μTAS 2019
The 23rd International Conference on Miniaturized Systems for Chemistry and Life Sciences

Final PROGRAM

Congress Center Basel
Basel, SWITZERLAND

Conference Chairs
Petra Dittrich
ETH Zürich, SWITZERLAND
Andreas Hierlemann
ETH Zürich, SWITZERLAND
Emmanuel Delamarche
IBM Research – Zürich, SWITZERLAND

Sponsored by CBMS
Chemical and Biological Microsystems Society
With Generous Support from Basel

Basel
basel.ch
## CONFERENCE AT A GLANCE

### SUNDAY, 27 OCTOBER

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<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>08:30</td>
<td>Workshop Registration</td>
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<tr>
<td>09:00 - 17:00</td>
<td>Morning and Afternoon Workshops</td>
</tr>
<tr>
<td>17:00 - 19:00</td>
<td>Conference Registration and Check-In</td>
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<tr>
<td>17:00 - 19:00</td>
<td>Wine and Cheese Welcome Reception</td>
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### MONDAY, 28 OCTOBER

<table>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>07:00 - 18:15</td>
<td>Registration</td>
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<tr>
<td>08:00 - 08:30</td>
<td>Opening Remarks</td>
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<tr>
<td>08:30 - 09:15</td>
<td>PLENARY PRESENTATION I</td>
</tr>
<tr>
<td></td>
<td>James R. Heath – Institute for Systems Biology Seattle, USA</td>
</tr>
<tr>
<td>09:15 - 09:30</td>
<td>Transition</td>
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<tr>
<td>09:30 - 10:30</td>
<td>SESSION 1A1 Exosomes Trapping and Isolation</td>
</tr>
<tr>
<td></td>
<td>SESSION 1B1 Particle Separation</td>
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<td></td>
<td>SESSION 1C1 Synthetic Biology Using Droplets</td>
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<tr>
<td>10:30 - 11:00</td>
<td>Break: Exhibit and Poster Inspection</td>
</tr>
<tr>
<td>11:00 - 12:20</td>
<td>SESSION 1A2 Single Cell Analysis (Secretion)</td>
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<td>SESSION 1B2 Reconfigurable &amp; Self-Powered Dev.</td>
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<tr>
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<td>SESSION 1C2 Separation and Assays in Droplets</td>
</tr>
<tr>
<td>12:20 - 13:10</td>
<td>Grab ‘n Go Lunch</td>
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<tr>
<td>13:10 - 13:15</td>
<td>Analytical Chemistry – Young Innovator Award Presentation</td>
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<tr>
<td>13:15 - 14:00</td>
<td>PLENARY PRESENTATION II</td>
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<tr>
<td></td>
<td>Keisuke Goda – University of Tokyo Tokyo, JAPAN</td>
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<td>14:00 - 16:30</td>
<td>Poster Session 1 and Exhibit Inspection</td>
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<tr>
<td>16:30 - 18:00</td>
<td>SESSION 1A3 Single-Cell Analysis (Secretion)</td>
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<td>SESSION 1B3 Organs on Chip</td>
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<td></td>
<td>SESSION 1C3 Genetic Engineering</td>
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<td>KEYNOTE PRESENTATION Angela Wu</td>
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<td>KEYNOTE PRESENTATION Adrian Roth</td>
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<td>KEYNOTE PRESENTATION Randall J. Platt</td>
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<tr>
<td>18:00 - 19:30</td>
<td>MicroTAS Student Mixer</td>
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<tr>
<td>18:00</td>
<td>Women’s Faculty Event</td>
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### TUESDAY, 29 OCTOBER

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<tbody>
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<td>Announcements</td>
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<tr>
<td>08:30 - 09:15</td>
<td>PLENARY PRESENTATION III</td>
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<tr>
<td></td>
<td>Stefan W. Hell – Max Planck Institute for Biophysical Chemistry Gottingen, GERMANY</td>
</tr>
<tr>
<td>09:15 - 09:30</td>
<td>Transition</td>
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<tr>
<td>09:30 - 10:50</td>
<td>SESSION 2A1 Exosomes and Extracellular Vesicles</td>
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<td>SESSION 2B1 Paper Microfluidics and Devices</td>
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<td></td>
<td>SESSION 2C1 Culture for Cells, Organisms &amp; Plants</td>
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<tr>
<td></td>
<td>KEYNOTE PRESENTATION Catherine Alix-Panabières</td>
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<td></td>
<td>KEYNOTE PRESENTATION Dhananjaya Dendukuri</td>
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<td>KEYNOTE PRESENTATION David Sinton</td>
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<tr>
<td>10:50 - 11:20</td>
<td>Break: Exhibit and Poster Inspection</td>
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<tr>
<td>11:20 - 12:20</td>
<td>Industrial Forum Session</td>
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<tr>
<td>12:20 - 12:35</td>
<td>MicroTAS 2020 Announcement</td>
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<td>12:35 - 14:00</td>
<td>Grab ‘n Go Lunch</td>
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<tr>
<td>12:40 - 14:00</td>
<td>Industrial Stage 1 (Singapore Room)</td>
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<tr>
<td>14:00 - 16:30</td>
<td>Poster Session 2 and Exhibit Inspection</td>
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<tr>
<td>16:30 - 18:00</td>
<td>SESSION 2A3 Circulating Tumor Cells</td>
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<td>SESSION 2B3 Immunoassays and POC Devices</td>
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<td>SESSION 2C3 Nanochannels</td>
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<td></td>
<td>KEYNOTE PRESENTATION Catherine Alix-Panabières</td>
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<td>KEYNOTE PRESENTATION Dhananjaya Dendukuri</td>
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<td>KEYNOTE PRESENTATION David Sinton</td>
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# CONFERENCE AT A GLANCE

## WEDNESDAY, 30 OCTOBER

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<tr>
<th>Time</th>
<th>Session</th>
<th>Details</th>
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<tbody>
<tr>
<td>08:15 - 08:30</td>
<td>Announcements</td>
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<tr>
<td>08:30 - 09:15</td>
<td>PLENARY PRESENTATION IV</td>
<td>Peng Yin – Harvard University, Boston, USA</td>
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<tr>
<td>09:15 - 09:30</td>
<td>Transition</td>
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<tr>
<td>09:30 - 10:30</td>
<td>SESSION 3A1</td>
<td>Pathogen Detection &amp; Analysis</td>
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<tr>
<td></td>
<td>SESSION 3B1</td>
<td>Devices for Detection and Imaging</td>
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<tr>
<td></td>
<td>SESSION 3C1</td>
<td>Surface Patterning</td>
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<tr>
<td>10:30 - 11:00</td>
<td>Break: Exhibit and Poster Inspection</td>
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</tr>
<tr>
<td>11:00 - 12:20</td>
<td>SESSION 3A2</td>
<td>Blood Cell and Blood Flow Analysis</td>
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<td></td>
<td>SESSION 3B2</td>
<td>3D Writing and Printing</td>
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<tr>
<td></td>
<td>SESSION 3C2</td>
<td>Active Particles and Particle Assemblies</td>
</tr>
<tr>
<td>12:20 - 13:10</td>
<td>Grab 'n Go Lunch</td>
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</tr>
<tr>
<td>12:25 - 13:05</td>
<td>Industrial Stage 2</td>
<td>(Singapore Room)</td>
</tr>
<tr>
<td>13:10 - 13:55</td>
<td>PLENARY PRESENTATION V</td>
<td>Zulfiqar A. Bhutta – Hospital for Sick Children, Toronto, Canada</td>
</tr>
<tr>
<td>13:55 - 14:15</td>
<td>Lab on a Chip and Dolomite – Pioneers in Miniaturization Lectureship Prize and Presentation</td>
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</tr>
<tr>
<td>14:15 - 16:45</td>
<td>Poster Session 3 and Exhibit Inspection</td>
<td></td>
</tr>
<tr>
<td>14:30 - 14:45</td>
<td>NIST and Lab on a Chip – Art in Science Award</td>
<td>(in Royal Society of Chemistry Booth Number 63, First Floor)</td>
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<tr>
<td>16:00</td>
<td>Exhibitor Raffle</td>
<td>(in Zurich Instruments Booth # 7 - Ground Floor)</td>
</tr>
<tr>
<td>16:15 - 16:45</td>
<td>Break: Exhibit and Poster Inspection</td>
<td></td>
</tr>
<tr>
<td>16:45 - 18:15</td>
<td>SESSION 3A3</td>
<td>Spheroids and Organoids</td>
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<tr>
<td></td>
<td>SESSION 3B3</td>
<td>Manipulation of Cells</td>
</tr>
<tr>
<td></td>
<td>SESSION 3C3</td>
<td>Nanopores and Nanochannels</td>
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<tr>
<td></td>
<td>KEYNOTE PRESENTATION</td>
<td>Jianhua Qin</td>
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<td>KEYNOTE PRESENTATION</td>
<td>Cullen R. Buie</td>
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<td></td>
<td>KEYNOTE PRESENTATION</td>
<td>Sumita Pennathur</td>
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<tr>
<td>19:00 - 23:00</td>
<td>Conference Banquet</td>
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<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>08:45 - 10:15</td>
<td>SESSION 4A1</td>
<td>Droplet Microfluidics Interfaced with Mass Spectrometry</td>
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<td></td>
<td>SESSION 4B1</td>
<td>Wearables</td>
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<td></td>
<td>SESSION 4C1</td>
<td>Biofibers Dynamics and Assemblies at the Microscale</td>
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<tr>
<td></td>
<td>KEYNOTE PRESENTATION</td>
<td>Detlev Belder</td>
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<td>KEYNOTE PRESENTATION</td>
<td>Stéphanie P. Lacour</td>
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<td></td>
<td>KEYNOTE PRESENTATION</td>
<td>Rikiya Watanabe</td>
</tr>
<tr>
<td>10:15 - 10:45</td>
<td>Break: Exhibit and Poster Inspection</td>
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</tr>
<tr>
<td>10:45 - 11:45</td>
<td>SESSION 4A2</td>
<td>Analysis of Neutrophils for Diagnosis of Sepsis and Inflammation</td>
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<tr>
<td></td>
<td>SESSION 4B2</td>
<td>Centrifugal Platforms</td>
</tr>
<tr>
<td></td>
<td>SESSION 4C2</td>
<td>Gas Control for Cells</td>
</tr>
<tr>
<td>11:45 - 11:50</td>
<td>Transition</td>
<td></td>
</tr>
<tr>
<td>11:50 - 12:35</td>
<td>PLENARY PRESENTATION VI</td>
<td>Aleksandra Radenovic – École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland</td>
</tr>
<tr>
<td>12:35 - 13:15</td>
<td>AWARDS</td>
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<tr>
<td>13:15</td>
<td>Closing Remarks - Conference Adjourns</td>
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TUESDAY, 29 OCTOBER
12:40 - 14:00

INDUSTRIAL STAGE 1a  
12:40 - 13:00

NEW APPLICATIONS IN PRESSURE CONTROL AND DROPLET GENERATION IN MICROFLUIDICS
Presenter: France Hamber
Fluigent  
www.fluigent.com

Fluigent’s broad range of solutions for use in microfluidic technologies and nanofluidics applications offer greater control, automation, precision, and ease of use. If you’re seeking to replace high-precision syringe pumps or other conventional instruments, we offer excellent solutions that minimize contamination and ensure full control of flow rates. In this industrial stage, we will present our new solutions and applications in pressure control and droplet generation.

INDUSTRIAL STAGE 1b  
13:00 - 13:20

SE ROLE HEN VALYRĪHA KORZION ISSE MICROFLUIDICS – THE USEFULNESS OF VALYRIAN STEEL FOR MICROFLUIDICS
Presenter: Holger Becker
microfluidic ChipShop GmbH  
www.microfluidic-chipshop.com

In the transfer from academic lab work to a commercial microfluidics product, materials and manufacturing methods play a decisive role. This presentation will point out some of the critical stumbling blocks during this transition together with suggestions on how to select materials and manufacturing methods to make academic microfluidic designs scaleable for a later industrial manufacturing.

INDUSTRIAL STAGE 1c  
13:20 - 13:40

THE TASTE OF PRECISION
Presenter: Melanie Büttner
CETONI GmbH  
www.cetoni.de

Microfluidic biological as well as chemical applications are not only characterized by contrasts such as resistance to harsh chemicals vs. sterility of the system, they also have one thing in common: precise and pulsation-free fluid delivery. The unique modularity of the CETONI-system allows a variety of applications merged with our software to automate these processes. In this presentation we show how the different advantages of the neMESYS syringe pump series can be used for customer-specific applications. And a short insight about a customer setup will be given. A compact setup for precise and reproducible delivery of liquid taste stimuli was developed. The high precision and easy usability of the neMESYS syringe pumps, combined with an elaborated setup, allowed the researchers to present taste stimuli with high precision to earn reproducible results.
As Lab-on-a-Chip devices are increasingly getting more complex including components of different form factors and materials, thus advanced and scalable integration processes are required. As a market leading supplier of wafer bonding and nanoimprint lithography (NIL) equipment, we will demonstrate how these technologies are applied to microfluidics chips. We will discuss processes for hybrid integration schemes such as CMOS integration and will show how NIL can be used to integrate on-chip optical bio-sensing by nanometer-scale resolution patterns.
DIAGNOSTIC CONSUMABLES: WHERE IS THIS CHALLENGING MARKET HEADED?
Presenter: James Downs

The growth in the use of automated health-care related diagnostic consumables is exploding. However, creating these consumables can be quite challenging. Globally, profound scientific advances are occurring in medical diagnostic technologies. These technologies will play an increasingly important role in delivering more efficient medical care as our health care systems are burdened by multiple demographic and cost factors. However, harnessing these advances in such a way as to functionalize them into a miniaturized consumable will require both a deep understanding of the underlying technical challenges and a broad set of manufacturing capabilities to overcome them. As a published economist whose focus is on innovation in highly knowledge-intensive industries, in this presentation, James Downs will overview the particular challenges of this dynamic environment and highlight the capabilities needed to address them effectively.

SENSORS FOR ONLINE MONITORING OF O₂, PH AND CO₂ IN MICROFLUIDICS
Presenter: Daniela Obermaier

Cell and μ-tissue culture in microfluidics gained huge popularity during the past years. Small volumes and controlled geometry makes microfluidics a perfect tool to conduct fast and reproducible experiments. On the way towards mimicking physiological in vivo conditions in microfluidics, the volume restrictions and its implications on e.g. oxygen and nutrient availability have to be kept carefully in mind. Monitoring of important culture parameters is crucial but challenging in microfluidics and millifluidics. Optical chemical sensors are perfectly suited for this purpose since they allow for minimal or even non-invasive monitoring in very small volumes. We present different sensor formats for online monitoring of oxygen, pH and carbon dioxide in microfluidic chips.
MONDAY, 28 OCTOBER
08:30 - 09:15
Plenary Presentation I
ENGINEERED TOOLS FOR IMMUNOTHERAPIES
James R. Heath
Institute for Systems Biology
Seattle, USA

TUESDAY, 29 OCTOBER
08:30 - 09:15
Plenary Presentation III
MINIFLUX NANOSCOPY: SUPERRESOLUTION POST NOBEL
Stefan W. Hell
Max Planck Institute for Biophysical Chemistry
Göttingen, GERMANY

WEDNESDAY, 30 OCTOBER
08:30 - 09:15
Plenary Presentation IV
ENGINEERING DNA DEVICES TO ADVANCE BIOIMAGING AND BIOSENSING
Peng Yin
Harvard University
Boston, USA

13:10 - 13:55
Plenary Presentation V
ADDRESSING NEWBORN SURVIVAL GLOBALLY: THE ROLE OF INNOVATIONS IN MOVING FROM POLICY TO ACTION
Zulfiqar A. Bhutta
Hospital for Sick Children
Toronto, CANADA

THURSDAY, 31 OCTOBER
11:50 - 12:35
Plenary Presentation VI
A TALE OF SINGLE PORE IN QUASI 2D MEMBRANES
Aleksandra Radenovic
École Polytechnique Fédérale de Lausanne (EPFL)
Lausanne, SWITZERLAND
### MONDAY, 28 OCTOBER
16:45 - 17:15

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<tr>
<th>Session 1A3 - Single-Cell Manipulation &amp; Analysis</th>
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<tbody>
<tr>
<td>CHARACTERIZATION OF OPTIMAL CULTURE CONDITIONS FOR MICROFLUIDIC 3D VASCULATURE-ON-CHIP</td>
</tr>
<tr>
<td><strong>Angela Wu</strong>&lt;br&gt;Hong Kong University of Science and Technology&lt;br&gt;Hong Kong, HONG KONG</td>
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<tr>
<th>Session 1B3 - Organs on Chip</th>
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<tbody>
<tr>
<td>ADVANCED CELL MODELS, ORGANS ON CHIPS &amp; MICROPHYSIOLOGICAL SYSTEMS AS INNOVATIVE TOOLS TO SUPPORT DRUG DEVELOPMENT</td>
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<tr>
<td><strong>Adrian Roth</strong>&lt;br&gt;Roche Innovation Center&lt;br&gt;Basel, SWITZERLAND</td>
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<tr>
<th>Session 1C3 - Genetic Engineering</th>
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<tr>
<td>TRANSCRIPTIONAL RECORDING BY CRISPR SPACER ACQUISITION FROM RNA</td>
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<tr>
<td><strong>Randall J. Platt</strong>&lt;br&gt;ETH Zürich&lt;br&gt;Basel, SWITZERLAND</td>
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### TUESDAY, 29 OCTOBER
16:30 - 17:00

<table>
<thead>
<tr>
<th>Session 2A3 - Circulating Tumor Cells &amp; Cancer Therapy</th>
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<tbody>
<tr>
<td>CIRCULATING TUMOR CELLS AS LIQUID BIOPSY: FINDING RARE EVENTS FOR A HUGE KNOWLEDGE OF CANCER DISSEMINATION</td>
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<tr>
<td><strong>Catherine Alix-Panabières</strong>&lt;br&gt;University of Montpellier&lt;br&gt;Montpellier, FRANCE</td>
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<tr>
<th>Session 2B3 - Immunoassays &amp; Point-of-Care Devices</th>
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<tr>
<td>A POINT-OF-CARE IMMUNOASSAY PLATFORM FOR THYROID FUNCTION BASED ON HYDROGEL SENSORS EMBEDDED INSIDE A MICROFLUIDIC DEVICE</td>
</tr>
<tr>
<td><strong>Dhananjaya Dendukuri</strong>&lt;br&gt;Achira Labs, Pvt. Ltd.&lt;br&gt;Bangalore, INDIA</td>
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<th>Session 2C3 - Nanochannels</th>
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<tbody>
<tr>
<td>NANOFLOIDICS FOR ENERGY AND ENVIRONMENTAL APPLICATIONS</td>
</tr>
<tr>
<td><strong>David Sinton</strong>&lt;br&gt;University of Toronto&lt;br&gt;Toronto, CANADA</td>
</tr>
</tbody>
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WEDNESDAY, 30 OCTOBER
16:45 - 17:15

Session 3A3 - Spheroids & Organoids
ORGANOIDS-ON-CHIPS TO ADVANCE HEALTH SCIENCE
Jianhua Qin
Chinese Academy of Sciences
Dalian, CHINA

Session 3B3 - Manipulation of Cells
AUTOMATED MICROFLUIDIC GENETIC MANIPULATION FOR HIGH THROUGHPUT BIOLOGY
Cullen R. Buie
Massachusetts Institute of Technology
Cambridge, USA

Session 3C3 - Nanopores & Nanochannels
BIPOLAR ELECTRODES FOR MICROFLUIDIC PUMPING
Sumita Pennathur
University of California, Santa Barbara
Santa Barbara, USA

THURSDAY, 31 OCTOBER
08:45 - 09:15

Session 4A1 - Droplets, Mass. Spectrometry or OMICS
INTERFACING DROPLET CHIPS TO MASS SPECTROMETRY
Detlev Belder
University of Leipzig
Leipzig, GERMANY

Session 4B1 - Wearables
SKIN-LIKE, MICROFABRICATED GALLIUM-BASED SENSORS FOR MOTION CAPTURE
Stéphanie P. Lacour
École Polytechnique Fédérale de Lausanne (EPFL)
Lausanne, SWITZERLAND

Session 4C1 - Biofibers Dynamics & Assemblies at the Microscale
MICROSYSTEMS FOR SINGLE MOLECULE ANALYSIS OF MEMBRANE PROTEINS
Rikiya Watanabe
RIKEN
Saitama, JAPAN
Meet with Plenary and Keynote presenters after their talk to ask questions that there may not have been time for. The Speaker Corner will be located in the Second Floor Foyer outside the meeting rooms on the following days and times.

### MONDAY, 28 OCTOBER
- 10:30: Plenary Speaker I – James R. Heath
- 14:00: Plenary Speaker II – Keisuke Goda

### TUESDAY, 29 OCTOBER
- 10:30: Plenary Speaker III – Stefan W. Hell
- 14:15: Plenary Speaker V – Zulfiqar A. Bhutta
- 18:15: Plenary Speaker VI – Aleksandra Radenovic

### WEDNESDAY, 30 OCTOBER
- 10:30: Plenary Speaker IV – Peng Yin
- 14:15: Plenary Speaker V – Zulfiqar A. Bhutta
- 18:15: Keynote Speaker Session 3A3 – Jianhua Qin

### THURSDAY, 31 OCTOBER
- 10:15: Keynote Speaker Session 4A1 – Detlev Belder
- 13:20: Plenary Speaker VI – Aleksandra Radenovic

Ancient Roman Wall in Kaiseraugst near Basel
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:

\[
\begin{align*}
1 & = \text{Monday} \\
2 & = \text{Tuesday} \\
3 & = \text{Wednesday} \\
4 & = \text{Thursday}
\end{align*}
\]

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

\[
\begin{align*}
A & = \text{San Francisco, Third Floor} \\
B & = \text{Singapore, Second Floor} \\
C & = \text{Sydney, Second Floor}
\end{align*}
\]

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

\[
\begin{align*}
1 & = \text{Concurrent Session 1 - morning} \\
2 & = \text{Concurrent Session 2 - late-morning} \\
3 & = \text{Concurrent Session 3 - afternoon}
\end{align*}
\]

Posters
Three poster sessions will be held on two floors of the Congress Center on Monday, Tuesday, and Wednesday. Posters 1 - 82 will be located on the ground floor. Posters 83 - 248 will be located on the first floor. All posters are listed with their assigned number and day that they are on display. Authors will be available for questions during their appointed time. Posters are color coded by day and classification to coordinate with the poster floor plan on the last page of this program.

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:

\[
\begin{align*}
M & = \text{Monday} \\
T & = \text{Tuesday} \\
W & = \text{Wednesday}
\end{align*}
\]

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.
μTAS 2020
Palm Springs
California
October 4–8, 2020
The 24th International Conference on Miniaturized Systems for Chemistry and Life Sciences

Save the Date!
October 4–8, 2020

Palm Springs Convention Center
California, USA

Conference Chairs:
Amy E. Herr – University of California, Berkeley, USA
Joel Voldman – Massachusetts Institute of Technology, USA

cbmsociety.org/microtas2020
**SUNDAY, 27 OCTOBER**

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<td>08:30</td>
<td>Workshop Registration</td>
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</table>
| 09:00 - 12:00 | Morning Workshops                                                      | **Workshop 1**
DESIGN TOOLS FOR MICROFLUIDIC DEVICES
Robert Wille¹, Jan Madsen², and Ulf Schlichtmann³
¹Johannes Kepler University, AUSTRIA,
²Technical University of Denmark, DENMARK, and
³Technische Universität München, GERMANY

**Workshop 2**
COMMERCIALIZATION OF MICROFLUIDIC DEVICES AND SYSTEMS
Holger Becker
microfluidic ChipShop GmbH, GERMANY

**Workshop 3**
CARING FOR CELLS IN MICROSYSTEMS: ENSURING CELL-SAFE DEVICE DESIGN AND OPERATION
Sarvesh Varma and Joel Voldman
Massachusetts Institute of Technology, USA

**Workshop 4**
AG ELECTROKINETICS IN MICROSYSTEMS FOR SINGLE-CELL CYTOMETRY, MANIPULATION AND SENSING
Nathan Swami¹ and Federica Caselli²
¹University of Virginia, USA and
²University of Rome Tor Vergata, ITALY

**Workshop 5**
SPICE UP YOUR CHIPS WITH ELECTRONIC GADGETS AND ARDUINO
Yuksel Temiz
IBM Research – Zürich, SWITZERLAND

| 14:00 - 17:00 | Afternoon Workshops                                                   | **Workshop 6**
INTEGRATING THE NEEDS OF USERS INTO POINT-OF-CARE DIAGNOSTICS
Jaqueline Linnes
Purdue University, USA

**Workshop 7**
OPEN-SPACE MICROFLUIDICS: CONCEPTS, IMPLEMENTATIONS AND APPLICATIONS
Govind Kaigala¹, Patrick Misun², and Tomaso Zambelli²
¹IBM Research – Zürich, SWITZERLAND and
²ETH Zurich, SWITZERLAND

**Workshop 8**
LIVE CELL IMAGING IN MICROFLUIDICS
Tom Lummens¹, Oliver Biehlmaier², and Gregor Schmidt¹
¹ETH Zurich, SWITZERLAND and
²University of Basel, SWITZERLAND

**Workshop 9**
3D PRINTING TOOLS
Michael Breadmore¹, Rosanne Guijt², Greg Nordin², and Egan Doeyen²
¹University of Tasmania, AUSTRALIA, ²Deakin University, AUSTRALIA, and ³Brigham Young University, USA

**Workshop 10**
ORGAN-ON-A-CHIP: MERGING MICROFABRICATION WITH TISSUE ENGINEERING
Peter Loskill¹, Olivier Guenat², and Olivier Frey³
¹Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB, GERMANY, ²University of Bern, SWITZERLAND, and ³InSphero AG, SWITZERLAND

17:00 - 19:00 | Conference Registration and Check-In                                  | **Workshop 6**
                                                                 | **Workshop 7**
                                                                 | **Workshop 8**
                                                                 | **Workshop 9**
                                                                 | **Workshop 10**
                                                                 |                                                                 |
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- Organ-on-a-Chip
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- HTS
- microarrays
- Glass components for medical instruments & equipment

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Flow Cell for Next Generation Sequencing

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# MONDAY AT A GLANCE

## MONDAY, 28 OCTOBER

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<tr>
<th>Time</th>
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<tr>
<td>07:00 - 18:15</td>
<td>Registration</td>
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<tr>
<td>08:00 - 08:30</td>
<td>Opening Remarks</td>
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<tr>
<td>08:30 - 09:15</td>
<td><strong>PLENARY PRESENTATION I</strong>&lt;br&gt;James R. Heath – Institute for Systems Biology&lt;br&gt;Seattle, USA</td>
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<tr>
<td>09:15 - 09:30</td>
<td>Transition</td>
</tr>
<tr>
<td>09:30 - 10:30</td>
<td><strong>SESSION 1A1</strong> Exosomes Trapping and Isolation&lt;br&gt;<strong>SESSION 1B1</strong> Particle Separation&lt;br&gt;<strong>SESSION 1C1</strong> Synthetic Biology Using Droplets</td>
</tr>
<tr>
<td>10:30 - 11:00</td>
<td>Break: Exhibit and Poster Inspection</td>
</tr>
<tr>
<td>11:00 - 12:00</td>
<td><strong>SESSION 1A2</strong> Single Cell Analysis (Secretion)&lt;br&gt;<strong>SESSION 1B2</strong> Reconfigurable and Self-Powered Devices&lt;br&gt;<strong>SESSION 1C2</strong> Separation and Assays in Droplets</td>
</tr>
<tr>
<td>12:20 - 13:10</td>
<td>Grab ‘n Go Lunch</td>
</tr>
<tr>
<td>13:10 - 13:15</td>
<td><strong>Analytical Chemistry – Young Innovator Award Presentation</strong>&lt;br&gt;Award Recipient: Keisuke Goda, University of Tokyo, JAPAN</td>
</tr>
<tr>
<td>13:15 - 14:00</td>
<td><strong>PLENARY PRESENTATION II</strong>&lt;br&gt;Keisuke Goda – University of Tokyo&lt;br&gt;Tokyo, JAPAN</td>
</tr>
<tr>
<td>14:00 - 16:30</td>
<td>Poster Session 1 and Exhibit Inspection</td>
</tr>
<tr>
<td>16:00 - 16:30</td>
<td>Break</td>
</tr>
<tr>
<td>16:30 - 18:00</td>
<td><strong>SESSION 1A3</strong> Single-Cell Manipulation and Analysis&lt;br&gt;<strong>SESSION 1B3</strong> Organs on Chip&lt;br&gt;<strong>SESSION 1C3</strong> Genetic Engineering</td>
</tr>
<tr>
<td>18:00 - 19:30</td>
<td>MicroTAS Student Mixer</td>
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<tr>
<td>18:00</td>
<td>Women’s Faculty Event</td>
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# Registration

- **07:00 - 18:15**<br>Registration
- **08:00 - 08:30**<br>Opening Remarks<br>Nicole Pamme, University of Hull, UK
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- **16:00 - 16:30**<br>Break
- **16:30 - 18:00**<br>SESSION 1A3 Single-Cell Manipulation and Analysis<br>SESSION 1B3 Organs on Chip<br>SESSION 1C3 Genetic Engineering
- **18:00 - 19:30**<br>MicroTAS Student Mixer
- **18:00**<br>Women’s Faculty Event

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**Canton of Basel-Stadt**

Dr. Conradin Cramer, Head of the Education Department

**MicroTAS 2019 Conference Chairs**

Petra S. Dittrich, ETH Zürich, SWITZERLAND
Andreas Hierlemann, ETH Zürich, SWITZERLAND
Emmanuel Delamarche, IBM Research – Zürich, SWITZERLAND
# MINIATURIZATION OF HYDROCYCLONES: THEORETICAL AND EXPERIMENTAL EXPLORATION

Jung Y. Han, Beqir Krasniqi, Jung Kim, Melissa Keckley, and Don L. DeVoe  
University of Maryland, USA

# THE SEPARATION OF NANO-SIZED PARTICLES IN MICRO-SCALED POST ARRAYS

Jason P. Beech¹, Kevin Keim², Bao Dang Ho¹, Carlotta Guiducci², and Jonas O. Tegenfeldt³  
¹Lund University, SWEDEN and  
²École Polytechnique Fédérale de Lausanne, (EPFL) SWITZERLAND

# 10:10 SIZE-BASED BIOMOLECULAR SEPARATION ENABLED BY FIELD-EFFECT ELECTROOSMOSIS

Vesna Bacheva¹,², Federico Paratore¹,², Shimon Rubin¹, Govind V. Kaigala², and Moran Bercovici²  
¹Technion - Israel Institute of Technology, ISRAEL and  
²IBM Research – Zürich, SWITZERLAND

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**PLENARY PRESENTATION I**

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

### San Francisco Room

**08:30** ENGINEERED TOOLS FOR IMMUNOTHERAPIES  
*James R. Heath*  
*Institute for Systems Biology, Seattle, USA*

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**09:30** MULTINODAL HIGH THROUGHPUT ACOUSTIC TRAPPING OF EXOSOMES FROM URINE SAMPLES  
Axel Broman, Andreas Lenshof, Mikael Evander, Anson Ku, Yvonne Ceder, and Thomas Laurell  
Lund University, SWEDEN

**09:50** DIRECT AND SCALABLE ISOLATION OF CIRCULATING EXOSOMES FROM WHOLE BLOOD USING CENTRIFUGAL FORCES

Hui Min Tay¹, Sheng Yuan Leong³, Megha Upadya¹, Fang Kong¹, Hong Kit Lim¹, Rinkoo Dalan¹, Chor Yong Dalton Tay¹, Ming Dao²,³, and Han Wei Hou¹  
¹Nanyang Technological University, SINGAPORE,  
²Tan Tock Seng Hospital, SINGAPORE, and  
³Massachusetts Institute of Technology, USA

---

**10:10** SEPARATION OF SINGLE EXOSOMES UTILIZING A COMPOSITE NANOFLUIDIC STRUCTURE

Haruka Ishibashi¹, Osamu Ishibashi¹, Aya Horikawa¹, Mika Hayashi¹, and Yan Xu¹,²  
¹Osaka Prefecture University, JAPAN and  
²Japan Science and Technology Agency (JST), JAPAN

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### Singapore Room

**09:30** MINIATURIZATION OF HYDROCYCLONES: THEORETICAL AND EXPERIMENTAL EXPLORATION

Jung Y. Han, Beqir Krasniqi, Jung Kim, Melissa Keckley, and Don L. DeVoe  
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<td>09:30</td>
<td>DROPLET-BASED MICROFLUIDICS FOR BOTTOM-UP SYNTHETIC BIOLOGY</td>
<td>Thomas Beneyton¹, Dorothee Krafft², Celina Love², Mathias Girault¹, Claudia Bednarz², Christin Kleineberg², Christian Woelfer², Ivan Ivanov², Tanja Vidakovíc-Koch², Kai Sundmacher², T.-Y. Dora Tang¹, and Jean-Christophe Baret¹</td>
<td>University of Bordeaux, FRANCE and Max Planck Institute, GERMANY</td>
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<td>09:50</td>
<td>CREATION OF DNA MICRODROPLETS BASED ON PHASE TRANSITION AND SEQUENCE DESIGN</td>
<td>Yusuke Sato, Tetsuro Sakamoto, and Masahiro Takinoue</td>
<td>Tokyo Institute of Technology, JAPAN</td>
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<tr>
<td>10:10</td>
<td>A VERSATILE AND ROBUST DROPLET-BASED MICROFLUIDIC AUTOMATION SYSTEM FOR HIGH-THROUGHPUT OPTIMIZATION OF BIOSYNTHETIC PATHWAYS</td>
<td>Kosuke Iwai¹,², Maren Wehrs¹, Peter W. Kim¹,², Jess Sustarich¹,², Trent R. Northen¹,³,4, Hector Garcia Martín³,², Paul D. Adams³,⁴, and Anup K. Singh¹,²</td>
<td>Joint BioEnergy Institute, USA, Sandia National Laboratories, USA, Lawrence Berkeley National Laboratory, USA, DOE Joint Genome Institute, USA, and University of California, Berkeley, USA</td>
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<tr>
<td>10:30</td>
<td>Speaker Corner (see page 7)</td>
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<tr>
<td>10:30</td>
<td>Break: Exhibit and Poster Inspection</td>
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<tr>
<td>11:00</td>
<td>PRECIENT: A PLATFORM FOR THE RAPID EVALUATION OF SINGLE CELL PRODUCED ANTIBODY SUCCESS USING INTEGRATED MICROFLUIDIC-ENABLED TECHNOLOGY</td>
<td>Jose A. Wippold¹, Han Wang¹,², Joseph Tingling³, Julian Leibowitz³, Paul Defqiireddo³, and Arum Han</td>
<td>Texas A&amp;M University, USA and Tsinghua University, CHINA</td>
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<td>11:20</td>
<td>METABOLIC CHARACTERIZATION OF INDIVIDUAL IGG-SECRETING CELLS</td>
<td>Mira ElKhoury¹, Guilhem Cheron¹, Andrew D. Griffiths¹, Jean Baudry¹, and Klaus Eyer¹,²</td>
<td>École Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE and ETH Zürich, SWITZERLAND</td>
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<tr>
<td>11:40</td>
<td>SYNCHRONIZED DROP-SCREENING/SORTING FOR SINGLE CELL SECRETION MEASUREMENTS</td>
<td>Guoyun Sun, Ming Wang, and Chia-Hung Chen</td>
<td>National University of Singapore, SINGAPORE</td>
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<tr>
<td>12:00</td>
<td>DEMOCRATIZED HIGH-THROUGHPUT SINGLE-CELL SECRETION SCREENING USING DROPLETS FORMED BY STRUCTURED MICROPARTICLES</td>
<td>Joseph de Rutte, Robert Dimatteo, Mark van Zee, Robert Damoiseaux, and Dino Di Carlo</td>
<td>University of California, Los Angeles, USA</td>
</tr>
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MONDAY PROGRAM

Session 1B2 - Reconfigurable and Self-Powered Devices
Chair: Sally Peyman, University of Leeds, UK

Singapore Room

11:00 RECONFIGURABLE MICROFLUIDICS: REAL-TIME SHAPING OF VIRTUAL CHANNELS THROUGH HYDRODYNAMIC FORCES
David Taylor1,2 and Govind Kaigala2
1École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and 2IBM Research – Zürich, SWITZERLAND

11:20 LIQUID CIRCUITS IMPLEMENTED USING SMARTPHONE-CONTROLLED VALVES AND SELF-VENTED CHANNELS
Yuksel Temiz, Yulieth Arango, Onur Gökçe, and Emmanuel Delamarche
IBM Research – Zürich, SWITZERLAND

11:40 DNA-ONLY BIOASSAY FOR SIMULTANEOUS DETECTION OF PROTEIN AND NUCLEIC ACID TARGETS ON THE SELF-POWERED ISIMPLE CHIP
Aida Montserrat, Saba Safdar, Karen Ven, Francesco Dal Dosso, Jeroen Lammertyn, and Dragana Spasic
KU Leuven, BELGIUM

12:00 SINGLE LAYER DOMINO CAPILLARICS FOR PERFORMING ADVANCED AUTONOMOUS BIOASSAYS
Mohamed Yafia, Andy Ng, Oriol Ymbern, and David Juncker
McGill University, CANADA

Sydney Room

11:00 DROPLET-BASED SINGLE EXTRACELLULAR VESICLE PROTEIN PROFILING FOR THE IMPROVEMENT OF IMMUNOTHERAPY
Jina Ko1, Yongcheng Wang2, Angela Marquad1, Jonathan Carson1, David Weitz2, and Ralph Weissleder1
1Massachusetts General Hospital, USA and 2Harvard University, USA

11:20 DROPLET-BASED INVESTIGATION OF A BIOCHEMICAL BISTABLE CIRCUIT FOR SENSITIVE AND NOISE-FREE DETECTION OF NUCLEIC ACIDS
Robin Deteix1, Nicolas Lobato-Dauzier1, Elia Henry2, Shu Okumura1, Guillaume Gines2, Yannick Rondelez2, Teruo Fujii3, and Anthony J. Genot4
1University of Tokyo, JAPAN, 2François Jacob Institute of Biology-INSERM/CEA, FRANCE, 3PSL Research University, FRANCE, and 4LIMMS-IIS/CNRS, JAPAN

11:40 IN-DROPLET SEPARATION OF PROTEINS AND NUCLEIC ACIDS
Mario A. Saucedo-Espinosa, Elisabeth F. Hirth, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

12:00 ELECTROPHYSIOLOGICAL ANALYSIS OF Aß42 IN PLANAR LIPID BILAYER IMITATING NERVOUS CELL-MEMBRANE
Yuri Numaguchi, Keisuke Shimizu, Kaori Tsukakoshi, Kazunori Ikebukuro, and Ryuji Kawano
Tokyo University of Agriculture and Technology, JAPAN

12:20 Grab ‘n Go Lunch

13:10 Analytical Chemistry – Young Innovator Award Presentation
Award Recipient: Keisuke Goda, University of Tokyo, JAPAN
13:15 INTELLIGENT IMAGE-ACTIVATED CELL SORTING & BEYOND
Keisuke Goda\textsuperscript{1,2,3}
\textsuperscript{1}University of Tokyo, Tokyo, JAPAN, \textsuperscript{2}Wuhan University, CHINA, and \textsuperscript{3}University of California, Los Angeles, USA

14:00 Poster Session 1 and Exhibit Inspection
Ground Floor and First Floor
Poster presentations are listed by topic category with their assigned number starting on page 40.

16:00 Break

16:30 Keynote Presentation
CHARACTERIZATION OF OPTIMAL CULTURE CONDITIONS FOR MICROFLUIDIC 3D VASCULARITY-ON-CHIP
Sin Yen Tan and Angela R. Wu
Hong Kong University of Science and Technology, HONG KONG

17:00 MICROFLUIDIC MONITORING HOST-VIRAL INTERACTION AT THE SINGLE-CELL LEVEL
Reya Ganguly\textsuperscript{1}, Solib Kang\textsuperscript{1}, Byungjin Lee\textsuperscript{1}, Si Hyung Jin\textsuperscript{1}, Yohei Yamuchi\textsuperscript{2}, Jaeseong Kim\textsuperscript{1}, and Chang-Soo Lee\textsuperscript{1}
\textsuperscript{1}Chungnam National University, KOREA and \textsuperscript{2}University of Bristol, UK

17:20 ONE CELL, ONE DROP, ONE CLICK: HYBRID MICROFLUIDIC MAMMALIAN SINGLE-CELL ENGINEERING
Kenza Samlali, Fatemeh Ahmadi, Angela B.V. Quach, Guy Soffer, and Steve C.C. Shih
Concordia University, CANADA

17:40 ISOLATION OF CIRCULATING FETAL TROPHOBLAST USING FETAL-CHIP FOR NON-INVASIVE PRENATAL DIAGNOSIS
Huimin Zhang\textsuperscript{1}, Yuan yuan Yang\textsuperscript{2}, Zhi Zhu\textsuperscript{2}, and Chaoyong Yang\textsuperscript{1,2}
\textsuperscript{1}Shanghai Jiao Tong University School of Medicine, CHINA and \textsuperscript{2}Xiamen University, CHINA
### Session 1B3 - Organs on Chip
**Chair:** Noo Li Jeon, Seoul National University, KOREA

#### Singapore Room

**16:30** **Keynote Presentation**  
ADVANCED CELL MODELS, ORGANS ON CHIPS & MICROPHYSIOLOGICAL SYSTEMS AS INNOVATIVE TOOLS TO SUPPORT DRUG DEVELOPMENT  
Adian Roth  
Roche Innovation Center, Basel, SWITZERLAND

**17:00** ASSESSING GUT MICROBIOME-LIVER CROSSALK WITH A MODULAR MICROFLUIDIC PLATFORM  
Hsih-Yin Tan, Louis Jun Ye Ong, Chak Ming Leung, Lor Huai Chong, and Yi-Chin Toh  
National University of Singapore, SINGAPORE

**17:20** NANOFABRICATED BONE-ON-CHIP: TOWARDS A BONE REGENERATION MODEL  
Víctor P. Galván1, David Barata1, Athanasia Zampouka1, Jiaping Li1, Bernhard Hesse2, Marc Bohner3, and Pamela Habibovic1  
1Maastricht University, THE NETHERLANDS, 2European Synchrotron Radiation Facility, FRANCE, and 3RMS Foundation, SWITZERLAND

**17:40** INTEGRATION OF EX-VIVO PRECISION-CUT LIVER SLICE (PCLS) CULTURE WITH MICROFLUIDIC NMR METABOLICOMICS  
Bishnubrata Patra1, Manvendra Sharma1, Ruby Karsten2, Maciej Grajewski2, Sabeth Verpoorte2, and Marcel Utz1  
1University of Southampton, UK and 2University of Groningen, THE NETHERLANDS

### Session 1C3 - Genetic Engineering
**Chair:** Hang Lu, Georgia Institute of Technology, USA

#### Sydney Room

**16:30** **Keynote Presentation**  
TRANSCRIPTIONAL RECORDING BY CRISPR SPACER ACQUISITION FROM RNA  
Randall J. Platt, Michal Okoniewski, Tanmay Tanna, Mariia Y. Cherepkoka, and Florian Schmidt  
ETH Zürich, SWITZERLAND

**17:00** SPATIALLY-RESOLVED AND MULTIPLEX MICRORNA QUANTIFICATION FROM FORMALIN-FIXED, PARAFFIN-EMBEDDED TISSUE USING NANOLITER WELL ARRAYS  
Maxwell B. Nagarajan1, Augusto M. Tentori1, Wen Cai Zhang2, Frank J. Slack2, and Patrick S. Doyle3  
1Massachusetts Institute of Technology, USA and 2Beth Israel Deaconess Medical Center, USA

**17:20** MICRORNA DIAGNOSTICS ON AN ELECTROCHEMICAL BIOSENSOR VIA CRISPR/CAS13A TECHNOLOGY  
Richard Bruch, Julia Baaske, Claire Chatelle, Wilfried Weber, Gerald A. Urban, and Can Dincer  
University of Freiburg, GERMANY

**17:40** GENE EXPRESSION BASED DRUG SCREENING PLATFORM  
Sumin Lee, Seo Woo Song, Junhoi Kim, and Sunghoon Kwon  
Seoul National University, KOREA

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**18:00 - 19:30** MicroTAS Student Mixer

**18:00** Women’s Faculty Event
WHY USE FLUIGENT’S MICROFLUIDIC CONTROLLERS?

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Lab on a Chip activities at MicroTAS 2019

Don’t miss out:
Pioneers of Miniaturization lecture
Hang Lu Georgia Tech, USA
13:55-14:15, Wed 30 October

Art in Science competition award (booth 63)
14:30-14:45, Wed 30 October

The Widmer poster prize announcement
12:45-12:55, Thurs 31 October

Join us at booth 63

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Registered charity number: 207890
TUESDAY AT A GLANCE

08:15 - 08:30 Announcements

08:30 - 09:15 PLENARY PRESENTATION III
Stefan W. Hell – Max Planck Institute for Biophysical Chemistry Göttingen, GERMANY

09:15 - 09:30 Transition

09:30 - 10:50
SESSION 2A1 Exosomes and Extracellular Vesicles
SESSION 2B1 Paper Microfluidics and Devices
SESSION 2C1 Microfluidic Culture for Cells, Organisms and Plants

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

11:20 - 12:20 Industrial Forum Session

12:20 - 12:35 MicroTAS 2020 Announcement

12:35 - 14:00 Grab ‘n Go Lunch

12:40 - 14:00 Industrial Stage 1 (Singapore Room)
Fluigent, microfluidic ChipShop GmbH, CETONI GmbH, EVG Group (EVG)

14:00 - 16:30 Poster Session 2 and Exhibit Inspection

16:00 - 16:30 Break

16:30 - 18:00
SESSION 2A3 Circulating Tumor Cells and Cancer Therapy
SESSION 2B3 Immunoassays and Point-of-Care Devices
SESSION 2C3 Nanochannels

KEYNOTE PRESENTATION Catherine Alix-Panabières
KEYNOTE PRESENTATION Dhananjaya Dendukuri
KEYNOTE PRESENTATION David Sinton

TUESDAY, 29 OCTOBER

08:15 Announcements

PLENARY PRESENTATION III
Chair: Petra S. Dittrich, ETH Zürich, SWITZERLAND

San Francisco Room

08:30 MINFLUX NANOSCOPY: SUPERRESOLUTION POST NOBEL
Stefan W. Hell
Max Planck Institute for Biophysical Chemistry Göttingen, GERMANY
Max Planck Institute for Medical Research, GERMANY

09:15 Transition
**San Francisco Room**

**09:30** IDENTIFYING EXTRACELLULAR VESICLE POPULATIONS FROM LONG-TERM CULTURED SINGLE CELLS USING MULTI-COLOR TIRFM  
Jonas Nikoloff, Lucas Armbricht, André Kling, and Petra S. Dittrich  
ETH Zürich, SWITZERLAND

**09:50** PLATELET MEMBRANE CLOCKED SURFACE FOR PLASMONIC SWITCH ON BINDING OF CANCER THREATS  
Sumit Kumar, Jae-A Han, Issac J. Michael, and Yoon-Kyoung Cho  
Ulsan National Institute of Science and Technology (UNIST), KOREA

**10:10** NODE-PORE SENSING DEVICE TO DETECT TUMOR-DERIVED EXTRACELLULAR VESICLES  
Thomas R. Carey, Jennifer Hall, and Lydia L. Sohn  
University of California, Berkeley, USA

**10:30** HIGHLY SENSITIVE DETECTION OF TUMOR-DERIVED EXTRACELLULAR VESICLES USING AN ENZYMIC ASSAY AND REDOX CYCLING  
Dilu G. Mathew¹, Pepijn Beekman¹,², Serge G. Lemay¹, Séverine Le Gac¹, and Wilfred G. van der Wiel¹  
¹University of Twente, THE NETHERLANDS and ²Wageningen University, THE NETHERLANDS

**Singapore Room**

**09:30** CITIZEN LED SAMPLING TO MONITOR PHOSPHATES IN RIVER WATER USING SIMPLE PAPER MICROFLUIDIC DEVICES  
Samantha Richardson, Alexander Iles, Jeanette M. Rotchell, Mark Lorch, and Nicole Pamme  
University of Hull, UK

**09:50** VERSATILE PRINTED MICROHEATERS TO ENABLE LOW-POWER THERMAL CONTROL IN PAPER DIAGNOSTICS  
Kristin M. Byers, Li-Kai Lin, Taylor J. Moehling, Lia A. Stanciu, and Jacqueline C. Linnes  
Purdue University, USA

**10:10** AN ALL-IN-ONE PAPER-BASED MICROFLUIDIC DEVICE FOR MULTIPLEXED DETECTION OF CARDIAC PROTEIN MARKERS  
Hao Fu¹,², Xiao Li²,³, Zhen Qin¹, and Xinyu Liu¹,²  
¹University of Toronto, CANADA, ²McGill University, CANADA, and ³Stanford University, USA

**10:30** MICRO TOTAL ANALYSIS SYSTEM FOR DETERMINATION OF LITHIUM ION IN HUMAN WHOLE BLOOD WITH HYBRID DEVICE OF DMF AND TINY PAPER SENSORS  
Takeshi Komatsu¹, Manabu Tokeshi¹, and Shih-Kang Fan²  
¹Hokkaido University, JAPAN and ²National Taiwan University, TAIWAN
09:30  STANDARDIZED, MODULAR MICROFLUIDIC BUILDING BLOCKS FOR AUTOMATED CELL CULTURING SYSTEMS
Anke Vollertsen, Elsbeth Bossink, Dean de Boer, Jet Spalink, Robert Passier, Albert van den Berg, Loes Segerink, Andries van der Meer, and Mathieu Odijk
University of Twente, THE NETHERLANDS

09:50  INTEGRATED MICROFLUIDIC CHIP WITH FLOWING UPSTREAM SPERM SORTING AND ZP REMOVED OOCYTE INCUBATION FOR IN-VITRO FERTILIZATION
Suei-Shen Wang¹, Yung-Chin Tzeng¹, Yueh-Jen Chen¹, Li-Chen Pan², and Fan-Gang Tseng³\(^1^,³\)
¹National Tsing Hua University, TAIWAN, ²Taipei Medical University, TAIWAN, and ³Research Center for Applied Sciences, TAIWAN

10:10  DROPLET LIQUID EXCHANGER FOR CHEMICAL SCREENS IN CAENORHABDITIS ELEGANS
Guillaume Aubry, Marija Milisavljevic, and Hang Lu
Georgia Institute of Technology, USA

10:30  NOVEL MICRO-FLUIDIC CIRCUIT MODEL OF PLANT VASCULAR SYSTEM FOR THE GROWTH NAVIGATION
Ryo Miyake¹, Toshihiro Kasama¹, Maia Godonoga¹, Yoshishige Endo¹, Takumi Okamoto², Tetsushi Koide², Chiharu Sone², Masashi Komine³, Yukio Yaji³, Yoshihiro Kaneta³, and Atsushi Ogawa³
¹University of Tokyo, JAPAN, ²Hiroshima University, JAPAN, and ³Akita Prefectural University, JAPAN

11:20  HOW TO BRING RESEARCH FROM THE BENCH TO THE BEDSIDE, AND ALSO TO UNDERSTAND PITFALLS AND HOW TECHNOLOGY NEEDS TO MAP INTO THE REALITY
Panel: Vincent Linder BioMedical Consultant, PORTUGAL
Martin Kopp Roche Diagnostics, SWITZERLAND
Oliver Nolte Center for Laboratory Medicine, SWITZERLAND
Xavier Ding FIND, SWITZERLAND

12:20  MicroTAS 2020 Announcement

12:35  Grab ‘n Go Lunch
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<td>12:40</td>
<td>1a – NEW APPLICATIONS IN PRESSURE CONTROL AND DROPLET GENERATION IN MICROFLUIDICS</td>
<td>France Hamber</td>
<td>Fluigent, FRANCE</td>
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<td>13:00</td>
<td>1b – THE ROLE OF VALRYIAN KORZION ISSE MICROFLUIDICS – THE USEFULNESS OF VALRYIAN STEEL FOR MICROFLUIDICS</td>
<td>Holger Becker</td>
<td>microfluidic ChipShop GmbH, GERMANY</td>
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<td>13:20</td>
<td>1c – THE TASTE OF PRECISION</td>
<td>Melanie Büttner</td>
<td>CETONI GmbH, GERMANY</td>
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<td>13:40</td>
<td>1d – INTEGRATION TECHNOLOGIES FOR NEXT-GENERATION MICROFLUIDIC DEVICES</td>
<td>Bernd Dielacher</td>
<td>EVG Group (EVG)</td>
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<td>14:00</td>
<td>Poster Session 2 and Exhibit Inspection</td>
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<tr>
<td>16:00</td>
<td>Break</td>
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<td>16:30</td>
<td>Keynote Presentation</td>
<td>Catherine Alix-Panabieres</td>
<td>University Medical Center of Montpellier, FRANCE</td>
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<td>17:00</td>
<td>MICROFLUIDIC 3D CELL SIEVING FOR CLOGGING-FREE RARE CELL ENRICHMENT WITH HIGH-THROUGHPUT AND LARGE VOLUME</td>
<td>Jie Cheng1,2, Yiran Zhang1, Yifei Ye1,2, Xizhao Sui1, Mingxiao Li2, Wenjie Zhao1,2, Xinyu Wei2, Hongyan Guo3, Yang Zhao2, and Chengjun Huang1,2</td>
<td>Chinese Academy of Sciences, CHINA, National Engineering Research Center for Beijing Biochip Technology, CHINA, and Peking University People’s Hospital, CHINA</td>
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<tr>
<td>17:20</td>
<td>MICROFLUIDIC ISOLATION OF METABOLICALLY ACTIVE CIRCULATING TUMOR CELLS AND CIRCULATING STROMAL CELLS</td>
<td>Kinga Matula1, Francesca Rivello1, Alqara Pirusa1, Minke Smits2, Niven Mehra2, and Wilhelm T.S. Huck1</td>
<td>Radboud University, THE NETHERLANDS and Radboud Institute of Molecular Life Sciences, THE NETHERLANDS</td>
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<td>17:40</td>
<td>AUTOMATION &amp; INTEGRATION OF COMPUTER VISION ANALYSIS FOR IMMUNOTHERAPY RESEARCH WITH ON-CHIP CELL TRAPPING</td>
<td>Chris Tostado1, Joel Heng2, Lucas Ong1, Joel Voldman3, Ramanuj DasGupta2, and Yi-Chin Toh1</td>
<td>National University of Singapore, SINGAPORE, Genomic Institute of Singapore, SINGAPORE, and Massachusetts Institute of Technology, USA</td>
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Keynote Presentation
A POINT-OF-CARE IMMUNOASSAY PLATFORM FOR THYROID FUNCTION BASED ON HYDROGEL SENSORS EMBEDDED INSIDE A MICROFLUIDIC DEVICE
Jayeeta Pai, Mithila Azad, Bhavna Goyal, Rajiv Nair, Rakesh Sharma, and Dhananjaya Dendukuri
Achira Labs, INDIA

MICROGEL TEMPLATED DROPLET ELISA
Vishwesh Shah, Yilian Wang, Joseph de Rutte, Chueh-Yu Wu, and Dino Di Carlo
University of California, Los Angeles, USA

HIGHLY MULTIPLEXED DIGITAL ASSAYS VIA PHASE-CHANGING HYDROGEL BARCODE PARTICLES
Luis F. Alonzo, Samantha A. Byrnes, Priscilla Delgado, Toan Huynh, Bernhard H. Weigl, and Kevin P. Nichols
Intellectual Ventures Lab, USA

A LABEL-FREE PLASMO-FLUIDIC BIOSENSOR FOR ULTRASENSITIVE DETECTION OF VIRAL DISEASES
Xiangchao Zhu, Mustafa Mutlu, and Ahmet Ali Yanik
University of California, Santa Cruz, USA

Keynote Presentation
NANOFLUIDICS FOR ENERGY AND ENVIRONMENTAL APPLICATIONS
David Sinton
University of Toronto, CANADA

NANOFLUIDIC ENZYME REACTOR EXCEEDING LIMIT OF BULK REACTION RATE
Koki Yamamoto¹, Kyojiro Morikawa¹, Koreyoshi Imamura², Hiroyuki Imanaka², and Takehiko Kitamori¹
¹University of Tokyo, JAPAN and ²Okayama University, JAPAN

A NANOFLUIDIC MEMRISTOR BASED ON ION CONCENTRATION POLARIZATION
Yang Bu, Zisun Ahmed, and Levent Yobas
Hong Kong University of Science and Technology, HONG KONG

NANOFLUIDIC FABRICATION AND MANIPULATION OF ATTOLITER DROPLETS
Hiroto Kawagishi¹, Shuichi Kawamata¹, and Yan Xu²
¹Osaka Prefecture University, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

Adjourn for the Day
FluoSurf
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WEDNESDAY AT A GLANCE

08:15 - 08:30  Announcements

08:30 - 09:15  PLENARY PRESENTATION IV
Peng Yin
Harvard University, Boston, USA

09:15 - 09:30  Transition

09:30 - 10:30  SESSION 3A1
Detection and Analysis of Pathogens
SESSION 3B1
Devices for Detection and Imaging
SESSION 3C1
Surface Patterning

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

11:00 - 12:20  SESSION 3A2
Blood Cell and Blood Flow Analysis
SESSION 3B2
3D Writing and Printing
SESSION 3C2
Active Particles and Particle Assemblies

12:20 - 13:10  Grab ‘n Go Lunch

12:25 - 13:05  Industrial Stage 2 (Singapore Room)
SCHOTT NEXTERION®, PreSens Precision Sensing GmbH

13:10 - 13:55  PLENARY PRESENTATION V
Zulfiqar A. Bhutta
Hospital for Sick Children, Toronto, CANADA

13:55 - 14:15  Lab on a Chip and Dolomite – Pioneers in Miniaturization
Lectureship Prize and Presentation

14:15 - 16:45  Poster Session 3 and Exhibit Inspection

14:30 - 14:45  NIST and Lab on a Chip - Art in Science Award
(in Royal Society of Chemistry Booth Number 63, First Floor)

14:15 - 16:45  Break

16:45 - 18:15  SESSION 3A3
Spheroids and Organoids
SESSION 3B3
Manipulation of Cells
SESSION 3C3
Nanopores and Nanochannels

KEYNOTE PRESENTATION
Jianhua Qin

KEYNOTE PRESENTATION
Cullen R. Buie

KEYNOTE PRESENTATION
Sumita Pennathur

19:00 - 23:00  Conference Banquet

WEDNESDAY, 30 OCTOBER

08:15  Announcements

PLENARY PRESENTATION IV
Chair: Nicole Pamme, University of Hull, UK
San Francisco Room

08:30  ENGINEERING DNA DEVICES TO ADVANCE BIOIMAGING AND BIOSENSING
Peng Yin
Harvard University, Boston, USA

09:15  Transition
WEDNESDAY PROGRAM

Session 3A1 - Detection and Analysis of Pathogens
Chair: Jacqueline Linnes, Purdue University, USA

San Francisco Room

09:30 MULTIPLEX DROPLET PLATFORM FOR RAPID SINGLE-CELL ANTIBIÓGRAM
Pengfei Zhang, Aniruddha Kaushik, Kuangwen Hsieh, and Tza-Huei Wang
Johns Hopkins University, USA

09:50 EMBRACING CHAOS – A SIMPLIFIED PLATFORM FOR MULTIPLEXING DIGITAL ASSAYS IN POLYDISPERSE DROPLETS
Samantha A. Byrne, Tim Chang, Toan Huynh, Luis Alonzo, Caitlin E. Anderson, Lex Ball, Anna Astashkina, Jim McDermott, John Connelly, Bernhard H. Weigl, and Kevin P. Nichols
Intellectual Ventures Laboratory, USA

10:10 MICROFLUIDIC PCR-BASED DETECTION OF SUB-ATTOMOL PATHOGENIC DNA IN URINE USING HIERARCHICAL SELECTIVE ELECTROKINETIC PRECONCENTRATION
Wei Ouyang and Jongyoon Han
Massachusetts Institute of Technology, USA

Singapore Room

09:30 ELECTRICAL DETECTION OF PATHOGENS BEYOND THE LIMITATION OF DEBYE SCREENING USING GRAPHENE FIELD-EFFECT TRANSISTORS IN MICRODROPLETS
Takao Ono1, Yasushi Kanai1, Koichi Inoue1, Yohei Watanabe2, Shin-ichi Nakakita3, Toshio Kawahara4, Yasuo Suzuki4, and Kazuhiro Matsumoto1
1 Osaka University, JAPAN, 2 Kyoto Prefectural University of Medicine, JAPAN, 3 Kagawa University, JAPAN, and 4 Chubu University, JAPAN

09:50 MINIMAL INSTRUMENT IMMUNOASSAY SYSTEM BY CARTRIDGE-INTEGRATED INKJET PRINTED OPTICAL DETECTION SYSTEM
Sebastian Schattenschneider1, Falk Kemper2, Erik Beckert2, Peter Miethe3, Andreas Willems4, Holger Becker4, and Claudia Gärtner1
1 microfluidic ChipShop, GERMANY, 2 Fraunhofer IOF, GERMANY, 3 fzm GmbH, GERMANY, and 4 inno-train Diagnostik GmbH, GERMANY

10:10 MICROFLUIDIC DEVICE FOR BIOLOGICAL SAMPLES IMAGING WITH USE OF A MINIATURE MEMS TRANSMISSION ELECTRON MICROSCOPE
Michal Krysztof, Marcin Biaas, and Anna Górecka-Drzazga
Wrocław University of Science and Technology, POLAND
09:30 PIXELATED CHEMICAL DISPLAY: TOWARDS MASSIVELY PARALLEL DYNAMIC SURFACE PROCESSING
Pierre-Alexandre Goyette1, Dina Dorrigiv1,2, Maude Tremblay1, Kayla Simeone1,2, and Thomas Gervais1,2
1 Polytechnique Montréal, CANADA, 2 Institut du Cancer de Montréal, CANADA, and 3 Université de Montréal, CANADA

09:50 FACILE ASSEMBLY OF LARGE AREA CELL ARRAYS USING PATTERNED ELASTOMERIC SURFACES
Karla Perez-Toralla, Angel Olivera-Torres, Mark Rose, Ruiguo Yang, and Stephen Morin
University of Nebraska, USA

10:10 ELECTROKINETIC SCANNING PROBE FOR LOCALIZED SURFACE PATTERNING AND ANALYSIS
Nadya Ostromohov1,2, Baruch Rofman1, Moran Bercovici1, and Govind V. Kaigala2
1IBM Research – Zürich, SWITZERLAND and 2Technion-Israel Institute of Technology, ISRAEL

10:30 Speaker Corner (see page 7)

10:30 Break: Exhibit and Poster Inspection

Session 3A2 - Blood Cell and Blood Flow Analysis
Chair: Kae Sato, Japan Women’s University, JAPAN

11:00 DEFORMABILITY BASED CELL SORTING ENABLING QUALITY CONTROL OF STORED RED BLOOD CELLS
Emel Islamzada1,2, Kerryn Matthews1, Quan Guo1, Aline T. Santosou1, Mark D. Scott1,2, and Hongshen Ma1,3
1 University of British Columbia, CANADA, 2 Canadian Blood Services, CANADA, and 3 Vancouver General Hospital, CANADA

11:20 PLASMA GENERATION AND LABEL-FREE MONONUCLEAR CELL SEPARATION FROM WHOLE BLOOD BY ONE-STEP ACOUSTIC FOCUSING
Julia Alsved1, Anke Urbansky2, Pelle Ohlsson1, Klara Petersson1, Erling Nielsen1, Agnes Michanek1, and Per Augustsson2
1AcouSort AB, SWEDEN and 2Lund University, SWEDEN

11:40 FULLY AUTOMATED LAB-ON-A-DISC FOR LABEL-FREE ENRICHMENT OF HIGHLY PURE PLATELETS FROM WHOLE BLOOD
Chi-Ju Kim1,2, Dong Yeob Ki2, Juhee Park2, Vijaya Sunkara2, and Yoon-Kyong Cho1,2
1Ulsan National Institute of Science and Technology (UNIST), KOREA and 2Institute for Basic Science (IBS), KOREA

12:00 ARTIFICIAL MICROCIRCULATION REPLICAS USING BACKSIDE LITHOGRAPHY FOR BLOOD FLOW ANALYSIS
Marianne Fenech1,2, Vincent Giord2, Viviana Claveria3, Sebastien Meance3, Manouk Abkarian3, and Benoit Charlot3
1University of Ottawa, CANADA and 2University of Montpellier, FRANCE
### Singapore Room

**11:00** DIRECT LASER WRITING OF THREE-DIMENSIONAL GRAPHENE-LADEN MICROSTRUCTURES INSIDE ENCLOSED MICROFLUIDIC CHANNELS  
Michael A. Restaino¹,², Noah Eckman¹, Abdullah T. Alsharhan¹, Andrew C. Lamont¹, Asha J. Hall², and Ryan D. Sochol¹  
¹University of Maryland, USA and ²Army Research Laboratory, USA

**11:20** OPTO-FLUIDIC 3D PRINTING PLATFORM FOR CELL MICRO-ENVIRONMENT AND TISSUE ENGINEERING  
Sandrine Assié-Souleille, Julie Foncy, Victor Fournié, Godefroi Saint Martin, Rémi Courson, Louisa Boyer, Justine Creff, Arnaud Besson, Xavier Dollat, Julien Roul, Emmanuelle Trévisiol, and Laurent Malaquins  
Université de Toulouse, FRANCE

**11:40** MICRO-3D PRINTED NOZZLES AND MIXERS FOR TIME-RESOLVED STRUCTURAL BIOLOGY  
Juraj Kosa and Michael Heymann²  
¹CFEL, GERMANY and ²MPI of Biochemistry, GERMANY

**12:00** NEW 4D PRINTING USING DRY-ERASE MARKER  
Seo Woo Song¹, Sumin Lee¹, Jun Kyu Choe², Junwon Kang¹, Jiyun Kim², and Sunghoon Kwon¹  
¹Seoul National University, KOREA and ²Ulsan National Institute of Science and Technology (UNIST), KOREA

### Sydney Room

**11:00** MICROFLUIDIC FABRICATION OF HIERARCHICAL PHOTONIC CRYSTAL MICROSPHERES AND THEIR APPLICATIONS  
Juan Wang¹,², Hai Le-The², Lingling Shui¹, Johan G. Bomer², Loes I. Segerink², and Jan Eijkel²  
¹South China Normal University, CHINA and ²University of Twente, THE NETHERLANDS

**11:20** FABRICATION OF A POROUS MICROPARTICLE WHOSE TRANSPARENCY CHANGE ACCORDING TO THE SURROUNDING ENVIRONMENT  
Kibeom Kim and Wook Park  
Kyung Hee University, KOREA

**11:40** ACTIVE PARTICLES AS MOBILE MICROELECTRODES FOR UNIFIED, DIRECTED AND LABEL-FREE CARGO TRANSPORT AND DELIVERY  
Xiaoye Huo, Yue Wu, Sinwook Park, Alicia Boymelgreen, and Gilad Yossifon  
Technion - Israel Institute of Technology, ISRAEL

**12:00** LIGHT-DRIVEN MICRO-ROBOT FOR MICRO-PARTICLE AND CELL MANIPULATION  
Shuailong Zhang¹, Erica Scott¹, Nika Shakiba¹, Peter W. Zandstra¹ ², and Aaron R. Wheeler¹  
¹University of Toronto, CANADA and ²University of British Columbia, CANADA

**12:20** Grab ‘n Go Lunch
12:25  2a – DIAGNOSTIC CONSUMABLES: WHERE IS THIS CHALLENGING MARKET HEADED?
James Downs
SCHOTT NEXTERION®, GERMANY

12:45  2b – SENSORS FOR ONLINE MONITORING OF O₂, PH AND CO₂ IN MICROFLUIDICS
Daniela Obermaier
PreSens Precision Sensing GmbH, GERMANY

PLENARY PRESENTATION V
Chair: Emmanuel Delamarche, IBM Research – Zürich, SWITZERLAND

13:10  ADDRESSING NEWBORN SURVIVAL GLOBALLY: THE ROLE OF INNOVATIONS IN MOVING FROM POLICY TO ACTION
Zulfiqar A. Bhutta¹,²
¹Hospital for Sick Children, Toronto, CANADA and
²Aga Khan University, PAKISTAN

13:55  Lab on a Chip and Dolomite – Pioneers in Miniaturization
Lectureship Prize and Presentation
Prize Recipient: Hang Lu, Georgia Institute of Technology, USA

14:15  Speaker Corner (see page 7)

14:15  Poster Session 3 and Exhibit Inspection
Ground Floor and First Floor
Poster presentations are listed by topic category with their assigned number starting on page 40.

14:30  NIST and Lab on a Chip - Art in Science Award
(in Royal Society of Chemistry Booth Number 63)

16:15  Break
Session 3A3 - Spheroids and Organoids  
Chair: Olivier Frey, InSphero AG, SWITZERLAND

San Francisco Room

16:45 **Keynote Presentation**  
ORGANOIDS-ON-CHIPS TO ADVANCE HEALTH SCIENCE  
Jianhua Qin  
Dalian Institute of Chemical Physics, CHINA

17:15 **MULTI-STEP IMMUNOSTAINING TOOL FOR SPHEROID ARRAY USING DROPLET CONTACT-BASED SPHEROID TRANSFER**  
Hwisoo Kim, Hyewon Roh, Chang Hyun Cho, and Je-Kyun Park  
Korea Advanced Institute of Science and Technology (KAIST), KOREA

17:35 **OPTIMIZING CO-CULTURE MEDIUM CONDITION FOR THE INTEGRATION OF KIDNEY ORGANOID AND VASCULAR BED**  
Ryu Okada, Yoshikazu Kameda, Kensuke Yabuuchi, Toshikazu Aroaka, Jun K. Yamashita, Tatsuiji Enoki, Minoru Takasato, Kenji Osatune, and Ryuji Yokokawa  
1Kyoto University, JAPAN, 2RIKEN, JAPAN, and 3Takara Bio Inc., JAPAN

17:55 **BRIDGING THE GAP: A MICROFLUIDIC DEVICE FOR STUDYING ORGANOTYPIC BARRIER TISSUES**  
1Colorado State University, USA and 2Applied Medical, USA

Session 3B3 - Manipulation of Cells  
Chair: Ashleigh Theberge, University of Washington, USA

Singapore Room

16:45 **Keynote Presentation**  
AUTOMATED MICROFLUIDIC GENETIC MANIPULATION FOR HIGH THROUGHPUT BIOLOGY  
Po-Hsun Huang, Sijie Chen, and Cullen R. Buie  
Massachusetts Institute of Technology, USA

17:15 **INTRACELLULAR DELIVERY OF ACTIVE BIOMOLECULES THROUGH VORTEX-INDUCED CELL DEFORMATION**  
Jeongsoo Hur and Aram J. Chung  
Korea University, KOREA

17:35 **DIELECTROPHORESIS REVEALS THAT BACTERIAL ELECTROPORATION CORRELATES WITH CELL POLARIZABILITY**  
Qianru Wang, Sijie Chen, and Cullen R. Buie  
1Stanford University, USA and 2Massachusetts Institute of Technology, USA

17:55 **VERSATILE ENGINEERING OF LYSINS: ONE DROP TO KILL**  
Hans Gerstmans, Fabrice Gielens, Lorenz Van Hileghem, Rob Lavigne, Florian Hollfelder, Jeroen Lammertyn, and Yves Briers  
1Ghent University, BELGIUM, 2KU Leuven, BELGIUM, 3University of Exeter, UK, and 4University of Cambridge, UK
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| 16:45 | **Keynote Presentation**                                                       | BIPOLAR ELECTRODES FOR MICROFLUIDIC PUMPING                                                         | Alexander Eden, Farnaz Lorestani, Sean MacKenzie, Rena Yang, David Huber, Carl D. Meinhart, and Sumita Pennathur  
University of California, Santa Barbara, USA                                                  |
| 17:15 | **CONTROLLING DNA FLOW IN NANOCHANNELS USING TOPOGRAPHY**                       | Franziška M. Esmek and Irene Fernandez-Cuesta                                                       | Hamburg University, GERMANY                                                                             |
| 17:35 | **NANOPOR DECODING FOR MICRORNA PATTERN OF CANCER WITH DNA COMPUTATION**      | Nanami Takeuchi, Moe Hiratani, Asuka Tada, and Ryuji Kawano                                          | Tokyo University of Agriculture and Technology, JAPAN                                                   |
| 17:55 | **SINGLE MOLECULE ELECTRICAL IDENTIFICATION OF EPIGENETIC VARIATIONS BY NANOFUID INTEGRATED NANOGAP DEVICES** | Takahito Ohshiro, Yuuki Komoto, Masamitsu Konno, Jun Koseki, Ayumu Asai, Hideshi Ishii, and Masateru Taniguchi | Osaka University, JAPAN                                                                                  |

18:15 Adjourn for the Day

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**Conference Banquet**

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<td>19:00</td>
<td>Join us at ZicZac to enjoy “Real Food Good Mood” with live entertainment and network with colleagues. As of the printing of this program, there are a few tickets remaining for purchase. Please visit the Onsite Conference Registration Desk for availability. Please note that transportation will not be provided by the conference. Check with your hotel front desk for directions on how to take Tram number 6 to the Morgartenring stop across from ZicZac using your BaselCard.</td>
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<td>23:00</td>
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Pasturel et al., Biochips, 2018

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Décourt et al., Lab Chip, 2018

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<td>08:45 - 10:15</td>
<td>Droplet Microfluidics Interfaced with Mass Spectrometry</td>
<td>Wearables</td>
<td>Biofibers Dynamics and Assemblies at the Microscale</td>
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<td>Detlev Belder</td>
<td>Stéphanie P. Lacour</td>
<td>Rikiya Watanabe</td>
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<td>10:15 - 10:45</td>
<td>Break: Exhibit and Poster Inspection</td>
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<tr>
<td>10:45 - 11:45</td>
<td>Analysis of Neutrophils for Diagnosis of Sepsis and Inflammation</td>
<td>Centrifugal Platforms</td>
<td>Gas Control for Cells</td>
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<td>11:45 - 11:50</td>
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<td>11:50 - 12:35</td>
<td>PLENARY PRESENTATION VI</td>
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<td>12:35 - 12:45</td>
<td>CHEMINAS - Young Researcher Poster Awards</td>
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<td>12:45 - 12:55</td>
<td>Lab on a Chip - Widmer Poster Award</td>
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<td>12:55 - 13:05</td>
<td>IMT Masken und Teilungen AG – Microfluidics on Glass Poster Award</td>
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<td>13:05 - 13:15</td>
<td>Sensors (MDPI) - Outstanding Sensors and Actuators, Detection Technologies Poster Award</td>
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<td>13:15</td>
<td>Closing Remarks - Conference Adjourns</td>
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<tr>
<td>08:45</td>
<td><strong>Keynote Presentation</strong></td>
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<tr>
<td></td>
<td><strong>INTERFACING DROPLET CHIPS TO MASS SPECTROMETRY</strong></td>
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<td></td>
<td>Detlev Belder, Leipzig University, GERMANY</td>
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<td></td>
<td><strong>HIGH-THROUGHPUT X-RAY CRYSTALLOGRAPHY BASED ON THE</strong></td>
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<td></td>
<td><strong>PROTEIN CRYSTAL ARRAY</strong></td>
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<tr>
<td></td>
<td>Reo Takeda¹, Masatoshi Maeki¹, Sho Ito², Go Ueno²,</td>
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<td>Kunio Hirata², Akihiko Ishida¹, Hirofumi Tani¹,</td>
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<td>Masaki Yamamoto¹, and Manabu Tokeshi¹</td>
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<td>¹ Hokkaido University, JAPAN, ²RIKEN, JAPAN, and</td>
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<td>³ University of Hyogo, JAPAN</td>
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<tr>
<td>09:35</td>
<td><strong>MASSIVE SCREENING OF METABOLITES USING PICOLITER DROPLET</strong></td>
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<td></td>
<td><strong>ARRAY WITH NANOSTRUCTURE-INITIATOR MASS SPECTROMETRY</strong></td>
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<td></td>
<td>Noel S. Ha¹,², Markus de Raad¹, Fangchao Song¹, Kai Deng¹,²,</td>
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<td>Nicole Ing²,³, Anup K. Singh¹,², and Trent R. Northen¹,²,³</td>
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<tr>
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<td>¹ Lawrence Berkeley National Laboratory, USA, ²US Department of Energy</td>
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<td>Joint BioEnergy Institute, USA, ³US Department of Energy Joint Genome</td>
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<td>Institute, USA, and ⁴Sandia National Laboratories, USA</td>
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<tr>
<td>09:55</td>
<td><strong>MULTI-OMIC DIGITAL MICROFLUIDIC APPROACH TO</strong></td>
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<td><strong>CHARACTERIZATION OF THE NEURAL STEM</strong></td>
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<td>Erica Y. Scott, Calvin Chan, Betty Li, Harrison Edwards, Julian Lamanna,</td>
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<td>Filip Stojic, Cindi Morshed, and Aaron Wheeler</td>
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<td>University of Toronto, CANADA</td>
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**Session 4B1 - Wearables**

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<td><strong>Keynote Presentation</strong></td>
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<td></td>
<td><strong>SKIN-LIKE, MICROFABRICATED GALLIUM-BASED SENSORS FOR MOTION CAPTURE</strong></td>
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<td></td>
<td>Laurent Dejace, Arthur Hirsh, and Stéphanie P Lacour</td>
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<td></td>
<td>École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND</td>
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<tr>
<td>09:15</td>
<td><strong>ORGANIC TRANSDERMAL IONTOPHORESIS PATCH POWERED BY</strong></td>
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<td></td>
<td><strong>SERIALIZED LAYER-BUILT BIOFUEL CELLS</strong></td>
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<td></td>
<td>Takaya Mizuno, Kaito Sato, Shinya Kusama, Shotaro Yoshida, and Matsuhiko</td>
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<td>Nishizawa</td>
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<td>Tohoku University, JAPAN</td>
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<td>09:35</td>
<td><strong>METAL WIRING ON FLEXIBLE ORIGAMI STRUCTURE FOR STABLE</strong></td>
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<td><strong>RESISTANCE VALUE AGAINST DEFORMATION</strong></td>
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<td>Takuya Uchida¹, Hiroki Yasuaga², Eiji Iwase³, and Hiroaki Onoe¹</td>
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<td>¹ Keio University, JAPAN and ²Waseda University, JAPAN</td>
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<td>09:55</td>
<td><strong>MEDIATOR-FREE WEARABLE ENZYMATIC SENSING TO MITIGATE</strong></td>
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<td><strong>IONIC AND ELECTROACTIVE INTERFERENCE FOR RELIABLE</strong></td>
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<td><strong>OPERATION IN COMPLEX BIOFLUID</strong></td>
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<td>Bo Wang, Yichao Zhao, Hannaneh Hojajii, Minsoo Kim, and Sam Emaminejad</td>
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<td>University of California, Los Angeles, USA</td>
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### Sydney Room

**THURSDAY PROGRAM**

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<tr>
<th>Time</th>
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</thead>
</table>
| 08:45  | **Keynote Presentation**  
MICRORSYSTEMS FOR SINGLE MOLECULE ANALYSIS OF MEMBRANE PROTEINS  
Rikiya Watanabe  
RIKEN, JAPAN |                                                                                                                                  |
| 09:15  | **INFLUENCE OF TOPOLOGICAL CONSTRAINTS ON DIFFERENTIATION AND ALIGNMENT OF MULTINUCLEATED MYOTUBES**  
Ki-Young Song1,2, Jorge Correia2, Gorge L. Ruas2, and Ana I. Teixeira2  
1Beijing Institute of Technology, CHINA and 2Karolinska Institutet, SWEDEN |                                                                                                                                  |
| 09:35  | **ASSEMBLY OF ACTOMYOSIN BUNDLES IN MICROFLUIDIC CHANNEL**  
Shusei Kawara1, Yuichi Hiratsuka2, and Hiroaki Onoe1  
1Keio University, JAPAN and 2Japan Advanced Institute Science Technology (JAIST), JAPAN |                                                                                                                                  |
| 09:55  | **INVESTIGATING FIBROBLAST-INDUCED COLLAGEN GEL CONTRACTION USING A DYNAMIC MICROSCALE PLATFORM**  
Tianzi Zhang1, John H. Day1, Xiaojing Su1, Arturo G. Guadarrama2, Nathan K. Sandbo2, Stephane Esnault2, Loren C. Denlinger2, Erwin Berthier1, and Ashleigh B. Theberge1,3  
1University of Washington, USA, 2University of Wisconsin, USA, and 3University of Wisconsin School of Medicine and Public Health, USA |                                                                                                                                  |

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**Sydney Room**

**Session 4C1 - Biofibers Dynamics and Assemblies at the Microscale**  
Chair: Tom Robinson, Max Planck Institute of Colloids and Interfaces, GERMANY

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<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 10:45  | **RAPID MONITORING OF SEPSIS BY INTEGRATION OF SPIRAL INERTIAL MICROFLUIDICS AND ISODIELECTRIC SEPARATION**  
Do-Hyun Lee1, Hyungkook Jeon1, Bakr Jundi2, Rebecca M. Baron2, Bruce D. Levy2, Jongyoon Han1, and Joel Voldman1  
1Massachusetts Institute of Technology, USA and 2Harvard Medical School, USA |                                                                                                                                  |
| 11:05  | **EARLY SEPSIS DIAGNOSIS BY MEASURING NEUTROPHIL SPONTANEOUS MIGRATION AND RESIDUAL-PHAGOCYTOSIS USING MICROFLUIDICS**  
Sinan Muldur1, Anika Marandi1, Andreu Cullere1, Jarone Lee2, Michael Filbin1, Felix Ellett1, and Daniel Irimia1  
1Massachusetts General Hospital, USA, 2Harvard Medical School, USA, and 3Shriners Burns Hospital, USA |                                                                                                                                  |
| 11:25  | **LABEL-FREE IMPEDANCE MAPPING OF NEUTROPHIL DYNAMIC IMMUNE RESPONSES FOR RAPID MULTI-PARAMETRIC INFLAMMATORY PROFILING**  
Chayakorn Petchakup1, Sheng Yuan Leong1, Hui Min Tay1, Rinkoo Dalan2, King Ho Holden Li1, and Han Wei Hou1  
1Nanyang Technological University, SINGAPORE and 2Tan Tock Seng Hospital, SINGAPORE |                                                                                                                                  |

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**San Francisco Room**

**Session 4A2 - Analysis of Neutrophils for Diagnosis of Sepsis and Inflammation**  
Chair: Tohid Didar, McMaster University, CANADA

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1Nanyang Technological University, SINGAPORE and 2Tan Tock Seng Hospital, SINGAPORE |                                                                                                                                  |
THURSDAY PROGRAM

Session 4B2 - Centrifugal Platforms
Chair: Roland Zengerle, University of Freiburg, GERMANY

Singapore Room

10:45 MINIATURIZED ALL-IN-ONE POWERED LAB ON A DISC PLATFORM
Edwin En-Te Hwu, Marlitt Viehrig, Sriram Thoppe Rajendran,
Laura Serioli, Kinga Zór, and Anja Boisen
Technical University of Denmark, DENMARK

11:05 AUTOMATING PROTEIN IMMUNOPRECIPITATION IN CENTRIFUGAL MICROFLUIDICS
Daniel Brassard1, Jamal Daoud1, Liviu Clime1, Matthias Geissler1,
Lidija Malic1, Denis Charlebois2, and Teodor Veres1
1National Research Council, CANADA and
2Canadian Space Agency, CANADA

11:25 AUTOMATION AND INTEGRATION OF A CENTRIFUGAL MICRODEVICE FOR DNA PURIFICATION USING DYNAMIC SOLID PHASE EXTRACTION AND NOVEL LASER-ACTUATED VALVING
Leah M. Dignan1, Kimberly R. Jackson1, M. Shane Woolf1,
Christopher J. Tomley1, and James P. Landers1,2
1University of Virginia, USA and 2MicroLab Inc., USA

Session 4C2 - Gas Control for Cells
Chair: Yi-Chin Toh, National University of Singapore, SINGAPORE

Sydney Room

10:45 INVESTIGATION OF DRUG METABOLISM WITH LIVER ZONATION MODEL USING OXYGEN GRADIENT IN A MICROFLUIDIC DEVICE
Satomi Matsumoto1, Eric Leclerc2, Astia Riziki Safitri1, Mathieu Danoy3,
Toshiro Maekawa1, Haruyuki Kinoshita1, Marie Shinohara1,
Kikuo Komori1, Yasuyuki Sakai3, and Teruo Fujii1
1University of Tokyo, JAPAN and 2LIMMS/CNRS-IIS, JAPAN

11:05 A MICROFLUIDIC OXYGENATOR WITH LARGE GAS EXCHANGE SURFACE
Julie Lachaux1, Gilgueng Hwang1, Caterina Casari2,
Nassim Arouche1, Valeria Lotito1, Allisier Paris1,
Cécile V. Denis2, Peter S. Lenting2, Georges Uzan2,
Pierre Molinie1, Olaf Mercier1,
and Anne-Marie Haghiri-Gosnet1
1C2N CNRS, FRANCE, 2Institut National de la Santé et de la Recherche Médicale (INSERM), FRANCE; and 3HML, FRANCE

11:25 3D PRINTED DEVICES FOR 96-WELL GAS CONTROL
Adam Szmelter, Jason Jacob, and David T. Eddington
University of Illinois, Chicago, USA

11:45 Transition
### THURSDAY PROGRAM

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<td>Michael Graf, Martina Lihter, Michal Macha, Sanjin Marion, and Aleksandra Radenovic</td>
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<td>12:35</td>
<td>CHEMINAS - Young Researcher Poster Awards</td>
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<td>12:45</td>
<td>Lab on a Chip - Widmer Poster Award</td>
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<td>Closing Remarks</td>
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<td>13:20</td>
<td>Speaker Corner (see page 7)</td>
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<tr>
<td>13:20</td>
<td>Closing Remarks - Conference Adjourns</td>
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Congress Center Basel
POSTER PRESENTATIONS

CLASSIFICATION

a Cells, Organisms and Organs on a Chip
b Chemical Applications: Separations, Mixers and Reactions
c Diagnostics, Drug Testing & Personalized Medicine
d Fundamentals in Microfluidics and Nanofluidics
e Micro- and Nanoengineering
f Sensors and Detection Technologies
g Other Applications of Microfluidics
h Late News

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

a - Cells, Organisms and Organs on a Chip

Bioinspired, Biomimetic & Biohybrid Devices

M001.a ANTI-FOULING SURFACES FEATURED WITH MAGNETIC ARTIFICIAL CILIA
Shuaizhong Zhang1, Ye Wang1, Patrick R. Onck2, and Jaap M.J. den Toonder1
1Eindhoven University of Technology, THE NETHERLANDS and 2University of Groningen, THE NETHERLANDS

M002.a BIOMECHANICALLY TUNED LUNG-ON-CHIP: TUNING INTRINSIC STIFFNESS OF THE AIR-LIQUID INTERFACE AND ON-CHIP ORIENTATION OF MEMBRANE STRAIN
Lisa D. Muiznieks, Jessica Ayache, Sasha Cai Lesher-Perez, and Guilhem Velvé Casquillas
Elvesys, FRANCE

M003.a SENSING OF OXYGEN CONCENTRATION IN A MICROFLUIDIC DEVICE MIMICKING LIVER 3D MICROARCHITECTURE
Manon Boul1,2, Satomi Matsumoto3, Marie Shinohara3, Yasuyuki Sakai3, Teruo Fuji3, Anne Dubart-Kupperschmitt3, Eric Leclerc3, and Bruno Le Pioufle3
1ENS Paris Saclay, FRANCE, 2Université Paris-Saclay, FRANCE, and 3Tokyo University, JAPAN

T001.a BIOSENSING AND POWER GENERATION ROBOTS USING ANHYDROBIOMIC CHIRONOMID FOR SPACE EXPLORING
Yo Tanaka1, Satoshi Amaya1, Doudou Ma1, Yigang Shen1, Oleg Gusev2,3, Takahiro Kikawada1, and Yaxiaer Yalikun1
1RIKEN, JAPAN, 2NARO, JAPAN, and 3Kazan Federal University, RUSSIA

T002.a MICROFLUIDIC FABRICATION OF BIO-ACTUATORS DRiven BY ARTIFICIAL MUSCLES MADE FROM MOLECULAR MOTORS
Yingzhe Wang1, Yuichi Hiratsuka2, Takahiro Nitta2, Kaoru Uesugi1, and Kehsuke Morishima1
1Osaka University, JAPAN, 2Japan Advanced Institute of Science and Technology (JAIST), JAPAN, and 3Gifu University, JAPAN
### Bioinspired, Biomimetic & Biohybrid Devices

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<th>T003.a</th>
<th>STEREOLITHOGRAPHY (SLA) 3D PRINTED TEMPLATES FOR ENGINEERING PERFUSABLE BIOMIMETIC VASCULATURES IN ALGINATE HYDROGEL</th>
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<tr>
<td></td>
<td>Terry (Tsz Him) Ching¹,², Toh Yi-Chin², and Michinao Hashimoto¹</td>
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<td>¹Singapore University of Technology and Design, SINGAPORE and ²National University of Singapore, SINGAPORE</td>
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<td>Kotaro Doi¹, Hiroshi Kimura², Masaomi Nangaku¹, and Teruo Fujii¹</td>
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<td>¹University of Tokyo, JAPAN and ²Tokai University, JAPAN</td>
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<th>W002.a</th>
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### a - Cells, Organisms and Organs on a Chip

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<td></td>
<td>Byeongyeon Kim, Suyeon Shin, and Sungyoung Choi</td>
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<th>M005.a</th>
<th>DIELECTROPHORETIC CANCER-TYPE SORTING CHIP AS ADVANCED LIQUID BIOPSY</th>
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<tr>
<td></td>
<td>Yuto Sasaki, Mio Mizoguchi, Ken Yamamoto, and Masahiro Motosuke</td>
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<th>M006.a</th>
<th>MICROFLUIDIC CHIP FOR T CELL-ANTIGEN PRESENTING CELL INTERACTION CHARACTERIZATION</th>
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<td></td>
<td>Margaux Duchamp¹, Marion Arnaud², Clarisse Vaillier¹, Sara Bobisse², George Coukos², Alexandre Harari², and Philippe Renaud¹</td>
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<td>¹École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND, ²Centre Hospitalier Universitaire Vaudois, SWITZERLAND, and ³Université de Lausanne, SWITZERLAND</td>
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<td>Jolien Breukers, Sara Horta, Nick Geuken, Karen Vanhoorebeke, and Jeroen Lammertyn</td>
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<td>KU Leuven, BELGIUM</td>
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### Cell Capture, Counting, & Sorting

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### Bioinspired, Biomimetic & Biohybrid Devices

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<td>Terry (Tsz Him) Ching¹,², Toh Yi-Chin², and Michinao Hashimoto¹</td>
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<td>Kotaro Doi¹, Hiroshi Kimura², Masaomi Nangaku¹, and Teruo Fujii¹</td>
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<th>W002.a</th>
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<td>Byeongyeon Kim, Suyeon Shin, and Sungyoung Choi</td>
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¹Ajou University, KOREA and ²ETH Zürich, SWITZERLAND

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

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1ETH Zürich, SWITZERLAND, 2Hoffmann-La Roche, SWITZERLAND, 3InSphero AG, SWITZERLAND, and 4University of Basel, SWITZERLAND

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1IEMN UMR-8520, FRANCE, 2UNIROUEN, INSERM, DC2N, FRANCE, 3LIMMS/CNRS-IIS, JAPAN, 4Institute for Research and Innovation in Biomedicine (IRIB), FRANCE, and 5Ligue Nationale Contre le Cancer, FRANCE

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1University of Tokyo, JAPAN and 2KRISTEC, JAPAN

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1 University of Bremen, GERMANY, 2 Jacobs University, GERMANY, and 3 Ionovation GmbH, GERMANY

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1 LAAS-CNRS, FRANCE, 2 University of Florence, ITALY, and 3 Université de Toulouse, FRANCE

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1 École de Technologie Supérieure, CANADA, 2 Tecnológico de Monterrey, MEXICO, 3 Université du Québec à Montréal, CANADA, 4 Khalifa University, UAE, and 5 Concordia University, CANADA

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1ETH Zürich, SWITZERLAND and 2InSphero AG, SWITZERLAND

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1York University, CANADA and 2University of Toronto, CANADA

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

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École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
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University of Twente, THE NETHERLANDS

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1Eindhoven University of Technology, THE NETHERLANDS and 2Åbo Akademi University, FINLAND

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1Southern University of Science and Technology, CHINA and 2University of Hong Kong, CHINA

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1University of Bern, SWITZERLAND, 2Helmholtz-Institute for Pharmaceutical Research Saarland (HIPS), GERMANY, 3Völklingen Heart Center, GERMANY, and 4University Hospital of Bern, SWITZERLAND

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1Institute of Industrial Science, JAPAN, 2Tokai University, JAPAN, and 3University of Tokyo, JAPAN

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1Kyoto University, JAPAN, 2Center for iPS Cell Research and Application, JAPAN, 3Takara Bio, JAPAN, and 4RIKEN, JAPAN

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1University of Hull, UK and 2Hull York Medical School, UK

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1University of Miami, USA and 2University of Miami Miller School of Medicine, USA
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ETH Zürich, SWITZERLAND

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Sertan Sukas1,2, Albert van den Berg1, Leon Terstappen1, and Séverine Le Gac1
1 University of Twente, THE NETHERLANDS and 2 Vrije Universiteit Brussel, BELGIUM

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Stony Brook University, USA

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Kyohei Terao¹, Hamizah Cognart², Jean-Louis Viovy², and Catherine Villard²
¹Kagawa University, JAPAN, and ²Institut Curie, FRANCE

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¹National University of Singapore, SINGAPORE and ²Healthtech, SINGAPORE

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¹Southeast University, CHINA, ²Nanjing Forestry University, CHINA, ³Sun Yat-Sen University, CHINA, and ⁴Soochow University, CHINA

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¹Yale University, USA, ²Yale Cancer Center and Yale Stem Cell Center, USA, and ³Memorial Sloan Kettering Cancer Center, USA

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¹Singapore-MIT Alliance for Research and Technology, SINGAPORE and ²National University of Singapore, SINGAPORE

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¹Radboud University, THE NETHERLANDS and ²Aduro Biotech Europe, THE NETHERLANDS

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¹University of California, Los Angeles, USA and ²University of California, Berkeley, USA

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Alinaghi Salari¹,², Appak-Baskoy¹,², Michael Kolios¹,², and Scott Tsai¹,²
¹Institute for Biomedical Engineering, Science and Technology (iBEST), CANADA and ²Ryerson University, CANADA

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¹Indian Institute of Technology (IITM), INDIA, ²University of Cambridge, UK, and ³National Tsing Hua University, TAIWAN

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Yanqing Song¹, Andrew Glidle¹, Christopher Quince², Gavin Collins³, William Sloan¹, and Huabing Yin¹
¹University of Glasgow, UK, ²University of Warwick, UK, and ³National University of Ireland, IRELAND
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¹Max Planck Institute, GERMANY, ²University of Tokyo, JAPAN, ³University of Washington, USA, and ⁴Jiangsu Normal University, CHINA

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Taishi Tonooka¹, Lev Tsimring², and Jeff Hasty²
¹Kyoto Institute of Technology, JAPAN and ²University of California, San Diego, USA

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¹University of Ulsan, KOREA and ²University of Ulsan College of Medicine, KOREA
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1Kyoto University, JAPAN, 2RIKEN, JAPAN, and 3Takara Bio Inc., JAPAN

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1University of Ulsan, KOREA and 2University of Ulsan College of Medicine, KOREA

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1National Tsing Hua University, TAIWAN and 2Academia Sinica, TAIWAN

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University of Prince Edward Island, CANADA

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Hiroaki Ito1, Kohei Fujimoto2, and Makoto Kaneko3
1Chiba University, JAPAN, 2Osaka University, JAPAN, and 3Meijo University, JAPAN

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1Dankook University, KOREA, 2Hanbat National University, KOREA, 3Seoul National University, KOREA, and 4Korea Institute of Machinery and Materials (KIMM), KOREA

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1Daegu Gyeongbuk Institute of Science and Technolog (DIGIST), KOREA and 2Transitional Responsive Medicine Center (TRMC), KOREA
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Alberto Mantegazza, Francesco Clavica, and Dominik Obrist  
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Lucas P. Bressan, Taissa M.S. Lima, Géssica D. da Silveira, and José A.F. da Silva  
State University of Campinas, BRAZIL

**T051.b** AUTOMATED CAPILLARY DROPLET REACTOR FOR THE SYNTHESIS OF IRON OXIDE GOLD CORE-SHELL NANOPARTICLES  
Christian D. Ahrberg, Ji Wook Choi, and Bong Geun Chung  
Sogang University, KOREA

**T052.b** ON-CHIP SYNTHESIS OF Au NANOPARTICLES BY MICROWAVE-INDUCED REACTION IN MICROCHANNEL EMBEDDED IN THE POST-WALL WAVEGUIDE  
Akinobu Yamaguchi1, Mitsuyoshi Kishihara2, Takao Fukuoka1, Masaya Takeuchi1, and Yuichi Utsumi1  
1University of Hyogo, JAPAN and 2Okayama Prefectural University, JAPAN

**W052.b** COFFEE CUP-SIZED MICRODROPLET RADIOSYNTHESIZER  
Jia Wang, Philip H. Chao, and R. Michael van Dam  
University of California, Los Angeles, USA

**W053.b** PARTICLE ENCAPSULATION IN MICROFLUIDIC DROPLETS WITH MASS-SPECTROMETRIC INVESTIGATION OF HETEROGENEOUS REACTIONS  
Monique Kretzschmar and Detlev Belder  
Leipzig University, GERMANY
M054.b COUPLING ON-CHIP SEPARATIONS TO ION MOBILITY SPECTROMETRY  
Nora T. Hartner, Sebastian K. Piendl, Christian-Robert Raddatz, Christian Thoßen, Rico Warias, Stefan Zimmermann, and Detlev Belder  
Leipzig University, GERMANY

M055.b PAPER MICROFLUIDIC CASSETTE INTEGRATED WITH PINCHING ELECTRODES FOR SPRAY PLUM FOCUSING AND HIGH PERFORMANCE MS DETECTIONS  
Yi-Chieh Li and Che-Hsin Lin  
National Sun Yat-sen University, TAIWAN

M056.b TOWARDS USB POWERED μPADS: 5 VOLT PAPER ISOTACHOPHORESIS  
Federico Schaumburg1, Pablo A. Kler1, Claudio L.A. Berlii1, and Charles S. Henry2  
1Universidad Nacional del Litoral-CONICET, ARGENTINA and 2Colorado State University, USA

T053.b CONTINUOUS BINARY PROTEIN SEPARATION IN A MICROFABRICATED ELECTRICAL SPLITT DEVICE  
Andrea Capuano1,2, Andrea Adami1, Viviana Mulloni1, and Leandro Lorenzelli1  
1University of Trento, ITALY and 2Fondazione Bruno Kessler, ITALY

T054.b DEVELOPMENT OF ON-LINE DESALTING DEVICE BY MEMBRANE INTEGRATION INTO NANOFLUIDIC DEVICE  
Kyojiro Morikawa, Yutaka Kazoe, Hisashi Shimizu, Kazuma Mawatari, and Takehiko Kitamori  
University of Tokyo, JAPAN

T055.b SINGLE STEP SEPARATION AND CONCENTRATION OF BIOMARKER PROTEINS USING AGAROSE BASED MINIATURIZED ISOELECTRIC GATES FOR BEDSIDE DIAGNOSTICS  
Sreekant Damodara1, Alison E. Fox-Robichaud1,2, Dhruba J. Dwivedi1,2, Patricia C. Liaw1,2, and P. Ravi Selvaganapathy1  
1McMaster University, CANADA and 2Thrombosis and Atherosclerosis Research Institute, CANADA

W054.b CONTINUOUS LITHIUM EXTRACTION FROM HIGH MG2+/LI+ RATIO BRINE BASED ON ION CONCENTRATION POLARIZATION  
Minsoo Lee1, Hyukjin J. Kwon2, Woohul Jung3, and Geunbae Lim1  
1Pohang University of Science and Technology, KOREA, 2Massachusetts Institute of Technology, USA, and 3Research Institute of Industrial Science and Technology, KOREA
W055.b  MICROSCALE FORMATION OF IMMOBILIZED pH GRADIENT IN SIMPLE STRAIGHT CHANNEL  
Sukyo Joung¹, Dohyun Kim², Jintae Kim³, and Minsub Chung⁴  
¹Hongik University, KOREA, ²Myongji University, KOREA, and ³Konkuk University, KOREA

W056.b  SMALL RNA EXTRACTION FROM CELL-LYSATE USING ISOTACHOPHORESIS  
Ruba Khnouf¹, Crystal Han², and Sarah Munro³  
¹Jordan University of Science and Technology, JORDAN, ²San Jose State University, USA, and ³University of Minnesota, USA

M057.b  EVALUATION OF MIXING PERFORMANCE OF ON-CHIP MICROMIXER WITH LOW DEAD VOLUME BASED ON VIBRATION-INDUCED FLOW  
Toshiyuki Matsui, Hiroaki Suzuki, and Takeshi Hayakawa  
Chuo University, JAPAN

M058.b  ORGANIC CHEMICAL REACTION ON AN ELECTROWETTING-ON-DIELECTRIC (EWOD) DIGITAL MICROFLUIDIC DEVICE  
Matin Torabinia, Parham Asgari, Junha Jeon, and Hyejin Moon  
University of Texas, Arlington, USA

M059.b  THREE-DIMENSIONAL LAMINAR-FLOW MICROMIXER FOR KINETIC STUDIES OF INCREASED ACCURACY THROUGH A PRE-FOCUSED STREAM INJECTION  
Sheng Ni and Levent Yobas  
Hong Kong University of Science and Technology, HONG KONG

T056.b  3D HELICAL MICROMIXER BY LOST WAX CASTING  
Daiki Tachibana, Ken Matsubara, Yoshimi Tanaka, Hiroki Ota, and Ohmi Fuchiwaki  
Yokohama National University, JAPAN

T057.b  DRUG MICRONIZATION USING HIGH PRESSURE MICROFLUIDICS  
Deepali Arora¹, Rossen Sedev², Craig Priest³, Chau Chun Beh⁴, and Neil Foster⁵  
¹Curtin University, AUSTRALIA and ²University of South Australia, AUSTRALIA

T058.b  PILOT-SCALE SOLVENT EXTRACTION OF HIGH-VALUE METALS  
Die Yang, Moein N. Kashani, and Craig Priest  
University of South Australia, AUSTRALIA

T059.b  VERSATILE MICROFLUIDIC PLATFORM FOR PROTOCOLS ON A CHIP VIA CAPACITIVE SENSING FOR SAMPLE DISPENSING AND SURFACE ACOUSTIC WAVE (SAW) DRIVEN MIXING  
Yaqi Zhang¹, Citsabehsan Devendran¹, Alex de Marco¹, and Adrian Neild¹  
¹Monash University, AUSTRALIA and ²ARC Centre of Excellence for Advanced Molecular Imaging, AUSTRALIA

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**Electrophoretic & Chromatographic Separation**

**Micromixers & Microreactors**
Micromixers & Microreactors

W057.b  AN ULTRA-RAPID ACOUSTIC MIXER BY BOUNDARY-DRIVEN MICROSTREAMING OF INTEGRATED SHARP-EDGES AND BUBBLES
Mohammadreza Rasouli and Maryam Tabrizian
McGill University, CANADA

W058.b  IMPEDANCE-BASED EXCITATION-FREQUENCY OPTIMIZATION FOR A TRANSFER-TAPE-SUPPORTED LASER-MICROMACHINED CAVITATION-MICROSTREAMING MICROMIXER
Hyunjin Jeon, Kaba Abdi Mirgissa, Kyehan Rhee, and Dohyun Kim
Myongji University, KOREA

W059.b  THE EFFECT OF MICROREACTOR STRUCTURE ON QUANTITATIVE ANALYSIS OF TRACE VOLATILE ORGANIC COMPOUNDS
Qi Li, Zhenzhen Xie, Michael H. Nantz, and Xiao-An Fu
University of Louisville, USA

b - Chemical Applications: Separations, Mixers and Reactions

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M060.b  HIGH THROUGHPUT SEPARATION OF BACTERIA FROM BLOOD FOR SEPSIS DIAGNOSTICS USING EXTENDED ELASTO-INERTIAL MICROFLUIDICS
Sharath Narayana Iyengar, Tharagan Kumar, Gustaf Mårtensson, and Aman Russom
KTH Royal Institute of Technology, SWEDEN

M061.b  PDMS-BASED MICROPOROUS SIEVING MATRICES FOR SIZE-SELECTIVE FILTRATION OF SUBMICROMETER-SIZED PARTICLES
Takatomo Ouchi, Yurika Sakurai, Kayo Nakada, Masumi Yamada, and Minoru Seki
Chiba University, JAPAN

M062.b  THE MAGNUS FORCE ON SPINNING MICROPARTICLES
Miguel Solsona1, Hans Keizer1, Hans L. de Boer1, Yannick P. Klein1, Wouter Olthuis1, Leon Abelmann2, and Albert van den Berg1
1University of Twente, THE NETHERLANDS, and 2Saarland University, THE NETHERLANDS

M063.b  VIABLE/NON-VIABLE CELL ASSAY USING ELECTROKINETIC DETERMINISTIC LATERAL DISPLACEMENT
Bao D. Ho, Jason P. Beech, and Jonas O. Tegenfeldt
Lund University, SWEDEN

T060.b  INERTIAL FOCUSING OF DEFORMABLE PARTICLES IN TRIANGULAR CHANNELS
Yo-han Choi, Jeong-ah Kim, and Wonhee Lee
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T061.b  SIZE BASED SEPARATION OF PARTICLES WITH MICROFLUIDIC VORTEX TRAPPING INCORPORATING AN ORTHOGONAL TURN
Navya Rastogi, Pranjal Seth, Ramray Bhat, and Prosenjit Sen
Indian Institute of Science, INDIA
T062.b THE SEPARATION AND IDENTIFICATION OF PARASITE EGGS FROM HORSE FECES  
Jason P. Beech, Kushagr Punyani, Eva Tydén, and Jonas O. Tegenfeldt  
1Lund University, SWEDEN and 2Swedish University of Agricultural Sciences, SWEDEN

W060.b A 3D PRINTED MODULAR MICROFLUIDIC DEVICE FOR LARGE SCALE CELL HARVESTING FROM BIOREACTORS  
Mahsa Asadniaye Fardjahromi, Lin Ding, Sajad Razavi Bazaz, Graham Vesey, Mohsen Asadnia, and Majid Ebrahimip Yazdani  
1University of Technology Sydney, AUSTRALIA, 2Regeneus Pty Ltd, AUSTRALIA, and 3Macquarie University, AUSTRALIA

W061.b MULTIPLE SIZE SEPARATION OF MICROPARTICLES WITH LOW DEAD VOLUME BASED ON GRAVITY-AIDED VIBRATION-INDUCED FLOW  
Naoki Kitada and Takeshi Hayakawa  
Chuo University, JAPAN

W062.b VERTICAL SLIT-FRACTIONATION: HIGH-THROUGHPUT PARTICLE/CELL SEPARATION  
Naotaka Jin, Jumpei Yamamoto, Masumi Yamada, Kazuki Iijima, Koji Katayama, and Minoru Seki  
1Chiba University, JAPAN and 2Tosoh Corporation, JAPAN

M064.b MICROFLUIDIC DEVICE FOR DIRECT MEASUREMENT OF INITIAL RATE OF ENZYME REACTION BY ELECTROPHORETIC FILTRATION  
Junku Takao, Tatsuro Endo, Hideaki Hisamoto, and Kenji Sueyoshi  
Osaka Prefecture University, JAPAN

M065.b SCREENING OF RARE EARTH EXTRACTION: DIRECT ANALYSIS OF RATE AND PHASE BEHAVIOR IN A MICROPILLAR ARRAY  
Claudia Binder, Benjamin Lageder, Bronwyn Bradshaw-Hajek, Barbara Breeze, Emma Schofield, Stephen Woollam, and Craig Priest  
1University of South Australia, AUSTRALIA, 2Johnson Matthey Technology Centre, UK, and 3Anglo American’s Technical Solutions, SOUTH AFRICA

T063.b AN INTEGRATED CHIP-APPROACH TO STUDY ENANTIOSELECTIVE HETEROGENEOUS CATALYSTS AT THE MICROSCALE  
Rico Warias, Hannes Westphal, Daniele Ragno, Alessandro Massi, and Detlev Belder  
1Leipzig University, GERMANY and 2University of Ferrara, ITALY

T064.b MICROFLUIDIC METHOD FOR INVESTIGATING KINETICS OF EMULSION DESTABILIZATION  
Marcin Dudek, Diana Fernandes, Eirik H. Herø, and Gisle Øye  
1Norwegian University of Science and Technology, NORWAY and 2Polytechnic Institute of Porto, PORTUGAL
W063.b FEMTO-LITER PROTEIN PURIFICATION BY PARALLEL TWO-PHASE NANOFLUIDICS
Shu Matsuura, Yutaka Kazoe, and Takehiko Kitamori
University of Tokyo, JAPAN

W064.b OPTIMIZATION OF PROTEIN CONJUGATION ON A USER-FRIENDLY MICROFLUIDIC CHIP
Andrew W.L. Kinman and Rebecca R. Pompano
University of Virginia, USA

M066.c A MICROFLUIDIC PLATFORM FOR DIAGNOSIS OF OVARIAN CLEAR CELL CARCINOMA VIA QUANTIFICATION OF FXYD2 GENE
Ting-Hang Liu¹, Chang-Ni Lin², Keng-Fu Hsu³, and Gwo-Bin Lee¹
¹National Tsing Hua University, TAIWAN, ²National Cheng Kung University Hospital, TAIWAN, and ³National Cheng Kung University, TAIWAN

M067.c ARRAY OF MICRO-MAGNETS FOR CTC SORTING IN LAB-ON-A-CHIP DEVICES
Lucie Descamps¹, Samir Mekkaoui¹, Emmanuelle Laurenceau¹, Marie-Charlotte Audry¹, Jessica Garcia², Léa Payen², Damien Le Roy³, and Anne-Laure Deman¹
¹Lyon Institute of Nanotechnology, FRANCE, ²Hospices Civils de Lyon, FRANCE, and ³Institut Lumière Matière, FRANCE

M068.c DEVELOPING AN OPTICAL DNA MAPPING TOOLBOX TO IDENTIFY CHROMOSOMAL TRANSLOCATIONS IN ACUTE MYELOID LEUKEMIA
Miriam Hitz¹, Gaurav Goyal², Vilhelm Müller², Linda Fogelstrand³, and Fredrik Westerlund²
¹University of Applied Sciences, Aachen, GERMANY, ²Chalmers University of Technology, SWEDEN, and ³Sahlgrenska University Hospital, SWEDEN

M069.c RAPID AND VIABLE ISOLATION OF HETEROGENEOUS CIRCULATING TUMOR CELLS USING HIGH-DENSITY TAPERED-SLIT FILTERS
Jae-Eul Shim¹, Jiyoon Bu¹, Mi-Kyung Lee¹, Young-Ho Cho¹, Tae-Ha Kim², Jong-Uk Bu², and Sae-Won Han³
¹Korea Advanced Institute of Science and Technology (KAIST), KOREA, ²SenPlus, Ltd., KOREA, and ³Seoul National University Hospital, KOREA

T065.c A HERRINGBONE MICROFLUIDIC PROBE FOR AFFINITY SEPARATION OF CELLS
Ayoub Ggia¹,², Pavithra Sukumar¹, Muhammedin Deliorman¹, and Mohammad Qasaimeh¹,²
¹New York University, Abu Dhabi, UAE and ²New York University, NY, USA
Cancer Research, Capture & Analysis of Circulating Tumor Cells

T066.c  AN INTEGRATED MICROFLUIDIC PLATFORM TO DETECT TUMOR CELLS FROM BILE JUICE OF CHOLANGIOCARCINOMA PATIENTS BY USING NOVEL AFFINITY REAGENTS
Wen-Yen Huang1, Nai-Jung Chiang2, Cheng-Hsiu Chang3, Priya Gopinathan1, Terry D. Juang1, Hsiu-Chi Tu2, Yen-Shen Shan2, Shang-Cheng Hung3, and Gwo-Bin Lee1
1 National Tsing Hua University, TAIWAN, 2 National Cheng Kung University Hospital, TAIWAN, and 3 Academia Sinica, TAIWAN

T067.c  BIOPHYSICS OF CIRCULATING TUMOR CELL CLUSTERS
Baris R. Mutlu1, Taronish Dubash1, Claudius Dietsche2, Avanish Mishra1, Kevin Keim1, Jon Edd1, Daniel Haber1, Shyamala Maheswaran1, and Mehmet Toner1
1 Massachusetts General Hospital and Harvard Medical School, USA, 2 ETH Zürich, SWITZERLAND, and 3 Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

T068.c  MONITORING IMMUNOLOGICAL SYNAPSES AT SINGLE CELL LEVEL IN A MICROFLUIDIC DEVICE
Faruk A. Shaik1, Clara Lewuillon1,2, Yasmine Touil1,2, Aurélie Guillemette1,2, Bruno Quesnel1,2, Carine Brinster1,2, Loïc Lemonnier3, Dominique Collard4, and Mehmet C. Tarhan5
1 University of Lille, FRANCE, 2 INSERM UMRS-1172, FRANCE, 3 INSERM U1003, FRANCE, 4 University of Tokyo, JAPAN, and 5 IEMN UMR-8520, FRANCE

T069.c  SEPARATION/CAPTURE OF CANCER CELLS IN BLOOD USING A NUCLEIC-ACID APTAMER MODIFIED DYNAMIC DEFORMABLE MICROFILTER
Yuta Nakashima1, Soichiro Fukuyama1, Seitaro Kumamoto1, Keiichiro Yasuda2, Yusuke Kitamura2, Masaaki Iwatsuki1, Hideo Baba1, Toshihiro Ihara2, and Yoshitaka Nakanishi
1 Kumamoto University, JAPAN and 2 Ogic Technologies, JAPAN

W065.c  A MICROFLUIDIC PLATFORM FOR APPLYING LOCALIZED AND DYNAMICALLY-CONTROLLED COMPRESSION ON CANCER CELLS
Sevgi Onal, Maan M. Alkaisi, and Volker Nock
University of Canterbury, NEW ZEALAND

W066.c  APPLICATION OF DNA-DIRECTED PATTERNING TO FABRICATE AN IN VITRO BONE MARROW MICROENVIRONMENT FOR THE HIGH-THROUGHPUT STUDY OF PROSTATE CANCER DORMANCY
Molly Kozminskey and Lydia Sohn
University of California, Berkeley, USA

W067.c  FOCUSING AND SORTING OF TUMOR CELL CLUSTERS IN AN INERTIAL MICROCHANNEL
Jian Zhou, Qiyue Luan, and Ian Papautsky
University of Illinois, Chicago, USA
PICKING OF CIRCULATORY TUMOR CELLS (CTC’S) USING A MICROFABRICATED GLASS PIPETTE INTEGRATED WITH SACA CHIP BASED DIGITIZED IMAGING SYSTEM (DIGI-SACA)

Ping-Hao Yeh1, Venkanagouda S. Goudar1, Hsin-Yao Wu1, Hsueh-Yao Chu1, and Fan-Gang Tseng1,2

1 National Tsing Hua University, TAIWAN and 2 Academica Sinica, TAIWAN

IN SITU TOTAL ANALYSIS SYSTEM OF CLINICALLY ACTIONABLE GENETIC ABERRATIONS OF SINGLE CIRCULATING TUMOR CELLS ON CHIP

Amos Chungwon Lee1, Jessica Svedlund2, Evangelia Darai2, Yongju Lee1, Ahyoun Choi1, Sumin Lee1, Seo Woo Song1, Daewon Lee1, Yeongjae Choi1, Yunjin Jeong1, Narayanan Madaboosi2, Mats Nilsson2, and Sunghoon Kwon1

1 Seoul National University, KOREA and 2 Science for Life Laboratory, SWEDEN

A CMOS-BASED LAB-ON-CHIP DIAGNOSTIC SYSTEM FOR RAPID DETECTION AND WORLDWIDE MONITORING OF AZOLE-RESISTANT ASPERGILLUS FUMIGATUS


Imperial College London, UK

A MICRONEEDLE-BASED LATERAL FLOW IMMUNOASSAY FOR RAPID PROTEIN DETECTION

Xue Jiang and Peter B. Lillehoj

Michigan State University, USA

A SIMPLE POINT-OF-CARE TEST FOR DRUG MONITORING IN WHOLE BLOOD OF PATIENTS WITH AUTOIMMUNE DISEASES

Henry Ordutowski, Francesco Dal Dosso, Séverine Vermeire, Ann Gils, Jeroen Lammertyn, and Dragana Spasic

KU Leuven, BELGIUM

CAPILLARY DRIVEN POROUS PDMS MICRONEEDLE FOR NAKED-EYE GLUCOSE SENSOR

Hakjae Lee, Kai Takeuchi, Yui Sasaki, Nobuyuki Takama, Tsuyoshi Minami, and Beomjoon Kim

University of Tokyo, JAPAN
M074.c DEVELOPMENT AND CLINICAL TESTING OF A MICROFLUIDIC IMMUNOAFFINITY BASOPHIL ACTIVATION TEST FOR POINT-OF-CARE ALLERGY DIAGNOSIS
Frida Kalm1,2, Zenib Aljadi1,2, Harisha Ramachandraiah2, Caroline Nilsson1,3, Ola Winqvist4, Joachim Lundahl1,2, Anna Nopp1,2, and Aman Russom2
1 Karolinska Institutet and, SWEDEN, 2 KTH Royal Institute of Technology, SWEDEN, 3 Sachs’ Children and Youth Hospital, SWEDEN, and 4 Karolinska University Hospital, SWEDEN

M075.c FLOW VISUALIZATION IN A CORONARY NETWORK WITH MICROVASCULAR OBSTRUCTION (MVO) USING A MULTISCALE IN-VITRO BENCHTOP MODEL
Mirunalini Thirugnanasambandam1, Christian Wüthrich1, Sabrina Frey1, Peter Heeb2, Cornelia Nef2, André Bernard2, and Dominik Obrist1
1 University of Bern, SWITZERLAND and 2 University of Applied Sciences Buchs NTB, SWITZERLAND

M076.c FULLY-INTEGRATED CARTRIDGE FOR FAST POINT-OF-CARE DIAGNOSIS OF PERIODONTAL DISEASE
Katherine E. Boehle, J. Jacob Carrano, and John C. Carrano
Paratus Diagnostics, LLC, USA

M077.c IOT PCR SYSTEM FOR DISEASE DETECTION AND SPREAD MONITORING
Hanliang Zhu1, Pavel Podesva1, Xiaocheng Liu1, Haoqing Zhang1, Tomas Teply2, Ying Xu1, Honglong Chang1, Airong Qian1, and Pavel Neuzil1
1 Northwestern Polytechnical University, CHINA and 2 Czech Technical University, CZECH REPUBLIC

M078.c NANOFUIDIC BARCODES FOR QUANTIFICATION/IDENTIFICATION OF BIOMARKERS
Sokhna M. Ngom1, François-Damien Delapiere2, Fatima Flores-Galicia1, Stephane Guilet1, Edmond Cambril1, Jean Gamby1, Antoine Pallandre1, Isabelle Le Potier1, and Anne-Marie Haghiri-Gosnet1
1 C2N-CNRS, FRANCE, 2 SPEC-CEA, FRANCE, and 3 LCP-CNRS, FRANCE

M079.c OPTIMIZING ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY BASED IMMUNOASSAYS ON ZINC-OXIDE-NANOWIRE PAPER-BASED ELECTRODES
Xiao Li1,2,3, Hao Fu1,2, Ted Li1, and Xinyu Liu1,2
1 University of Toronto, CANADA, 2 McGill University, CANADA, and 3 Stanford University, USA

M080.c POINT-OF-CARE HIV NUCLEIC ACID SCREENING WITH A MAGNETOFLUIDIC ON-DEMAND ASSAY CARTRIDGE
Alexander Y. Trick, Fan-En Chen, Liben Che, and Tza-Huei Wang
Johns Hopkins University, USA
M081.c  RAPID SEPSIS DIAGNOSIS BY PHAGOCYTIC ACTIVITY OF IMMUNE CELLS
Seyong Kwon, Min Seok Lee, and Joo H. Kang
Ulsan National Institute of Science and Technology (UNIST), KOREA

M082.c  SELF-CONTAINED DIAGNOSTIC PLATFORM FOR PATHOGEN AND ANTIBIOTIC RESISTANCE DETECTION FOR DIABETIC FOOT ULCERS
Joerg Nestler1, Cornelia Stiehl1, Jenny Graunitz1,2, Sascha Geidel1,2, Andreas Morschhauser2, Thomas Otto2, Martina Schneemann2,6, Apoorva Jnana3, Thokur Streepathy Murali3, Kapaettu Satyamoorthy3, Sakthi U. Maheswari3, Siddharth Ramakrishnan4, Purbasha Halder5, Dhananjaya Dendukuri5, Frank F. Bier6, and Harald Peter6
1BiFlow Systems GmbH, GERMANY, 2Fraunhofer ENAS, GERMANY, 3Manipal Academy of Higher Education, INDIA, 4Achira Laboratories Pvt. Ltd., INDIA, 5Potsdam University, GERMANY, and 6Fraunhofer IZI-BB, GERMANY

M083.c  THIN POLYMERIC SHEET-BASED IMMUNOASSAY PLATFORMS INTEGRATED WITH MICRO/NANO-IMPRINTED MULTISCALE ARCHITECTURES
Shuhei Aoyama1,2, Yuto Akiyama2, Kenji Monden2, Masumi Yamada1, and Minoru Seki1
1Chiba University, JAPAN and 2Denka Co., Ltd., JAPAN

M084.c  WORLD-TO-CHIP INTERFACE FOR BLOOD-PLASMA SEPARATION ON A DIGITAL MICROFLUIDIC DEVICE
Christopher Dixon, Julian Lamanna, and Aaron R. Wheeler
University of Toronto, CANADA

T070.c  A LAB-ON-A-DISK DEVICE FOR ISOLATION AND IDENTIFICATION OF PARASITE EGGS IN STOOL
Sertan Sukas1, Bieke Van Dorst2, Agata Kryj1, Ole Lagatie3, Wim De Malsche1, and Lieven Stuyver2
1Vrije Universiteit Brussel, BELGIUM and 2Janssen Diagnostics, BELGIUM

T071.c  A NOVEL DIAGNOSTIC DEVICE FOR RAPID TESTING OF ANTIBIOTIC ALLERGIES: FOCUS ON FLUIDIC DESIGN AND MANUFACTURING OF DISPOSABLE DISCS
Elizaveta Vereshchagina1, Sergi Morais2, Luis A. Tortajada-Garano2, Angel Maquieira2, Estrella Fernandez2, Teresa Molina2, Veceslav Linte3, Brindus Comanescu4, Michal M. Mielenki4, Erik Andreassen4, Anna Franquesa-Vazquez2, Werner Balika2, Alfredo Sáez4, and Sergio Peransi Llopis6
1SINTEF Digital, NORWAY, 2Universitat Politècnica de València, SPAIN, 3Optoelectronica, ROMANIA, 4SINTEF Industry, NORWAY, 5STRATEC Consumables GmbH, AUSTRIA, and 6Lumensia Sensors, SPAIN
T072.c **AN INTEGRATED MICROFLUIDIC DEVICE FOR BLOOD PLASMA SEPARATION AND IMMUNOASSAY DETECTION**

Stanley C. Liu¹, Suraiya Rasheed², Neha Garg³, Paul Yoo³, Mohammad Aghaamoor³, and Abraham Lee³

¹Arcadia High School, USA, ²University of Southern California, USA, and ³University of California, Irvine, USA

T073.c **CHIP-AND-DIP: CAPILLARY-DRIVEN FLOW DEVICES FOR POINT-OF-CARE DIAGNOSTICS**

Sammer-ul Hassan and Xunli Zhang

University of Southampton, UK

T074.c **DEVELOPMENT OF AN AFFORDABLE AND SENSITIVE DIAGNOSTIC TEST FOR DENGUE DISEASE USING MICROFLUIDICS AND SMARTPHONES**

Sophie M. Jégouic¹ and Alexander D. Edwards¹,²

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T075.c **FLUORESCENCE SIGNAL AMPLIFICATION FOR SENSITIVE ENZYME IMMUNOASSAY UTILIZING AN IMMUNO-WALL**

Keine Nishiyama¹, Toshihiro Kasama², Masatoshi Maeki³, Akihiko Ishida¹, Hirofumi Tani¹, Yoshinobu Baba¹, and Manabu Tokeshi¹

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T076.c **HEMORHEOMETER-ON-A-CHIP: ANALYSIS OF BLOOD BIOPHYSICAL PARAMETERS IN A MICROCHANNEL**

Ziya Isiksacan, Murat Serhatlioglu, and Caglar Elbuken

Bilkent University, TURKEY

T077.c **LAB-ON-CHIP PLATFORM WITH FULLY INTEGRATED SAMPLE PREPARATION MODULE COUPLED WITH A HYBRIDIZATION-FREE SURFACE ACOUSTIC WAVE SENSOR FOR RAPID FOODBORNE PATHOGEN DETECTION**

Katerina Tsougeni¹, Georgia Kaprou¹,², Christos-Mortiz Loukas¹, George Papadakis¹, Audrey Hamiot¹, Michael Eck³, David Rabus³, George Kokkoris¹, Vasileios Papadopoulos¹, Bruno Dupuy⁴, Gerhard Jobust⁵, Electra Gizeli¹,², Angeliki Tserepi¹,², and Evangelos Gogolides¹,²

¹NCSR-Demokritos, GREECE, ²University of Crete, GREECE, ³Institute of Molecular Biology and Biotechnology-FORTH, GREECE, ⁴Institute Pasteur, FRANCE, ⁵Jobst Technologies GmbH, GERMANY, and ⁶SENSEor SAS, FRANCE

T078.c **NANOPLASMO-FLUIDIC PCR CHIP WITH MICROLITER VOLUME FOR RAPID DIAGNOSTICS**

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**Diagnostic Devices**

**T079.c** PAPER-BASED DEVICE WITH INTEGRATED ION-SELECTIVE OPTODES FOR COLORIMETRIC QUANTIFICATION OF SALIVARY METAL IONS
Yasuhiro Suenaga, Hiroyuki Shibata, Yuki Hiruta, and Daniel Citterio
Keio University, JAPAN

**T081.c** POROUS MICRONEEDLE ELECTRODES FOR THE ELECTROCHEMICAL SENSING ON SKIN
Hiroyuki Kai
Tohoku University, JAPAN

**T081.c** REUSABLE MICROFLUIDIC DEVICE FOR COMPLETE BLOOD COUNT APPLICATIONS
Damien Isebe1, Amin Amirouche2, Jean L. Papilleau2, Philippe Piedcoq1, Manuel Alessio2, Nicolas Verplanck2, Pierre Blandin2, Amaïs Ali-Cherif1, and Yves Fouillet2
1HORIBA Medical, FRANCE and 2CEA, LETI-Health, FRANCE

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Riho Shimazu1, Junnosuke Kawahara1, Kosuke Tomimuro1, Kazushi Misawa1, Yan Ni1, Yuki Hiruta1, Maarten Merkx2, and Daniel Citterio1
1Keio University, JAPAN and 2Eindhoven University of Technology, THE NETHERLANDS

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Amin Kazemzadeh, Ruben R.G Soares, Noa Lapins, and Aman Russom
KTH Royal Institute of Technology, SWEDEN

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Bhushan J. Toley, Andrea Dsouza, and Saylee Jangam
Indian Institute of Science, INDIA

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Minjie Shen1, Nan Li1, and Youchun Xu1,2
1Tsinghua University, CHINA and 2National Engineering Research Center for Beijing Biochip Technology, CHINA

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Kuo-Wei Hsu1, Wen-Bin Lee1, Huey-Ling You2, Mel S. Lee2, and Gwo-Bin Lee1
1National Tsing Hua University, TAIWAN and 2Kaohsiung Chang Gung Memorial Hospital, TAIWAN
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<td>¹Intellectual Ventures Lab, USA and ²Cornell University, USA</td>
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\(^1\)SIMTech, SINGAPORE and \(^2\)Indian Institute of Technology Hyderabad, INDIA

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\(^1\)Harvard University, USA, \(^2\)Harvard Medical School, USA, and \(^3\)Boston Children’s Hospital, USA

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\(^1\)KTH Royal Institute of Technology, SWEDEN, \(^2\)Stockholm University, Sweden, \(^3\)Karolinska Institutet, Sweden and \(^4\)University of Missouri, USA

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\(^1\)Asan Medical Center, KOREA and \(^2\)University of Ulsan College of Medicine, KOREA

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\(^1\)University of Tokyo, JAPAN and \(^2\)Musashino University, JAPAN

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\(^1\)Nanna Therapeutics Ltd, UK and \(^2\)Wellcome Centre for Mitochondrial Research, UK

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\(^1\)Toyo University, JAPAN and \(^2\)Kyushu University, JAPAN

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\(^1\)National University of Singapore, SINGAPORE and \(^2\)Institute for Health Innovation and Technology (iHealthtech), SINGAPORE

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\(^1\)University of Helsinki, FINLAND and \(^2\)Aalto University, FINLAND

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\(^1\)Keio University, JAPAN and \(^2\)Tokyo Institute of Technology, JAPAN
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Lingling Wu¹, Xin Qu¹, Yanling Song¹, and Chaoyong Yang¹,²
¹Shanghai Jiao Tong University School of Medicine, CHINA and ²Xiamen University, CHINA

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Singapore Institute of Manufacturing Technology (A*Star), SINGAPORE

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Wenwen Chen¹, Wentao Su¹, Hongjing Li², and Jianhua Qin¹
¹Chinese Academy of Sciences, CHINA and ²First Affiliated Hospital of Dalian Medical University, CHINA

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¹University of Tokyo, JAPAN and ²Innovation Center of NanoMedicine (iCONM), JAPAN

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1 University of Tokyo, JAPAN, 2 National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and 3 Canon Medical Systems Corporation, JAPAN

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1 Institute for Basic Science (IBS), KOREA and 2 Ulsan National Institute of Science & Technology (UNIST), KOREA

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1 Peking University, CHINA and 2 Peking University Health Science Center, CHINA

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

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1 Sogang University, KOREA, 2Yunsei University, KOREA, 3Ulsan National Institute of Science and Technology (UNIST), KOREA, and 4Korea Advanced Institute of Science and Technology (KAIST), KOREA

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1 Forschungszentrum Jülich GmbH, GERMANY and 2RWTH Aachen University

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1 University of Macau, CHINA and 2Universidade de Lisboa, PORTUGAL

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1 University of Potsdam, GERMANY, 2 Biflow Systems GmbH, GERMANY, 3 Mittweida University of Applied Sciences, GERMANY,
4 Fraunhofer Institute for Electronic Nano Systems ENAS, GERMANY and 5 Fraunhofer Institute for Cell Therapy and Immunology, GERMANY

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1 Chalmers University of Technology, SWEDEN, 2 Linköping University, SWEDEN, 3 Karolinska Institute, SWEDEN, and 4 Vietnam National Children's Hospital, VIETNAM

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1 University of Macau, CHINA and 2 Universidade de Lisboa, PORTUGAL

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1 Central European Institute of Technology, CZECH REPUBLIC and 2 Northwestern Polytechnical University, CHINA

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1 Universität Hamburg, GERMANY, 2 Institute for Medical Microbiology, GERMANY, and 3 Heinrich-Pette-Institut, GERMANY
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Robert W. Baber¹, Marco Donolato², Mikkel F. Hansen¹, and Jeppe Fock²

¹Technical University of Denmark, DENMARK and ²Blusense Diagnostics ApS, DENMARK

POINT-OF-CARE NUCLEIC ACID SENSORS VIA PAPER-BASED OLGONUCLEOTIDE-TEMPLATED REACTIONS

Robert B. Channon¹, Suraj Pavagada¹, Jason Y.H. Chang¹, Sung Hye Kim¹, David MacIntyre¹,², Phillip R. Bennett¹,², Vasso Terzidou¹,², Danny O’Hare¹, and Sylvain Ladame¹

¹Imperial College London, UK, ²Queen Charlotte’s Hospital, UK, and ³Chelsea & Westminster Hospital, UK

3D PRINTED RASPBERRY PI MICROSCOPY FOR LOW COST MICROFLUIDIC BACTERIAL MOTILITY ANALYSIS

Tai The Diep and Alexander Daniel Edwards

University of Reading, UK

A MICROFLUIDIC MODULE FOR INTEGRATED LYYSIS AND GENETIC MATERIAL DETECTION OF GRAM-POSITIVE AND GRAM-NEGATIVE BACTERIA

Catarina R.F. Caneira¹, Silvia Monteiro², Ricardo Santos², Virginia Chu¹, and João P. Conde¹

¹INESC-MN, PORTUGAL and ²Universidade de Lisboa, PORTUGAL

BACTERIAL IDENTIFICATION BY OPTICAL MAPPING OF GENOMIC DNA IN NANOFUIDIC CHANNELS

My Nyblom¹, Vilhelm Müller¹, Anna Johhning¹,²,³, Marie Wrande⁴, Albertas Dvirnas⁵, Sriram KK¹, Christian G. Giske⁶,⁷, Tobias Ambjörnsson⁵, Linus Sandgren⁵, Erik Kristiansson³, and Fredrik Westerlund¹

¹Chalmers University of Technology, SWEDEN, ²Fraunhofer-Chalmers Centre, SWEDEN, ³University of Gothenburg, SWEDEN, ⁴Uppsala University, SWEDEN, ⁵Lund University, SWEDEN, ⁶Karolinska Institute, SWEDEN, and ⁷Karolinska University Hospital, SWEDEN

FAST ANTIMICROBIAL SUSCEPTIBILITY TESTING OF *E. coli* BY OXYGEN CONSUMPTION MEASUREMENTS IN AN ISOTHERMAL MICRO-INCUBATOR PLATFORM

Yang Liu, Thomas Lehnert, Terry P.N. Baltus, and Martinus A.M. Gijs

École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

LABEL-FREE BACTERIAL SMARTPHONE DETECTION IN MICRO CAPILLARY FILM ALLOWS RAPID TESTING OF THERAPEUTIC BACTERIOPHAGE SPECIFICITY

Sultan Illya Dönmez, Sarah Needs, Mojgan Rabiey, Helen Osborn, and Alexander Edwards

University of Reading, UK
**PATHOGEN DETECTION & ANTIBIOTICS**

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Fudan University, CHINA

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Wenbo Zhou¹, Yaoping Liu¹, Shuangling Li², Meng Xiao³, Jie Gong⁴, Hang Li⁵, and Wei Wang¹,⁵
¹Peking University, CHINA, ²Peking University First Hospital, CHINA, ³Peking Union Medical College Hospital, CHINA, ⁴Chinese Center for Disease Control and Prevention, CHINA, and ⁵National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA

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Carlos Manzanas, Xiao Jiang, Julia C. Loeb, John A. Lednicky, and Z. Hugh Fan
University of Florida, USA

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Pieter Berden¹,²,³, Camila D. Campos¹,², Rodrigo S. Wiederkehr³, Liesbet Lagae¹,², Tim Stakenborg¹, Jan Michiels²,³, and Maarten Fauvart¹,²,³
¹Imec, BELGIUM, ²KU Leuven, BELGIUM, and ³VIB, BELGIUM

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Young Ki Hahn¹, Ji Hyun Kim², and Honggu Chun²
¹Kyungpook National University, KOREA and ²Korea University, KOREA

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¹University of Southampton, UK and ²University Hospital Southampton NHS Trust, UK

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¹University of Hull, UK, ²University of Porto, PORTUGAL, ³National Institute for Agricultural and Veterinary Research, PORTUGAL, and ⁴Biomode SA, PORTUGAL
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¹Dartmouth College, USA and ²Dartmouth-Hitchcock Medical Center, USA

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¹Tsinghua University, CHINA and ²National Engineering Research Center for Beijing Biochip Technology, CHINA

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¹Nagoya University, JAPAN, ²Osaka University, JAPAN, ³Kyushu University, JAPAN, and ⁴National Institute of Advanced Industrial Science and Technology, JAPAN

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¹CEA-Leti, FRANCE, ²CEA-DRF, FRANCE, and ³SDMIS, FRANCE
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1Purdue University, USA and 2Omnivis LLC, USA

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1Massachusetts General Hospital, USA and 2Harvard University, USA

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¹Kyusyu University, JAPAN and ²BEX Co., Ltd., JAPAN

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¹University of California, Los Angeles, USA, ²University of Virginia, USA, ³Rutgers –New Jersey Medical School, USA, ⁴Duke University, USA, and ⁵VA Greater Los Angeles Healthcare System, USA

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¹Chonnam National University, KOREA and ²Ulsan National Institute of Science and Technology (UNIST), KOREA

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¹KTH Royal Institute of Technology, SWEDEN, ²Karolinska Institutet, SWEDEN, and ³University of Helsinki, FINLAND

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¹University of Washington, USA, ²Harvard Medical School, USA, and ³Independent Contractor, USA

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¹Inserm, FRANCE, ²LIMMS/CNRS-IIS, FRANCE, ³Kyushu Institute of Technology, JAPAN, ⁴Centre Oscar Lambret, FRANCE, and ⁵University Lille, FRANCE

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1 Université Rennes 1, FRANCE, 2 Utrecht University, THE NETHERLANDS, and 3 University of Twente, THE NETHERLANDS

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Morteza Jeyhani1,2,3, Vaskar Gnywali1,2,3, Niki Abbas1,2,3, Dae Kun Hwang1,2,3, and Scott S.H. Tsai1,2,3
1 Ryerson University, CANADA, 2 St. Michael's Hospital, CANADA, and 3 Institute for Biomedical Engineering, Science and Technology (iBEST), CANADA

T124.d ON-CHIP SAMPLE AUTOMATED DISCRETIZATION, SELECTIVE RETRIEVAL AND CONTROLLABLE METERING UTILIZING MEMBRANE INTEGRATED TRAPS FOR SINGLE-CELL ENCAPSULATION AND SORTING
Hesam Babahosseini1,2, Tom Misteli1, and Don L. DeVoe2
1 National Institutes of Health (NIH), USA and 2 University of Maryland, USA

T125.d ON-DEMAND DROPLET GENERATOR FOR EXTRACTION OF ELECTROKINETICALLY FOCUSED ANALYTES
Vasileios A. Papadimitriou, Stella A. Kruit, Loes I. Segerink, and Jan C.T. Eijkel
University of Twente, THE NETHERLANDS

T126.d SEQUENTIAL FORMATION OF DAUGHTER DROPLETS BY BREAKUP OF MICRODROPLETS INTO BYPASS CHANNEL
Shohei Hattori1, Dong Hyun Yoon1, Yoshito Nozaki1, Taisuke Isano2, Hitoshi Yamagata3, Hiroyuki Fujita4, Tetsushi Sekiguchi5, and Shuichi Shoji1
1 Waseda University, JAPAN and 2 Canon Medical Systems Corp., JAPAN

T127.d SUPERPARAMAGNETIC NANOPIERCLE ENCAPSULATION VIA DROPLET-BASED MICROFLUIDICS FOR TARGETED DRUG DELIVERY SYSTEM
Sakon Rahong1, Ratchanont Sukthai1, Narin Paiboon2, Kunat Suktham2, Annop Klamchuen2, and Suvimol Surassmo2
1 King Mongkut's Institute of Technology Ladkrabang, THAILAND and 2 National Nanotechnology Center (NANOTEC), THAILAND

T128.d WATER EVAPORATION BASED SELF-AQUEOUS TWO-PHASE SYSTEM DROPLET FORMATION
Byeong-Ul Moon, Lidija Malic, Keith Morton, Abdelrahman Elmazalawy, and Teodor Veres
National Research Council Canada, CANADA
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A PORTABLE DROPLET SORTING PLATFORM WITH INTEGRATED THERMOCAPILLARY SORTING AND CAPACITANCE DETECTING  
Yigang Shen¹,², Yaxiaer Yaliku¹,³, Yusufu Aishan¹,², and Yo Tanaka¹,²  
¹RIKEN, JAPAN, ²Osaka University, JAPAN, and ³Nara Institute of Science and Technology, JAPAN

**W119.d**  
CLIMBING DROPLETS DRIVEN BY MECHANOWETTING  
Ye Wang¹,², Edwin de Jong³, Patrick R. Onck³, and Jaap M.J. den Toonder¹,²  

**W120.d**  
CONTROLLED RELEASE OF LIPOSOMAL CARGO IN DOUBLE EMULSIONS TO INDUCE GENE EXPRESSION IN BACTERIA  
Ariane Stucki, Petra Jusková, Nicola Nuti, Steven Schmitt, Lucas Armbrrecht, and Petra S. Dittrich  
ETH Zürich, SWITZERLAND

**W121.d**  
FABRICATION AND EVALUATION OF ATTOLITER DROPLETS  
Risa Takane¹, Hiroto Kawagishi¹, Yasunori Matsui¹, Hiroshi Ikeda¹, and Yan Xu¹,²  
¹Osaka Prefecture University, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

**W122.d**  
IMPROVING DNA LIBRARY PREPARATION FOR NEXT GENERATION SEQUENCING THANKS TO AN INNOVATIVE DROPLET MICROFLUIDIC DEVICE  
Davide Ferraro¹,², Marco Serra¹, Thanh Duc Mai¹,², Almut Eisele¹, Leïla Périé¹, Jean-Louis Viowy¹, and Stephanie Descroix¹  
¹Institut Curie, FRANCE, ²University of Padova, ITALY, and ³Institut Galien de Paris-Sud, FRANCE

**W123.d**  
MICRODROPLET ARRAY CONCENTRATION WITH SIZE-TRIGGERED RELEASE SYSTEM  
Piangrawee Santivongskul¹, Mao Fukuyama¹,², and Akihide Hibara¹  
¹Tohoku University, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

**W124.d**  
MULTIPLEXING ANTIBIOTIC SCREENING IN DROPLET MICROFLUIDICS USING AN OPTOFLUIDIC PLATFORM  
Sundar Hengoju¹,², Lisa Mahler¹, Oksana Shvydkiv¹, Miguel Tovar¹, Miriam Rosenbaum¹,², and Martin Roth¹  
¹Hans Knöll Institute, GERMANY and ²Friedrich Schiller University, GERMANY

**W125.d**  
PHOSPHOLIPID EXTRACTION AND PHASE SEPARATION USING DROPLET MICROFLUIDICS  
David J. Rowe, Daniel J. Health, Anthony D. Postle, James S. Wilkinson, and Goran Z. Mashanovich  
University of Southampton, UK
**Droplet Microfluidics**

**W126.d** RAYDROP, AN UNIVERSAL DROPLET GENERATOR BASED ON A NON EMBEDDED "CO-FLOW-FOCUSING"
Adrien Dewandre, Javier Rivero-Rodriguez, Youen Vitry, Benjamin Sobac, and Benoit Scheid
Université libre de Bruxelles, BELGIUM

**W127.d** SILICON CHAMBERS FOR ENHANCED-IMAGING OF DROPLET ARRAYS IN A GRADED TEMPERATURE FIELD
Nicolas Lobato-Dauzier¹,², Robin Deteix¹,², Matthieu Denoual¹,³, Soo Hyeon Kim¹, Hiroshi Toshiyoshi¹,², Hiroyuki Fujita¹, Teruo Fujii¹,², and Anthony J. Genot⁴
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**W128.d** TOWARDS THE DEVELOPMENT OF A DROPLET MICRO-REACTOR FOR INDUSTRIAL RELEVANT SCREENING IN BIOTECHNOLOGY
Kartik Totlani, Thorben de Riesse, Maxime Bisschops, Walter van Gulik, Michiel Kreutzer, and Volkert van Steijn
Delft University of Technology, THE NETHERLANDS

**d - Fundamentals in Microfluidics and Nanofluidics**

**Electrokinetic Phenomena**

**M129.d** TUNING DETERMINISTIC LATERAL DISPLACEMENT SEPARATION WITH AC ELECTROKINETICS
Victor Calero¹, Pablo Garcia-Sanchez², Antonio Ramos², and Hywel Morgan¹
¹University of Southampton, UK and ²Universidad de Sevilla, SPAIN

**M130.d** ION CONCENTRATION POLARISATION FOR PARTICLE MESOPOROSITY DIFFERENTIATION
Vasileios A. Papadimitriou, Miguel Solsona, Wouter Olthuis, Albert van den Berg, and Jan C.T. Eijkel
University of Twente, THE NETHERLANDS

**T129.d** OBSERVATION OF MEMBRANE CHANGES AND VIABILITY OF CELLS IN A PARALLEL ELECTROTHERATION PLATFORM
Kevin Keim, Mohamed Z. Rashed, and Carlotta Guiducci
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

**W129.d** DIELECTROPHORETIC ANALYSIS: A TOOL FOR STUDYING THE IMPACT OF ORGANIC SOLVENTS ON WHOLE-CELL BIOCATALYSTS
Miriam S. Epping, Armin Grundmann, Harald Groeger, and Martina Viehues
Bielefeld University, GERMANY

**W130.d** "TUNABLE NANOGATE" DEVICE FOR SIZE-SORTING OF NANOPARTICLES
Satoko Fujiwara, Tatsuro Endo, Hideaki Hisamoto, and Kenji Sueyoshi
Osaka Prefecture University, JAPAN
M131.d SIMULATION OF THE MIGRATION OF RIGID NON-SPHERICAL PARTICLES IN CURVED MICRO CHANNELS
Thomas E. Hafemann and Jochen Fröhlich
Technical University Dresden, GERMANY

T130.d A TRANSPORT-REACTION MODEL FOR EXPANDING THE DYNAMIC RANGE OF LATERAL FLOW IMMUNOASSAYS USING REAL-TIME IMAGING
Sathishkumar N. and Bhushan J. Toley
Indian Institute of Science, INDIA

T131.d UNRAVEL THE PHYSICS OF PARTICLE FOCUSING MECHANISMS IN MICROCHANNELS
Marzieh Chaharlang, Brady L. Goenner, and Bruce K. Gale
University of Utah, USA

W131.d OPTIMIZING RESIDENCE TIME DISTRIBUTION IN CAPILLARY-BASED SYSTEMS USING COMPUTATIONAL FLUID DYNAMIC SIMULATIONS
Kirandeep K. Gill¹, Deema A. Masoudi¹, Sughan Narayanasamy¹, Patrick Hester², Pedro Estrela¹, and Nuno M. Reis¹
¹University of Bath, UK and²Lamina Dielectrics Ltd, UK

M132.d STRUCTURAL ANALYSIS OF WATER CONFINED IN NANOCANS
Kazuma Mawatari¹, Jun Shirai¹, Koji Ohara², Shinji Kohara³, Toshio Yamaguchi², Koji Yoshida³, and Takehiko Kitamori¹
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M133.d UNRAVELING THE UNEXPECTED CHANNEL-LENGTH-DEPENDENT NANOFLUIDIC SALINITY GRADIENT POWER: EXPERIMENTS AND MODELING
Li-Hsien Yeh and Po-Hsien Peng
National Taiwan University of Science and Technology, TAIWAN

T132.d THERMAL DIFFUSIVITY MEASUREMENT IN NANOCHEL BY PHOTOTHERMAL OPTICAL PHASE SHIFT
Kazuma Mawatari, Tokio Sato, and Takehiko Kitamori
University of Tokyo, JAPAN

W132.d EFFECT OF PORE SIZE ON SLIP FLOW IN MICRO- AND NANO-POREUS MEDIA
Md Minhajul Islam and D. Jed Harrison
University of Alberta, CANADA
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W133.d THERMAL AND ELECTROKINETIC EFFECT ON DIFFUSIOOSMOSIS-DRIVEN IONIC TRANSPORT THROUGH NANOPORES
Jongwan Lee1, Kyunghun Lee1, Cong Wang2, Dogyeong Ha1, Jungyu Park2, and Taesung Kim1
1Ulsan National Institute of Science and Technology (UNIST), KOREA and 2Sogang University, KOREA

Platforms Based on Capillary Forces

M134.d A HYDROGEL MICRONEEDLE PATCH FOR CONTINUOUS MONITORING OF GLUCOSE FROM INTERSTITIAL FLUID
Somayeh Ramezanian and Jacqueline C. Linnes
Purdue University, USA

M135.d ENABLING RHEOLOGICAL ANALYSIS OF COMPLEX FLUIDS AT THE POINT-OF-NEED
Jose C. Contreras-Naranjo and Victor M. Ugaz
Texas A&M University, USA

M136.d POINT-OF-CARE 2DPN ELISA WITH AUTOMATED ENHANCED DETECTION OF AMPLIFIED NUCLEIC ACIDS
Kristin M. Byers1, Anna R. Bird1, Hyundae Cho2, and Jacqueline C. Linnes1
1Purdue University, USA and 2Crosslife Technologies Inc., USA

T133.d 3D PRINTED DOMINO CAPILLARIC CIRCUITS WITH INTEGRATED REAGENTS AND SAMPLE AUTONOMOUS ALIQUOTING FOR DIAGNOSTICS
Oriol Ymbern, Arya Tavakoli, Mohamed Yafia, Andy Ng, and David Juncker
McGill University, CANADA

T134.d ADVANCES IN FLUID CONTROL TECHNIQUES FOR PAPER BASED MICROFLUIDIC DEVICES (MICROPADS)
Aditya R. Jangid, E. Brandon Strong, Carsten Knutsen, Jay T. Wells, Megan L. Mitchell, Brittany Lore, Nick Tod, Emiliano Escamilla, Andres W. Martinez, and Nathaniel W. Martinez
California Polytechnic State University, USA

T135.d EVAPORATION FLOW: ANALYSIS THAT IS INDEPENDENT OF HUMIDITY AND TEMPERATURE
Marta Orlowska1, Bin Guan1, Rossen Sedev1,2, and Craig Priest1
1University of South Australia, AUSTRALIA and 2Curtin University, AUSTRALIA

T136.d PORTABLE UV ADSORPTION BASED HIGHLY SENSITIVE DETECTION OF HEMOGLOBIN ON PLASTIC MICROFLUIDIC CHIP
Wei Wang, Kay Khine Maw, WeiDong Zhou, and ZhiPing Wang
Singapore Institute of Manufacturing Technology (A*Star), SINGAPORE
W134.d 3D-PRINTED PASSIVE GRADIENT GENERATORS
Cesar Parra-Cabrera, Hans Van Cauteren, Clement Achille, Ruben Dochy and Rob Ameloot
KU Leuven, BELGIUM

W135.d DEVELOPMENT OF LASER-CUT MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICE WITH SUCRose VALVE FOR AUTOMATED COMPETITIVE ELISA OF AFLATOXIN B1
Sumamal Charernchai¹, Miyuki Chikae¹, Wanida Wonsawat², Hirose Daisuke¹, Phan T. Tue³, and Yuzuru Takamura¹
¹Japan Advanced Institute of Science and Technology (JAIST), JAPAN,
²Suan Sunandha Rajabhat University, THAILAND, and
³Tokyo Institute of Technology, JAPAN

W136.d MERGING 3D PRINTING WITH PAPER-BASED MICROFLUIDIC DEVICES (MICROPADS)
E. Brandon Strong, Aditya R. Jangid, Siddharth Prabhu, Megan L. Mitchell, Jonah Holbrook, Jacqueline Chuang, Oscar Mercado, Bo Liu, Andres W. Martinez, and Nathaniel W. Martinez
California Polytechnic State University, USA

W137.d SYNTHETIC MICROFLUIDIC PAPER WITH SUPERIOR FLUORESCENT SIGNAL READOUT
Weijin Guo, Jonas Hansson, and Wouter van der Wijngaart
KTH Royal Institute of Technology, SWEDEN

M137.d BOUNDARY LAYER MODIFICATION FOR A MICROTESLA ROTOR PUMPING OF NON-NEWTONIAN FLUIDS
Jessica Hallgath and Joe Fujiou Lo
University of Michigan, USA

M138.d DIRECT IMAGING OF CHANNEL CROSS-SECTION FOR INVESTIGATING INERTIAL FOCUSING DYNAMICS IN A CURVED CHANNEL
Jian Zhou and Ian Papautsky
University of Illinois, Chicago, USA

T137.d A FACILE AND ROBUST METHOD FOR THE PREPARATION OF QUASI-DOUBLE EMULSIONS USING A HIGH-DENSITY MICROWELL ARRAY
Yin Wu, Xu Cui, Zongwei Zhang, and Gang Li
Chongqing University, CHINA

T138.d LATERAL FOCUSING IN VISCOELASTIC FLOW IN SPIRAL CHANNELS
Hua Gao, Jian Zhou, and Ian Papautsky
University of Illinois, Chicago, USA
INVESTIGATION ON VON WILLEBRAND FACTOR (VWF) PROTEOLYSIS BY ADAMTS13 ON-A-CHIP
Amid Shakeri and Tohid F. Didar
McMaster University, CANADA

SPATIOTEMPORALLY GENERATED MICROFLUIDS WITH THE AID OF HIGH-SPEED FLOW CONTROL
Yusuke Kasai, Makoto Saito, Shinya Sakuma, and Fumihito Arai
Nagoya University, JAPAN

CUSTOMIZABLE WORLD-TO-CHIP INTERFACE IN COMBINATION WITH MULTIPHASE MICROFLUIDICS EXPANDING THE APPLICATION RANGE OF A LAB-ON-CHIP PLATFORM
Hannah Bott, Franz Lärmer, and Jochen Hoffmann
Robert Bosch GmbH, GERMANY

HIGH-YIELD PARALLEL ASSEMBLY OF SINGLE SPHERE ON GEOMETRICALLY DESIGNED ADHESIVE POLYMER-POST
Junghyun Bae, Seojoon Kim, and Wook Park
Kyung Hee University, KOREA

POST-PROCESSING COMPATIBLE PACKAGING METHOD FOR CMOS OPTO-NANOFLUIDIC CHIP
Jaehwan Kim, Huaiyu Meng, and Rajeev J. Ram
Massachusetts Institute of Technology, USA

ENABLING COST-EFFECTIVE GLASS MICROFLUIDICS FOR LIFE SCIENCES: THE EXAMPLE OF A COMPLETE SEQUENCING DEVICE FABRICATED AT WAFER SCALE
Sarah Heub1, Rita Smajda1, Guy Voirin1, Gilles Weder1, Anke Sanz-Velasco1, Tobias Bauert2, Alexis Tzannis2, Raphael Pugin1, and Michel Despont1
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INTEGRATION OF POROUS SILICON-BASED OPTICAL APTASENSORS IN A 3D-PRINTED MICROFLUIDIC PLATFORM FOR PROTEIN DETECTION
Sofia Arshavsky-Graham1,2, Niklas-Maximilian Epping3, Anton Enders3, Thomas Schepers2, Janina Bahmann2, and Ester Segal1
1Technion – Israel Institute of Technology, ISRAEL and 2Leibniz Universität Hannover, GERMANY

RAPID PDMS-GLASS BONDING USING ARGON PLASMA JET TOWARDS AUTOMATIC CHIP FABRICATION
Shih-Chi Chuang and Chia-Hung Dylan Tsai
National Chiao Tung University, TAIWAN
W140.e  FABRICATION OF PMMA MICROFLUIDIC DEVICES INTEGRATED WITH POROUS PETE MEMBRANES FOR RELIABLE CYTOTOXICITY TESTS OF DRUGS
Thao Nguyen1, Su Hyun Jung1, Min Seok Lee1, Tae-Eun Park1, Suk-kyun Ahn2, and Joo H. Kang1
1Ulsan National Institute of Science and Technology (UNIST), KOREA and
2Pusan National University, KOREA

W141.e  PDMS BONDING WITHOUT O2 PLASMA TREATMENT
Haruka Oda and Shoji Takeuchi
University of Tokyo, JAPAN

M142.e  3D FABRICATED PNEUMATIC GAIN VALVES FOR INTEGRATED LOGIC CONTROLLERS
Hsiang-Chih Yang, and Yu-Chuan Su
National Tsing Hua University, TAIWAN

M143.e  STAINLESS MICROFLUIDIC PROBE WITH 2D-ARRAY APPERTURES
Shogo Kamiya, Koki Takahashi, Hidekuni Takao, Fusao Shimokawa, and Kyohei Terao
Kagawa University, JAPAN

T142.e  HIGH-THROUGHPUT, LARGE-SCALE AND ULTRA-LOW PROTEIN CONSUMPTION: A NOVEL DROPLET-BASED PROTEIN CRYSTALLIZATION SYSTEM
Hui-Feng Wang1, Jian-Bo Chen2, Sheng Ye1, and Qun Fang1
1Zhejiang University, CHINA and
2Hangzhou Jieijing Biotechnology Co., Ltd, CHINA

T143.e  VALVES AND PUMPS USING COLLAGEN-BASED TUBULAR CONSTRUCTS
Kelvin Chow, Nima Vaezzadeh, and Axel Günther
University of Toronto, CANADA

W142.e  FROM "DIGITAL" TO "ANALOGUE" PUMPING: COMPLEMENTING AN EXISTING LAB-ON-CHIP ARCHITECTURE WITH NOVEL MICROFLUIDIC PUMPING METHODS
Hannah Bott1, Franz Lärmer1, Roland Zengerle2, and Jochen Hoffmann1
1Robert Bosch GmbH, GERMANY and
2University of Freiburg, GERMANY

W143.e  MULTIFUNCTIONAL FEMTO-PIPETTE IN OPEN MICROFLUIDICS
Eleonoor Verlinden1, Masoud Madadelahi1,2, Edin Sarajlic3, Amir Shamloo3, Andreas H. Engel1, Urs Stauffer1, and Murali K. Ghatkesar1
1Delft University of Technology, THE NETHERLANDS, 2Sharif University of Technology, IRAN, and 3SmartTip B.V., THE NETHERLANDS
M144.e  A FLEXIBLE PLATFORM WITH INKJET-PRINTED ORGANIC ELECTROCHEMICAL TRANSISTORS INTEGRATED IN MICROFLUIDICS FOR SELECTIVE ION DETECTION
Silvia Demuru, Brince P. Kunnel, and Danick Briand
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

M145.e  ADDITIVE MANUFACTURING OF MULTILAYERED MICROFLUIDIC DEVICES WITH DENSELY PACKED MICROSCALE FEATURES
Chia-Heng Chu, Enerelt Buretugs, Jacob M. Owens, Ruxiu Liu, Dohwan Lee, and A. Fatih Sarioglu
Georgia Institute of Technology, USA

M146.e  ARRAY OF SOFT OR HARD MAGNETIC MICROTRAPS BASED ON COMPOSITE POLYMER NOVEL TECHNOLOGY
Lucie Descamps1, Samir Mekkaoui1, Emmanuelle Laurenceau1, Marie-Charlotte Audry1, Jessica Garcia2, Léa Payen2, Damien Le Roy3, and Anne-Laure Deman1
1Lyon Institute of Nanotechnology, FRANCE, 2Hospices Civils de Lyon, FRANCE, and 3Institut Lumière Matière, FRANCE

M147.e  BULK SYNTHESIS OF HYDROGEL ANISOTROPIC MICROPARTICLES WITH DEGASSED REPLICA MOLDING LITHOGRAPHY
Hyeon Ung Kim, Yong Jun Lim, Nak Jun Lee, Hyun Jee Lee, and Ki Wan Bong
Korea University, KOREA

M148.e  DEVELOPMENT OF A LARGE-AREA TALL MICRONEEDLE ARRAY SKIN PATCH WITH RADIATION: A NEW DESIGN AND ITS ASSESSEMENT FOR A LONG-TERM TRANSDERMAL DRUG DELIVERY
Ki-Hwan Nam1, Chan Bae Jeong1, Dong-Uk Kim1, Youn-Mook Lim2, and Ki Soo Chang1
1Korea Basic Science Institute, KOREA and 2Korea Atomic Energy Research Institute (KAERI), KOREA

M149.e  FLEXIBLE, TRANSPARENT, SUB-100 μM MICROFLUIDIC CHANNELS WITH FDM 3D-PRINTED THERMOPLASTIC POLYURETHANE
Matt D. Nelson, Nirupama Ramkumar, and Bruce K. Gale
University of Utah, USA

M150.e  GRAPHENE-MEDIATED MICRO-PATTERNING OF CONDUCTIVE POLYMERS TOWARD IMPLANTABLE ELECTRODES
Tetsuhiko F. Teshima1, Koji Sakai1, Yoshiaki Kashimura1, Hiroki Miyazako1, Hiroshi Nakashima1, Shingo Tsukada1, Yuko Ueno2, Toshihisa Osaki2, and Shoji Takeuchi2
1Nippon Telegraph and Telephone Corporation, JAPAN and 2University of Tokyo, JAPAN
M151.e  LOW-COST AND 3D-PRINTED HOLLOW MICRONEEDLE ARRAYS WITH COMPLEX DESIGNS FOR TRANSDERMAL DRUG DELIVERY APPLICATIONS
Christopher Yeung, Haifong Lin, Shawnus A. Chen, Kimber King, Brian King, Farooq Akhtar, and Sam Emaminejad
University of California, Los Angeles, USA

M152.e  MINIATURIZED WRINKLED ELECTRODE WITH 30-FOLD ENHANCEMENT IN ELECTROCHEMICAL SIGNAL
Amanda H. Imamura1,2, Julia Zakashansky2, Emanuel Carrilho1, and Michelle Khine2
1University of São Paulo, BRAZIL and 2University of California, Irvine, USA

M153.e  PDMS CURING INHIBITION BY 3D-PRINTED TEMPLATES. WHY? AND HOW TO AVOID IT?
Bastien Venzac1, Shaniang Deng1,2, Shuhan Yang1,2, Aufried Lenferink1, Cees Otto1, and Séverine Le Gac1
1University of Twente, THE NETHERLANDS and 2Tianjin University, CHINA

M154.e  RAPID FABRICATION OF A SLIPCHIP DEVICE FOR LOCAL STIMULATION USING DESKTOP SLA PRINTING
Megan A. Catterton and Rebecca R. Pompano
University of Virginia, USA

M155.e  SELF-DRIVEN SURFACE-ENHANCED RAMAN SCATTERING MICROFLUIDIC DEVICES FABRICATED BY FEMTOSECOND LASER FOR HG2+ DETECTION
Zhi Yu1, Xiuyun Li1, and Chunlei Guo1,2
1Chinese Academy of Sciences, CHINA and 2University of Rochester, USA

M156.e  STREPTAVIDIN–FUNCTIONALIZED HYDROGEL MICROPARTICLES FOR CUSTOMIZABLE MULTIPLEX BIOMOLECULE DETECTION
Yoon Ho Roh, Hyun Jee Lee, and Ki Wan Bong
Korea University, KOREA

M157.e  THREE-DIMENSIONAL LIQUID PATTERING WITH MICROMESH STRUCTURE BY 3D PRINTING FABRICATION
Suryong Kim1, Byungjun Lee2, Jihoon Ko1, Youngtaek Kim1, and Noo Li Jeon1
1Seoul National University, KOREA and 2Curiochips, KOREA

T144.e  A SANDWICH-STRUCTURED RATION DEVICE BASED ON POLYIMIDE-TRANSFERRED VOLUME SENSOR FOR FLEXIBLE MICROFLUIDIC SYSTEM
Zhihua Pu, Jiaming Ma, Wenwen Li, Xiaochen Lai, Xiao Su, Haixia Yu, and Dachao Li
Tianjin University, CHINA

T145.e  A TWO-WAY MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE FOR PERMEATION ASSAYS
Marika Sugimoto, Keisuke Yanagisawa, and Naoki Sasaki
Toyo University, JAPAN
T146.e BIOINSPIRED MICROMECHANICAL INTERLOCKING STRUCTURES FOR ENHANCED ADHERENCE BETWEEN SOFT ELASTOMERIC LAYERS
Navajit S. Baban¹,², Ajymurat Orozaliev¹, Christopher. J. Stubbs², and Yong-Ak Song¹,³
¹New York University, Abu Dhabi, UAE and ²New York University, USA

T147.e DEVELOPMENT OF A LARGE-AREA AND SPHERICAL ARRAY OF POLYMERIC PHOTOVOLTAIC PIXELS FOR ARTIFICIAL VISION
Marta J.I. Airaghi Leccardi, Naïg A.L. Chenais, and Diego Ghezzi
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

T148.e DEVELOPMENT OF PZT ACTUATOR ARRAY ON AN ACTIVE-MATRIX OXIDE TFTS FOR SINGLE CELL SPATIAL TRANSCRIPTOME AIMING NEURODEGENERATIVE DISEASE
Rahul Bhardwaj¹, Phan T. Tue², Shinsuke Ishigaki³, Hidetaka Uno⁴, Zhi-Hong Wang⁴, Yoshiaki Ukita⁵, Sadahiro Iwabuchi⁶, Shinichi Hashimoto⁷, Takehiko Oka⁸, Kozo Kawahara⁹, Gen. Sobue⁶, Tsuneo Urisu⁴, Daisuke Hirose¹, and Yuzuru Takamura¹
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T149.e FLOW RATE DETERMINATION IN CAPILLARY-DRIVEN MICROFLUIDICS USING COMBINATORIAL SELECTION OF RESISTORS VIA ELECTROWETTING AND SMARTPHONE CONTROL
Marie L. Salva¹,², Yuksel Temiz¹, Marco Rocca², Yulieth C. Arango¹, Christof M. Niemeyer², and Emmanuel Delamarche¹
¹IBM Research – Zürich, SWITZERLAND and ²Karlsruhe Institute of Technology, GERMANY

T150.e HIGH-VOLUME FABRICATION OF SYLGARD 184 DEVICES FOR SINGLE CELL ANALYTICS
Christina Liedert¹, Benedek Poor², Olli-Heikki Huutunen¹, Johanna Hiitola-Keinänen¹, Sanna Aikio¹, Heli Pessa², Pinja Elomaa², Jussi Hiitunen¹, Päivi Saavalainen², and Leena Hakalahti¹
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T151.e LOW-COST, LARGE-SCALE, CONTINUOUS PRODUCT OF GIANT MAGNETIC MICROPARTICLES, AND CUSTOMIZED FUNCTIONALIZATION
Suk-Heung Song¹, Sujeong Lim¹, Hye Yeon Choi², Gyu Dong Kim², Joo Ho Kim², Yong-Gyun Jung², and Wook Park¹
¹Kyung Hee University, KOREA and ²Ezdiatech Inc., KOREA

T152.e PARTICLE MANIPULATION ON MAGNETIC GRID PATTERN
Fujio Tsumori
Kyushu University, JAPAN
T153.e  RAPID AND LOW-COST FABRICATION AND INTEGRATION OF COMPLEX 3D MICROFLUIDIC ARCHITECTURES FOR LAB-ON-BODY APPLICATIONS  
Haisong Lin, Christopher Yeung, Yichao Zhao, Shuyu Lin, Bo Wang, Xuanbing Cheng, Zhaqing Wang, Tianyou Cai, Wenzhuo Yu, and Sam Emaminejad  
University of California, Los Angeles, USA

T154.e  ROLL-TO-ROLL MANUFACTURING OF MICROFLUIDIC CHIPS FOR BIOANALYTICAL APPLICATIONS  
Jan Hesse1, Anja Haase1, Dieter Nees1, Stephan Rutloff1, Johannes Gütz1, Pelin Tören-Özgür1, Markus Rumpler1, Martin Smolka1, Georgios Kokkinis2, Günther Kriechhammer2, Daniel Scheidi2, Blanca Wilting3, Ingo Katzmayr3, Max Sonnleitner3, Mirko Lohse4, and Manuel Thesen4  
1Joanneum Research FmbH, AUSTRIA, 2Pessl Instruments GmbH, AUSTRIA, 3GENSPEED Biotech GmbH, AUSTRIA, and 4micro resist technology GmbH, GERMANY

T155.e  SELF-PROPELLING MICRO SWIMMER WITH CONTROLLABLE MOTION  
Cheolheon Park1, Yeongjae Choi2, Hansol Choi2, Seo Woo Song2, Sunghoon Kwon2, and Wook Park1  
1Kyung Hee University, KOREA and 2Seoul National University, KOREA

T156.e  THE DEVELOPMENT OF A MICROFLUIDIC BLOOD OXYGENATOR WITH FOUR-SIDED GAS TRANSFER CHANNELS  
Mohammadhossein Dabaghi1, Neda Saraei1, Gerhard Fusch1, Niels Rochow1, John L. Brash1, Christoph Fusch1,2, and P. Ravi Selvaganapathy1  
1McMaster University, CANADA and 2University Hospital Nuremberg, GERMANY

T157.e  3D PRINTING OF FLUORINATED POLYMERS TO MODULATE THE SURFACE WETTING BEHAVIOUR  
Patrick Risch, Dorothea Helmer, Frederik Kotz, and Bastian E. Rapp  
University of Freiburg, GERMANY

W144.e  ULTRA–THIN GLASS MICRO DOME STRUCTURE (GMDS) FOR MULTIDIRECTIONAL CELL OBSERVATION  
Yusufu Aishani1,2, Yaxiaer Yalikun1, Satoshi Amaya1, Yigang Shen1,2, and Yo Tanaka1,2  
1Biosystems Dynamics Research (BDR), JAPAN and 2Osaka University, JAPAN

W145.e  A SIMPLE AND ROBUST FABRICATION METHOD FOR CREATING 3D TAPERED POLYDIMETHYLSILOXANE CHANNELS  
Hoon Suk Rho1, Henk-Willem Veltkamp2, Danielle Baptista1, Séverine Le Gac1, and Pamela Habibovic1  
1Maastricht University, THE NETHERLANDS and 2University of Twente, THE NETHERLANDS
W146.e APPLICATION OF 3D-PRINTED MICROFLUIDIC DEVICE AND MINIATURE PHOTODETECTION TECHNOLOGY TOWARDS PHOTOMETRY-BASED BIOCHEMICAL ANALYSIS IN DEEP-SEA
Tatsuhiro Fukuba$^1$ and Yuki Sano$^2$
$^1$Japan Agency for Marine-Earth Science and Technology, JAPAN and $^2$Yokohama City University, JAPAN

W147.e BIOMIMETIC UNDULATED MICROWRINKLES CONSTRUCTION BY ORIENTING MICROPARTICLES IN RESPONSIVE HYDROGEL SHEETS VIA DIELECTROPHORESIS
Min-Yu Chiang, Yu-Chih Lo, and San-Yuan Chen
National Chiao Tung University, TAIWAN

W148.e DUAL-FIBER OPTICAL STRETCHER CONFIGURED FOR SINGLE CELL ROTATIONAL MANIPULATION
Liang Huang, Fei Liang, Peng Zhao, Yongxiang Feng, and Wenhui Wang
Tsinghua University, CHINA

W149.e A CELL-LOSS-FREE CONCAVE MICROWELL ARRAY BASED SIZE-CONTROLLED MULTI-CELLULAR TUMOROID GENERATION FOR ANTI-CANCER DRUG SCREENING
Soo Yeon Jeong, Sang Woo Lee, Tae Hoon Shin, and Gi Seok Jeong
Asan Medical Center, KOREA

W150.e KIRIGAMI-INSPIRED MESH FOR RARE CELL RECOVERY
Yaoping Liu$^1$, Meixuan Zhang$^1$, Han Xu$^2$, Xiaolong Rao$^3$, and Wei Wang$^1,4$
$^1$Peking University, CHINA, $^2$Peking University Shenzhen Graduate School, CHINA, $^3$Peking University First Hospital, CHINA, and $^4$National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA

W151.e LIGHT DRIVEN MASSIVE INTEGRATE GEL ACTUATOR FOR SINGLE CELL MANIPULATION
Yuha Koike$^1$, Yoshiyuki Yokoyama$^2$, and Takeshi Hayakawa$^1$
$^1$Chuo University, JAPAN and $^2$Toyama Industrial Technology Research and Development Center, JAPAN

W152.e MICROFLUIDIC, HIGHER-THROUGHPUT ICE RECRYSTALLIZATION INHIBITION ASSAY
Prashant Agrawal, Audrey K. Gruneberg, Laurie A. Graham, Peter L. Davies, and Richard D. Oleschuk
Queen’s University, CANADA

W153.e PCB-IMPLEMENTED GRAPHENE ELECTROLYTE-GATED FIELD-EFFECT TRANSISTORS FOR BIOSENSING APPLICATIONS
Sotirios Papamatsialou, Pedro Estrela, and Despina Moschou
University of Bath, UK
**W154.e** PDMS MICROFLUIDIC DEVICES FABRICATION BY A CYCLIC BIOMACHINING PROCESS
Arrate Santaolalla¹, Yara Alvarez-Braña¹, Gorka Gallastegui¹, Lourdes Basabe-Desmonts¹,², Naiara Rojo¹, and Fernando Benito-Lopez¹
¹University of the Basque Country, SPAIN and
²Basque Foundation of Science, SPAIN

**W155.e** SACRIFICIAL TEMPLATE REPLICATION-FABRIACTION OF SUSPENDED ARBITRARY THREE-DIMENSIONAL MICROCHANNELS IN FUSED SILICA GLASS
Frederik Kotz¹, Patrick Risch¹, Michael Thiel², Alexander Quick², Semih Sevim³, Joseph Puigmarti-Luis³, Dorothea Helmer³, and Bastian E. Rapp¹
¹University of Freiburg, GERMANY, ²Nanoscribe GmbH, GERMANY and
³ETH Zürich, SWITZERLAND

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Jinsik Yoon and Wook Park
Kyung Hee University, KOREA

**W157.e** THE ENCELADUS ORGANIC ANALYZER: INSTRUMENTATION AND METHODS FOR DETECTING TRACE ORGANIC MOLECULES IN OUR SOLAR SYSTEM
Zachary Estlack¹, Md Enayet Razu², Beau Compton², Zachary Duca³, Amanda Stockton³, Matin Golzar³, Anna Butterworth³, Jeremy McCauley³, James New⁴, Jungkyu Kim¹, and Richard A. Mathies⁴
¹University of Utah, USA, ²Texas Tech University, USA,
³Georgia Tech, USA, ⁴University of California, Berkeley, USA, and
⁵University of Kent, UK

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**M158.e** FABRICATION AND EVALUATION OF FLEXIBLE NANOVALVES IN 2D- NANOCHANNELS
Hiroto Kawagishi¹, Shunichi Funano², Yo Tanaka², Shuichi Kawamata³, and Yan Xu¹,³
¹Osaka Prefecture University, JAPAN, ²RIKEN, JAPAN, and
³Japan Science and Technology Agency (JST), JAPAN

**M159.e** FABRICATION OF NANOCHANNELS WITH EMBEDDED METAL ELECTRODES FOR ACTIVE CONTROL OF ZETA POTENTIAL
Kuanghua Chou, Alexander Eden, David Huber, and Sumita Pennathur
University of California, Santa Barbara, USA

**M160.e** RAPID STIMULI-RESPONSIVITY OF HYDROGEL MICROFIBER ACTUATOR WITH SURFACE POROUS STRUCTURE
Masahiko Karube and Hiroaki Onoe
Keio University, JAPAN
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Lucas J. Kooijman, Yasser Pordeli, Bernard Y. van der Wel, Erwin W. Berenschot, Jan C.T. Eijkel, and Niels R. Tas
University of Twente, THE NETHERLANDS

T159.e  LARGE-SCALE NANOPORE ARRAY BASED ON A COST-EFFECTIVE SHRINKAGE PROCESS FOR NANOSIZED TARGET SEPARATION
Yaoping Liu¹, Jingquan Liu²,³, and Wei Wang¹,²
¹Peking University, CHINA, ²National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA, and ³Shanghai Jiao Tong University, CHINA

W158.e  A SIMPLE METHOD FOR 3D MULTIMATERIAL NANOSTRUCTURE MANUFACTURING
Benoît X.E. Desbiolles, Arnaud Bertsch, and Philippe Renaud
École Polytechnique Fédérale de Lausanne, SWITZERLAND

W159.e  FREESTANDING GRAPHENE CVD GROWTH ON INSULATING SUBSTRATE USING GA CATALYST
Tomoki Tsuji, Kenta Arima, Kazuya Yamamura, and Kentaro Kawai
Osaka University, JAPAN

W160.e  INTEGRATING A NANOPORE INTO A MICRO-CHANNELED AFM CANTILEVER FOR THE LOCALIZED DETECTION OF IONS AND BIOMOLECULES
Tilman Schlotter¹, Morteza Aramesh¹, Csaba Forró¹, Livie Drowling-Carter¹, Ines Lüchtfeld², Stephan J. Ihle¹, Ivan Shorubalko³, Vahid Hosseini³, Dmitry Momotenko³, Tomaso Zambelli⁴, Enrico Klotzsch⁵, and Janos Vörös⁶
¹ETH Zürich, SWITZERLAND, ²Empa Dübendorf, SWITZERLAND, and ³Humboldt Universität zu Berlin, SWITZERLAND

M161.e  FABRICATION AND CHARACTERIZATION OF FLEXDYM–POLYCARBONATE DEVICES: IMPLEMENTING NEW MATERIALS FOR ORGAN-ON-CHIP TECHNOLOGIES
Alexander H. McMillan¹,², Emma K. Thomée¹,³, Alessandra Dellaquila¹,⁴, and Sasha Cai Lesher-Pérez¹
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T160.e  3D DIFFUSION-INDUCED MICROFABRICATION OF MECHANICALLY HETEROGENEOUS HYDROGEL FOR BIOMEDICAL APPLICATION
Chih-Chen Lin, and Yu-Chuan Su
National Tsing Hua University, TAIWAN
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Marta Broto¹, Brian Chen¹, Michael R. Thomas¹, Chris S. Wood¹, Amrit S. Lota², Sanjay Prasada, and Molly M. Stevens¹  
¹Imperial College London, UK and ²Royal Brompton Hospital, UK

**W161.e** ENGINEERED 3D ELECTROOSMOTIC MICROCHANNELS FOR RAPID AND MASS TRANSPORTATION OF BODY FLUIDS IN WEARABLE DEVICES  
Shinya Kusama, Kaito Sato, Yuya Matsui, Shotaro Yoshida, and Matsuhiko Nishizawa  
Tohoku University, JAPAN

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Hiroki Naito¹, Takao Yasui¹, Taisuke Shimada¹, Nobutaka Shioya², Takafumi Shimoaka², Masayoshi Tanaka³, Kazuki Nagasima⁴, Mina Okochi³, Takeshi Yanagida⁵, Takeshi Hasegawa⁶, and Yoshinobu Baba¹  
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Jie Cheng, Yudong Yang, Haiyang Mao, Yifei Ye, Wenjie Zhao, Xinyu Wei, Yang Zhao, Mingxiao Li, and Chengjun Huang  
Chinese Academy of Sciences, CHINA

**T162.e** FABRICATION OF TiO₂ MICRO-SPIKES AND MICRO-FLOWERS FOR MASSIVELY PARALLEL INTRACELLULAR DELIVERY  
Loganathan Mohan¹, Srabani Kar², Balasubramaniam Nandhini¹, Pallavi Gupta¹, Pallavi Shinde¹, Pallab Sinha Mahapatra¹, and Tuhin Subhra Santra¹  
¹Indian Institute of Technology, Madras (IITM), INDIA and ²University of Cambridge, London, UK

**T163.e** STRETCHABLE AND TRANSPARENT SUPERHYDROPHOBIC AND OLEOPHOBIC PDMS THIN FILM WITH HIERARCHICAL STRUCTURES  
Chaerin Yu¹, Eungjun Lee², Do Hyun Kim², and Dong-Weon Lee¹  
¹Chonnam National University, KOREA and ²Korea Advanced Institute of Science and Technology (KAIST), KOREA
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Yuta Kuwahata1, Hiroaki Takehara1,2, and Takanori Ichiki1,2
1University of Tokyo, JAPAN and 2Innovation Center of NanoMedicine (iCONM), JAPAN

MASKLESS SURFACE PATTERNING BY PLASMA POLYMERIZATION FOR MULTIBIOSENSING APPLICATIONS
Laura Barillas1, Ekaterina Makhneva1, Ihsan Amin1, Klaus-Dieter Weltmann1, Hermann Seitz2, and Katja Fricke1
1Leibniz Institute for Plasma Science and Technology (INP), GERMANY and 2University of Rostock, GERMANY

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Zhenglin Li and Sung-Jin Kim
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Koki Yoshida, Tomoki Hayashi, and Hiroaki Onoe
Keio University, JAPAN

BUBBLE-ASSISTED MICRO / NANOFUIDICS: DEMONSTRATION OF BUBBLE GENRATION AND VALVE FUNCTION
Shun Furukawa, Kazuma Mawatari, and Takehiko Kitamori
University of Tokyo, JAPAN

A MICROFLUIDIC CHIP INTEGRATING IMPEDANCE FLOW CYTOMETRY AND ELECTRIC IMPEDANCE SPECTROSCOPY FOR SINGLE-CELL ELECTRICAL PROPERTY MEASUREMENT
Yongxiang Feng, Peng Zhao, Fei Liang, Liang Huang, and Wenhui Wang
Tsinghua University, CHINA

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Ryoutarou Oishi, Tatsumi Mizuta, Kenji Sueyoshi, Tatsuro Endo, and Hideaki Hisamoto
Osaka Prefecture University, JAPAN

ANALYTE CAPTURE IN AN ARRAY OF FUNCTIONALIZED DROPLETS FOR A REGENERABLE BIOSENSOR
Charles-Louis Azzopardi, Franck Chollet, Jean-François Manceau, and Wilfrid Boireau
University Bourgogne Franche-Comté, FRANCE
M168.f CENTRIFUGAL MICROFLUIDIC PLATFORM COMPRISING AN ARRAY OF BEAD MICROCOLUMNS FOR THE MULTIPLEXED COLORIMETRIC QUANTIFICATION OF INFLAMMATORY BIOMARKERS AT THE POINT-OF-CARE
Ahmad S. Akhtar, Inês F. Pinto, Ruben R.G. Soares, and Aman Russom
KTH Royal Institute of Technology, SWEDEN

M169.f DEVELOPING INTEGRATED CENTRIFUGAL CONVECTIVE PCR DEVICE FOR DETECTION OF DRUG-RESISTANT GENE
Sakiko Ushiro, Masato Saito, Wilfred V. Espulgar, and Eiichi Tamiya
Osaka University, JAPAN

M170.f ELECTRICAL DETECTION OF DEOXYRIBONUCLEASE USING DNA MOLECULES IMMOBILIZED BETWEEN MICROELECTRODES
Takahiro Himuro, Shota Tsukamoto, and Yoji Saito
Seikei University, JAPAN

M171.f ENHANCING THE SENSING PERFORMANCE OF APTAMERIC GFETs FOR INTERLEUKIN-6 DETECTION USING NEGATIVE ELECTRIC FIELD
Zhuang Hao, Yunlu Pan, Cong Huang, and Xuezeng Zhao
Harbin Institute of Technology, CHINA

M172.f IDENTIFYING MULTIPLE VIRAL SPECIES AT A SINGLE PARTICLE LEVEL USING A COMBINATION OF NANOPORES AND MACHINE LEARNING APPROACH
Akihide Arima1, Makusu Tsutsui2, Yoshida Takeshi2, Kazumichi Yokota2, Wataru Tonomura2, Takao Yasui1, Taisuke Shimada1, Tomoko Yamazaki2, Kenji Tatematsu2, Shun’ichi Kuroda2, Masateru Taniguchi2, Takashi Washio2, Tomoji Kawai2, and Yoshinobu Baba1
1 Nagoya University, JAPAN and 2 Osaka University, JAPAN

M173.f INKJET-PRINTED SINGLE-STEP COMPETITIVE IMMUNOASSAY MICRODEVICE FOR THE DETECTION OF CRP
Yuko Kawai1, Masaya Kakuta2, Kenji Sueyoshi1, Tatsuro Endo1, and Hideaki Hisamoto1
1 Osaka Prefecture University, JAPAN and 2 Sysmex Corporation, JAPAN

M174.f MULTIPLEXED DETECTION OF PLANT HEALTH BIOMARKERS
Eduardo J.S. Brás1,2, Ana M. Fortes2, Virginia Chu1, Pedro Fernandes2, and João P. Conde1,2
1 Institute of Nanoscience and Nanoscience and Nanotechnology, PORTUGAL and 2 Universidade de Lisboa, PORTUGAL
M175.f PRIMARY HAEMOSTASIS ASSESSMENT BY REAL-TIME DIRECT SENSING OF PLATELET-COLLAGEN INTERACTIONS UNDER DYNAMICS IN A BROAD SHEAR RATE SPECTRUM WITH MICROACOUSTIC BIOSENSOR APPROACH
Aleksandr Oseev\textsuperscript{1}, Fabien Remy-Martin\textsuperscript{1}, Thomas Lecompte\textsuperscript{2}, Alain Rouleau\textsuperscript{1}, Guillaume Mourey\textsuperscript{1,3,4}, Jean-François Manceau\textsuperscript{1}, Céline Élie-Caille\textsuperscript{1}, Wilfrid Boireau\textsuperscript{1}, Emmanuel de Maistre\textsuperscript{5}, and Thérèse Leblois\textsuperscript{1}
\textsuperscript{1}Université de Bourgogne Franche-Comté, FRANCE, \textsuperscript{2}Geneva University, SWITZERLAND, \textsuperscript{3}University Hospital of Besançon, FRANCE, \textsuperscript{4}Laboratoire de Biologie Médicale et de Greffe, FRANCE, and \textsuperscript{5}Centre Hospitalier Universitaire de Dijon, FRANCE

M176.f RETROREFLECTIVE OPTICAL IMMUNOSENSING BASED ON THE BIOSPECIFIC PARTICLE MOVEMENT AND TIME-LAPSE IMAGING IN MICROCHANNEL
Kyung Won Lee, Kwan Young Jeong, Ka Ram Kim, Hyeong Jin Chun, and Hyun C. Yoon
Ajou University, KOREA

M177.f SMARTPHONE-INTEGRATED IMMUNOSENSING BASED ON THE WAVELENGTH FILTERING FROM CHROMOGENIC ENZYMATIC REACTION
Kwan Young Jeong, Saemi Kim, Kyung Won Lee, Ka Ram Kim, Hyeong Jin Chun, and Hyun C. Yoon
Ajou University, KOREA

M178.f SWEAT LACTIC ACID MONITORING SYSTEM USING PLASTER-BASED SAMPLING DEVICE FOR APPLICATION IN INTENSIVE CARE UNIT
Yusuke Suzuki\textsuperscript{1}, Akiko Hosoyama\textsuperscript{2}, Kenichiro Morisawa\textsuperscript{2}, Yasuhiko Taira\textsuperscript{2}, and Hiroyuki Kudo\textsuperscript{1}
\textsuperscript{1}Meiji University, JAPAN and \textsuperscript{2}St. Marianna University School of Medicine, JAPAN

M179.f USE OF A GLASS FIBRE MEMBRANE (GF/DVA) TOWARDS THE DEVELOPMENT OF A LATERAL FLOW ASSAY FOR DETECTION OF TRICLOSAN IN RIVER WATER
Samantha Richardson, Alexander Iles, Jeanette M. Rotchell, Mark Lorch, and Nicole Pamme
University of Hull, UK

T165.f A DNA NANOTECHNOLOGY TOOLBOX FOR MIX-AND-MATCH BIOSENSOR DESIGN
Iene Rutten, Saba Safdar, Karen Ven, Devin Daems, Dragana Spasic, and Jeroen Lammertyn
KU Leuven, BELGIUM

T166.f AN ON-DEMAND HIGH-INTEGRATED MICROFLUIDIC DROPLET PLATFORM FOR SENSITIVE AND RAPID SERS DETECTION OF EPSTEIN-BARR VIRUS DNA
Wen Wu, Ya-Ning Wang, Wen-Shu Zhang, Wen-Qi Ye, Yue Wang, and Zhang-Run Xu
Northeastern University, CHINA
T167.f ANGULAR-BASED MEASUREMENT IN 3D PAPER-BASED ANALYTICAL DEVICES
Dong-Ho Kim, Seong-Geun Jeong, Byungjin Lee, Jaeseong Kim, and Chang-Soo Lee
Chungnam National University, KOREA

T168.f CONTINUOUS TISSUE-SELEX UTILIZING A PRE-SCREENING PROCESS FOR MEMBRANE TARGETING APTAMERS ON AN INTEGRATED MICROFLUIDIC SYSTEM
Yi-Cheng Tsai and Gwo-Bin Lee
National Tsing Hua University, TAIWAN

T169.f SLIPSZYMES: LUBRICANT-INFUSED DNAZYME SURFACES FOR DETECTION OF PATHOGENIC BACTERIA IN COMPLEX FLUIDS
Hanie Yousefi1, Sahar E. Samani2, Akansha Prasad2, Amid Shakeri2, Hsuan-Ming Su2, Carlos D.M. Filipe2, and Tohid F. Didar2
1University of Toronto, CANADA and 2McMaster University, CANADA

T170.f ELECTRICAL DETECTION OF THE MECHANICAL ALTERATION OF SICKLING RED BLOOD CELLS WITHIN A MICROFLUIDIC CAPILLARY NETWORK
Xu Tieying1, Maria Lizzarralde2, Jean Roman1, Wassim El Nemem2, Bruno Le Pioufle1, and Olivier François1,2
1ENS Paris-Saclay, FRANCE, 2INTS, FRANCE and 3ESYCOM, FRANCE

T171.f FLEXIBLE MICROFLUIDIC NETWORKS ENABLING RAPID PROTOTYPING OF NOVEL SURFACE CHEMISTRIES IN LAB-ON-CHIP
Francesca Costantini1, Lorenzo Iannascoli1, Nicola Lovechio1, Mara Mirasoli2, Giampiero de Cesare1, Domenico Caputo1, and Augusto Nascetti1
1Sapienza University of Rome, ITALY and 2University of Bologna, ITALY

T172.f IMMUNOASSAYS BASED ON HOT ELECTRON INDUCED ELECTROCHEMILUMINESCENCE ON DISPOSABLE CELL CHIPS WITH PRINTED ELECTRODES
Nur-E-Habiba1,2, Kalle Salminen2, Päivi Grönroos2, Esko Kauppinnen1, Veikko Sariola1, and Sakari Kulmala2
1Tampere University, FINLAND and 2Aalto University, FINLAND

T173.f ISOHERMAL NANOPORE DNA SENSING USING DIFFUSION CURRENT
Wei-Lun Hsu1, Soumyadeep Paul1, Zhen Gu2, Ya-Lun Ho1, Jean-Jacques Delaunay1, Yi-Lun Ying2, Yi-Tao Long2,3, and Hirofumi Daigui1
1University of Tokyo, JAPAN, 2East China University of Science and Technology, CHINA, and 3Nanjing University, CHINA

T174.f OPTICAL BIOSENSING ON A SMART HANDSET: NON-SPECTROSCOPIC SENSING PLATFORM BASED ON RETROREFLECTION
Ka Ram Kim, Hyeong Jin Chun, Kyung Won Lee, Kwan Young Jeong, and Hyun C. Yoon
Ajou University, KOREA
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**Biosensors**

**T175.f** QUANTUM-LIMITED 2D SENSORS FOR PH AND BIOSENSING  
Arvind Balijepalli1, Son T. Le1,2, Harish C. Pant1, and Curt A. Richter1  
1National Institute of Standards and Technology (NIST), USA,  
2Theiss Research, USA, and 3National Institutes of Health (NIH), USA

**T176.f** SENSITIVE REAGENT-FREE ELECTROCHEMICAL DETECTION OF HORMONE CORTISOL USING HYBRID NANOCOMPOSITE-BASED SENSORS  
Bo Wu, Ye Liu, Yi-Chieh Wang, and Li-Jing Larry Cheng  
Oregon State University, USA

**T177.f** SURFACE ENHANCED RAMAN SCATTERING ACTIVE CHIPS FOR MYCOTOXIN DETECTION IN FOOD MATRICES  
Alessandro Chiado, Chiara Novara, Niccolò Paccotti, Paola Rivolo, Francesco Geobaldo, and Fabrizio Giorgis  
Politecnico di Torino, ITALY

**T178.f** THREE-DIMENSIONAL PAPER-BASED DEVICE WITH INTEGRATED TIMER FUNCTION FOR PERSONAL IMMUNOASSAY APPLICATIONS  
Chung-An Chen, Chiao-Wen Chen, Shi-Jia Chen, Chin-Chou Chu, and Chien-Fu Chen  
National Taiwan University, TAIWAN

**T179.f** UTILIZING A LIGHT IMAGE ARRAY WITH VARYING LIGHT INTENSITIES IN OPTICALLY-INDUCED DIELECTROPHORESIS (ODEP)-BASED MICROFLUIDIC SYSTEM FOR A CULTURE-FREE SCREEN OF BACTERIA WITH DIFFERENT RESPONSES TO ANTIBIOTICS TREATMENT  
Po-Yu Chu1, Chih-Yu Chen1, and Min-Hsien Wu1,2  
1Chang Gung University, TAIWAN and 2Chang Gung Memorial Hospital, TAIWAN

**W165.f** A NOVEL HANDHELD MICRO-CAPILLARY BIOSENSOR FOR SALIVARY CORTISOL  
Young J. Kim, Wan J. Kim, and Bongjin Jeong  
Electronics and Telecommunications Research Institute, KOREA

**W166.f** A NOVEL OXYGEN NANOSENSOR FOR IN VITRO MICROENVIRONMENT MONITORING IN MESENCHYMAL STEM CELL CULTURE  
Yunjie Hao1,2, Manohar Prasad Koduri1,2, Fan Gang Tseng1,3, James Henstock2, John A. Hunt2,4, and Judy Curran2  
1National Tsing Hua University, TAIWAN, 2University of Liverpool, UK, 3Academia Sinica, TAIWAN, and 4Nottingham Trent University, UK

**W167.f** AN INTEGRATED CAPILLARY-DRIVEN IMPEDIMETRIC BIOSENSOR FOR MICROPARTICLE-LABELED IMMUNOASSAY  
Ali Khodayari Bavil1, Drago Sticker2, Peter Ertl2, and Jungkyu Kim3  
1Texas Tech University, USA, 2Vienna University of Technology, AUSTRIA, and 3University of Utah, USA
W168.f  ASSESSMENT OF CARDIOMYOCYTE MATURITY BY MEASURING CHANGES IN CONTRACTILE FORCE ACCORDING TO DRUG CONCENTRATION
Jong Yun Kim and Dong-Weon Lee
Chonnam National University, KOREA

W169.f  CYTOTOXICITY ASSAYS WITH SINGLE CELL RESOLUTION BASED ON SINGLE CELL ADHESION DOT ARRAYS (SCADA)
Maite Garcia-Hernando1, Alba Calatayud-Sanchez1, Jaione Etxebarria-Elezgarai1, Marian M. de Pancorbo1, Fernando Benito-Lopez1, and Lourdes Basabe-Desmonts1,2
1 University of the Basque Country, SPAIN and 2Basque Foundation of Science, SPAIN

W170.f  DIGITAL PHOTOGRAPHY TECHNIQUES IN MICROFLUIDICS: EXPOSURE BRACKETING FOR HIGH DYNAMIC RANGE MAGNETOPHORETIC CYTOMETRY
Ozgun Civelekoglu, Ningquan Wang, Ruxiu Liu, Mert Boya, Tevhide Ozkaya-Ahmadov, and A. Fatih Sarioğlu
Georgia Institute of Technology, USA

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1 National Tsing Hua University, TAIWAN and 2 Academia Sinica, TAIWAN

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1 Korea Institute of Science and Technology (KIST), KOREA and 2Seoul National University, KOREA

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1 Academy of Scientific and Innovative Research, INDIA, 2 Central Scientific Instruments Organization, INDIA, and 3 University of Hull, UK

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¹Ben-Gurion University, ISRAEL and  
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¹Kanagawa Institute of Industrial Science and Technology, JAPAN and  
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¹University of Southampton, UK and ²SouthWestSensor Ltd, UK

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¹Keio University, JAPAN and ²Osaka Prefecture University, JAPAN

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¹University of Toronto, CANADA, ²McGill University, CANADA, and ³University of Pennsylvania, USA
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1ETH Zürich, SWITZERLAND and 2University of Basel, SWITZERLAND

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1University of Rome Tor Vergata, ITALY and 2CNR Institute for Photonics and Nanotechnologies, ITALY

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1National Tsing Hua University, GERMANY, 2Academia Sinica, TAIWAN, 3National Defense Medical Center, TAIWAN, 4National Taiwan University, TAIWAN, 5Norwegian University of Science and Technology, NORWAY, 6Centro de Investigación en Ciencias Atómicas, COSTA RICA, and 7University of Costa Rica, COSTA RICA

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1Leibnitz IFW Dresden, GERMANY, 2Universitätsklinikum Carl Gustav Carus an der Technischen Universität Dresden, GERMANY, and 3Chemnitz University of Technology, GERMANY

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1Kyoto University, JAPAN and 2Panasonic Corporation, JAPAN

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1University of Virginia, USA and 2University of Rome Tor Vergata, ITALY

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Vincent Haguet1, Dorothée Balle1, and Gaëlle Saint-Aurel2
1CEA Grenoble, FRANCE and 2GENEL SAS, FRANCE

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1Hokkaido University, JAPAN, 2Tianma Japan, Ltd., JAPAN, 3Hokkaido Institute of Public Health, JAPAN, and 4Tohoku University, JAPAN

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1Hitachi, Ltd., JAPAN and 2Hitachi High-Technologies Corporation, JAPAN

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1Korea University, KOREA and 2Korea Research Institute of Ships & Ocean Engineering, KOREA

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Katsumi Uchiyama², and Hizuru Nakajima²
¹Tokyo University of Pharmacy and Life Sciences, JAPAN,
²Tokyo Metropolitan University, JAPAN,
³Mebius Advanced Technology Ltd., JAPAN, and
⁴Aichi Institute of Technology, JAPAN

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¹Hong Kong University of Science and Technology, HONG KONG and
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¹ Chalmers University of Technology, SWEDEN, ² Freie Universität Berlin, GERMANY, and ³ Umeå University, SWEDEN

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¹ University of Split, CROATIA and ² Bedalov d.o.o for Research, Development, Innovation and Consulting, CROATIA

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¹ École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and ² ETH Zürich, SWITZERLAND
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1 Nara Institute of Science and Technology, JAPAN, 2 RIKEN, JAPAN, and 3 Osaka University, JAPAN

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1 Queen’s University, CANADA and 2 CMC Microsystems, CANADA

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1 Maastricht University, THE NETHERLANDS and 2 Hasselt University, BELGIUM

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Jongsung Park1, Dong-Su Kim1, Ji-Kwan Kim2, and Dong-Weon Lee1
1 Chonnam National University, KOREA and 2 Gwangju University, KOREA

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Kelu Peng1, Sunghyun Cho2, Junyi Yao1, Younghak Cho2, Hyunsoo Kim2, and Jaewon Park1
1 Southern University of Science and Technology, CHINA, 2 Korea Institute of Machinery and Materials (KIMM), KOREA, and 3 Seoul National University of Science and Technology, KOREA
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