Thomas Laurell, *Lund University, SWEDEN*

**Ballroom B**

**17:10** KEYNOTE PRESENTATION

**MICROFLUIDIC PLATFORMS FOR IMMUNOTHERAPY AND GENOME EDITING**

Aram Chung

*Korea University, KOREA*

**17:40** **MULTI-STEP DROPLET MICROFLUIDIC PLATFORM FOR HIGH-CONTENT SINGLE-CELL SEQUENCING**

Tomasz S. Kaminski[1,2], Joachim De Jonghe[2,3], and Florian Hollfelder[2]

[1] *University of Warsaw, POLAND,* [2] *University of Cambridge, UK, and* [3] *Francis Crick Institute, UK*

**18:00** **AN AUTOMATED SINGLE-CELL MICROFLUIDIC PLATFORM FOR MONOCLONAL ANTIBODY DISCOVERY**

Fatemeh Ahmadi[1], Hao Tran[1], Natasha Letourneau[1], Samuel R. Little[1], Annie Fortin[2], Anna Moraitis[2], and Steve C.C. Shih[1]

[1] *Concordia University, CANADA and* [2] *National Research Council Canada, CANADA*

**Session 2C4 - Single Cell Analysis III (continued)**

**18:20** **SINGLE-CELL ELECTROKINETICS REVEALS SURFACE-MEDIATED ATTACHMENT BETWEEN ALGAE AND BACTERIA**
Hyungseok Kim[1], Qianru Wang[2], Rhona K. Stuart[3], Xavier Mayali[3], and Cullen R. Buie[1]
[1]*Massachusetts Institute of Technology, USA,* [2]*Stanford University, USA, and* [3]*Lawrence Livermore National Laboratory, USA*

**18:40** **Adjourn for the Day**

# WEDNESDAY AT A GLANCE

| | | | |
|---|---|---|---|
| 08:15-08:30 | Announcements | | |
| 08:30-09:15 | **Plenary Presentation IV**<br>Bogusław Buszewski – *Mikolaj Kopernik University Torun, POLAND* | | |
| 09:15-09:30 | Transition | | |
| 09:30-10:30 | Session 3A1<br>Cell/Organ-on-a-Chip II | Session 3B1<br>Biomolecular Detection II | Session 3C1<br>Micromixers & Microreactors |
| 10:30-11:00 | Break: Exhibit and Poster Inspection | | |
| 11:00-12:00 | Session 3A2<br>Nucleid Acid Analysis | Session 3B2<br>Biohybrid Microrobots | Session 3C2<br>Separation |
| 12:00-13:05 | Lunch | | |
| 12:05-12:45 | Industrial Stage 3 | | |
| 13:05-13:50 | **Plenary Presentation V**<br>Lydia L. Sohn – *University of California, Berkeley, USA* | | |
| 13:50-14:00 | MicroTAS 2024 Announcement | | |
| 14:00-16:00 | Poster Session 3 and Exhibit Inspection | | |
| 15:30-16:00 | Break | | |
| 16:00-17:30 | Session 3A4<br>Neurobiology & Neuroscience | Session 3B4<br>Point-of-Care | Session 3C4<br>3D Printing |
| | KEYNOTE<br>Ashley E. Ross | KEYNOTE<br>Jacqueline Linnes | KEYNOTE<br>Rosanne Guijt |
| 19:00-22:00 | Conference Banquet | | |



# WEDNESDAY, 18 OCTOBER

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

## Plenary Presentation IV

**Chair:** Zbigniew Brzózka, *Warsaw University of Technology, POLAND*

**Hall C**

**08:30** BIOANALYTICS FROM MICRO- TO NANO- DIMENSION
Bogusław Buszewski
*Mikolaj Kopernik University Torun, POLAND*

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

## Session 3A1 - Cell/Organ-on-a-Chip II

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

**Hall C**

**09:30** **A CELL WRAPPING SEEDING TECHNIQUE TO CONSTRUCT TUBULAR ORGAN-ON-A-CHIP MODELS**
Jing Nie, Sha Lou, Andreas M.A.O. Pollet, Manon van Vegchel, Carlijn Bouten, Jaap M.J. den Toonder
*Eindhoven University of Technology, NETHERLANDS*

**09:50** **USING SELF-ASSEMBLY AND MIGRATION TO FORM TUBULAR TISSUE ENGINEERED IN VITRO MODELS OF BIOLOGICAL BARRIERS**
Seyedaydin Jalali and Ponnambalam R. Selvaganapathy
*McMaster University, CANADA*

**10:10** **NANOWIRE EMBEDDED CONDUCTING DIAPHRAGMS FOR COUPLING ELECTRICAL CUES WITH MECHANICAL STIMULATION TO PROMOTE INTERCELLULAR COMMUNICATION**
Abdullah-Bin Siddique, Aditya Rane, and Nathan Swami
*University of Virginia, USA*

## Session 3B1 - Biomolecular Detection II

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

**Auditorium**

**09:30** **TWO-STAGE TUBERCULOSIS DIAGNOSTICS FROM A SINGLE SAMPLE: COMBINING CENTRIFUGAL MICROFLUIDICS AT THE POINT-OF-CARE WITH SUBSEQUENT COMPREHENSIVE NGS ANTIBIOTIC RESISTANCE PROFILING**
Judith Schlanderer[1], Jan Lüddecke[1,2], Andrey Golubov[4], Wolfgang Grasse[5], Thomas A. Kohl[6],Christoph Metzger-Boddien[5], Stefan Niemann[6], Claudia Pilloni[4], Sara Plesnik[4], Bijendra Raya[7], Bhawana Shresta[7], Roland Zengerle[1,2], Markus Beutler[4], Harald Hoffmann[3,4], and Nils Paust[1,2]
[1]*Hahn-Schickard, GERMANY,* [2]*University of Freiburg, GERMANY,* [3]*SYNLAB Gauting, GERMANY,* [4]*IML Red GmbH, GERMANY,* [5]*gerbion, GERMANY,* [6]*Research Center Borstel, GERMANY, and* [7]*Nepal Anti-Tuberculosis Association, NEPAL*

**09:50** **COMPETITVE PCR PLATFORM FOR PRECISE NUCLEIC ACID QUANTIFICATION**
Reya Ganguly and Chang-Soo Lee
*Chungnam National University, KOREA*

**10:10** **INTEGRATION OF ENZYMATICDNA SYNTHESIS AND SEQUENCING ON DIGITAL MICROFLUIDICS FOR AUTOMATIC INFORMATION STORAGE**
Huimin Zhang
*Xiamen university, CHINA*

## Session 3C1 - Micromixers & Microreactors

**Chair:** Per Augustsson, *Lund University, SWEDEN*

**Ballroom B**

**09:30** **SPATIOTEMPORALLY GENERATED MICROVORTEXES WEAVE LAMINAR FLOW**
Makoto Saito, Niko Kimura, Yoko Yamanishi, and Shinya Sakuma
*Kyushu University, JAPAN*

**09:50** **DNA-POWERED MULTITARGET STIMULI-RESPONSIVE GEL SENSOR FOR THE SENSING OF HISTAMINE AND CAFFEINE**
Satofumi Kato[1], Yurika Ishiba[1], Masahiro Takinoue[2], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*Tokyo Institute of Technology, JAPAN*

**10:10** **PREPARATION OF MONODISPERSE DNA GELS USING VIBRATION-INDUCED FLOW**
Zhitai Huang[1], Kanji Kaneko[1], Ryotaro Yoneyama[1], Takeshi Hayakawa[1], Masahiro Takinoue[2], and Hiroaki Suizuki[1]
[1]*Chuo University, JAPAN and* [2]*Tokyo Institute of Technology, JAPAN*

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

## Session 3A2 - Nucleid Acid Analysis

**Chair:** Jean-Louis Viovy, *Institut Curie/CNRS, FRANCE*

**Hall C**

**11:00** **UTILIZING SPATIALLY-RESOLVED AND MULTIPLEXED MICRORNA QUANTIFICATION TO PREDICT DRUG RESISTANCE IN BRCA1 MUTANT TUMORS AND PREDICT THE EFFICACY OF COMBINATION THERAPY**
Omar N. Mohd[1], Yu J. Heng[2], Gerburg M. Wulf[2], Frank J. Slack[2], and Patrick S. Doyle[1]
[1]*Massachusetts Institute of Technology, USA and*
[2]*Harvard Medical School, USA*

**11:20** **MICROFLUIDICS-MEDITATED CRISPR/CAS9 DELIVERY: THE DROPLET CELL PINCHER (DCP) PLATFORM FOR EFFICIENT GENOME EDITING**
You-Jeong Kim, Da Young Yun, Ha-Sung Lee, Cheulhee Jung, and Aram J. Chung
*Korea University, KOREA*

**11:40** **EMULSION-FREE DIGITAL PCR WITH PERMEABILITY-ENGINEERED HYDROGEL CAPSULES**
Jie Li and Yifan Liu
*Shanghaitech University, CHINA*

## Session 3B2 - Biohybrid Microrobots

**Chair:** Jens Ducrée, *Dublin City University, IRELAND*

**Auditorium**

**11:00** **AN ANTAGONISTIC PAIR OF 3D CARDIAC RING TISSUES FOR SELF-BEATING BIOHYBRID ROBOT**
Tomohiro Morita, Minghao Nie, and Shoji Takeuchi
*University of Tokyo, JAPAN*

**11:20** **ELEVATED VWF LEVELS DRIVE THROMBUS INSTABILITY**
Ava M. Obenaus[1], Dang Truong[2], Junmei Chen[3], José A. López[3], and Nathan J. Sniadecki[1]
[1]*University of Washington, USA,* [2]*University of Washington Bothell, USA, and* [3]*Bloodworks Northwest Research Institute, USA*

**11:40** **LIGHT CONTROLLED BIOHYBRID MICROBOTS**
Nicola Pellicciotta[1,2], Ojus S. Bagal[1], Viridiana C. Sosa[1], Giacomo Frangipane[1,2], Gaszton Vizsnyiczai[3], and Roberto Di Leonardo[1,2]
[1]*Sapienza University of Rome, ITALY,* [2]*CNR Institute of Nanotechnology, ITALY, and* [3]*Eötvös Loránd Research Network, HUNGARY*

## Session 3C2 - Separation

**Chair:** Jonas Tegenfeldt, *Lund University, SWEDEN*

**Ballroom B**

**11:00** **DLD-BASED SINGLE CELL MASS CYTOMETRY**
Yingqi Yang, Junwen Zhu, Huichao Chai, Peng Zhao, and Wenhui Wang
*Tsinghua University, CHINA*

**11:20** **CONTINUOUS-FLOW SIZE FRACTIONATION OF SUBMICRON PARTICLES AND EXTRACELLULAR VESICLES WITH TWO-DIMENSIONAL ELECTROPHORESIS IN AN ARTIFICIAL SIEVING ARRAY**
Yang Bu, Jinhui Wang, Sheng Ni, Zechen Lu, Yusong Guo, and Levent Yobas
*Hong Kong University of Science and Technology, CHINA*

**11:40** **ENGINEERING HIGH-THROUGHPUT ELECTROKINETIC FILTRATION FOR BIOMOLECULES ENRICHMENT**
Mingyang Cui, Eric M. Wynne, and Jongyoon Han
*Massachusetts Institute of Technology, USA*

**12:00 - 13:05** **Lunch**

## Industrial Stage 3

**Chair:** Frankie Myers, *Mosaic Design Labs, USA*

**Auditorium**

**12:05** **3a - PRIMO, BIOENGINNEERING TOOL FOR 2D AND 3D CELLULAR MODELS**
Matthieu Opitz
*Alvéole – Sygnis, FRANCE*

**12:25** **3b - MULTI-ELECTRODE ARRAYS FOR CMOS BIOSENSORS**
Christine Dufour
*X-FAB MEMS Foundry GmbH, GERMANY*

## Plenary Presentation V

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

**Hall C**

**13:05** **MICROFLUIDICS FOR ASSESSING BREAST CANCER SUSCEPTIBILITY**
Lydia L. Sohn
*University of California, Berkeley, USA*

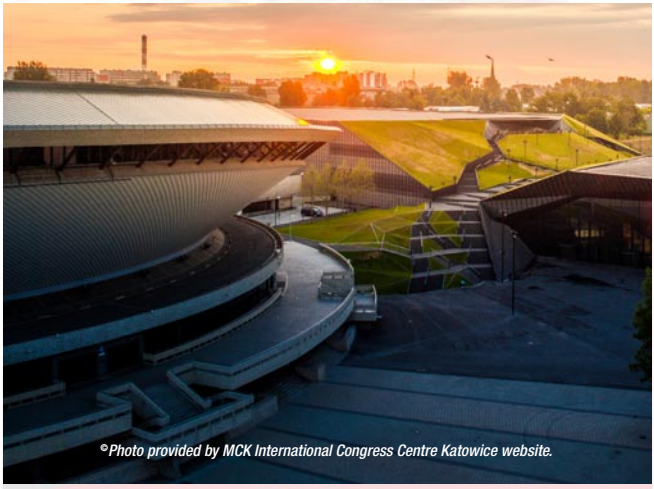
## MicroTAS 2024 Announcement

**Hall C**

**13:50** **2024 Conference Chairs**
- David Juncker, *McGill University, CANADA*
- Aaron Wheeler, *University of Toronto, CANADA*

**14:00 - 16:00** **Poster Session 3 and Exhibit Inspection**
Presentations are listed by topic category with their assigned number starting on page 45.

**15:30 - 16:00** **Break**



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## Session 3A4 - Neurobiology & Neuroscience

**Chair:** Tza-Huei (Jeff) Wang, *Johns Hopkins University, USA*

**Hall C**

**16:00** KEYNOTE PRESENTATION
**EX VIVO ORGAN-ON-CHIP PLATFORMS FOR SENSING NEURON-IMMUNE COMMUNICATION**
Ashley E. Ross
*University of Cincinnati, USA*

**16:30** **NEURAL STEM CELL SINGLE-CELL ISOLATION USING THE OPTOELECTRONIC MICROROBOT**
Mohamed Elsayed[1], Harrison Edwards[1], Filip Stojic[1], Mahmoud A. Sakr[1], Christopher Bendkowski[2], Xi Chen[1,3], Laurent Menillo[2], Shuailong Zhang[4], Michael Shaw[2], Cindi Morshead[1], and Aaron Wheeler[1]
[1]*University of Toronto, CANADA,* [2]*University College London, UK,* [3]*Harbin Institute of Technology, CHINA, and* [4]*Beijing Institute of Technology, CHINA*

**16:50** **MONITORING THE MITOCHONDRIAL NETWORK IN SH-SY5Y NEURONAL-LIKE CELLS UNDER THE INFLUENCE OF POTENTIAL DRUGS IN NEURODEGENERATIVE DISEASES**
Damian Woznica, Ewelina Kalwarczyk, Julia Anchimowicz, Weronika Switlik, and Slawomir Jakiela
*Warsaw University of Life Sciences, POLAND*

**17:10** **ELECTROCEUTICAL THERAPEUTIC TECHNOLOGY FOR AN INTRACTABLE PERIPHERAL NEUROPATHY USING A HIGH-THROUGHPUT SCREENING PLATFORM**
Aseer Intisar[1], Hyun Young Shin[1,2], Hyun Gyu Kang[1], Woon-Hae Kim[1,2], Hanwoong Woo[1], Min Young Kim[1], Yu Seon Kim[1], Yun Jeoung Mo[1], Yun-Il Lee[1], and Minseok S. Kim[1,2]
[1]*Daegu Gyeongbuk Institute of Science & Technology (DGIST), KOREA and* [2]*CTCELLS Corp., KOREA*

## Session 3B4 - Point-of-Care

**Chair:** Michal Chudy, *Warsaw University of Technology, POLAND*

**Auditorium**

**16:00** KEYNOTE PRESENTATION
**PAPER-BASED MOLECULAR DIAGNOSTICS FOR PATHOGEN DETECTION AT THE EXTREME POINTS-OF-CARE**
Jacqueline Linnes
*Purdue University, USA*

**Session 3B4 - Point-of-Care (continued)**

**16:30** **INTEGRATING A CHIMERIC BINJARI VIRUS NANOTECHNOLOGY INTO PAPER-BASED ASSAYS FOR POC DETECTION OF FLAVIVIRAL INFECTIONS IN VETERINARY APPLICATIONS**
Ryan A. Johnston[1], Gervais Habarugira[1], Sally Isberg[1], Jessica Harrison[1], Mahali Morgan[1], Lorna Melville[1], Steven Davis[1], Christopher Howard[1], Charles Henry[2], Paul Hick[1], Peter Kirkland[1], Helle Bielefeldt-Ohmann[1], Roy A Hall[1], and Jody Hobson-Peters[1]
[1]*University of Queensland, AUSTRALIA and*
[2]*Colorado State University, USA*

**16:50** **ORIGAMI PAPER-BASED IMMUNOASSAY DEVICE WITH CRISPR/CAS12A SIGNAL AMPLIFICATION**
Hikaru Suzuki, Guodong Tong, Yuki Hiruta, and Daniel Citterio
*Keio University, JAPAN*

**17:10** **LAMP-MEDIATED CRISPR/CAS12A REACTION ON SSDNA IMMOBILIZED ITO-BASED EG-FET FOR RAPID HEPATITIS C VIRUS DETECTION**
Hsin-Ying Ho, Wei-Sin Kao, Ling-Shan Yu, and Che-Hsin Lin
*National Sun Yat-sen University, TAIWAN*

**Session 3C4 - 3D Printing**
**Chair:** Michael Breadmore, *University of Tasmania, AUSTRALIA*

**Ballroom B**

**16:00** **KEYNOTE PRESENTATION**
**3D PRINTING MEMBRANE INTEGRATED DEVICES**
Rosanne Guijt
*Deakin University, AUSTRALIA*

**16:30** **TUNA STEP: A TUNABLE STEP EMULSIFICATION FOR DYNAMIC CONTROL OF DROPLET VOLUME TO 3D PRINT FUNCTIONALLY GRADED MATERIALS**
Francesco Nalin[1], Maria Celeste Tirelli[1], Witold Postek[2], Piotr Garstecki[1], and Marco Costantini[1]
[1]*Polish Academy of Sciences, POLAND and*
[2]*Broad institute of MIT and Harvard, USA*

**16:50** **DIGITAL MANUFACTURING OF MICROFLUIDIC SYSTEMS USING ULTRALOW-COST LCD PHOTOPOLYMERIZATION 3D PRINTERS FOR WIDESPREAD ADOPTION**
Houda Shafique, Vahid Karamzadeh, Yonatan Morocz, Andy Ng, and David Juncker
*McGill University, CANADA*

**17:10** **HYBRID BIOFABRICATION OF MULTILAYERED HIGH-RESOLUTION CONSTRUCTS USING NATURAL AND LOW-VISCOSITY BIOINKS**
Soo Jee Kim, Gihyun Lee, and Je-Kyun Park
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**17:30** **Adjourn for the Day**

## Conference Banquet

### Spodek

**19:00 – 22:00**

No conference is complete without a banquet. This year's banquet will be held in one of the most recognizable buildings in Poland, which is the "Spodek" in Katowice.

As of the printing of this program, there are a few tickets remaining for purchase. Please visit the Onsite Conference Registration Desk for availability.

# THURSDAY AT A GLANCE

| | | | |
|---|---|---|---|
| 08:30-09:15 | **Plenary Presentation VI**<br>Artur Chmielewski – *National Aeronautics and Space Administration (NASA), USA and California Institute of Technology, USA* | | |
| 09:15-09:35 | **Microsystems & Nanoengineering/Springer Nature – Test of Time Award** | | |
| 09:35-09:50 | **Transition** | | |
| 09:50-11:20 | **Session 4A1**<br>**Cell-on-a-Chip & Pathogens**<br>**KEYNOTE**<br>Krzysztof Pyrć | **Session 4B1**<br>**Microvalves & Delivering**<br>**KEYNOTE**<br>David Juncker | **Session 4C1**<br>**Space Exploration**<br>**KEYNOTE**<br>Lourdes Basabe |
| 11:20-11:50 | **Break and Exhibit 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>• **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, 19 OCTOBER

## Plenary Presentation VI

**Chair:** Jan Dziuban, *Wroclaw University of Science and Technology, POLAND*

**Hall C**

08:30 **HOW MICRODEVICES REVOLUTIONIZE DEEP SPACE EXPLORATION**
Artur Chmielewski
*National Aeronautics and Space Administration (NASA), USA and California Institute of Technology, USA*

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

**Hall C**

**09:15** **DESIGNING FOR TRANSLATION OF SINGLE-CELL BIOLOGY TOOLS**
Amy E. Herr
*University of California, Berkeley, USA*

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

## Session 4A1 - Cell-on-a-Chip Pathogens
**Chair:** Victor Ugaz, *Texas A&M University, USA*

**Hall C**

**09:50** **KEYNOTE PRESENTATION**
**ADVANCED MODELS FOR COMPREHENSIVE UNDERSTANDING OF VIRAL INFECTION**
Krzysztof Pyrć
*Jagiellonian University, POLAND*

**10:20** **SARS-COV-2 ELICITS A DIFFERENTIAL INNATE IMMUNE RESPONSE IN HIPSC-DERIVED AIRWAY-ON-CHIP AND ALVEOLI-ON-CHIP MODELS**
Sachin Yadav, Kazuya Fujimoto, Toru Takenaga, Yukiko Muramoto, Ryuta Mikawa, Koichi Igura, Senye Takahashi, Takeshi Noda, Shimpei Gotoh, and Ryuji Yokokawa
*Kyoto University, JAPAN*

**10:40** **ADIPOSE TISSUE MICROPHYSIOLOGICAL SYSTEM TO STUDY OBESTIY-ASSOCIATED PATHOPHYSIOLOGY**
Heejoeng Yoon, Jeong Kon Seo, and Tae-Eun Park
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

**11:00** **ADRIAMYCIN-INDUCED GLOMERULOPATHY MODEL USING HIPSC-DERIVED PODOCYTES**
Darryl Koh[1], Ayumu Tabuchi[1], Kensuke Yabuuchi[2,3], Yoshiki Sahara[2], Minoru Takasato[2,4], Kazuya Fujimoto[1], and Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN,* [2]*Institute of Physical and Chemical Research (RIKEN), JAPAN,* [3]*Osaka University, JAPAN, and* [4]*Kyoto University, JAPAN*

## Session 4B1 - Microvalves & Delivering
**Chair:** Jeroen Lammertyn, *KU Leuven, BELGIUM*

**Auditorium**

**09:50** **KEYNOTE PRESENTATION**
**DIGITAL MANUFACTURING OF FUNCTIONAL, READY-TO-USE MICROFLUIDIC SYSTEMS**
David Juncker
*McGill University, CANADA*

**Session 4B1 - Microvalves & Delivering (continued)**

**10:20** **A SINGLE-MOLECULE VALVE ENABLED BY A FLEXIBLE NANOFLUIDIC DEVICE**
Nattapong Chantipmanee[1], Hiroto Kawagishi[2], Shun-ichi Funano[3], Yo Tanaka[3], and Yan Xu[1,2]
[1]*Osaka Metropolitan University, JAPAN,* [2]*Osaka Prefecture University, JAPAN, and* [3]*Institute of Physical and Chemical Research (RIKEN), JAPAN*

**10:40** **INTEGRATED ON-CHIP GEL VALVES WITH HIGH EXPANSION RATE BY USING PARTIAL CONSTRAINT TO SUBSTRATES**
Kyoka Nakano[1], Yoshiyuki Yokoyama[2], and Takeshi Hayakawa[1]
[1]*Chuo University, JAPAN and* [2]*Toyama Industrial Technology Research and Development Center, JAPAN*

**11:00** **PROBING 3D TISSUE RHEOLOGY WITH A HIGH-THROUGHPUT MICROFLUIDIC ASPIRATION PIPETTE**
Sylvain Landiech[1], Pierre Lapèze[1], Marianne Elias[1], Morgan Delarue[1], Clément Roux[2], Fabien Mesnilgrente[1], David Bourier[1], and Pierre Joseph[1]
[1]*LAAS - CNRS, FRANCE and* [2]*Université Toulouse III, FRANCE*

## Session 4C1 - Space Exploration
**Chair:** Nicolas Verplanck, *CEA, FRANCE*

**Ballroom B**

**09:50** **KEYNOTE PRESENTATION**
**TOWARDS UNIVERSAL ANALYTICAL PLATFORMS TO STUDY BIOLOGICAL SYSTEMS**
Lourdes Basabe
*University of the Basque Country, SPAIN*

**10:20** **AN AUTOMATED AND MULTIPLEXING MICROFLUIDIC SYSTEM FOR IN-SITU BIOMARKER ANALYSIS FOR ASTRONAUT HEALTH MONITORING**
Zachary Estlack[1], Matin Golozar[2], Anna L. Butterworth[2], Richard A. Mathies[2], and Jungkyu Kim[1]
[1]*University of Utah, USA, and* [2]*University of California, Berkeley, USA*

**10:40** **MICROFLUIDIC PLATFORMS - NEW RESEARCH TOOLS FOR SPACE BIOLOGY APPLICATIONS**
Agnieszka Krakos (Podwin)[1], Patrycja Śniadek[1], Wojciech Kubicki[1], Dawid Przystupski[2], Mateusz Psurski[3], Marta Jurga[4], Julita Kulbacka[2], Rafał Walczak[1], and Jan Dziuban[1]
[1]*Wrocław University of Science and Technology, POLAND,* [2]*Wrocław Medical University, POLAND,* [3]*Polish Academy of Sciences, POLAND, and* [4]*Wrocław University of Environmental and Life Sciences, POLAND*

**11:00** **MICROFLUIDIC-BASED DIFFRACTED X-RAY TRACKING METHOD FOR PRECISE RECORDING OF ION CHANNEL MOTION IN RESPONSE TO SEQUENTIAL CHEMICAL SOLUTION CHANGES**
Yusuke Asagoe[1], Hirofumi Shimizu[2], and Yoshikazu Hirai[1]
[1]*Kyoto University, JAPAN and* [2]*University of Fukui, JAPAN*

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

## Awards Ceremony and Closing Remarks

**Hall C**

**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
- 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

**12:30** **Closing Remarks – MicroTAS 2023 Conference Chairs**

- Zbigniew Brzózka – *Warsaw University of Technology, POLAND*
- Elżbieta Jastrzębska – *Warsaw University of Technology, POLAND*

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

| MONDAY | TUESDAY | WEDNESDAY |
|---|---|---|
| 14:35 – 16:35 | 15:10 – 17:10 | 14:00 – 16:00 |

# CLASSIFICATION

(last character of poster number)

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

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

### Bioinspired, Biomimetic and Biohybrid Devices

**M001.a** **A 3D-PRINTED DEVICE FOR FOLDING STRING-SHAPED MUSCLE TISSUE TOWARD CULTURED MEAT PRODUCTION**
Jung-Chun Sun[1], Byeongwook Jo[1], Yuya Morimoto[1,2], and Shoji Takeuchi[1]
[1] *University of Tokyo, JAPAN and* [2] *Waseda University, JAPAN*

**M002.a** **BIOINSPIRED INTESTINAL MODEL BASED ON DYNAMIC AND MULTI-SCALE CURVED SUBSTRATES**
Valentin Chalut[1], Damien Le Roy[2], Delphine Delacour[3], Anne-Laure Deman[1], and Caterina Tomba[1]
[1] *Université Claude Bernard Lyon 1, FRANCE,* [2] *Institut Lumière Matière, FRANCE, and* [3] *Institut de Biologie du Développement de Marseille, FRANCE*

**M003.a** **HUMAN PLATELET MEMBRANE REACTOR FOR REMOVAL OF PATHOGENIC BIOFILMS ON NATURAL TEETH**
Mamata Karmacharya[1,2], Sumit Kumar[1,2], and Yoon-Kyoung Cho[1,2]
[1] *Ulsan National Institute of Science and Technology (UNIST), KOREA and* [2] *Institute of Basic Science (CSLM-IBS), KOREA*

**M903.a** **A VESSEL ON CHIP MODEL TO STUDY THE ROLE OF SHEAR STRESS IN VASCULAR CONDITIONS**
Swachhatoa Ghosh, Praphulla C. Shukla, and Soumen Das
*Indian institute of Technology, Kharagpur, INDIA*

**T001.a** **A LIVING SKIN DISPLAY THAT TELLS YOU WILL BE SICK**
Jun Sawayama[1], Yuki Takayama[1,3], Shogo Nagata[1], Hoshimi Aoyagi[1], Aki Takimoto[1], Miki Takase[2], Miho Ogawa[2], Makoto Takeo[2], Koji Yano[3], Shoji Takeuchi[1], Takashi Tsuji[2], and Hiroyuki Fujita[3,4]
[1] *University of Tokyo, JAPAN,* [2] *Institute of Physical and Chemical Research (RIKEN), JAPAN,* [3] *Canon Medical Systems Co., JAPAN, and* [4] *Tokyo City University, JAPAN*

**T002.a** **CONSTRUCTION OF A SKIN-COVERED ROBOTIC FINGER WITH HYDROGEL SUBCUTANEOUS SUPPORT TOWARDS LONG-TERM OPERATION IN AIR**
Keisuke Ohta[1], Minghao Nie[1], Haruka Oda[1], Yuya Morimoto[1,2], and Shoji Takeuchi[1]
[1] *University of Tokyo, JAPAN and* [2] *Waseda University, JAPAN*

**T003.a** **MICROFLUIDIC CONSTRUCTION OF ARTIFICIAL CELLS WITH MULTIPLE DNA CONDENSATES AS ORGANELLE MIMIC**
Ryotaro Yoneyama[1], Ryota Ushiyama[1], Tomoya Maruyama[2], Masahiro Takinoue[2], and Hiroaki Suzuki[1]
[1] *Chuo University, JAPAN and* [2] *Tokyo Institute of Technology, JAPAN*

**W002.a** **CORE-SHELL HYDROGEL FIBERS USING INTERFACIAL POLYELECTROLYTE COMPLEXATION FOR CELL CULTURE APPLICATIONS**
Yoshinobu Utagawa[1], Kosuke Ino[1], Masahiro Takinoue[2], and Hitoshi Shiku[1]
[1] *Tohoku University, JAPAN and* [2] *Tokyo Institute of Technology, JAPAN*

**W003.a** **REJUVENATING T CELLS TO BEAT CANCER USING ARTIFICIAL IMMUNE NICHES**
Janet Huisman[1], Ansooya Bokil[1], Nadra Nilsen[1], Emma Haabeth[1], Naresh Veldurthi[1], Simon Sayer[2], Markus Lunzer[2], and Oyvind Halaas[1]
[1] *Norwegian University of Science and Technology, NORWAY and* [2] *UpNano GmbH, AUSTRIA*

## Cell Capture, Counting, & Sorting

**M004.a** **A HIGH-THROUGHPUT AND MULTIFUNCTIONAL MICROFLUIDIC CHIP FOR RAPID ENRICHMENT OF CTMS AND CTC CLUSTERS**
Chan-Hua Yeh[1], Hsinyu Yang[1,2], Cian-Ling Wang[1], Hsien-Chih Peng[1], and Fan-Gang Tseng[1,2]
[1] *National Tsing Hua University, TAIWAN and* [2] *Academia Sinica, TAIWAN*

**M005.a** **CROSSOVER CELL MIGRATION MEASUREMENTS (CCM): COMPREHENSIVE OPTICAL AND ELECTRICAL CELL TRACKING**
Karina Torres-Castro[1,2], Brian J. Nablo[1], and Darwin R. Reyes[1]
[1] *National Institute of Standards and Technology, USA and* [2] *Theiss Research, USA*

**M006.a** **ELECTROHYDRODYNAMICS: A VERSATILE TECHNIQUE FOR SINGLE CELL DIAGNOSIS AND ITS APPLICATIONS ON METAL NANOPARTICLE LOCATING**
Chih-Jie Li and Hsiang-Yu Wang
*National Tsing Hua University, TAIWAN*

**M007.a** **HIGH THROUGHPUT X-Y SPERM SORTING BY ELECTRIC FIELD GRADIENT IN A REVERSE MICRO FLOW**
I-Jui Chen[1], Hsien-Chih Peng[1], Nian-Je Wu[1], Ren-Guei Wu[1], and Fan-Gang Tseng[1,2]
[1] *National Tsing Hua University, TAIWAN and* [2] *Academia Sinica, TAIWAN*

**M008.a** **INTEGRATED SERS- DROPLET MICROFLUIDICS PLATFORM FOR SINGLE CELL SORTING**
Yuanshuai Zhu[1], William J. Peveler[1], Andrew Glidle[1], Zhugen Yang[2], and Huabing Yin[1]
[1] *University of Glasgow, UK, and* [2] *Cranfield University, UK*

**M009.a** **LOW-COMPLEX IMAGE-ACTIVATED CELL SORTING**
Neus Godino, Tobias Gerling, Felix Pfisterer, Nina Hupf, Simone De Carli, and Michael Kirschbaum
*Fraunhofer IZI-BB, GERMANY*

**M010.a** **PH SORTING OF BACTERIA LADEN DROPLETS**
Giulia Venturini, Donald A. Morrison, and David T. Eddington
*University of Illinois, Chicago, USA*

**M011.a** **SIMPLE AND ROBUST MICROFLUIDIC CAPTURE OF T CELLS AND ANALYSIS OF CD MARKERS**
Yohan Choi, Woo-Joong Kim, Dongwoo Lee, Bum Joon Jung, Eui-Cheol Shin, and Wonhee Lee
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**T004.a** **AUTONOMOUS CELL MANIPULATION SYSTEM BASED ON DEEP REINFORCEMENT LEARNING**
Seiya Matsuda, Takaaki Abe, and Yoshiaki Ukita
*University of Yamanashi, JAPAN*

**T005.a** **DROPLET MICROFLUIDIC SYSTEMS FOR HIGH-THROUGHPUT PASSIVE SELECTION AND ENRICHMENT OF BACTERIA PRODUCING BIOSURFACTANTS**
Klaudia J. Staskiewicz[1,2], Maria Dabrowska[2], Lukasz Kozon[1,2], Lukasz Drewniak[2], and Tomasz S. Kaminski[2]
[1] *Polish Academy of Sciences, POLAND and*
[2] *University of Warsaw, POLAND*

**T006.a** **GELATIN METHACRYLATE AS A CELL-ENCAPSULATING HYDROGEL FOR IMAGE-BASED SINGLE-CELL SCREENING**
Takeru Fukunaga[1], Shunya Okamoto[1], Takayuki Shibata[1], Tuhin S. Santra[2], and Moeto Nagai[1]
[1] *Toyohashi University of Technology, JAPAN and*
[2] *Indian Institute of Technology, Madras, INDIA*

**T007.a** **HIGHLY ACCURATE MULTIPLEX FLUORESCENCE-ACTIVATED DROPLET SORTING PLATFORM**
Wannes Verbist, Jolien Breukers, Sapna Sharma, Lotte Coelmont, Francesco Dal Dosso, Kai Dallmeier, and Jeroen Lammertyn
*KU Leuven, BELGIUM*

**T008.a** **LARGE-SCALE CELL CAPTURE ARRAYS ON SUSPENDED SILICON NITRIDE MEMBRANES**
Jacek Lechowicz, Amir Tahmasebipour, Varoon Aluri, and Marc S. Chooljian
*Mekonos Inc, USA*

**T009.a** **MICROFLUIDICS DEVICES AS A TOOL TO STUDY MECHANISM OF TRANSFORMATION BETWEEN STREPTOCOCCUS PNEUMONIAE CELLS**
Anna Borowska, Donald A. Morrison, and David T. Eddington
*University of Illinois, Chicago, USA*

**T010.a** **RED BLOOD CELL DISTRIBUTION ON COMPLEX BIFURCATING NETWORKS**
Jonatan Mac Intyre, Elizabath M. Nallukunnel Raju, Micaela Tavares Oliveira, Samin Nooranian, Irina Raykhel, Ilya Skovorodkin, Seppo Vainio, and Caglar Elbuken
*University of Oulu, FINLAND*

**T011.a** **SINGLE CELL ANALYSIS OF INERTIAL MIGRATION BY TUMOR CELLS AND CLUSTERS**
Jian Zhou, Alexandra Vorobyeva, Qiyue Luan, and Ian Papautsky
*University of Illinois, Chicago, USA*

**W004.a** **CELL PATTERNING ON CYTOPHOBIC SUBSTRATES TROUGH COMBINED PHYSICOCHEMICAL AND BIOCHEMICAL FUNCTIONALIZATIONS**
Enrique Azuaje-Hualde[1], Job Komen[2], Juncal Alonso-Cabrera[1], Albert van der Berg[2], Marian M. de Pancorbo[1], Andries van der Meer[2], Fernando Benito-Lopez[1], and Lourdes Basabe-Desmonts[1]
[1]*University of the Basque Country, SPAIN and*
[2]*University of Twente, NETHERLANDS*

**W005.a** **EFFECTS OF MICROFLUIDIC SORTING ON CANCER CELLS**
Esra Yilmaz, Zhimeng Fan, Jason P. Beech, Vinay Swaminathan, and Jonas O. Tegenfeldt
*Lund University, SWEDEN*

**W006.a** **GLASS-BOTTOM NANOWELLS FOR SINGLE CELL IMAGE CYTOMETRY**
Samuel Berryman, Deasung Jang, Pan Deng, Kerryn Matthews, and Hongshen Ma
*University of British Columbia, CANADA*

**W007.a** **INTEGRATED LABEL-FREE BLOOD FRACTIONATION AND LEUKOCYTE CONCENTRATOR IN PMMA SPIRAL MICROFLUIDIC DEVICES**
Kay Khine Maw[1,2], Sheng Yuan Leong[1], Wei Wang[2], and Han Wei Hou[1,3]
[1]*Nanyang Technological University, SINGAPORE,* [2]*Singapore Institute of Manufacturing Technology (SIMTech), SINGAPORE, and* [3]*Nanyang Technological University, SINGAPORE*

**W008.a** **LEVERAGING THE ELASTIC DEFORMABILITY OF POLYDIMETHYLSILOXANE MICROFLUIDIC CHANNELS FOR EFFICIENT INTRACELLULAR DELIVERY**
Hashim Alhmoud, Mohammed Alkhaled, Batuhan E. Kaynak, and Selim Hanay
*Bilkent University, TURKEY*

**W009.a** **OPTOHYDRODYNAMIC TWEEZERS FOR SINGLE-CELL MANIPULATION AND ANALYSIS**
Shreyas K Vasantham[1], Yurii Promovych[1], Piotr Garstecki[1], Abhay Kotnala[1,2], and Ladislav Derzsi[1]
[1]*Polish Academy of Sciences, POLAND and* [2]*University of Houston, USA*

**W010.a** **SHEATH-AIDED INERTIAL SEPARATION OF BLOOD CELLS BY SIZE**
Tianlong Zhang[1,2], Yaxiaer Yalikun[2], Yoichiroh Hosokawa[2], and Ming Li[1]
[1]*Macquarie University, AUSTRALIA and* [2]*Nara Institute of Science and Technology, JAPAN*

**W011.a** **SINGLE CELL DIFFERENTIATION ON A NOVEL ELECTRO MECHANO SENSING PLATFORM**
Ishita Bansal, Nishant Sharma, and Prosenjit Sen
*Indian Institute of Science, INDIA*

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

**M012.a** **3D POROUS MICROFLUIDIC ARCHITECTURES FOR PERFUSABLE ENGINEERED HEART TISSUES**
Aniruddha Paul, Tomas V. Dorp, Anne Leferink, Anke R. Vollertsen, Andries V. D. Meer, and Mathieu Odijk
*University of Twente, NETHERLANDS*

**M013.a** **AN INTEGRATED ELECTROTHERMAL PUMP FOR TAILORED PULSATILE VASCULAR CULTURE IN MICROPHYSIOLOGICAL SYSTEMS**
Kai Zhao, Itaru Kawata, Yoshiyasu Ichikawa, and Masahiro Motosuke
*Tokyo University of Science, JAPAN*

**M014.a** **ELECTRODES ON POROUS MEMBRANES FOR DIELECTROPHORETIC ASSEMBLY AND IMPEDIMETRIC MEASUREMENT OF MODEL BARRIER TISSUES ON CHIP**
Alexander P.M. Guttenplan and Darwin R. Reyes
*National Institute of Standards and Technology, USA*

**M015.a** **HYDROSTATIC PRESSURE AS A BIOMECHANICAL STIMULI ON HUVECS IN A 96-WELL-PLATE**
David T. Eddington
*University of Illinois, Chicago, USA*

**M016.a** **MICROFLUIDIC HARVESTING OF SINGLE BREAST CANCER CELL-DERIVED SPHEROIDS FOR HIGH-THROUGHPUT CANCER STEM CELL-TARGETING DRUG SCREENING**
Wenxiu Li
*City University of Hong Kong, HONG KONG*

**M017.a** **OXYGEN CONSUMPTION RATE (OCR) CHARACTERIZATION OF SINGLE SPHEROIDS USING A MICROFLUIDIC PLATFORM AND FLUORESCENCE LIFETIME IMAGING MICROSCOPY**
Santhosh Kannan[1,2], Chien-Chung Peng[1], and Yi-Chung Tung[1]
[1]*Academia Sinica, TAIWAN and* [2]*National Tsing Hua University, TAIWAN*

**M018.a** **THREE-DIMENSIONAL IN VITRO GUT-IMMUNE MODEL TO MIMIC PEYER'S PATCHES BASED ON BIOPRINTING**
Jongho Park, Gihyun Lee, and Je-Kyun Park
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**T012.a** **A NEW LAB-ON-A-CHIP SYSTEM FOR MODELING VASCULARIZED OVARIAN CANCER TISSUE**
Paulina Musolf, Magdalena Flont, Joanna Konopka, Agnieszka Żuchowska, and Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

**T013.a** **BATCH BAYESIAN OPTIMIZATION FOR IN VITRO SKELETAL MUSCLE TISSUE MATURATION WITH MULTIPLE STIMULATION PARAMETERS**
Daiki Miyata[1], Keitaro Kasahara[1], Yuta Tokuoka[1], Yujin Taguchi[1], Takahiro Yamada[1], Akira Funahashi[1], Yuta Kurashina[2], and Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Tokyo University of Agriculture and Technology, JAPAN*

**T014.a** **EVALUATION OF POLYMETHYLPENTENE, AN OXYGEN PERMEABLE THERMOPLASTIC, FOR LONG-TERM ON-A-CHIP CELL CULTIVATION**
Linda Sønstevold[1], Maciej Czerkies[2], Enrique Escobedo-Cousin[1], Slawomir Blonski[2], and Elizaveta Vereshchagina[1]
[1] *SINTEF Digital, NORWAY and* [2] *Institute of Fundamental Technological Research, POLAND*

**T015.a** **HYPOXIA ON A CHIP: ASSESSING THE CLINICAL HALLMARKS OF HYPOXIA ON NATURALLY HYPOXIC SPHEROIDS**
Elena Refet-Mollof[1,2,3], Rodin Chermat[1,2,3], Philip Wong[2,3,4,5], and Thomas Gervais[1,2,3]
[1] *Polytechnique Montréal, CANADA,* [2] *Centre de recherche du Centre Hospitalier de l'Université de Montréal, CANADA,* [3] *Institut du Cancer de Montréal, CANADA,* [4] *Centre Hospitalier de l'Université de Montréal, CANADA, and* [5] *Princess Margaret Cancer Centre, CANADA*

**T016.a** **MICROFLUIDIC SYSTEM FOR MODELING THE VASCULARIZATION OF THE PANCREATIC ISLET MODEL**
Patrycja Sokołowska, Magdalena Kopińska, Elżbieta Jastrzębska, and Zbigniew Brzózka
*Warsaw University of Technology, POLAND*

**T017.a** **POROUS MICROCHAMBER-INTEGRATED MICROPERFUSION SYSTEM FOR FORMATION, MORPHOLOGY CONTROL, AND OBSERVATION OF MULTICELLULAR AGGREGATES**
Yusuke Araki, Mai Takagi, Rie Utoh, and Masumi Yamada
*Chiba University, JAPAN*

**T018.a** **TOWARDS 3D CELL CULTURES ON-CHIP – TECHNOLOGICAL STUDIES OF NOVEL HYDROGEL MATRICES**
Adrianna Cieślak[1], Agnieszka Krakos (Podwin)[1], Magdalena Łabowska[1], Julita Kulbacka[2,3], and Jerzy Detyna[1]
[1] *Wrocław University of Science and Technology, POLAND,* [2] *Wrocław Medical University, POLAND, and* [3] *State Research Institute Centre for Innovative Medicine, LITHUANIA*

**W012.a** **AN EFFECTIVE METHOD TO PROMOTE THE MATURATION OF HUMAN IPSC CARDIOMYOCYTES USING A THIN POLYMER FILM**
Yu-Hsiang Hsu[1], Hong-Wen Wang[1], Chia-Wei Liu[1], Ching-Ying Huang[2], Darien Z.H. Chan[2], and Patrick C.H. Hsieh[1,2]
[1] *National Taiwan University, TAIWAN and* [2] *Academia Sinica, TAIWAN*

**W013.a** **DEVELOPING RAPID SCAFFOLD-FREE CELL SHEET BIOFABRICATION TECHNIQUE AND ITS APPLICATION AS BUILDING BLOCKS OF COMPLEX 3D TISSUE CONSTRUCTS**
Maedeh Khodamoradi and Ponnambalam R. Selvaganapathy
*McMaster University, CANADA*

**W014.a** **FABRICATION OF ROPE-LIKE AXON BUNDLE BY APPLYING DIAMOND-LIKE CARBON THIN FILM DEPOSITION**
Tetsuo Endo and Masahito Ban
*Nippon Institute of Technology, JAPAN*

**W015.a** **MICROENGINEERING PAPER PLATFORM WITH MICROFLUIDIC DELIVERY FOR SPHEROIDS CRYOPRESERVATION AND DRUG TESTING**
Ayoub Glia[1], Safeeya Alawadhi[1], Muhammedin Deliorman[1], Pavithra Sukumar[1], and Mohammad A. Qasaimeh[1,2]
[1] *New York University, Abu Dhabi, UAE and* [2] *New York University, USA*

**W016.a** **MYOBLAST CELL CULTURE ON EDIBLE BLOOD PLASMA-ALGINATE HYDROGEL MICROFIBERS FOR CULTURED MEAT APPLICATION**
Kensei Okada, Byeongwook Jo, Minghao Nie, and Shoji Takeuchi
*University of Tokyo, JAPAN*

**W017.a** **THE STUDY OF PRIMARY CELLS DIFFERENTIATION INTO CANCER-ASSOCIATED FIBROBLASTS (CAF) UNDER MICROFLUIDIC CONDITIONS**
Magdalena Flont, Patrycja Sokolowska, and Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

**W018.a** **UNLEASHING THE POTENTIAL OF CONTINUOUS UNIDIRECTIONAL PERFUSION: AN AUTOMATED SMART LID SYSTEM FOR LONG-TERM CULTURE OF BIOENGINEERED TISSUES**
Sarah Heub[1], Stéphanie Boder-Pascher[1], Manon Garzuel[1], Charlotte Fonta[1], Ary Marsee[2], Hüseyin B. Atakan[1], Jonas Goldowsky[1], Réal Ischer[1], Diane Ledroit[1], Thomas M. Valentin[1], Kerstin Schneeberger[2], and Bart Spee[2]
[1] *CSEM SA, SWITZERLAND and* [2] *Utrecht University, NETHERLANDS*

## Inter-& Intracellular Signaling, Cell Migration

**M019.a** **A BILAYERED TUMOR-VASCULAR MODEL IN DIGITAL MICROFLUIDIC CHIP FOR TUMOR CELL INTRAVASATION STUDY**
Wenting Qiu[1,2], Wanqing Wu[1], Jinqing Huang[2], and Mengsu Yang[1]
[1] *City University of Hong Kong, HONG KONG and* [2] *Hong Kong University of Science and Technology, HONG KONG*

**M020.a** **MIMICKING T CELL ACTIVATION AND MIGRATION IN RESPONSE TO CHEMOKINE GRADIENT IN A MICROSYSTEM**
Parvaneh Sardarabadi[1], Kang-Yun Lee[2], Wei-Iun Sun[2], and Cheng-Hsien Liu[1]
[1] *National Tsing Hua University, TAIWAN and*
[2] *Taipei Medical University, TAIWAN*

**T019.a** **DEVELOPMENT OF A THREE-DIMENSIONAL MICROFLUIDIC PLATFORM FOR CELL MIGRATION STUDIES**
Tak Keung Pang, Yu Zhu, Eileen Yi Lam Li, Anna M. Blocki, Yi Ping Ho, and Wood Yee Chan,
*Chinese University of Hong Kong, HONG KONG*

**W019.a** **MICROWELL CHIPS REVISITED: APPLYING MICROWELLS TO STUDY CELL-CELL JUNCTION IN CALCIUM SIGNALING**
Hanyu Yao and Hon Son Ooi
*Chinese University of Hong Kong, HONG KONG*

## Liposomes/Membranes

**M021.a** **EVALUATION OF MEMBRANE PROTEINS SYNTHESIZED USING THE IN SITU IVTT SYSTEM FOR INSERTION INTO MONODISPERSE GUVS**
Satoshi Nanjo[1], Mamiko Tsugane[1], Tomoaki Matsuura[2], and Hiroaki Suzuki[1]
[1]*Chuo University, JAPAN and* [2]*Tokyo Institute of Technology, JAPAN*

**M022.a** **GIGA-OHM SEALED BLOCK COPOLYMER-BASED 3D POLYMORPHIC ARTIFICIAL CELL MEMBRANE ARRAY FOR ELECTROPHYSIOLOGICAL RECORDING**
Dong-Hyun Kang[1], Bong Kyu Kim[1,2], Hyunil Ryu[1], and Tae Song Kim[1]
[1]*Korea Institute of Science and Technology, KOREA and*
[2]*Korea University, KOREA*

**M023.a** **STABILIZING ARTIFICIAL CELLS WITH HYDROGEL CYTOSKELETON**
Conghui Ma
*ShanghaiTech University, CHINA*

**T020.a** **A CENTRIFUGAL DROPLET FORMATION UNIT FOR SINGLE-STEP GENERATION OF GIANT LIPOSOMES IN A CDICE DEVICE**
Sho Takamori[1], Hisatoshi Mimura[1], Toshihisa Osaki[1], and Shoji Takeuchi[1,2]
[1]*Kanagawa Institute of Industrial Science and Technology, JAPAN and*
[2]*University of Tokyo, JAPAN*

**T021.a** **FORMING ASYMMETRIC LIPOSOMES WITH NATURALLY-DERIVED LIPIDS TO MIMIC RED BLOOD CELLS**
Alex R. McDonald, Paige Allard, Kaitlyn E.E. Ramsay, and Katherine S. Elvira
*University of Victoria, CANADA*

**T022.a** **ION FLUX RECORDING OF SINGLE PROTEINS IN 3D FREE-STANDING LIPID BILAYER ARRAY FORMED BY PRESSURE-ASSISTED ELECTROFORMATION IN PHYSIOLOGICAL SALT CONCENTRATION**
Bong Kyu Kim[1,2], Dong-Hyun Kang[1], Hyunil Ryu[1], Seok Chung[2], and Tae Song Kim[1]
[1]*Korea Institute of Science and Technology, KOREA and*
[2]*Korea University, KOREA*

**W020.a** **ANALYZING THE ROLE OF PROTEIN ON TEAR FILM LIPID LAYER IN EVAPORATION RESISTANCE USING A 3D-PRINTED CHAMBER**
Ahmed Fuwad, Deeborah Lee, Sun Min Kim, and Tae-Joon Jeon
*INHA University, KOREA*

**W021.a** **INVESTIGATION AND CHARACTERIZATION OF SINGLE NANOSIZED LIPOSOMES IN A NANOFLUIDIC DEVICE**
Soji Miyata[1], Nattapong Chantipmanee[1], and Yan Xu[1,2]
[1]*Osaka Metropolitan University, JAPAN and* [2]*Japan Science and Technology Agency (JST), JAPAN*

**W022.a** **MICROFLUIDIC FORMATION OF MULTICAVITY LIPID PARTICLE (MCLP) FROM DOUBLE EMULSION TEMPLATE**
Mostafa Bakouei, Indraja S. Raju, Ali Kalantarifard, and Caglar Elbuken
*University of Oulu, FINLAND*

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

**M024.a** **BIOENERGETIC HEALTH ASSESSMENT OF CORAL POLYPS VIA REAL-TIME MONITORING OF OXYGEN CONSUMPTION RATES IN A MICROFLUIDIC DEVICE**
Hsin-ying Wu, Pei-Heng Tai, and Shih-Hao Huang
*National Taiwan Ocean University, TAIWAN*

**M025.a** **LOW-COST OPTOFLUIDIC DEVICE FOR RAPID AND CONTINUOUS LIGHT SHEET SCREENING OF NEURODEGENERATION IN LARVAL AND ADULT C. ELEGANS**
Faraz Rahimpouresfahani, Nima Tabatabaei, and Pouya Rezai
*York University, CANADA*

**T023.a** **A MICROFLUIDC PLATFOM FOR IN SITU ANALYSIS OF BIOFILM FORMATION IN FLOW AND TURBULENCE MEASUREMENT**
Keqing Wen[1,2], Anna A. Gorbushina[1,2], Karin Schwibbert[1], and Jérémy Bell[1]
[1]*Bundesanstalt für Materialforschung und -prüfung (BAM), GERMANY and* [2]*Freie Universität Berlin, GERMANY*

**T024.a** **DEVELOPING MICROFLUIDIC PLATFORMS FOR RAPID IDENTIFICATION OF NEW TARGETS FOR NEURODEGENERATIVE DISORDERS**
Paloma P. Torres, Richard Kaye, Ian Johnston, Maria Dimitriadi, and Christabel Tan
*University of Hertfordshire, UK*

**T025.a** **SONOROTOR: AN ACOUSTIC ROTATIONAL ROBOTIC PLATFORM FOR ZEBRAFISH LARVAE**
Zhiyuan Zhang and Daniel Ahmed
*ETH Zürich, SWITZERLAND*

**W023.a** **ACOUSTOFLUIDIC IMMOBILISATION OF C. ELEGANS FOR NEURODEGENERATIVE DISEASE RESEARCH**
Nino F. Läubli and Gabriele S. Kaminski Schierle
*University of Cambridge, UK*

**W024.a** **ELECTRICAL-IMPEDANCE-SPECTROSCOPY-BASED DETECTION OF MORPHOLOGY AND VIABILITY OF IMMOBILIZED C. ELEGANS WORMS IN A MICROFLUIDIC DEVICE**
Song Yu[1], Tiancong Lan[1], Jiaqi Liu[1], Shuangye Xu[1], Xinxin Lu[1], Yiyan Zhang[2], Di Chen[3], Zixin Wang[4], and Zhen Zhu[1]
[1]*Southeast University, CHINA,* [2]*Nanjing University, CHINA,* [3]*Zhejiang University, CHINA, and* [4]*Sun Yat-sen University, CHINA*

## Organs on Chip

**M026.a** **A COMPARTMENTALISED MICROFLUIDIC DEVICE ENABLES AIR-LIQUID INTERFACE CULTURE OF AIRWAY EPITHELIAL CELLS AND MEASUREMENT OF DYNAMIC IMMUNE CELL RECRUITMENT**
Lucy-May Young, Louis J.Y. Ong, Kirsten Spann, and Yi-Chin Toh
*Queensland University of Technology, AUSTRALIA*

**M027.a** **A MULTIORGAN-ON-CHIP PLATFORM TO STUDY CANCER METASTASIS AND ASSOCIATED VASCULAR HOMEOSTATIC DYNAMICS**
Nilesh Kumar, Prosenjit Sen, and Ramray Bhat
*Indian Institute of Science, INDIA*

**M028.a** **A THERMOPLASTIC ELASTOMER BASED MICROFLUIDIC DEVICE FOR BLOOD VESSEL NETWORK FORMATION AND APPLICATIONS**
Byeong-Ui Moon[1], Kebin Li[1], Han Shao[2], Lauren Banh[2], Lidija Malic[1], Edmond Young[2], Sowmya Viswanathan[2,3], and Teodor Veres[1]
[1]*National Research Council Canada, CANADA,* [2]*University of Toronto, CANADA, and* [3]*University Health Network, CANADA*

**M029.a** **BLADDER-ON-A-CHIP RECAPITULATING THE STRATIFIED UROTHELIUM BY CO-CULTURING WITH FIBROBLASTS**
Taiki Nishimura[1], Yuji Takata[1], Kazuhiro Ofuji[2], Kazuya Fujimoto[1], Minoru Takasato[2], and Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN and* [2]*Institute of Physical and Chemical Research (RIKEN), JAPAN*

**M030.a** **DESMOPLASIA IN STROMAL CELLS AND ANTI-CANCER DRUG RESISTANCE: ONE CHIP MICRO ENGINEERED TUMOR MODEL**
Madhu Shree Poddar[1], Yu-De Chu[2], Chau-Ting Yeh[2], and Cheng-Hsien Liu[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*Chang Gung Memorial Hospital, TAIWAN*

**M031.a** **DEVELOPMENT OF MICROPHYSIOLOGICAL MODEL FOR HYPOXIA-INDUCED PLACENTAL REMODELING**
Ahmed Fuwad, Seorin Jeong, Tae-Joon Jeon, and Sun Min Kim
*INHA University, KOREA*

**M032.a** **EVALUATION OF THE THREE-DIMENSIONAL SHAPE OF THE CELL SPHEROIDS FORMED BY USING VIBRATION-INDUCED FLOW**
Yui Katsumata and Takeshi Hayakawa
*Chuo University, JAPAN*

**M033.a** **INJECTION MOLDED LUNG-ON-CHIP MODEL INTEGRATING A PROTEIN-BASED CELL CULTURE MEMBRANE TO STUDY ALVEOLAR ECM REMODELING**
Tobias A. Weber[1], Jan Schulte[1], Pauline Zamprogno[1], Johannes Fehr[1], and Olivier T. Guenat[1,2]
[1]*University of Bern, SWITZERLAND and* [2]*University Hospital of Bern, SWITZERLAND*

**M034.a** **MICROFLUIDIC PLATFORM FOR MODELLING OF ALVEOLAR-VASCULAR CELL INTERACTIONS IN PULMONARY HYPERTENSION (PH) ASSOCIATED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)**
Maike Haensel, Vanessa Ho, Joshua Edel, Darryl Overby, Clare Lloyd, and Beata Wojciak-Stothard
*Imperial College London, UK*

**M035.a** **ON-CHIP MODEL OF TUMOR ANGIOGENESIS IN TRANSLOCATION RENAL CELL CARCINOMA INCORPORATING PERICYTES AND ENDOTHELIAL CELLS**
Atsuya Kitada[1], Hang Zhou[1], Kazuya Fujimoto[1], Miwa Tanaka[2], Masaya Baba[3], Takuro Nakamura[4], and Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN,* [2]*Japanese Foundation for Cancer Research, JAPAN,* [3]*Kumamoto University, JAPAN, and* [4]*Tokyo Medical University, JAPAN*

**M036.a** **QUANTIFYING THE REGENERATION OF RADIATION-DAMAGED VESSELS ON A 3D VASCULATURE CHIP USING DEEP LEARNING-BASED IMAGE ANALYSIS**
Dong-Hee Choi[1,2], Jinchul Ahn[1,2], Yong Hun Jung[1,2], Euijeong Song[2], and Seok Chung[1,3]
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**M037.a** **TIME COURSE ANALYSIS AND NUMERICAL SIMULATION OF ON-CHIP-VASCULAR BED FORMATION TOWARD QUANTITATIVE UNDERSTANDING**
Kazuya Fujimoto, Yoshikazu Kameda, and Ryuji Yokokawa
*Kyoto University, JAPAN*

**T026.a** **A GLOMERULUS-ON-A-CHIP PLATFORM FOR STUDYING HYPERTENSION-BORN PROTEINURIC RENAL DISEASE**
Zong-Min Liu, Bo-Yi Yao, Yun-Jie Hao, and Fan-Gang Tseng
*National Tsing Hua University, TAIWAN*

**T027.a** **A MULTIWELL MICROFLUIDIC-MEA PLATFORM FOR NEUROMUSCULAR JUNCTION RECONSTRUCTION**
Oramany Phouphetlinthong, Audrey Moisan, Audrey Sebban, Pauline Duc, Florence Rage, and Benoit Charlot
*Université de Montpellier, FRANCE*

**T028.a** **ADVANCING CANCER COMPREHESION: UNVEILING PROMISING OPTIONS WITH MULTI-ORGAN-ON-CHIP (MULTI-OOC) APPORACH**
Paweł Romańczuk, Agnieszka Żuchowska, Elżbieta Jastrzębska, Magdalena Matczuk, Joanna Zajda, and Zbigniew Brzózka
*Warsaw University of Technology, POLAND*

**T029.a** **CANTILEVER MICRO ELECTRODE ARRAY (MEA) FOR THE MEASUREMENT OF INNER EXTRACELLULAR ACTIVITY OF CEREBRAL ORGANOïDS**
Oramany Phouphetlinthong, Emma Partiot, Audrey Sebban, Raphaël Gaudin, and Benoît Charlot
*Université de Montpellier, FRANCE*

**T030.a** **DEVELOPING MICROFLUIDIC DEVICES FOR CELLULAR MODELLING OF INHERITED KIDNEY DISORDERS**
George Parpas, Colin Johnson, and Christoph Walti
*University of Leeds, UK*

**T032.a** **FIBROBLASTS INDUCE DRUG RESISTANCE IN LUNG CANCER ORGANOIDS**
Qiyue Luan, Ines Pulido, Jian Zhou, Takeshi Shimamura, and Ian Papautsky
*University of Illinois, Chicago, USA*

**T033.a** **LARGE-SCALE MANUFACTURING OF FOIL-BASED MICROFLUIDIC CHIPS FOR NEURON CELL CULTURE AND AXON OUTGROWTH MONITORING**
Nihan Atak[1], Anja Haase[1], Ana Ayerdi-Izquierdo[2], Martin Smolka[1], Jan Hesse[1], Nerea briz Iceta[2], Lea Tomasova[3], Clarissa Salado[4], Stephan Ruttloff[1], Johannes Götz[1], Alvaro Conde[5], Conor O'Sullivan[6], and Nastasia Okulova[6]
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**T034.a** **MONOLITHIC CO-CULTURE SYSTEM FOR THE GUT-LIVER INTERACTION STUDY INTEGRATING PARACELLULAR BARRIER FUNCTION ASSAY**
Ryuya Kida[1], Alan Rajendran[2], Mamiko Tsugane[1], Jean-Charles Duclos-Vallee[2], Maxime M. Mahe[3], Sakina Bensalem[2], Hiroaki Suzuki[1], and Bruno L. Piouffle[2]
[1] *Chuo University, JAPAN,* [2] *Universite Paris Saclay, FRANCE, and* [3] *Nantes Universite, FRANCE*

**T035.a** **OPTIMIZATION OF CULTURE CONDITIONS FOR PROMOTING ANGIOGENESIS AROUND AND WITHIN A LIVER SPHEROID IN A MICROFLUIDIC DEVICE**
Satomi Matsumoto[1], Wenlong Wang[1], Ayumi Haginiwa[1], Anna K. Kopec[2], Julie Harney[2], Lindsay Tomlinson[2], Nasir Khan[2], Kazuya Fujimoto[1], and Ryuji Yokokawa[1]
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**T036.a** **SPIDER SILK MEMBRANE-BASED TISSUE MODELS IN OPEN-TOP MICROFLUIDIC CHIPS ALLOW INTERMEDIATE SHEAR LEVELS**
Linneea Gustafsson[1,3], Nayere Tabina[2], Volker Lauschke[2], My Hedhammar[3], and Wouter van der Wijngaart[3]
[1] *Spiber Technologies AB, SWEDEN,* [2] *Karolinska Institutet, SWEDEN, and* [3] *KTH Royal Institute of Technology, SWEDEN*

**T037.a** **UNIBODY 3D PRINTING OF MICROFLUIDIC DEVICES FOR CELL CULTURE APPLICATIONS**
Louis Jun Ye Ong, Lucy M-G. Young, and Yi-Chin Toh
*Queensland University of Technology, AUSTRALIA*

**W025.a A 3D PRINTED PATIENT-SPECIFIC CAROTID VESSEL WITH PHYSIOLOGICAL HEMODYNAMICS AND TISSUE ARCHITECTURE**

Jorge A. Catano[1], Louis J. Y. Ong[1], Prasad KDV. Yarlagadda[1,2], Zhiyong Li[1], and Yi-Chin Toh[1]
[1] *Queensland University of Technology, AUSTRALIA and*
[2] *University of Southern Queensland, AUSTRALIA*

**W026.a A MICROFLUIDIC ONE-SINGLE-TOUCH PLATFORM FOR HIGH-THROUGHPUT GENERATION OF VASCULARIZED TUMOR MODELS**

Shou-Yu Ma[1,2], Didem Rodoplu Solovchuk[1], Gou-Jen Wang[2], and Chia-Hsien Hsu[1,2]
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[2] *National Chung Hsing University, TAIWAN*

**W028.a ASSESSING COMBINATION IMMUNOTHERAPY THROUGH A TUMOUR-MICROENVIRONMENT-ON-CHIP PLATFORM**

Hsuan-Yu Mu, Chiao-Min Lin, Li-An Chu, Ji Li, Chao-Yu Liu, Hsi-Chien Huang, Sheng-Liang Cheng, Tsung-Ying Lee, Hsin Mei Lee, Hsin-Min Chen, Yun-Jen Tsai, Yunching Chen, and Jen-Huang Huang
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**W029.a DESIGN AUTOMATION FOR ORGANS-ON-CHIP**

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[1] *Technical University of Munich, GERMANY,*
[2] *Johannes Kepler University Linz, AUSTRIA, and*
[3] *Software Competence Center Hagenberg GmbH, AUSTRIA*

**W030.a DEVELOPMENT OF A MICROFLUIDIC MODEL OF CEREBRAL MICROBLEEDS AT THE BLOOD-BRAIN INTERFACE**

Sae R. Choi[1], Natalia Ospina-Munuz[1], Nishanth Surianarayanan[1], Sehong Kang[2], Michelle Luo[3], Yun Chang[1], Xiaoping Bao[1], Alisa S. Wolberg[3], Martha U. Gellette[2], Hyunjoon Kong[2], and Bumsoo Han[1]
[1] *Purdue University, USA,* [2] *University of Illinois, Urbana-Champaign, USA, and* [3] *University of North Carolina, USA*

**W031.a EVALUATION AND COMPARISON OF ANGIOGENIC SPROUTS ACCORDING TO THE ORIGINS OF ENDOTHELIAL CELLS IN AN ON-CHIP ALVEOLAR SOFT PART SARCOMA (ASPS) ANGIOGENESIS MODEL**

Ayumi Haginiwa[1], Surachada Chuaychob[1], Satomi Matsumoto[1], Miwa Tanaka[2], Kazuya Fujimoto[1], Takuro Nakamura[3], and Ryuji Yokokawa[1]
[1] *Kyoto University, JAPAN,* [2] *Japanese Foundation for Cancer Research, JAPAN, and* [3] *Tokyo Medical University, JAPAN*

**W032.a GROWING SPHEROIDS IN A CONTINUOUSLY PERFUSABLE HYBRID MICROFLUIDIC CHIP**

Hiba Aljayyousi[1], Amani Ghassan[1], Sarah Sahloul[1], Navajit Baban[1], Ajymurat Orozaliev[1], Piergiorgio Percipalle[1], and Yong-Ak Song[1,2]
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**W033.a** **MEDIUM FLOW CONTROLLED-CYCLIC BREATHING LUNG INFLAMMATION CHIP FOR PULMONARY DRUG SCREENING**
Chao-Yu Liu, Ying-Ru Chen, Hsuan–Yu Mu, and Jen–Huang Huang
*National Tsing Hua University, TAIWAN*

**W034.a** **NOVEL THIOL-ENE-BASED MICROFLUIDIC DEVICE INTEGRATED WITH INKJET-PRINTED MULTI-SENSING CAPABILITIES FOR ORGAN-ON-A-CHIP APPLICATIONS**
Denise Marrero[1,2], Ferran Pujol-Vila[1], Gemma Gabriel[1,2], Rosa Villa[1,2], Mar Alvarez[1,2], and Xavi Illa[1,2]
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**W035.a** **PERIODONTIUM-ON-CHIP: A NOVEL VASCULARIZED HUMAN DENTAL MODEL TO STUDY PERIODONTITIS**
Sara Svanberg[1], Elisabeth Hirth[1], Thimios A. Mitsiadis[2], and Petra S. Dittrich[1]
[1] *ETH Zürich, SWITZERLAND and* [2] *University of Zurich, SWITZERLAND*

**W036.a** **THE ONSET OF CELLULAR DYSFUNCTION IN A 3D GLYCATED EXTRACELLULAR MATRIX**
Insung Yong[1], Eun Sun Ji[2], Hyejin Kim[1], Yoonmi Hong[1], Jin Young Kim[2], and Pilnam Kim[1]
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## Single-Cell Analysis

**M038.a** **A MICROFLUIDIC PLATFORM TO STUDY BACTERIAL MOTILITY UNDER CONFINEMENT**
Md Ramiz Raza, Jijo E. George, Savita Kumari, Mithun K. Mitra, and Debjani Paul
*Indian Institute of Technology, Bombay, INDIA*

**M039.a** **CONSTRUCTION OF A CELL SIZE AND HARDNESS MEASUREMENT METHOD USING A MICROFLUIDIC DEVICE WITH A MULTI-LAYERED STRUCTURE**
Mitsuhiro Horade[1], Masatsugu Moriga[1], Shuichi Murakami[2], and Tsunemasa Saiki[3]
[1] *National Defense Academy of Japan, JAPAN,* [2] *Osaka Research Institute of Industrial Science and Technology, JAPAN, and* [3] *Hyogo Prefectural Institute of Technology, JAPAN*

**M040.a** **DEVELOPMENT OF A MICROFLUIDIC DEVICE FOR MEASUREMENT OF DEFORMABILITY AND PLURIPOTENCY FROM THE SAME CELL**
Takuma Nomiyama, Sachiko Ide, and Noritada Kaji
*Kyushu University, JAPAN*

**M041.a** **HIGH-THROUGHPUT REAL-TIME CHARACTERISATION OF THE INTRINSIC MEMBRANE MECHANICAL PROPERTIES OF LIVING CELLS**
Ziyu Guo and Yi Sui
*Queen Mary University of London, UK*

**M042.a** **IN-SITU LABEL-FREE QUANTITATIVE PHASE IMAGING FLOW CYTOMETRY FOR BACTERIA EXTRACELLULAR POLYMERIC SUBSTANCES CHARACTERIZATION IN SEWAGE TREATMENT**
Fei Liang, Shunan Zhao, Junwen Zhu, Yifan Sun, Ruiping Liu, and Wenhui Wang
*Tsinghua University, CHINA*

**M043.a** **MASSIVELY PARALLEL HIGH THROUGHPUT SINGLE-CELL PRINTING AND HIGHLY EFFICIENT LARGE BIOMOLECULAR DELIVERY INTO CELLS**
Ashwini S. Shinde[1], Pallavi S. Shinde[1], Kavitha Illath[1], Moeto Nagai[2], Srabani Kar[3], and Tuhin S. Santra[1]
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**M044.a** **ON THE COMPATIBILITY OF NANOVIALS WITH MICROFLUIDIC IMPEDANCE CYTOMETRY**
Federico Petitta[1], Cristian Brandi[1], Adele De Ninno[2], Paolo Bisegna[1], and Federica Caselli[1]
[1]*University of Rome Tor Vergata, ITALY and*
[2]*Italian National Research Council, ITALY*

**M045.a** **PERFORMANCE-ENHANCED CLOGGING-FREE VISCOUS SHEATH CONSTRICTION IMPEDANCE FLOW CYTOMETRY**
Junwen Zhu, Yongxiang Feng, Huichao Chai, Fei Liang, Zhen Cheng, and Wenhui Wang
*Tsinghua University, CHINA*

**M046.a** **STUDYING SINGLE PROTOPLASTS - A FLUIDOT CASE STUDY ON SINGLE PLANT CELLS**
Karen Ven[1], David De Vleesschauwer[2], Jolien Breukers[1], Robin De Groote[1], Aurélie Mohrbacher[1], Ilse Van Den Brande[2], Sarah De Cokere[2], Francesco Dal Dosso[1], Peter Denolf[2], and Jeroen Lammertyn[1]
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**M047.a** **UNCOVERING STRAIN-DEPENDENT MECHANICAL BIOMARKERS WITH SEQUENTIAL-SQUEEZE NODE-PORE SENSING**
Rachel Rex, Sharicka Zutshi, and Lydia Sohn
*University of California, Berkeley, USA*

**T038.a** **APOPTOSIS MONITORING OF CHINESE HAMSTER OVARY CELLS USING MICROFLUIDIC ISODIELECTROPHORESIS**
John-Alexander Preuss[1], Roberto Rodriguez-Moncayo[2], Joel Voldman[2], and Janina Bahnemann[1]
[1]*University of Augsburg, GERMANY and* [2]*Massachusetts Institute of Technology, USA*

**T039.a** **DEFORMABILITY CYTOMETRY REVEALS INCREASED CELL STIFFNESS IN PATIENTS WITH MAJOR DEPRESSIVE DISORDER**
Lisa Kwapich[1], Alexander Karabatsiakis[2], Tobias Neckernuss[3], Daniel Geiger[3], Jonas Pfeil[1,3], Eun-Jin Sim[4], Markus Kiefer[4], Alexander Behnke[1], Iris T. Kolassa[1], and Othmar Marti[1]
[1]*Ulm University, GERMANY,* [2]*University of Innsbruck, AUSTRIA,* [3]*Sensific GmbH, GERMANY, and* [4]*Ulm University Medical Center, GERMANY*

**T040.a** **ELECTROROTATION OF SINGLE CELLS FOR THE ANALYSIS OF MEMBRANE DAMAGE INDUCED BY THE NEUROTOXIC PROTEIN ALPHA-SYNUCLEIN**
Till Ryser, Hilal Lashuel, and Carlotta Guiducci
*École Polytechnique Fédérale de Lausanne, SWITZERLAND*

**T041.a** **HIGHLY SELECTIVE IMAGE-BASED ELECTROPORATION OF SINGLE CELLS**
Felix Pfisterer, Neus Godino, Tobias Gerling, Simone De Carli, and Michael Kirschbaum
*Fraunhofer IZI-BB, GERMANY*

**T042.a** **LABEL -FREE ANALYSIS OF GROWTH AND LYSIS OF MICROBIAL COMMUNITIES AT THE SINGLE-CELL LEVEL USING OBJECT DETECTION ORIENTED DEEP LEARNING AND DROPLET MICROFLUIDICS**
Anuj Tiwari, Vasileios Anagnostidis, Robyn Manly, Nela Nikolic, Ben Temperton, and Fabrice Gielen
*University of Exeter, UK*

**T043.a** **MICROFLUIDIC MEASUREMENT OF YOUNG'S MODULI OF STORED AND MALARIA-INFECTED SINGLE RED BLOOD CELLS**
Savita Kumari[1], Priyanka Naik[1], Chhaminder Kaur[1], Vijay Mistari[1], Tanusri Roy[1], Swati Patankar[1], Shamik Sen[1], Dhrubaditya Mitra[2,3], and Debjani Paul[1]
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**T044.a** **ONE-SHOT SINGLE-CELL PROTEOME AND METABOLOME ANALYSIS TECHNIQUE FOR THE SAME SINGLE CELL ANALYSIS**
Jie Wu
*Zhejiang University, CHINA*

**T045.a** **RAPID AND ROBUST CONSTRUCTION OF SINGLE CELL CAPTURE ARRAY ON DIGITAL MICROFLUIDICS FOR DRUG SCREENING ASSAY**
Wanqing Wu, Wenting Qiu, and Mengsu Yang
*City University of Hong Kong, HONG KONG*

**T046.a** **TRANSCRIPTOME, PROTEOME AND METABOLOME PROFILING OF SINGLE MOUSE OOCYTES WITH DROPLET-BASED MICROFLUIDICS AND MASS SPECTROMETRY TECHNIQUES**
Yi-Rong Jiang[1], Jie Wu[1], Lan-Rui Cao[2], Hao Wu[2], Xu-Dong Fu[2], and Qun Fang[1,3]
[1] *Zhejiang University, CHINA,* [2] *Zhejiang University Medical Center, CHINA, and* [3] *ZJU-Hangzhou Global Scientific and Technological Innovation Center, CHINA*

**W037.a** **A "SMART" HYDROGEL-BASED MICROFLUIDIC PLATFORM FOR SELECTIVE CELL RETRIEVAL**
Julie Van Lent, Karen Ven, Amelie Remmerie, Vince Engelborghs, Christian Clasen, Karen Vanhoorelbeke, and Jeroen Lammertyn
*KU Leuven, BELGIUM*

**W038.a APPLICATION OF QUANTITATIVE ANALYSIS OF SINGLE-CELL PROTEINS IN LEUKEMIA GATING, TUMOR CLASSIFICATION AND HIERARCHY OF CANCER STEM CELLS**
Ting Zhang[1], Lixing Liu[1], Yuanchen Wei[1], Chiyuan Gao[1], Liangliang Ma[2], Mengge Gao[3], Xiaosu Zhao[3], Yixiang Wang[4], Deyong Chen[1], Lichao Sun[2], Junbo Wang[1], and Jian Chen[1]
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**W039.a DETECTION OF SINGLE-CELL CYTOKINE SECRETION USING CELL-BASED REPORTER CELLS IN A HONEYCOMB MICROFLUIDIC DEVICE**
Jonathan C. Briones[1], Wilfred V. Espulgar[2], JeongHoon Park[1], Eri Itotagawa[1], Shohei Koyama[1], Eiichi Tamiya[1], Hyota Takamatsu[1], and Masato Saito[1]
[1] *Osaka University, JAPAN and* [2] *De La Salle University, PHILIPPINES*

**W040.a FETAL NUCLEATED RED BLOOD CELLS (FNRBCS) ISOLATION BASE ON SACA CHIP AND AUTOMATIC FLUORESCENCE IMAGE SYSTEM**
Hsinyu Yang[1,2], Chunhao Lai[1], and Fangang Tseng[1,2]
[1] *National Tsing Hua University, TAIWAN and* [2] *Academia Sinica, TAIWAN*

**W041.a IMPEDANCE FLOW CYTOMETRY CONFIGURED FOR SINGLE-CELL ELECTRICAL-MECHANICAL INTRINSIC CHARACTERIZATION**
Junwen Zhu[1], Yongxiang Feng[1], Huichao Chai[1], Weihua He[1], Liang Huang[2], and Wenhui Wang[1]
[1] *Tsinghua University, CHINA and* [2] *Hefei University of Technology, CHINA*

**W042.a MAGNETIC ARTIFICIAL CILIA ACTUATION IN CELL CULTURE MEDIUM FOR STUDYING DYNAMIC MECHANOTRANSDUCTION**
Roel Kooi, Tanveer Ul Islam, Oscar M.J.A. Stassen, Jan de Boer, and Jaap M.J. den Toonder
*Eindhoven University of Technology, NETHERLANDS*

**W043.a NEUROMORPHIC-ENABLED IMAGING FLOW CYTOMETRY WITH MULTI-ANGLE SPATIAL-TEMPORAL ENHANCEMENT**
Weihua He, Yongxiang Feng, Junwen Zhu, Fei Liang, and Wenhui Wang
*Tsinghua University, CHINA*

**W044.a PARALLEL MONITORING OF SINGLE-CELL CULTURE IN OIL-SEALED HYDROGEL MICROWELLL ARRAY FOR SINGLE-CELL ANALYSIS ON EXOSOMES**
Chisaki Yamagata[1], Shun Itai[1], Yuta Kurashina[2], Makoto Asai[1], Ayuko Hoshino[3], and Hiroaki Oneo[1]
[1] *Keio University, JAPAN,* [2] *Tokyo University of Agriculture and Technology, JAPAN, and* [3] *University of Tokyo, JAPAN*

**W045.a RISK IN LONG-TERM OPTICAL MONITORING OF CELL CULTURE: INVESTIGATION OF VISIBLE LIGHT INDUCED DEFECT ON YEAST CELL CYCLE**
Yingying Wang[1], Yulu Geng[1], Jiaming Fu[2], Qing-an Huang[1], Zhenxiang Yi[1], and Zhen Zhu[1]
[1] *Southeast University, CHINA and* [2] *Nanjing Forestry University, CHINA*

**W046.a** **ULTRA-SENSITIVE FLUORESCENCE-ACTIVATED DROPLET SORTING ENABLED BY TETRAMER HYBRIDIZATION CHAIN REACTION**
Long Chen[1,2], Yifan Liu[1], and Xiangqiang Mi[2]
[1] *ShanghaiTech University, CHINA and* [2] *Chinese Academy of Sciences, CHINA*

## Synthetic Biology

**M048.a** **SILICA NANOPARTICLE-ASSEMBLED MICROWELL ARRAY CHIP FOR HIGH-CAPACITY OLIGONUCLEOTIDE SYNTHESIS**
Duo Fu, Xiao Su, Dachao Li, and Xiaoping Li
*Tianjin University, CHINA*

**T047.a** **DROPLET-DIGITAL MULTIPLEXED SORTER MICROFLUIDICS FOR STRAIN DEVELOPMENT**
Chiara Leal Alves[1], Sebastien Dumont[2], Fatemeh Ahmadi[1], Ziuwin Leung[1], Zhiyang Deng[1], Michelle Oeser[2], and Steve C. C. Shih[1]
[1] *Concordia University, CANADA and* [2] *Lallemand, CANADA*

**W047.a** **INTERFACING ELECTROCHEMICAL MEASUREMENTS WITH MICROFLUIDICS FOR METABOLIC ENGINEERING**
Nicholas F.O. Crudele, Laszlo Kekedy-Nagy, Chiara Leal Alves, James M. Perry, and Steve C.C. Shih
*Concordia University, CANADA*

## Other Applications in Biology

**M049.a** **DETECTION OF A SINGLE AMYLOID NUCLEATION EVENT IN MICROMETER-SIZED PROTEIN DROPLETS FORMED BY LIQUID-LIQUID PHASE SEPARATION**
Mao Fukuyama[1], Taiki Ozawa[1], Suguru Nishinami[2], Yoko Maruyama[1], Shunsuke Tomita[3], Yumiko Ohhashi[4], Motohiro Kasuya[5], Masao Gen[1], Eri Chatani[6], Kentaro Shiraki[2], and Akihide Hibara[4]
[1] *Tohoku University, JAPAN,* [2] *University of Tsukuba, JAPAN,* [3] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN,* [4] *Tokyo Institute of Technology, JAPAN,* [5] *Komatsu University, JAPAN, and* [6] *Kobe University, JAPAN*

**M050.a** **LARGE-SCALE MICROFLUIDIC ELECTROPORATION FOR THE TRANSFORMATION OF PREVIOUSLY GENETICALLY INTRACTABLE BACTERIA**
Po-Hsun Huang[1], Yiyin E. Chen[1], Cheng Li[1], Mary Anderson[1], Kerwyn C. Huang[2], and Cullen R. Buie[1]
[1] *Massachusetts Institute of Technology, USA and* [2] *Stanford University, USA*

**M051.a** **QUANTITATIVE PHASE DEFORMABILITY CYTOMETRY FOR NONINVASIVE HIGH-THROUGHPUT CHARACTERIZATION OF CELLS**
Qinru Xiao[1], Yanping He[1], Md Habibur Rahman[1], Guangyao Cheng[1], Renjie Zhou[1], and Yi-Ping Ho[1,2]
[1] *Chinese University of Hong Kong, HONG KONG and* [2] *City University of Hong Kong, HONG KONG*

**T048.a** **AU NANOROD MIXED PDMS MICROTIP DEVICE FOR HIGHLY EFFICIENT INTRACELLULAR DELIVERY ACTIVATED BY INFRARED LIGHT PULSES**
Hima Manoj[1], Kavitha Illath[1], Uvanesh Kasiviswanathan[3], Srabani Kar[2], and Tuhin S. Santra[1]
[1] *Indian Institute of Technology, Madras, INDIA,* [2] *Indian Institute of Science Education and Research Tirupati, INDIA, and* [3] *Motilal Nehru National Institute of Technology, Allahabad, INDIA*

**T049.a** **DEVELOPMENT NOVEL MICROFLUIDIC DEVICES FOR PASSIVE SEMEN SEPARATION**
Ilona Grabowska-Jadach, Kamil Żukowski, Sandra Skorupska, Natalia Glapa, Waldemar Kuczyński, Michał Chudy, and Artur Dybko
*Warsaw University of Technology, POLAND*

**T050.a** **MICROBIAL ECOSYSTEM ANALYSIS OF BIOCHAR-ENRICHED SOIL IN KENYA USING MICROFLUIDIC SOIL MODELS**
Erik Karlsson, Edith C. Hammer, Pelle Ohlsson, and Hanbang Zou
*Lund University, SWEDEN*

**T051.a** **REAL-TIME MONITORING OF THE ACTIVATION OF CELLULAR STRESS RESPONSE IN A RECOMBINANT ECOLI REPORTER STRAIN ON A DIELECTROPHORESIS CHIP**
Lourdes Albina Nirupa Julius, Dora Akgül, Fabian Falk, Vlad Badilita, and Jan G. Korvink
*Karlsruhe Institute of Technology, GERMANY*

**W048.a** **COMBINED EFFECT OF CONFINEMENT AND SHEAR ALTERS TRYPSIN-MEDIATED DEADHESION OF CELLS IN A MICROFLUIDIC GRADIENT GENERATOR**
Senjuti Chakraborty, Shamik Sen, and Debjani Paul
*Indian Institute of Technology, Bombay, INDIA*

**W049.a** **INTEGRATION OF FIBER OPTICAL SENSORS INTO MICROSYSTEMS FOR THE DETECTION OF SPECIFIC BIOFILM PATTERNS**
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], and Janina Bahnemann[1,4]
[1] *Leibniz University, GERMANY,* [2] *Leibniz University Hannover, GERMANY,* [3] *Hannover Medical School, GERMANY, and* [4] *University of Augsburg, GERMANY*

**W050.a** **MODULATION OF IMMUNE RESPONSE USING MAGNETICALLY-ACTUATED DYNAMIC SURFACES - ADVANCING BIOMATERIALS FOR THE NEXT-GENERATION SMART IMPLANTS**
Lanhui Li and Burcu Gumuscu
*Eindhoven University of Technology, NETHERLANDS*

**W051.a** **STUDY OF PLASMA MEMBRANE AND NUCLEAR ENVELOPE WOUND REPAIR DYNAMICS USING A NANOSTRUCTURED MICROFLUIDICS PLATFORM**
Apresio K. Fajrial and Xiaoyun Ding
*University of Colorado, Boulder, USA*

## b - Diagnostics, Drug Testing & Personalized Medicine

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

**M052.b** **3D-OXYGEN GRADIENT CHIP FOR CANCER CELL MIGRATION RESEARCH**
Pan Zuo, Jelle Sleeboom, and Jaap den Toonder
*Eindhoven University of Technology, NETHERLANDS*

**M053.b** **ENHANCING INFILTRATION OF CAR-T CELLS INTO SOLID TUMOR MICROENVIRONMENT THROUGH 3D ADAPTATION**
Seung Won Oh[1], Junho Lee[1], Sangjoon Lah[1], Jae-Ho Cheong[2], Chan Hyuk Kim[1], and Pilnam Kim[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), KOREA and* [2]*Yonsei University, KOREA*

**M054.b** **RAPID ISOLATION OF CIRCULATING TUMOR CELLS AND FULL COLLECTION OF THEIR EXOSOMES USING A THREE-DIMENSIONAL MICROBEAD ARRAY DESIGN**
Sungchi Tsai[1], Wen-Yi Chang[1], Yun-Chi Tsai[1], Pyea-Yoo Kim[1], and Howard Doong[1,2]
[1]*LifeCode Biotech, TAIWAN and* [2]*Fu-Jen Catholic University, TAIWAN*

**T052.b** **A 3D MANUFTACTURING OF PEUMATIC MICROPUMP TO CAPTURE CIRCULATING TUMOR CELLS AND AUTOMATED STAINGING WITH FLUORESCENT DYE**
Sungchi Tsai[1] and Howard Doong[1,2]
[1]*LifeCode Biotech, TAIWAN and* [2]*Fu-Jen Catholic University, TAIWAN*

**T053.b** **ENRICHMENT OF CHEMO-RESISTANT LIVE FLOATING PANCREATIC CANCER CELLS FROM MEDIA OF TUMOR MODEL BASED ON CELL MEMBRANE BIOPHYSICAL METRICS**
Aditya Rane[1], Javad Jarmoshti[1], Abdullah-Bin Siddique[1], Sara Adair[1], Karina Torres-Castro[2], Todd W. Bauer[1], Carlos Honrado[3], and Nathan S. Swami[1]
[1]*University of Virginia, USA,* [2]*National Institute of Standards & Technology (NIST), USA, and* [3]*Iberian International Nanotechnology Institute, PORTUGAL*

**T054.b** **THE BIOMECHANICS OF DIFFERENT BREAST CANCER CELL SUBTYPES DIFFERS IN RESPONSE TO FAST INDUCED DEFORMATION AND RECOVERY**
Emile Gasser[1,2], Kyohei Terao[3], Emilie Su[2], Nassiba Abbade[1,2], Kotryna Vaidziulyte[1], Jean-Baptiste Manneville[2], Matthieu Piel[1], Jean-Louis Viovy[1], Jean-Yves Pierga[1], and Catherine Villard[2]
[1]*Institut Curie, FRANCE,* [2]*Université Paris Cité, FRANCE, and* [3]*Kagawa University, JAPAN*

**W052.b** **CANCER RESEARCH, CAPTURE & ANALYSIS OF CIRCULATING TUMOR CELLS**
Lu-Wei Chang[1], Xin-Zhi Lee[1], Huan-Wei Liao[1], Hsin-Yu Yang[1,2], and Fan-Gang Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

**W053.b** **MICROGAP CHANNEL SYSTEM FORMED ON NANOIMPRINTED MICROCONE ARRAY FOR IMMUNOAFFINITY-BASED SELECTION OF RARE CELLS**
Yuhei Saito[1], Natsumi Shimmyo[1], Rie Utoh[1], Shuhei Aoyama[2], Minoru Seki[1], and Masumi Yamada[1]
[1] *Chiba University, JAPAN and* [2] *Denka Co. Ltd., JAPAN*

## Civilization Diseases (diabetes, allergies)

**M055.b** **MICROFLUIDIC IMMUNOSENSING PLATFORM BASED ON ROLLING CIRCLE AMPLIFICATION-ASSISTED DNA DENDRIMER PROBE FOR PORTABLE AND SENSITIVE DETECTION OF ALLERGEN-SPECIFIC IGE**
Yiyu Chen[1], Huiting Lian[1], Bin Liu[1], Guangming Liu[2], and Xiaofeng Wei[1]
[1] *Huaqiao University, CHINA and* [2] *Jimei University, CHINA*

**T055.b** **NEW TWO FLOW CHEMILUMINESCENCE-BASED RAPID DIAGNOSTIC TEST (RDT) PLATFORM FOR RAPID DIAGNOSTICS OF CARDIAC BIOMARKERS**
Heeyeong Jang, Supreeth Setty, and Chong Ahn
*University of Cincinnati, USA*

**W054.b** **GELMA HYDROGEL IMMUNOWALL DEVICE FOR IL-6 QUANTITATION IN HUMAN SERUM**
Yuto Banno, Takuma Nomiyama, Shoma Okuno, and Noritada Kaji
*Kyushu University, JAPAN*

## Clinical Chemistry

**W055.b** **TARGET-RESPONSIVE CATALYZED HAIRPIN ASSEMBLY-INTEGRATED PHOTOTHERMAL APTASENSOR FOR SENSITIVE AND VISUAL QUANTIFICATION OF CARCINOEMBRYONIC ANTIGEN USING A DISTANCE-BASED MICROFLUIDIC CHIP**
Xiaofeng Wei, Zhiming Wang, Huiting Lian, and Bin Liu
*Huaqiao University, CHINA*

## Drug Delivery

**M056.b** **A MICROFLUIDICS-BASED METHOD FOR BRAIN TUMOR-TARGETING NANOMEDICINE PREPARATION**
Ji Wang and Shuhuai Yao
*Hong Kong University of Science and Technology, HONG KONG*

**M057.b** **DELIVERY OF LARGE CARGO IN MAMMALIAN CELLS ENHANCED BY INFRARED LIGHT PULSE-ACTIVATED MICRO-RING DEVICE**
Ashwini S. Shinde[1], Pallavi S. Shinde[1], Kavitha Illath[1], Moeto Nagai[2], Srabani Kar[3], and 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, INDIA*

**M058.b** **NANOSTRUCTURED MICROFLUIDICS FOR HIGH-THROUGHPUT NUCLEAR DELIVERY OF PLASMID DNA AND RAPID PROTEIN EXPRESSION**
Apresio K. Fajrial, Leyla Akh, and Xiaoyun Ding
*University of Colorado, Boulder, USA*

**T056.b** **ALGINATE HYDROGEL BEADS WITH TUNABLE CROSS-LINKING RATIO ENABLE PRECISELY CONTROLLED RELEASE OF ADENO-ASSOCIATED VIRUS FOR GENE THERAPY**
Aiki Hioki[1], Shuhei Takatsuka[1], Yuta Kurashina[2], and Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Tokyo University of Agriculture and Technology, JAPAN*

**T057.b** **DEVELOPMENT OF ARTIFICIAL EXOSOMES USING A MICROFLUIDIC DEVICE FOR RNA DELIVERY**
Masatoshi Maeki[1,2], Ayuka Niwa[1], Shota Oyama[1], Akihiko Ishida[1], and Manabu Tokeshi[1]
[1] *Hokkaido University, JAPAN and* [2] *KEK, JAPAN*

**W056.b** **BIORESIST-BASED SINGLE-CELL ARRAY CHIP FOR STANDARDIZED OPTOPORATION**
Aniket Mishra[1], Shunya Okamoto[1], Takayuki Shibata[1], Tuhin S. Santra[2], and Moeto Nagai[1]
[1] *Toyohashi University of Technology, JAPAN and* [2] *Indian Institute of Technology, Madras, INDIA*

**W057.b** **INVESTIGATING NOVEL DRUG DELIVERY MECHANISMS WITH A MICROFLUIDIC CULTURE MODEL OF THE BIOPHYSICAL BARRERS TO DRUG DELIVERY IN PANCREATIC DUCTAL ADENOCARCINOMA**
Delanyo Kpeglo[1], Margaret A. Knowles[1], Malcolm Haddrick[2], Stephen D. Evans[1], and Sally A. Peyman[1]
[1] *University of Leeds, UK and* [2] *Medicines Discovery Catapult, UK*

## Drug Screening & Development

**M059.b** **ESTABLISHMENT OF MICROFLUIDIC STAPHYLOCOCCUS AUREUS BIOFILM ON THIOL-ENE POLYMERS FOR ANTIMICROBIAL EFFICACY SCREENING**
Jéssica Amorim, Cristina D. Cruz, Markus Haapala, Päivi Tammela, and Tiina M. Sikanen
*University of Helsinki, FINLAND*

**M060.b** **LOW ASPECT RATIO LAMINATION MIXER (LARLM) ENABLED BY TWO-PHOTON POLYMERIZATION FOR LIPID NANOPARTICLE SYNTHESIS WITH IN-SITU SIZE DETERMINATION**
Ebrahim Taiedinejad
*Technische Universität Braunschweig, GERMANY*

**M061.b** **SIMPLE DROPLET MICROFLUIDICS PLATFORM FOR DRUG SCREENING ON CANCER SPHEROIDS**
Caroline Parent[1], Kiran Raj Melayil[1], Ya Zhou[1], Vivian Aubert[1], Didier Surdez[2], Olivier Delattre[1], Claire Wilhelm[1], and Jean-Louis Viovy[1]
[1] *Institut Curie, FRANCE and* [2] *Univerity of Zurich, SWEDEN*

**T058.b** **DIGITAL TWIN OF MINIATURIZED SYSTEM FOR HOLLOW-FIBER INFECTION MODEL TO ACCELERATE ANTIMICROBIAL RESISTANCE EVALUATION**
Kazuhiro Noda[1], Toshihiro Kasama[1], Marie Shinohara[1], Masakaze Hamada[2], Kotaro Aoki[2], Yukiko T. Matsunaga[1], Madoka Takai[1], Yoshikazu Ishii[2], and Ryo Miyake[1]
[1] *University of Tokyo, JAPAN and* [2] *Toho University, JAPAN*

**T059.b** **HIGH-THROUGHPUT DROPLET PLATFORM TO PRODUCE BARCODED APC LIBRARY FOR T CELL ANTIGEN SCREENING**
Xu Cui
*University of Singapore, SINGAPORE*

**T060.b** **MICROCHAMBER DEIVICE FOR SIMULTANEOUS ASSESSMENTS OF LOCAL BARRIER FUNCTION AND MORPHOLOGY OF EPITHELIAL CELL SHEET**
Ryuya Kida, Mamiko Tsugane, and Hiroaki Suzuki
*Chuo University, JAPAN*

**W058.b** **EFFICIENT FULL-LENGTH IGG SECRETION AND SORTING FROM SINGLE YEAST CLONES IN DROPLET PICOREACTORS**
Esteban Lebrun[1,2], Vasily A. Shenshin[1], Cécile Plaire[1], Vincent Vigneres[3], Théo Pizette[1], Bruno Dumas[1], Jean-Marc Nicaud[2], and Guillaume Mottet[1]
[1]*Sanofi, FRANCE,* [2]*INRAE, FRANCE, and* [3]*Arcale, FRANCE*

**W059.b** **LABEL-FREE LONG-TERM VISUALIZATION OF ADHERENT CELL MULTIPOLAR DIVISION UNDER THIAMET-G TREATMENT**
Fei Liang[1], Peng Zhao[1], Yongxiang Feng[1], Huichao Chai[1], Weihua He[1], Jing Li[2], and Wenhui Wang[1]
[1]*Tsinghua University, CHINA and* [2]*Capital Normal University, CHINA*

**W060.b** **REPRODUCTION OF INCREASED MUSCLE CONTRACTION FORCE BY FLAVONOIDS USING A MODEL DEVICE WITH ARTIFICIAL SKELETAL MUSCLE**
Kota Kishishita, Tomohiro Nakamura, Marino Mizutani, and Sho Yokoyama
*Osaka Institute of Technology, JAPAN*

## Liquid Biopsy and Sample Preparation

**M062.b** **DEPLETION OF TUMOUR CELLS FROM ~40 ML SALVAGED BLOOD AT ~5 ML/MIN LEVERAGING MODIFIED PERFECT FILTERS COMBINED WITH LEUKOCYTE-DEPLETED FILTER**
Yi Zhang[1], Xiaoqing Zhang[2], Qingmei Xu[1], Songtao Dou[1], Xiangyang Guo[2], and Wei Wang[1,3,4]
[1]*Peking University, CHINA,* [2]*Peking University Third Hospital, CHINA,* [3]*National Key Laboratory of Advanced Micro and Nano Manufacture Technology, CHINA, and* [4]*Beijing Advanced Innovation Center for Integrated Circuits, CHINA*

**M063.b** **ROBOTIC CENTRIFUGAL MICROFLUIDICS: A NOVEL AUTOMATION PLATFORM FOR LARGE SAMPLE VOLUME APPLICATIONS DEMONSTRATED BY CELL-FREE DNA ISOLATION**
Tu T. Truong[1], Yumi Kaku[1], Sara ElGenk[1], Moritz Bösenberg[1], Holger Sültmann[2], Timo Gemoll[3], Nikolas C. C. von Bubnoff[3], Sabrina Kartmann[1,4], Jan Lüddecke[1,4], Tobias Hutzenlaub[1,4], Nils Paust[1,4], Peter Juelg[1,4], Lea Kubetzko[3], Stefanie Derer[3], Martina Oberländer[3], Alexander Katalinic[3], Ruth Deck[3], Christian Sina[3], and Hauke Busch[3]
[1]*Hahn-Schickard, GERMANY,* [2]*German Cancer Research Center (DKFZ), GERMANY,* [3]*University of Lübeck (UKSH), GERMANY, and* [4]*University of Freiburg (IMTEK), GERMANY*

**T061.b** **A MODULAR FINGER-ACTUATED FRUGAL APPROACH FOR POINT-OF-CARE BLOOD SAMPLE PREPARATION**
Maiwenn Kersaudy Kerhoas
*Heriot Watt University, UK*

**T062.b** **HIGHLY MULTIPLEXED ANTIBIOTIC SUSCEPTIBILITY ASSAY EMPLOYING COMBINATORIAL PICOLITRE DROPLET GENERATION**
Ashkan Samimi[1,2], Sundar Hengoju[1], and Miriam A. Rosenbaum[1,2]
[1] *Hans Knöll Institute, GERMANY and*
[2] *Friedrich Schiller University, GERMANY*

**T063.b** **STANDALONE ELECTROKINETIC PRECONCENTRATOR FOR ENHANCED DETECTION SENSITIVITY OF COMMERCIALLY AVAILABLE RAPID ASSAYS**
Barak Sabbagh[1,2], Sinwook Park[2], and Gilad Yossifon[2]
[1] *Technion - Israel Institute of Technology, ISRAEL and*
[2] *Tel Aviv University, ISRAEL*

**W061.b** **ACOUSTOFLUIDIC IMMUNOFLUORESCENCE ENHANCEMENT FOR TEAR-BASED DIABETIC RETINOPATHY DIAGNOSIS**
Hsuan-An Chen[1], Yan-Chin Yen[1], Sheng-Min Hsu[2], and Han-Sheng Chuang[1,3]
[1] *National Cheng Kung University, TAIWAN,* [2] *National Cheng Kung University Hospital, TAIWAN, and* [3] *Medical Device Innovation Center, TAIWAN*

**W062.b** **ON-CHIP COLORIMETRIC ASSAY FOR POINT-OF-CARE LITHIUM BLOOD LEVEL DETERMINATION USING FINGER-PRICK-BLOOD**
Carl Olsson[1], Federico Ribet[1], Janosch Hauser[1], Olof Beck[2], Fredrik Wikström[2], Martin Schalling[2], Lena Backlund[2], and Niclas Roxhed[1]
[1] *KTH Royal institute of Technology, SWEDEN and*
[2] *Karolinska Institutet, SWEDEN*

## Neurobiology/Neuroscience

**W063.b** **SCREENING OF RNA OLIGONUCLEOTIDE BEACON (MIRNA) FOR NEURODEGENERATIVE BIOMARKERS DETECTION IN MICROFLOUDIC SYSTEMS**
Weronika Z. Świtlik, Julia Anchimowicz, Magdalena Stobiecka, and Slawomir Jakiela
*Warsaw University of Life Sciences, POLAND*

## Nucleic-Acid Analysis

**M064.b** **A CENTRIFUGAL MICROFLUIDIC DEVICE CAPABLE OF SEQUENTIAL DISPENSING OF MULTIPLE SAMPLES FOR THE DETECTION OF MULTIPLE FOOD ALLERGENS**
Daigo Natsuhara[1], Yuka Kiba[2], Shunya Okamoto[1], Moeto Nagai[1], Masashi Kitamura[2], and Takayuki Shibata[1]
[1] *Toyohashi University of Technology, JAPAN and* [2] *Josai University, JAPAN*

**M065.b** **A PROGRAMMABLE DNA-BASED NANOSENSOR FOR SEQUENCE-BASED DETECTION AT SINGLE NUCLEOTIDE RESOLUTION**
Eun Yeong Lee and Yong Shin
*Yonsei University, KOREA*

**M067.b** **DE NOVO ASSEMBLY OF YEAST GENOMES USING OPTICAL GENOME MAPPING**
Luis M. Leal Garza[1], Albertas Dvirnas[2], Gaurav Goyal[1], Ikenna Obi[3], Nasim Sabouri[3], Tobias Ambjörnsson[2], and Fredrik Westerlund[1]
[1]*Chalmers University of Technology, SWEDEN,* [2]*Lund University, SWEDEN, and* [3]*Umeå University, SWEDEN*

**M068.b** **LAB-ON-FOIL MICROFLUIDIC CHIP FOR POC DIAGNOSTICS OF GENETIC DISORDER FABRICATED BY R2R UV NIL**
Anja Haase
*Joanneum Research Forschungsgesellschaft mbH, AUSTRIA*

**M070.b** **SYNCHRONIZED PHYSICO-CHEMICAL OPTIMIZATION ENABLES RAPID MICROFLUIDIC CONVECTIVE PCR**
MinGin Kim, Vijay Ravisankar, Yassin A. Hassan, and Victor M. Ugaz
*Texas A&M University, USA*

**T064.b** **A CUSTOMIZED HEATER PATTERNING PLATFORM BASED ON CARBON BLACK-PDMS AND NICHROME WIRE**
Juhee Lim and Joong Ho Shin
*Pukyong National University, KOREA*

**T065.b** **AMPLIFICATION OF SERS INTENSITY FOR DOUBLE-STRANDED DNA DETECTION USING DIFFUSE REFLECTION FACILITATED BY AG/ZNO NANOWIRE ARRAYS**
Yujin Jung, Jung Kim, Jong Hwan Lee, Sung Kyun Lee, Nam Hoon Kim, and Hong Gi Kim
*Korea Research Institute of Chemical Technology, KOREA*

**T066.b** **AN INTEGRATED PLATFORM FOR EXTRACTION AND DETECTION OF CHLAMYDIA TRACHOMATIS DNA IN RESOURCE-LIMITED SETTINGS**
Anton Stolt, Pablo Rodriguez Mateos, Alexander Iles, and Nicole Pamme
*Stockholm University, SWEDEN*

**T067.b** **ELECTROSTATIC MICROFILTRATION PERFORMS BETTER THAN THE COMMERCIAL KIT IN THE CAPTURE AND DETECTION OF LOW-ABUNDANCE CELL-FREE DNA (CFDNA)**
Yaoping Liu[1], Matilda Yu Yan Ong[2], Melody Xing Yen Song[2], Joshua Raymond[1], Chia-Ching Chan[1], and Jongyoon Han[1,3]
[1]*Singapore - MIT Alliance for Research and Technology (SMART), SINGAPORE,* [2]*Ngee Ann Polytechnic, SINGAPORE, and* [3]*Massachusetts Institute of Technology (MIT), USA*

**T068.b** **MICROFLUIDIC PLATFORM FOR DNA SEQUENCE PROFILING TOWARDS EARLY DETECTION OF CANCER**
Christine O'Keefe, Yang Zhao, Thomas R. Pisanic, Weiwen Cui, Tian-Li Wang, Ie-Ming Shih, and Tza-Huei Wang
*Johns Hopkins University, USA*

**T069.b** **SIMPLE MOLECULAR DIAGNOSTIC TECHNIQUES FROM SAMPLE PREPARATION USING AMINE-FUNCTIONALIZED DIATOMACEOUS EARTH (AMINE-DE) TO ACCURATE MUTATION DETECTION BY HOT-SPOT-SPECIFIC PROBE (HSSP)**
Hyo Joo Lee, Bonhan Koo, Yoon Ok Jang, Huifang Liu, and Yong Shin
*Yonsei University, KOREA*

**T070.b** **ZNO-AU-SERS DIRECT NUCLEIC ACID AMPLIFICATION SYSTEM FOR RAPID AND SENSITIVE MOLECULAR DIAGNOSTICS**
Myoung Gyu Kim[1], Kwan Hee Lee[2], Mi Yeon Jue[2], Jun Ki Kim[2], and Yong Shin[1]
[1] *University of Yonsei, KOREA and* [2] *University of Ulsan College of Medicine, KOREA*

**W064.b** **A DIGITAL MICROFLUIDIC APPROACH TO ANALYZING FORENSIC SAMPLES**
Mohamed Elsayed[1], Leticia Bodo[1], Jonathan Millman[2], and Aaron Wheeler[1]
[1] *University of Toronto, CANADA and*
[2] *Centre of Forensic Sciences, CANADA*

**W065.b** **AN EASY-TO-USE MULTIPLEX PCR CHIP BY USING WAX FILM FOR SEALING AND CONTROLLABLE RELEASE OF PRIMERS**
Yuanyue Zhang, Nan Li, and Youchun Xu
*Tsinghua University, CHINA*

**W066.b** **AUTOMATION OF DIGITAL DROPLET PCR USING CENTRIFUGAL MICROFLUIDICS FOR HIGHLY SENSITIVE DETECTION AND QUANTIFICATION OF SARS-COV-2 VIRAL RNA**
Lidija Malic[1], Liviu Clime[1], Byeong-Ui Moon[1], Christina Nassif[1], Dillon Da Fonte[1], Matthias Geissler[1], Aaron Bessoff[1], Luke Lukic[1], Mojra Janta[1], Denis Charlebois[2], and Teodor Veres[1]
[1] *National Research Council Canada, CANADA and*
[2] *Canadian Space Agency, CANADA*

**W067.b** **FAST AND ROBUST DETECTION OF SCLEROTIUM ROLFSII VIA WORKFLOW INTEGRATION OF IFAST-BASED EXTRACTION AND LAMP**
Phanupong Changtor[1,2], Pablo Rodriguez Mateos[1], Kittisak Buddhachat[2], Nonglak Yimtragool[2], Wandee Wattanachaiyingcharoen[2], Alexander Iles[1], and Nicole Pamme[1]
[1] *Stockholm University, SWEDEN and* [2] *Naresuan University, THAILAND*

**W068.b** **MULTIPLEXED DETECTION OF MICRORNA BIOMARKERS VIA CRISPR-CAS-POWERED GRAPHICALLY-ENCODED HYDROGEL BIOSENSORS**
Haoliang Lu, Erol Hasan, and Dana Alsulaiman
*King Abdullah University of Science and Technology, SAUDI ARABIA*

**W069.b** **SPATIAL MULTIPLEXING AND QUANTITATIVE MIRNA DETECTION OF PLANT TISSUE USING NANOLITER WELL ARRAYS**
Jennifer Fang and Patrick S. Doyle
*Massachusetts Institute of Technology, USA*

## Pathogen Detection & Antibiotics

**M071.b** **A MICROFLUIDIC COMBINATORY ANTIBIOTIC CONCENTRATION GRADIENT GENERATOR INTEGRATING SURFACE-ENHANCED RAMAN SPECTROSCOPY FOR MULTIPARALLEL ANTIMICROBIAL SUSCEPTIBILITY TESTING**
Yu-Tung Yeh and Nien-Tsu Huang
*National Taiwan University, TAIWAN*

**M072.b** **COLLECTION OF STREPTOCOCCUS PYOGENES FROM PEDIATRIC PATIENTS WITH PHARYNGITIS USING THE CANDYCOLLECT DEVICE**
Wan-chen Tu[1], Andrea Blom[2], Ingrid Jeacopello[1], Victoria A. M. Shinkawa[1], Daniel B. Hatchett[1], Juan C. Sanchez[1], Anika M. McManamen[1], Xiaojing Su[1], Elena Alfaro[2], Alexandra Lindstrom[2], Bridget L. Johnson[2], Erwin Berthier[1], Sanitta Thongpang[1,3], Ellen R. Wald[2], Gregory P. DeMuri[2], and Ashleigh B. Theberge[1]
[1]*University of Washington, USA,* [2]*University of Wisconsin, USA, and* [3]*Mahidol University, THAILAND*

**M073.b** **IMPROVING ACCURACY OF DIGITAL MELT VIA OLIGONUCLEOTIDE-ENABLED CURVE ALIGNMENT**
Amelia Traylor, Pei-Wei Lee, Kuangwen Hsieh, Weiwen Cui, and Jeff Tza-Huei Wang
*Johns Hopkins University, USA*

**M074.b** **LONG-TERM STORAGE OF READY-TO-USE REAGENTS FOR POINT-OF-CARE ISOTHERMAL NUCLEIC ACID TESTING IN RESOURCE-POOR SETTINGS**
Giulia Core, Jonathan M. Cooper, and Julien Reboud
*University of Glasgow, UK*

**M075.b** **OXYGEN CONSUMPTION MONITORING AS A METHOD TO EXPLORE HETERORESISTANCE IN MIXED BACTERIAL POPULATIONS EXPOSED TO ANTIBIOTIC TREATMENT**
Petra Juskova[1], Steven Schmitt[2], Adrian Egli[3], and Petra S. Dittrich[1]
[1]*ETH Zürich, SWITZERLAND,* [2]*Myria Biosciences AG, SWITZERLAND, and* [3]*University of Zurich, SWITZERLAND*

**M076.b** **RAPID ANTIMICROBIAL SUSCEPTIBILITY TESTING IN SLIPCHIPS**
Ka Hei Wat[1,2], Dhruv Mehra[2], Miao Xu[2], Ho Cheung Shum[1,2], and Sammer Ul Hassan[1,2]
[1]*Advanced Biomedical Instrumentation Centre, HONG KONG and* [2]*University of Hong Kong, HONG KONG*

**T071.b** **AN ENCAPSULATED SILVER/CHITOSAN HYDROGEL AS A LONG-ACTING DELIVERY VEHICLE FEATURING WITH ATTRACTED-KILLED INHIBITION MECHANISM IN RALSTONIA SOLANACEARUM**
Yi-Hsin Chien, Bon-Yen Lin, and Han-Hsiang Shih
*Feng Chia University, TAIWAN*

**T072.b** **DROPLET MICROFLUIDIC AND DEEP LEARNING POWERED APPROACH FOR LABEL-FREE ANTIMICROBIAL SUSCEPTIBILITY TESTING FOR COLISTIN IN CLINICAL ISOLATES**
Justine Riti[1], Guillaume Sutra[1], Thierry Naas[2,3,4], Hervé Volland[1], Stéphanie Simon[1], and Karla Perez-Toralla[1]
[1]*CEA, FRANCE,* [2]*APHP Hôpital Bicêtre, FRANCE,* [3]*Université Paris-Saclay-INSERM-CEA, FRANCE, and* [4]*Associated French National Reference Center for Antibiotic Resistance, FRANCE*

**T073.b** **INTEGRATING A LOLLIPOP-INSPIRED MICROFLUIDIC ORAL SAMPLING DEVICE WITH RAPID GROUP A STREPTOCOCCUS TESTING**
Juan C. Sanchez[1], Victoria A. M. Shinkawa[1], Ingrid Jeacopello[1], Xiaojing Su[1], Ellen R. Wald[2], Gregory P. DeMuri[2], Erwin Berthier[1], Sanitta Thongpang[1,3], and Ashleigh B. Theberge[1]
[1]*University of Washington, USA,* [2]*University of Wisconsin, USA, and* [3]*Mahidol University, THAILAND*

**T074.b** **MICROFLUIDIC PLATFORM TO VISUALIZE AND QUANTIFY BACTERIAL RESPONSE TO DYNAMIC DRUG TREATMENTS**
Friederike L. Born, Petra Jusková, and Petra S. Dittrich
*ETH Zürich, SWITZERLAND*

**T075.b** **PORTABLE DEVICES FOR RNA PURIFICATION, AMPLIFICATION, AND DETECTION OF MAYARO VIRUS**
Z. Hugh Fan, Morteza Alipanah, John A. Lednicky, and J. Glenn Morris
*University of Florida, USA*

**T076.b** **RAPID DETECTION OF CARBAPENEM RESISTANT ENTEROBACTERIACEAE (CRE) ANTIBIOTIC RESISTANCE WITH STANDALONE POINT-OF-CARE (POC) SELF-COALESCING MICROFLUIDIC**
Lily M. Kamat[1,2,3], Priscilla Delgado[1,3], Ali Haider[4], Jesse Waggoner[4], and David R. Myers[1,2,3]
[1]*Emory University, USA,* [2]*Georgia Tech, USA,* [3]*Aflac Cancer and Blood Disorders Center of CHOA, USA, and* [4]*Emory University School of Medicine, USA*

**W070.b** **A HEAT-ACTIVATED ANTIMICROBIAL MICROFILM FOR ELIMINATING PATHOGEN TRANSMISSION IN HIGH TOUCH SURFACES**
Dimitris Barmpakos[1,2,3], Stavroula Kritikou[4], Athanasios Tsakris[4], Georgia Vrioni[4], and Nikos Chronis[1,2]
[1]*National Centre for Scientific Research "Demokritos", GREECE,* [2]*National Technical University of Athens, GREECE,* [3]*University of West Attica, GREECE, and* [4]*National and Kapodistrian University of Athens, GREECE*

**W071.b** **AN EXTRACORPOREAL PLATELET-POOR PLASMA (PPP) CLOT HEMOADSORPTION FOR IMPROVED TREATMENT OF BACTEREMIA**
Bong Hwan Jang, Su Hyun Jung, Seyong Kwon, Sung Jin Park, and Joo H. Kang
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

**W072.b** **DUAL MODULE DROPLET-BASED SERS MICROFLUIDIC SENSING PLATFORM FOR HER-2 POSITIVE EXOSOME DETECTION**
Kwun Hei Willis Ho, Huang Lai, RouLin Zhang, Ching Ying Lam, YuTian Gu, and Mo Yang
*Hong Kong Polytechnic University, HONG KONG*

**W073.b** **LAB-IN-A-PACKAGE: DETECTING SALMONELLA IN WHOLE CHICKEN SAMPLES IN SITU**
Akansha Prasad, Shadman Khan, Jonathan K. Monteiro, Jiuxing Li, Fatima Arshad, Liane Ladouceur, Lei Tian, Amid Shakeri, Carlos Filipe, Yingfu Li, and Tohid F. Didar
*McMaster University, CANADA*

**W074.b** **MOVING RAPID ANTIBIOTIC SUSCEPTIBILITY TESTING TO THE CLINIC: THE ROLE OF MASS-MANUFACTURING MICROFLUIDICS IN GENERATING CLINICAL DATA**
Sarah Needs[1], Jessica Hayward[1], Stephen P. Kidd[2], and Alexander Edwards[1]
[1] *University of Reading, UK and* [2] *Hampshire Hospitals NHS Foundation Trust, UK*

**W075.b** **POWER-FREE HIV RNA EXTRACTION FROM WHOLE BLOOD FOR REAL-TIME SMARTPHONE-BASED DETECTION**
Emeka Nwanochie[1], Hyunjin Lee[1], Dong Hong Lee[1], Eddy Odari[2], Steven Wereley[1], Tamara Kinzer-Ursem[1], and Jacqueline Linnes[1]
[1] *Purdue University, USA and* [2] *Jomo Kenyatta University of Science and Technology, KENYA*

**W076.b** **RAPID DIAGNOSIS OF ANTIMICROBIAL RESISTANCE USING FLOURESCENT PROBE-BASED MOLECULAR IMAGING AND MICROFLUIDIC SYSTEM**
Brian Choi, Min Seok Lee, Hwi Hyun, Sungho Kim, Hajin Kim, Taejoon Kwon, and Joo H. Kang
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

## Personalized Medicine

**M077.b** **A THERMAL ACTIVATION METHOD TO IMPROVE SKIN PERMEABILITY FOR HIGHLY EFFICIENT EXTRACTION OF INTERSTITIAL FLUID**
Hao Zheng, Zhihua Pu, Wangwang Zhu, Yuxiao Ma, Chengcheng Li, Xingguo Zhang, and Dachao Li
*Tianjin University, CHINA*

**M078.b** **DEVELOPMENT OF A FRUGAL TUMOR ON-CHIP PLATFORM FOR SCREENING DRUG-NANOCARRIERS**
Dhruba Dhar, Soumen Das, and Jyotirmoy Chatterjee
*Indian institute of Technology, Kharagpur, INDIA*

**M079.b** **OVERCOMING CO-TRANSFECTION HURDLES FOR CELLULAR/GENE THERAPY: ON-CHIP SEQUENTIAL INTRACELLULAR DELIVERY OF GENETIC CODING MOLECULES VIA AN ACOUSTIC-ELECTRIC MICROFLUIDIC PLATFORM**
Aida Z. Travatfard, Mohammad Aghaamoo, and Abraham P. Lee
*University of California, Irvine, USA*

**M080.b** **SILVER ELECTROCEUTICAL TECHNOLOGY TO TREAT SARCOPENIA**
Min Young Kim[1], Hyun Young Shin[2], Sohae Yang[1], Aseer Intisar[1], and Minseok S. Kim[1,2]
[1] *Daegu Gyeongbuk Institute of Science & Technology (DGIST), KOREA and* [2] *CTCELLS, Inc, KOREA*

**T077.b** **AN APTAMER-BASED MICRONEEDLE PATCH TO CONTINUOUSLY MONITOR BIOMARKERS OF CARDIOVASCULAR DISEASES**
Sung-Chi Chang, Chih-Hung Wang, and Gwo-Bin Lee
*National Tsing Hua University, TAIWAN*

**T078.b** **EXPLORING THE EFFECTS OF HIGH TEMPERATURE EXPOSURE ON RNA INTEGRITY FROM STABILIZED BLOOD SAMPLES IN REMOTE RESEARCH STUDIES**
Filip Stefanovic, Lauren G. Brown, Yuting Zeng, Serena Nguyen, Victoria Shinakawa, Erwin Berthier, Amanda J. Haack, and Ashleigh B. Theberge
*University of Washington, USA*

**T079.b** **RAPID IDENTIFICATION OF THERAPEUTIC BACTERIOPHAGES FOR PERSONALIZED PHAGE THERAPY USING HIGH THROUGHPUT ALL-INCLUSIVE TABLETS**
Fereshteh Bayat Bayat, Arwa Hilal, Mathura Thirugnanasampanthar, Carlos Filipe, Tohid F. Didar, and Zeinab Hosseinidoust
*McMaster University, CANADA*

**T080.b** **THERANOSTICS MOLECULAR ROBOT: DETECT A MIRNA FROM TUMOR CELLS AND GENERATE THE DNA DRUG IN A LIPOSOME**
Harune Suzuki[1], Ken Komiya[2], and Ryuji Kawano[1]
[1] *Tokyo University of Agriculture and Technology, JAPAN and* [2] *Japan Agency for Marine-Earth Science and Technology, JAPAN*

**W077.b** **CELL PROCESSING FOR AUTOLOGOUS CELL THERAPY: HIGH-EFFICIENCY MICROFLUIDIC CELL SEPERATION AND WASHING DEVICES**
An Eng Lim, Shan Mei Tan, and Shireen Goh
*Agency for Science, Technology and Research (A*STAR), SINGAPORE*

**W078.b** **METAL-POLYMER SERIES CONNECTION HYBRID STENT INTEGRATED WITH PI BASED WIRELESS PRESSURE SENSOR**
Lei Wang, Dong-Su Kim, Nomin-Erdene Oyunbaatar, and Dong-Weon Lee
*Chonnam University, KOREA*

**W079.b** **RAPID IMMUNE RESPONSE ASSESSMENT FOR POST-INFUSION CAR-T PATIENTS THROUGH BIOPHYSICAL WBC ANALYSIS**
Kwan Zen Nicholas Tan[1], Zeming Kerwin Kewk[1], Kai Yun Quek[1], Chin Ren Goh[1], Zhi Heng Nicholas Ng[1], Wei Inng Francesca Lorraine Lim[2], Yun Xin Chen[2], Michael E. Birnbaum[3], and Jongyoon Han[3]
[1] *Singapore - MIT Alliance for Research and Technology (SMART), SINGAPORE,* [2] *Singapore General Hospital, SINGAPORE, and* [3] *Massachusetts Institute of Technology, USA*

**W080.b** **WORKFLOW INTEGRATION FOR ELECTROCHEMICAL-BASED HOME-TESTING**
Fabien Abeille[1], Bianka Fabinyi[1], Jelle Bannink[1], Thérèse Gorisse[1], Daniel-Stefan Cristea[2], Marko Blom[1], and Winnie E. Svendsen[2]
[1] *Micronit BV, NETHERLANDS and* [2] *Technical University of Denmark, DENMARK*

## Protein Analysis & Proteomics

**M081.b** **DIGITAL MAGNETIC PROXIMITY EXTENSION RPA-CRISPR/CAS12A-ASSISTED IMMUNOASSAY WITH ATTOMOLAR SENSITIVITY**
Fangchi Shao, Jiumei Hu, Kuangwen Hsieh, Pengfei Zhang, Pataraiarin Akarapipad, Joon Soo Park, and Tza-Huei Wang
*Johns Hopkins University, USA*

**M082.b** **INTEGRATED STRATEGY FOR STREAMLINED SINGLE-CELL FUNCTIONAL PROTEOMICS AND SENSITIVE DOPAMINE DETECTION**
Hsiung-Lin Tu[1], Sofani Gebreyesus[1], Gul Muneer[1], Ying Li[1], Asad Ali[1], Chih-Min Wang[2], and Yu-Ju Chen[1]
[1]*Academia Sinica, TAIWAN and* [2]*National Taiwan Ocean University, TAIWAN*

**T081.b** **DISPOSABLE, FLEXIBLE MICROFLUIDIC SYSTEM FOR RAPID, PRE-ANALYTICAL SEPARATION OF IGG ANTIBODIES FROM SERUM SAMPLES**
Marcin Drozd, Katarzyna Tokarska, Zuzanna Tylenda, Sylwia Karoń, Kamil Żukowski, Mariusz Pietrzak, Elżbieta Malinowska, and Zbigniew Brzózka
*Warsaw University of Technology, POLAND*

**T082.b** **MAMMOTHFLUIDICS': AMINO ACID DATING OF FOSSILISED TEETH**
Laila Patinglag[1], Marc R. Dickinson[2], Kirsty EH. Penkman[2], and Kirsty J. Shaw[1]
[1]*Manchester Metropolitan University, UK and* [2]*University of York, UK*

**W081.b** **ELECTROKINETIC TRAPPING AND QUANTIFICATION OF HISTONES FROM PLASMA IN A MICROFLUIDIC DEVICE USING DEHYDRATED ISOELECTRIC GATES**
Shadi Shahriari, Patricia P. Liaw, Alison E. Fox-Robichaud, and Ponnambalam Ravi Selvaganapathy
*McMaster University, CANADA*

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

**M083.b** **APPLICATION OF ONE-POT DUAL-CLAMPED SERS-BASED DIAGNOSTIC PLATFORM IN THE DETECTION OF SARS-COV-2 FROM CLINICAL SAMPLES: COMPARISON WITH COMMERCIAL RAPID ANTIGEN TEST KITS**
Kiran Kaladharan[1] and Fan-Gang Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

**M084.b** **HPV 16 DNA AMPLIFICATION AND DETECTION FROM CELL LYSATES, ON A PAPER SUBSTRATE, WITH A LATERAL FLOW READOUT**
Luke Brennan, Francesca Hamacher, Ana Claure, Jacqueline Linnes, and Natalia Rodriguez
*Purdue University, USA*

**M085.b** **INTEGRATED MICROFLUIDIC PLATFORM AND BIO-OPTICAL SENSOR SYSTEM: A RAPID AND SENSITIVE SAMPLE-TO-ANSWER DIAGNOSTIC APPROACH FOR EMERGING INFECTIOUS DISEASES**
Bonhan Koo, Myoung Gyu Kim, and Yong Shin
*Yonsei University, KOREA*

**M086.b** **ON-CHIP RPA AND CAS12A ASSAY USING AUNIS-BASED PLASMONIC PCR SYSTEM FOR REAL-TIME SARS-COV-2 DETECTION**
Eun-Sil Yu, Hyejeong Jeong, Jaehyeok Park, Jaemyeong Kwon, and Ki-hun Jeong
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**M087.b** **RNASTICK: HASSLE-FREE DIPSTICK BASED RNA ISOLATION FROM WASTEWATER**
Shruti Ahuja, Maria D'costa, Avani Kulkarni, Kiran Kondabagil, and Siddharth Tallur
*Indian Institute of Technology, Bombay, INDIA*

**T083.b** **CENTRIFUGAL FORCE-ASSISTED THERMAL CONVECTION PCR DEVICE FOR RAPID DETECTION OF VIRAL RNA IN SALIVA: A PROMISING POINT-OF-CARE TESTING APPROACH**
Masato Saito[1], Jonathan Briones[1], Ryota Kokutani[2], Yasutaka Minegishi[2], Shigeto Hamaguchi[1], and Satoshi Kutsuna[1]
[1] *Osaka University, JAPAN and* [2] *NIPPON GENE Co., LTD., JAPAN*

**T084.b** **IMMUNOCHROMATOGRAPHIC HCG TEST STRIPS USING GOLD NANOTRIANGLES**
Asahi Kimura, Mao Hamamoto, and Hiromasa Yagyu
*Kanto Gakuin University, JAPAN*

**T085.b** **LAB-ON-A-FOIL MICROFLUIDIC SYSTEM FOR SARS-COV-2 DIAGNOSTICS**
Kamil Żukowski[1], Katarzyna Tokarska[1], Marcin Drozd[1], Mariusz Pietrzak[1], Adam Nowiński[2], Elżbieta Malinowska[1], and Zbigniew Brzózka[1]
[1] *Warsaw University of Technology, POLAND and* [2] *Screenmed, POLAND*

**T086.b** **POINT-OF-CARE PATHOGEN TESTING PLATFORM WITH INTEGRATED SAMPLE AMPLIFICATION CONTROL**
Navaporn Sritong, Riley J. Brown, Karin F. K. Ejendal, and Jacqueline C. Linnes
*Purdue University, USA*

**T087.b** **TOWARDS DETECTION OF AIRBORNE PATHOGENIC MICROORGANISMS BY A MICROTOTAL ANALYSIS SYSTEM**
Guillaume Blaire, Manuel Alessio, Melissa Baque, Fabrice Navarro, and Jean-Maxime Roux
*CEA Leti, FRANCE*

**W082.b** **ABSOLUTE ELECTRICAL QUANTIFICATION OF TARGET NUCLEIC ACID USING DIGITAL SORT-ENABLED COUNTING (DISCO)**
Yi Liu and Xu Cui
*University of Singapore, SINGAPORE*

**W083.b** **DIGITAL FOCUS ASSAY PLATFORM FOR THE QUANTIFICATION OF VIABLE VIRUSES**
Siddharth Raghu Srimathi, Maxinne A. Ignacio, Margaret A. Scull, and Don L. DeVoe
*University of Maryland, USA*

**W084.b** **INEXPENSIVE-BY-DESIGN, VERSATILE AND INTUITIVE MOLECULAR DIAGNOSTICS PLATFORM FOR POINT OF USE**
Laura Folkertsma[1,2], Alvaro J. Conde[1], Brigitte B. Bruijns[3,4], Arno C. Pol[5], Elsa Dragt[6], Michelle G. van Heteren[1], Elwin X. Vrouwe[1], Lisanne P. Karbaat[7], Frank van der Hoek[8], Marko Blom[1], Tom Evers[6], Han J.W. Zendman[5], Herbert Torfs[2], and Ronny van 't Oever[1]
[1]*Micronit BV, NETHERLANDS,* [2]*Salvitat BV, NETHERLANDS,* [3]*Saxion University of Applied Sciences, NETHERLANDS,* [4]*Politieacademie, NETHERLANDS,* [5]*NYtor, NETHERLANDS,* [6]*DE-design, NETHERLANDS,* [7]*Holland Innovative, NETHERLANDS, and* [8]*Fris en Fruitig VZW*

**W085.b** **LYOPHILIZED CHEMILUMINESCENCE (CL) BASED MICROCAPILLARY FLOW ASSAY (MCFA) LAB CHIPS FOR RAPID AND HIGH-SENSITIVE TESTS OF SARS-COV-2**
Supreeth Setty[1], Heeyeong Jang[1], Nogi Park[2], Keun Seok Seo[2], and Ahn Chong[1]
[1]*University of Cincinnati, USA and* [2]*Mississippi State University, USA*

**W086.b** **RAPID SINGLE-ROUND POOL TESTING OF INFECTIOUS DISEASE ENABLED BY MULTICOLOR DIGITAL MELTING PCR**
Xu Cui
*University of Singapore, SINGAPORE*

## Others

**M088.b** **CAPTURE AND CHARACTERIZATION OF EXTRACELLULAR VESICLES BY DIELECTROPHORESIS**
Charlotte Neel[1,2], Jean F. Audibert[1], Sameh Obeid[2], Rasta Ghasemi[1], Sakina Bensalem[1], Zuzana Krupova[3], Myriam Taverna[2], and Bruno Le-Pioufle[1]
[1]*ENS Paris-Saclay, FRANCE,* [2]*Institut Galien Paris-Saclay, FRANCE, and* [3]*Excilone, FRANCE*

**T088.b** **FULLY-AUTOMATIC MICROFLUIDIC BEAD-BASED ASSAY FOR FAST QUANTIFICATION OF MULTIPLE KIDNEY FAILURE BIOMARKERS**
Gloria Porro
*École Polytechnique Fédérale de Lausanne, SWITZERLAND*

**W087.b** **A MICROFLUIDIC SYSTEM INTEGRATED WITH A SHEAR FORCE CONTROL DEVICE TO OPTIMIZE SELECTION OF APTAMERS TARGETING FOLATE RECEPTOR ALPHA**
Yang-Sheng Shao, Yi-Cheng Tsai, and Gwo-Bin Lee
*University of Tsing Hua, TAIWAN*

**W088.b** **SINGLE MOLECULE DRUG-DNA INTERACTION STUDIES USING NANOFLUIDIC DEVICES**
Sriram Kk, Kseniya Ihnatsiuk, Raphael de Paiva, Andrew Kellett, and Fredrik Westerlund
*Chalmers University of Technology, SWEDEN*

## c - Fundamentals in Microfluidics and Nanofluidics

### Acousto- and Magnetofluidics

**M089.c** **ACOUSTIC SENSING OF BIOANALYTES WITH FUNCTIONALIZED MICROBUBBLES**
Marc Prudhomme[1], Mahmoud Addouche[1], Jacques Fattaccioli[2], and Franck Chollet[1]
[1]*FEMTO-ST, FRANCE and* [2]*ENS Paris, FRANCE*

**M090.c** **ACOUSTOFLUIDICS IN LAB-ON-A-ROBOT APPLICATION**
Cornel Dillinger[1], Till Häussner[1], Nitesh Nama[2], and Daniel Ahmed[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*University of Nebraska, Lincoln, USA*

**M091.c** **FULLY MICROFABRICATED SURFACE ACOUSTIC WAVE TWEEZER FOR (SUB-)MICRON PARTICLE FOCUSING**
Armaghan Fakhfouri[1], Melanie Colditz[1], Citsabehsan Devendran[2], Stefan Jacob[3], Kateryna Ivanova[1], Adrian Neild[2], and Andreas Winkler[1]
[1]*Leibniz IFW Dresden, GERMANY,* [2]*Monash University, AUSTRALIA, and* [3]*Physikalisch-Technische Bundesanstalt, GERMANY*

**M092.c** **LEVERAGING PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS (PMUT) FOR 3D ACOUSTOFLUIDIC MANIPULATION OF PARTICLES AND ORGANOIDS**
Emilie Vuille-dit-Bille[1,2], Sarah Heub[1], Dara Z. Bayat[1], Marc-Alexandre Dubois[1], Thomas Overstolz[1], Michel Despont[1], Selman Sakar[2], and Gilles Weder[1]
[1]*CSEM SA, SWITZERLAND and* [2]*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

**M093.c** **NAVIGATION OF ULTRASOUND MICROROBOTS THROUGH OBSTACLES BY MEANS OF AN AUTONOMOUS SYSTEM**
Mahmoud Medany[1], Sarp Sepici[1], S. Karthik Mukkavilli[2], and Daniel Ahmed[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*IBM Research, SWITZERLAND*

**M094.c** **SILICA SEED PARTICLES IMPROVE NANOPARTICLE ACOUSTIC TRAPPING EFFICIENCY AND THROUGHPUT**
Megan Havers[1], Thierry Baasch[1], Andreas Lenshof[1], Mikael Evander[2], and Thomas Laurell[1]
[1]*Lund University, SWEDEN and* [2]*AcouSort AB, SWEDEN*

**M095.c** **UPSCALING OF ACOUSTIC FOCUSING OF PARTICLES IN A PARALLEL CHANNEL CONFIGURATION**
Amaury A. de Hemptinne, Pierre P. Gelin, and Wim W. De Malsche
*Vrije Universiteit Brussel (VUB), BELGIUM*

**T089.c** **ACOUSTICALLY LEVITATED DROPLET AS A MICROGRAVITY SIMULATOR**
Sreejith Kamalalayam Rajan, Aditya Vashi, and Nam-Trung Nguyen
*Griffith University, AUSTRALIA*

**T090.c** **CELL CONCENTRATION BY USING SIMPLE ACOUSTOFLUIDIC SYSTEM WITH LOW SAMPLE LOSS FOR RARE CELL APPLICATIONS**
Natsumi Hirata, Hayato Yamaki, and Takeshi Hayakawa
*Chuo University, JAPAN*

**T091.c** **HIGH-POWER ACOUSTOFLUIDICS DRIVEN BY LINE DOUBLE-PARABOLIC-REFLECTORS WAVE-GUIDED HIGH-POWER ULTRASONIC TRANSDUCER**
Enrico Corato[1], Wei Qiu[1], Takeshi Morita[2], and Per Augustsson[1]
[1] *Lund University, SWEDEN and* [2] *University of Tokyo, JAPAN*

**T092.c** **MANIPULATION OF THE POSITION AND ORIENTATION OF PROLATE SPHEROIDS IN A PSEUDO-STANDING SURFACE ACOUSTIC WAVE FIELD**
Sebastian Sachs[1], Christian Cierpka[1,2], and Jörg König[1]
[1] *Technische Universität Ilmenau, GERMANY and* [2] *Lund Universiy, SWEDEN*

**T093.c** **PRECISION GUIDED NON-INVASIVE TREATMENT OF ANEURYSMS USING ACOUSTIC ROBOTICS**
Mahmoud Medany and Daniel Ahmed
*ETH Zürich, SWITZERLAND*

**T094.c** **SURFACE ACOUSTIC WAVE MICROFLUIDIC DEVICE ENABLES RAPID PROTEIN CONCENTRATION ANALYSIS IN BLOOD PLASMA**
Nakul Sridhar[1], Julie McAfee[2], Rachelle Nuss[2], Kathryn Hassell[2], and Xiaoyun Ding[1]
[1] *University of Colorado, Boulder, USA and*
[2] *University of Colorado, Anschutz, USA*

**W089.c** **ACOUSTOFLUIDIC PROPERTIES OF POLYSTYRENE PARTICLES**
Alexander Edthofer[1], Jakub Novotny[2], Andreas Lenshof[1], Thomas Laurell[1], and Thierry Baasch[1]
[1] *Lund University, SWEDEN and* [2] *Institute of Analytical Chemistry of the CAS, CZECH REPUBLIC*

**W090.c** **ECHOTILT: A LOW-COST ACOUSTOFLUIDIC METHOD FOR HIGH FLOW RATE ENVIRONMENTAL NANOPLASTIC ENRICHMENT**
Liesbeth G. B. van der Geer, Martim Costa, Björn Hammarström, Selim Tanriverdi, Haakan N. Joensson, Martin Wiklund, and Aman Russom
*KTH Royal institute of Technology, SWEDEN*

**W091.c** **INVESTIGATION ON PARTICLE DEFLECTION IN SURFACE ACOUSTIC WAVE MICROFLUIDIC DEVICE FOR EFFICIENT EXOSOME EXTRACTION**
Tao Peng
*University of Macau, CHINA*

**W092.c** **MICROSCALE PARTICLE MANIPULATION USING AN ACOUSTOFLUIDIC END EFFECTOR ASSISTED BY ROBOTIC ARM**
Jan Durrer[1], Prajwal Agrawa[!1], Ali Ozgul[1], Stephan Neuhuass[2], Nitesh Nama[3], and Daniel Ahmed[1]
[1] *ETH Zürich, SWITZERLAND,* [2] *University of Zurich, SWITZERLAND, and* [3] *University of Nebraska, Lincoln, USA*

**W093.c** **RECONFIGURATION OF ACOUSTOFLUIDICS VIA TUNING THE COMPETITION BETWEEN DIFFERENT WAVE MODES**
Yu Gao and Xiaoyun Ding
*University of Colorado, Boulder, USA*

W094.c **THE ACOUSTOPHORETIC MIGRATION AND SEPARATION OF SUSPENDED CELLS IN ACOUSTIC IMPEDANCE GRADIENTS**
Mahdi Rezayati Charan and Per Augustsson
*Lund University, SWEDEN*

## Capillary Microfluidics

M096.c **LABEL-FREE ANTIMICROBIAL SUSCEPTIBILITY TESTING IN MICROFLUIDIC 'DIP STICKS'**
Zhuoling Yu[1], Sarah H. Needs[2], Brian V. Jones[1], Alexander D. Edwards[2], and Nuno M. Reis[1]
[1]*University of Bath, UK and* [2]*University of Reading, UK*

M097.c **ON THE DYNAMIC CONTACT ANGLE OF CAPILLARY-DRIVEN MICROFLOWS IN OPEN CHANNELS**
Jodie C. Tokihiro, Jean Berthier, Anika M. McManamen, David N. Phan, Sanitta Thongpang, and Ashleigh B. Theberge
*University of Washington, USA*

T095.c **3D INVESTIGATION OF DROPLET FORMATION AND GEOMETRY-INDUCED SINGLE DROPLET COALESCENCE USING MICRO-COMPUTED TOMOGRAPHY**
Bastian Oldach, Carolin Müller, Philipp Wintermeyer, and Norbert Kockmann
*TU Dortmund University, GERMANY*

T096.c **MICROFLUIDIC GENERATION OF MICRO-SOAP BUBBLES FOR AIRBORNE MOLECULAR ROBOT**
Rina Takagi and Ryuji Kawano
*Tokyo University of Agriculture and Technology, JAPAN*

T097.c **TIME- AND DISTANCE-RESOLVED FLUID FLOW IN VERTICAL MICROFLUIDIC STRIPS: A NEW OPEN SOURCE ROBOTIC PLATFORM FOR QUANTITATIVE, MULTIPARAMETER MEASUREMENT OF GLOBAL HAEMOSTASIS AND BLOOD FUNCTION**
Rüya M. Sarıyer[1], Kirandeep Gill[2], Sarah H. Needs[1], Daniel Hodge[1], Nuno M. Reis[2], Chris I. Jones[1], and Alexander D. Edwards[1]
[1]*University of Reading, UK and* [2]*University of Bath, UK*

W095.c **DETERMINISTIC CELL-PARTICLE PAIRING DEVICE IN THE OPEN MICROFLUIDICS ARCHITECTURE TOWARD SINGLE-CELL RNA SEQUENCING**
Hiroto Teratani, Tomoki Murakami, and Hiroaki Suzuki
*Chuo University, JAPAN*

W096.c **MULTIPHASE RESERVOIR SUBCIRCUIT FOR MICROFLUIDIC CHAIN REACTION OF IMMISCIBLE AND MISCIBLE MULTIPHASE LIQUIDS IN CAPILLARIC CIRCUITS**
Geunyong Kim, Andy Ng, David Juncker
*McGill University, CANADA*

## Centrifugal Microfluidics

M098.c **A PORTABLE LAB ON A DISC PLATFORM FOR CONTINUOUS HANDLING OF WIDE RANGE OF SAMPLE VOLUME**
Sourav Acharya, Jasleen Chhabra, Soumyo Mukherji, and Debjani Paul
*Indian Institute of Technology, Bombay, INDIA*

**M099.c** **AUTOMATING COMPLEX DNA LIBRARY PREPARATION PROCEDURES IN CENTRIFUGAL MICROFLUIDICS**
Daniel Brassard[1], Jimin Guo[1], Nadine Adam[2], Adrian Vester[2], Julie Shay[2], Caroline Miville-Godin[1], Mojra Janta-Polczynski[1], Jason Ferreira[1], Maxence Mounier[1], Kyle Tapp[2], Ana Pilar[2], and Matthew Shiu[1]
[1]*National Research Council, CANADA,* [2]*Health Canada, CANADA, and* [3]*Canadian Space Agency, CANADA*

**M100.c** **FAST AND BUBBLE-FREE FILLING OF NANOIMPRINTED HIGH-DENSITY PICOLITER WELL ARRAYS FOR DIGITAL ASSAYS ENABLED BY CENTRIFUGAL MICROFLUIDICS**
Salman Murad[1], Marvin Heyer[1], Fabian Lickert[2], Julian Menges[2], Silvia Calabrese[2], Tobias Hutzenlaub[1,2], Nils Paust[1,2], and Peter Juelg[1,2]
[1]*IMTEK, GERMANY and* [2]*Hahn-Schickard, GERMANY*

**M101.c** **INDUCTION HEATING FOR LAB-ON-A-DISC APPLICATIONS**
Tadej Kokalj[1], Marko Mahne[2], Indradumna Banerjee[3], Franci Vode[1], Aman Russom[3], and Matjaz Vencelj[2]
[1]*Institute of Metals and Technology, SLOVENIA,* [2]*Jozef Stefan Institute, SLOVENIA, and* [3]*KTH Royal Institute of Technology, SWEDEN*

**T098.c** **A RAPID PCR SYSTEM BASED ON CENTRIFUGAL MICROFLUIDICS WITH TEC-BASED CONTACT HEATING**
Yu Wu and Youchun Xu
*Tsinghua University, CHINA*

**T099.c** **CENTRIFUGAL GRAVITY ENABLES VOID-FREE PRIMING OF DEAD-END NANOLITER CAVITIES**
Yu-Kai Lai[1], Jacob F. Hess[1,2], and Nils Paust[1,2]
[1]*University of Freiburg, GERMANY and* [2]*Hahn-Schickard, GERMANY*

**T100.c** **FLIPPING AS A CONTROL STRATEGY FOR CENTRIFUGAL MICROFLUIDIC SYSTEMS**
Ali Gholizadeh, Gabriel Mazzucchelli, and Tristan Gilet
*University of Liège, BELGIUM*

**W097.c** **A METHOD FOR BUBBLE-FREE REAGENT DISCRETIZATION AND AUTOMATED DIGITAL POYMERASE CHAIN REACTION ON CENTRIFUGAL MICROFLUIDICS**
Tae-Hyeong Kim, Daniel Brassard, Lidija Malic, Keith J. Morton, Christina Nassif, Dillon Da Fonte, Luke Lukic, Jason Ferreira, Caroline Miville-Godin, Maxence Mounier, Aaron Bessoff, and Teodor Veres
*National Research Council Canada, CANADA*

**W098.c** **ALGORITHMIC DESIGN OPTIMIZATION AND PROGRAMMABILITY OF HIGHLY INTEGRATED LAB-ON-A-DISC SYSTEMS**
Jens Ducree
*Dublin City University, IRELAND*

**W099.c** **DEVELOPMENT OF AN AUTOMATED NUCLEAR ACID AMPLIFICATION ASSAY WITH ELECTROCHEMICAL MONITORING USING AN ELECTRIFIED-LAB-ON-A-DISC PLATFORM**
Fabian O. Romero-Soto[1], Meysam Saeedi[1], Dario Mager[2], Mohammad M. Aeinehvand[1], and Sergio O. Martinez-Chapa[1]
[1] *Tecnologico de Monterrey, MEXICO and*
[2] *Karlsruhe Institute of Technology, GERMANY*

**W100.c** **HYPERGRAVITY CELL CULTURE SYSTEM THROUGH SPINNING OF THE MAGNETIC COUPLING DISK**
Byeongwook Jo and Shoji Takeuchi
*University of Tokyo, JAPAN*

## Digital Microfluidics

**M102.c** **ABSOLUTE QUANTIFICATION OF NUCLEIC ACID ON DIGITAL MICROFLUIDICS PLATFORM BASED ON SUPERHYDROPHOBIC-SUPERHYDROPHILIC MICROPATTERNING**
Li Meng[1], Mingzhong Li[1], Man-Kay Law[1], Pui-In Mak[1], and Rui P. Martins[1,2]
[1] *University of Macau, CHINA and* [2] *Universidade de Lisboa, PORTUGAL*

**M103.c** **ENABLING LONG-TERM LIQUID HANDLING IN DIGITAL MICROFLUIDICS PLATFORMS FOR CELL CULTURE SETTINGS**
Oksana K. Savchak and Burcu Gumuscu
*Eindhoven University of Technology, NETHERLANDS*

**T102.c** **DEVELOPMENT OF A 3D FABRICATED DIGITAL MICROFLUIDIC PLATFORM FOR MULTIPLEXED OPERATIONS ON LARGE ELECTRODE ARRAYS**
Mert Ozden and Burcu Gumuscu-Sefunc
*Eindhoven University of Technology, NETHERLANDS*

**T103.c** **HIGH-THROUGHPUT AND LOW-COST ORTHOGONAL ELECTRODE MATRIX DIGITAL MICROFLUDICS CHIP**
Yufan Wang[1], Chi Chung Tsoi[3], Xiaodong Lin[2], Haoran Li[1], Ren Shen[1], Xuming Zhang[3], and Yanwei Jia[1]
[1] *University of Macau, CHINA,* [2] *Macau Zhuhai UM Science & Technology Research Institute, CHINA, and* [3] *Hong Kong Polytechnic University, CHINA*

**W101.c** **A PORTABLE, INTEGRATED SYSTEM FOR ON-CHIP ANTIBIOTIC SUSCEPTIBILITY TESTING**
Caiwei Li
*University of Macau, MACAO*

**W102.c** **DRUG SCREENING OF PRIMARY TUMOR CELLS ON SMART DIGITAL MICROFLUIDICS FOR CANCER PRECISION MEDICINE**
Yingying Liu, Caiwei Li, Wenhao Hui, Pui-in Mak, Rui P. Martins, and Yanwei Jia
*University of Macau, CHINA*

**W103.c** **POLARITY-DEPENDENT ELECTRO-WETTING OR -DEWETTING ON A CONDUCTIVE SILICON SUBSTRATE**
Lele Zhou
*ShanghaiTech University, CHINA*

## Droplet Microfluidics

**M104.c** **"PICO'CLOCK" - HIGHLY CONTROLLABLE PICOINJECTION FOR TIMED REACTIONS IN DROPLET MICROFLUIDICS**
Jolien Breukers and Jeroen Lammertyn
*KU Leuven, BELGIUM*

**M105.c** **A NOVEL STRATEGY TO SYNTHESIZE FLUORINATED SURFACTANT AND ITS APPLICATIONS IN DROPLET MICROFLUIDICS**
Jiyuan Yao[1,2], Lingling Shui[2], Shuting Xie[2], Loes Segerink[1], and Sergii Pud[1]
[1] *University of Twente, NETHERLANDS and*
[2] *South China Normal University, CHINA*

**M106.c** **CHARACTERIZATION OF DROPLET GENERATION THROUGH A POST-ARRAY DEVICE**
Shuzo Masui, Yusuke Kanno, and Takasi Nisisako
*Tokyo Institute of Technology, JAPAN*

**M107.c** **DOUBLING ACCELERATION OF SYNTHESIS SPEED OF METAL COMPLEXES BY SCALE EFFECTS IN MICRODROPLETS**
Masashi Kobayashi[1], Tomoya Murashige[1], Takashiro Akitsu[2], Hiroyuki Fujita[3], Takashi Tanii[1], Masahiro Furuya[1], Tetsushi Sekiguchi[1], Shuichi Shoji[1], Risa Fujita[4], and Daiki Tanaka[4]
[1] *Waseda University, JAPAN,* [2] *Tokyo University of Science, JAPAN,* [3] *Canon Medical Systems Corporation, JAPAN, and* [4] *Research Organization for Nano & Life Innovation, JAPAN*

**M108.c** **ELECTROKINETIC DESALTING AND SALTING OF WATER-IN-OIL DROPLETS**
Aparna Krishnamurthy and Robbyn K. Anand
*Iowa State University, USA*

**M109.c** **FORMATION OF DNA-FUNCTIONALIZED COLLOIDAL CRYSTALS IN A MICRODROPLET**
Naotomo Tottori[1], Azusa Takao[1], Maasa Yokomori[1], Miho Tagawa[2], Shigeo S. Sugano[3], Shinya Sakuma[1], and Yoko Yamanishi[1]
[1] *Kyushu University, JAPAN,* [2] *Nagoya University, JAPAN, and* [3] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

**M110.c** **LMOI: A NOVEL EVAPORATION TUNABLE MICROREACTOR PLATFORM**
Rutvik Lathia, Satchit Nagpal, Chandantaru D. Modak, Bheema Reddy, and Prosenjit Sen
*Indian Institute of Science, INDIA*

**M111.c** **OIL-INFUSED SIEVE-BASED TRAPPING SYSTEM FOR VERSATILE 3D CELL CULTURE AND BIOCHEMICAL APPLICATIONS**
Bheema S. Reddy, Rutvik Lathia, Chandantaru D. Modak, Satyarthi Mishra, Ramray Bhat, and Prosenjit Sen
*Indian Institute of Science, INDIA*

**T106.c** **CONTROLLED ATPS DROPLET FORMATION AND CAPTURE USING MICROFLUIDICS**
Hailin Fu, Chris Li, Tongsheng Wang, Kalpit Bakal, Jaap M. J. den Toonder, Bert E. W. Meijer, and Hans M. Wyss
*TU Eindhoven, NETHERLANDS*

**T107.c** **DROPLET MICROFLUIDIC BASED FABRICATION OF SOFT MICROROBOTS WITH TAILORED MAGNETIC ANISOTROPY**
Chao Song, Yimo Yan, Michael G. Christiansen, Stavros Stavrakis, Simone Schürle, and Andrew deMello
*ETH Zürich, SWITZERLAND*

**T108.c** **FABRICATION OF CRESCENT-SHAPED PARTICLES FOR PARTICLE-TEMPLATED DROPLET FORMATION**
Yimin Yang and Ghulam Destgeer
*Technical University of Munich, GERMANY*

**T109.c** **IMPROVING THE EFFICIENCY OF DROPLET COMPARTMENTALIZATION BY DOUBLE EMULSIONS FOR CRISPR-BASED NUCLEIC ACID DETECTION**
Yang Zhang and Ming Li
*Macquarie University, AUSTRALIA*

**T110.c** **MICROFLUIDIC DEVICES FOR THE GENERATION OF MONODISPERSE, SUBMICROMETER, SELF-ASSEMBLED SUPERPARTICLES**
Tanner W. Young, Baixu Zhu, Xingchen Ye, and Stephen C. Jacobson
*Indiana University, USA*

**T111.c** **ON CHIP SHEATH FLOW INDUCED MICROPARTICLE ENCAPSULATION IN SPIRAL CHANNELS**
Byeong-Ui Moon[1], Lidija Malic[1], Dillon Da Fonte[1], Liviu Clime[1], Félix Lussier[2], Luke Lukic[1], David Juncker[2], and Teodor Veres[1]
[1] *National Research Council Canada, CANADA and*
[2] *McGill University, CANADA*

**W105.c** **AN ASYMMETRIC CROSS-JUNCTION MICROFLUIDIC DEVICE FOR SYNTHESIS OF ANISOTROPIC MAGNETIC JANUS PARTICLES IN A MICROFLUIDIC DEVICE**
Muhammad Saqib and Emine Yegan Erdem
*Bilkent University, TURKEY*

**W108.c** **FABRICATION OF SYNTHETIC POLYMER FOAMS AND GRADIENT STRUCTURES VIA MICROFLUIDICS FOR ENERGY ABSORPTION APPLICATIONS**
Abhishek Viswanath and Marco Costantini
*Polish Academy of Sciences, POLAND*

**W109.c** **LENGTH-CODED AMPHIPHILIC PARTICLES FOR THE ENCAPSULATION OF A WIDE RANGE OF DROPLET VOLUMES**
Muhammad Usman Akhtar, Mehmet Akif Sahin, Helen Werner, and Ghulam Destgeer
*Technical University of Munich, GERMANY*

**W110.c** **MONITORING PANCREATIC α-AMYLASE OF POSTOPERATIVE PATIENTS WITH DROPLET-BASED MICROFLUIDICS**
Xinne Zhao[1], Fiona R. Kolbinger[2], Denys Makarov[1], and Larysa Baraban[1]
[1]*Helmholtz-Zentrum Dresden-Rossendorf e.V., GERMANY and*
[2]*Dresden University of Technology, GERMANY*

**W111.c** **THE EFFECTS OF DIFFERENTIAL IMPEDANCE SIGNAL ON DROPLET MEASUREMENT**
Xun Liu[1], Tao Tang[2], Yoichiroh Hosokawa[1], and Yaxiaer Yalikun[1]
[1]*Nara Institute of Science and Technology, JAPAN and*
[2]*National University of Singapore, SINGAPORE*

## Electrokinetic Phenomena

**M112.c** **ELECTRO-ROTATION MEASUREMENT SYSTEM FOR AUTOMATIC HIGH-THROUGHPUT DIELECTRIC CHARACTERIZATIONS OF CELLS POPULATIONS**
Samuele Moscato[1,2], Andrea Ballo[1,2], Pasquale Memmolo[3], Paolo Bonacci[2], Nicolò Musso[2], Stefania Stefani[2], Ron Pethig[2], Maide Bucolo[2], and Massimo Camarda[1]
[1]*STLab srl, ITALY,* [2]*University of Catania, ITALY, and*
[3]*CNR ISASI, ITALY*

**M113.c** **MICROFLUIDIC CHIP FOR MULTIMODAL MANIPULATION OF PARTICLES/CELLS BASED ON WAVY FLOATING ELECTRODE**
Wenru Dai, Hongfang Yu, and Liang Huang
*Hefei University of Technology, CHINA*

**T112.c** **EVAPORATIVE CRYSTALLIZATION OF SESSILE DROPLETS USING ELECTROWETTING**
Qi An[1], Pingping Cui[1,2], Bijoy Bera[1], Massimo Mastrangeli[1], Johan T. Padding[1], and Burak Eral[1]
[1]*TU Delft, NETHERLANDS and* [2]*Tianjin University, CHINA*

**T113.c** **OSTE-BASED MICROFLUIDIC CHIP FOR PEF TREATMENT OF MAMMALIAN CELLS**
Neringa Bakute[1], Eivydas Andriukonis[1], Kamile Kasperaviciute[1], Elinga Brazionyte[1], Jorunas Dobilas[1], Vilius Vertelis[1], Skirmantas Kersulis[1], Gatis Mozolevskis[2], Arunas Stirke[1,2]
[1]*State Research Institute Physical and Technological Sciences Center (FTMC), LITHUANIA and* [2]*University of Latvia, LATVIA*

**W112.c** **HIGH THROUGHPUT AND SCALABLE PRECONCENTRATION OF CHARGED ANALYTES BASED ON ION CONCENTRATION POLARIZATION ON A PACKED BED OF MICROBEADS**
Umesha Peramune, Zisun Ahmed, Suriya Dhakshinamoorthy, Mehdi Shadkhah, Baskar Ganapathysubramanian, and Robbyn K. Anand
*Iowa State University, USA*

**W113.c** **STUDY OF AC ELECTROTHERMAL MICRO FLOWS TO ENHANCE BIOCHEMICAL DETECTION**
Léna Gonzalez[1], Laurent Davoust[2], and Jena-Maxime Roux[1]
[1]*CEA Leti, FRANCE and* [2]*CNRS, FRANCE*

## Modeling/Numerical Simulation

**M114.c** **ACCELERATING CFD SIMULATIONS OF MICROFLUIDIC DEVICES BY EXPLOITING HIGHER LEVELS OF ABSTRACTIONS**
Michel Takken[1] and Robert Wille[1,2]
[1] *Technical University of Munich, GERMANY and*
[2] *Software Comptence Center Hagenberg SCCH, AUSTRIA*

**M115.c** **NUMERICAL CHARACTERIZATION OF COMPLIANCE OF THICK PDMS MICROCHANNELS**
Mohammed Elmahdi Elgack, Omar Ghannam,
and Mohamed Abdelgawad
*American University of Sharjah, UAE*

**T114.c** **EFFECT OF JUNCTION ANGLE ON PARTICLE ENCAPSULATION IN DROPLET MICROFLUIDICS**
Maryam Fatehifar, Alessandro De Rosis, and Alistair Revell
*University of Manchester, UK*

**T115.c** **OPTIMIZATION OF MICROCHANNEL GEOMETRY FOR IMPROVING SENSITIVITY ON PARTICLE/CELL IMPEDANCE MEASUREMENT**
Yuanyuan Guo and Liang Huang
*Hefei University of Technology, CHINA*

**W114.c** **ENHANCING MASS TRANSFER EFFICIENCY VIA INTERNAL FLUID VORTEX IN DIFFERENT HELIX CONFIGURATIONS**
Pin-Ru Huang[1], Guan-Yu Lu[1], Po-Yao Syu[1], Wei-Hsin Tien[2], Yi-Hsin Chien[3], Wei-Hsiang Wang[1], and Ya-Yu Chiang[1,4]
[1] *National Chung Hsing University, TAIWAN,* [2] *National Taiwan University of Science and Technology, TAIWAN,* [3] *Feng Chia University, TAIWAN, and* [4] *National Taiwan University, TAIWAN*

**W115.c** **THE VIBRATION-INDUCED CHAOTIC MIXING WITH SWITCHING OF VIBRATIONS AXES**
Kanji Kaneko[1,2], Yosuke Hasegawa[3], Takeshi Hayakawa[1], and Hiroaki Suzuki[1]
[1] *Chuo University, JAPAN,* [2] *Japan Society for the Promotion of Science (JSPS), JAPAN, and* [3] *University of Tokyo, JAPAN*

## Nanofluidics/Nanofluidic Phenomena

**M116.c** **CO-FLOW OF NEWTONIAN AND VISCOELASTIC FLUIDS FOR BACTERIA SEPARATION BY SIZE IN A MICROCHANNEL**
Tianlong Zhang[1,2], Yaxiaer Yalikun[2], Yoichiroh Hosokawa[2], and Ming Li[1]
[1] *Macquarie University, AUSTRALIA and*
[2] *Nara Institute of Science and Technology, JAPAN*

**M117.c** **NANOFLUIDIC DEVICE WITH POSITIVELY CHARGED CHANNEL SURFACES IMITATE INHIBITORY SYNAPTIC FUNCTION**
Peiyue Li[1], Pan Zhang[1], Han Xu[1], Yechang Guo[1], Shaofeng Wang[3], Yufeng Jin[1], and Wei Wang[1,2]
[1] *Peking University, CHINA,* [2] *National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA, and*
[3] *China University of Geosciences, CHINA*

**M118.c** **ON-DEMAND 3D NANOCONFINEMENT IN BEAD-ARRAY MICROFLUIDIC CHIPS VIA CONTROLLABLE PDMS COLLAPSE FOR EFFICIENT BIOREACTION**
Jui-Hong Weng[1], Deng-Kai Yang[1], Abdullah-Bin Siddique[2], Nathan Swami[2], and Chia-Fu Chou[1]
[1]*Academia Sinica, TAIWAN and* [2]*University of Virginia, USA*

**T116.c** **ENHANCED DNA MIXING WITH VISCOELASTIC WAVES**
Enrico Turato, Jason P. Beech, and Jonas O. Tegenfeldt
*Lund University, SWEDEN*

**T117.c** **NANOFLUIDIC ELECTROKINETIC TRANSPORT ACROSS MULTIPLE NANOCHANNELS MONITORED IN REAL TIME**
Nattapong Chantipmanee[1], Taichi Nakajima[2], Sasikarn Seetasang[2,3], and Yan Xu[1,2,4]
[1]*Osaka Metropolitan University, JAPAN,* [2]*Osaka Prefecture University, JAPAN,* [3]*National Nanotechnology Center (NANOTEC), THAILAND, and* [4]*Japan Science and Technology Agency (JST), JAPAN*

**T118.c** **THE EFFECT OF CONFINEMENT ON FLOW GENERATION BY ARTIFICIAL CILIA**
Yiqing Sun, Ye Wang, and Jaap den Toonder
*Eindhoven University of Technology, NETHERLANDS*

**W116.c** **GATE-CONTROLLED NANOFLUIDIC MEMORY DEVICES MIMIC EXCITATORY SYNAPTIC AND INHIBITORY SYNAPTIC FUNCTIONS**
Pan Zhang[1], Peiyue Li[1], Han Xu[1], Yechang Guo[1], Shaofeng Wang[3], Yufeng Jin[1], and Wei Wang[1,2]
[1]*Peking University, CHINA,* [2]*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA, and* [3]*China University of Geosciences, CHINA*

**W117.c** **NANOFLUIDIC EVALUATION OF INDIVIDUAL NANOGEL-BASED MOLECULAR SYSTEMS**
Yusuke Dote[1], Xuejin Huang[2], Madoka Takai[2], Nattapong Chantipmanee[1], and Yan Xu[1]
[1]*Osaka Metropolitan University, JAPAN and* [2]*Tokyo University, JAPAN*

**W118.c** **WETTABILITY INSPIRED MODIFICATION OF MEMBRANES FOR IMPROVED DESALINATION**
Vinay Arya and Chirodeep Bakli
*Indian institute of Technology, Kharagpur, INDIA*

## Others

**T119.c** **LONG-TERM OPERATION OF SPRING-BASED SYRINGE PUMP THROUGH THE SEQUENTIAL OPERATION OF THE CLOCKWORK MECHANISM**
Won Han, Se Been Park, and Joong Ho Shin
*Pukyong National University, KOREA*

**W119.c** **ROOM TEMPERATURE QUANTITATIVE LIQUID CONCENTRATION INTERFACE**
Hidekatsu Tazawa[1] and Kazuma Mawatari[2]
[1]*University of Tokyo, JAPAN and* [2]*Waseda University, JAPAN*

## d - Integrated Microfluidic Platforms

### Chemical & Particle Synthesis

**M120.d** **A DROPLET MICROFLUIDIC DEVICE FOR RAPID IN-SITU POLYMERIZATION OF SUPERABSORBENT POLYMER MICROPARTICLES (SAP-MPS)**
Ehsan Tabesh, John Brown, Alireza Zabihihesari, Siu Ning (Sunny) Leung, and Pouya Rezai
*York University, CANADA*

**M121.d** **RAIL-AIDED LATERAL PARTICLE TRANSPORT ACROSS INTACT CO-FLOWS: EFFECT OF WALLS AND RAIL GEOMETRY**
Vyacheslav R. Misko, Iwona Ziemecka, Amaury de Hemptinne, Matthieu Briet, Pierre Gelin, Ilyesse Bihi, Dominique Maes, and Wim De Malsche
*Vrije Universiteit Brussel (VUB), BELGIUM*

**T120.d** **A NOVEL MICROFLUIDIC REACTOR ARCHITECTURE FOR RAPID DNA SYNTHESIS**
Naghmeh Fatemi, Ahmed Taher, Jelle Fondu, Hamideh Jafarpoorchekab, Kherim Willems, Olivier Henry, Peter Peumans, Tim Stakenborg, and Ben Jones
*imec, BELGIUM*

**T121.d** **TUNABLE SYNTHESIS OF BRANCHED GOLD NANOPARTICLES IN MICROFLUIDIC DEVICE FOR LARGE BIOMOLECULAR DELIVERY**
Kavitha Illath[1], Hima Manoj[1], Ashwini Shinde[1], Moeto Nagai[2], and Tuhin S. Santra[1]
[1] *Indian Institute of Technology, Madras, INDIA and*
[2] *Toyohashi University of Technology, JAPAN*

**W120.d** **RAIL INDUCED PARTICLE MULTILAYER COATING**
Amaury A. de Hemptinne, Iwona I. Ziemecka, Vyacheslav R.V.R. Misko, Matthieu M. Briet, Pierre P. Gelin, Ilyesse I. Bihi, Dominique D. Maes, and Wim W. De Malsche
*Vrije Universiteit Brussel (VUB), BELGIUM*

**W121.d** **ULTRA-HIGH THROUGHPUT MICROFLUIDIC PHOTOCATALYTIC SYNTHESIS AND SCREENING UP TO 10,000 REACTIONS PER DAY**
Jia-Min Lu
*Zhejiang University, CHINA*

### Eletrophoretic & Chromatographic Separation

**M122.d** **ELECTROPHORETIC QUALITY ASSESSMENT OF ADENO-ASSOCIATED VIRUS (AAV) BY MICROFLUIDIC ION CONCENTRATION POLARIZATION**
Yejin Park[1,2], Mingyang Cui[2], Jinsik Kim[1], and Jongyoon Han[2]
[1] *Dongguk University, KOREA and*
[2] *Massachusetts Institute of Technology, USA*

**M123.d** **HIGH-THROUGHPUT ELECTROKINETIC FILTER FOR CHO MEDIA REGENERATION**
Eric M. Wynne, Dohyun Park, Mingyang Cui, and Jongyoon Han
*Massachusetts Institute of Technology, USA*

**T122.d** **EXPLORING THE POTENTIAL OF VORTEX LIQUID CHROMATOGRAPHY**
Pierre Gelin[1], Ilyesse Bihi[1], Levi Ezechukwu[1], Elahe Naghdi[1], Eiko Westerbeek[1,2], Wouter Olthuis[2], Jan Eijkel[2], and Wim De Malsche[1]
[1] *Vrije Universiteit Brussel (VUB), BELGIUM and*
[2] *Twente University, NETHERLANDS*

**T123.d** **MINIATURIZED EXTRACTION DEVICE COUPLED TO MASS SPECTROMETRY FOR ON-LINE PURIFICATION AND CHARACTERIZATION OF NUCLEAR SAMPLES**
Marine Boudias[1], Erwan Dupuis[1], Alexandre Quémet[2], and Carole Bresson[1]
[1] *Université Paris-Saclay, FRANCE and* [2] *CEA, FRANCE*

**T124.d** **POINT-OF-CARE TESTING (POCT) OF THALASSEMIA ON ISOELECTRIC FOCUSING (IEF) CHIP/PLATFORM**
Kay Khine Maw, Wei Wang, and Zhiping Wang
*Agency for Science, Technology and Research (A*STAR), SINGAPORE*

**W122.d** **FEMI-GC: A MICRO GAS CHROMATOGRAPHY SYSTEM WITH FLUIDIC AND ELECTRICAL MODULAR INTERFACING**
Nipun Thamatam, Mustahsin Chowdhury, and Masoud Agah
*Virginia Polytechnic and State University, USA*

**W123.d** **NANOSPRAY EMITTERS: MICROFABRICATED ELECTROSPRAY INTERFACES (ESI) WITH A LIQUID JUNCTION FOR SENSITIVE BIONANALYSES**
Elizaveta Vereshchagina[1], Tomáš Václavek[2], Anand Summanwar[1], Sigurd Moe[1], Leny Nazareno[1], Aina K. Herbjørnrød[1], Guido Sordo[1], Anna Nordborg[3], Andreas Vogl[1], Franta Foret[2], and Roman Řemínek[2]
[1] *SINTEF Digital, NORWAY,* [2] *Czech Academy of Sciences, CZECH REPUBLIC, and* [3] *SINTEF Industry, NORWAY*

## Micromixers & Microreactors

**M125.d** **CHARACTERIZATION OF A MICROFLUIDIC MIXING PROBE (MMP)**
Dima S. Ali, Ayoub Glia, Muhammedin Deliorman, and Mohammad Qasaimeh
*New York University, Abu Dhabi, USA*

**M126.d** **HYDRODYNAMIC ENHANCEMENT OF AGGLUTINATION-BASED NANOPARTICLE DETECTION DRIVEN BY THE VIBRATION-INDUCED FLOW**
Kanji Kaneko[1,2], Mamiko Tsugane[1], Yosuke Hasegawa[3], Takeshi Hayakawa[1], and Hiroaki Suzuki[1]
[1] *Chuo University, JAPAN,* [2] *Japan Society for the Promotion of Science (JSPS), JAPAN, and* [3] *University of Tokyo, JAPAN*

**M127.d** **MICROFLUIDIC-ASSISTED DIGITAL MANUFACTURING OF FUNCTIONALLY GRADED POROUS MATERIALS WITH TRANSIENT PHYSICAL AND BIOLOGICAL PROPERTIES**
Maria Celeste Tirelli[1], Francesco Nalin[1], Nehar Celikkin[1], Andrea Curatolo[2], Piotr Kasprzycki[2], Karol Karnowski[2], and Marco Costantini[1]
[1] *Polish Academy of Sciences, POLAND and*
[2] *International Center for Translational Eye Research, POLAND*

**M128.d** **SIMULATIONS AND ANALYSIS OF PROGRAMMABLE LIQUID METAL DROPLET ARRAY PLATFORM FOR GENERATING RECONFIGURABLE FLOW FIELD**
Xu Gao, Shitao Shen, and Wei Wang
*Peking University, CHINA*

**T125.d** **DEVELOPMENT OF MICROWAVE MICROFLUIDICS WITH PARALLEL HEATING USING POST-WALL WAVEGUIDE FOR COMBINATORIAL SYNTHESIS**
Kaito Fujitani[1], Hiroshi Nakamura[1], Akinobu Yamaguchi[1], Mitsuyoshi Kishihara[2], and Yuichi Utsumi[1]
[1] *University of Hyogo, JAPAN and* [2] *Okayama Prefectural University, JAPAN*

**T126.d** **MICROBIAL STIR BARS: LIGHT-ACTIVATED ROTATION OF TETHERED BACTERIAL CELLS TO ENHANCE MIXING IN STAGNANT FLUIDS**
Jyoti P. Gurung[1], Moein N. Kashani[2,3], Charitha M.D.E. Silva[1], and Matthew A.B. Baker[1,4]
[1] *University of New South Wales, AUSTRALIA,* [2] *University of South Australia, AUSTRALIA,* [3] *Australian National Fabrication Facility, AUSTRALIA, and* [4] *ARC centre of Excellence in Synthetic Biology, AUSTRALIA*

**T127.d** **PNEUMATIC VALVE-BASED MICROFLUIDIC DEVICE FOR THE DETECTION OF HEPO GENE**
Hyewon Yun and Chang-Soo Lee
*Chungnam National University, KOREA*

**W124.d** **AN INTEGRATED, AUTOMATED MICROFLUIDIC INSTRUMENT FOR COMPLEX BIOLOGICAL MICROREACTIONS**
Greg Liddiard, Bahar Kazemi, Munawar Jawad, Chris Lambert, Sabin Nepal, and Bruce Gale
*University of Utah, USA*

**W125.d** **ELECTRO-GUIDED MICRO-VESSELS WITH DUAL MOTION**
Annaël Sort-Montenegro, Luke Dowling, Colm Delaney, and Larisa Florea
*Trinity College Dublin, IRELAND*

**W126.d** **MICROFLUIDIC ULTRAFAST MIXER FOR CONTINUOUS AND SCALABLE PRODUCTION OF DRUG DELIVERY NANOPARTICLES**
Dong-Pyo Kim, Gi-Su Na, Jeong-Un Joo, and Byung Kwon Kaang
*Pohang University of Science and Technology (POSTECH), KOREA*

**W127.d** **POLYDIMETHYLSILOXANE-FREE MICROFLUIDIC TECHNOLOGY FOR THE RAPID CAPTURE OF EXTRACELLULAR VESICLES FROM URINE**
Janis Cipa[1,2], Edgars Endzelins[2], Roberts Rimsa[1], Arturs Abols[1,2], Aija Line[2], and Gatis Mozolevskis[1]
[1] *Cellboxlab Ltd, LATVIA and* [2] *University of Latvia, LATVIA*

## Mimicking Acutators (Muscles, Nanorobots)

**M129.d** **MULTI-POLAR ELECTRODE DEVICE FOR SELECTIVE STIMULATION OF THREE-DIMENSIONAL CULTURED SKELETAL MUSCLE TISSUE**
Hirone Yamada[1], Yuya Morimoto[2], Byeongwook Jo[1], Minghao Nie[1], and Shoji Takeuchi[1]
[1] *University of Tokyo, JAPAN and* [2] *Waseda University, JAPAN*

**T128.d** **A MICROFLUIDIC DOCKING ASSEMBLED ROTATIONAL ACTUATOR DRIVEN BY BIOMOLECULAR MOTORS**
Masakiyo Takahashi[1], Yingzhe Wang[1], Takahiro Nitta[2], Yuichi Hiratsuka[3], and Keisuke Morishima[1]
[1] *Osaka University, JAPAN,* [2] *Gifu University, JAPAN, and* [3] *Japan Advanced Institute of Science and Technology (JAIST), JAPAN*

**W128.d** **MICROFLUIDIC SOFT ROBOTS BASED ON TEXTILE TECHNOLOGIES FOR ENDOSCOPY AND MICROMANIPULATION**
Vivian Aubert[1], Anissa Kaddouche[1], Clara Brouaux[1], Raphael Leurond[1], Chloé Visbecq[2], Quentin Watel[2], Aurelie Cayla[2], Fabien Salaün[2], Francois Boussu[2], and Jean-Louis Viovy[1]
[1] *Institut Curie, FRANCE and* [2] *University Lille, FRANCE*

## Particle Separation

**M130.d** **DESIGN OF A MICROFLUIDIC DEVICE FOR MICROPARTICLE COLLECTION THROUGH ELECTROSTATIC ATTRACTION AND REPULSION**
Yuki Ito, Kota Suzuki, Keiichiro Yoshida, and Sho Yokoyama
*Osaka Institute of Technology, JAPAN*

**M131.d** **ECHOGRID: A NOVEL ACOUSTOFLUIDIC, HIGH-THROUGHPUT PLATFORM FOR ENVIRONMENTAL MICROPLASTIC ENRICHMENT**
Martim Costa, Liesbeth van der Geer, Björn Hammarström, Selim Tanriverdi, Håkan Jönsson, Martin Wiklund, and Aman Russom
*KTH Royal Institute of Technology, SWEDEN*

**M132.d** **MICROFLUIDIC DEVICE WITH 3D SELF-ASSEMBLED LIQUID METAL ELECTRODES FOR DIELECTROPHORETIC FRACTIONATION OF LARGE-SIZE-RANGE PARTICLES**
Huichao Chai, Junwen Zhu, Yongxiang Feng, and Wenhui Wang
*Tsinghua University, CHINA*

**M133.d** **SIZE-BASED SEPARATION OF MULTI-TARGET USING AN ALL GLASS MICROFLUIDIC DEVICE WITH DEFORMABLE CHANNEL**
Doudou Ma[1,2,3], Yalikun Yaxiaer[2,3], Nobutoshi Ota[2], Yuri Ito[2], and Koki Yamamoto[2]
[1] *Oaka University, JAPAN,* [2] *Center for Biosystems Dynamics Research, JAPAN, and* [3] *Nara Institute of Science and Technology, JAPAN*

**T129.d** **AUTOMATED DROPLETS SCREENING SYSTEM USING A MICROFLUIDIC DEVICE INTEGRATING PNEUMATIC MICROVALVES**
Jo Han He, Yi Ting Hsiau, Jing Tang Yang, and Suz I Yeh
*National Cheng Kung University, TAIWAN*

**T130.d** **DEVELOPMENT OF HIGH-THROUGHPUT CIRCULATING TUMOR CELLS SEPARATION DEVICE BASED ON 3D HYDRODYNAMIC FILTRATION**
Taiga Ajiri, Hiroyuki Obinata, Natsuki Maeda, and Kentaro Shirai
*Sysmex Corporation, JAPAN*

**T131.d** **HIGH-THROUGHPUT FLUORESCENCE-ACTIVATED SINGLE EXTRACELLULAR VESICLE SORTER**
Yoshiyuki Tsuyama[1], Kenji Hinode[2], Yusuke Yoshioka[1], and Sadao Ota[2]
[1] *Tokyo Medical University, JAPAN and* [2] *University of Tokyo, JAPAN*

**T132.d** **PRESSURE-DEPENDENT SORTING OF GROUP A STREPTOCOCCUS BY DETERMINISTIC LATERAL DISPLACEMENT: AN EXAMPLE OF SORTING A HETEROGENOUS SAMPLE BY A PASSIVE MICROFLUIDIC METHOD**
Elham Akbari, Sebastian Wrighton, Jason P. Beech, Pontus Nordenfelt, and Jonas O. Tegenfeldt
*Lund University, SWEDEN*

**W129.d** **CAPILLARITY ENABLED LARGE-ARRAY 3D LIQUID METAL ELECTRODES FOR COMPACT DIELECTROPHORETIC MICROFLUIDICS**
Huichao Chai, Yongxiang Feng, Junwen Zhu, and Wenhui Wang
*Tsinghua University, CHINA*

**W130.d** **DEVELOPMENT OF PARTICLE SEPARATION AND CONCENTRATION MICROFLUIDIC DEVICE FOR DIAGNOSIS OF PERITONEAL DIALYSIS PERITONITIS**
Ye Sung Lee, Sung Hoon Bae, Alexander Zhbanov, and Sung Yang
*Gwangju Institute of Science and Technology (GIST), KOREA*

**W131.d** **MICRO/NANOPARTICLE SEPARATION VIA RADIAL TEMPERATURE GRADIENT IN THREE-DIMENSIONAL SPIRAL MICROCHANNELS**
Junho Kim, Kyunghoon Lee, and Taesung Kim
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

**W132.d** **SEPARATION OF TWO BACTERIAL SPECIES USING VISCOELASTIC FLOWS**
Tianlong Zhang[1,2], Li Ming[1], Yaxiaer Yalikun[2], and Yoichiroh Hosokawa[2]
[1] *Macquarie University, AUSTRALIA and* [2] *Nara Institute of Science and Technology, JAPAN*

## Others

**M134.d** **CONTINUOUS BIODIESEL PRODUCTION PROCESS AND SYSTEM OPTIMIZATION**
Pin-Ru Huang[1], Cheng-Yu Wang[1], Hsiang-Yu Yang[1], Bo-Chuan Hsueh[1], Faisal Maqbool[1], Yu-Chieh Chen[1,3], Yi-Hsin Chien[2], and Ya-Yu Chiang[1,3]
[1] *National Chung Hsing University, TAIWAN,* [2] *Feng Chia University, TAIWAN, and* [3] *National Taiwan University, TAIWAN*

**M135.d** **MICROFLUIDIC PRODUCTION OF [18F]ALF-PSMA-11 RADIOPHARMACEUTICAL**
Olga Ovdiichuk[1], Laurent Tanguy[2], and Charlotte Collet[1,3]
[1] *Nancyclotep, FRANCE,* [2] *PMB-Alcen, FRANCE, and*
[3] *Université de Lorraine, FRANCE*

**T133.d** **CHARACTERIZING ACOUSTIC BEHAVIOR OF SILICON MICROCHANNELS SEPARATED BY POROUS WALLS**
Mehrnaz Hashemiesfahan[1,2], Pierre Gelin[1], Jo W. Christiaens[1], Han Gardeniers[2], and Wim De Malsche[1]
[1] *Vrije Universiteit Brussel (VUB), BELGIUM and*
[2] *University of Twente, NETHERLANDS*

**T134.d** **IN-SITU ENZYMATIC ACTIVITY MONITORING PLATFORM USING FOIL-BASED DISPOSABLE MICROFLUIDIC CHIPS**
Alvaro J. Conde[1], Veronica Mora Sanz[2], Elisabeth Hengge[3], Jihye Jung[3], Bernd Nidetzky[3], Matija Strbac[2], Nerea Briz Iceta[2], Andoni Rodriguez[4], Pakapreud Khumwan[5], Conor O'Sullivan[6], Nastasia Okulova[6], and Maciej Skolimowski[1]
[1]*Micronit BV, NETHERLANDS,* [2]*Tecnalia-BRTA, SPAIN,* [3]*Graz University of Technology, AUSTRIA,* [4]*Bionic Surface Technologies GmbH, AUSTRIA,* [5]*Joanneum Research, AUSTRIA, and* [6]*Inmold AS, DENMARK*

**W133.d** **COAXIAL DUAL-ION SOURCE UTILIZING CHIP-BASED MICRO RF PLASMA AND ELECTROSPRAY IONIZATIONS FOR MASS SPECTROMETRY DETECTING OF ALL-POLARITIES SAMPLES**
Yi Chi Liu and Che Hsin Lin
*National Sun Yat-sen University, TAIWAN*

**W134.d** **INDEPENDENT UNIT OPERATION OF SERIALLY AND PARALLELLY INTERCONNECTED MULTIPLE MICROFLUIDIC DEVICES USING CLAPMED PRESSURES**
Kao-Mai Shen[1], Chihchen Chen[1], Kyojiro Morikawa[1,2,3], and Takehiko Kitamori[1,2,3,4]
[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*

## e - Micro- and Nanoengineering

### Bonding, Sealing & Interfacing Technologies

**M136.e** **IRREVERSIBLE PDMS BONDING USING FLAME ACTIVATION OF ADHESIVES FOR FABRICATION OF ORGAN-ON-CHIP DEVICES**
Mohammadhossein Dabaghi, Ryan Singer, and Jeremy Hirota
*McMaster University, CANADA*

**T135.e** **CLEAN-ROOM FREE FABRICATION OF HYBRID GLASS CHIP FOR PRECISE OXYGEN CONTROL**
Charlotte Bouquerel[1,2], Simon Dumas[1], Elias Abedelnour[3], Ester Simkova[1], Guillem Wetherell Mateu[1], Linda Meddahi[1], Bertrand Cinquin[4], Giacomo Gropplero[1], Michael Tatoulian[3], Maria Carla Parrini[1], William Cesar[2], and Stephanie Descroix[1]
[1]*Institut Curie, FRANCE,* [2]*Fluigent, FRANCE,* [3]*PSL University, FRANCE, and* [4]*Institut Pierre Gilles de Gennes, FRANCE*

**T136.e** **SEMI-AUTOMATED FABRICATION METHOD OF A HYDROGEL-BASED MICROFLUIDIC CHIP FOR CELL CULTURE**
Pouya Mehrdel, Christophe Vedrine, and Gabriele Pitingolo
*Biaoster, FRANCE*

**W135.e** **INTEGRATION OF GAAS-BASED LATERAL FIELD EXCITATION (LFE) SENSOR WITH PDMS MICROFLUIDIC CHANNEL: SIMULATION AND EXPERIMENTAL VALIDATION**
Muhammad Hamidullah, Franck Chollet, and Thérèse Leblois
*University Bourgogne Franche-Comté, FRANCE*

**W136.e** **THE STUDY OF IRREVERSIBLE INTEGRATION OF POROUS PLASTIC MEMBRANES IN A POLY(DIMETHYLSILOXANE) MICROFLUIDIC SYSTEM FOR 3D CELL CULTURE**
Magdalena Flont, Krzysztof Mrozik, and Elżbieta Jastrzębska
*Warsaw University of Technology, POLAND*

## Micropumps, Valves and Dispensers

**M137.e** **A FULLY AUTOMATED PORTABLE PERFUSION SYSTEM FOR LIQUID DOSING, CELL INCUBATION AND MONITORING**
Katarzyna Tokarska, Kamil Zukowski, and Zbigniew Brzózka
*Warsaw University of Technology, POLAND*

**M138.e** **CHARACTERIZATION OF THE FLOW PROFILE IN PUSHBUTTON-ACTIVATED MICROFLUIDIC DEVICES**
Dong Hyun Han, Gihyun Lee, Untaek Oh, and Je-kyun Park
*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

**M139.e** **HIGH-RIGIDITY ON-CHIP MEMBRANE PUMP FOR HIGH-SPEED PICOLITRE PIPETTE**
Nariaki Kiyama[1], Makoto Saito[1], Yoshitaka Shirasaki[2], Yoko Yamanishi[1], and Shinya Sakuma[1]
[1] *Kyushu University, JAPAN and* [2] *University of Tokyo, JAPAN*

**M140.e** **NUMERICAL SIMULATIONS OF POLYDIMETHYLSILOXANE (PDMS) PUMPS FOR MICROFLUIDICS APPLICATIONS**
Pablo E. Guevara-Pantoja, Fernando Benito-Lopez, and Lourdes Basabe-Desmonts
*University of the Basque Country, SPAIN*

**T137.e** **A LOW-COST MICROFLUIDIC SENSOR WITH GLASSY CARBON/GRAPHENE ELECTRODES AND A VALVELESS MICROPUMP FOR HIGHLY SENSITIVE DETECTION OF HEAVY METAL IONS**
Peng Zhou, Yingming Xu, Terrence Simon, and Tianhong Cui
*University of Minnesota, USA*

**T138.e** **DUAL MAGNET SOLENOID ACTUATOR FOR PORTABLE MICROFLUIDIC APPLICATIONS**
Seo Jun Bae and Do Jin Im
*Pukyong National University, KOREA*

**T139.e** **METACHRONAL MOTION OF MINIATURIZED MAGNETIC ARTIFICIAL CILIA GENERATES MICROFLUIDIC FLOW**
Zhiwei Cui, Ye Wang, and Jaap den Toonder
*Eindhoven University of Technology, NETHERLANDS*

**T140.e** **PHOTOACTIVE MICROFLUIDIC PUMPS - BY SPLAY ALIGNED LIQUID CRYSTAL NETWORK ACTUATORS**
Christina A. Schmidleithner[1], Yuxin You[2], Dirk J. Broer[2], and Johannes R. Peham[1]
[1] *AIT Austrian Institute of Technology, AUSTRIA and*
[2] *Technical University of Eindhoven, NETHERLANDS*

**W137.e** **A PORTABLE SPRING-POWERED 3D-PRINTED WIND-UP SYRINGE PUMP FOR MICROFLUIDIC APPLICATIONS**
Se Been Park and Joong Ho Shin
*Pukyong National University, KOREA*

**W138.e** **FABRICATION OF AN AUTOMATED, NON-ELECTRIC SYRINGE PUMP THAT PUMPS LIQUIDS SEQUENTIALLY USING A SPIRAL SPRING FOR IMMUNOASSAY**
Minseon Kim and Joong Ho Shin
*Pukyung National University, KOREA*

**W139.e** **MICROSCALE IN-TUBE CHECK-VALVE**
Edwin En-Te Hwu[1], Dali Reda[1], Bilge G. Kyuchuk[1], Tien-Jen Chang[1], Nikolaj Gadegaard[2], and Anja Boisen[1]
[1] *Technical University of Denmark, DENMARK and*
[2] *University of Glasgow, UK*

## Microscale Fabrication, Patterning and Integration

**M141.e** **3-D PRINTED MICRO-OPTOFLUIDIC CHAMBER FOR CELL POPULATION CHARACTERIZATION AND VELOCITY DETECTION**
Emanuela Cutuli, Giovanna Stella, Dario Sanalitro, Lorena Saitta, Francesca Guarino, Gianluca Cicala, and Maide Bucolo
*University of Catania, ITALY*

**M142.e** **ACOUSTICALLY LEVITATED STRUCTURAL COLOR VOXELS WITH VARIED ULTRASOUND SENSITIVITY FOR AERIAL DISPLAYS**
Hayato Goto, Satoshi Nishita, and Hiroaki Onoe
*Keio University, JAPAN*

**M143.e** **COST-EFFECTIVE LITHO-FREE TECHNIQUE FOR HIGH THROUGHPUT SINGLE CELL TRAPPING AND BIOPRINTING USING WETTABILITY CONTRAST AND SUPERHYDROPHOBIC COPPER SURFACES**
Khuushi[1], Sanna Showkat[2], and Prosenjit Sen[1]
[1] *Indian Institute of Science, INDIA and*
[2] *National Institute of Techology, Srinagar, INDIA*

**M144.e** **ENGINEERING SUB-10 MICRON CAPILLARY-SCALE MICROVASCULATURE MODELS IN HYDROGEL**
Shusei Kawara[1], Brian Cunningham[1,2], James Bezer[1], Neelima Kc[1], Jun Ishihara[1], James J. Choi[1], and Sam H. Au[1,2]
[1] *Imperial College London, UK and*
[2] *Cancer Research UK Convergence Science Centre, UK*

**M145.e** **FABRICATION OF PERIODIC SURFACE STRUCTURE ON NANO-ENABLED GRAPHENE OVER KAPTON POLYAMIDE MEMBRANES USING FEMTOSECOND LASER**
Suman Chatterjee, Abhijit Cholkar, David Kinahan, and Dermot Brabazon
*Dublin City University, IRELAND*

**M146.e** **FUNCTIONNALITIES INTEGRATION IN 3D-PRINTED MICROFLUIDICS USING A "PRINT-PAUSE-PRINT" STRATEGY**
Bastien Venzac[1], Laurent Malaquin[1], Vincent Raimbault[1], Corentin Tregouet[3], Elise Bou[1,2], Timothée Derkenne[3], and Matthieu Sagot[1,2]
[1] *LAAS - CNRS, FRANCE,* [2] *Smartcatch, FRANCE, and*
[3] *ESPCI Paris, FRANCE*

**M147.e** **IMPROVED SINGLE-SHOT THREE-DIMENSIONAL PRINTING METHOD BY EXPLOITING STEREOGRAPHIC OPTICAL PROXIMITY CORRECTION IN GRAYSCALE LITHOGRAPHY**
Jinsik Yoon and Wook Park
*Kyung Hee University, KOREA*

**M148.e** **MICROLFUIDICS FOR HOBBYISTS**
Ladislav Derzsi, Yurii Promovych, Shreyas Vasantham, and Piotr Garstecki
*Polish Academy of Sciences, POLAND*

**M149.e** **DESIGN AND DEVELOPMENT OF INTRICATE MICRO-CHANNELS TO IMPROVE MICROFLUIDIC HEAT-SINK PERFORMANCE**
Pramod Vishwakarma, Win-Jet Luo, and Bivas Panigrahi
*National Chin-Yi University of Technology, TAIWAN*

**M150.e** **POROUS MEMBRANE-ASSISTED MAGNETIC BEADS METHOD FOR COMPETITIVE IMMUNODETECTION OF VANCOMYCIN**
Shaofeng Wang[1,2], Yechang Guo[1], Yi Zhang[1], Qingmei Xu[1], Songtao Dou[1], Jiajie Kang[2], and Wei Wang[1,3]
[1]*Peking University, CHINA,* [2]*China University of Geosciences, CHINA, and* [3]*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA*

**M151.e** **SPHEROID FORMATION IN PDMS MICROFLUIDIC DEVICES FABRICATED FROM 3-D PRINTED MOLDS WITH STEEL BALL ARRAYS**
Ziya Isiksacan[1,2], Rahime Senturk[1,2,3], Ismail Bilican[4], Aslihan Gokaltun[1,2,5], and O. Berk Usta[1,2]
[1]*Massachusetts General Hospital and Harvard Medical School, USA,* [2]*Shriners Children's Boston, USA,* [3]*Eindhoven University of Technology, NETHERLANDS,* [4]*Aksaray University, TURKEY, and* [5]*Hacettepe University, TURKEY*

**M152.e** **UTILIZATION OF POLY (LACTIC-CO-GLYCOLIC) ACID FOR ON-CHIP REAGENT ENCAPSULATION IN DISPOSABLE THERMOPLASTIC CHIPS**
Jaesung Lee, Evan Benke, Ian M. White, and Don L. DeVoe
*University of Maryland, USA*

**T141.e** **4D PRINTING OF SEQUENTIAL-CURING SYSTEM FOR FABRICATION OF MICROFLUIDIC DEVICES FOR BIOASSAYS**
David Böcherer, Yuanyuan Li, Bastian E. Rapp, and Dorothea Helmer
*University of Freiburg, GERMANY*

**T142.e** **AN OPEN-SOURCE MICROFLUIDIC DESIGN AUTOMATION WORKFLOW FOR 3D PRINTING**
Brady Goenner[1], Scott Temple[1], Sebastian Zapata[2], Pierre Emmanuel-Gaillardon[1], Gregory Nordin[2], and Bruce K. Gale[1]
[1]*University of Utah, USA and* [2]*Brigham Young University, USA*

**T143.e** **DIRECT WRITING TECHNIQUE FOR COMBINATORIAL SCREENING OF SOLUTION-PROCESSABLE MULTI-MATERIAL FILMS AND COATINGS**
Anindya L. Roy and Konrad Walus
*University of British Columbia, CANADA*

**T144.e** **ENHANCEMENT OF IMPEDANCE CYTOMETRY SIGNAL WITH DIMENSION-ADJUSTABLE MICROFLUIDIC CHANNEL**
Trisna Julian[1], Tao Tang[2], Yoichiroh Hosokawa[1], and Yaxiaer Yalikun[1]
[1]*Nara Institute of Science and Technology, JAPAN and* [2]*National University of Singapore, SINGAPORE*

**T145.e** **FABRICATION OF VILLI MICROINTESTINAL STRUCTURES FOR EVALUATION OF INTESTINAL MICROBIOTA**
Yota Yamakawa[1], Wataru Iwasaki[2], and Noritada Kaji[1]
[1] *Kyushu University, JAPAN and* [2] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

**T146.e** **HIGH-RESOLUTION SURFACE REPLICATION OF LIVING ORGANISMS USING AIR-THROUGH-PRECURSOR SUCTION-AUGMENTED REPLICA MOLDING**
Seok Joon Mun, Wookyoung Jang, Ji Yeon Eom, Hyeon Ung Kim, and Ki Wan Bong
*Korea University, KOREA*

**T147.e** **IN-SITU SYNTHESIS AND FLUID FLOW CHARACTERIZATION OF VERTICAL CELL IMPRINTED POLYMER (CIP) BASED MEMBRANES IN MICROCHANNELS FOR FUTURE ELECTROCHEMICAL SENSING APPLICATIONS**
Ayobami E. Oseyemi[1], Alireza Zabihihesari[1], Garrett Kraft[2], and Pouya Rezai[1]
[1] *York University, CANADA and* [2] *Sixth Wave Innovations Inc., CANADA*

**T148.e** **MICROPATTERNED CYCLIC OLEFIN COPOLYMER FOILS FOR ENHANCED CELL GROWTH IN MICROFLUIDICS**
Jiří Smejkal[1], Petr Aubrecht[1], Petr Malinský[2], Marcel Štofik[1], and Jan Malý[1]
[1] *Jan Evangelista Purkyně University in Ústí nad Labem, CZECH REPUBLIC and* [2] *Academy of Sciences of the Czech Republic, CZECH REPUBLIC*

**T149.e** **PARALLEL HIGH-THROUGHPUT SINGLE-CELL PRINTING PLATFORM FOR OPTOPORATION MEDIATED LARGE CARGO DELIVERY**
Gayathri Rajeswari[1], Pallavi Gupta[2], Moeto Nagai[3], Pallab Sinha Mahapatra[1], and Tuhin Subhra Santra[1]
[1] *Indian Institute of Technology, Madras, INDIA,*
[2] *CSIR-Central Drug Research Institute (CDRI), INDIA, and*
[3] *Toyohashi University of Technology, JAPAN*

**T150.e** **RAPID, LOW-COST FABRICATION OF VALVED ELECTRONIC MICROFLUIDICS VIA INKJET-PRINTING AND XUROGRPAHY (MINX)**
Kruthika Kikkeri and Joel Voldman
*Massachusetts Institute of Technology, USA*

**T151.e** **STOPPING INERTIAL FLOW WITHIN A MICROFLUIDIC CHANNEL**
Mehmet Akif Sahin, Muhammad Usman Akhtar, and Ghulam Destgeer
*Technical University of Munich, GERMANY*

**W140.e** **"AGC-ACE" PROCESS, HIGH-PRECISION AND HIGH-SPEED DEEP MICROFABRICATION TECHNIQUE OF SILICA GLASS USING HYDROGEN FLUORIDE GAS AND CATALYST**
Yoshitaka Ono[1,2], Kohei Sano[1], and Yasuo Hayashi[1]
[1] *AGC Inc., JAPAN and* [2] *Tokyo University of Science, JAPAN*

**W141.e** **A NOVEL METHOD OF CLEANING SLA 3D PRINTED MICROFLUIDIC DEVICES THROUGH CENTRIFUGATION**
Kim Nicolau, Vipul Gupta, Fernando Maya Alejandro, and Michael C. Breadmore
*University of Tasmania, AUSTRALIA*

**W142.e APPLICATION OF BIOLOGICAL ADHESION MECHANISM TOWARD FLUIDIC SELF-ASSEMBLY**
Akira Ito and Hiroaki Suzuki
*Chuo University, JAPAN*

**W143.e ELECTROHYDRODYNAMIC JET ASSISTED RAPID PROTOTYPING OF NON-SACRIFICIAL MICROFLUIDIC TEMPLATES: APPLICATION TO SOFT LITHOGRAPHY AND HOT EMBOSSING**
Anupam Choubey and Supreet Singh Bahga
*Indian Institute of Technology, Delhi, INDIA*

**W144.e FABRICATION OF BIOMIMETIC AND FLAT COLLAGEN SCAFFOLDS CONTAINING EMBEDDEDMICROCHANNELS INSIDE 3D EXTRACELLULAR MATRICES WITH 2D BASEMENT MEMBRANE LININGS**
Ali Maghzian, Neda Fakhri, Arezoo Khalili, Terry Sachlos, and Pouya Rezai
*York University, CANADA*

**W145.e FACILE FABRICATION OF HIERARCHICALLY STRUCTURED SUPERHYDROPHOBIC GLASS SUBSTRATES**
Kathryn Pacheco[1,2] and Don DeVoe[1,2]
[1] *University of Maryland, USA and*
[2] *Fischell Institute for Biomedical Devices, USA*

**W146.e HYBRID PLASMONIC NANOCAVITY MICROCHIP FOR SINGLE EV SERS MOLECULAR PROFILING**
Mahsa Jalali, Carolina del Real Mata, Yao Lu, Laura Montermini, Janusz Rak, and Sara Mahshid
*McGill University, CANADA*

**W147.e MICROCHANNEL FABRICATION WITH SMOOTH SURFACE AND HIGH ETCHING SELECTIVITY ON GLASS SUBSTRATE**
Kyojiro Morikawa[1,2,3], Po-yin Chen[1], Hai Linh Tran[1], Yutaka Kazoe[4], Chihchen Chen[1], and Takehiko Kitamori[1,3,5]
[1] *National Tsing Hua University, TAIWAN,* [2] *University of Tokyo, JAPAN,* [3] *Kanagawa Institute of Industrial Science and Technology, JAPAN,* [4] *Keio University, JAPAN, and* [5] *Lund University, SWEDEN*

**W148.e NEW MULTI-RESOLUTION 3D PRINTING: 2 µM CHANNELS AND TINY DIFFUSION MIXER IN ONLY 0.017 MM^3 PRINTED VOLUME**
Dallin Miner, Matthew Viglione, Kent Hooper, Adam T. Woolley, and Gregory P. Nordin
*Brigham Young University, USA*

**W149.e PARYLENE-BASED MICROCHANNELS FOR BRAIN DRUG DELIVERY APPLICATIONS**
Feyza Pirim, Akin M. Yılmaz, Ali C. Atik, Haluk Kulah, and Mahmut K. Aslan
*Middle East Technical University, TURKEY*

**W150.e SINGLE-CELL TRAPPING AND RELEASING METHOD USING NITROGEN GAS GENERATED FROM LIGHT-RESPONSIVE GAS-GENERATING POLYMER (LGP)**
Hidetaka Ueno[1], Yoshinori Akagi[2], and Shohei Yamamura[3]
[1] *Kobe University, JAPAN,* [2] *Sekisui Chemical Co., Ltd., JAPAN, and* [3] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

**W151.e** **SUPERHYDROPHILIC/ SUPERHYDROPHOBIC DROPLET MICROARRAYS FOR NUCLEIC ACID DETECTION**
Mohammad Awashra[1], Pinja Elomaa[2], Päivi Saavalainen[2], and Ville Jokinen[1]
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## Nanoscale Fabrication, Patterning and Integration

**M153.e** **FABRICATION OF HOMOGENEOUS SHELL-ISOLATED SERS SUBSTRATES FOR CATALYTIC APPLICATIONS**
Ketki Srivastava[1], Thimo S. Jacobs[2], Stefan Ostendorp[3], Dirk Jonker[4], Arturo Susarrey Arce[4], Han Gardeniers[4], Gerhard Wilde[3], Bert M. Weckhuysen[2], Albert van den Berg[1], Ward van der Stam[2], and Mathieu Odijk[1]
[1]*University of Twente, NETHERLANDS,* [2]*Utrecht University, NETHERLANDS,* [3]*WWU Münster, GERMANY, and* [4]*University of Twente, NETHERLANDS*

**M154.e** **HIGH-THROUGHPUT NANOPARTICLE ALIGNMENT AND PATTERNING USING WRINKLE-BASED NANOCHANNEL ARRAY: TOWARD MULTIPLEX BIOSENSORS**
Yeonghoon Jeong, Jungyu Park, Minsu Kwon, and Taesung Kim
*Ulsan National Institute of Science and Technology (UNIST), KOREA*

**T152.e** **BUBBLE DEGASSING CHARACTERISTICS VIA NANOSTRUCTURES ON THE SUBSTRATE OF A MICROFLUIDIC DEVICE**
Hyewon Kim[1], Hyewon Lim[1], Yejin Nam[2], Sanghyun Lee[2], Sangmin Lee[2], and Hyungmo Kim[1]
[1]*Gyeongsang National University, KOREA and* [2]*Dongeui University, KOREA*

**T153.e** **NANOSCALE LENSES EMBEDDED IN MICROFLUIDIC CHANNELS FOR SIZE-SELECTIVE OPTICAL TRAPPING AND GUIDING OF PARTICLES**
Brigham Pope and Stephen Jacobson
*Indiana University, USA*

**T154.e** **TARGETED INSERTION OF DNA NANOPORE INTO GIANT LIPOSOMES**
Hiroki Koiwa[1], Shin-ichiro M. Nomura[2], Satoshi Murata[2], and Kan Shoji[1]
[1]*Nagaoka University of Technology, JAPAN and* [2]*Tohoku University, JAPAN*

**W152.e** **ENHANCED BIOMOLECULE SENSING USING NANOWIRE-INTEGRATED PLASTIC LABWARE FABRICATED BY INJECTION MOLDING FOR IMPROVED ANTIBODY DETECTION**
Jung Kim, Yujin Jung, Jong-Hwan Lee, Sung Kyun Lee, Nam Hoon Kim, and Hong Gi Kim
*Korea Research Institute of Chemical Technology, KOREA*

**W153.e** **SELF-ASSEMBLED, HIERARCHAL NANOPATTERNED STRUCTURES TO ENHANCE DURABILITY OF LUBRICANT INFUSED SURFACES**
Joowon Lim, Beomsu Kim, Chenrui Li, Geonho Lee, Seokhyun Noh, Junho Oh, and Won Chul Lee
*Hanyang University, KOREA*

## New Materials and Surface Modification

**M155.e** **ARTIFICIAL IRIS FOR ENHANCED ANTI-COUNTERFEITING STRATEGIES**
Cheolheon Park[1] and Daewon Lee[2]
[1]*Seoul National University, KOREA and* [2]*Myongji University, KOREA*

**M156.e MEMS COMPATIBLE SUBSTRATES FOR CYANOBACTERIA MOTILITY STUDIES IN LOC DEVICES**
Lourdes Albina Nirupa Julius[1], Lukas Matter[1], Nils Schuergers[2], Johannes Lützenkirchen[1], Vanessa Trouillet[1], Teba Gil-Díaz[1,3], Emil R. Mamleyev[1], Annegret Wilde[2], Vlad Badilita[1], and Jan G. Korvink[1]
[1]*Karlsruhe Institute of Technology, GERMANY,* [2]*University of Freiburg, GERMANY, and* [3]*Friedrich Schiller University Jena, GERMANY*

**M157.e OMNIPHOBIC AND SUBSTRATE-INDEPENDENT SPRAY COATING CONSISTING OF HIERARCHICAL STRUCTURES PREVENTS THE TRANSMISSION OF INFECTIOUS DISEASES ON HIGH-TOUCH SURFACES**
Noor Abu Jarad, Kenneth Rachwalski, Fereshteh Bayat, Shadman Khan, Amid Shakeri, Roderick MacLachlan, Martin Villegas, Eric D. Brown, Leyla Soleymani, and Tohid F. Didar
*McMaster University, CANADA*

**T155.e HIGH-RESOLUTION 3D IMAGING OF CANCER CELLS INFILTRATING A CYTOP V-GROOVE MICROCHANNEL DIRECTLY WRITTEN BY FS-LASER**
Kazunari Ozasa, Kotaro Obata, Hiroyuki Kawano, Atsushi Miyawaki, and Koji Sugioka
*Institute of Physical and Chemical Research (RIKEN), JAPAN*

**T156.e NANOFIBERS WITH DIFFERENT PHYSICOCHEMICAL PROPERTIES AS A NEW SUBSTRATE FOR MICRO- AND NANOENGINEERING USED FOR HYPOXIA SIMULATION OF HUMAN CARDIOMYOCYTES**
Zuzanna Iwoń[1], Aleksandra Kierlańczyk[1], Ewelina Krogulec[2], Michał Wojasiński[1], Iwona Łopianiak[1], and Elżbieta Jastrzębska[1]
[1]*Warsaw University of Technology, POLAND and*
[2]*Nencki Institute of Experimental Biology PAS, POLAND*

**T157.e OSTEMER AS A MATERIAL SUITABLE FOR BIOLOGICAL MICROFLUIDIC APPLICATIONS**
Petr Aubrecht, Jiří Smejkal, Petr Panuška, Klára Španbauerová, Viktorie Neubertová, Jindřich Matoušek, Stanislav Vinopal, Michaela Liegertová, Marcel Štofik, and Jan Malý
*Jan Evangelista Purkyně University in Ústí nad Labem, CZECH REPUBLIC*

**W154.e A SCALABLE, MICROFLUIDIC APPROACH FOR FABRICATION OF METER-LONG ALIGNED COLLAGEN SHEET FOR LOAD-BEARING SCAFFOLDS**
Samuel V. Lasinski, Lihua Wei, Yuming Zhang, Chantel Campbell, Wuyang Gao, and Axel Guenther
*University of Toronto, CANADA*

**W155.e INFLUENCE OF AIR PLASMA TREATMENT ON THE CONTACT ANGLE OF FLEXDYM®**
Samuel Wenger, Mattéo Meister, Laure Jeandupeux, Frédéric Flahaut, Jérôme Charmet, and Alexandra Homsy
*Haute Ecole Arc, SWITZERLAND*

**W156.e NEW PDMS CROSSLINKING PROCEDURE**
Michal Chudy, Elżbieta Jastrzębska, Monika Mehra, and David Madukwe
*Warsaw University of Technology, POLAND*

**W157.e** **TOWARDS ECO-FRIENDLY LAB-ON-A-CHIP WITH BIO-SOURCED POLYMER**
Morgane Zimmer[1], Stephane Trombotto[2], Anne-Laure Deman[1], and Emmanuelle Laurenceau[1]
[1]*Université Claude Bernard Lyon 1, FRANCE and*
[2]*Ingénierie des Matériaux Polymères, FRANCE*

## Others

**M158.e** **A METHOD FOR REGULATING THE FATE OF STEM CELLS USING SELF-POWERED DEVICES**
Jing Li and Dahai Ren
*Tsinghua University, CHINA*

**T158.e** **ADAPTATION OF OPENROAD FOR MICROFLUIDIC DESIGN AUTOMATION**
Brady Goenner[1], Scott Temple[1], Pierre Emmanuel-Gaillardon[1], Gregory Nordin[2], and Bruce K. Gale[1]
[1]*University of Utah, USA and* [2]*Brigham Young University, USA*

## f - Sensors and Detection Technologies

### Chemical & Electrochemical Sensors

**M159.f** **DEVELOPMENT OF AN ORIGINAL MICROMACHINED FLUIDIC CIRCUIT BOARD FOR A COMPACT MULTIGAS DETECTION SYSTEM EXCLUSIVELY BASED ON MEMS COMPONENTS**
Florence Ricoul, Jean-Baptiste Tissot, Raymond Charles, Armelle Keiser, and Nicolas Verplanck
*University Grenoble Alpes, FRANCE*

**M160.f** **EXTRACTION-FREE DETECTION OF LISTERIA MONOCYTOGENES WITH AN ELECTROCHEMICAL LAMP-BASED SENSOR IN FOOD SAMPLES**
Ane Rivas Macho[1], Unai Eletxigerra[2], Ruth Díez-Ahedo[2], Santos Merino[2,3], Felipe Goñi-de-Cerio[1], and Garbiñe Olabarria[1]
[1]*GAIKER Technology Center, SPAIN,* [2]*TEKNIKER, SPAIN, and*
[3]*University of the Basque Country, SPAIN*

**M161.f** **MICROFLUIDIC BIOSENSOR FOR THE CONTINUOUS ENZYMATIC DETECTION OF ORGANOPHOSPHATE PESTICIDES IN WATER**
Julie Lachaux, Celestine Mairaville, Menel Ben Frej, Hervé Volland, Stephanie Simon, and Karla Perez Toralla
*Paris-Saclay University, FRANCE*

**M162.f** **MICROFLUIDIC IMMUNOSENSOR FOR IMMUNE RESPONSE DETECTION OF ANTIBIOTIC RESISTANT BACTERIA AND VACCINES**
Ruta Grinyte[1], Pol Monterde[1], Daniel M. Prats[1], David Cecilia[1], Pooya Azizian[1,2], and Joan M. Cabot[1]
[1]*Leitat Technological Center, SPAIN and*
[2]*Technical University of Catalonia, SPAIN*

**M163.f** **NANODISC-BASED PORTABLE BIOELECTRONIC NOSE FOR MONITORING OF FOOD FRESHNESS IN GAS PHASE**
Hyun Seok Song
*Korea Institute of Science and Technology, KOREA*

**M164.f** **PLA/AU MICRONEEDLES-BASED ELECTROCHEMICAL SENSORS FOR INTERSTITIAL FLUID GLUCOSE MONITORING: FACILE FABRICATION AND SUPERIOR PERFORMANCE**
Shicheng Zhou, Toshihiro Kasama, Ryo Miyake, and Madoka Takai
*University of Tokyo, JAPAN*

**M165.f** **SMART SENSOR LID FOR MONITORING PH IN MULTIWELL PLATES**
Micaela T. Oliveira[1,2,3], Luke Marren[1,4], Ana S. Martins[1], Lorena Diéguez[1], and Alar Ainla[1]
[1] *International Iberian Nanotechnology Laboratory (INL), PORTUGAL,* [2] *University of Minho, PORTUGAL,* [3] *University of Oulu, FINLAND, and* [4] *Technological University Dublin, IRELAND*

**T159.f** **DEVELOPMENT OF ELECTROCHEMICAL DNA SENSOR WITH NANOPORE-BASED DNA EXTRACTION FUNCTION**
Haruki Tanabe, Hiromu Akai, and Kan Shoji
*Nagaoka University of Technology, JAPAN*

**T160.f** **INTEGRATION AND RELIABILITY OF THIN FILM ELECTRODES IN MINIATURIZED ELECTROCHEMICAL CELLS**
Elizaveta Vereshchagina[1], Karolina Kolczyk-Siedlecka[2], Zbigniew Szklarz[2], Aina K. Herbjørnrød[1], Paul Wittendorp[1], Guido Sordo[1], Shruti Jain[1], Chi Hoang[1], Sigurd Moe[1], Anand Summanwar[1], and Pawel Wojcik[2]
[1] *SINTEF Digital, NORWAY and*
[2] *redoxme AB sp. z o.o. Oddział w Polsce, POLAND*

**T162.f** **MOLECULARLY IMPRINTED ELECTROCHEMICAL SENSOR BASED ON THE POLY(O-PHENYLENEDIAMINE-CO-O-AMINOPHENOL) FOR DETECTION OF WHITE SPOT SYNDROME VIRUS VIA VIRAL ENVELOPE PROTEIN VP28**
Young-ran Yun
*Gwangju Institute of Science and Technology (GIST), KOREA*

**T163.f** **NANOPORE SENSING FOR NUCLEIC ACID DETECTION AT FEMTOMOLAR LEVELS WITHOUT AMPLIFICATION**
Nanami Takeuchi and Ryuji Kawano
*Tokyo University of Agriculture and Technology, JAPAN*

**T164.f** **POINT-OF-CARE MULTIPLEXED ELECTROCHEMICAL BIOSENSOR FOR SALIVARY HEART FAILURE BIOMARKERS**
Trey W. Pittman[1], Chuck Henry[1,4], Chamindie Punyadeera[2,3], Xi Zhang[2], and Daniel Decsi[2]
[1] *Colorado State University, USA,* [2] *Griffith University, AUSTRALIA,* [3] *Translational Research Institute, AUSTRALIA, and* [4] *Chulalongkorn University, THAILAND*

**W158.f** **ANALYTICAL DETERMINATION OF TRANSEPITHELIAL ELECTRICAL RESISTANCE FROM ELECTRIC CELL-SUBSTRATE IMPEDANCE SENSING METHOD AS THE DIAMETER OF THE ELECTRODES GOES MICRO**
Jose Yeste[1,2,3,4], Xavi Illa[3,4], Nitesh Shashikanth[1,2], Denise Marrero[3,4], Anton Guimerà-Brunet[3,4], Rosa Villa[3,4], and Jerrold R. Turner[1,2]
[1] *Brigham and Women's Hospital, USA,* [2] *Harvard Medical School, USA,* [3] *Instituto de Microelectronica de Barcelona, IMB-CNM (CSIC), SPAIN, and* [4] *Centro de Investigacion Biomedica en Red en Bioingenieria, Biomateriales y Nanomedicina (CIBER-BBN), SPAIN*

**W159.f** **ELECTROCHEMICAL MICROFLUIDIC SENSOR BASED ON CELL IMPRINTED POLYMER-COATED MICROWIRES FOR SELECTIVE RECOGNITION OF BACTERIA IN WATER**
Shiva Akhtarian[1], Satinder Kaur Brar[1], Garrett Kraft[2], and Pouya Rezai[1]
[1] *York University, CANADA and* [2] *Sixth Wave Innovations Inc., CANADA*

**W160.f** **MICROBIAL COUNTING IN AN ARRAY OF MICROCHAMBERS COMBINED WITH A CHEMICAL IMAGING SENSOR**
Ko-ichiro Miyamoto[1], Yohta Horie[1], Ryuju Arai[1], Carl Frederik Werner[2], and Tatsuo Yoshinobu[1]
[1] *Tohoku University, JAPAN and* [2] *Kyoto Institute of Technology, JAPAN*

**W161.f** **MICROFLUIDIC DETERMINATION OF EQUIVALENCE AND ISOELECTRIC POINTS USING 3D-PRINTED FLOW CELL AND OPEN-SOURCE AUTOMATION STRATEGY**
Robin Dinter, Lennart Helwes, Stijn De Vries, Henning Jibben, Marcel Pillath, and Norbert Kockmann
*TU Dortmund University, GERMANY*

**W162.f** **NANO-STRUCTURIZED LEAD NEELDES PRODUCED UTILIZING SULFURIC ACID ELECTRO-ETCHING FOR ELECTROCATALYTIC DETECTION OF PIROXICAM IN URINE**
Wei-Ren Hou, Dai-En Li, and Che-Hsin Lin
*National Sun Yat-sen University, TAIWAN*

**W163.f** **PAPER-BASED ELECTROCHEMICAL LACTATE SENSOR FABRICATED BY LASER-INDUCED GRAPHENE TECHNIQUE FOR HUMAN SWEAT ANALYSIS**
Jinze Chen, Panpan Gao, Toshihiro Kasama, Madoka Takai, and Ryo Miyake
*University of Tokyo, JAPAN*

## Optical Detection & Imaging

**M166.f** **A HIGH-SENSITIVITY, HIGH Q-FACTOR TERAHERTZ METASURFACE SENSOR BASED ON SURFACE LATTICE RESONANCES FOR BIOCHEMICAL DETECTION**
Sun Hongshun, Li Liye, Ma Lijun, Cao Yunhao, Chen Yusa, Xiong Shisong, Yang Bingquan, and Wu Wengang
*Peking University, CHINA*

**M167.f** **ALGINATE/TIO2 BEAD BIOSYSTEM FOR CHOLESTEROL DETERMINATION IN A MICROFLUIDIC DEVICE**
Sandra Garcia-Rey[1], Juncal A. Alonso-Cabrera[1], Udara B. Gunalitake[1], Lourdes Basabe-Desmonts[1,2], and Fernando Benito-Lopez[1]
[1] *University of the Basque Country, SPAIN and* [2] *IKERBASQUE, SPAIN*

**M168.f** **DEPENDENCE ON MOLECULAR ADSORPTION AND DESORPTION ON THE SERS STRUCTURE USING BOEHMITE**
Shunya Saegusa[1], Taku Tanaka[1], Ryota Tanaka[1], Masayuki Naya[2], Takao Fukuoka[1], Yuichi Utsumi[1], and Akinobu Yamaguchi[1]
[1] *University of Hyogo, JAPAN and* [2] *Keio University, JAPAN*

**M169.f** **DUAL-FIELD CELL CHARACTERIZATION AND SORTING VIA NEUROMORPHIC-ENABLED IMAGING FLOW CYTOMETRY**
Weihua He, Yongxiang Feng, Fei Liang, Junwen Zhu, and Wenhui Wang
*Tsinghua University, CHINA*

**M170.f** **IN-LINE MICRO SPECTROMETER AS THE COLOR AND CONCENTRATION SENSOR WITH A STRUCTURAL COLOR POLYMER**
Satoshi Nishita and Hiroaki Onoe
*Keio University, JAPAN*

**M171.f** **NEXT GENERATION IN-SITU SENSING-ON-CHIP (µSOC)**
Chayenne W.C. van Dongen[1], Georgia Kontaxi[1], Hanieh Bazyar[1], Behrooz Fereidoonnezhad[1], Nikolas Gaio[2], and Tawab Karim[2]
[1] *Delft University of Technology, NETHERLANDS and*
[2] *Bi/ond, NETHERLANDS*

**M172.f** **THREAD-BASED OPTICAL BIOSENSOR FOR UREA DETERMINATION**
Izabela Lewińska[1], Paweł Bącal[2], Miguel M. Erenas[3,4], Luis Fermín Capitán-Vallvey[3,4], and Łukasz Tymecki[1]
[1] *University of Warsaw, POLAND,* [2] *Polish Academy of Sciences, POLAND,* [3] *University of Granada, SPAIN, and* [4] *University of Granada, SPAIN*

**T165.f** **3D BIOPRINTED HYDROGEL SENSOR WITH OPTICAL DETECTION TOWARDS RAPID PH-BASED SALIVARY DIAGNOSTICS**
Magdalena Łabowska, Agnieszka Krakos (Podwin), and Wojciech Kubicki
*Wrocław University of Science and Technology, POLAND*

**T166.f** **A LABEL-FREE STRATEGY TO CLASSIFY MICROEMBOLUS AND WHITE BLOOD CELLS IN MICRORESERVOIRS USING LENSLESS IMAGING POWERED WITH DEEP LEARNING-BASED ALGORITHMS**
Alperay E. Tarim[1], Oyku Doyran[1], Eda Efe[1], Ozden Yalcin-Ozuysal[1], and Cumhur H. Tekin[1,2]
[1] *Izmir Institute of Technology, TURKEY and* [2] *METU MEMS Center, TURKEY*

**T167.f** **AN ANGLE-MULTIPLEXED ALL-METAL METASURFACE FOR REFRACTIVE INDEX SENSING BASED ON SURFACE LATTICE RESONANCE**
Liye Li and Wengang Wu
*Peking University, CHINA*

**T168.f** **DEVELOPMENT OF A GLOBOTRIAOSYLCERAMIDE (GB3) SUPPORTED LIPID BILAYER (SLB)-FORMED MICROCHIP TO OPTICALLY DETECT SHIGA TOXIN IN FOODS**
Jeongtae Kim[1], Keying Li[1], Jeongyun Kim[2], Moo-Seung Lee[3], and Chiwan Koo[1]
[1] *Hanbat National University, KOREA,* [2] *Dankook University, KOREA, and* [3] *Korea Research Institute of Bioscience and Biotechnology (KRIBB), KOREA*

**T169.f** **EGGSHELL BIOACTIVE MEMBRANE-ASSISTED FABRICATION OF COPPER NANOCLUSTERS AS A VOLATILE AMMONIA-RESPONSIVE FLUORESCENT PROBE FOR EVALUATION OF CHRONIC KIDNEY DISEASE STAGE AT AMBIENT TEMPERATURE**
Yi-Hsin Chien, Kuan-Hsiang Yeh, Zheng-Da Du, Wei-Chen Lin, and Yu-Ling Huang
*Feng Chia University, TAIWAN*

**T170.f** **IONIC LIQUID-BASED DYE NANOEMULSION USING MEROCYANINE DYE: HIGHLY-SENSITIVE AND RAPIDLY-RESPONSIVE ION-SENSING COMPONENT OF HYDROGEL-BASED MICROANALYTICAL DEVICES**
Yu Koizumi, Shuto Oka, Kenji Sueyoshi, Tatsuro Endo, and Hideaki Hisamoto
*Osaka Metropolitan University, JAPAN*

**T171.f** **PHYSIOLOGICAL GLUCOSE SENSING IN 3D TUMOUR SPHEROIDS USING SERS BASED NANO PARTICLE SENSORS**
Koyel Dey[1,2], Venkanagouda S. Goudar[1], Fan Gang Tseng[1], and Tuhin Santra[2]
[1] *National Tsing Hua University, TAIWAN and*
[2] *Indian Institute of Technology, Madras, INDIA*

**W165.f** **3D PRINTED CELL ENCAPSULATION SYSTEM TOWARDS DRY-RESISTANT YEAST-BASED BIOHYBRID SENSOR**
Kazuki Nishimoto, Minghao Nie, and Shoji Takeuchi
*University of Tokyo, JAPAN*

**W166.f** **A SURFACE LATTICE RESONANCE BIOCHEMICAL SENSOR BASED ON A COMPOSITE METAL METASURFACE**
Liye Li, Lijun Ma, Yifan Ouyang, and Wengang Wu
*Peking University, CHINA*

**W167.f** **AN OPEN SPACE OPTOFLUIDIC SENSOR BASED ON WHISPERING GALLERY MODE MICROSPHERES FOR VIRUS DETECTION**
Bin Guan[1], Tuck-Weng Kok[2], Nicolas Riesen[1], David G. Lancaster[1], Koukou Suu[3], and Craig Priest[1]
[1] *University of South Australia, AUSTRALIA,* [2] *University of Adelaide, AUSTRALIA, and* [3] *ULVAC Inc., JAPAN*

**W168.f** **DEVELOPMENT OF SILICON NITRIDE INTEGRATED PHOTONICS PLATFORM FOR BIOSENSING APPLICATIONS**
Mateusz Slowikowski, Marcin Juchniewicz, Marcin Lelit, Adrian Duszczyk, Sylwia Karon, Krystian Pavlov, Maciej Filipiak, Bartlomiej Stonio, Bartosz Michalak, Michal Golas, Marcin Mysliwiec, and Piotr Wisniewski
*Warsaw University of Technology, POLAND*

**W169.f** **FLUOROMETRIC DETECTION OF SALMONELLA IN WATER USING CELL IMPRINTED POLYMER THIN FILMS INTEGRATED WITH A MICROFLUIDIC DEVICE**
Islam Mahmoud[1], Ali Doostmohammadi[1], Garret Kraft[2], and Pouya Rezai[1]
[1] *York University, CANADA and* [2] *Sixth Wave Innovations Inc, CANADA*

**W170.f** **MICROFLUIDIC ELECTROCHEMICAL SURFACE-ENHANCED RAMAN SCATTERING SENSORS FOR DETECTION OF PESTICIDES IN SURFACE WATERS**
Elizaveta Vereshchagina[1], Karolina Milenko[1], Rebeca Moldovan[2], Aina K. Herbjørnrød[1], Anand Summanwar[1], Guido Sordo[1], Sigurd Moe[1], Firehun Tsige Dullo[1], Cosmin Farcau[3], and Ede Bodoki[2]
[1] *SINTEF Digital, NORWAY,* [2] *University of Medicine and Pharmacy, ROMANIA, and* [3] *National Institute for Research and Development of Isotopic and Molecular Technologies, ROMANIA*

**W171.f** **SELF-ASSEMBLED PHOTOSENSITIVE DNA/SG-I NANOFLOWER-ASSISTED COLORIMETRIC SENSOR FOR DETECTION OF CARCINOEMBRYONIC ANTIGEN**
Shan He, Huiting Lian, Xuegong Cao, Bin Liu, and Xiaofeng Wei
*Huaqiao University, CHINA*

## Physical Sensors

**M173.f** **COULOMETRIC DETECTION OF FLOW RATE IN A MICROCHANNEL USING ON-CHIP MICROELECTRODES**
Harsh Deswal[1], Ullas Pandey[2], Shiv G. Singh[2], and Amit Agrawal[1]
[1]*Indian Institute of Technology, Bombay, INDIA and*
[2]Indian Institute of *Technology, Hyderabad, INDIA*

**M174.f** **FLEXIBLE ULTRA THIN GLASS SHEET CANTILEVER INTEGRATED WITH STRAIN GAUGE SENSOR FOR STIFFNESS MEASUREMENT**
Yapeng Yuan[1,3], Yaxiaer Yalikun[2], and Yo Tanaka[3]
[1]*Osaka University, JAPAN,* [2]*Graduate School of Nara Institute of Science and Technology, JAPAN, and* [3]*Institute of Physical and Chemical Research (RIKEN), JAPAN*

**M175.f** **POSITION INDEPENDENT MICROPARTICLE SENSING WITH SU8 MICROELECTRODES 3-D INTEGRATED WITH MICROWAVE SENSORS**
Yağmur C. Alataş[1], Uzay Tefek[1], Burak Sarı[2], and Mehmet S. Hanay[1]
[1]*Bilkent University, TURKEY and* [2]*Sabancı University, TURKEY*

**T173.f** **EIS MONITORING OF SINGLE YEAST GROWTH AND DISSECTION ON A MEA-INTEGRATED MICROFLUIDIC DEVICE**
Zhao Zhang[1], Mingze Luo[1], Liudi Dong[1], Haoran Wu[1], Yanze Shi[1], Yingying Wang[1], Xiao Xie[1], Zixin Wang[2], Qing-An Huang[1], and Zhen Zhu[1]
[1]*Southeast University, CHINA and* [2]*Sun Yat-Sen University, CHINA*

**T174.f** **MICRO ULTRASONIC ENDOSCOPE ARRAYS FOR INVASIVE KNEE JOINT DIAGNOSTICS**
Yuchen Chiang, Chien-Chong Hong, and Tong-Miin Liou
*National Tsing Hua University, TAIWAN*

**T175.f** **STUDY ON GEOMETRIC STRUCTURE OPTIMIZATION OF SPATIAL POSITIONING DEVICE BASED ON FLOATING ELECTRODES**
Tan Wang, Qiang Fang, and Liang Huang
*Hefei University of Technology, CHINA*

**W172.f** **CLOSED LOOP, LOCALIZED TEMPERATURE CONTROL FOR MICRO-FLUIDICS**
Saima Hamid, Naveen Kumar K. Ramakrishnan, and Shishir Kumar
*Indian Institute of Technology, Hyderabad, INDIA*

**W173.f** **ELECTRO-MICROFLUIDIC DETECTION AND QUANTIFICATION OF MICROPLASTICS IN WATER: SALINITY'S IMPACT ON SENSOR PERFORMANCE**
Haider Warraich, Alireza Zabihihesari, Shooka Karimpour, and Pouya Rezai
*York University, CANADA*

**W174.f** **ORIGAMI-INSPIRED TACTILE SENSOR WITH ENHANCED SENSITIVITY IN POSTURE AND BRUXISM DETECTION**
Rajat Subhra Karmakar[1], Chia-Pei Chu[1], Jhih-Fong Huang[2], Jui-I Chao[2], Ying-Chih Liao[1], and Yen-Wen Lu[1]
[1] *National Taiwan Univerisity, TAIWAN and*
[2] *National Yang Ming Chiao Tung University, TAIWAN*

## Others

**M176.f** **EVALUATION METHOD FOR INTERNAL ELASTIC DISTRIBUTIONS OF CELL CULTURE ENVIRONMENTS BY USING ARRAYED LIGHT-DRIVEN GEL ACTUATORS**
Hibiki Nakajima[1], Yoshiyuki Yokoyama[2], Masaya Hagiwara[3], and Takeshi Hayakawa[1]
[1] *Chuo University, JAPAN,* [2] *Toyama Industrial Technology Research and Development Center, JAPAN, and* [3] *Institute of Physical and Chemical Research (RIKEN), JAPAN*

**M177.f** **SMARTPHONE-BASED TACHOMETER FOR LOW-COST POINT-OF-CARE CENTRIFUGAL MICROFLUIDICS APPLICATIONS**
Noa Lapins, Ahmad Saleem Akhtar, and Aman Russom
*KTH Royal Institute of Technology, SWEDEN*

**T176.f** **MULTIPLEXED BIOSENSOR USING QUARTZ-ON-SILICON MICRO-ACOUSTIC (QSIM) TECHNOLOGY FOR IN-VITRO LABEL-FREE INVESTIGATION OF HEMOSTASIS**
Aleksander Oseev[1,4], Franck Chollet[1,4], Thomas Lecompte[2,3], and Thérèse Leblois[1,4]
[1] *University Bourgogne Franche-Comté, FRANCE,* [2] *Université de Lorraine, FRANCE,* [3] *Université de Genève, SWITZERLAND, and* [4] *CNRS, FRANCE*

**W175.f** **A MINIATURIZED 3-D-MRI SCANNER FEATURING A HIGH-VOLTAGE SOI ASIC FOR NON-INVASIVE OBJECT RECONSTRUCTION AND FLOW ANALYSIS**
Shuhao Fan[1], Qi Zhou[1], Ka-Meng Lei[1], Rui P. Martins[1,2], and Pui-In Mak[1]
[1] *University of Macau, MACAO and* [2] *Universidade de Lisboa, PORTUGAL*

**W176.f** **PERMITTIVITY-BASED MICROPARTICLE CLASSIFICATION BY THE INTEGRATION OF IMPEDANCE CYTOMETRY AND MICROWAVE RESONATORS**
Uzay Tefek[1], Burak Sari[2], and Mehmet S. Hanay[1]
[1] *Bilkent University, TURKEY and* [2] *Sabanci University, TURKEY*

## g - Other Applications of Microfluidics

### Artificial Intelligence and Microfluidics

**M178.g** **AUTONOMOUS CELL DISTROBUTION CONTROL MICROFLUIDIC SYSTEM BASED ON DEEP REINFORCEMENT LEARNING**
Kenji Tamura, Takaaki Abe, and Yoshiaki Ukita
*University of Yamanashi, JAPAN*

**M179.g** **EVALUATING DONOR RED BLOOD CELL QUALITY USING BLOOD SMEARS AND DEEP LEARNING**
Erik S. Lamoureux[1], You Cheng[1], Emel Islamzada[1], Kerryn Matthews[1], Simon P. Duffy[1,2], and Hongshen Ma[1,3]
[1] *University of British Columbia, CANADA,* [2] *British Columbia Institute of Technology, CANADA, and* [3] *Vancouver General Hospital, CANADA*

**T177.g** **ARTIFICIAL INTELLIGENCE-BASED VESSEL-ON-A-CHIP PLATFORM FOR ACCURATE IDENTIFICATION OF DEVELOPMENTAL STAGES IN VASCULOGENESIS**
Hang Zhou, Taiga Irisa, Kazuya Fujimoto, and Ryuji Yokokawa
*Kyoto University, JAPAN*

**T178.g** **DEEP LEARNING-BASED OBJECT DETECTION FOR SOIL BACTERIAL COMMUNITY ANALYSIS IN MICROFLUIDICS**
Hanbang Zou, Alexandros Sopasakis, Francois Maillard, Erik Karlsson, Julia Duljas, Simon Silwer, Pelle Ohlsson, and Edith C. Hammer
*Lund University, SWEDEN*

**T179.g** **SEGMENTATION, FEATURE EXTRACTION AND CLASSIFICATION OF LEUKOCYTES LEVERAGING DEEP NEURAL NETWORKS**
Tingxvan Fang[1,2], Xvkun Huang[1,3], Xiao Chen[1,3], Deyong Chen[1,3], Junbo Wang[1,3], and Jian Chen[1,3]
[1] *Chinese Academy of Sciences, CHINA,* [2] *Wuhan University, CHINA, and* [3] *University of Chinese Academy of Sciences, CHINA*

**W177.g** **ARTIFICIAL INTELLIGENT IDENTIFICATION AND CLASSIFICATION OF SINGLE CANCER CELLS USING HYPERSPECTRAL IMAGE COMBINED WITH MACHINE LEARNING WITHOUT FLUORESCENCE LABELING**
Chih-Ching Hsu[1] and Fan-Gang Tseng[1,2]
[1] *National Tsing Hua University, TAIWAN and* [2] *Academia Sinica, TAIWAN*

**W178.g** **DEEP LEARNING-ENABLED HIGH-THROUGHPUT DETECTION OF SARS-COV-2 VARIANT OF CONCERN USING THE CENTRIFUGAL MICROFLUIDIC PLATE**
Li Zhang and Youchun Xu
*Tsinghua University, CHINA*

## Fuel Cells & Energy

**W179.g** **INSIGHTS IN OPERATION OF MEMBRANELESS MICRO FLOW BATTERIES**
Alberto E. Quintero[1,2], Beatriz Oraá-Poblete[1], Daniel Perez-Antolin[1], Ange A. Maurice[2], and Alberto Bernaldo de Quirós[1]
[1] *Micro Electrochemical Technologies S.L., SPAIN and* [2] *Carlos III of Madrid University, SPAIN*

## Microfludics for X-Ray and e-Beam Applications

**M180.g** **CREATION OF A BIOLOGICAL X-RAY IMAGING SYSTEM INCORPORATING A MICROFLUIDIC SYSTEM**
Akinobu Yamaguchi, Kanta Yamamoto, Shunya Saegusa, Hidehiro Ishizawa, Masahiro Takeo, Sho Amano, Satoru Suzuki, and Yuichi Utsumi
*University of Hyogo, JAPAN*

**M181.g** **X-RAY-COMPATIBLE MICROFLUIDIC DEVICE FOR DIELECTROPHORETIC MANIPULATION AND TRAPPING OF CELLS AND MICROPARTICLES**
Simone De Carli[1], Neus Godino[1], Christian Guernth-Marschner[1], Chang Liu[2,3], Wilhelm Eschen[2,3], Jan Rothhardt[2,3,4], and Michael Kirschbaum[1]
[1] *Fraunhofer IZI-BB, GERMANY,* [2] *Friedrich-Schiller-University Jena, GERMANY,* [3] *Helmholtz-Institute Jena, GERMANY, and* [4] *Fraunhofer IOF, GERMANY*

**T180.g** **DROPLET-ON-DEMAND SAMPLE DELIVERY AT A PULSED X-RAY SOURCE**
Sebastian Dehe, Mark S. Hunter, Raymond G. Sierra, Thomas Kroll, and Daniel P. DePonte
*Stanford University, USA*

**W180.g** **IN SITU X-RAY DIFFRACTION OF ACCELERATED CEMENT CARBONATION WITH A 3D-PRINTED MICROFLUIDIC DEVICE**
Valentin Herault, Eddy Foy, Valérie Geertsen, Corinne Chevallard, Stéphane Poyet, and Mark A. Levenstein
*Université Paris-Saclay, FRANCE*

## Microfluidics in Military and Defense Applications

**T181.g** **AT-HOME BIOAEROSOL SAMPLING USING AEROSOLIZED DROPLETS AND OPEN MICROFLUIDICS**
Wan-chen Tu, Jodie C. Tokihiro, David N. Phan, Tammi L. van Neel, Ulri N. Lee, Jean Berthier, Igor Novosselov, John S. Meschke, Ashleigh B. Theberge, and Erwin Berthier
*University of Washington, USA*

## Paper-Based Microfluidics

**M182.g** **BASIC EVALUATION OF COLORIMETRIC SIGNALING ON PAPER-BASED ANALYTICAL DEVICES FOR TRACE HEAVY METAL ION ANALYSIS**
Misaki Nakagawa, Sera Ohta, Yuki Hiruta, and Daniel Citterio
*Keio University, JAPAN*

**M183.g** **COMBINATION OF PAPER-BASED MICROFLUIDICS AND A CAFETIÈRE-BASED PRE-CONCENTRATION PROCESS FOR ON-SITE DETECTION OF COPPER CONTAMINATION IN WATERS**
Jacqueline Karlsson[1], Pablo Giménez-Gómez[1], Samantha Richardson[2], Alexander Iles[1], and Nicole Pamme[1]
[1]*Stockholm University, SWEDEN and* [2]*University of Hull, UK*

**M184.g** **IMPACT OF PAPER CHARACTERISTICS ON CHEMIRESISTOR SWEAT VOLUME SENSOR**
Genis Rabost-Garcia[1,2], Laura Verdaguer-Sánchez[1], and Jasmina Casals-Terré[1]
[1]*Universitat Politècnica de Catalunya, SPAIN and*
[2]*Onalabs Inno-hub S.L., SPAIN*

**M185.g** **PAPER FLUIDICS FOR THE INVESTIGATION OF ROOT EXUDATES OF LIVING PLANTS IN SPACE AND TIME**
Daniel Patko[1], Udara B. Gunatilake[1], Lionel X. Dupuy[2,3], Lourdes Basabe-Desmonts[1,3], and Fernando Benito-Lopez[1]
[1]*University of the Basque Country, SPAIN,* [2]*NEIKER, SPAIN, and* [3]*IKERBASQUE, SPAIN*

**M186.g** **SMART AND PORTABLE PAPER-BASED SENSOR FOR ON-SITE DETECTION OF NITRATES AND LEAD IONS IN ENVIRONMENTAL MONITORING**
Akashlina Basu and Soumen Das
*Indian institute of Technology, Kharagpur, INDIA*

**T182.g** **BLOOMSAFE: DEVELOPING A COST-EFFECTIVE, RAPID, AND PORTABLE DIAGNOSTIC TOOL FOR THE DETECTION OF TOXINS RESULTING FROM ALGAL BLOOMS**
Marcus S. Hill, Andrew P. Dean, James Redfern, and Kirsty J. Shaw
*Manchester Metropolitan University, UK*

**T183.g** **DEVELOPMENT OF A DISTANCE-BASED PAPER ANALYTICAL DEVICE FOR ON-SITE MONITORING OF DISSOLVED INORGANIC CARBON IN INLAND WATERS**
Pablo Giménez-Gómez[1], Iris Hättestrand[1], Susanne Sjöberg[1], Christophe Dupraz[1], Samantha Richardson[2], Mike Rogerson[3], and Nicole Pamme[1]
[1]*Stockholm University, SWEDEN,* [2]*University of Hull, UK, and* [3]*Northumbria University, UK*

**T184.g** **MULTIPLEXED ANALYSIS OF SOIL NUTRIENTS WITH CAFETIÈRE-BASED EXTRACTION AND PAPER-BASED ANALYTICAL DEVICES (PADS) FOR ON-SITE MONITORING**
Nicolina Priem[1], Pablo Giménez-Gómez[1], Samantha Richardson[2], and Nicole Pamme[1]
[1]*Stockholm University, SWEDEN and* [2]*University of Hull, UK*

**T185.g** **PAPER-BASED MICROFLUIDIC DEVICE FOR THE DETECTION OF MICROBIAL CONTAMINATION AND ANTIMICROBIAL RESISTANCE IN DRINKING WATER**
Yuwei Pan[1,2] and Zhugen Yang[1]
[1]*Cranfield University, UK and* [2]*University of Glasgow, UK*

**W181.g** **AN OFFLINE DEEP LEARNING-ASSISTED AUTOMATED PAPER-BASED MICROFLUIDIC PLATFORM**
Sixuan Duan[1,2], Tianyu Cai[1], Fuyuan Liu[1,2], Hang Yuan[1], Yifan Li[1,2], Wenwen Yuan[1,2], Keran Jiao[1], Min Chen[1,2], Yuyuan Chen[1], and Pengfei Song[1,2]
[1]*Xi'an Jiaotong-Liverpool University, CHINA and* [2]*University of Liverpool, UK*

**W182.g** **CAPILLARY-DRIVEN MICROFLUIDICS COUPLED WITH PAPER-BASED PLATFORM FOR RAPID AND USER-FRIENDLY DETECTION OF WATER CONTAMINANTS**
Prakash Aryal[1], Claire Hefner[1], Eric Brack[2], Todd Alexander[2], and Charles Henry[1,3]
[1]*Colorado State University, USA,* [2]*U.S. Army Combat Capabilities Development Command (DEVCOM), USA, and* [3]*Chulalongkorn University, USA*

**W183.g** **EVALUATION OF PAPER-BASED LATERAL-FLOW STRIP FOR EARLY DIAGNOSIS OF BREAST CANCER USING ACTUAL HUMAN SERUM**
Jungchan Shin[1], Dongwoo Kim[1], Keunkoo Shin[1], Yugyeong Kim[2], Eunae Kang[2], Jongam Song[1], and Kyounghoon Suh[1]
[1]*E&S Healthcare Co., Ltd., KOREA and*
[2]*Nature Inspired Energy Technology (NIET), KOREA*

**W184.g ORIGAMI PAPER MICROFLUIDIC ASSAY TO TEST EDIBLE OIL QUALITY**
Pavithra Sukumar[1], Muhammedin Deliorman[1], Fernando Castano[1], Dana H. Abujalban[3], Muhammad A. Datt[3], and Mohammad A. Qasaimeh[1,2]
[1]*New York University, Abu Dhabi, UAE,* [2]*New York University, USA, and* [3]*Jordan University of Science and Technology, JORDAN*

**W185.g REAL-TIME FLOW MONITORING PLATFORM FOR PAPER-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, and Nuria Lopez-Ruiz
*University of Granada, SPAIN*

## Space Exploration

**M187.g LAB-PAYLOAD FOR BIO-NANOSATELLITE**
Patrycja Sniadek, Agnieszka Krakos, Adrianna Graja, Bartosz Kawa, Marcin Białas, Rafal Walczak, and Jan Dziuban
*Wrocław University of Science and Technology, POLAND*

**T186.g INERTIAL MICROFLUIDIC PASSIVE MIXER FOR BIOLOGICAL NANOSATELLITE MISSIONS**
Adrianna Graja, Mateusz Gumieniak, Maciej Dzimira, Tymon Janisz, and Agnieszka Krakos
*Wrocław University of Science and Technology, POLAND*

**T187.g MEMS PLASMA SPECTROMETER FOR DETECTION OF THE BIOTIC METHANE ON MARS**
Jan Dziuban[1], Pawel Knapkiewicz[1], Tomasz Grzebyk[1], and Pin Chen[2]
[1]*Wrocław University of Science and Technology, POLAND and*
[2]*Jet Propulsion Laboratory California Institute of Technology, USA*

**W186.g INTEGRATED MICROFLUIDIC SYSTEM FOR AUTOMATED BACTERIAL CULTIVATION IN SPACE**
Wen-Ching Chen[1], Pin-Ru Huang[1], Jun-Wei Chang[1], Shao-Yu Huang[1], Chieh-Chen Huang[1], and Ya-Yu Chiang[1,2]
[1]*National Chung Hsing University, TAIWAN and*
[2]*National Taiwan University, TAIWAN*

**W187.g MEMS-BASED MASS SPECTROMETER FOR POTABLE AND SPACE APPLICATIONS**
Piotr Szyszka, Jakub Jendryka, Jan Sobków, Michał Zychla, Marcin Białas, Paweł Knapkiewicz, Jan Dziuban, and Tomasz Grzebyk
*Wrocław University of Science and Technology, POLAND*

## Others

**M188.g A SELF-ALIGNING TERAHERTZ METASURFACE MICROFLUIDIC SENSOR WITH HIGH SENSITIVITY AND HIGH QUALITY FACTOR**
Yunhao Cao, Hongshun Sun, Lijun Ma, Yusa Chen, and Wengang Wu
*Peking University, CHINA*

**T188.g** **GROWING THE UNKNOWN: INVESTIGATION INTO A NEW APPROACH FOR IN-SITU MICROBIAL GROWTH**

Sydney K. Wheatley[1,2], Tina Navaei[3], Emily Pope[3], Tartela Alkayyali[3], Christopher Cartmell[4], Bradley A. Haltli[3,5], Russell G. Kerr[3,5], and Ali Ahmadi[1,2]

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h – Late News

## Cells, Organisms and Organs on a Chip

**M189.h** **A MICROFLUIDIC ANALYSIS OF CELL-CELL COMMUNICATION FOR SCREENING OF CHEMICALS TO REGULATE CIRCADIAN METABOLISM**
Huiseong Son and Chang-Soo Lee
*Chungnam National University, KOREA*

**M190.h** **BIOENGINEERED HUMAN GUT-ON-CHIP MODEL TO STUDY HOST-MICROBIOME INTERACTIONS**
Elise Delannoy, Aurélie Burette, Catherine Daniel, Laurine De Rycker, and Alexandre Grassart
*University of Lille, FRANCE*

**M191.h** **DEVELOPMENT OF POLY(ETHYLENE-GLYCOL)-DIMETHACRYLATE (PEGDMA)-BASED BIOINK FOR STEREOLITHOGRAPHY THREE-DIMENSIONAL (3D) PRINTING**
Shu-Yung Chang, Joseph Zhi Wei Lee, Anupama S. Ranganath, Terry Ching, and Michinao Hashimoto
*Singapore University of Technology and Design, SINGAPORE*

**M192.h** **EXPLORATION OF DETRIMENTAL EFFECT OF AGES ON 3D SKELETAL MUSCLE MODEL IN MICROPHYSIOLOGICAL SYSTEM**
Jaesang Kim[1], Inu Kim[1], Jeongmoo Han[1], Jisong Ahn[2], Youngmin Jo[1], Pilnam Kim[1], Hongki Yoo[1], and Jessie S. Jeon[1]
[1]*Korea Advanced Institute of Science and Technology, KOREA and* [2]*Korea Food Research Institute, KOREA*

**M193.h** **INTEGRATION OF SENSORS ONTO POROUS MEMBRANES FOR ELECTRICAL MONITORING OF CARDIOMYOCYTES**
Derrick J. Butler and Darwin R. Reyes
*National Institute of Standards and Technology, USA*

**M194.h** **MICROFLUIDIC 3D CULTURES OF SCAFFOLD-FREE CARDIOMYOCYTE SPHEROIDS DIFFERENTIATED FROM HUMAN-INDUCED PLURIPOTENT STEM CELLS**
Marina Castro Guerrero, Päivi Järvinen, Virpi Talman, Markus Haapala, and Tiina Sikanen
*University of Helsinki, FINLAND*

**M195.h** **MICROGELS FOR A LARGE-SCALE SCREENING AND LONGITUDINAL OBSERVATIONS OF CANCER CELL DORMANCY**
Misa Minegishi[1] and Hirofumi Shintaku[1,2]
[1]*RIKEN, JAPAN and* [2]*Kyoto University, JAPAN*

**M196.h** **PDMS-BASED MICROFLUIDIC APPROACH FOR PRIMARY MURINE ENDOTHELIAL CELLS PHENOTYPING**
Stefano Rocchetti[1], Kasper Marchlewicz[2,3], Marek Grosicki[1], Kanchana Pandian[4], Michal Chudy[3], and Stefan Chlopicki[1]
[1]*Jagiellonian University, POLAND,* [2]*Warsaw University of Technology, POLAND,* [3]*University of Warsaw, POLAND, and* [4]*Leiden University, NETHERLANDS*

**M197.h** **SPONTANEOUS DYNAMIC MICROCOMPARTMENTATION IN CELL-SIZED MICRODROPLETS**
Naoki Sasaki and Sakurako Kojima
*Rikkyo University, JAPAN*

**T189.h** **A MICROFLUIDIC PLATFORM FOR STUDYING MECHANO-CHEMICAL INTERACTIONS BETWEEN CO-CULTURES OF CANCER AND ENDOTHELIAL CELLS**
Brian J. Nablo and Darwin R. Reyes
*National Institute of Standards and Technology (NIST), USA*

**T190.h** **BIOPRINTING OPTIMIZATION BY COMPUTATIONAL FLUID DYNAMICS MODELING**
Simone L. Marasso[1], Francesca Frascella[2], Jens Grabel[3], Lucia Napione[2], Simona Villata[2], Desiree Baruffaldi[2], Lukas Wichmann[3], and Peter Farber[3]
[1]*CNR-IMEM, ITALY,* [2]*Politecnico di Torino, ITALY, and* [3]*Hochschule Niederrhein, GERMANY*

**T191.h** **DYNAMIC ORGAN-ON-A-CHIP FABRICATION USING DIGITAL PHOTOMASK**
Terry Ching[1,2], Nina Shu-Yung Chang[1], Yi-Chin Toh[3], and Michinao Hashimoto[1]
[1]*Singapore University of Technology and Design, SINGAPORE,* [2]*National University of Singapore, SINGAPORE, and* [3]*Queensland University of Technology, AUSTRALIA*

**T192.h** **EXPLORING MICROBE-INDUCED GUT DISEASE AND THERAPEUTICS WITH A GUT MICROBIOME-ON-A CHIP**
Jeeyeon Lee, Nishanth Menon, and Chwee Teck Lim
*National University of Singapore, SINGAPORE*

**T193.h** **LUNG-ON-CHIP FOR THE STUDIES OF TUMOR HETEROGENEITY AND TARGETED THERAPY TESTS**
Yu-Che Chueh[1], Yi-Ting Ke[1], Kang-Yun Lee[2], Wei-Lun Sun[3], and Cheng-Hsien Liu[1]
[1]*National Tsing Hua University, TAIWAN,* [2]*Taipei Medical University, TAIWAN, and* [3]*Pythia Biotech Ltd, TAIWAN*

**T194.h** **MICROFLUIDIC PERFUSION CULTURE DEVICE THAT APPLIES MULTIPLE DEGREES OF SHEAR STRESS AND VARIOUS FLOW TYPES**
Hayate Yamamoto[1], Jumpei Muramatsu[1], Shigenori Miura[2], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*University of Tokyo, JAPAN*

**T195.h** **MONITORING BRAIN ACTIVITY WITH ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY**
Shadi Karimi[1,2], Jasmina Casals Terre[1], and Michael Krieg[2]
[1]*Universitat Politecnica Catalunya, SPAIN and* [2]*Institute of Photonic Sciences, SPAIN*

**T196.h POLYSTYRENE LUNG-ON-A-CHIP MODEL FOR OXYGEN METABOLISM STUDIES**
Pim de Haan[1], Jean-Paul S.H. Mulder[1], Ruby E.H. Karsten[1], Monieb A.M. Ahmed[1], Maud Pijnenburg[2], Anika Nagelkerke[1], Irene H. Heijink[2], and Elisabeth Verpoorte[1]
[1]*University of Groningen, NETHERLANDS and* [2]*University Medical Center Groningen, NETHERLANDS*

**T197.h TAPERED MICROSTEPS IN MICROCHANNELS FOR BUILDING THREE-DIMENSIONAL UNIDIRECTIONAL NEURAL NETWORKS**
Sanshiro Yanagawa[1], Midori Kato-Negishi[2], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*Musashino University, JAPAN*

**W188.h A NOVEL SILICON MESH MEMBRANE AS A SCAFFOLD FOR ORGAN-ON-CHIP APPLICATIONS**
Mariia Zakharova[1], Mar Cóndor[2], Sohail F. Shaikh[2], Aaron Delahanty[2], Dries Braeken[2], Andries D. van der Meer[1], and Loes I. Segerink[1]
[1]*University of Twente, NETHERLANDS and* [2]*Interuniversity Microelectronics Centre, BELGIUM*

**W189.h DEVELOPMENT OF A BREAST CANCER MICROENVIRONMENT PLATFORM FOR ANTI-CANCER DRUG SCREENING**
Ki-Hwan Nam and HyeMi Kim
*Korea Basic Science Institute, KOREA*

**W190.h ENHANCING THE ENRICHMENT OF WHITE BLOOD CELLS IN A SIZE-BASED SEPARATION MICROFLUIDIC DEVICE WITH A RECTANGULAR CHANNEL**
Dhiren Mohapatra, Rahul Purwar, and Amit Agrawal
*Indian Institute of Technology Bombay, INDIA*

**W191.h HIGH-THROUGHPUT ORGAN-ON-A-CHIP PLATFORM FOR OSTEOARTHRITIS MODELING AND BIOMARKER DETECTION**
Aldeliane Maria Da Silva[1], Heidi Hannula[1], Muthusamy Saranya[1], Tuan Nguyen[2], Sebastien Mosser[2], Prateek Singh[2], Ali Mobasheri[1], and Gabriela S. Lorite[1]
[1]*University of Oulu, FINLAND and* [2]*Finnadvance, FINLAND*

**W192.h MAGNETICALLY-ASSEMBLED ARRAYS OF MICROVASCULAR NETWORKS ON CHIP**
Katarzyna Rojek[1], Antoni Wrzos[2], Stanisław Żukowski[2], Michał Bogdan[1], Maciej Lisicki[2], Piotr Szymczak[2], and Jan Guzowski[1]
[1]*Polish Academy of Sciences, POLAND and* [2]*University of Warsaw, POLAND*

**W193.h MICROFLUIDIC-BASED ISOLATION AND ANALYSIS OF CIRCULATING TUMOR CELLS FOR MONITORING THERAPY EFFICACY IN PANCREATIC DUCTAL ADENOCARCINOMA PATIENTS**
Malgorzata A. Witek[1,2], Ian M. Freed[1], Anup Kasi[2], Oluwadamilola Fateru[1], Mengjia Hu[2], Nyla Weatherington[1], Harsh Pathak[2], Stephen Hyter[2], Mateusz L. Hupert[3], Prabhakar Chalise[2], Andrew K. Godwin[2], and Steven A. Soper[1,2]
[1]*University of Kansas, USA,* [2]*University of Kansas Medical Center, USA, and* [3]*Biofluidica, Inc., USA*

**W194.h** **NOVEL LIQUID BASED OXYGEN ISOLATION TECHNOLOGY FOR SINGLE CELL SCREENING FOR MITOCHONDRIAL DISEASES**
Shruti Mankar, Abhishek Kumarranjan, Kunpeng Cai, and Kentaro Shirai
*Sysmex Corporation, JAPAN*

**W195.h** **PUMPLESS FLUIDIC DEVICE FOR THE CULTURE OF MECHANOSENSITIVE CELLS UNDER UNIDIRECTIONAL RECIRCULATING FLUIDIC FLOW**
Eun-Jin Lee[1,2] and Mandy B. Esch[2]
[1]*University of Maryland, USA and* [2]*National Institute of Standards and Technology (NIST), USA*

## Diagnostics, Drug Testing & Personalized Medicine

**M198.h** **A SAMPLE-TO-ANSWER MICROFLUIDIC SYSTEM FOR NAKED-EYE DETECTION OF HEPATITIS C RNA USING IMMISCIBLE PHASE EXTRACTION COUPLED WITH ISOTHERMAL AMPLIFICATION**
Mohammad N. Abo-Zeid[1,2], Bongkot Ngamsom[1], Alexander Iles[3], Nicole Pamme[3], Cheryl Walter[1], and John Greenman[1]
[1]*University of Hull, UK,* [2]*Assiut University, EGYPT, and* [3]*Stockholm University, SWEDEN*

**M199.h** **ANALYTICAL PANEL BASED ON SPRI BIOSENSORS FOR QUANTIFICATION OF SELECTED POTENTIAL BRAIN GLIOMA BIOMARKERS**
Lukasz Oldak[1,2] and Ewa Gorodkiewicz[1,2]
[1]*University of Bialystok, POLAND and* [2]*Biomarkilo Sp. z o.o., POLAND*

**M200.h** **DEVELOPMENT OF A PIPELINE TO STREAMLINE DESIGN OF CRISPR-BASED DIAGNOSTIC TOOLS FOR THE DIFFERENTIATION OF SARS-COV-2 VARIANTS**
Gabriel Lamothe[1], Julie Carbonneau[1], Charles Joly-Beauparlant[1], Thierry Vincent[1], Patrik Quessy[2], Anthony Guedon[2], Gary Kobinger[3], Jean-François Lemay[2], Guy Boivin[1], Arnaud Droit[1], Nathalie Turgeon[1], and Jacques P. Tremblay[1]
[1]*Laval University, CANADA,* [2]*CNETE, Inc., CANADA, and* [3]*University of Texas Medical Branch, USA*

**M201.h** **HIGH-PERFORMANCE MICROFLUIDIC DNA EXTRACTOR BASED ON OPTIMIZED EXCITATION VOLTAGE AND 3D OUT-OF-PLANE CAVITATION MICROSTREAMING**
Sofonias N. Kedir, Bhargav K. Pullagura, Abdi M. Kaba, and Dohyun Kim
*Myongji University, KOREA*

**M202.h** **PROTEIN DIGESTION BY THIN-LAYER NANOFLUIDIC CHANNELS**
Yu-Ting Hung[1], Kyojiro Morikawa[1,2,3], Hai Linh Tran[1], Chihchen Chen[1], and 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*

**T198.h** **ACOUSTIC TRAPPING BASED HIGH THROUGHPUT ISOLATION AND CHARACTERIZATION OF PATHOGEN ACTIVATED PLATELET DERIVED EXTRACELLULAR VESICLES FROM PLASMA**
Axel Broman, Frida Palm, Genevieve Marcoux, John Semple, Thomas Laurell, Johan Malmström, and Oonagh Shannon
*Lund University, SWEDEN*

**T199.h** **CENTRIFUGE FREE IMMUNE CELL RADIOLABELING ACHIEVED USING ACOUSTOPHORESIS METHODS**
Stephen Adler[1], Emma Stevenson[2], Noriko Sato[3], Julia Alsved[4], and Peter Choyke[3]
[1]*Frederick National Laboratory for Cancer Research, USA,* [2]*University of Alabama, USA,* [3]*National Cancer Institute, USA, and* [4]*AcouSort AB, SWEDEN*

**T200.h** **FILTER-IN-CENTRIFUGE SEPARATION OF LOW-CONCENTRATION BACTERIA FROM BLOOD**
Mohammad Osaid, Kaiyang Zeng, and Wouter van der Wijngaart
*KTH Royal Institute of Technology, SWEDEN*

**T201.h** **INTEGRATED MICROFLUIDIC DEVICE FOR RAPID MIXING, LOW CONSUMPTION AND FAST DISPENSING FOR APPLICATIONS IN TIME-RESOLVED CRYOGENIC ELECTRON MICROSCOPY**
Stefania Torino[1,2], Mugdha K. Dhurandhar[1,2], and Rouslan G. Efremov[1,2]
[1]*Vlaams Instituut voor Biotechnologie, BELGIUM and* [2]*VUB - Vrije Universiteit Brussel, BELGIUM*

**T202.h** **TUMOR MICROENVIRONMENT LABCHIP INTEGRATING DIELECTROPHORESIS FOR HIPEC APPLICATIONS**
Chia-Peng Wang[1], Chih-Yung Hsu[1], Mao-Chih Hsieh[2], Yu-Ting Tai[2], Jen-Tsan Ashley Chi[3], Kang-Yun Lee[4], Wei-Lun Sun[5], and Cheng-Hsien Liu[1]
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**W196.h** **A MICROFLUIDIC DEVICE FOR ISOLATION AND QUANTITATION OF HEPATOCYTE-SECRETED EXTRACELLULAR VESICLES AND MONITORING THEIR EXOSOMAL ENZYME ACTIVITIES ON-CHIP**
Ehsanollah Moradi, Päivi Järvinen, Markus Haapala, and Tiina Sikanen
*University of Helsinki, FINLAND*

**W197.h** **ADVANCING CARDIOTOXICITY ASSESSMENT: SCADA PLATFORM FOR DRUG SCREENING OF HIPSC-DERIVED CARDIOMYOCYTES**
Alba Calatayud-Sanchez[1], Pilar Montero-Calle[2], Fernando Benito-Lopez[1], Manuel M. Mazo[2], and Lourdes Basabe-Desmonts[1,3]
[1]*University of the Basque Country, SPAIN,* [2]*University of Navarra, SPAIN, and* [3]*Basque Foundation for Science, SPAIN*

**W198.h** **CHARACTERIZATION OF A 3D PRINTED MICROFLUIDIC CHIP FOR LOCALIZED AND SUSTAINED STIMULATION IN HIPPOCAMPAL SLICES**
Colby E. Witt, Maria Kristendotter, Lauren M. Delong, and Ashley E. Ross
*University of Cincinnati, USA*

**W199.h** **FREEZE-DRYING OF IMMOBILIZED HUMAN LIVER MICROSOMES INSIDE MICROFLUIDIC ENZYME REACTORS**
Iiro Rautsola[1], Markus Haapala[1], Leo Huttunen[1], Ossi Korhonen[2], and Tiina Sikanen[1]
[1]*University of Helsinki, FINLAND and* [2]*University of Eastern Finland, FINLAND*

**W200.h** **POINT-OF-CARE VISCOMETER FOR PORTABLE COAGULATION MEASUREMENT**
Mina Stefanovic, Alexandros Sklavounos, Qimo Huang, Lenny Chen, Anthony Yong, and Aaron Wheeler
*University of Toronto, CANADA*

## Fundamentals in Microfluidics and Nanofluidics

**M203.h** **DEVELOPING MINIATURIZED OPTICAL DETECTORS INTEGRATED ON CENTRIFUGAL LAB ON DISC PLATFORMS FOR COLOR-DEPENDENT DETECTIONS**
Vahid Kordzadeh-Kermani[1], Maryam Vahid[2], Seyed Nezameddin Ashrafizadeh[1], Sergio O. Martinez-Chapa[3], Marc J. Madou[4], and Masoud Madadelahi[3]
[1]*Iran University of Science and Technology, IRAN,* [2]*Isfahan University of Technology, IRAN,* [3]*Tecnologico de Monterrey, MEXICO, and* [4]*University of California, Irvine, USA*

**M204.h** **EVAPORATION OF BACTERIA-LADEN SURROGATE RESPIRATORY FLUID DROPLETS: SESSILE MODE V/S LEVITATED MODE**
Amey Nitin Agharkar, Dipasree Hajra, Prasenjit Kabi, Dipshikha Chakravortty, Saptarshi Basu, and Vivek Jaiswal
*Indian Institute of Science, INDIA*

**M205.h** **HIGH-THROUGHPUT NUCLEIC ACID CYTOMETRY WITH HYDROLYSIS-PROBE PCR IN POLYACRYLAMIDE BEADS**
Rodrigo Cotrim Chaves and Aaron Streets
*University of California, Berkeley, USA*

**M206.h** **PERMEATION MECHANISM OF IMIDAZOLIUM-BASED ILS INTO CU3(BTC)2 SINGLE CRYSTAL**
Ichiro Ohira, Yumeng Zheng, and Kentaro Kinoshita
*Tokyo University of Science, JAPAN*

**M207.h** **RAPID, COST-EFFECTIVE CENTRIFUGAL MICROFLUIDIC DISC FOR AUTOMATED NANOLITER VOLUME ASSAY OPTIMIZATION**
Renna L. Nouwairi, Carter K. Jones, Maura E. Charette, Emilee Holmquist, Zoey Golabek, and James P. Landers
*University of Virginia, USA*

**M208.h** **SHEATH FLOW ASSISTED ELECTRO-HYDRODYNAMIC LATERAL PARTICLE MIGRATION AND SEPARATION**
Seyedamirhosein Abdorahimzadeh, Feby W. Pratiwi, Seppo J. Vainio, Henrikki Liimatainen, and Caglar Elbuken
*University of Oulu, FINLAND*

**T203.h** **DIELECTROPHORETIC MANIPULATION OF PREOSTEOBLASTIC CELLS IN PRESENCE OF A SILICA-BASED ALLOPLASTIC SCAFFOLD IN A MICROFLUIDIC FLOW CELL DEVICE**
Lilliam V. Trejos-Soto[1], Abraham Valerio-Aguilar[2,3], Guido A. Ramírez-González[1], Sergio A. Paniagua[4], Jorge Oviedo-Quirós[2,5], Alfonso García-Piñeres[2], Carolina Centeno-Cerdas[1], and Leonardo Lesser-Rojas[2]
[1]*Costa Rica Institute of Technology (TEC), COSTA RICA,* [2]*University of Costa Rica, COSTA RICA,* [3]*Kent State University, USA,* [4]*National Center for High Technology (CENAT), COSTA RICA, and* [5]*National Children's Hospital, COSTA RICA*

**T204.h** **FLOW RATE-INDEPENDENT MULTISCALE MICROFLUIDIC SYSTEM AND ITS APPLICATIONS FOR THE CAPTURE AND STUDY OF CTCS**
Jing Yan[1] and Jerome Charmet[2]
[1] *University of Cambridge, UK, CHINA and* [2] *University of Applied Sciences Western Switzerland, SWITZERLAND*

**T205.h** **INTEGRATED MICROVALVES FOR AUTONOMOUS ON-CHIP FLOW CONTROL**
Mohammed Shahadha[1], Denise Gruner[1,2], Anthony Beck[1], Andreas Voigt[1], Markus Friedemann[2], Paula Kalenczuk[1], Stefan Grünzner[1], Franziska Obst[1], Uwe Marschner[1], Mario Menschikowski[2], and Andreas Richter[1]
[1] *Technische Universität Dresden, GERMANY and* [2] *University Hospital Carl Gustav Carus Dresden, GERMANY*

**T206.h** **PLATFORM BASED ON ACTIVE-MATRIX DIGITAL MICROFLUIDICS FOR HIGH-THROUGHPUT SINGLE-CELL PROCESSING AND SINGLE-CELL PROTEOMICS**
Siyi Hu[1,2]
[1] *Chinese Academy of Sciences, CHINA and* [2] *Guangdong ACXEL Micro & Nano Tech Co., Ltd, CHINA*

**T207.h** **REMOVAL OF DMSO FROM CELL SAMPLES USING ACOUSTIC TRAPPING**
Albin Hermansson, Anke Urbansky, and Mikael Evander
*AcouSort AB, SWEDEN*

**W201.h** **AN INTEGRATED MULTIPLEXED CHIP FOR DIGITAL DROPLET LOOP-MEDIATED ISOTHERMAL AMPLIFICATION**
Paul Gaube, Elfi Töpfer, and Claudia Gärtner
*microfluidic ChipShop GmbH, GERMANY*

**W202.h** **EFFICIENT OIL MICRODROPLET COLLECTION USING SPACE-FILLING OPEN MICROFLUIDIC CHANNELS WITH OLEOPHILIC AND OLEOPHOBIC SURFACES**
Yusho Segawa[1], Kentaro Kinoshita[1], and Hiroyuki Kai[1,2]
[1] *Tokyo University of Science, JAPAN and* [2] *Toyo University, JAPAN*

**W203.h** **FREEZE FRAME IMAGING- A NEW IMAGING TECHNIQUE FOR FAST DYNAMICS PARTICLE TRACKING**
Ola Jakobsson[1], Massimiliano Rossi[2], Christian Cierpka[3], and Per Augustsson[1]
[1] *Lund University, SWEDEN,* [2] *University of Bologna, ITALY, and* [3] *Technische Universität Ilmenau, GERMANY*

**W204.h** **NUMERICAL SIMULATION FOR COMPARISON OF MIXING EFFICIENCY IN SERPENTINE CHANNELS WITH DIFFERENT FLOW DIRECTIONS**
Hyeonji Hong[1], Jaehwan Jeong[2], Il Doh[1], and Eunseop Yeom[2]
[1] *Korea Research Institute of Standards and Science, KOREA and* [2] *Pusan National University, KOREA*

**W205.h** **PUMP-FREE UNIDIRECTIONAL COLLOID TRANSPORT SYSTEM BASED ON LIGHT-DRIVEN SELF-ASSEMBLY IN WEDGE-SHAPED GAP**
Natsumi Watanabe and Hiroaki Onoe
*Keio University, JAPAN*

**W206.h** **REUSABLE WIRE ELECTRODE INTERFACE FOR DROPLET MERGING WITH A PULSE-WIDTH FLOW MODULATION CONTROL SYSTEM TO SIMPLIFY DROPLET-BASED MICROFLUIDIC TISSUE SAMPLING**
Andresa Bresler Bezerra, Md Mohibullah, and Christopher J. Easley
*Auburn University, USA*

## Integrated Microfluidic Platforms

**M209.h** **DEVELOPMENT OF MULTI-MATERIAL 3D-PRINTED MICROFLUIDIC CONNECTORS FOR NANOPARTICLE SYNTHESIS**
Muhammad Mubashar Saeed, David Kinahan, Nicholas Dunne, Eadaoin Carthy, and Srishti Agarwal
*Dublin City University, IRELAND*

**M210.h** **MICROFLUIDIC DISTILLATION DEVICE WITH CONTROLLING GAS AND LIQUID FILM FLOW**
Chengyu Hsu[1], Kyojiro Morikawa[1,2,3], Satoru Matsuoka[4], Morihito Saito[4], Masaharu Ueno[5], Chihchen Chen[1], and Takehiko Kitamori[1,3,6]
[1]*National Tsing Hua University, TAIWAN,* [2]*University of Tokyo, JAPAN,* [3]*Kanagawa Institute of Industrial Science and Technology, JAPAN,* [4]*Daicel Corporation, JAPAN,* [5]*Tokushima University, JAPAN, and* [6]*Lund University, SWEDEN*

**T208.h** **A PORTABLE HEATING AND COOLING TEMPERATURE CONTROLLER FOR ORGAN CHIPS**
Shiemaa A.M. Elhassan[1], Gurhan Özkayar[1], Joost Lötters[1,2], Nicolaas J.H. Raat[3], and Murali K. Ghatkesar[1]
[1]*Delft University of Technology, NETHERLANDS,* [2]*Bronkhorst B.V., NETHERLANDS, and* [3]*Erasmus Medical Centre, NETHERLANDS*

**T209.h** **ELECTROKINETIC-ASSISTED CONTINUOUS SEPARATION OF CATIONIC DYES USING ANION-EXCHANGEABLE MULTISCALE-POROUS CHANNELS**
Woonjae Choi and Geunbae Lim
*Pohang University of Science and Technology, KOREA*

**T210.h** **PRECISE SYNTHESIS OF COPOLYMERS USING SERIALLY CONNECTED GLASS MICROFLUIDIC CHIPS**
Adelina Smirnova[1], Hisashi Shimizu[1], Yu Sugimoto[1], Kyojiro Morikawa[1,2], Takahiro Aratani[3], Atsushi Mori[3], Makoto Ouchi[4], Chihchen Chen[2], and Takehiko Kitamori[1,2,5]
[1]*University of Tokyo, JAPAN,* [2]*National Tsing Hua University, TAIWAN,* [3]*Daicel Corporation, JAPAN,* [4]*Kyoto University, JAPAN, and* [5]*Lund University, SWEDEN*

**W207.h** **A SEMI-AUTOMATED MONODISPERSITY-TUNABLE MAGNETIC PLATFORM FOR ON-CHIP IMMUNOMAGNETIC SEPARATION OF BACTERIA**
Didem Rodoplu Solovchuk[1], Shou-Yu Ma[1], Jing-Yi Yang[1], Hung-Yu Chien[1], and Chia-Hsien Hsu[1,2,3]
[1]*National Health Research Institutes, TAIWAN,* [2]*National Tsing Hua University, TAIWAN, and* [3]*National Chung Hsing University, TAIWAN*

**W208.h FLUIDIC CONTROL OF AN INTEGRATED AND MODULAR SYSTEM FOR DIAGNOSING ISCHEMIC STROKE**
Katie Childers[1], Harshani Wijerathne[1], Sheila de Melo Barros[1], Favour Nwachukwu[1], Mateusz L. Hupert[2], Farhad Shiri[1], Malgorzata A. Witek[1], Daniel S. Park[3], Alison Baird[4], and Steven A. Soper[1]
[1]*University of Kansas, USA,* [2]*Biofluidica, Inc, USA,* [3]*Louisiana State University, USA, and* [4]*SUNY Downstate Medical Center, USA*

**W209.h PROTEIN-PROTEIN INTERACTION MEASUREMENT USING PARTICLE DIFFUSOMETRY IN A LOW-VOLUME MICROFLUIDIC CHIP**
Hui Ma, Aiswarya A. Ramanujam, Jacqueline C. Linnes, and Tamara L. Kinzer-Ursem
*Purdue University, USA*

## Micro- and Nanoengineering

**M211.h A NEW POLYMERIC, BIODEGRADABLE, AND MINIMALLY INVASIVE GLAUCOMA IMPLANT**
Inês C.F. Pereira
*Eindhoven University of Technology, NETHERLANDS*

**M212.h IMPROVING INTERFACIAL ADHESION OF HYDROGEL MATRICES TO PDMS-BASED MICROFLUIDIC PLATFORMS**
Yu Na, Utku Devamoglu, Séverine Le Gac, and Julieta I. Paez
*University of Twente, NETHERLANDS*

**M213.h LOW-COST MICROFLUIDIC PDMS MOLDS BASED ON PCB SILKSCREEN FOR EDUCATIONAL AND RAPID PROTOTYPING USE**
Marco Carminati
*Politecnico di Milano, ITALY*

**M214.h THE PREPARATION OF SERS SUBSTRATE USING ULTRASONIC-ASSISTED FABRICATION METHOD FOR THE DETECTION OF HUMAN IGG**
Aysen Gumustas[1,2], Hilal Torul[3], Mert Kerem Ulku[4], M.A. Sahir Arikan[4], Ugur Tamer[1,3], and Ender Yildirim[1,4]
[1]*METU MEMS Center, TURKEY,* [2]*Ankara University, TURKEY,* [3]*Gazi University, TURKEY, and* [4]*Middle East Technical University, TURKEY*

**T211.h AN INTEGRATED BIOSENSOR FOR AFLATOXIN B1 DETECTION**
Yi Liu, Cong Lin, and Jiahao Miao
*Peking University, CHINA*

**T212.h FABRICATION OF WARP-RESISTANT MICROMOLDS BY DIGITAL-LIGHT-PROCESSING (DLP) PRINTING**
Nie Xiaolei, Nidhi Nagaraju, and Michinao Hashimoto
*Singapore University of Technology and Design, SINGAPORE*

**T213.h MICROFLUIDIC FRONT DYNAMICS FOR THE CHARACTERIZATION OF PUMPS FOR LONG-TERM AUTONOMOUS MICROSYSTEMS**
Yara Alvarez-Braña[1], Andreu Benavent-Claro[2], Fernando Benito-Lopez[1], Aurora Hernandez-Machado[2], and Lourdes Basabe-Desmonts[1]
[1]*University of the Basque Country, SPAIN and*
[2]*University of Barcelona, SPAIN*

**T214.h** **STUDYING AND IMPROVING THE CYTOCOMPATIBILITY OF SLA RESINS**
Bastien Venzac[3], Sem Bertelink[1], Ludivine Laffont[2], Isabelle Grasseau[2], Karine Reynaud[2], Marie Saint-Dizier[2], and Séverine Le Gac[1]
[1]*University of Twente, NETHERLANDS,* [2]*PRC - INRAE, FRANCE, and* [3]*LAAS - CNRS, FRANCE*

**W210.h** **DEVELOPING A BACKSIDE PHOTOLITHOGRAPHY METHOD FOR CREATING MICROFLUIDIC BLOOD OXYGENATORS WITH ROUNDED CROSS-SECTIONS AND HIERARCHICAL BLOOD VASCULAR NETWORKS**
Neda Saraei and Ravi Selvaganapathy
*McMaster University, CANADA*

**W211.h** **IN-LINE QUALITY CONTROL SYSTEM FOR THE STATE-OF-THE-ART ROLL-TO-ROLL MASS-MANUFACTURING PROCESS FOR VERSATILE MICROFLUIDIC SYSTEMS**
Nastasia Okulova[1], Victor J. Tolstrup[1], Conor O'Sullivan[1], Anja Haase[2], Andoni Rodriguez[3], Andreas Flanschger[3], Alvaro Conde[4], Maciej Skolimowski[4], Veronica Mora Sanz[5], Nerea Briz Iceta[5], and Jan Kafka[1]
[1]*Inmold A/S, DENMARK,* [2]*JOANNEUM RESEARCH, AUSTRIA,* [3]*bionic surface technologies GmbH, AUSTRIA,* [4]*Micronit Micro Technologies, NETHERLANDS, and* [5]*Tecnalia Research and Innovation, SPAIN*

**W212.h** **NOVEL MAGNETIC CULTURE SUBSTRATES: POLYCARBONATE AND POLYDIMETHYLSILOXANE MEMBRANES FOR STUDYING CARDIAC CELL RESPONSES**
Oliwia Tadko[1], Dominik Kołodziejek[1], Zuzanna Żółtowska[1], Natalia Wasiak[1], Marcin Drozd[1,2], and Elżbieta Jastrzębska[1,2]
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## Other Applications of Microfluidics

**M215.h** **IMAGE-TO-HYDRAULIC RESISTANCE: PRE-TRAINED ARTIFICIAL NEURAL NETWORK MODEL TO OVERCOME HAGEN-POISEUILLE EQUATIONS LIMITATIONS**
Juan Sandubete-López[1,2], Patrick Finn[1], José L. Risco-Martín[2], and Alexander H. McMillan[1]
[1]*Elvesys Microfluidic Innovation Center, FRANCE and*
[2]*Universidad Complutense de Madrid, SPAIN*

**M216.h** **UTILIZING CHATGPT TO ASSIST CAD FOR MICROFLUIDIC DEVICES**
Brady L. Goenner, Matt D. Nelson, and Bruce K. Gale
*University of Utah, USA*

**T215.h** **THE AUTOMATION AND CHARACTERIZATION OF A MICROFLUIDIC ACOUSTIC LEVITATION SYSTEM FOR SYNCHROTRON SAMPLE DELIVERY**
Eleanor Hedges[1], Danny Axford[2], Davide Crivelli[2], Emilio Perez Juarez[2], Gabriel Leen[3], Victoria Baker[4], Florimond Gueniat[4], and Peter Docker[2]
[1]*University of Shefield, UK,* [2]*Diamond Light Source, UK,* [3]*University of Limerick, IRELAND, and* [4]*Birminham City University, UK*

**W213.h ICE-NUCLEATING PARTICLE ACTIVITY IN RIVER OUTFLOWS**
Mark D. Tarn[1], Katherine H. Bastin[1], Rachel E. Sipler[2], and Benjamin J. Murray[1]
[1]*University of Leeds, UK and* [2]*Bigelow Laboratory for Ocean Sciences, USA*

**W214.h TNT PAPER-BASED SENSOR WITH ENHANCED SENSITIVITY**
Viktoriia Lastivka[1], Piotr Kasprzak[2], Izabela Mazur[2], Piotr Baran[2], Wawrzyniec Pniewski[2], Ilona Grabowska-Jadach[1], Michal Chudy[1], Katarzyna Tokarska[3], Kamil Zukowski[3], and Artur Dybko[1]
[1]*Warsaw University of Technology, POLAND,* [2]*Military Institute of Armament Technology, POLAND, and* [3]*CEZAMAT, POLAND*

## Sensors and Detection Technologies

**M217.h 3-D PRINTED MICROFLUIDIC DEVICES FOR IN-FIELD COLOURIMETRIC MEASUREMENT OF SOIL MACRONUTRIENTS**
Reuben Mah Han Yang[1], Fernando Maya Alejandro[1], Marcus Hardie[1], Richard Doyle[1], Lawrence Di Bella[2], Robert Milla[3], and Michael Breadmore[1]
[1]*University of Tasmania, AUSTRALIA,* [2]*Herbert Can Productivity Services Ltd, AUSTRALIA, and* [3]*Burdekin Productivity Services, AUSTRALIA*

**M218.h FLUORESCENCE REPORTING COUPLED WITH AMPEROMETRIC SENSING USING A NON-POTENTIOSTAT-DRIVEN BIPOLAR ELECTRODE WITH MICROCHIP ELECTROPHORESIS**
Indika K. Warnakula[1], Manjula B. Wijesinghe[2], and Susan M. Lunte[1]
[1]*University of Kansas, USA and* [2]*University of Peradeniya, SRI LANKA*

**M219.h INVESTIGATIONS ON RECEPTOR LAYER COMPOSITION, QUALITY OF ELECTROCHEMICAL TRANSDUCERS GOLD SURFACE AND PREPARATION PROCEDURE OF BIOSENSOR DEDICATED TO CHOSEN SARS-COV-2 GENETIC MARKERS DETECTION**
Robert Ziółkowski, Jakub Krzemiński, Dominika Baran, Anna Szymczyk, and Elżbieta Malinowska
*Warsaw University of Technology, POLAND*

**M220.h PROOF OF PRINCIPLE HIGH SURFACE AREA MICROFLUIDIC BIOSENSOR BASED ON INTERLOCKED MICROPILLARS FOR EARLY CANCER DIAGNOSTICS**
Gunita Paidere, Edmunds Zutis, Janis Cipa, Roberts Rimsa, Gatis Mozolevskis, and Andris Anspoks
*University of Latvia, LATVIA*

**T216.h DEVELOPMENT OF A MICROFLUIDIC AIR-LIQUID INTERFACE BASED VISCOMETER FOR BIOLOGICAL APPLICATIONS**
Vinaya Vinaya[1], Ayan Kumar[2], Stuti Maheshwari[3], and Prosenjit Sen[1]
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**T217.h FROM DESIGN TO PERFORMANCE: OPTIMIZING THE FABRICATION PROTOCOL AND FINE-TUNING THE PARAMETERS OF SOFT MICROFLUIDIC FORCE SENSORS**
Wael Othman[1,2] and Mohammad A. Qasaimeh[1,2]
[1]*New York University Abu Dhabi, UAE and* [2]*New York University, USA*

**T218.h** **LAB-AROUND-FIBER FOR IMMUNOCAPTURE AND OPTICAL DETECTION OF ANTIMICROBIAL RESISTANCE MARKERS**
Fatima Flores-Galicia, Marine Poret, Camille Frangville, Alexandre Lerner, Hervé Volland, Guillaume Laffont, and Karla Perez-Toralla
*Paris-Saclay University, FRANCE*

**T219.h** **TEMPERATURE MONITORING BY RELATIVE DIFFERENTIAL METHOD OF MOLECULAR TEMPERATURE PROBES FOR POINT-OF-CARE DIAGNOSTICS**
Lauri K. Rannaste[1,2], Leena M. Hakalahti[1], and Jussi A. Hiltunen[1]
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**W215.h** **A MICROFLUIDIC PLATFORM FOR SELECTIVE ON-SITE ELECTROCHEMICAL IDENTIFICATION OF ILLICIT DRUGS**
Annemarijn Steijlen, Marc Parrilla, Robin Van Echelpoel, and Karolien De Wael
*Universiteit Antwerpen, BELGIUM*

**W216.h** **ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY (EIS) FOR RAPID PATHOGEN DETECTION IN LAB-ON-A-DISC (LOAD) PLATFORM**
Eadaoin Carthy[1,2], David Boyle[1,2], Kellie Adamson[1,2], Elaine Spain[1,2], and Robert J. Forster[1,2]
[1] *Dublin City University, IRELAND and* [2] *National Centre for Sensor Research, IRELAND*

**W217.h** **INTEGRATED POINT-OF-CARE MICROFLUIDIC DEVICE FOR MULTIPLEX QUANTITATIVE MONITORING OF VIRAL RESPIRATORY INFECTIONS AND IMMUNE RESPONSES WITH MOLECULARLY IMPRINTED POLYMERS**
Roozbeh Siavash Moakhar[1], Carolina del Real Mata[1], Mahsa Jalali[1], Tamer Abdel Fatah[1], Imman Isaac Hosseini[1], Sripadh Guptha Yedire[1], Houda Shafique[1], Sahar Sadat Mahshid[2], and Sara Mahshid[1]
[1] *McGill University, CANADA and* [2] *Sunnybrook Health Sciences Centre, CANADA*

**W218.h** **NOTEM: THE NEAR-FIELD OPTICAL TRANSMISSION ELECTRON MICROSCOPY FOR AN INNOVATIVE 'IN VIVO' PARALLEL IMAGING ON THE NANOMETRIC SCALE**
Krzysztof P. Grzelakowski
*NOTEM, POLAND*


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